Product Catalog

Commercial Self-Contained
Intellipak™ Signature Series
Remote Air-Cooled Condenser

20 - 110 Tons — Water-Cooled
20 - 60 Tons — Air-Cooled

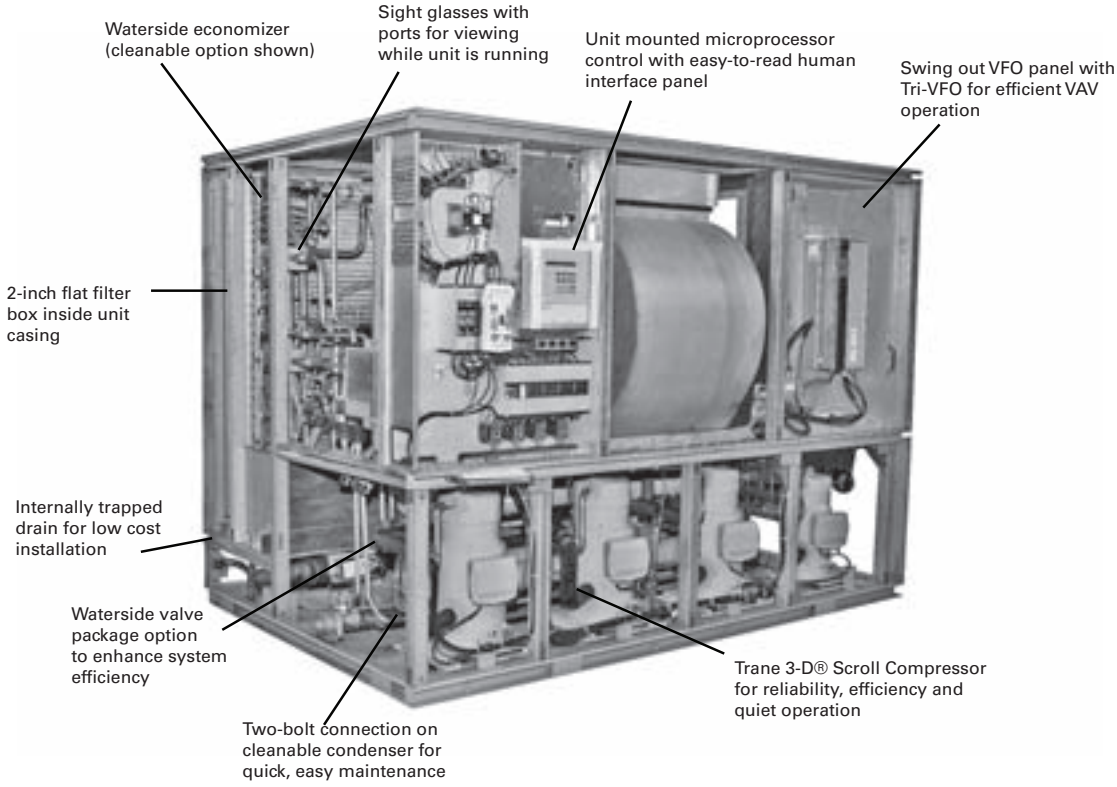
June 2014

PKG-PRC002U-EN

Introduction

Affordable Self-Contained Value from Trane…

IntelliPak™ Signature Series Self-Contained Units



Revision History

PKG-PRC002-EN (26 Jun 2014). Updated evaporator fan and low flow fan information in General Data tables. Reordered General Data tables

PKG-PRC002-EN (04 Apr 2013). Add wireless comm interface (WCI).

PKG-PRC002-EN (18 Oct 2012). Corrected Table 60 values. Updated fan FLA and LRA values in Electrical Data tables.

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Features and Benefits

Why consider Signature Series self-contained floor-by-floor systems?

Improved Cash Management

- Factory-installed and tested options reduce field labor and installation risk, while improving system reliability
- Requires less sophisticated maintenance than built-up systems

Tenant Satisfaction

- Complete HVAC system on each floor minimizes tenant inconvenience during routine maintenance
- Tenants can control system after hours to increase productivity and minimize expense

Low First Cost

- Reduce field labor, installation time, and cost with factory packaged controls and piping
- Reduce installed tonnage up to 20 percent by taking advantage of building diversity and VAV flexibility
- Flexible air discharge arrangement matches most building configurations

Lower Installed Cost

- Single point power connection
- Single point water connection
- Factory commissioned and tested controls
- Factory installed options
- Internally trapped drain connection

Economical Operation

- Free cooling with waterside or airside economizer
- Energy savings with floor-by-floor system since only units on floors requiring cooling need to operate
- Significant annual energy consumption reduction due to partial occupancy after-hours, when compared to a central chilled water system
- Simple heating alternatives include perimeter radiation and fan-powered VAV
- Energy savings from the integrated water valve control using pump unloading

Assured Acoustical Performance

- Flexible, horizontal discharge plenum provides smooth airflow, reducing static pressure losses for optimum acoustical performance
- Multiple compressor design reduces acoustical levels. Scroll compressor design smooths gas flow for quieter operation

Indoor Air Quality (IAQ) Features

- Sloped drain pan
- Stainless steel sloped drain pan option
- Internally trapped drain connection
- Double wall construction option
- Matt-faced fiberglass insulation
- High efficiency throwaway filter option

- Easily cleanable evaporator, condensers, and waterside economizers
- Filter access door allows easy removal to encourage frequent filter changing
- Airside economizer with Traq™ damper allows direct measurement and control of outdoor air

Enhanced Serviceability

- Self-supporting removable panels
- Quick access service panel fasteners
- Eye level control/service center
- Refrigerant line sight glasses in view during operation

Competitive Advantage

- Increased capacity to meet today's growing floor plates and building loads
- Compact cabinet to minimize mechanical room requirements
- Up to 17% more efficient than competitive units
- Low leaving air temp capability to reduce fan motor energy, improve acoustical performance, and minimize duct sizes
- Factory-installed and tested IntelliPak™ microprocessor controller

Standard Features

- 20 through 110 ton industrial/commercial water-cooled self-contained units
- 20 through 60 ton industrial/commercial remote air-cooled self-contained units
- Fully integrated, factory-installed, and commissioned microelectronic controls
- Unit mounted human interface panel with a two line x 40 character clear language (English, Spanish, or French) display and a 16-function keypad that includes custom, diagnostics, and service test mode menu keys
- Improved Trane 3-D™ scroll compressor
- Compressor lead/lag
- CV or VAV system control
- Low ambient compressor lockout adjustable control input
- EISA efficiency open drip proof (ODP) and totally enclosed fan (TEFC) cooled supply fan motor options
- FROSTAT™ coil frost protection on all units
- Daytime warm-up (occupied mode) on units with heat and morning warm-up operation on all units
- Supply air static over pressurization protection on units with variable frequency drives (VFDs)
- Supply airflow proving
- Supply air tempering control with heating option
- Supply air heating control on VAV with hydronic heating option
- Emergency stop input
- Mappable sensors and setpoint sources
- Occupied/unoccupied switching
- Timed override activation
- Refrigeration circuits are completely factory piped and tested on water-cooled units
- Factory piped and tested, mechanically cleanable water-cooled condensers

- Two-bolt removable condenser waterboxes for quick and easy cleaning
- Sloped drain pans to ensure complete condensate removal for IAQ
- Internally trapped drain connection with cleanout
- Internally isolated centrifugal supply fan
- Sturdy-gauge galvanized steel framework with easily removable painted galvanized steel exterior panels
- UL listing on standard options
- Fan belts and grease lines are easily accessible
- Access panels and clearance provided to clean both evaporator and waterside economizer coil fins
- Condensing pressure control on all variable water flow systems with valves
- Programmable water purge during unoccupied mode
- High entering air temperature limit
- Low entering air temperature limit with waterside economizer or hydronic heat
- Shipped with protective shrink wrap covering of unit and any indoor modules shipped loose

Optional Features

- Trane communication interface module: ICS interface control module
- BACnet Communication Interface Module
- Generic BAS interface
- Comparative enthalpy control
- Ventilation override from up to five external inputs
- Remote human interface controls up to four units
- Fully integrated, factory-installed/commissioned variable frequency drive control with or without optional integrated bypass
- Waterside economizer with factory installed piping and controls
- Waterside modulating condensing temperature control valves include factory installed piping and control wiring
- Removable cast iron headers on cleanable waterside economizer
- Flexible horizontal discharge plenum with or without factory cut holes
- Heating options include hot water, steam, and electric
- Refrigerant suction discharge line service (shut-off) valves
- Protective coatings for the unit and/or evaporator coils
- Double wall construction
- Stainless steel sloped drain pan
- Medium efficiency throwaway filters
- Through-the-door non-fused disconnect switch
- Trane's air quality Traq™ damper in airside economizer mixing box
- High duct temperature thermostat
- Dual electrical power connection
- CO2 reset input
- 2 and 4-inch filter racks for all sizes
- Hi-capacity coils available on many models

Variable Frequency Drives (VFD)

Variable frequency drives are factory installed, wired, and tested to provide supply fan motor speed modulation. VFDs are quieter and more efficient than inlet guide vanes and may even be eligible for utility rebates. The VFDs are available with and without a manual integrated bypass option, controlled through the human interface (HI) panel. Bypass control provides full nominal airflow control to CV zone setpoints in the unlikely event of a drive failure by manually placing the drive in the bypass mode.

Field Installed Accessories

- Airside economizer control with or without mixing box
- Wireless comm interface (WCI)
- Programmable sensors with or without night set back for CV and VAV systems
- ICS zone sensors used with Tracer™ system for zone control
- Field installed module kits available for field upgrade of controls
- Ultra low leak dampers for 0-100 percent modulating fresh air economizer

Integrated Self-Contained Systems

Integrated Comfort™ System (ICS)

Trane's Integrated Comfort system (ICS) increases job control by combining IntelliPak™ Signature Series self-contained units and a Tracer™ building management system. This integrated system provides total building comfort and control. Building owners and managers not only save energy when using ICS. They have the ability to automate their facilities and the convenience of a control system interface.

Simplifying The Comfort System

Trane's designers combined new technology and innovation to bring you more system capabilities and flexibility. Our Integrated Comfort System (ICS) with HVAC equipment is easy to use, install, commission, and service.

Everything you need to know about your self-contained VAV system is available using Tracer, Trane's family of building automation products. Tracer is a software package that minimizes custom programming requirements and allows easy system setup and control using your personal computer. By enabling all CSC units to communicate using the LonTalk interface, transforming your heating and cooling units into a true system is made simple.

Operating data from all system components is readily available for evaluation. You can control, monitor, and service your facility—all from your personal computer. That is why all Tracer controls have been designed to be LonTalk compatible.

The IntelliPak self-contained unit, as part of Trane ICS, provides powerful maintenance monitoring, control, and reporting capabilities. Tracer places the self-contained unit in the appropriate operating mode for: system on/off, night setback, demand limiting, setpoint adjustment based on outside parameters and much more. You can monitor unit diagnostic conditions through Tracer such as: sensor failures, loss of supply airflow, and an inoperative refrigerant circuit.

Tracer points monitored for IntelliPak Signature Series Self-Contained include:

- Compressor on/off status
- Ventilation status
- Condenser water flow status
- Heat status
- Supply air pressure
- Supply air temperature
- Suction temperature of each circuit
- Entering economizer water temperature
- Zone temperature
- Entering condenser water temperature
- Supply air temperature reset signal
- Morning warm-up sensor temperature
- Entering air temperature

Tracer control points available for IntelliPak Signature Series self-contained include:

- Cooling and heating setpoints
- VAV discharge air temperature setpoints
- Supply air pressure setpoint
- Cooling and heating enable/disable
- Air economizer enable/disable
- Airside economizer minimum position
- Unit priority shutdown

Commissioning, control, efficiency, and information…it simply all adds up to one reliable source…Trane.

Interoperability with BACnet™

The Trane Tracer SC BACnet Control Interface (BCI) for IntelliPak self-contained offers a building automation control system with outstanding interoperability benefits. BACnet, which is an industry standard, is an open, secure and reliable network communication protocol for controls, created by American Society of Heating, refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).

Interoperability allows application or project engineers to specify the best products of a given type, rather than one individual supplier's entire system. It reduces product training and installation costs by standardizing communications across products. Interoperable systems allow building managers to monitor and control IntelliPak equipment with Tracer SC controls or a 3rd party building automation system. It enables integration with many different building controls such as access/intrusion monitoring, lighting, fire and smoke devices, energy management, and a wide variety of sensors (temperature, pressure, humidity, occupancy, CO_2 and air velocity).

Trane Wireless Comm Interface (WCI)

The Trane® Wireless Comm Interface (WCI) is the perfect alternative to Trane's BACnet™ wired communication links (for example, Comm links between a Tracer™ SC and a Tracer™ UC400). Minimizing communication wire used between terminal products, zone sensors, and system controllers has substantial benefits. Installation time and associated risks are reduced. Projects are completed with fewer disruptions. Future re-configurations, expansions, and upgrades are easier and more cost effective.

Trane R-410A 3-D™ Scroll Compressor

The R-410A Trane 3-D™ Scroll provides important reliability and efficiency benefits inherent in its design. The 3-D™ Scroll allows the orbiting scrolls to touch in all three dimensions, forming a completely enclosed compression chamber which leads to increased efficiency. In addition, the orbiting scrolls only touch with enough force to create a seal, eliminating wear between the scroll involutes. The fixed and orbiting scrolls are made of high strength cast iron which results in less thermal distortion and minimal leakage. In addition, improved part isolation provides reduced compressor sound levels compared to previous designs.

Features listed below optimize the compressor design and performance:

- Optimized scroll profile
- Heat shield protection to reduce heat transfer between discharge and suction gas
- Improved sealing between high side and low side

Additional features are incorporated in the compressor design for greater reliability:

- Patented design motor cap for improved motor cooling
- Improved bearing alignment
- Improved resistance to dry start-up
- Oil sight glass for evaluating proper oil levels

Low Torque Variation

The 3-D™ Scroll has a very smooth compression cycle, imposing very little stress on the motor and resulting in greater reliability. Low torque variation reduces noise and vibration.

Suction Gas Cooled Motor

Compressor motor efficiency and reliability is further optimized with the latest scroll design. The patented motor cap directs suction gas over the motor, resulting in cooler motor temperatures for longer life and better efficiency.

Proven Design through Testing and Research

The new R-410A 3-D™ Scroll compressor is the next generation of reliable Trane 3-D™ Scroll compressors provided by Trane, the leader in scroll compressor technology.

Figure 1. One of two matched scroll plates - the distinguishing feature of the scroll compressor

Application Considerations

Self-Contained Acoustical Recommendations

Successful acoustical results are dependent on many system design factors.

Following are general acoustical recommendations. For more information, or if there is concern about a particular installation, contact a professional acoustical consultant.

Location and Orientation of the Mechanical Equipment Room

Locate the equipment room adjacent to stairwells, utility rooms, electrical closets, and rest rooms if possible (See figure below). This minimizes the acoustic effects and risk of workmanship or installation errors. Place the discharge and return air ductwork over these less acoustically sensitive areas, using vertical or horizontal fresh air shafts. Consult code requirements for fresh air and smoke purge constraints.

Return Air Ductwork

Duct the return air into the mechanical equipment room. Connect ductwork to the unit if local code dictates. The return air ductwork must have an elbow inside the equipment room. This elbow will reduce sound transmissions through the return duct. Extend the ductwork from the elbow far enough to block the "line of sight" to the exterior of the equipment room. Use a minimum ductwork length of 15 feet to the equipment room exterior. Line the duct with two-inch, three-pound density insulation. Use multiple, small return ducts for better acoustical performance to the occupied space.

Supply Air Ductwork

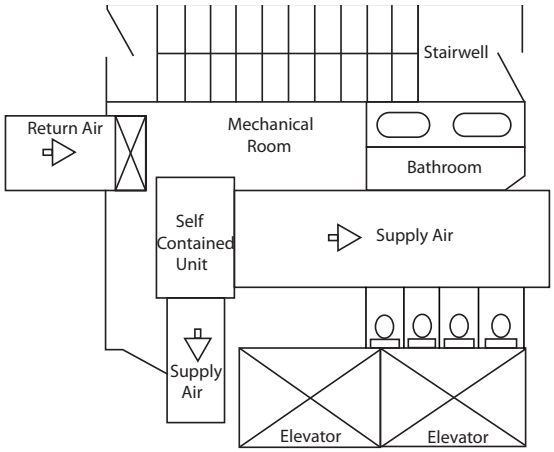
Insulate the supply air duct with two-inch, three-pound density insulation. Extend this lining at least 15 feet out from the equipment room wall, keeping the duct aspect ratio as small as possible. Minimize large flat panels since they transmit sound. In addition, small aspect ratios will minimize potential "oil canning" of the duct due to flow turbulence.

The flexible horizontal discharge plenum option helps avoid complicated ductwork transitions. Ductwork turning vanes typically improve pressure drop but degrade acoustical performance.

Recommended Maximum Air Velocities

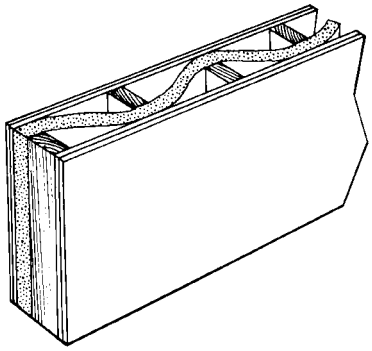
The maximum recommended velocity for the discharge air duct is 2,000 fpm. The maximum recommended velocity for the return air duct is 1,000 fpm. Limit air velocities below these operating points to minimize the risk of flow turbulence that causes regenerated noise. Using round supply duct and static regain allows maximum discharge air velocities up to 3,000 fpm. Lining round supply duct also substantially lowers frequency noise attenuation. However, flow regenerated noise potential increases dramatically at air velocities over 3000 fpm.

Figure 2. Equipment room location and orientation



Equipment Room Construction Options

The preferred equipment room wall construction is concrete block. If this is not feasible then a double stud offset wall is suggested (See figure). This removes physical contact that would transmit sound through the equipment room wall to the occupied space. Interweave fiberglass insulation between the wall studs. Use two layers of sheetrock on each side of the wall.



Workmanship details are critical to acoustical performance. Seal all wall and floor penetrations by the ductwork, water piping, and equipment room access doors with a flexible material such as caulk and/or gasketing to stop noise and air leaks.

Locate the equipment room door away from acoustically sensitive areas like conference rooms. The door should swing out of the equipment room, if possible, so that the low pressure in the equipment room pulls the door in to help maintain a tight seal.

Equipment Options

The flexible horizontal discharge plenum allows multiple tested outlet options. This minimizes the risk of acoustic and/or pressure drop problems by avoiding complex transitions close to the fan discharge.

Static Pressure Versus Acoustics

Design the system to minimize the total static pressure required from the self-contained unit fan. Typically a change in static pressure of only 0.5 inches can reduce NC level by approximately 2 or 3 in the occupied space.

Isolation Recommendations

Unit

The Signature Series unit fan and compressors are internally isolated. Therefore, external isolation is not required. Consult a vibration specialist before considering external or double vibration isolation.

Ductwork

Design duct connections to the unit using a flexible material. Consult local codes for approved flexible duct material to prevent fire hazard potential.

Piping Connections

Rubber isolator connectors are recommended for condenser piping to prevent vibration transmission to or from the building plumbing. The Signature Series self-contained unit is internally isolated and does not require additional isolation. However, ensure proper system vibration isolation design prevents vibration transmission from the building plumbing to the unit. Also be sure to properly isolate the drain line.

Condenser Water Piping

Piping Location and Arrangement

Provide at least 24 inches of clearance between the piping and the unit for service. Place the risers away from the side of the unit if possible. Be sure to allow sufficient space for valves and unions between the piping and the self-contained unit. Lay out condenser piping in reverse returns to help balance the system. This is accomplished by equalizing the supply and return pipe length. Multi-

story buildings may use a direct return system with balancing valves at each floor. Install all heat exchangers and most cooling tower piping below the sump operating water level to prevent overflow during unit and/or system shut down.

Recommended Pump Location

Locate pump downstream of the cooling tower and upstream of the self-contained unit. This provides smoother and more stable unit operation.

When the tower and pump are both roof mounted, be sure to provide the necessary net positive suction head pressure to prevent cavitation. Raise the tower or submerge the pump in a sump to provide positive suction. To prevent an on-line pump failure, use a standby pump to avoid a complete system shutdown.

Several partial capacity pumps or variable speed pumps may be used. Review the economics of these alternate pumping options.

Strainers and Water Treatment

Water strainers are required at the unit inlet to eliminate potential unit damage from dirty water. Specify a water basket-type strainer to avoid an incorrect stream strainer application. Untreated or poorly treated water may result in equipment damage. Consult a water treatment specialist for treatment recommendations.

Isolation Valves

Install isolation valves at each unit before the strainer and after the condenser. This allows periodic servicing of the unit or strainer while allowing other units in the system to remain in operation.

Pressure Gauges

Install pressure gauges on the inlet and outlet of the self-contained unit. Select the gauge's scale so that the unit design operating point is approximately mid-scale.

Thermometers

Install thermometers on the condenser water inlet and outlet lines to each unit for system analysis. Trane Company recommends using a thermometer temperature range of 40 to 140°F, using a 2°F temperature increment.

Drains

The unit condensate drain is internally trapped to offset the pressure differential that exists during fan operation. Install a trapped drain in the low point of the mechanical equipment room floor to collect water from cleaning operations.

Condensing Pressure Control (Water-Cooled condensers)

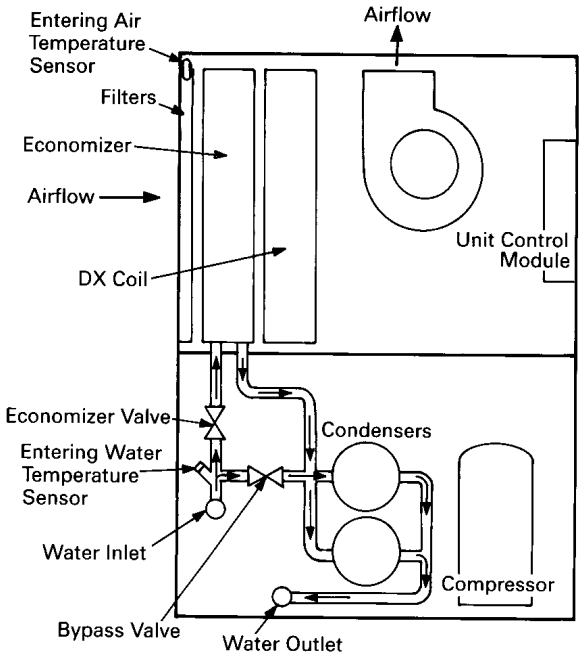
Often cold condensing water applications between 35°F and 54°F require a condensing pressure control valve. Any unit with variable-flow waterside valves can modulate water flow to maintain a user defined condensing temperature. However, to utilize this feature, the building water system must be capable of operating at reduced water flow rates through the self-contained units. It is imperative to install variable volume pumps or an external bypass in the water distribution system.

Waterside Economizer Flow Control

Units equipped with waterside economizer control valves can be set up for variable or constant water flow.

Use constant water flow setup on water systems that are not capable of unloading water supply to the unit. The economizer and condenser valves will operate in complement to one another to provide continuous water flow.

Use variable water flow setup with water flow systems that can take advantage of pump unloading for energy savings. Since non-cooling operation restricts water flow during part load economizing or condensing temperature control, it is imperative to install variable volume pumps or an external bypass in the water distribution system.



Free Cooling Opportunities and Alternatives

Free cooling is available with either the airside or waterside economizer options.

Waterside Economizer

The waterside economizer substantially reduces the compressor energy requirements because it uses the cooling water before it enters the condensers. Additional equipment room space is not required since the coils are contained within the overall unit dimensions.

Disadvantages include higher airside pressure drop and a higher head on condenser water pumps.

The coils may be mechanically cleanable (optional) for ease in maintenance versus expensive and difficult chemical cleaning methods.

Airside Economizer

The airside economizer substantially reduces compressor, cooling tower, and condenser water pump energy requirements using outside air for free cooling. It also reduces tower make up water needs and related water treatment.

Disadvantages include building requirements that locate the mechanical room and self-contained unit toward an exterior wall to minimize ductwork, building barometric control, or additional air shafts. Also, airside economizers require additional mechanical room space.

Unit Operating Limits

Airflow

The minimum recommended airflow for proper VAV system staging and temperature control is 35 percent of nominal design airflow. Adjusting VAV boxes with the appropriate minimum settings will prevent the self-contained unit from operating in a surge condition at airflows below this point. Continuous operation in a surge condition can cause fan failure. Reference General Data Tables on Table 1, p. 20 for minimum airflow conditions.

Signature Series self-contained units use fixed pitch sheaves. Adjust air balancing by obtaining alternate fixed pitch sheave selections from the local Trane sales office.

Water Flow

Use 3 gpm/ton for optimum unit capacity and efficiency. Use 2.5 or 2 gpm/ton to reduce pump energy, cooling tower and piping costs. However, these reduced water flows may impact unit capacity and efficiency by one or two percent. Consult General Data Tables on pages 17-20 for unit specific water flow ranges.

Remote Air-Cooled Condenser

Unit Location

Unobstructed condenser airflow is essential to maintaining capacity and operating efficiency. When determining unit placement, give careful consideration to assure sufficient airflow across the condenser coils. Avoid these two detrimental conditions: warm air recirculation and coil starvation.

Both warm air recirculation and coil starvation cause reductions in unit efficiency and capacity because of the higher head pressure associated with them. In more severe cases, nuisance unit shutdowns will result from excessive head pressures.

Clearance

Ensure vertical condenser air discharge is unobstructed. While it is difficult to predict the degree of warm air recirculation, a unit installed with a ceiling or other obstruction above it will experience a capacity reduction that will reduce the maximum ambient operation limit. Nuisance high head pressure trips may also occur.

The coil inlet must also be unobstructed. A unit installed closer than the minimum recommended distance to a wall or other vertical riser will experience a combination of coil starvation and warm air recirculation. This may result in unit capacity and efficiency reductions, as well as possible excessive head pressures. Reference the service clearance section on page 111 for recommended lateral distances.

Ambient Limitations

Standard ambient control allows operation down to 45°F with cycling of condenser fans. Units with the low ambient option are capable of starting and operating in ambient temperatures down to 0°F. Optional low ambient units use a condenser fan damper arrangement that controls condenser capacity by modulating damper airflow in response to saturated condenser temperature.

Maximum ambient operating temperature of a standard condenser is 115°F. Operation at design ambient above 115°F can result in excessive head pressures. For applications above 115°F, contact the local Trane sales office.

Selection Procedure

Following is a sample selection for a standard applied water-cooled self-contained at particular operating conditions. Use Trane Official Product Selection System, TOPSS™, for making all final selections or contact your local Trane representative.

Unit Capacities

1. Determine entering air temperature dry bulb and wet bulb and entering water temperature.
2. See chapter "Performance Data," p. 27 to find gross total and sensible capacity that best meets capacity requirements.
3. Apply the cfm correction factors from the capacity correction factor Table 13, p. 37 to determine gross total and gross sensible capacities at desired cfm.
4. Multiply condenser water delta T by the total capacity cfm correction factor to determine new condenser water delta T.
5. Using design cfm, determine static air pressure drops for accessories from the air pressure drop Charts Figure 1, p. 27 through Figure 21, p. 33. Add accessory static pressure drops to external supply and return static air pressure drops. Use the total air pressure drop to determine rpm and brake horsepower requirements from the appropriate fan curve. Note: The fan curves include refrigerant coil and internal cabinet static loses.
6. Calculate supply fan motor heat by using the following equation:

   Fan motor heat (MBh) = 2.8 x fan motor brake horsepower
7. Determine net total capacity and net sensible capacity by subtracting fan motor heat from gross total capacity and gross sensible capacity.
8. Refer to Trane psychometric chart to determine leaving air temperatures.

Waterside Economizer Capacity

After determining that the unit will meet the required mechanical cooling capacity, determine the waterside economizer capacity by referring to the appropriate two-row (low capacity) or four-row (high capacity) waterside economizer capacity found in one of Table 15, p. 38 through Table 48, p. 72.

9. Determine entering air temperature dry bulb and wet bulb, condenser water flow (gpm), and economizer entering water temperature.
10. Refer to the appropriate waterside economizer table to find gross total and sensible capacity and the leaving water temperature.
11. Apply the cfm correction factor for the waterside economizer from the appropriate table to determine the gross total and sensible capacities at the desired cfm.
12. Multiply the condenser water delta T by the total capacity cfm correction factor to determine the new delta T.
13. Calculate supply fan motor heat by using the following equation:

    Fan motor heat (MBh) = 2.8 x fan motor brake horsepower
14. Determine net total and sensible capacity by subtracting fan motor heat from gross total and sensible capacity.
15. Refer to the Trane psychometric chart to determine leaving air temperatures.

Selection Example

Design Conditions

Total gross capacity required = 420 MBh = 35.2 Tons

Total sensible capacity required = 315 MBh

Entering air temperature = 80/67°F

Entering water temperature = 85°F

Water flow rate = 105 gpm

Airflow = 14840 cfm at 2.5-inch duct static pressure

Unit includes:

- Constant Volume
- Waterside economizer
- Medium velocity throwaway filters

Unit Selection

Tentatively select a 35 ton unit: Model SCWF 35.

Refer to Table 26, p. 49 to obtain gross total and sensible unit capacities, and gpm at the design conditions:

Total capacity = 432.0 MBh

Sensible capacity = 329.0 MBh

Leaving water temperature = 95.1°F

Since the design cfm is greater than the nominal cfm, adjust the capacities and condenser water delta T to reflect the higher cfm: design cfm 14840 = +6% of nom. Cfm nominal 14000 cfm

Refer to Table 13, p. 37 to obtain the capacity correction factors for +6% of nominal cfm:

Cooling capacity multiplier = 1.009

Sensible capacity multiplier = 1.027

Multiply the capacities by the correction factors:

- 432 MBh x 1.009 = 435.89 MBh
- 329 MBh x 1.027 = 337.88 MBh

The SCWF 35 meets the total and sensible design requirements.

Multiply the delta T of 10.1°F by the cooling capacity correction factor of 1.009 to obtain new delta T of 10.19°F and add this to the entering water temperature to obtain the actual leaving water temperature of 95.19°F.

Model Number Descriptions

Self-Contained

Digit 1 - Unit Model

S = Self Contained

Digit 2 - Unit Type

C = Commercial
I = Industrial

Digit 3 - Condenser Medium

W = Water-cooled
R = Air-cooled

Digit 4 - Development Sequence

F = Signature Series

Digit 5 - Refrigerant Circuit Configuration

U = Standard Capacity
V = High Capacity

Digit 6, 7 - Unit Nominal Capacity

20 = 20 tons (water or air)
22 = 22 tons (water only)
25 = 25 tons (water or air)
29 = 29 tons (water or air)
30 = 30 tons (air only)
32 = 32 tons (water only)
35 = 35 tons (water or air)
38 = 38 tons (water only)
40 = 40 tons (air only)
42 = 42 tons (water only)
46 = 46 tons (water only)
50 = 50 tons (air only)
52 = 52 tons (water only)
58 = 58 tons (water only)
60 = 60 tons (air only)
65 = 65 tons (water only)
72 = 72 tons (water only)
80 = 80 tons (water only)
90 = 90 tons (water only)
C0 =100 tons (water only)
C1 =110 tons (water only)

Digit 8 - Unit Voltage

6 = 200 volt/60 hz/3 ph
4 = 460 volt/60 hz/3 ph
5 = 575 volt/60 hz/3 ph

Digit 9 - Air Volume/Temp Control

2 = VFD and supply air temp ctrl
3 = VFD w/ bypass and supply air temp ctrl
4 = Constant volume, zone temp cool only
5 = Constant volume, w/ zone temp heat/cool
6 = Constant volume and supply air temp ctrl

Digit 10, 11 - Design Sequence

** = Factory Assigned

Digit 12 - Unit Construction

A = Vertical Discharge
B = Vertical Discharge With Double Wall

Digit 13 - Flexible Horizontal Discharge Plenum Type

B = STD plenum w/ factory-cut holes
C = Low plenum w/ factory-cut holes
E = Std plenum w/ field-cut holes
F = Low plenum w/ field-cut holes
H = STD plenum double wall w/ field-cut holes
J = Low plenum double wall w/ field-cut holes
K = Extended height plenum w/factory-cut holes, ship separate
L = STD plenum w/factory-cut holes, ship separate
M =Low plenum w/factory-cut holes, ship separate
N = Extended height plenum w/field-cut holes, ship separate
P = STD plenum w/field-cut holes, ship separate
R = Low plenum w/field-cut holes, ship separate
T = Extended height double-wall plenum w/ field-cut holes, ship separate
U = STD double-wall plenum w/field-cut holes, ship separate
V = Low double-wall plenum w/field-cut holes, ship separate
W =STD double-wall (perf) plenum w/field-cut holes (90-110 ton only)
X = Low double-wall (perf) plenum w/field-cut holes (90-110 ton only)
Y = Extended height double-wall (perf) plenum w/field-cut holes, ship separate (90-110 ton only)
0 = None

Digit 14 - Motor Type

2 = ODP motor
3 = TEFC motor

Digit 15, 16 - Motor HP

05 = 5 hp
07 = 7.5 hp
10 = 10 hp
15 = 15 hp
20 = 20 hp
25 = 25 hp
30 = 30 hp
40 = 40 hp
50 = 50 hp (400V, 460V, 575V only)
60 = 60 hp (90-110 ton only)

Digit 17, 18, 19 - Fan rpm

040 = 400 rpm
045 = 450 rpm
050 = 500 rpm
052 = 525 rpm
055 = 550 rpm
057 = 575 rpm
060 = 600 rpm
065 = 650 rpm
070 = 700 rpm
075 = 750 rpm
080 = 800 rpm
085 = 850 rpm
090 = 900 rpm
095 = 950 rpm
100 = 1000 rpm
105 = 1050 rpm
110 = 1100 rpm
115 = 1150 rpm
120 = 1200 rpm
125 = 1250 rpm
130 = 1300 rpm
135 = 1350 rpm

Digit 20 - Heating Type

A = Steam coil
B = Hot water coil
C = Electric heat, 1 stage
D = Electric Heat (2 Stage)
F = Hydronic heat ctrl interface
G = Elec. heat ctrl interface, 1 stage
H = Elec. heat ctrl interface, 2-stage (90-110 ton only)
J = Elec. heat ctrl interface, 3 stage (90-1 10 ton only)
K = Steam coil ship separate, LH
L = Hot water coil ship separate, LH
T = Hot water coil, high capacity, LH
U = Hot water coil, high capacity, LH, ship separate
0 = None

Digit 21 - Unit Isolators

A = Isopads
B = Spring isolators
0 = None

Digit 22 - Unit Finish

1 = Paint - slate gray
2 = Protective coating
3 = Protective coating w/ finish coat

Digit 23 - Supply Fan Options

0 = Standard fan
1 = Low CFM fan

Digit 24 - Unit Connection

1 = Disconnect switch
2 = Terminal block
3 = Dual point power (2 blocks)

Digit 25 - Industrial Options

A = Protective coating evaporator coil
B = Silver solder
C = Stainless steel screws
D = A and B
E = A and C
F = B and C
G = A, B, and C
0 = none

Digit 26 - Drain Pan Type

A = Galvanized sloped
B = Stainless steel sloped

Digit 27 - Waterside Economizer

A = Mechanical clean full capacity (4-row)
B = Mechanical clean low capacity (2-row)
C = Chemical clean full capacity (4-row)
D = Chemical clean low capacity (2-row)
0 = None

Digit 28 - Ventilation Control

B = Airside econ w/ Traq damper, top O/A
C = Airside econ w/ std damper, top O/A
E = Airside econ w/ Traq damper & comparative enthalpy, top O/A
F = Airside econ w/ std damper & comparative enthalpy, top O/A
H = 2-position damper ventilation interface
J = Airside economizer interface
K = Airside economizer interface w/ comparative enthalpy

Digit 29 - Water Piping

D = Left hand basic piping
F = Left hand Intermediate piping
K = Left hand basic w/ flow switch
M = Left hand intermediate w/ flow switch
0 = None

Digit 30 - Condenser Tube Type

A = Standard condenser tubes
B = 90/10 CuNi condenser tubes
0 = None (air-cooled only)

Digit 31 - Compressor Service Valves

1 = With service valves
0 = None

Digit 32 - Miscellaneous System Control

1 = Timeclock
2 = Interface For remote HI (IPCB)
3 = Dirty filter switch
4 = 1 and 2
5 = 1 and 3
6 = 2 and 3
7 = 1, 2 and 3
0 = None

Digit 33 - Control Interface Options

A = Generic BAS Module; 0-5 VDC (GBAS)
B = Ventilation Override Module (VOM)
D = Remote Human Interface (RHI)
G = GBAS and VOM
H = GBAS and RHI
J = VOM and RHI
M = GBAS, VOM, and RHI
N = BACnet Communications Interface (BCI)
P = BCI and GBAS
Q = BCI and VOM
R = BCI and RHI
T = BCI and GBAS and VOM
U = BCI and GBAS and RHI
V = BCI and VOM and RHI
W= BCI and GBAS and VOM and RHI
0 = None
1 = Lontalk Comm5 Interface (LCI)
2 = LCI and GBAS
3 = LCI and VOM
4 = LCI and RHI
5 = LCI and GBAS and VOM
6 = LCI and GBAS and RHI
7 = LCI and VOM and RHI
8 = LCI and GBAS and VOM and RHI

Digit 34 - Agency

T = UL agency listing
0 = None

Digit 35 - Filter Type

1 = 2″ T/A w/ 2″ rack
2 = 2″ med. eff. T/A w/ 2″ rack
3 = 4″ bolt-on rack w/ 2″ med eff. filter
4 = 6″ rack w/ 2″ construction T/A pre-filter & 4″ filter space
5 = 6″ rack w/ 2″ med. eff. T/A pre-filter & 4″filter space

Digit 36 - Miscellaneous Control Option

A = Low entering air temp. protect device (LEATPD)
B = High duct temp t-stat, ship separate
C = Plenum high static switch, ship separate
E = A and B
F = A and C
H = B and C
L = A, B, and C
0 = None

Self-Contained Ship-With Accessory Model Number

Digit 1 - Parts/Accessories

P = parts/accessories

Digit 2 - Unit Model

S = self-contained

Digit 3 - Shipment

W = with unit

Digit 4 - Development Sequence

F = signature series
G = modular series

Digit 5 - Sensors and Other Accessories

S = sensors

Digit 6 - Sensors and Thermostats (Field Installed)

A = BAYSENS077 - zone temp only (CV and VAV)
B = BAYSENS073- zone temp with timed override button (CV and VAV)
C = BAYSENS074 - zone temp with timed override button, setpoint dial (CV and VAV)
E = BAYSENS108 - CV zone sensor -dual setpoint, man/auto changeover
F = BAYSENS110 - CV zone sensor-dual setpoint, man/auto changeover w, indicastor lights
G = BAYSENS119 - CV/VAV programmable night setback Sensor
H = BAYSENS021 - VAV zone sensor with indicator lights
L = outside air temperature sensor kit
M = outside air humidity sensor kit
0 = none

Digit 7 - Mixed Air Temperature Protection Kit (Field Installed)

1 = mixed air temperature protection kit
0 = none

Digit 8 - Carbon Dioxide Sensor (Field Installed)

1 = carbon dioxide sensor kit
0 = none

Digit 9 - Future Option

0 = none

Digits 10, 11 - Design Sequence

** = Factory Assigned

Remote Air-Cooled Condenser Model Number Description

Digit 1 - Unit Model

C = Condenser

Digit 2 - Unit Type

C = Commercial
I = Industrial

Digit 3 - Condenser Medium

R = Remote

Digit 4 - Development Sequence

C = C

Digit 5, 6, 7 - Nominal Capacity

020 = 20 tons
029 = 29 tons
035 = 35 tons
040 = 40 tons
050 = 50 tons
060 = 60 tons

Digit 8 - Unit Voltage

4 = 460 volt/60 hz/3 ph
5 = 575 volt/60 hz/3 ph
6 = 200 volt/60 hz/3 ph

Digit 9 - Control Option

0 = No low ambient damper, I-Pak.
A = No low ambient damper, t-stat.
B = Low ambient, I-Pak.
C = Low ambient, t-stat.

Digit 10, 11 - Design Sequence

** = Factory Assigned

Digit 12 - Unit Finish

1 = Paint, slate gray
2 = Protective coating
3 = Protective coating with finish coat

Digit 13 - Coil Options

A = Non-coated aluminum
C = Protective coating aluminum

Digit 14 - Unit Isolators

0 = None
A = Spring isolators
B = Isopads

Digit 15 - Panels

1 = Louvered panels

Digit 16 - Agency Listing

0 = None
U = With UL listing

General Data

Table 1. SCWF/SIWF Water-cooled self-contained, 20 to 42 tons

Unit Size	20	22	25	29	32	35	38	42
Compressor Data								
Quantity	2	2	2	1/1	1/1	3	3	2/1
Nominal Ton/comp	10	10	10	15/10	15/10	10	10	10/15
Circuits	2	2	2	2	2	3	3	3
Evaporator Coil Data								
Rows	2	2	3 or 6	2	4 or 6	3	4 or 6	3
Sq. Ft.	21.81	21.81	21.81	29.98	29.98	31.35	31.35	38.57
Fpf	144	144	144	144	144	144	144	144
Condenser Data								
Minimum Gpm W/o Econ	36	36	36	46	46	54	54	64
Minimum Gpm W/ Econ	41	41	41	60	60	65	65	64
Maximum Gpm	80	80	80	102	102	119	119	142
Evaporator Fan Data								
Quantity	1	1	1	1	1	1	1	1
Diameter	18”	18”	18”	18”	18”	20"	20"	25”
Minimum Hp	5	5	5	5	5	5	5	7. 5
Minimum Kw	(3.73)	(3.73)	(3.73)	(3.73)	(3.73)	(3.73)	(3.73)	(5.39)
Maximum Hp	20	20	20	20	20	25	25	30
Maximum Kw	(14.91)	(14.91)	(14.91)	(18.64)	(18.64)	(18.64)	(18.64)	(22.37)
Minimum Design Cfm	6325	6325	6500	8700	8700	9100	9880	11200
Maximum Design Cfm	8500	9350	10625	12325	13600	14875	16150	17850
High Capacity Option								
Rows	—	—	6	—	6	—	6	—
Optional Low Flow Fan[6]								
Diameter	—	—		—		—	18”	—
Min/max Design Cfm	—	—		—		—	6000/10625	—
General Data R-410A								
EER	14.0	14.0	14.0	14.0	14.3	14.0	14.2	14.2
IEER (CV)	15.3	15.3	15.0	15.6	15.2	15.2	14.9	15.6
IEER (VAV)	17.4	17.4	17.5	18.1	18.8	18.0	18.5	18.3
Refrigerant Charge, lbs. R-410A								
Circuit A	19.5	19.5	21.5	22.0	28.5	21.5	23.5	22.0
Circuit B	19.5	19.5	21.5	19.5	23.5	21.5	23.5	22.0
Circuit C	–	–	–	–	–	21.5	23.5	22.0
Capacity Steps - %	100/53/0	100/53/0	100/53/0	100/62/39/0	100/59/39/0	100/65/31/0	100/65/30/0	100/71/ 43/26/0

Notes:
1. Compressors are Trane 3-D™ scroll.
2. EER and IEER are rated in accordance to AHRI Standard 340/360-2010. Based on 80/67° F (26.7/19.4 °C) to evaporator coil, nominal airflow and 85-95 °F (29.4/35 °C) condenser water.
3. All units operate with R-410A. Units ships with full operating charge.
4. Maximum cfm limits are set to prevent moisture carryover on the evaporator coil.
5. Minimum cfm limits are set to ensure stable thermal expansion valve operation at low load conditions.
6. Optional low flow fan (unit model number digit 23 = 1) is available ONLY when High Capacity option is selected (unit model number digit 5 = V).

Table 2. SCWF/SIWF Water-cooled self-contained, 46-110 tons

Unit Size	46	52	58	65	72	80	90	100	110
Compressor Data									
Quantity	2/1	3	3	3/1	3/1	4	5	2/4	6
Nominal Ton/Comp	10/15	15	15	15/10	15/10	15	15	10/15	15
Circuits	3	3	3	4	4	4	5	6	6
Evaporator Coil Data									
Rows	4 or 6	2	4 or 6	3	4 or 6	6	6	6	6
Sq. Ft.	38.57	49.09	49.09	49.09	49.09	49.09	56.81	56.81	56.81
FPF	144	144	144	144	144	144	144	144	144
Condenser Data									
Min GPM w/o Econ	64	84	84	102	102	112	140	168	168
Min GPM w/ Econ	64	84	84	102	102	112			
Maximum GPM	142	186	186	226	226	248	300	350	350
Evaporator Fan Data									
Quantity	1	1	1	1	1	1	1	1	1
Size (Dia.)	25”	25”	25”	27.5”	27.5”	27.5”	27.5”	27.5”	27.5”
Minimum HP	7.5	10	10	10	10	10	15	15	15
Minimum kW	(5.59)	(7.46)	(7.46)	(7.46)	(7.46)	(7.46)	(11.19)	(11.19)	(11.19)
Maximum HP	30	50	50	50	50	50	60	60	60
Maximum kW	(22.37)	(37.29)	(37.29)	(37.29)	(37.29)	(37.29)	(44.74)	(44.74)	(44.74)
Min Design CFM	11960	14250	15080	16900	18700	20800	17500	17500	17500
Max Design CFM	19550	22100	24650	27625	29800	29800	35000	35000	35000
High Capacity Option									
Rows	6	—	6	—	6	—	8	8	8
Optional Low Flow Fan									
Size (Dia.)	18”		18”		20”				
Min./Max Design CFM	7700/13600	—	8900/ 13600	—	10700/ 16150	—			
General Data R-410A									
EER	14.3	14.0	14.3	14.0	14.0	14.0	14.1	14.1	14.0
IEER (CV)	15.2	15.7	15.3	15.4	14.9	14.6	16.3	16.3	16.3
IEER (VFD)	18.8	17.9	18.9	18.2	18.5	19.3	18.6	18.5	18.1
Refrigerant Charge — lbs. R-410A									
Circuit A	24.5	21.0	26.5	22.0	24.5	28.0	24.5	24.5	24.5
Circuit B	24.5	21.0	26.5	22.0	24.5	28.0	24.5	24.5	24.5
Circuit C	24.5	21.0	26.5	22.0	24.5	28.0	24.5	24.5	24.5
Circuit D	–	–	–	21.0	22.0	28.0	24.5	24.5	24.5
Circuit E	–	–	–	–	–	–	24.5	24.5	24.5
Circuit F	–	–	–	–	–	–	–	24.5	24.5
Capacity Steps - %	100/70/41/30/0	100/65/ 32/0	100/65/ 30/0	100/71/ 44/24/0	100/71/43/ 23/0	100/73/46/ 20/0	100/80/40/ 20/0	100/75/38/ 19/0	100/66/33/ 17/0

Notes:
1. Compressors are Trane 3-D™ scroll.
2. EER and IEER are rated in accordance to ARI Standard 340/360-2007. Based on 80/67° F (26.7/19.4 °C) to evaporator coil, nominal airflow and 85-95 °F (29.4/35 °C) condenser water.
3. All units operate with R-410A. Units ships with full operating charge.
4. Maximum cfm limits are set to prevent moisture carryover on the evaporator coil.
5. Minimum cfm limits are set to ensure stable thermal expansion valve operation at low load conditions.

Table 3. SCRF/SIRF Air-cooled self-contained

Unit Size	20	25	29	30	35	40	50	60
Compressor Data								
Quantity	2	1/1	1/1	3	3	2/1	3	4
Nominal Ton/Comp	10	15/10	15/10	10	10	10/15	15	15
Circuits	2	2	2	2	2	2	2	2
Evaporator Coil Data								
Rows	3	2	4	3	4	4	4	6
Sq. Ft.	21.81	29.98	29.98	31.35	31.35	38.57	49.09	49.09
FPF	144	144	144	120	144	144	144	144
Evaporator Fan Data								
Quantity	1	1	1	1	1	1	1	1
Size (Dia.)	18”	18”	18”	20”	20”	25”	25”	27.5”
Minimum HP	5	5	5	5	5	7.5	10	10
Minimum kW	(3.73)	(3.73)	(3.73)	(3.73)	(3.73)	(5.59)	(7.46)	(7.46)
Maximum HP	20	20	20	25	25	30	40	50
Maximum kW	(14.91)	(18.64)	(18.64)	(18.64)	(18.64)	(22.37)	(37.29)	(37.29)
Minimum Design CFM	6500	8700	8700	9100	9880	11960	15080	20800
Maximum Design CFM	10625	12325	13600	14875	16150	19550	24650	29800
General Data								
EER	10.0	10.0	10.5	10.4	10.6	10.7	10.5	10.3
IEER (CV)	10.8	11.6	12.2	12.5	12.0	12.7	12.1	11.2
IEER (VAV)	11.9	12.8	13.7	13.5	13.9	14.4	13.7	14.1
Refrigerant Charge	See Note 6							
Capacity Steps - %	100/53/0	100/62/39/0	100/59/39/0	100/65/31/0	100/65/30/0	100/70/41/30/0	100/65/30/0	100/73/46/20/0
CCRC/CIRC Unit Match	20	29	29	35	35	40	50	60

Notes:
1. Compressors are Trane 3-D™ scroll.
2. EER and IEER are rated in accordance to ARI Standard 340/360-2007. Based on 80/67° F (26.7/19.4 °C) to evaporator coil, nominal airflow and 85-95 °F (29.4/35 °C) condenser water.
3. All units operate with R-410A. Units ship with a dry nitrogen holding charge. Field refrigerant system charge required. Refer to Table 5, p. 23 for amounts required.
4. Maximum cfm limits are set to prevent moisture carryover on the evaporator coil.
5. Minimum cfm limits are set to ensure stable thermal expansion valve operation at low load conditions.

Table 4. CCRC/CIRC Remote air-cooled condenser

Unit Size	20	29	35	40	50	60
Condenser Fan Data						
Number/Type/Drive	4/Prop/Direct	4/Prop/Direct	6/Prop/Direct	6/Prop/Direct	8/Prop/Direct	8/Prop/Direct
Size (inches)	26	26	26	26	26	26
Size (mm)	(660.4)	(660.4)	(660.4)	(660.4)	(660.4)	(660.4)
HP ea.	1	1	1	1	1	1
Nominal CFM	18,800	21,200	35,600	39,800	46,200	56,400
Nominal (liters / sec)	(8873)	(10005)	(16801)	(18784)	(21804)	(26618)
Condenser Coil Data						
Circuit 1 Size (in.)	1/46x71	1/64x71	2/46x71	2/46x71	2/64x71	2/64x71
Circuit 1 Size (mm)	(1/1168x1803)	(1/1626x1803)	(2/1168x1803)	(2/1168x1803)	(2/1626x1803)	(2/1626x1803)
Circuit 2 No./Size (in.)	1/46x71	1/46x71	1/46x71	1/64x71	1/64x71	2/64x71
Circuit 2 No./Size (mm)	(1/1168x1803)	(1/1168x1803)	(1/1168x1803)	(1/1626x1803)	(1/1626x1803)	(2/1626x1803)
Face Area (sq. ft.)	45.4	54.2	68	76.9	94.7	126.2
Face Area (sq.m)	(4.2)	(5)	(6.3)	(7.1)	(8.8)	(11.7)
Rows/fpf	4/144	4/144	4/144	4/144	4/144	4/144
Ambient Temperature Operating Range						
Standard Ambient (F)	50-115	50-115	50-115	50-115	50-115	50-115
Standard Ambient (C)	(10 - 46.1)	(10 - 46.1)	(10 - 46.1)	(10 - 46.1)	(10 - 46.1)	(10 - 46.1)
Low Ambient Option (F)	0-115	0-115	0-115	0-115	0-115	0-115
Low Ambient Option (C)	(-17.8 - 46.1)	(-17.8 - 46.1)	(-17.8 - 46.1)	(-17.8 - 46.1)	(-17.8 - 46.1)	(-17.8 - 46.1)

Note: Units ship with dry nitrogen charge. field refrigerant system charge required. See Table 5 for amounts required.

Table 5. SCRF/SIRF Air–cooled self–contained and CCRC/CIRC remote air-cooled condenser refrigerant data

SCRF/SIRF & CCRC/CIRC Unit Size	20/20	25/29	29/29	30/35	35/35	40/40	50/50	60/60
No. of Refrigerant Circuits	2	2	2	2	2	2	2	2
Operating Charge - lbs. R-410A	35.5/35.5	44.5/33.5	51/37.5	71/35.5	75/37.5	86.5/39.5	98/50	101.5/101.5
Operating Charge - kg R-410A	16.1/16.1	20.2/15.2	23.1/17	32.2/16.1	34/17	39.2/17.9	44.5/22.7	46/46
Cond. Storage Cap. - lbs. R-410A	37/37	51/37	51/37	74/37	74/37	74/51	102/51	102/102
Cond. Storage Cap. - kg R-410A	16.8/16.8	23.1/16.8	23.1/16.8	33.6/16.8	33.6/16.8	33.6/23.1	46.3/23.1	46.3/46.3

Notes:
1. Refrigerant charges are listed as circuit 1 circuit 2 and provide only an estimate. Final charge requires sound field charging practice.
2. Operating charge is for entire system, which includes the air–cooled self–contained, remote air–cooled condenser, and 25 feet of interconnecting refrigerant piping.
3. At conditions of 95° F (35° C), condenser storage capacity is 95% full.
4. To determine the correct amount of refrigerant needed for a particular application, reference the Trane Reciprocating Refrigeration Manual.

Table 6. SCWF/SIWF water flow volumes

Unit Size	Water Volume in U.S. Gallons / Liters					
	W/o Economizer		With Mech. Cleanable Econ		With Chem. Cleanable Econ	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
20	9.0	34.1	17.4	65.9	16.9	64.0
22	9.0	34.1	17.4	65.9	16.9	64.0
25	9.0	34.1	17.4	65.9	16.9	64.0

Table 6. SCWF/SIWF water flow volumes (continued)

Unit Size	Water Volume in U.S. Gallons / Liters					
	W/o Economizer		With Mech. Cleanable Econ		With Chem. Cleanable Econ	
29	9.0	34.1	20.5	77.6	18.8	71.2
32	9.0	34.1	20.5	77.6	18.8	71.2
35	10.0	37.9	21.9	82.9	20.2	76.5
38	10.0	37.9	21.9	82.9	20.2	76.5
42	15.0	56.8	32.2	121.9	31.4	118.9
46	15.0	56.8	32.2	121.9	31.4	118.9
52	15.0	56.8	36.9	139.7	35.9	135.9
58	15.0	56.8	36.9	139.7	35.9	135.9
65	16.0	60.6	37.9	143.5	36.9	139.7
72	16.0	60.6	37.9	143.5	36.9	139.7
80	16.0	60.6	37.9	143.5	36.9	139.7
90	22.5	85.2	50.1	189.6	N/A	N/A
100	23.0	87.1	50.6	191.5	N/A	N/A
110	24.0	90.8	51.6	195.3	N/A	N/A

Table 7. SCWF/SIWF Refrigerant circuits, number of compressors by circuit

	Circuit					
Unit Size	**1**	**2**	**3**	**4**	**5**	**6**
20/22/25 Ton	1- 10T	1- 10T				
29/32 Ton	1- 15T	1- 10T				
35/38 Ton	1- 10T	1- 10T	1- 10T			
42/46 Ton	1- 15T	1- 10T	1- 10T			
52/58 Ton	1- 15T	1- 15T	1- 15T			
60/72 Ton	1- 15T	1- 15T	1- 15T	1- 10T		
80 Ton	1- 15T	1- 15T	1- 15T	1- 15T		
90 Ton	1- 15T	1- 15T	1- 15T	1- 15T	1- 15T	
100 Ton	1-15T	1-15T	1-15T	1-15T	1-10T	1-10T
110 Ton	1- 15T	1- 15T	1- 15T	1- 15T	1- 15T	1- 15T

Note: This table depicts compressor location in unit, plan view from left corner.

Table 8. SCRF/SIRF Refrigerant circuits, number of compressors by circuit

Circuit	**1**	**2**
Unit Size		
20 Ton	1-10T	1- 10T
25/29 Ton	1-15T	1-10T
30/35 Ton	2-10T	1-10T
40 Ton	1-10T, 1-15T	1-10T
50 Ton	2-15T	1-15T
60 Ton	2-15T	2-15T

Note: This table depicts compressor location in unit, plan view from left corner.

Table 9. Filter data, water-cooled units models SCWF & SIWF

Unit Size	20- 38 tons	40-85 tons	90-110 tons
Number - Size (In.)	8 - 20x18	12 - 25 x 20	15 - 24 x 24
	4 - 20 x 20	6 - 20 x 20	3 - 24 x 12
Units With Hot Water Or Steam			
Number - Size (In.)	4 - 16x20	4 - 25 x 20	n/a
	4 - 20 x 20	2 - 20 x 20	
	4 - 18 x 20	8 - 25 x 16	
		4 - 20 x 16	

Table 10. Filter data, air-cooled units models SCRF & SIRF

Unit size	20- 35 tons	40-60 tons
Number - Size (in.)	8 - 20x18	12 - 25 x 20
	4 - 20 x 20	6 - 20 x 20
Units With Hot Water Or Steam		
Number - Size (in.)	4 - 16x20	4 - 25 x 20
	4 - 20 x 20	2 - 20 x 20
	4 - 18 x 20	8 - 25 x 16
		4 - 20 x 16

Table 11. Self-Contained Heating Coil

Unit Size	SCWF 20 - 38	SCWF 42 - 80	SCRF 20 - 35	SCRF 40 - 60
Steam Coil				
Coil Type	NS	NS	NS	NS
Rows	1	1	1	1
No./Size (inches)	((2) 24x58)	((2) 30x81)	((2) 24x58)	((2) 30x81)
No./Size (mm)	((2) 609.6x1473.2)	((2) 762x2057.4)	((2) 609.6x1473.2)	((2) 762x2057.4)
FPF	42	42	42	42
Hot Water Coil				
Coil Type	5W	5W	5W	5W
Rows	1 or 2			
No./Size (inches)	(2) 24x58	(2) 30x81	(2) 24x58	(2) 30x81
No./Size (mm)	((2) 609.6x1473.2)	((2) 762x2057.4)	((2) 609.6x1473.2)	((2) 762x2057.4)
FPF	80 or 108	80 or 108	80 or 108	80 or 108

Notes:
1. Hot water and steam heating coils have Prima-Flo® fins without turbulators.
2. For coil capacities, use TOPSS™ (Trane Official Product Selection Program).
3. Full capacity coils consist of two coils stacked and piped in parallel.

Table 12. Waterside Economizer Coil Physical Data

Model	Unit Size	Type	Rows	FPF	Height (in)	Length (in)
SCXF	20, 22 & 25	Chemically Cleanable	2	108	40	78.5
SCXF	20, 22 & 25	Mechanical Cleanable	2	108	40	78.5
SCXF	20, 22 & 25	Chemically Cleanable	4	108	40	78.5
SCXF	20, 22 & 25	Mechanical Cleanable	4	108	40	78.5
SCXF	29 & 32	Chemically Cleanable	2	108	55	78.5
SCXF	29 & 32	Mechanical Cleanable	2	108	55	78.5
SCXF	29 & 32	Mechanical Cleanable	4	108	55	78.5
SCXF	29 & 32	Chemically Cleanable	4	108	55	78.5
SCXF	35 & 38	Chemically Cleanable	2	108	57.5	78.5
SCXF	35 & 38	Mechanical Cleanable	2	108	57.5	78.5
SCXF	35 & 38	Chemically Cleanable	4	108	57.5	78.5
SCXF	35 & 38	Mechanical Cleanable	4	108	57.5	78.5
SCXF	42 & 46	Chemically Cleanable	2	144	55	101
SCXF	42 & 46	Mechanical Cleanable	2	144	70	101
SCXF	42 & 46	Chemically Cleanable	4	144	55	101
SCXF	42 & 46	Mechanical Cleanable	4	144	70	101
SCXF	52, 58, 65, 72, 80, 85	Chemically Cleanable	2	144	70	101
SCXF	52, 58, 65, 72, 80, 85	Mechanical Cleanable	2	144	70	101
SCXF	52, 58, 65, 72, 80, 85	Chemically Cleanable	4	144	70	101
SCXF	52, 58, 65, 72, 80, 85	Mechanical Cleanable	4	144	70	101
SCXF	90, 100 & 110	Mechanical Cleanable	4	144	70	119.3

Performance Data

Airside Pressure Drops

The dotted line on construction filters indicates cfm where face velocity exceeds manufacturer's recommended maximum of 300 fpm. After startup, construction filters must be replaced with medium velocity or high velocity filters.

Air pressure drops through electric heat is 0.5 inches WC.

See "Discharge Plenum," p. 30 for pressure drop through flexible horizontal discharge plenum and "Heating Coils," p. 29 for pressure drop through heating coils.

For 4-inch cartridge filters, air pressure drops must be added to the external static pressure design point.

Figure 1. Airside Pressure Drop SCWF/SIWF 20, 22, 25 and SCRF/SIRF 20

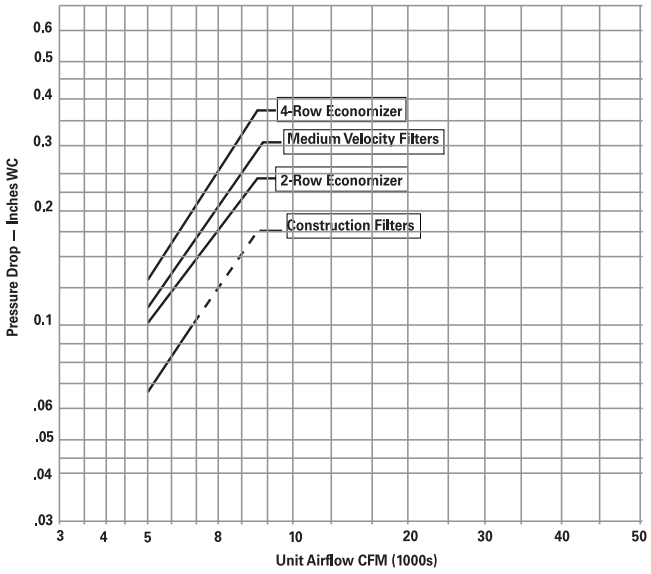


Figure 2. Airside Pressure Drop SCWF/SIWF 29, 32 and SCRF/SIRF 25, 29

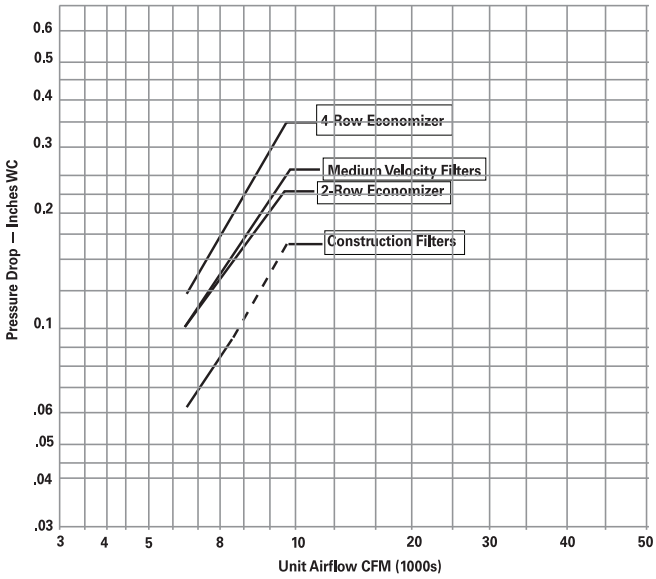


Figure 3. Airside Pressure Drop SCWF/SIWF 35, 38 and SCRF/SIRF 30, 35

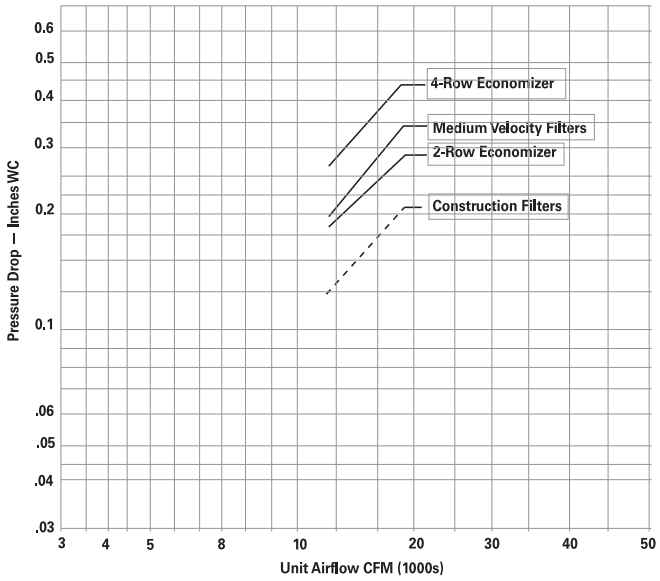


Figure 4. Airside Pressure Drop SCWF/SIWF 42, 46 and SCRF/SIRF 40

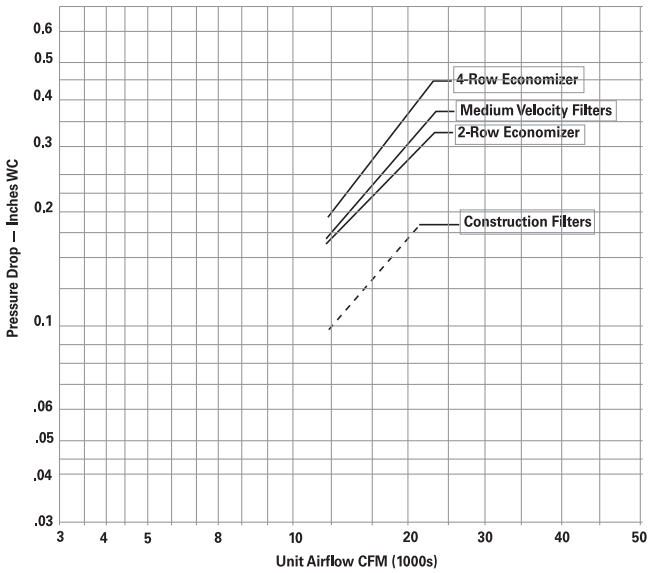


Figure 5. Airside Pressure Drop SCWF/SIWF 52, 58 and SCRF/SIRF 50

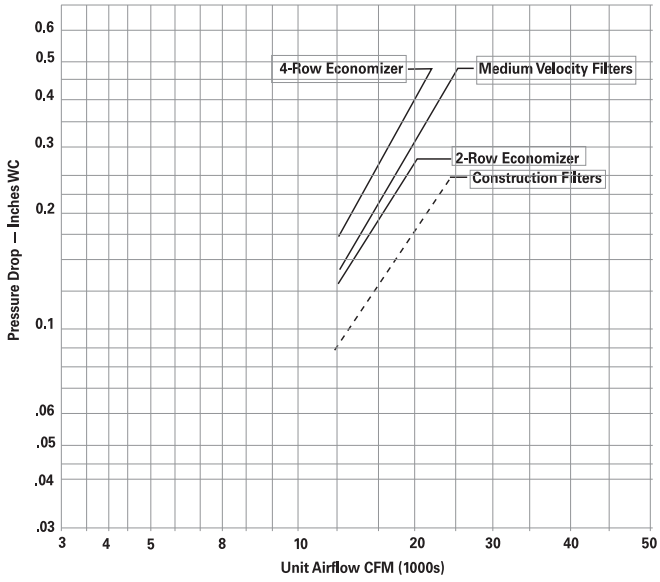


Figure 6. Airside Pressure Drop SCWF/SIWF 65, SCWF/SIWF 72, SCWF/SIWF 80 and SCRF/SIRF 60

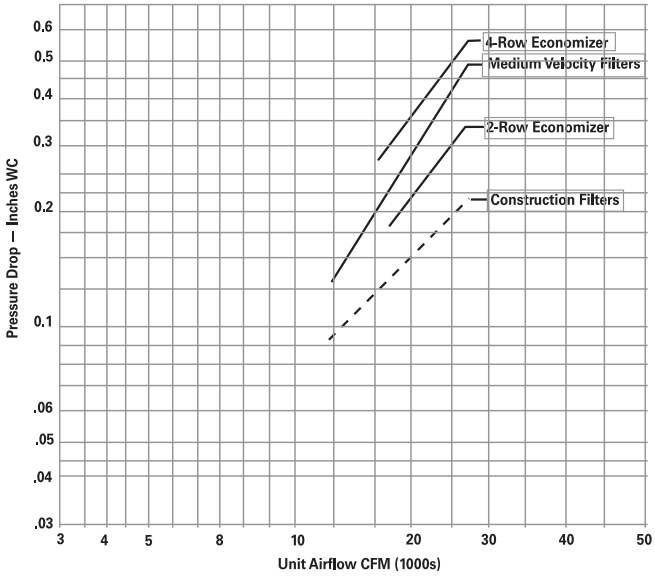
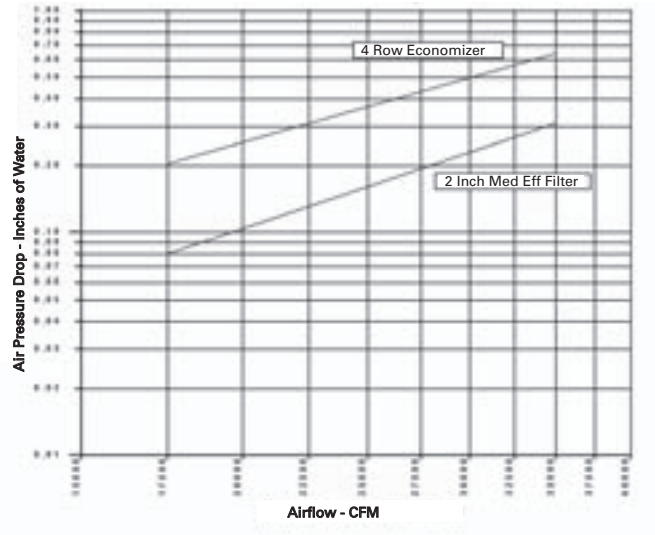


Figure 7. Airside Pressure Drop SCWF/SIWF 90-110



Heating Coils

Figure 8. Airside Pressure Drop Steam Coil 20 to 80-Ton Units

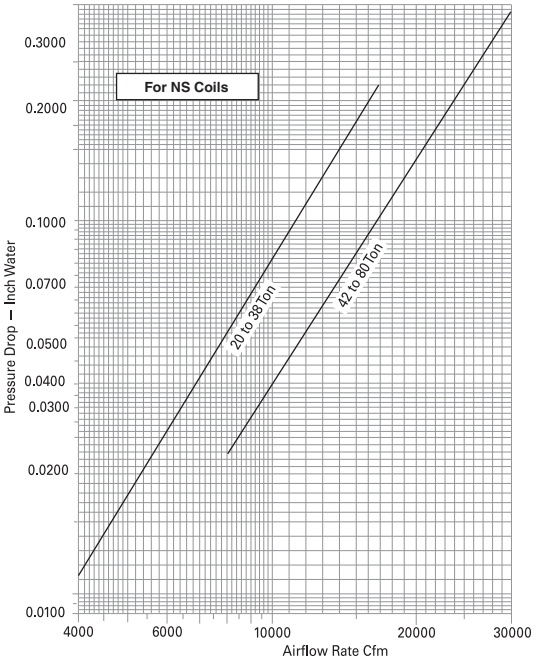
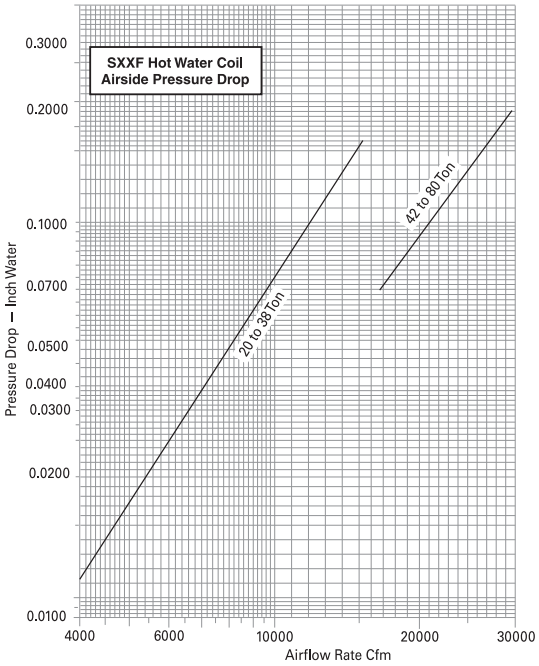


Figure 9. Airside Pressure Drop Hot Water Coil 20 to 80-Ton Units



Discharge Plenum

Figure 10. Airside Pressure Drop, Standard Height Discharge Plenum 20 to 38 Ton Unit

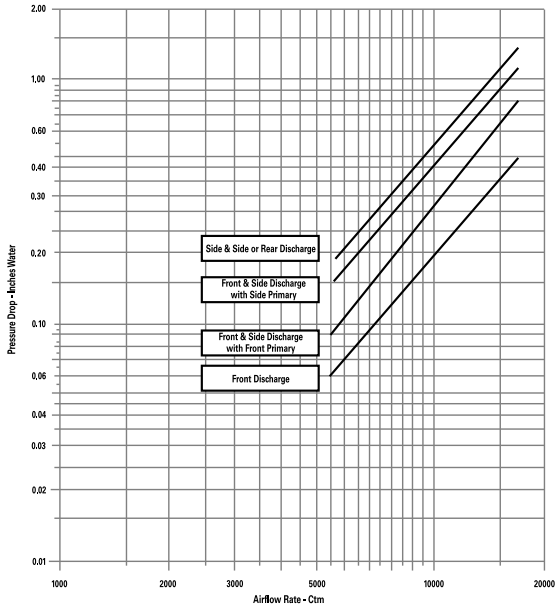


Figure 11. Airside Pressure Drop, Standard Height Discharge Plenum 42 to 80 Ton Unit

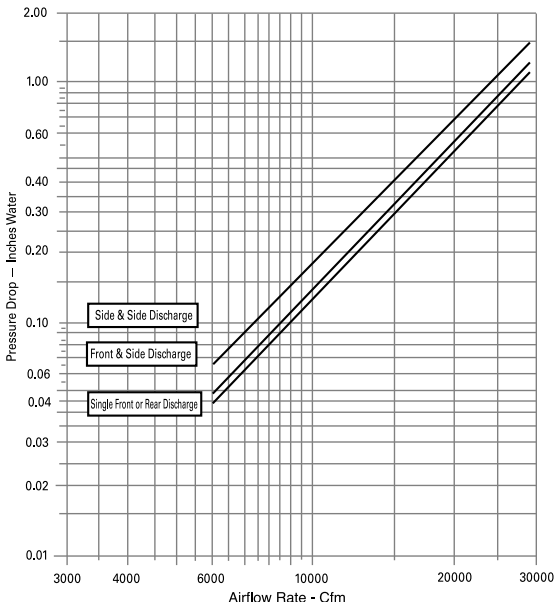


Figure 12. Airside Pressure Drop, Low Height Discharge Plenum 20 to 38 Ton Unit

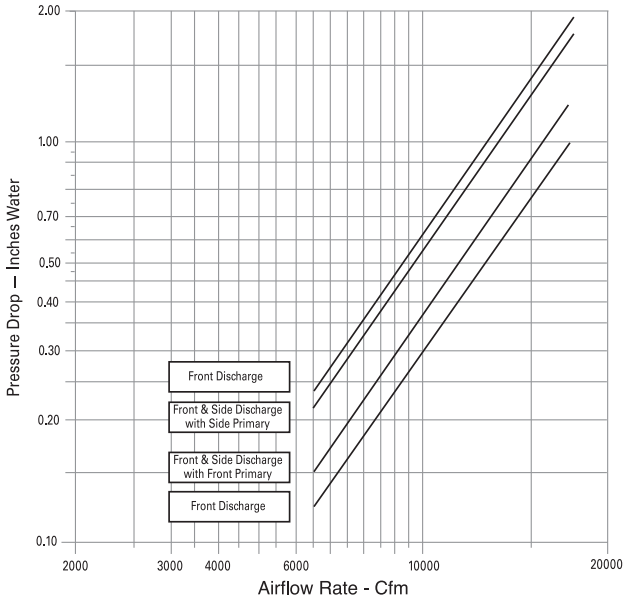


Figure 13. Airside Pressure Drop, Low Height Discharge Plenum 42 to 80 Ton Unit

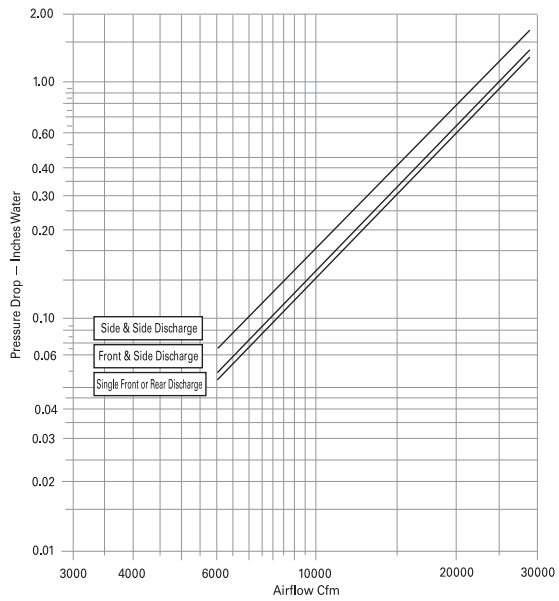


Figure 14. Airside Pressure Drop Extended Height Discharge Plenum 20 to 38-Ton Unit

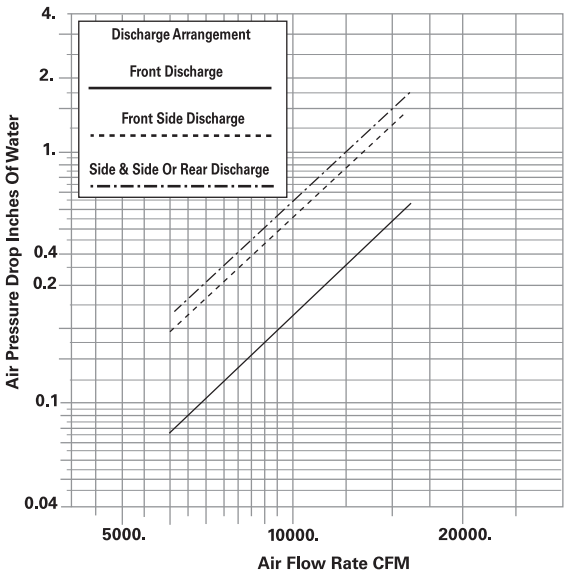


Figure 15. Airside Pressure Drop Extended Height Discharge Plenum 42 to 80-Ton Unit

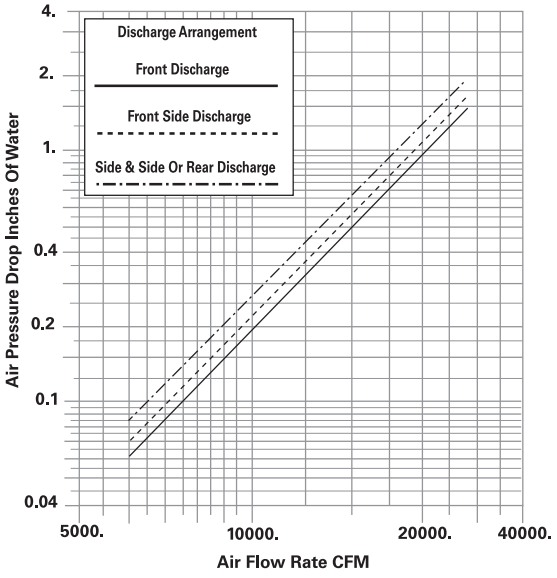


Figure 16. Airside Pressure Drop Standard Height Discharge Plenum 90 to 100-Ton Unit

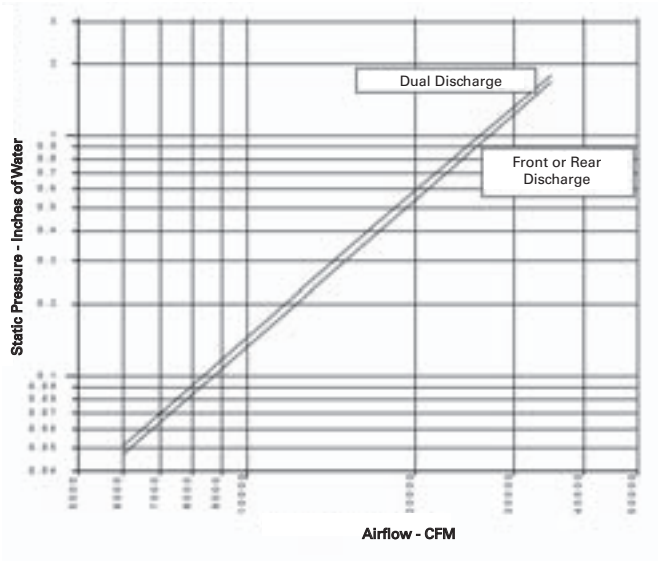


Figure 17. Airside Pressure Drop Low Height Discharge Plenum 90 to 100-Ton Unit

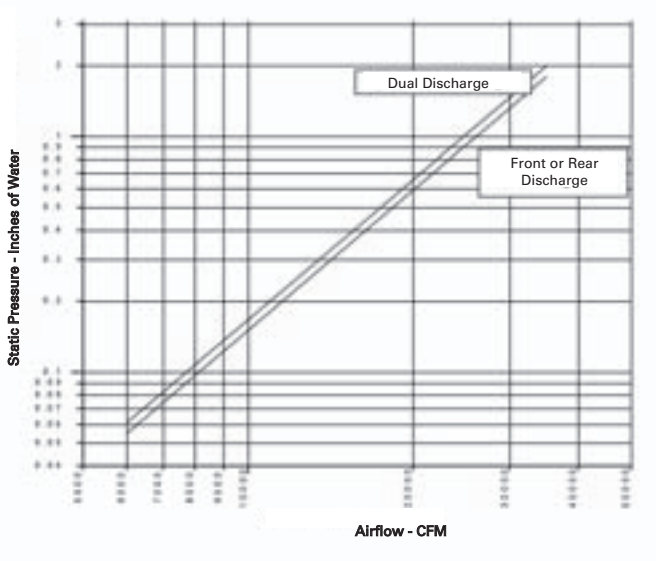
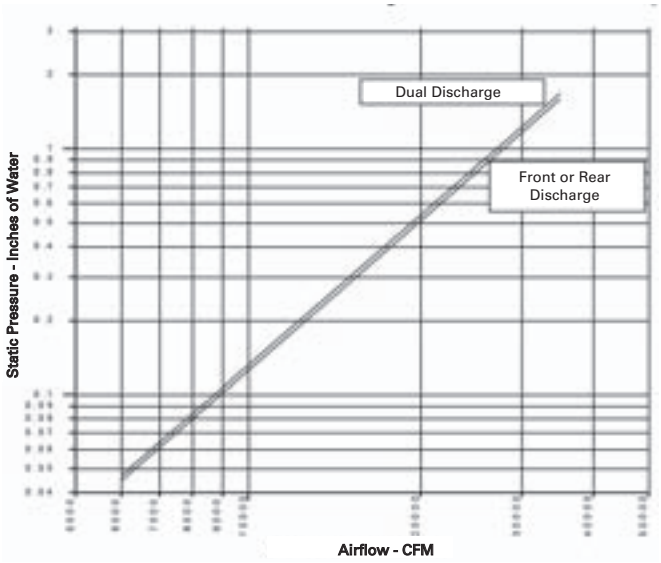


Figure 18. Airside Pressure Drop Extended Height Discharge Plenum 90 to 100-Ton Unit



Airside Economizer with Standard Damper

Figure 19. Airside Pressure Drop: Airside Economizer with Standard Damper 20 to 38-Ton Unit

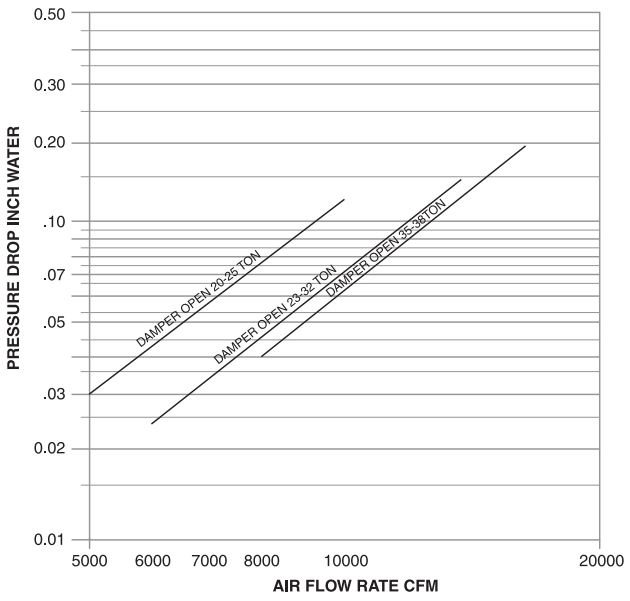


Figure 20. Airside Pressure Drop: Airside Economizer with Standard Damper 42 to 80-Ton Unit

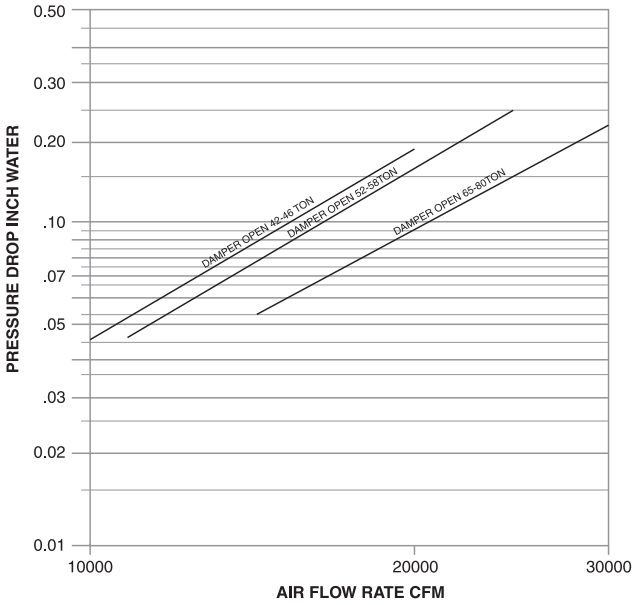
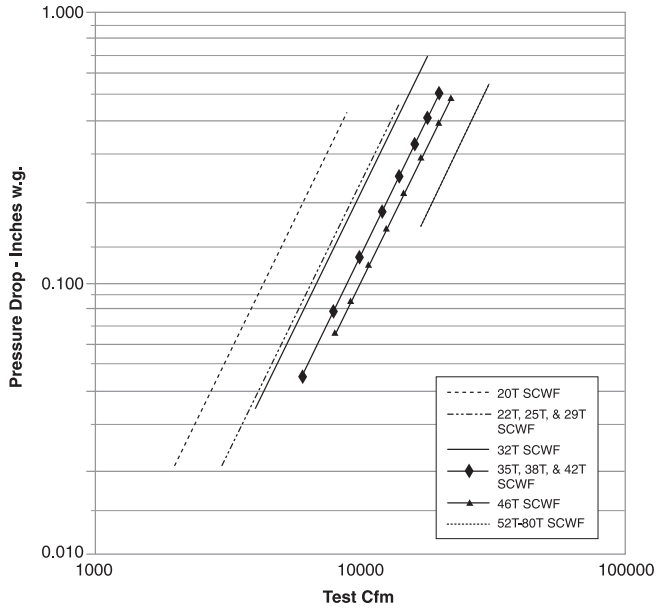


Figure 21. Airside Pressure Drop Airside Economizer with Traq™ Damper



Waterside Pressure Drop

Note: *Each curve provides total water pressure drop through the entire unit including all accessories and internal valves and piping. Do not add curves together.*

Figure 22. Waterside Pressure Drop SCWF/SIWF 20, 22, 25

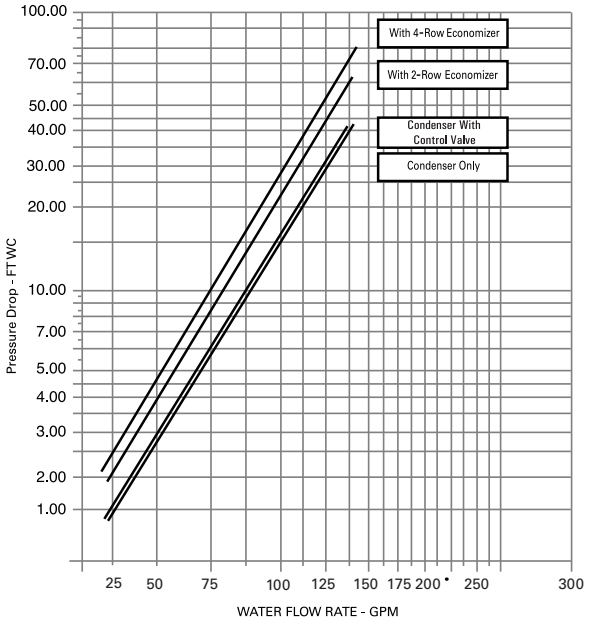


Figure 23. Waterside Pressure Drop SCWF/SIWF 29, 32

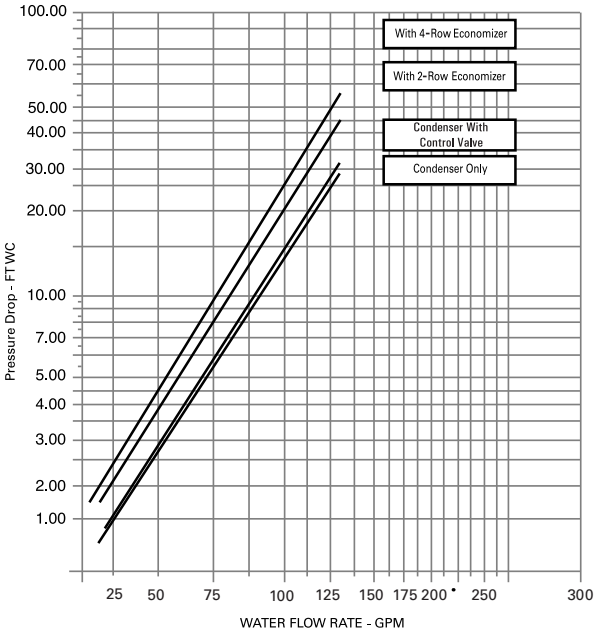


Figure 24. Waterside Pressure Drop CWF/SIWF 35, 38

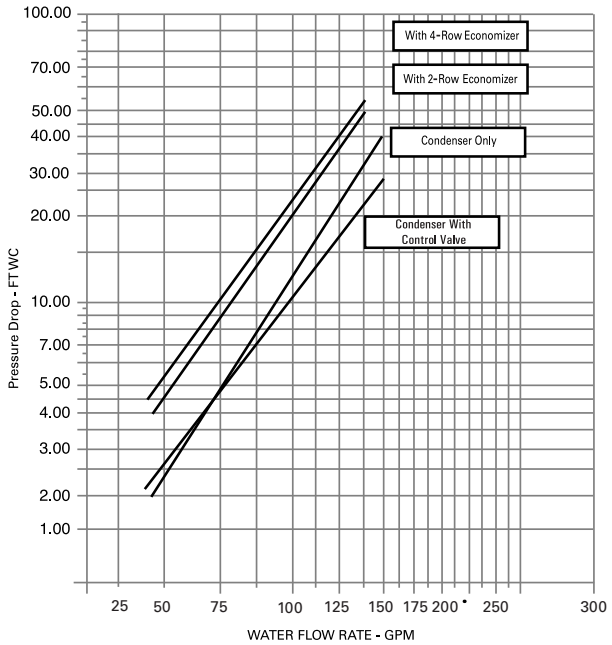


Figure 25. Waterside Pressure Drop SCWF/SIWF 42, 46

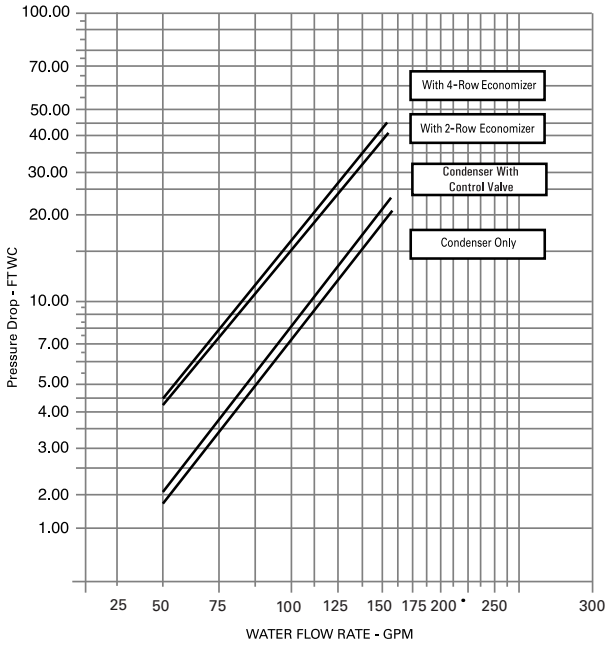


Figure 26. Waterside Pressure Drop SCWF/SIWF 52, 58

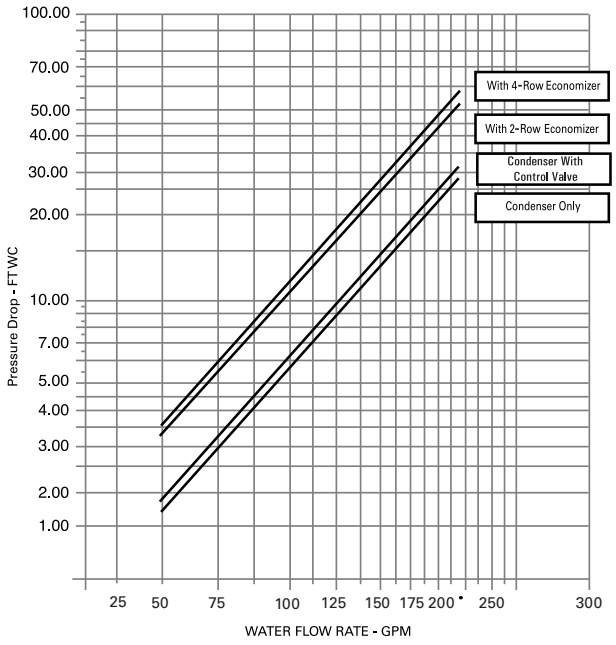


Figure 27. Waterside Pressure Drop SCWF/SIWF 65

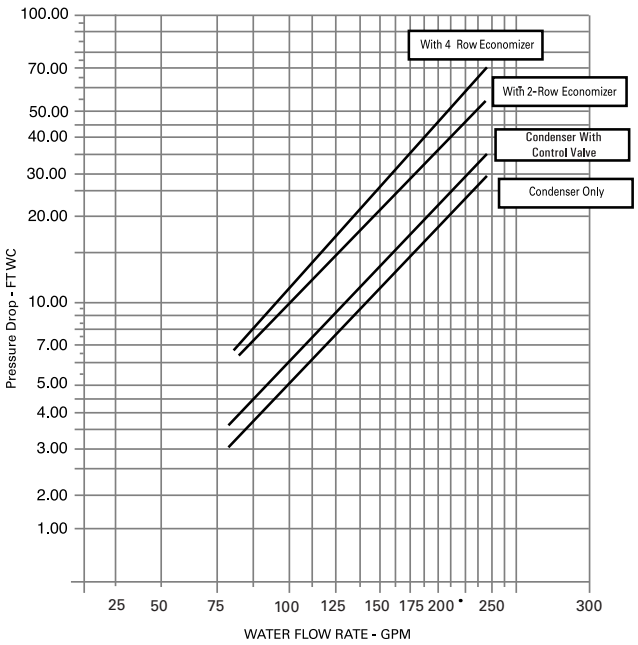


Figure 28. Waterside Pressure Drop SCWF/SIWF 72

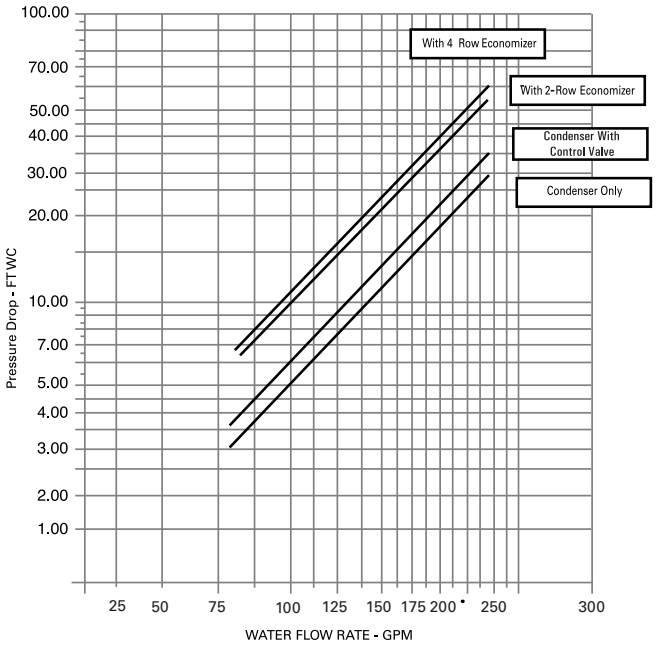


Figure 29. Waterside Pressure Drop SCWF/SIWF 80

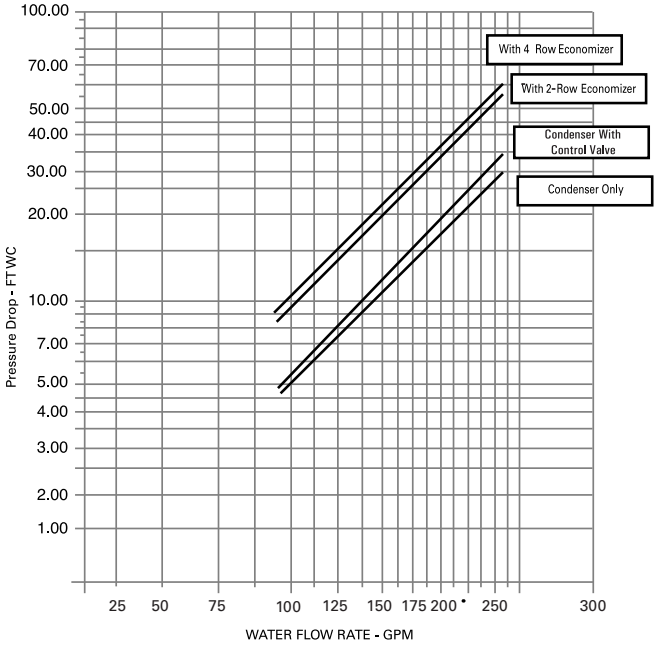


Figure 30. Waterside Pressure Drop SCWF/SIWF 90

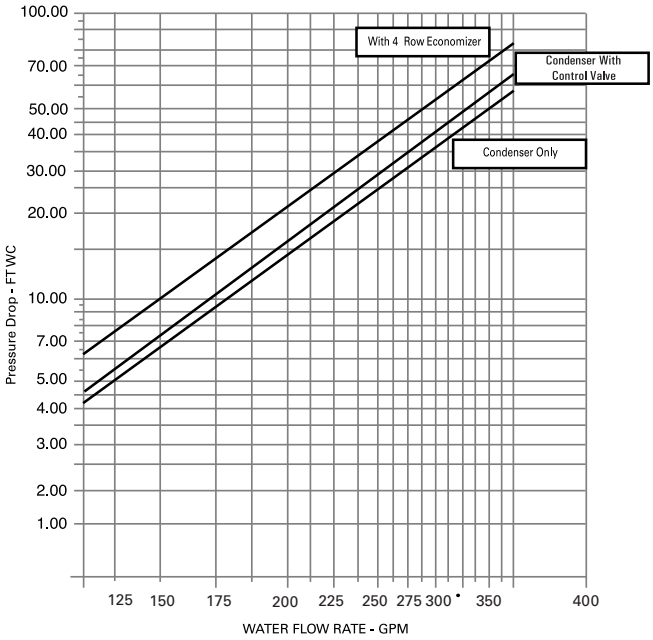


Figure 31. Waterside Pressure Drop SCWF/SIWF 100

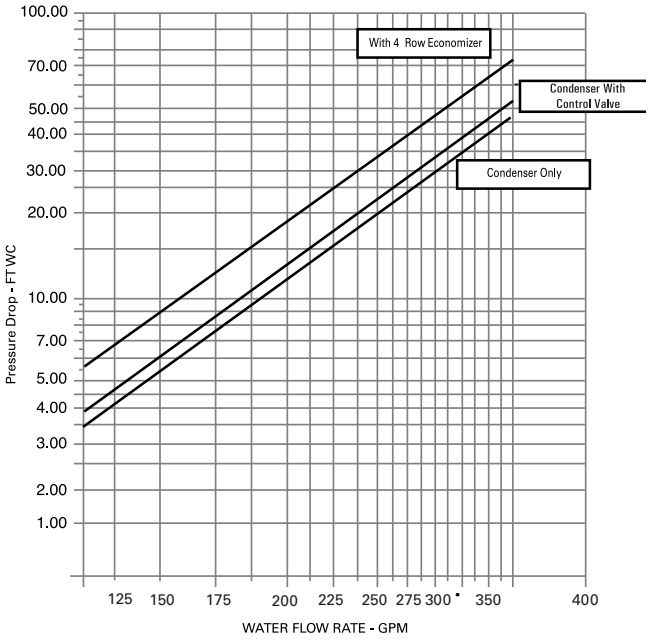
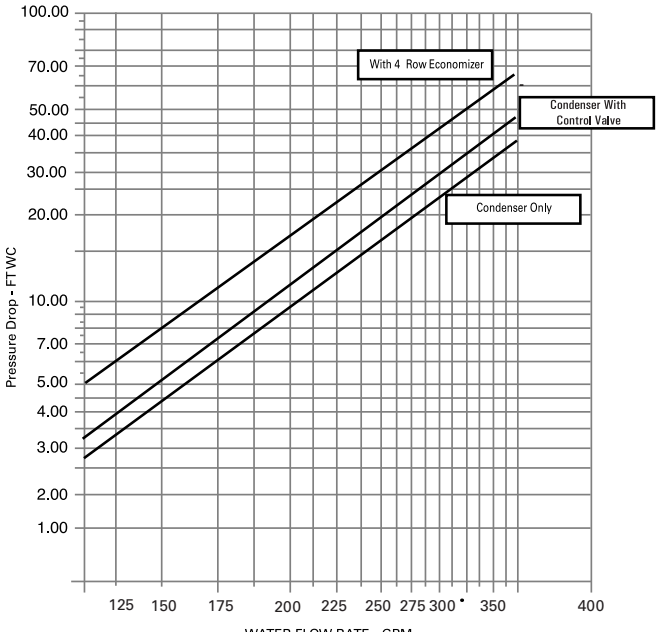


Figure 32. Waterside Pressure Drop SCWF/SIWF 110



Hot Water Coil

Figure 33. Hot Water Coil Pressure Drop SCXF 20-38 (one row)

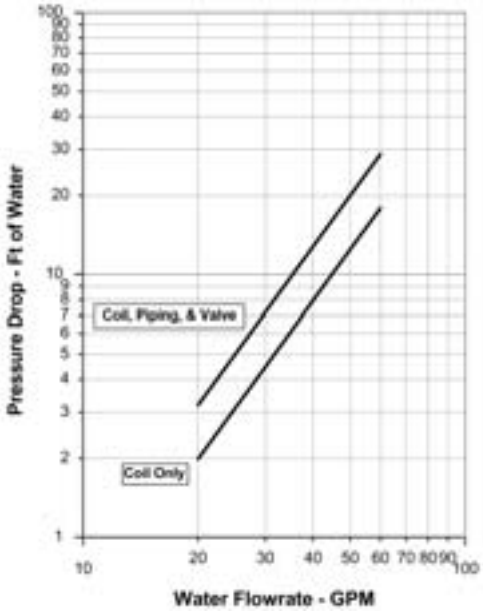
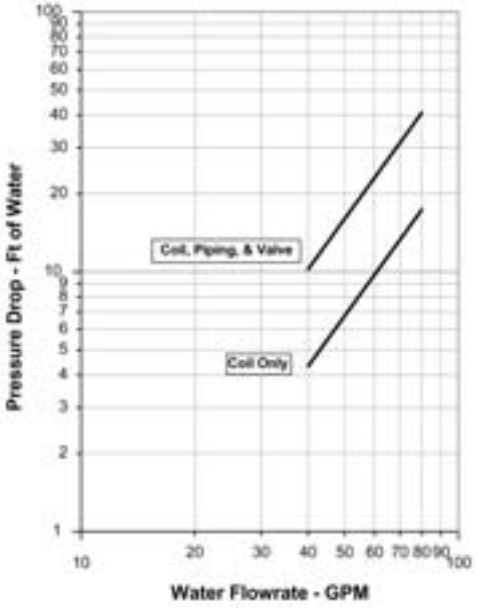


Figure 34. Hot Water Coil Pressure Drop SCXF 42 - 80 (one row)



Note: *Each curve provides total water pressure drop through the entire unit including all accessories and tinternal valves and piping. Do not add curves together.*

Table 13. CFM Capacity correction table

Cfm Compared To Rated Quanitity	DX Cooling		Waterside Economizer	
	Cooling Capacity Multiplier	Sensible Capacity Multiplier	Cooling Capacity Multiplier	Sensible Capacity Multiplier
-20%	0.970	0.910	0.970	0.910
-10%	0.985	0.955	0.985	0.955
Std	1.000	1.000	1.000	1.000
+3%	1.005	1.014	1.005	1.014
+6%	1.009	1.027	1.009	1.027

Table 14. SCWF/SIWF Water volume in u.s. gallons / liters

Unit Size	Unit W/O Economizer		Unit with Mech. Cleanable Econ		Unit with Chem. Cleanable Econ	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
20, 22, 25	9.0	34.1	17.4	65.9	16.9	64.0
29, 32	9.0	34.1	20.5	77.6	18.8	71.2
35, 38	10.0	37.9	21.9	82.9	20.2	76.5
42, 46	15.0	56.8	32.2	121.9	31.4	118.9
52, 58	15.0	56.8	36.9	139.7	35.9	135.9
65, 72, 80	16.0	60.6	37.9	143.5	36.9	139.7
90	22.5	85.2	50.1	189.6	N/A	N/A
100	23.0	87.1	50.6	191.5	N/A	N/A
110	24.0	90.8	51.6	195.3	N/A	N/A

Water-Cooled Performance Data

Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

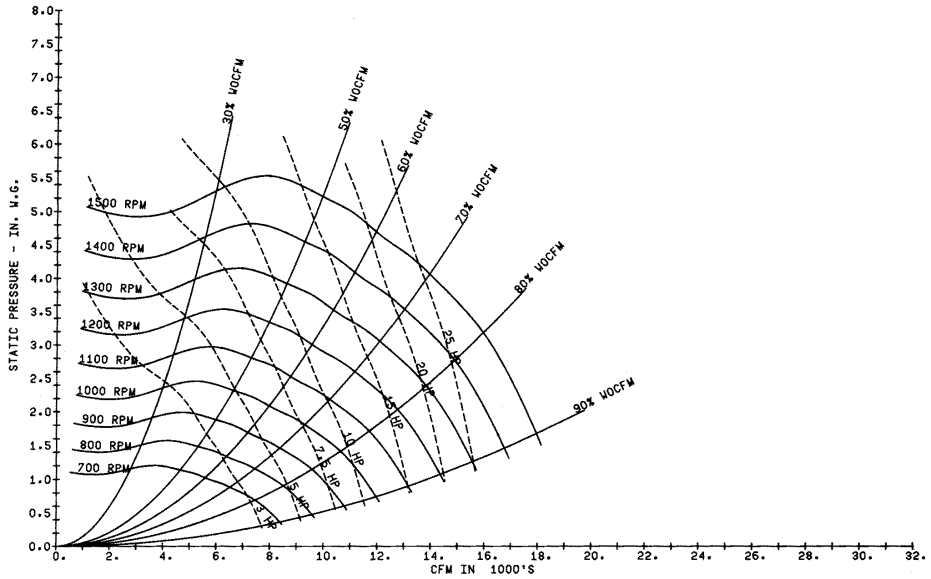
Table 15. SCWF/SIWF 20 - Economizer performance - 8,000 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	210.3	189.3	53.4	132.5	132.5	60.3	140.0	135.3	50.6	92.8	92.8	58.7
		60	220.8	193.7	52.4	136.2	136.2	59.5	147.0	144.0	49.9	96.1	96.1	58.2
		70	228.8	197.1	51.5	138.9	138.9	59.0	152.4	146.2	49.4	98.4	98.4	57.8
	67	50	265.7	160.4	55.6	155.2	119.1	61.2	175.6	114.8	52.0	102.0	88.3	59.1
		60	284.6	167.9	54.5	164.4	122.4	60.5	188.4	119.7	51.3	107.8	90.3	58.6
		70	299.0	173.7	53.5	171.8	125.0	59.9	198.0	123.3	50.7	112.6	92.0	58.2
	72	50	339.2	133.9	58.6	221.4	92.8	63.9	224.3	90.6	54.0	146.7	64.5	60.9
		60	364.8	143.3	57.2	238.3	98.5	62.9	241.1	96.5	53.0	157.3	68.0	60.2
		70	383.9	150.5	56.0	251.4	103.0	62.2	253.7	101.0	52.2	165.5	70.7	59.7
80	62	50	230.9	226.2	54.2	165.6	165.6	61.6	160.2	160.2	51.4	116.1	116.1	59.6
		60	239.2	234.5	53.0	170.2	170.2	60.7	166.4	166.4	50.5	120.1	120.1	59.0
		70	245.2	240.6	52.0	173.5	173.5	60.0	170.7	170.7	49.9	123.0	123.0	58.5
	67	50	271.3	204.6	55.9	171.1	166.8	61.8	177.8	149.8	52.1	116.4	111.3	59.7
		60	288.1	211.3	54.6	178.2	169.4	60.9	189.3	154.2	51.3	120.8	115.7	59.0
		70	300.9	216.5	53.6	183.7	171.4	60.2	198.1	157.5	50.7	124.2	119.1	58.5
	72	50	338.5	176.3	58.5	222.0	135.4	63.9	223.8	124.8	54.0	146.2	98.8	60.8
		60	363.9	185.8	57.1	238.0	140.8	62.9	240.5	130.7	53.0	156.8	102.2	60.2
		70	383.0	193.1	55.9	250.6	145.1	62.2	253.1	135.2	52.2	165.0	104.8	59.7
85	62	50	262.5	262.5	55.5	198.6	198.6	62.9	183.2	183.2	52.3	139.3	139.3	60.6
		60	270.4	270.4	54.0	204.1	204.1	61.8	190.2	190.2	51.3	144.1	144.1	59.8
		70	275.9	275.9	52.9	208.0	208.0	60.9	195.1	195.1	50.6	147.6	147.6	59.2
	67	50	283.5	251.3	56.3	199.2	199.2	63.0	188.1	187.8	52.5	139.6	139.6	60.6
		60	298.0	257.1	54.9	204.8	204.8	61.8	197.7	191.4	51.6	144.4	144.4	59.8
		70	309.0	261.6	53.8	208.8	208.8	61.0	205.0	194.3	50.9	147.9	147.9	59.2
	72	50	340.7	219.3	58.6	230.6	180.5	64.2	223.6	158.9	53.9	151.1	134.6	61.0
		60	364.4	228.2	57.1	244.2	185.1	63.1	240.0	164.7	53.0	159.8	137.4	60.3
		70	382.6	235.1	55.9	255.1	188.8	62.3	252.6	169.2	52.2	166.7	139.7	59.8

Table 16. SCWF/SIWF20 Gross cooling capacity - 8,000 cfm, 60 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	266	194	84.8	257	190	94.7	246	184	104.6
	67	292	160	85.6	281	155	95.5	269	150	105.3
	72	319	125	86.5	307	120	96.3	294	115	106.1
80	62	268	227	84.8	258	223	94.7	248	217	104.6
	67	292	195	85.6	282	190	95.5	270	185	105.3
	72	319	159	86.5	308	155	96.3	294	149	106.1
85	62	267	267	84.8	260	260	94.8	251	251	104.7
	67	293	227	85.6	283	223	95.5	271	217	105.4
	72	320	193	86.5	308	189	96.3	295	184	106.1

Figure 35. SCWF/SIWF 20 Fan performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

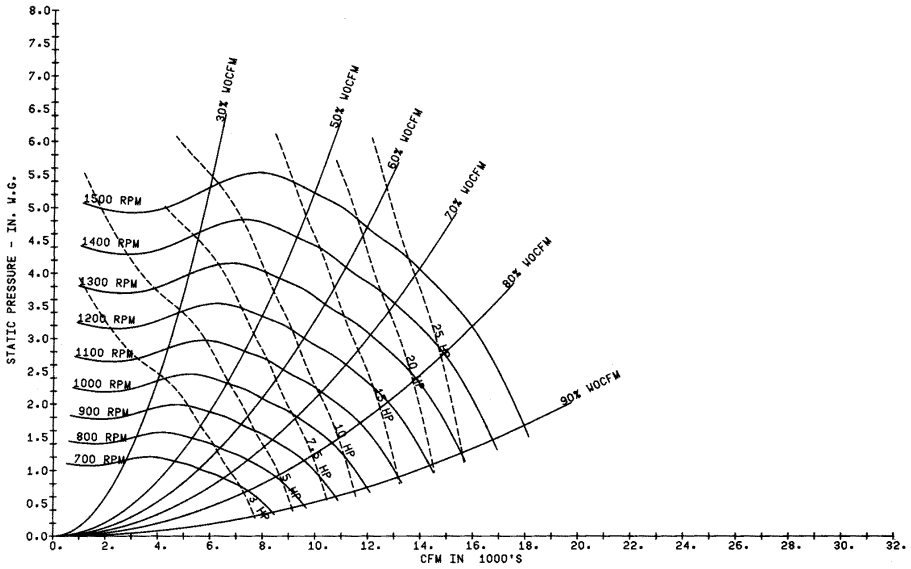
Table 17. SCWF/SIWF 22 - Economizer performance - 8800 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	226.8	205.7	53.2	143.3	143.3	60.2	150.1	145.0	50.5	99.6	99.6	58.6
		60	237.6	210.2	52.2	147.3	147.3	59.5	157.1	155.1	49.8	102.9	102.9	58.1
		70	245.9	213.8	51.4	150.2	150.2	58.9	162.5	157.3	49.2	105.4	105.4	57.7
	67	50	286.3	173.7	55.4	167.0	129.3	61.1	188.1	123.5	51.8	108.9	95.1	59.0
		60	305.8	181.4	54.3	176.4	132.6	60.3	200.9	128.4	51.1	114.8	97.1	58.5
		70	320.8	187.5	53.3	184.2	135.4	59.8	210.7	132.1	50.5	119.7	98.9	58.1
	72	50	365.5	144.5	58.3	238.0	100.2	63.7	240.1	97.1	53.7	156.6	69.2	60.7
		60	391.8	154.1	56.9	255.6	106.1	62.7	256.9	103.0	52.8	167.3	72.6	60.1
		70	411.9	161.6	55.7	269.5	110.8	62.0	269.8	107.6	52.0	175.9	75.4	59.6
80	62	50	249.7	244.6	54.1	179.1	179.1	61.5	172.2	172.2	51.3	124.5	124.5	59.5
		60	258.1	253.0	52.8	184.0	184.0	60.6	178.4	178.4	50.4	128.6	128.6	58.9
		70	264.5	259.4	51.9	187.6	187.6	59.9	182.9	182.9	49.7	131.7	131.7	58.4
	67	50	292.3	222.0	55.6	184.5	181.5	61.7	190.4	161.4	51.9	124.8	119.3	59.5
		60	309.6	228.8	54.4	191.8	184.1	60.8	201.9	165.8	51.1	129.2	123.7	58.9
		70	322.9	234.2	53.4	197.6	186.2	60.1	210.8	169.2	50.5	132.7	127.1	58.4
	72	50	364.6	190.8	58.3	238.6	146.7	63.7	239.6	134.1	53.7	156.1	106.2	60.7
		60	390.8	200.5	56.8	255.2	152.2	62.7	256.4	140.0	52.8	166.8	109.7	60.1
		70	410.9	208.1	55.7	268.6	156.8	62.0	269.2	144.6	52.0	175.3	112.4	59.6
85	62	50	284.2	284.2	55.3	214.8	214.8	62.8	196.8	196.8	52.2	149.5	149.5	60.4
		60	292.5	292.5	53.9	220.7	220.7	61.7	203.9	203.9	51.2	154.4	154.4	59.7
		70	298.4	298.4	52.7	225.0	225.0	60.8	209.0	209.0	50.4	158.1	158.1	59.1
	67	50	305.7	273.1	56.1	215.5	215.5	62.8	201.6	195.7	52.3	149.7	149.7	60.4
		60	320.5	279.0	54.7	221.4	221.4	61.7	211.1	206.2	51.4	154.7	154.7	59.7
		70	332.0	283.6	53.6	225.8	225.8	60.9	218.5	209.0	50.7	158.4	158.4	59.1
	72	50	366.9	237.7	58.3	247.9	195.9	64.0	239.3	171.1	53.7	161.4	145.1	60.9
		60	391.3	246.8	56.9	262.1	200.7	62.9	255.8	177.0	52.8	170.1	147.9	60.2
		70	410.3	254.0	55.7	273.5	204.6	62.1	268.6	181.5	52.0	177.3	150.2	59.6

Table 18. SCWF/SIWF22 Gross cooling capacity - 8,800 cfm, 66 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	272	202	84.1	262	197	94.0	251	192	103.9
	67	297	165	84.8	287	161	94.7	274	156	104.5
	72	325	127	85.6	313	123	95.4	299	118	105.2
80	62	273	238	84.1	264	233	94.0	253	228	103.9
	67	298	203	84.8	288	198	94.7	275	193	104.5
	72	325	164	85.6	313	160	95.4	299	155	105.2
85	62	276	276	84.2	268	268	94.1	259	259	104.1
	67	299	238	84.8	289	233	94.7	277	228	104.6
	72	326	201	85.6	314	197	95.4	301	192	105.3

Figure 36. SCWF/SIWF 22 Fan performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

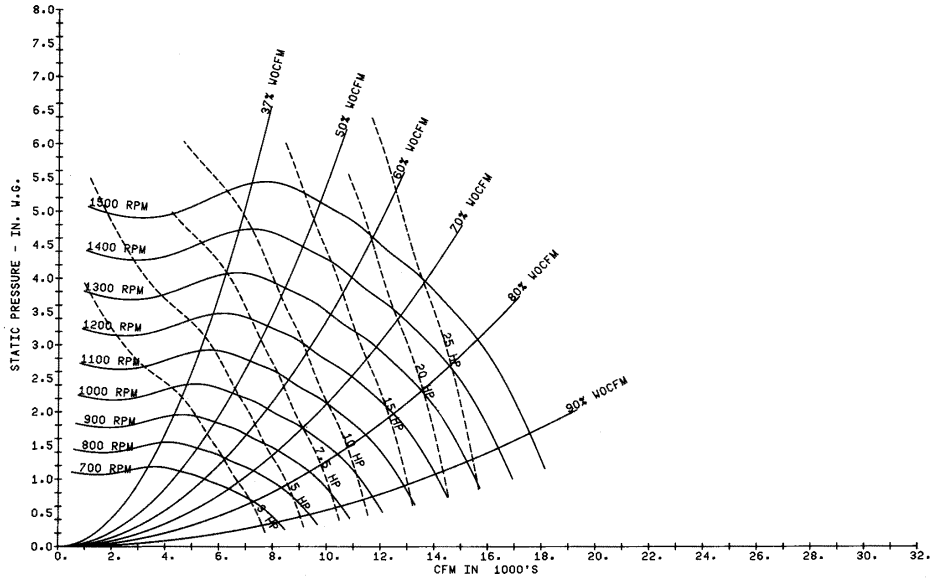
Table 19. SCWF/SIWF 25- Economizer performance - 10,000 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	250.7	229.6	53.0	159.0	159.0	60.0	164.5	158.7	50.2	109.2	109.2	58.5
		60	261.4	234.1	52.0	163.2	163.2	59.4	171.1	170.9	49.6	112.6	112.6	58.0
		70	265.2	235.7	51.6	164.6	164.6	59.1	173.5	171.9	49.3	113.7	113.7	57.8
	67	50	316.1	193.1	55.0	183.8	144.0	60.8	205.7	136.0	51.5	118.7	104.8	58.8
		60	335.6	200.8	53.9	193.5	147.5	60.2	218.1	140.7	50.8	124.5	106.8	58.3
		70	342.5	203.6	53.6	197.0	148.7	59.9	222.4	142.3	50.6	126.7	107.6	58.2
	72	50	404.1	160.2	57.8	262.3	110.9	63.3	262.5	106.4	53.3	170.7	75.8	60.4
		60	429.9	169.5	56.5	280.2	116.9	62.5	278.7	112.1	52.4	181.4	79.2	59.8
		70	439.1	172.9	56.0	286.5	119.0	62.2	284.5	114.1	52.1	185.2	80.4	59.6
80	62	50	276.9	271.1	53.8	198.7	198.7	61.3	189.1	189.1	51.0	136.5	136.5	59.3
		60	285.3	279.5	52.6	203.9	203.9	60.4	195.2	195.2	50.2	140.7	140.7	58.8
		70	288.2	282.4	52.2	205.6	205.6	60.1	197.2	197.2	49.9	142.2	142.2	58.6
	67	50	322.6	247.4	55.2	203.9	202.9	61.5	208.1	178.0	51.6	136.8	136.8	59.3
		60	339.8	254.2	54.1	211.3	205.6	60.6	219.1	182.2	50.8	141.1	134.8	58.8
		70	345.9	256.6	53.6	213.9	206.5	60.3	223.1	183.7	50.6	142.6	136.4	58.6
	72	50	403.2	212.1	57.8	262.8	163.2	63.3	262.0	147.5	53.3	170.2	116.9	60.4
		60	428.9	221.6	56.4	279.7	168.8	62.5	278.1	153.2	52.4	180.8	120.4	59.8
		70	438.1	225.0	56.0	285.8	170.9	62.1	283.9	155.2	52.1	184.6	121.6	59.6
85	62	50	315.6	315.6	55.0	238.3	238.3	62.6	216.2	216.2	51.9	163.9	163.9	60.2
		60	324.1	324.1	53.6	244.6	244.6	61.5	223.0	223.0	50.9	168.9	168.9	59.5
		70	326.9	326.9	53.2	246.6	246.6	61.2	225.4	225.4	50.6	170.6	170.6	59.3
	67	50	337.7	304.9	55.7	239.1	239.1	62.6	220.7	214.1	52.0	164.2	164.2	60.2
		60	352.4	310.7	54.4	245.3	245.3	61.5	229.7	227.2	51.1	169.2	169.2	59.5
		70	357.6	312.8	53.9	247.4	247.4	61.2	233.0	228.4	50.8	170.9	170.9	59.3
	72	50	404.8	264.6	57.9	273.0	218.6	63.7	261.5	188.6	53.3	175.9	160.0	60.6
		60	429.2	273.6	56.4	287.4	223.4	62.7	277.6	194.2	52.4	184.5	162.8	59.9
		70	438.0	276.9	55.9	292.5	225.1	62.3	283.2	196.2	52.1	187.7	163.8	59.7

Table 20. SCWF/SIWF25 Gross cooling capacity - 10,000 cfm, 75 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	285	228	83.7	274	223	93.6	261	217	103.5	-	-	-	-	-	-
75	67	311	182	84.4	298	177	94.3	285	172	104.1	-	-	-	-	-	-
	72	338	134	85.2	325	129	95.0	309	124	104.7	-	-	-	-	-	-
	62	286	274	83.8	275	269	93.6	262	262	103.5	295	295	94.2	280	280	104.0
80	67	311	228	84.4	299	223	94.3	285	217	104.1	321	251	94.9	305	245	104.7
	72	339	181	85.2	325	176	95.0	310	170	104.8	349	195	95.7	331	189	105.4
	62	300	300	84.2	291	291	94.1	280	280	103.9	320	320	94.9	306	306	104.7
85	67	313	273	84.5	300	267	94.3	287	261	104.1	322	305	94.9	306	298	104.7
	72	340	227	85.2	326	222	95.0	311	216	104.8	350	250	95.7	332	243	105.4

Figure 37. SCWF/SIWF 25 Fan performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

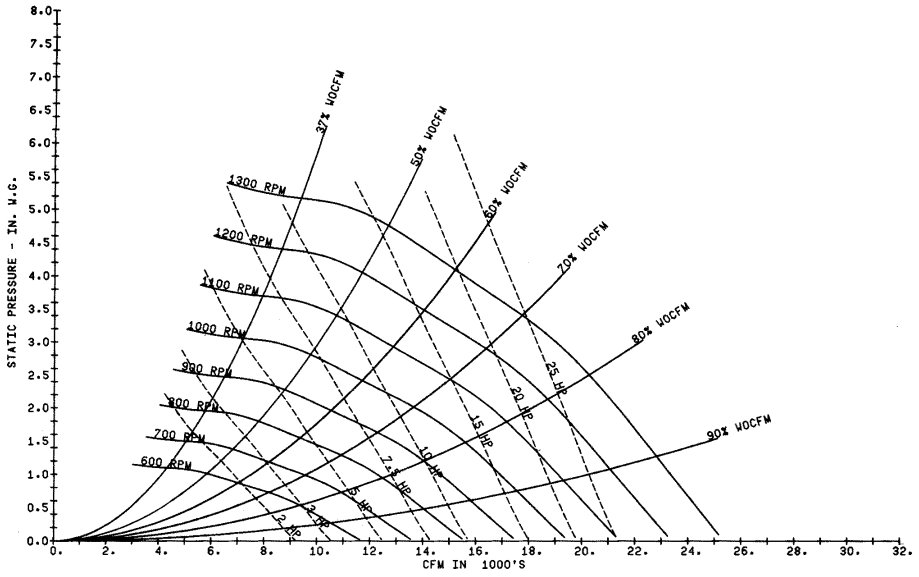
Table 21. SCWF/SIWF 29 - Economizer performance - 11,600cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	302.2	272.9	53.3	190.6	190.6	60.2	200.6	193.8	50.5	133.0	133.0	58.6
		60	316.4	278.8	52.3	195.7	195.7	59.5	209.8	206.5	49.8	137.3	137.3	58.2
		70	327.9	283.8	51.4	199.7	199.7	58.9	217.4	209.6	49.3	140.7	140.7	57.8
	67	50	382.0	231.0	55.5	222.7	171.6	61.1	251.7	164.8	51.9	145.8	126.7	59.0
		60	407.4	241.1	54.4	235.2	176.0	60.4	268.6	171.2	51.2	153.5	129.3	58.5
		70	428.3	249.5	53.4	245.9	179.8	59.8	282.3	176.4	50.5	160.5	131.8	58.1
	72	50	488.3	192.9	58.4	318.0	133.5	63.7	321.4	129.8	53.8	209.9	92.5	60.7
		60	522.1	205.3	57.0	340.8	141.2	62.8	343.5	137.7	52.9	223.9	97.0	60.1
		70	549.9	215.7	55.8	360.0	147.7	62.1	361.6	144.1	52.1	235.8	100.9	59.6
80	62	50	332.2	325.4	54.1	238.2	238.2	61.5	229.7	229.7	51.3	166.2	166.2	59.6
		60	343.2	336.5	52.9	244.5	244.5	60.6	237.9	237.9	50.5	171.6	171.6	58.9
		70	352.0	345.3	51.9	249.4	249.4	59.9	244.1	244.1	49.8	175.9	175.9	58.4
	67	50	389.9	294.8	55.7	245.9	240.6	61.7	254.7	215.0	52.0	166.6	159.4	59.6
		60	412.4	303.8	54.5	255.3	244.0	60.9	269.9	220.8	51.2	172.4	165.1	59.0
		70	431.0	311.3	53.5	263.4	246.9	60.2	282.5	225.6	50.5	177.4	170.0	58.5
	72	50	487.3	254.1	58.4	318.8	195.0	63.7	320.7	179.0	53.8	209.2	141.7	60.7
		60	520.9	266.7	57.0	340.3	202.2	62.8	342.8	186.8	52.9	223.2	146.2	60.1
		70	548.6	277.2	55.8	358.8	208.5	62.0	360.8	193.2	52.1	235.0	150.0	59.6
85	62	50	377.9	377.9	55.4	285.7	285.7	62.8	262.7	262.7	52.2	199.5	199.5	60.5
		60	388.6	388.6	53.9	293.2	293.2	61.7	271.9	271.9	51.3	205.9	205.9	59.7
		70	396.6	396.6	52.8	299.0	299.0	60.9	279.0	279.0	50.5	211.0	211.0	59.1
	67	50	407.5	362.3	56.2	286.6	286.6	62.9	269.4	261.6	52.4	199.9	199.9	60.5
		60	426.8	370.0	54.8	294.2	294.2	61.8	282.0	274.4	51.5	206.3	206.3	59.7
		70	442.8	376.5	53.7	300.1	300.1	60.9	292.4	278.4	50.7	211.5	211.5	59.1
	72	50	489.7	316.0	58.4	331.0	260.1	64.1	320.3	228.1	53.8	216.1	193.2	60.9
		60	521.5	327.9	57.0	349.3	266.3	63.0	342.1	235.8	52.9	227.6	196.9	60.2
		70	547.9	337.9	55.7	365.1	271.7	62.2	360.0	242.2	52.1	237.6	200.2	59.7

Table 22. SCWF/SIWF29 Gross cooling capacity - 11,600 cfm, 87 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB	EWB	Total	Sensible	LWT	Total	Sensible	LWT	Total	Sensible	LWT
°F	°F	MBh	MBh	°F	MBh	MBh	°F	MBh	MBh	°F
75	62	338	256	83.8	326	250	93.7	313	243	103.6
	67	369	208	84.5	355	203	94.3	340	196	104.2
	72	402	159	85.2	388	154	95.1	371	147	104.9
80	62	340	302	83.8	328	296	93.7	314	289	103.6
	67	370	256	84.5	357	251	94.4	342	244	104.2
	72	402	207	85.2	388	201	95.1	371	195	104.9
85	62	346	346	83.9	336	336	93.9	325	325	103.8
	67	371	301	84.5	358	295	94.4	343	288	104.2
	72	404	254	85.2	389	249	95.1	372	242	104.9

Figure 38. SCWF/SIWF 29 Fan performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 23. SCWF/SIWF 32- Economizer performance - 12,800 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	325.8	296.8	53.1	206.2	206.2	60.2	214.8	207.4	50.4	142.6	142.6	58.6
		60	340.9	303.2	52.1	212.0	212.0	59.4	224.4	222.7	49.7	147.3	147.3	58.1
		70	345.5	305.1	51.8	213.7	213.7	59.2	227.4	223.9	49.5	148.7	148.7	57.9
	67	50	410.8	250.1	55.3	239.5	186.4	61.0	268.8	177.2	51.7	155.5	136.5	58.9
		60	438.2	260.9	54.1	252.7	191.1	60.3	286.5	183.8	51.0	163.6	139.3	58.4
		70	446.8	264.3	53.8	257.1	192.7	60.0	292.0	185.9	50.7	166.4	140.3	58.3
	72	50	524.5	207.6	58.1	341.3	144.0	63.5	343.2	138.9	53.6	223.5	99.0	60.6
		60	561.3	221.1	56.7	366.1	152.2	62.6	366.3	147.1	52.6	238.5	103.8	60.0
		70	572.8	225.3	56.2	374.0	154.9	62.3	373.5	149.6	52.3	243.3	105.3	59.8
80	62	50	359.2	351.8	54.0	257.7	257.7	61.4	246.7	246.7	51.2	178.3	178.3	59.5
		60	371.0	363.6	52.7	264.8	264.8	60.5	255.3	255.3	50.3	184.1	184.1	58.8
		70	374.6	367.2	52.3	266.9	266.9	60.2	257.8	257.8	50.1	185.9	185.9	58.6
	67	50	419.5	320.1	55.5	265.0	262.1	61.6	272.1	231.7	51.8	178.6	178.6	59.5
		60	443.6	329.6	54.2	275.3	265.8	60.7	287.9	237.7	51.0	184.7	176.7	58.8
		70	451.2	332.6	53.8	278.6	267.0	60.5	292.9	239.6	50.7	186.7	178.6	58.7
	72	50	523.3	274.5	58.1	342.0	211.3	63.6	342.5	192.3	53.6	222.8	152.4	60.6
		60	560.0	288.2	56.7	365.5	219.1	62.6	365.5	200.4	52.6	237.7	157.2	60.0
		70	571.4	292.5	56.2	373.1	221.7	62.3	372.7	202.9	52.3	242.5	158.7	59.8
85	62	50	409.2	409.2	55.2	309.1	309.1	62.7	282.0	282.0	52.0	214.0	214.0	60.3
		60	420.9	420.9	53.8	317.6	317.6	61.6	291.8	291.8	51.1	220.9	220.9	59.6
		70	424.4	424.4	53.3	320.1	320.1	61.3	294.7	294.7	50.8	223.0	223.0	59.4
	67	50	439.0	394.1	56.0	310.1	310.1	62.8	288.3	279.8	52.2	214.4	214.4	60.4
		60	459.6	402.3	54.6	318.6	318.6	61.6	301.4	296.0	51.3	221.3	221.3	59.6
		70	466.1	404.9	54.1	321.2	321.2	61.3	305.5	297.6	51.0	223.5	223.5	59.4
	72	50	526.4	342.5	58.2	355.4	282.6	63.9	342.0	245.6	53.5	230.4	208.3	60.8
		60	560.6	355.2	56.7	375.4	289.3	62.8	364.8	253.6	52.6	242.5	212.2	60.1
		70	571.4	359.3	56.2	381.8	291.5	62.5	371.9	256.1	52.3	246.5	213.5	59.8

Table 24. SCWF/SIWF 32 Gross cooling capacity - 12,800 cfm, 96 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	370	309	83.9	355	302	93.8	338	294	103.6	-	-	-	-	-	-
75	67	403	244	84.6	386	237	94.5	368	230	104.2	-	-	-	-	-	-
	72	437	176	85.4	419	169	95.1	398	162	104.9	-	-	-	-	-	-
	62	371	365	84.0	356	354	93.8	340	340	103.6	368	368	94.1	350	350	103.9
80	67	404	307	84.7	387	300	94.5	369	292	104.3	400	317	94.8	381	309	104.5
	72	438	241	85.4	420	234	95.2	400	227	104.9	434	246	95.5	413	238	105.2
	62	396	396	84.5	383	383	94.4	368	368	104.2	400	400	94.8	384	384	104.6
85	67	405	370	84.7	389	363	94.5	370	355	104.3	402	385	94.8	382	373	104.6
	72	439	305	85.4	421	299	95.2	401	291	104.9	435	315	95.5	414	308	105.2

Figure 39. SCWF/SIWF 32 Fan Performance for CV or w/VFD

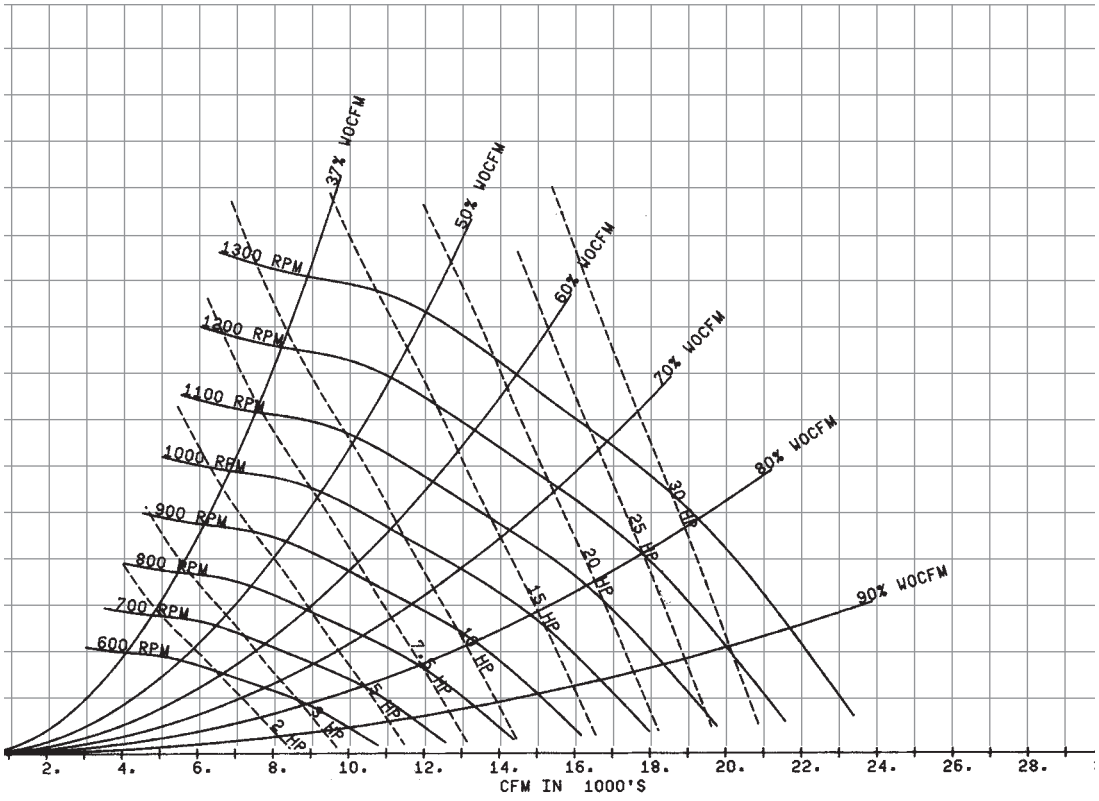


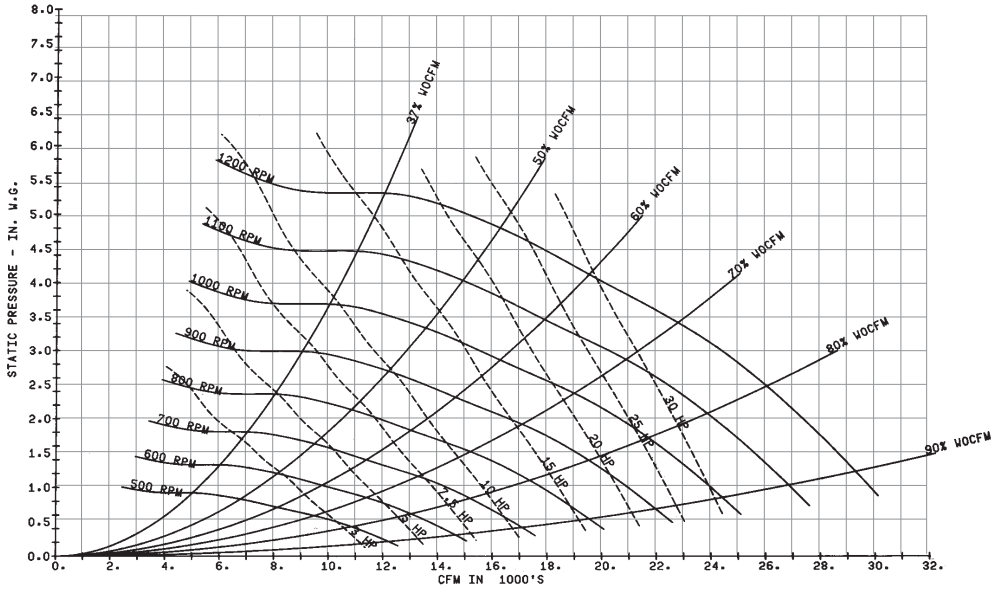
Table 25. SCWF/SIWF 35- Economizer performance - 14,000 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	335.2	309.5	52.6	212.8	212.8	59.8	216.3	208.3	49.9	143.3	143.3	58.3
		60	349.5	315.4	51.7	218.4	218.4	59.2	224.9	223.6	49.3	147.5	147.5	57.8
		70	358.9	319.4	51.0	221.9	221.9	58.7	230.7	225.9	48.9	150.3	150.3	57.5
	67	50	425.7	260.8	54.7	246.3	194.3	60.6	274.3	179.6	51.2	157.0	137.4	58.6
		60	451.9	271.0	53.6	259.2	198.8	59.9	290.2	185.6	50.5	164.7	140.1	58.1
		70	469.1	277.9	52.9	268.1	202.0	59.5	300.7	189.6	50.1	170.1	142.0	57.9
	72	50	544.6	216.1	57.4	354.1	149.9	63.0	350.3	141.5	53.0	228.0	100.5	60.2
		60	579.2	228.9	56.0	377.7	157.7	62.2	371.3	148.9	52.1	241.7	105.0	59.6
		70	602.1	237.4	55.1	393.3	162.9	61.6	385.1	153.9	51.5	250.9	107.9	59.2
80	62	50	370.3	362.2	53.4	265.9	265.9	61.0	248.2	248.2	50.6	179.2	179.2	59.1
		60	381.4	373.3	52.3	272.9	272.9	60.2	255.9	255.9	49.9	184.4	184.4	58.5
		70	388.6	380.5	51.5	277.3	277.3	59.7	260.8	260.8	49.4	187.8	187.8	58.2
	67	50	432.4	333.5	54.8	272.4	263.1	61.2	275.7	233.7	51.3	179.5	179.5	59.1
		60	455.5	342.6	53.7	282.1	277.2	60.4	290.3	239.2	50.5	184.9	176.3	58.5
		70	470.9	348.7	52.9	288.7	279.6	59.9	300.2	243.0	50.0	188.6	179.9	58.2
	72	50	543.4	286.3	57.3	353.7	220.4	63.0	349.6	195.1	52.9	227.3	154.2	60.2
		60	577.9	299.0	56.0	376.4	228.0	62.2	370.5	202.4	52.1	241.0	158.6	59.6
		70	600.6	307.6	55.1	391.9	233.1	61.6	384.3	207.4	51.5	250.1	161.5	59.2
85	62	50	422.4	422.4	54.6	319.0	319.0	62.2	283.7	283.7	51.4	215.0	215.0	59.9
		60	433.8	433.8	53.3	327.3	327.3	61.2	292.5	292.5	50.6	221.3	221.3	59.2
		70	440.9	440.9	52.4	332.5	332.5	60.6	298.0	298.0	50.0	225.3	225.3	58.8
	67	50	451.5	410.9	55.3	319.9	319.9	62.3	290.3	281.2	51.6	215.4	215.4	59.9
		60	471.1	418.7	54.0	328.3	328.3	61.3	302.1	297.2	50.8	221.7	221.7	59.2
		70	484.1	423.9	53.1	333.5	333.5	60.6	310.0	300.2	50.2	225.7	225.7	58.8
	72	50	544.2	357.0	57.4	365.6	294.8	63.3	348.9	248.6	52.9	232.4	209.6	60.3
		60	577.1	369.2	56.0	384.6	301.2	62.3	369.7	255.9	52.0	243.8	213.2	59.6
		70	599.3	377.5	55.1	397.7	305.6	61.7	383.5	260.8	51.4	251.6	215.8	59.2

Table 26. SCWF/SIWF 35 - Gross cooling capacity - 14,000 cfm, 105 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	419	330	84.2	403	323	94.1	385	314	103.9
	67	457	265	85.0	439	258	94.8	419	250	104.6
	72	497	198	85.7	477	190	95.5	454	182	105.3
80	62	421	393	84.3	405	386	94.1	387	377	104.0
	67	457	329	85.0	440	321	94.8	420	313	104.6
	72	497	262	85.8	478	255	95.6	455	247	105.3
85	62	438	438	84.6	424	424	94.5	408	408	104.4
	67	459	391	85.0	442	384	94.8	421	375	104.7
	72	498	327	85.8	479	319	95.6	457	311	105.3

Figure 40. SCWF/SIWF 35 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 27. SCWF/SIWF 38- Economizer performance - 15,200 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	355.5	330.9	52.5	226.5	226.5	59.8	228.0	219.3	49.8	151.4	151.4	58.2
		60	370.6	337.2	51.5	232.7	232.7	59.1	237.0	228.2	49.2	155.9	155.9	57.7
		70	374.1	338.7	51.3	234.0	234.0	58.9	239.0	238.1	49.0	156.9	156.9	57.6
	67	50	450.7	277.7	54.5	260.8	207.6	60.5	288.5	190.0	51.1	165.1	145.8	58.5
		60	478.7	288.7	53.4	274.4	212.4	59.8	305.2	196.3	50.4	173.1	148.5	58.0
		70	485.0	291.2	53.2	277.6	213.5	59.7	308.9	197.7	50.2	175.0	149.2	57.9
	72	50	576.2	229.0	57.1	374.4	159.1	62.9	368.4	149.1	52.8	239.5	106.0	60.0
		60	613.4	242.7	55.8	399.7	167.5	62.0	390.3	156.8	51.8	254.0	110.7	59.5
		70	621.8	245.8	55.4	405.4	169.4	61.8	395.3	158.6	51.6	257.3	111.8	59.3
80	62	50	394.0	385.2	53.3	283.0	283.0	61.0	262.3	262.3	50.5	189.2	189.2	59.0
		60	405.8	397.1	52.1	290.7	290.7	60.1	270.4	270.4	49.7	194.9	194.9	58.4
		70	408.5	399.7	51.9	292.4	292.4	59.9	272.2	272.2	49.6	196.1	196.1	58.3
	67	50	457.8	356.0	54.6	289.1	279.0	61.1	290.0	247.8	51.1	189.5	189.5	59.0
		60	482.4	365.7	53.5	299.5	296.9	60.3	305.3	253.5	50.4	195.2	185.9	58.4
		70	488.0	367.9	53.2	301.8	297.8	60.1	308.8	254.8	50.2	196.5	187.2	58.3
	72	50	574.9	304.5	57.1	374.0	235.0	62.9	367.6	206.3	52.7	238.7	163.2	60.0
		60	612.0	318.2	55.7	398.4	243.1	62.0	389.5	213.9	51.8	253.2	167.9	59.4
		70	620.3	321.3	55.4	404.0	245.0	61.8	394.5	215.7	51.6	256.4	168.9	59.3
85	62	50	449.7	449.7	54.5	339.5	339.5	62.1	299.8	299.8	51.3	227.1	227.1	59.8
		60	462.2	462.2	53.1	348.7	348.7	61.1	309.1	309.1	50.4	233.8	233.8	59.1
		70	464.8	464.8	52.8	350.7	350.7	60.9	311.1	311.1	50.2	235.3	235.3	59.0
	67	50	478.6	439.4	55.1	340.5	340.5	62.2	305.9	296.1	51.4	227.5	227.5	59.8
		60	499.4	447.7	53.8	349.7	349.7	61.1	318.2	315.4	50.6	234.2	234.2	59.1
		70	504.2	449.6	53.5	351.7	351.7	60.9	321.0	316.5	50.4	235.7	235.7	59.0
	72	50	575.8	380.7	57.1	386.7	315.1	63.1	366.9	263.3	52.7	244.3	222.3	60.1
		60	611.1	393.6	55.7	407.1	321.9	62.1	388.7	270.9	51.8	256.2	226.2	59.5
		70	619.2	396.6	55.4	411.8	323.5	61.9	393.6	272.7	51.6	259.0	227.1	59.4

Table 28. SCWF/SIWF38 Gross cooling capacity - 15,200 cfm, 114 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	443	367	83.9	425	359	93.8	405	349	103.6	-	-	-	-	-	-
75	67	482	290	84.6	463	282	94.4	440	274	104.2	-	-	-	-	-	-
	72	523	211	85.4	501	203	95.1	477	194	104.9	-	-	-	-	-	-
	62	444	441	84.0	427	427	93.8	407	407	103.6	443	443	94.1	421	421	103.9
80	67	483	365	84.7	464	357	94.5	441	347	104.3	481	379	94.8	457	369	104.5
	72	524	287	85.4	503	279	95.2	478	270	104.9	521	294	95.5	495	285	105.2
	62	473	473	84.5	457	457	94.4	439	439	104.2	480	480	94.8	460	460	104.6
85	67	484	439	84.7	465	430	94.5	443	421	104.3	482	459	94.8	458	449	104.6
	72	526	362	85.4	504	355	95.2	480	346	104.9	523	376	95.5	497	366	105.3

Figure 41. SCWF/SIWF 38 Fan Performance for CV or with VFD

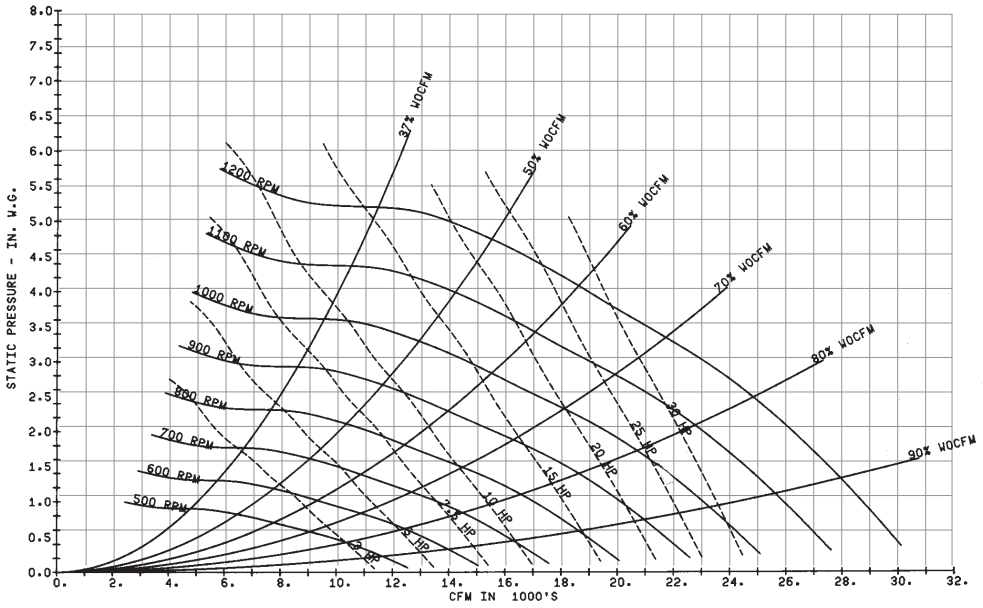
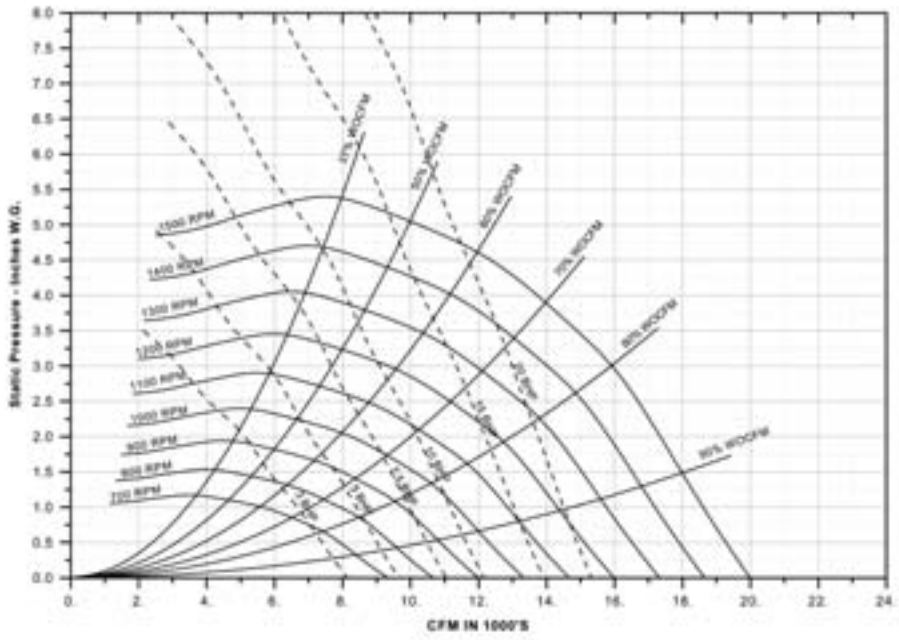


Figure 42. SCWF/SIWF 38 — 18″ Fan Performance for CV or with VFD



Note: For optional low flow fan on high capacity coil.

Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

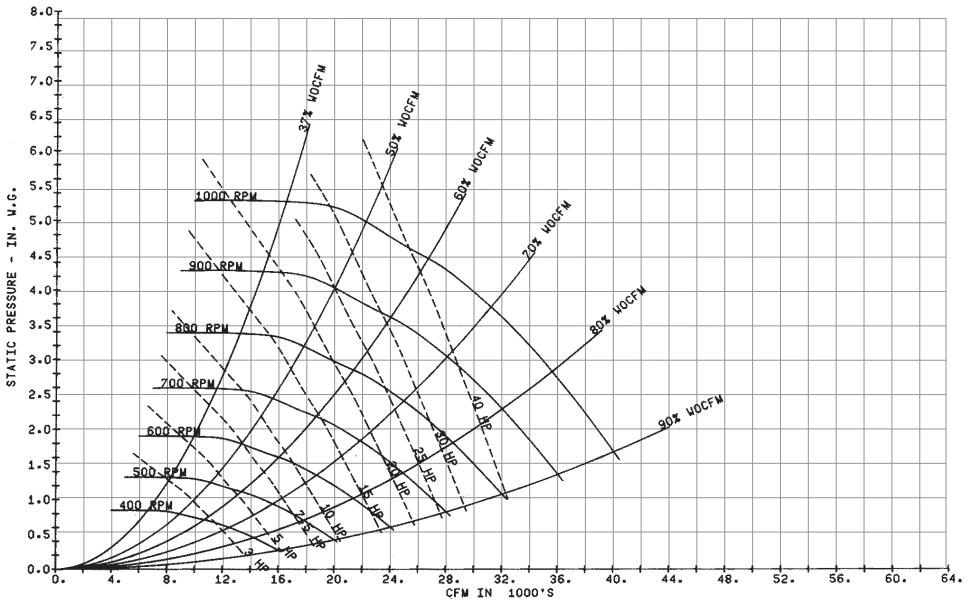
Table 29. SCWF/SIWF 42- Economizer performance - 16,800 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	438.5	393.8	53.4	274.5	274.5	60.2	291.1	290.3	50.5	191.1	191.1	58.6
		60	457.1	401.7	52.3	281.4	281.4	59.5	302.7	295.0	49.8	196.7	196.7	58.1
		70	468.6	406.6	51.6	285.4	285.4	59.0	310.0	298.0	49.4	200.0	200.0	57.8
	67	50	556.7	335.0	55.6	322.8	247.5	61.1	368.9	238.2	52.0	211.6	181.4	59.0
		60	591.2	348.7	54.4	339.9	253.6	60.4	390.4	246.4	51.2	221.9	184.9	58.5
		70	612.2	357.2	53.6	350.8	257.5	59.9	403.6	251.5	50.7	228.7	187.3	58.2
	72	50	711.9	281.0	58.6	462.2	193.6	63.8	471.3	189.6	54.0	306.1	133.9	60.8
		60	757.8	297.9	57.0	494.2	204.4	62.8	499.6	199.7	52.9	325.0	140.0	60.2
		70	786.0	308.5	56.1	513.6	211.0	62.2	517.1	206.0	52.3	336.6	143.8	59.7
80	62	50	480.2	470.5	54.1	343.0	343.0	61.5	331.6	331.6	51.3	238.9	238.9	59.6
		60	494.6	484.9	52.9	351.6	351.6	60.6	341.5	341.5	50.4	245.9	245.9	58.9
		70	503.3	493.6	52.1	356.5	356.5	60.0	347.4	347.4	49.9	250.0	250.0	58.5
	67	50	566.9	426.2	55.8	354.9	346.2	61.8	566.9	426.2	55.8	354.9	346.2	61.8
		60	597.1	438.3	54.5	367.9	350.9	60.8	391.2	316.4	51.2	247.4	236.8	58.9
		70	615.8	445.8	53.7	375.9	353.8	60.3	403.5	321.1	50.7	252.1	241.5	58.6
	72	50	710.3	368.9	58.5	462.7	281.8	63.8	470.3	259.3	54.0	305.1	203.7	60.8
		60	756.0	386.0	57.0	493.0	291.9	62.8	498.5	269.3	52.9	323.9	209.7	60.1
		70	784.0	396.7	56.0	511.9	298.3	62.2	515.9	275.6	52.3	335.5	213.5	59.7
85	62	50	545.5	545.5	55.4	411.4	411.4	62.8	379.0	379.0	52.2	286.7	286.7	60.5
		60	559.4	559.4	53.9	421.6	421.6	61.7	390.3	390.3	51.2	295.0	295.0	59.7
		70	567.3	567.3	53.0	427.4	427.4	61.0	397.0	397.0	50.6	299.9	299.9	59.2
	67	50	590.8	522.7	56.3	412.7	412.7	62.9	390.9	385.8	52.4	287.3	287.3	60.5
		60	616.6	533.0	54.8	423.0	423.0	61.7	406.8	392.0	51.5	295.6	295.6	59.7
		70	632.5	539.5	53.9	428.9	428.9	61.0	416.8	395.8	50.9	300.5	300.5	59.2
	72	50	712.7	457.3	58.6	479.1	374.9	64.1	469.3	328.9	53.9	313.2	276.2	61.0
		60	756.0	473.6	57.0	504.7	383.5	63.0	497.4	338.8	52.9	328.7	281.3	60.2
		70	782.8	483.8	56.0	520.7	388.9	62.3	514.8	345.1	52.3	338.5	284.5	59.8

Table 30. SCWF/SIWF42 Gross cooling capacity - 16,800 cfm, 126 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	487	388	84.0	468	379	93.9	447	369	103.7
	67	529	311	84.7	508	303	94.5	485	293	104.3
	72	577	230	85.5	554	222	95.3	528	212	105.0
80	62	489	463	84.0	470	448	93.9	449	431	103.8
	67	531	386	84.7	511	378	94.6	488	367	104.4
	72	577	308	85.5	554	299	95.3	528	290	105.0
85	62	509	509	84.4	493	493	94.3	475	475	104.2
	67	534	461	84.8	513	452	94.6	490	442	104.4
	72	577	385	85.5	557	374	95.3	528	367	105.0

Figure 43. SCWF/SIWF 42 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 31. SCWF/SIWF 46 - Economizer performance - 18,400 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	469.0	425.0	53.2	295.0	295.0	60.1	309.1	298.4	50.4	203.6	203.6	58.5
		60	488.5	433.3	52.1	302.5	302.5	59.4	321.0	315.6	49.7	209.4	209.4	58.0
		70	491.5	434.5	51.9	303.5	303.5	59.3	322.8	316.3	49.5	210.3	210.3	58.0
	67	50	594.6	360.1	55.3	344.7	266.9	61.0	390.9	254.1	51.8	224.1	194.0	58.9
		60	630.9	374.4	54.1	362.5	273.2	60.3	413.0	262.5	51.0	234.6	197.6	58.4
		70	636.3	376.6	54.0	365.3	274.2	60.1	416.4	263.8	50.9	236.3	198.2	58.3
	72	50	760.7	300.9	58.2	493.5	207.5	63.6	499.2	201.2	53.7	324.1	142.3	60.6
		60	808.6	318.4	56.7	526.8	218.7	62.6	528.4	211.6	52.7	343.5	148.6	60.0
		70	815.8	321.1	56.5	531.8	220.3	62.5	532.8	213.1	52.5	346.4	149.6	59.9
80	62	50	515.3	504.7	54.0	368.6	368.6	61.4	353.2	353.2	51.1	254.4	254.4	59.4
		60	530.5	519.8	52.7	377.9	377.9	60.5	363.6	363.6	50.3	261.7	261.7	58.8
		70	532.7	522.0	52.5	379.2	379.2	60.3	365.1	365.1	50.1	262.8	262.8	58.7
	67	50	605.5	459.2	55.5	380.0	374.4	61.6	394.0	330.3	51.9	255.0	243.6	59.4
		60	637.2	471.8	54.2	393.5	379.2	60.7	413.9	337.9	51.0	262.9	251.4	58.8
		70	642.0	473.7	54.0	395.6	380.0	60.6	417.0	339.1	50.9	264.1	252.5	58.7
	72	50	759.0	396.1	58.2	493.9	303.3	63.6	498.1	276.3	53.7	323.0	217.5	60.6
		60	806.6	413.9	56.7	525.5	313.9	62.6	527.3	286.6	52.6	342.3	223.7	60.0
		70	813.8	416.6	56.5	530.3	315.5	62.5	531.6	288.1	52.5	345.2	224.7	59.9
85	62	50	586.3	586.3	55.2	442.1	442.1	62.7	403.6	403.6	52.0	305.3	305.3	60.3
		60	601.2	601.2	53.7	453.1	453.1	61.6	415.5	415.5	51.0	314.0	314.0	59.6
		70	603.4	603.4	53.5	454.7	454.7	61.4	417.2	417.2	50.9	315.3	315.3	59.4
	67	50	631.8	564.1	56.0	443.5	443.5	62.7	414.9	413.1	52.2	305.9	305.9	60.3
		60	658.8	574.9	54.5	454.6	454.6	61.6	431.2	419.4	51.2	314.6	314.6	59.6
		70	662.8	576.6	54.3	456.2	456.2	61.4	433.7	420.3	51.1	315.9	315.9	59.4
	72	50	761.0	492.1	58.2	511.5	404.5	63.9	497.1	351.2	53.6	331.7	295.6	60.8
		60	806.5	509.1	56.7	538.2	413.4	62.8	526.1	361.4	52.6	347.6	300.7	60.0
		70	813.3	511.6	56.5	542.2	414.8	62.6	530.5	363.0	52.5	350.0	301.5	59.9

Table 32. SCWF/SIWF46 Gross cooling capacity - 18,400 cfm, 138 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	515	431	83.6	495	422	93.5	472	411	103.3	-	-	-	-	-	-
75	67	558	342	84.3	535	333	94.1	508	322	103.9	-	-	-	-	-	-
	72	608	246	85.0	582	237	94.8	554	227	104.5	-	-	-	-	-	-
	62	517	502	83.7	497	486	93.5	474	467	103.4	516	509	93.8	491	489	103.6
80	67	562	429	84.3	540	419	94.2	514	408	104.0	561	445	94.5	533	433	104.3
	72	608	338	85.0	582	329	94.8	554	319	104.5	602	346	95.1	570	335	104.8
	62	552	552	84.2	534	534	94.1	513	513	103.9	559	559	94.5	536	536	104.3
85	67	564	518	84.4	542	509	94.2	516	491	104.0	563	535	94.5	535	514	104.3
	72	608	429	85.0	587	416	94.8	559	405	104.6	603	444	95.1	572	433	104.8

Figure 44. SCWF/SIWF 46 Fan Performance for CV or with VFD

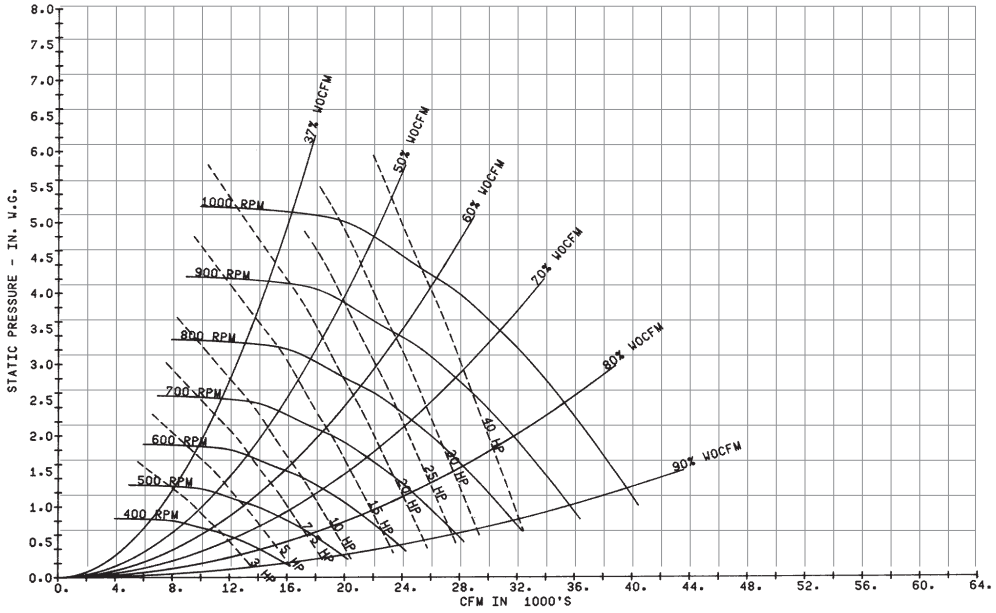
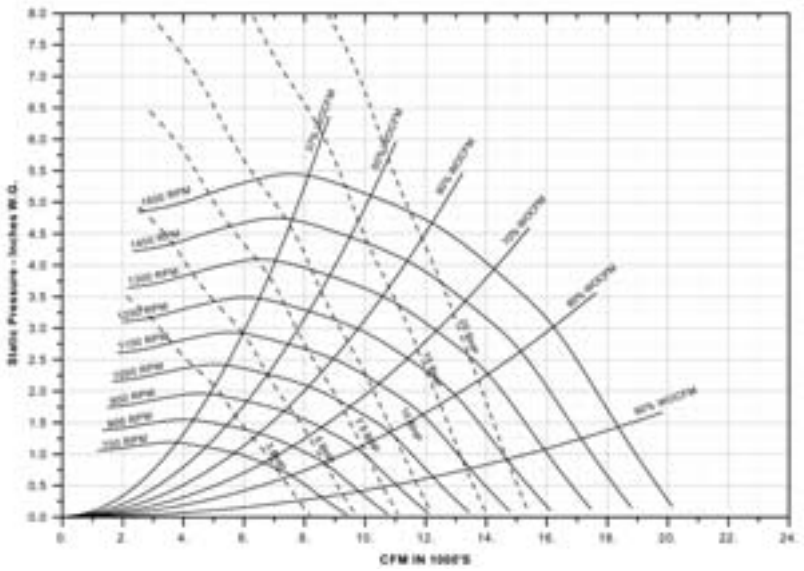


Figure 45. SCWF/SIWF 46 18″ Fan Performance for CV or with VFD



Note: For optional low flow fan on high capacity coil.

Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

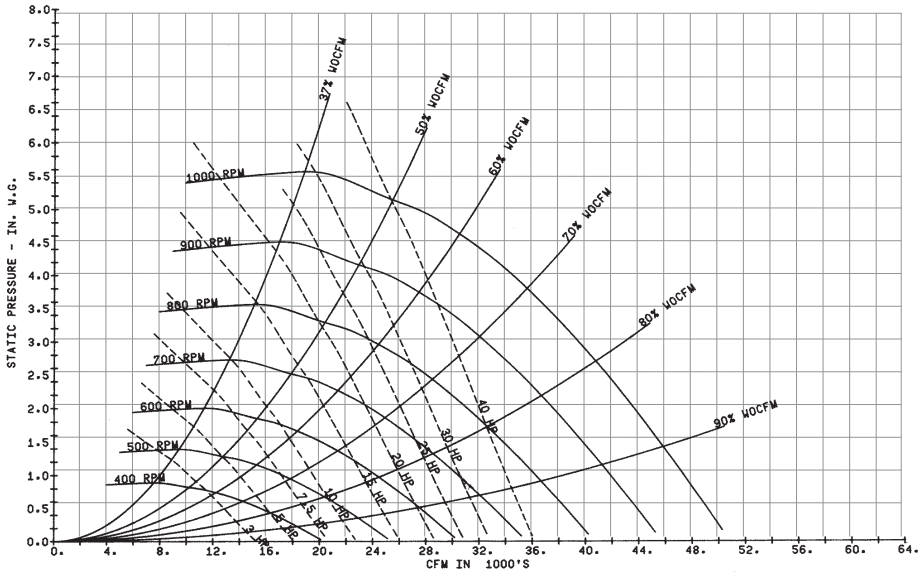
Table 33. SCWF/SIWF 52 - Economizer performance - 20,800 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	546.6	489.7	53.4	341.8	341.8	60.3	363.7	361.8	50.6	238.6	238.6	58.7
		60	570.0	499.6	52.3	350.4	350.4	59.5	378.3	367.7	49.9	245.6	245.6	58.1
		70	588.4	507.5	51.5	356.6	356.6	58.9	390.1	372.6	49.3	250.9	250.9	57.8
	67	50	694.3	417.0	55.7	402.7	307.8	61.2	461.2	297.3	52.1	264.6	226.1	59.1
		60	737.5	434.2	54.5	424.2	315.4	60.4	488.3	307.6	51.3	277.6	230.6	58.6
		70	771.2	447.8	53.5	441.7	321.7	59.9	509.6	315.8	50.6	288.6	234.5	58.2
	72	50	887.8	350.3	58.7	576.6	241.3	63.9	589.2	236.9	54.1	382.8	167.2	60.9
		60	945.5	371.6	57.1	616.7	254.8	62.9	625.0	249.6	53.0	406.6	174.9	60.2
		70	990.6	388.5	55.9	647.8	265.4	62.1	653.2	259.8	52.2	425.4	181.1	59.7
80	62	50	598.2	586.1	54.2	427.0	427.0	61.6	413.9	413.9	51.4	298.2	298.2	59.6
		60	616.2	604.1	52.9	437.6	437.6	60.6	426.4	426.4	50.5	306.9	306.9	58.9
		70	630.1	618.1	51.9	445.4	445.4	59.9	435.8	435.8	49.8	313.5	313.5	58.4
	67	50	707.0	530.2	55.9	442.3	430.2	61.8	464.9	385.4	52.2	299.4	286.4	59.6
		60	744.9	545.4	54.5	458.6	436.1	60.9	489.3	394.7	51.3	309.0	295.9	59.0
		70	774.8	557.5	53.5	471.5	440.8	60.2	509.2	402.3	50.6	316.7	303.6	58.5
	72	50	885.8	459.3	58.6	577.3	350.6	63.9	588.0	323.6	54.0	381.6	254.0	60.9
		60	943.2	480.9	57.1	615.2	363.4	62.9	623.6	336.3	53.0	405.2	261.7	60.2
		70	988.1	498.1	55.9	645.6	373.7	62.1	651.7	346.4	52.2	423.9	267.8	59.7
85	62	50	679.1	679.1	55.4	512.1	512.1	62.9	473.1	473.1	52.3	357.9	357.9	60.5
		60	696.3	696.3	53.9	524.8	524.8	61.7	487.2	487.2	51.2	368.3	368.3	59.7
		70	708.9	708.9	52.8	534.0	534.0	60.9	497.9	497.9	50.5	376.1	376.1	59.1
	67	50	736.6	649.9	56.3	513.8	513.8	62.9	488.4	480.9	52.5	358.6	358.6	60.5
		60	769.0	662.9	54.9	526.6	526.6	61.8	508.5	488.6	51.5	369.0	369.0	59.7
		70	794.5	673.3	53.7	535.8	535.8	60.9	524.8	494.9	50.8	376.9	376.9	59.1
	72	50	888.9	569.1	58.7	597.7	466.2	64.2	586.7	410.2	54.0	391.6	344.3	61.0
		60	943.3	589.5	57.1	629.7	477.0	63.1	622.2	422.8	53.0	411.1	350.7	60.3
		70	986.2	606.0	55.8	655.5	485.8	62.2	650.2	432.9	52.1	427.1	355.9	59.7

Table 34. SCWF/SIWF52 Gross cooling capacity - 20,800 cfm, 156 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	616	472	83.8	594	461	93.8	569	449	103.6
75	67	668	384	84.5	644	374	94.4	616	363	104.2
	72	728	291	85.2	701	281	95.1	671	269	104.9
	62	619	559	83.9	597	548	93.8	572	535	103.7
80	67	672	470	84.5	648	459	94.4	621	447	104.3
	72	728	380	85.2	701	370	95.1	671	359	104.9
	62	635	635	84.1	617	617	94.0	596	596	104.0
85	67	675	556	84.6	651	545	94.5	624	532	104.3
	72	728	469	85.2	701	459	95.1	671	448	104.9

Figure 46. SCWF/SIWF 52 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 35. SCWF/SIWF 58- Economizer performance - 23,200 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	592.9	536.8	53.2	372.8	372.8	60.1	391.0	377.5	50.4	257.4	257.4	58.6
		60	617.6	547.2	52.1	382.2	382.2	59.4	406.1	398.9	49.7	264.8	264.8	58.0
		70	626.2	550.8	51.7	385.2	385.2	59.1	411.4	401.1	49.4	267.3	267.3	57.9
	67	50	751.8	454.9	55.4	435.8	337.1	61.0	494.5	321.3	51.8	283.6	245.2	58.9
		60	797.7	473.1	54.2	458.4	345.1	60.3	522.7	331.9	51.0	296.9	249.8	58.4
		70	813.5	479.4	53.7	466.5	348.0	60.0	532.4	335.7	50.7	301.9	251.5	58.2
	72	50	961.6	380.3	58.3	623.9	262.3	63.6	631.6	254.6	53.7	410.1	180.0	60.7
		60	1022.3	402.5	56.8	666.1	276.4	62.7	668.7	267.7	52.7	434.7	188.0	60.0
		70	1043.5	410.3	56.2	680.7	281.3	62.3	681.6	272.3	52.3	443.2	190.8	59.8
80	62	50	651.2	637.7	54.0	465.7	465.7	61.4	446.6	446.6	51.2	321.8	321.8	59.4
		60	670.3	656.9	52.7	477.4	477.4	60.5	459.8	459.8	50.3	331.0	331.0	58.8
		70	676.9	663.4	52.3	481.2	481.2	60.2	464.3	464.3	50.0	334.1	334.1	58.6
	67	50	765.5	580.0	55.6	480.3	472.7	61.6	498.5	417.6	51.9	322.6	308.1	59.4
		60	805.6	595.9	54.3	497.4	478.9	60.7	523.8	427.2	51.0	332.5	318.0	58.8
		70	819.6	601.5	53.8	503.4	481.0	60.4	532.8	430.6	50.7	336.0	321.4	58.6
	72	50	959.5	500.5	58.2	624.4	383.1	63.6	630.3	349.4	53.7	408.7	275.0	60.6
		60	1019.8	523.0	56.7	664.5	396.5	62.6	667.3	362.4	52.7	433.2	282.9	60.0
		70	1040.9	531.0	56.2	678.6	401.3	62.3	680.1	367.0	52.3	441.8	285.6	59.8
85	62	50	740.7	740.7	55.2	558.6	558.6	62.7	510.4	510.4	52.0	386.1	386.1	60.3
		60	759.6	759.6	53.7	572.5	572.5	61.6	525.4	525.4	51.0	397.1	397.1	59.6
		70	765.8	765.8	53.2	577.0	577.0	61.2	530.5	530.5	50.7	400.8	400.8	59.3
	67	50	798.6	712.4	56.0	560.3	560.3	62.7	524.8	522.1	52.2	386.8	386.8	60.3
		60	832.8	726.1	54.6	574.3	574.3	61.6	545.5	530.1	51.3	397.9	397.9	59.6
		70	844.7	730.9	54.1	578.9	578.9	61.2	552.8	532.9	50.9	401.6	401.6	59.3
	72	50	962.1	621.6	58.3	646.7	510.8	63.9	628.9	444.0	53.7	419.7	373.6	60.8
		60	1019.7	643.1	56.7	680.5	522.2	62.8	665.8	457.0	52.7	439.8	380.2	60.1
		70	1039.8	650.7	56.2	692.4	526.2	62.4	678.6	461.5	52.3	447.0	382.5	59.8

Table 36. SCWF/SIWF58 Gross cooling capacity - 23,200 cfm, 174 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	663	552	83.8	637	540	93.7	608	526	103.5	-	-	-	-	-	-
75	67	717	438	84.4	688	426	94.3	654	413	104.1	-	-	-	-	-	-
	72	780	316	85.2	748	305	95.0	711	292	104.7	-	-	-	-	-	-
	62	665	665	83.8	640	640	93.7	610	610	103.5	664	664	94.0	632	632	103.8
80	67	722	548	84.5	694	536	94.3	661	522	104.1	720	568	94.7	685	553	104.4
	72	780	432	85.2	748	421	95.0	711	408	104.7	773	443	95.3	733	429	105.0
	62	709	709	84.3	686	686	94.2	660	660	104.1	718	718	94.6	689	689	104.5
85	67	725	661	84.5	696	648	94.4	664	634	104.2	723	691	94.7	688	676	104.5
	72	784	543	85.2	753	531	95.0	711	523	104.7	781	562	95.4	733	553	105.0

Figure 47. SCWF/SIWF 58 Fan Performance for CV or with VFD

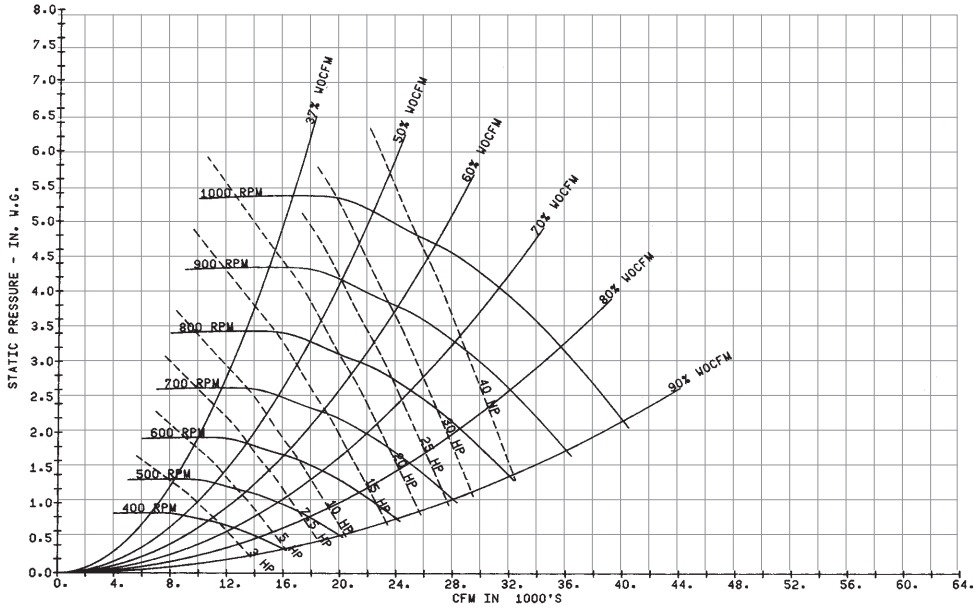
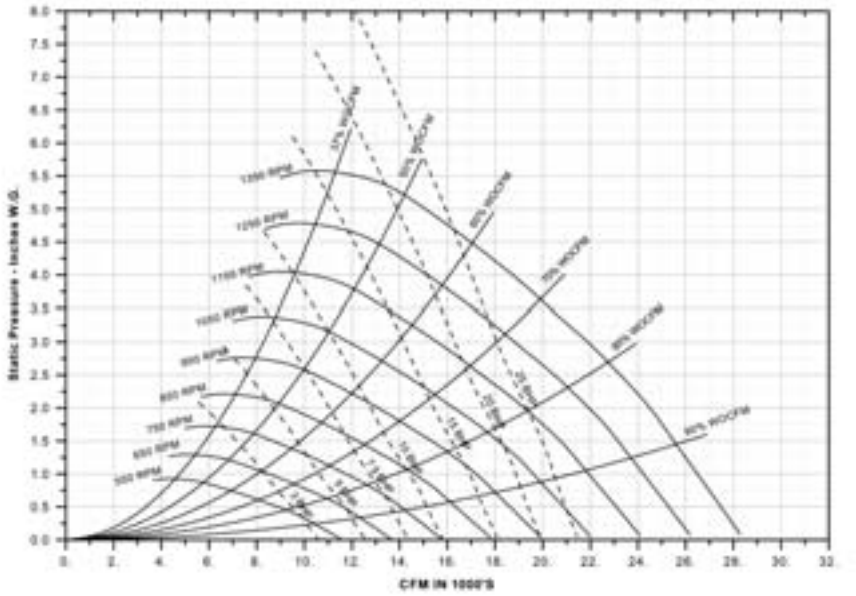


Figure 48. SCWF/SIWF 58 18" Fan Performance for CV or with VFD



Note: For optional low flow fan on high capacity coil.

Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

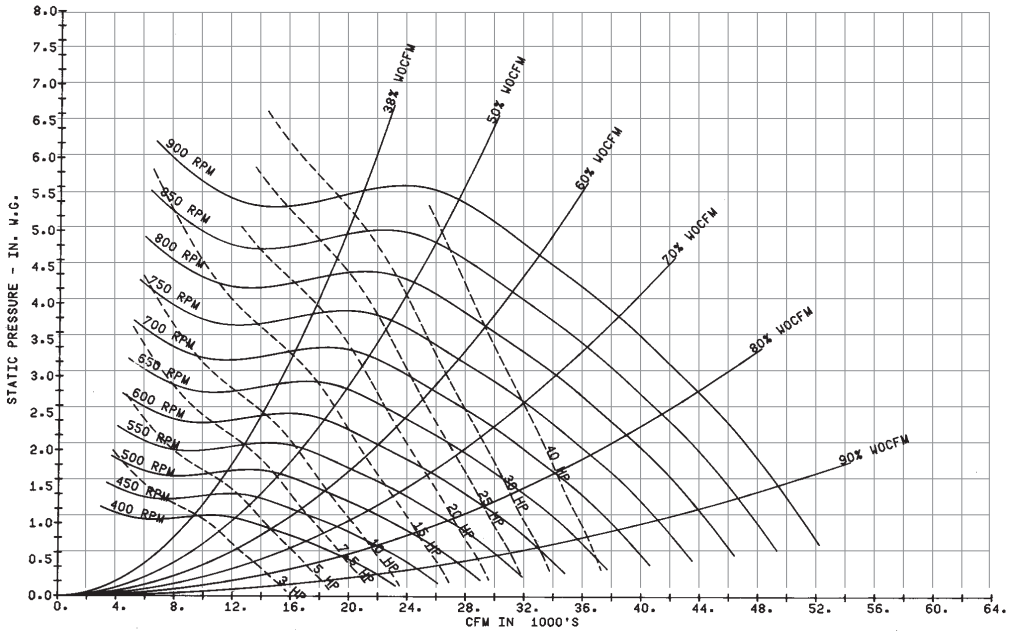
Table 37. SCWF/SIWF 65- Economizer performance - 26,000 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	644.4	590.0	52.9	407.4	407.4	60.0	420.9	405.9	50.2	278.1	278.1	58.4
		60	670.0	600.7	51.9	417.5	417.5	59.3	436.1	433.3	49.5	285.8	285.8	57.9
		70	689.7	609.0	51.1	424.7	424.7	58.8	448.0	438.2	49.0	291.4	291.4	57.6
	67	50	815.9	497.6	55.0	472.6	370.1	60.8	531.1	347.9	51.5	304.3	266.3	58.7
		60	863.7	516.4	53.9	495.9	378.4	60.1	559.7	358.7	50.7	317.8	271.0	58.3
		70	899.9	530.8	53.0	514.5	385.0	59.6	581.7	367.0	50.1	329.0	274.9	57.9
	72	50	1043.3	413.8	57.8	676.7	285.8	63.3	678.2	274.0	53.3	440.0	194.2	60.4
		60	1106.7	436.7	56.4	720.4	300.4	62.4	715.9	287.3	52.3	464.9	202.3	59.8
		70	1155.0	454.5	55.2	753.5	311.5	61.7	744.8	297.6	51.6	484.1	208.5	59.3
80	62	50	710.6	695.5	53.7	509.0	509.0	61.2	482.5	482.5	50.9	347.6	347.6	59.3
		60	730.5	715.4	52.5	521.6	521.6	60.3	496.2	496.2	50.1	357.2	357.2	58.7
		70	745.5	730.4	51.6	530.5	530.5	59.7	506.4	506.4	49.5	364.2	364.2	58.2
	67	50	830.6	636.1	55.2	522.6	520.8	61.4	535.3	453.2	51.6	348.2	348.2	59.3
		60	872.3	652.6	53.9	540.3	527.1	60.5	561.0	463.0	50.8	358.2	342.1	58.7
		70	904.5	665.4	53.0	553.9	532.0	59.9	581.3	470.7	50.1	365.8	349.7	58.2
	72	50	1041.0	546.6	57.8	676.9	419.8	63.3	676.7	377.8	53.3	438.6	298.1	60.4
		60	1104.0	569.9	56.3	718.5	433.6	62.4	714.3	391.0	52.3	463.4	306.1	59.8
		70	1152.2	588.1	55.2	750.9	444.5	61.6	743.2	401.3	51.6	482.5	312.3	59.3
85	62	50	809.6	809.6	54.9	610.6	610.6	62.5	551.5	551.5	51.8	417.1	417.1	60.1
		60	829.9	829.9	53.5	625.5	625.5	61.4	567.1	567.1	50.8	428.5	428.5	59.4
		70	844.4	844.4	52.5	636.1	636.1	60.6	578.6	578.6	50.1	436.9	436.9	58.9
	67	50	867.7	783.1	55.6	612.4	612.4	62.5	564.7	547.6	51.9	417.9	417.9	60.1
		60	903.1	797.2	54.3	627.4	627.4	61.4	585.6	575.9	51.0	429.3	429.3	59.4
		70	930.4	808.2	53.2	638.2	638.2	60.6	602.0	582.2	50.3	437.7	437.7	58.9
	72	50	1043.6	680.9	57.8	701.3	561.3	63.6	675.3	481.4	53.3	450.5	406.1	60.5
		60	1103.6	703.1	56.3	736.1	573.0	62.5	712.8	494.6	52.3	470.8	412.7	59.8
		70	1149.9	720.5	55.2	763.4	582.1	61.8	741.5	504.8	51.6	486.9	417.9	59.3

Table 38. SCWF/SIWF65 Gross cooling capacity - 26,000 cfm, 196 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	772	610	83.9	744	597	93.8	711	581	103.7
	67	838	490	84.6	806	477	94.5	770	463	104.3
	72	911	365	85.4	876	352	95.2	836	338	105.0
80	62	775	726	84.0	747	712	93.9	714	697	103.7
	67	840	607	84.6	809	593	94.5	774	577	104.3
	72	911	484	85.4	876	471	95.2	836	456	105.0
85	62	805	805	84.3	781	781	94.2	753	753	104.1
	67	844	721	84.7	812	707	94.5	777	691	104.4
	72	912	601	85.4	877	588	95.2	838	572	105.0

Figure 49. SCWF/SIWF 65 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 39. SCWF/SIWF 72 - Economizer performance - 28,000 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	692.2	640.9	52.7	440.0	440.0	59.9	448.3	431.7	50.0	297.1	297.1	58.3
		60	719.4	652.3	51.7	451.1	451.1	59.2	464.1	447.5	49.3	305.3	305.3	57.8
		70	725.9	655.0	51.4	453.6	453.6	59.0	467.9	467.4	49.1	307.1	307.1	57.7
	67	50	874.7	537.8	54.7	506.6	401.7	60.6	564.0	372.5	51.3	323.1	286.1	58.6
		60	925.8	557.8	53.6	531.1	410.4	59.9	593.9	383.7	50.5	337.1	291.0	58.1
		70	937.7	562.5	53.3	537.2	412.5	59.8	601.0	386.4	50.3	340.6	292.2	58.0
	72	50	1117.6	443.9	57.4	724.9	307.7	63.1	720.0	291.7	53.0	466.8	207.2	60.2
		60	1185.9	469.3	56.0	771.3	323.1	62.1	759.4	305.5	52.0	492.8	215.6	59.6
		70	1201.8	475.0	55.6	782.2	326.7	61.9	768.7	308.8	51.8	499.0	217.5	59.4
80	62	50	766.5	749.8	53.5	549.8	549.8	61.1	515.6	515.6	50.7	371.4	371.4	59.1
		60	787.8	771.1	52.3	563.5	563.5	60.2	530.2	530.2	49.9	381.5	381.5	58.5
		70	792.8	776.1	52.0	566.6	566.6	60.0	533.5	533.5	49.7	383.9	383.9	58.4
	67	50	890.5	689.6	54.9	562.1	542.9	61.2	568.5	486.6	51.3	372.0	372.0	59.1
		60	934.9	707.0	53.7	580.8	573.8	60.4	595.3	496.7	50.5	382.2	364.5	58.5
		70	945.5	711.2	53.4	585.3	575.4	60.2	601.8	499.1	50.3	384.7	366.9	58.4
	72	50	1114.9	589.6	57.4	724.9	454.5	63.1	718.5	404.1	53.0	465.3	319.7	60.2
		60	1183.0	614.7	56.0	769.1	469.2	62.1	757.7	417.8	52.0	491.2	328.0	59.5
		70	1198.9	620.6	55.6	779.7	472.7	61.9	767.0	421.1	51.8	497.3	330.0	59.4
85	62	50	874.4	874.4	54.7	659.4	659.4	62.3	589.3	589.3	51.5	445.6	445.6	60.0
		60	896.7	896.7	53.3	675.8	675.8	61.3	605.9	605.9	50.6	457.8	457.8	59.2
		70	901.7	901.7	53.0	679.5	679.5	61.0	609.7	609.7	50.4	460.6	460.6	59.1
	67	50	931.6	850.8	55.4	661.3	661.3	62.3	601.1	582.4	51.7	446.4	446.4	60.0
		60	969.2	865.7	54.0	677.8	677.8	61.3	622.8	619.2	50.8	458.6	458.6	59.2
		70	978.2	869.3	53.7	681.6	681.6	61.0	628.0	621.2	50.6	461.4	461.4	59.1
	72	50	1118.3	737.1	57.4	751.4	609.6	63.3	716.9	516.2	53.0	478.3	436.6	60.3
		60	1182.3	760.6	55.9	788.3	621.9	62.3	756.1	529.9	52.0	499.3	443.4	59.6
		70	1197.5	766.2	55.6	797.1	624.8	62.1	765.4	533.2	51.8	504.4	445.1	59.5

Table 40. SCWF/SIWF72 Gross cooling capacity - 28,800 cfm, 216 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
	62	809	674	83.6	778	660	93.4	743	663	103.3	-	-	-	-	-	-
75	67	875	535	84.2	840	533	94.0	800	517	103.8	-	-	-	-	-	-
	72	952	389	84.9	913	375	94.7	870	360	104.5	-	-	-	-	-	-
	62	812	812	83.6	781	781	93.5	746	746	103.3	815	815	93.8	776	776	103.6
80	67	881	670	84.2	847	655	94.1	808	638	103.9	883	701	94.4	841	682	104.2
	72	952	528	84.9	913	514	94.7	869	499	104.5	950	546	95.1	901	529	104.8
	62	865	865	84.1	837	837	94.0	805	805	103.9	883	883	94.4	847	847	104.3
85	67	884	806	84.3	850	791	94.1	811	774	103.9	886	852	94.5	844	833	104.2
	72	956	663	84.9	916	652	94.7	876	631	104.5	953	696	95.1	906	679	104.8

Figure 50. SCWF/SIWF 72 Fan Performance for CV or with VFD

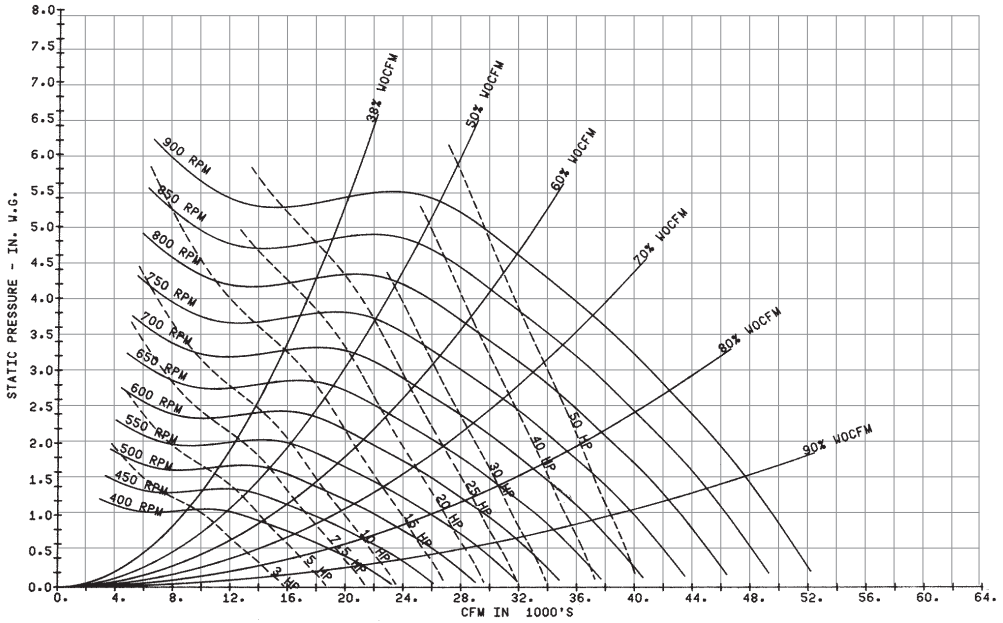
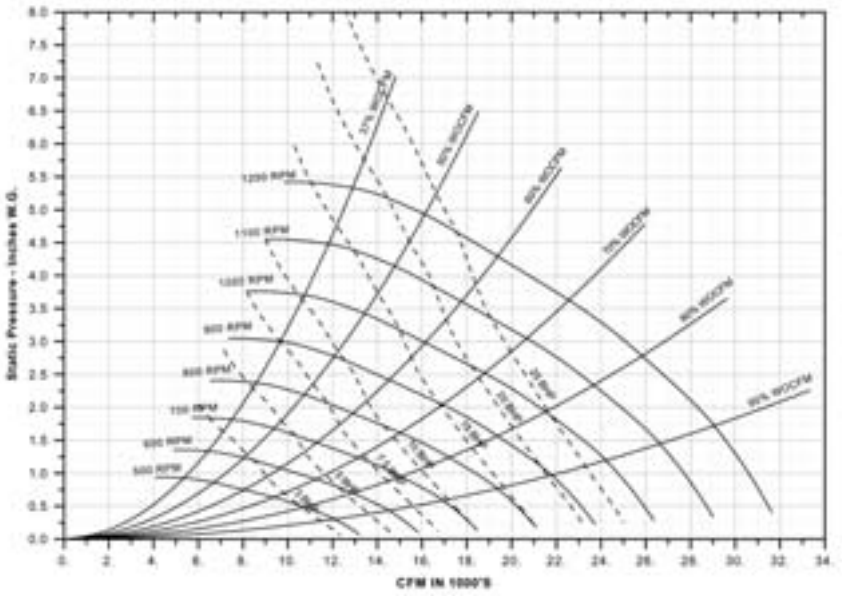


Figure 51. SCWF/SIWF 72 20" Fan Performance for CV or with VFD



Note: For optional low flow fan on high capacity coil.

Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

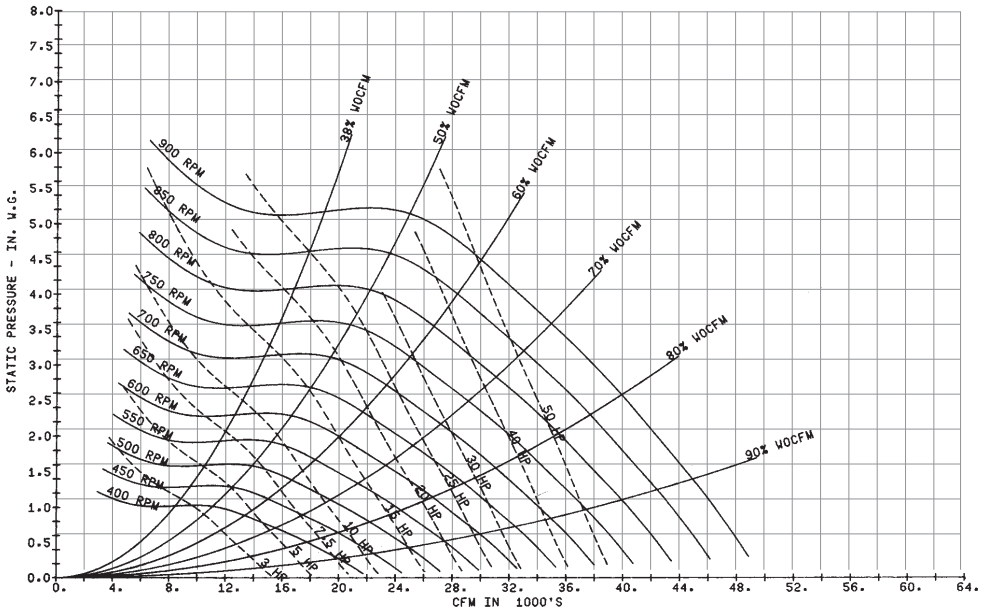
Table 41. SCWF/SIWF 80 - Economizer performance - 29,800 cfm

Entering Air			Full Capacity						Low Capacity					
			Entering Water Temp						Entering Water Temp					
			45°F			55°F			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	50	719.8	663.3	52.2	456.0	456.0	59.6	464.0	446.9	49.6	307.0	307.0	58.1
		60	746.6	674.5	51.2	466.7	466.7	58.9	479.5	462.3	49.0	314.9	314.9	57.6
		70	751.3	676.5	51.1	468.4	468.4	58.8	482.2	480.6	48.9	316.2	316.2	57.6
	67	50	915.9	559.9	54.2	527.8	416.0	60.3	587.4	385.5	50.9	334.7	294.7	58.3
		60	966.0	579.6	53.1	552.8	424.9	59.6	616.7	396.5	50.1	349.2	299.7	57.9
		70	974.5	583.0	52.9	557.1	426.4	59.5	621.7	398.4	50.0	351.7	300.6	57.8
	72	50	1171.5	464.7	56.7	760.6	321.6	62.6	750.3	303.3	52.5	486.5	215.0	59.9
		60	1238.3	489.6	55.3	805.9	336.7	61.7	788.8	316.9	51.6	511.9	223.2	59.3
		70	1249.7	493.8	55.1	813.6	339.3	61.6	795.4	319.2	51.4	516.3	224.6	59.2
80	62	50	794.7	777.5	52.9	569.7	569.7	60.7	533.0	533.0	50.3	383.7	383.7	58.8
		60	815.5	798.2	51.8	583.0	583.0	59.9	547.1	547.1	49.6	393.5	393.5	58.3
		70	819.0	801.7	51.6	585.1	585.1	59.7	549.4	549.4	49.4	395.2	395.2	58.2
	67	50	929.2	715.3	54.3	583.4	563.2	60.8	590.6	502.1	50.9	384.4	384.4	58.8
		60	973.1	732.5	53.1	601.8	592.6	60.0	617.2	512.1	50.1	394.3	375.9	58.3
		70	980.7	735.5	52.9	605.0	593.8	59.9	621.8	513.9	50.0	396.0	377.7	58.2
	72	50	1168.7	614.9	56.7	759.4	472.5	62.6	748.7	418.7	52.5	484.9	330.5	59.8
		60	1235.3	639.5	55.3	803.2	487.1	61.7	787.1	432.2	51.6	510.2	338.7	59.3
		70	1246.6	643.7	55.1	810.8	489.6	61.5	793.7	434.5	51.4	514.6	340.1	59.1
85	62	50	906.2	906.2	54.1	683.3	683.3	61.8	609.1	609.1	51.1	460.4	460.4	59.6
		60	927.8	927.8	52.7	699.1	699.1	60.8	625.1	625.1	50.2	472.2	472.2	58.9
		70	931.3	931.3	52.5	701.7	701.7	60.7	627.8	627.8	50.1	474.1	474.1	58.8
	67	50	969.0	880.5	54.7	685.2	685.2	61.9	622.3	602.9	51.2	461.2	461.2	59.6
		60	1006.1	895.3	53.4	701.2	701.2	60.8	643.6	637.3	50.4	473.0	473.0	58.9
		70	1012.5	897.8	53.2	703.8	703.8	60.7	647.3	638.7	50.2	475.0	475.0	58.8
	72	50	1170.1	766.1	56.7	783.6	631.4	62.8	747.1	533.8	52.5	496.6	450.0	60.0
		60	1233.4	789.5	55.3	820.2	643.6	61.8	785.4	547.2	51.5	517.0	456.6	59.3
		70	1244.3	793.5	55.0	826.5	645.7	61.7	791.9	549.5	51.4	520.6	457.8	59.2

Table 42. SCWF/SIWF80 Gross cooling capacity - 29,800 cfm, 240 gpm

Entering Air		Entering Water Temperature								
		75°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	918	777	83.7	882	760	93.5	840	741	103.3
	67	992	612	84.3	951	595	94.1	904	577	103.9
	72	1078	438	85.0	1033	422	94.8	981	405	104.5
80	62	921	921	83.7	884	884	93.5	843	843	103.4
	67	998	763	84.3	959	746	94.2	913	726	104.0
	72	1077	599	85.0	1032	583	94.8	981	566	104.5
85	62	983	983	84.2	951	951	94.1	913	913	104.0
	67	1002	921	84.4	962	903	94.2	917	884	104.0
	72	1083	755	85.0	1039	738	94.8	985	722	104.6

Figure 52. SCWF/SIWF 80 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 43. 90-ton SCWF economizer performance - 30,000 cfm

Entering Air		Flow	Entering Water Temperature					
			45°F			55°F		
EDB °F	EWB °F	Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	180	692.7	660.1	52.7	453.3	447.2	60.0
		225	732.1	676.1	51.5	471.0	464.8	59.2
		270	761.4	688.1	50.6	483.4	476.9	58.6
	67	180	846.1	532.2	54.4	500.1	408.8	60.5
		225	916.4	558.6	53.1	534.4	420.9	59.7
		270	969.4	578.7	52.2	561.0	430.0	59.2
	72	180	1074.0	420.9	56.9	698.1	296.9	62.7
		225	1170.0	453.7	55.4	761.5	316.7	61.8
		270	1242.0	478.8	54.2	809.8	332.3	61.0
80	62	180	785.1	776.3	53.7	566.6	560.2	61.3
		225	817.5	793.9	52.2	588.6	582.0	60.2
		270	839.5	830.0	51.2	603.9	597.3	59.5
	67	180	875.2	717.7	54.7	571.8	547.5	61.3
		225	937.4	722.0	53.3	598.5	573.5	60.3
		270	984.2	739.9	52.3	618.7	605.4	59.6
	72	180	1072.0	575.2	56.9	704.4	453.7	62.8
		225	1168.0	608.4	55.3	763.0	472.6	61.8
		270	1239.0	633.7	54.1	808.7	487.3	61.0
85	62	180	897.5	889.3	54.9	679.9	673.5	62.5
		225	934.0	925.4	53.3	706.0	699.5	61.3
		270	959.0	950.1	52.1	724.3	717.7	60.4
	67	180	931.6	875.3	55.3	681.8	671.2	62.6
		225	985.2	924.1	53.7	708.2	697.2	61.3
		270	1026.0	939.4	52.6	726.6	715.4	60.4
	72	180	1087.0	735.6	57.0	744.7	621.7	63.3
		225	1174.0	766.2	55.4	794.6	638.0	62.1
		270	1241.0	790.0	54.2	833.5	650.3	61.2

Table 44. SCWF/SIWF90 Gross cooling capacity - 30,000 cfm, 270 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	1071	836	84.2	1031	816	94.0	985	794	103.9	-	-	-	-	-	-
	67	1160	674	84.8	1115	656	94.7	1063	635	104.5	-	-	-	-	-	-
	72	1263	504	85.6	1213	486	95.4	1155	465	105.2	-	-	-	-	-	-
80	62	1075	993	84.2	1035	973	94.1	989	950	103.9	1064	1006	94.3	1015	982	104.1
	67	1166	830	84.9	1122	810	94.7	1071	788	104.5	1153	836	95.0	1099	812	104.8
	72	1262	666	85.6	1212	647	95.4	1155	626	105.2	1245	667	95.7	1184	644	105.4
85	62	1115	1115	84.5	1081	1081	94.4	1040	1040	104.3	1113	1113	94.7	1070	1070	104.5
	67	1171	985	84.9	1127	965	94.8	1076	942	104.6	1158	997	95.0	1104	973	104.8
	72	1266	822	85.6	1217	802	95.5	1161	779	105.2	1251	827	95.7	1192	803	105.5

Table 45. 100-ton SCWF economizer performance - 32,000 cfm

Entering Air			Entering Water Temperature					
			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	200	734.1	700.0	52.3	479.8	473.6	59.8
		250	773.3	715.9	51.2	497.8	491.3	59.0
		300	802.9	728.1	50.3	510.4	503.4	58.4
	67	200	899.4	565.6	54.0	529.6	433.7	60.3
		250	969.9	592.0	52.7	564.5	445.8	59.5
		300	1024.0	612.5	51.8	591.5	454.8	58.9
	72	200	1143.0	447.9	56.4	742.2	315.3	62.4
		250	1239.0	480.9	54.9	806.5	335.7	61.4
		300	1312.0	506.2	53.7	855.2	351.4	60.7
80	62	200	831.9	822.5	53.3	599.6	593.0	61.0
		250	864.1	838.8	51.9	622.0	614.9	60.0
		300	886.5	876.7	50.9	637.6	630.5	59.2
	67	200	928.5	741.3	54.3	605.0	579.1	61.0
		250	990.6	764.9	52.9	632.0	605.5	60.0
		300	1038.0	782.9	51.9	652.3	625.7	59.3
	72	200	1141.0	611.4	56.4	747.5	481.6	62.5
		250	1237.0	644.8	54.9	807.3	500.7	61.4
		300	1310.0	835.7	53.7	878.7	688.5	60.7
85	62	200	950.8	942.0	54.5	719.5	712.8	62.2
		250	987.2	978.1	52.9	746.1	739.2	61.0
		300	1013.0	1003.4	51.7	764.7	757.6	60.1
	67	200	987.0	928.4	54.8	721.5	710.4	62.2
		250	1040.0	981.5	53.3	748.3	736.8	61.0
		300	1081.0	997.2	52.2	767.0	755.2	60.1
	72	200	1154.0	781.2	56.5	788.5	659.3	62.9
		250	1242.0	811.8	54.9	839.3	675.7	61.7
		300	1310.0	835.7	53.7	878.7	688.5	60.9

Table 46. SCWF/SIWF100 Gross cooling capacity - 32,000 cfm, 280 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	1147	906	84.4	1104	879	94.3	1054	852	104.1	-	-	-	-	-	-
	67	1243	725	85.1	1193	709	95.0	1136	686	104.8	-	-	-	-	-	-
	72	1353	537	85.9	1298	517	95.7	1235	493	105.5	-	-	-	-	-	-
80	62	1152	1057	84.5	1108	1028	94.3	1058	996	104.2	1138	1058	94.6	1085	1024	104.4
	67	1249	892	85.2	1201	871	95.0	1146	846	104.8	1233	897	95.3	1175	871	105.0
	72	1352	716	85.9	1297	695	95.7	1235	672	105.5	1330	707	96.0	1243	719	105.6
85	62	1193	1193	84.8	1155	1155	94.7	1112	1112	104.6	1188	1188	94.9	1142	1142	104.8
	67	1254	1060	85.2	1206	1038	95.1	1151	1013	104.9	1238	1070	95.3	1180	1043	105.1
	72	1355	886	86.0	1301	865	95.8	1238	841	105.5	1335	889	96.0	1270	863	105.8

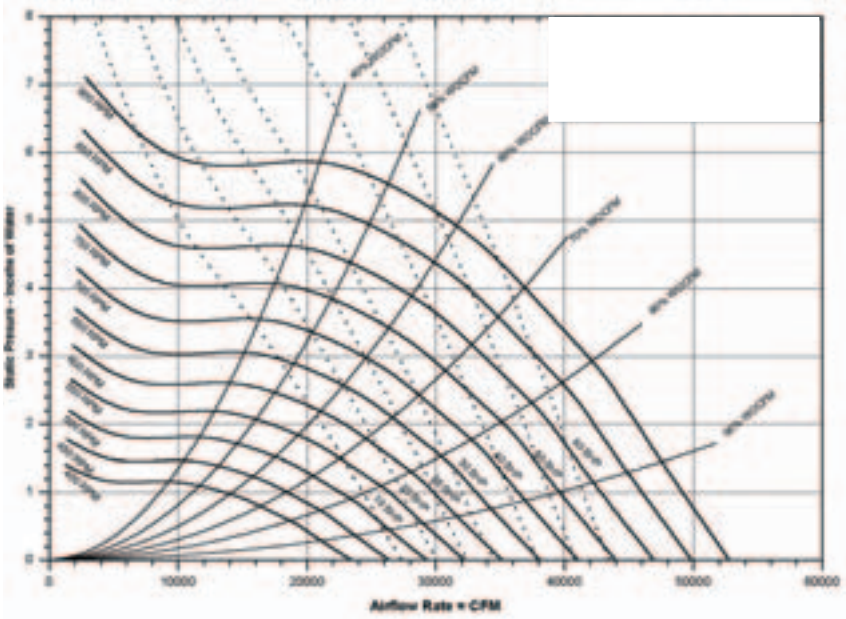
Table 47. 110-ton SCWF economizer performance - 32,000 cfm

Entering Air			Entering Water Temperature					
			45°F			55°F		
EDB °F	EWB °F	Flow Gpm	Total MBh	Sensible MBh	lWT °F	Total MBh	Sensible MBh	LWT °F
75	62	200	734.1	700.0	52.3	479.8	473.6	59.8
		250	773.3	715.9	51.2	497.8	491.3	59.0
		300	802.9	728.1	50.3	510.4	503.4	58.4
	67	200	899.4	565.6	54.0	529.6	433.7	60.3
		250	969.9	592.0	52.7	564.5	445.8	59.5
		300	1024.0	612.5	51.8	591.5	454.8	58.9
	72	200	1143.0	447.9	56.4	742.2	315.3	62.4
		250	1239.0	480.9	54.9	806.5	335.7	61.4
		300	1312.0	506.2	53.7	855.2	351.4	60.7
80	62	200	831.9	822.5	53.3	599.6	593.0	61.0
		250	864.1	838.8	51.9	622.0	614.9	60.0
		300	886.5	876.7	50.9	637.6	630.5	59.2
	67	200	928.5	741.3	54.3	605.0	579.1	61.0
		250	990.6	764.9	52.9	632.0	605.5	60.0
		300	1038.0	782.9	51.9	652.3	625.7	59.3
	72	200	1141.0	611.4	56.4	747.5	481.6	62.5
		250	1237.0	644.8	54.9	807.3	500.7	61.4
		300	1309.0	670.4	53.7	853.6	515.6	60.7
85	62	200	950.8	942.0	54.5	719.5	712.8	62.2
		250	987.2	978.1	52.9	746.1	739.2	61.0
		300	1013.0	1003.4	51.7	764.7	757.6	60.1
	67	200	987.0	928.4	54.8	721.5	710.4	62.2
		250	1040.0	981.5	53.3	748.3	736.8	61.0
		300	1081.0	997.2	52.2	767.0	755.2	60.1
	72	200	1154.0	781.2	56.5	788.5	659.3	62.9
		250	1242.0	811.8	54.9	839.3	675.7	61.7
		300	1310.0	835.7	53.7	878.7	688.5	60.9

Table 48. SCWF110 (High Capacity) Gross Cooling Capacity - 32,000 cfm, 300 gpm

Entering Air		Standard Capacity									High Capacity					
		Entering Water Temperature									Entering Water Temperature					
		75°F			85°F			95°F			85°F			95°F		
EDB °F	EWB °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F	Total MBh	Sensible MBh	LWT °F
75	62	1268	966	84.7	1221	943	94.6	1167	909	104.4	-	-	-	-	-	-
	67	1376	785	85.4	1323	762	95.3	1262	737	105.1	-	-	-	-	-	-
	72	1497	594	86.3	1439	573	96.1	1371	548	105.8	-	-	-	-	-	-
80	62	1273	1130	84.7	1226	1106	94.6	1172	1079	104.4	1260	1141	94.8	1202	1112	104.7
	67	1380	953	85.5	1328	930	95.3	1269	903	105.1	1365	957	95.6	1302	928	105.4
	72	1497	772	86.3	1438	749	96.1	1371	724	105.8	1477	769	96.3	1406	743	106.1
85	62	1299	1299	84.9	1259	1259	94.8	1213	1213	104.7	1295	1295	95.1	1246	1246	105.0
	67	1386	1122	85.5	1334	1098	95.3	1274	1070	105.2	1370	1131	95.6	1308	1102	105.4
	72	1497	946	86.3	1439	923	96.1	1376	893	105.9	1480	947	96.4	1411	919	106.1

Figure 53. SCWF90-110 Fan Performance with VFD



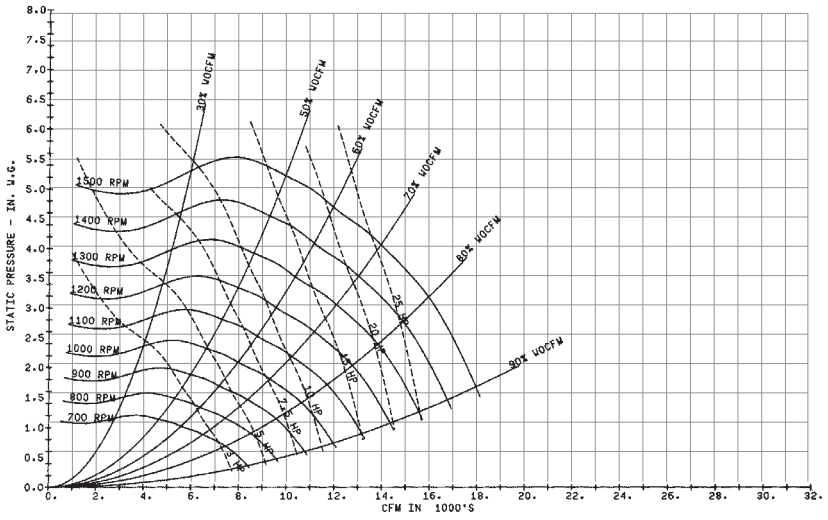
Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Remote Air-Cooled Performance Data

Table 49. SCRF/SIRF 20 Gross Cooling Capacity - 10,000 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	285.0	183.9	273.7	178.7	260.6	173.0	245.9	166.6	229.9	159.8
	67	313.8	137.0	301.0	132.0	286.5	126.2	270.2	119.9	252.8	113.2
75	62	286.8	228.9	275.7	223.5	262.8	217.5	248.4	210.6	233.0	203.3
	67	313.9	183.6	301.1	178.5	286.5	172.7	270.3	166.3	252.9	159.6
	72	343.9	136.3	329.7	131.2	313.5	125.4	295.6	119.1	276.7	112.6
80	62	288.0	274.1	276.9	268.7	264.0	262.6	249.6	249.6	234.1	234.1
	67	315.1	228.9	302.6	223.4	288.3	217.2	272.4	210.4	255.6	203.1
	72	344.0	182.6	329.7	177.4	313.5	171.6	295.7	165.2	276.8	158.6
85	62	302.3	302.3	292.7	292.7	281.5	281.5	268.9	268.9	255.2	255.2
	67	316.4	273.6	303.9	268.1	289.6	261.9	273.8	255.0	256.9	247.7
	72	344.6	228.0	329.8	223.3	314.8	216.3	295.8	211.0	276.9	204.4

Figure 54. SCRF/SIRF 20 Fan Performance for CV or with VFD

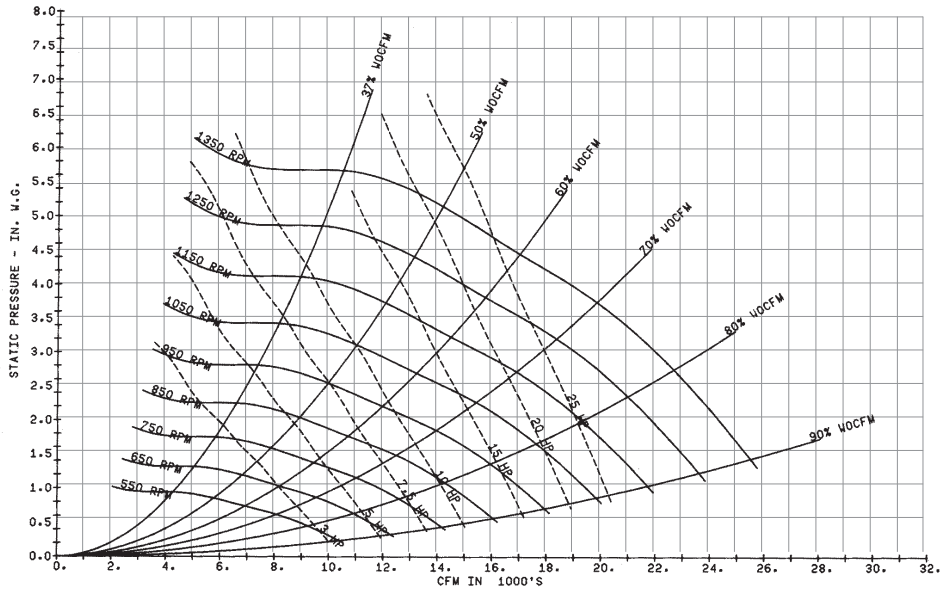


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 50. SCRF/SIRF 25 Gross Cooling Capacity - 11,600 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	334.5	207.6	322.1	201.9	307.7	195.3	291.4	187.9	273.7	180.1
	67	367.8	160.1	353.9	154.3	337.8	147.7	319.8	140.3	300.5	132.6
75	62	336.2	253.6	324.0	247.6	309.8	240.6	293.9	232.8	276.6	224.4
	67	367.9	207.5	354.1	201.6	338.0	194.9	320.1	187.5	300.8	179.7
	72	403.1	159.3	387.5	153.4	369.6	146.7	349.7	139.4	328.7	131.7
80	62	337.8	299.2	325.6	293.1	311.5	286.0	295.5	278.2	278.2	269.7
	67	368.9	253.7	355.3	247.6	339.6	240.5	322.0	232.7	303.1	224.3
	72	403.3	206.4	387.6	200.4	369.8	193.6	350.0	186.3	328.9	178.6
85	62	343.5	343.5	333.5	333.5	321.7	321.7	308.2	308.2	293.5	293.5
	67	370.8	298.8	357.1	292.6	341.4	285.5	323.8	277.5	304.9	269.1
	72	403.4	253.0	387.8	247.0	370.0	240.2	350.1	232.8	329.1	225.1

Figure 55. SCRF/SIRF 25 Fan Performance for CV or with VFD

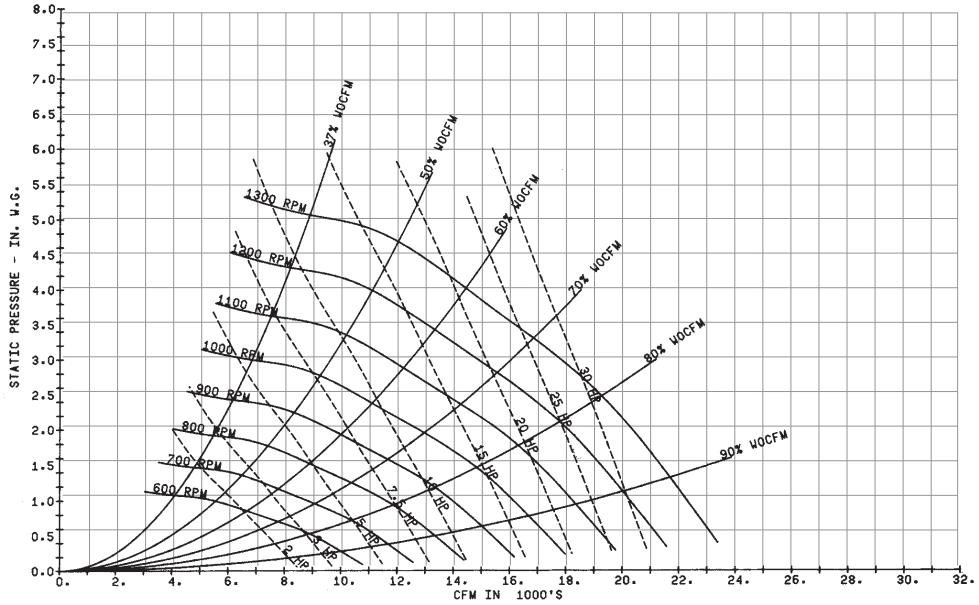


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 51. SCRF/SIRF 29 Gross Cooling Capacity - 12,800 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	371.1	245.8	355.3	238.6	336.1	231.5	315.7	224.2	296.3	212.0
	67	406.2	180.0	388.2	173.0	367.8	165.1	345.5	156.6	322.0	147.8
75	62	373.1	309.2	357.4	301.8	339.6	293.4	320.0	284.1	299.2	274.4
	67	406.1	245.2	388.1	238.0	367.8	230.1	345.5	221.5	321.9	212.6
	72	443.4	178.2	423.2	171.1	400.7	163.3	376.3	154.9	350.8	146.3
80	62	374.4	367.9	358.7	355.3	340.8	340.8	321.2	321.2	300.4	300.4
	67	408.2	308.0	390.7	300.4	370.9	291.9	349.3	282.6	326.8	272.9
	72	443.3	242.8	423.1	235.6	400.6	227.7	376.2	219.2	350.8	210.6
85	62	398.6	398.6	384.7	384.7	368.6	368.6	350.9	350.9	332.0	332.0
	67	409.7	371.0	392.1	363.3	372.3	354.8	350.7	342.2	328.2	324.6
	72	444.5	305.9	425.1	298.0	401.1	291.3	377.0	282.5	354.1	271.7

Figure 56. SCRF/SIRF 29 Fan Performance for CV or with VFD

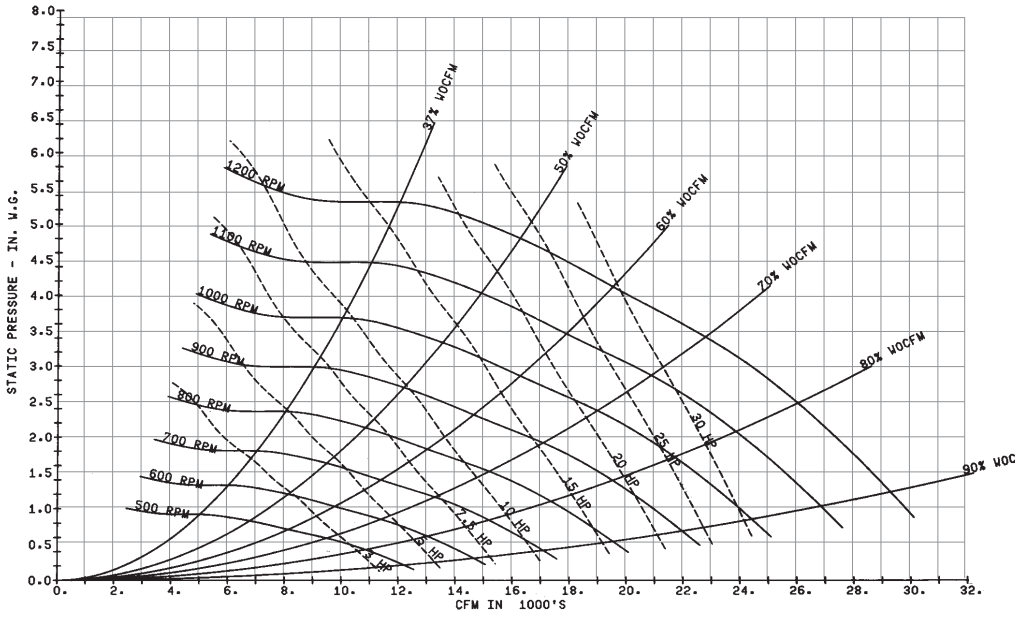


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 52. SCRF/SIRF 30 Gross Cooling Capacity - 14,000 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	419.7	268.8	404.4	261.1	385.9	253.2	365.2	243.9	342.4	233.9
	67	461.7	202.5	444.1	195.3	423.8	187.2	400.9	178.1	376.0	168.3
75	62	422.4	331.6	406.7	324.0	388.7	315.3	368.4	305.6	346.2	295.0
	67	461.6	267.4	444.1	260.2	423.8	252.0	400.9	242.9	376.0	233.0
	72	505.4	201.0	485.8	193.8	463.4	185.6	438.3	176.6	411.1	167.0
80	62	423.7	394.5	408.3	386.9	390.4	378.2	370.1	364.9	347.8	346.3
	67	462.9	330.9	445.6	323.3	425.8	314.6	403.4	304.8	379.1	294.3
	72	505.4	265.4	485.8	258.2	463.4	249.9	438.3	240.8	411.1	231.2
85	62	440.4	440.4	427.1	427.1	411.8	411.8	394.2	394.2	374.7	374.7
	67	464.7	393.3	447.5	385.6	427.6	376.8	405.2	367.0	380.9	356.3
	72	505.8	329.1	486.5	321.5	463.5	313.9	438.3	304.7	411.1	295.0

Figure 57. SCRF/SIRF 30 Fan Performance for CV or with VFD

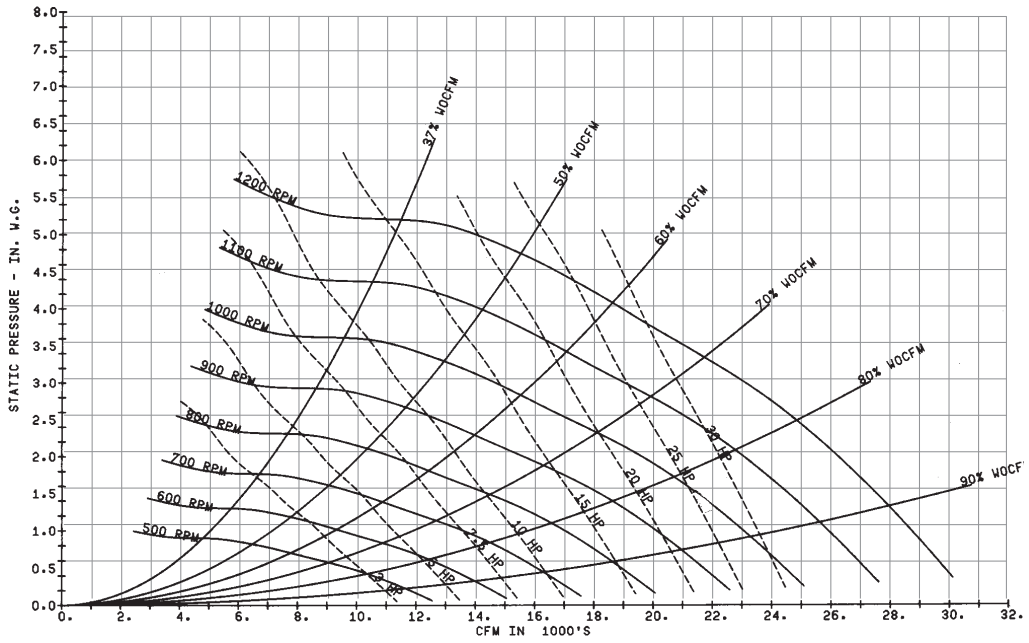


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 53. SCRF/SIRF 35 Gross Cooling Capacity - 15,200 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	444.1	293.4	426.7	285.4	405.6	277.5	366.0	212.2	359.4	254.7
	67	487.0	215.9	467.3	208.1	444.7	199.3	419.4	189.6	391.9	179.2
75	62	446.3	367.8	429.0	359.6	409.1	350.2	386.6	339.6	362.3	328.2
	67	486.9	292.3	467.2	284.5	444.6	275.6	419.3	265.8	391.9	255.3
	72	532.5	214.0	510.6	206.1	485.6	197.4	457.8	187.7	428.0	177.5
80	62	447.8	440.3	430.4	425.9	410.5	409.3	388.1	388.1	363.7	363.7
	67	488.8	366.6	469.5	358.2	447.5	348.7	422.9	338.2	396.4	326.8
	72	532.4	289.8	510.5	281.9	485.6	273.0	457.8	263.3	428.0	253.0
85	62	475.7	475.7	460.5	460.5	442.9	442.9	422.8	422.8	400.9	400.9
	67	490.5	440.4	471.2	432.0	449.2	422.5	424.5	411.8	398.0	392.9
	72	533.4	364.2	512.0	355.8	485.5	348.3	457.7	338.5	431.1	325.3

Figure 58. SRF/SIRF 35 Fan Performance for CV or with VFD

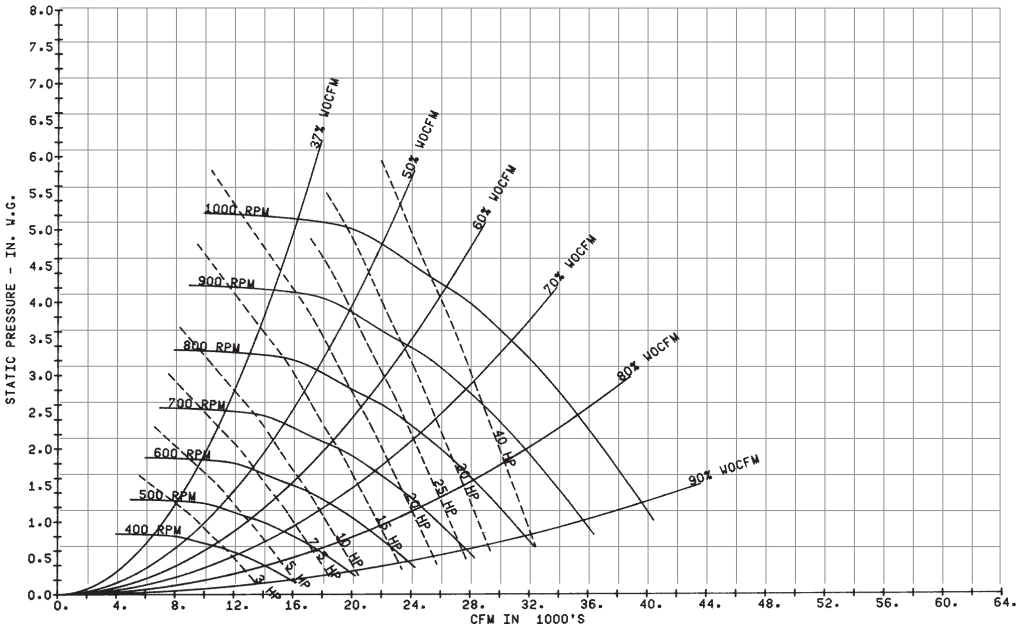


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 54. SCRF/SIRF 40 Gross Cooling Capacity - 18,400 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	521.3	346.2	499.5	338.3	476.9	325.4	450.2	312.9	416.4	305.8
	67	570.5	253.8	546.9	244.6	519.9	234.2	489.6	222.7	457.0	210.4
75	62	524.6	435.9	503.9	426.0	480.2	414.8	453.6	402.2	424.9	388.7
	67	570.4	346.5	546.8	337.2	519.8	326.6	489.6	315.0	457.0	302.6
	72	624.2	251.8	597.9	242.5	567.9	232.0	534.7	220.6	499.2	208.6
80	62	526.6	518.3	505.9	505.0	482.2	482.2	455.6	455.6	426.8	426.8
	67	574.9	434.5	551.8	424.5	525.5	413.1	496.3	400.5	465.0	387.0
	72	624.1	343.7	597.8	334.3	567.8	323.7	534.6	312.2	499.2	300.0
85	62	562.6	562.6	544.2	544.2	522.9	522.9	498.8	498.8	472.5	472.5
	67	577.2	523.9	554.1	513.8	527.8	501.5	498.5	483.6	467.2	464.7
	72	626.2	434.4	600.2	423.4	572.9	410.2	536.9	401.0	499.0	395.7

Figure 59. SCRF/SIRF 40 Fan Performance for CV or with VFD

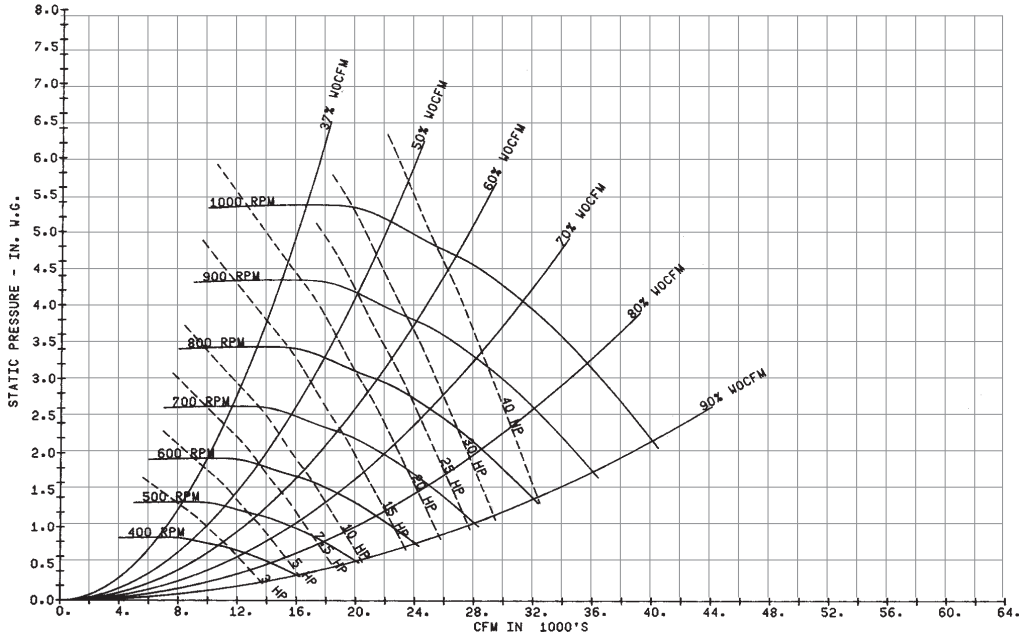


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 55. SCRF/SIRF 50 Gross Cooling Capacity - 23,200 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	669.2	444.2	642.2	431.6	611.5	417.1	572.6	408.5	534.4	389.5
	67	730.5	326.1	699.8	314.0	664.8	300.5	626.0	285.6	584.5	270.0
75	62	673.2	557.6	646.3	544.8	615.6	530.2	581.4	514.0	544.7	496.6
	67	730.3	443.3	699.6	431.2	664.7	417.5	625.9	402.5	584.4	386.7
	72	797.1	322.4	762.8	310.2	724.1	296.7	681.5	282.0	636.5	266.7
80	62	675.7	671.9	648.8	648.8	618.0	618.0	583.8	583.8	547.0	547.0
	67	735.6	554.8	705.7	541.7	671.7	527.0	634.1	510.7	594.2	493.4
	72	796.9	438.7	762.6	426.4	723.9	412.8	681.4	397.9	636.4	382.5
85	62	720.0	720.0	696.0	696.0	668.2	668.2	637.1	637.1	603.5	603.5
	67	738.5	667.9	708.5	654.7	674.4	639.8	636.8	623.5	596.9	596.9
	72	801.2	550.3	767.8	537.1	723.8	528.3	681.3	513.3	645.6	488.9

Figure 60. SCRF/SIRF 50 Fan Performance for CV or with VFD

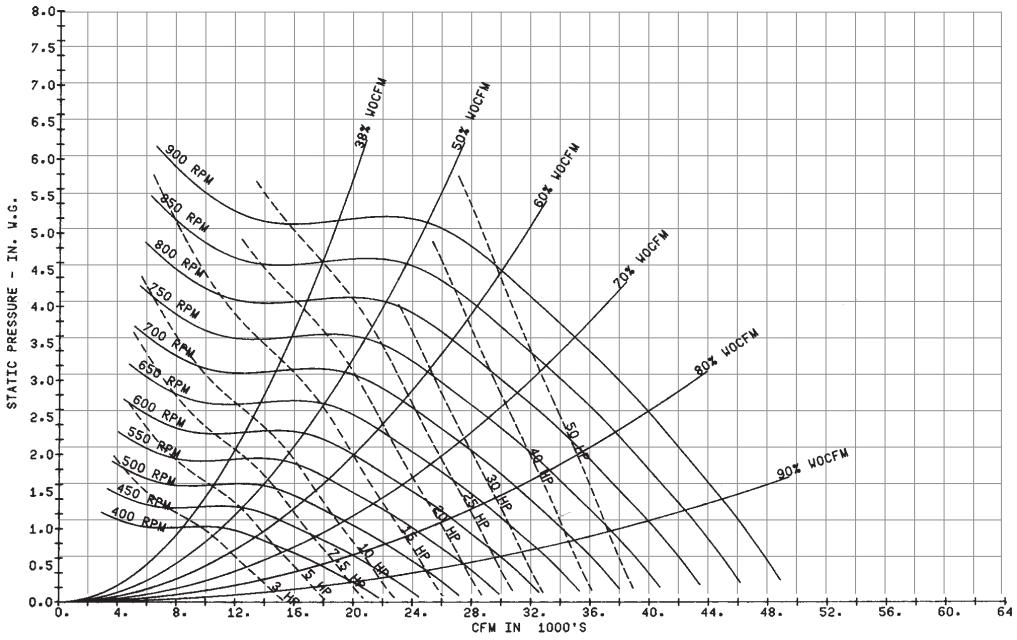


Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 56. SCRF/SIRF 60 Gross Cooling Capacity - 29,800 cfm

Ambient		Entering Ambient Air Temperature									
		75		85		95		105		115	
EDB	EWB	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh	Tot MBh	Sen MBh
70	62	905.7	607.8	868.9	588.8	826.0	568.6	778.5	546.3	718.9	530.6
	67	989.0	442.6	945.7	425.9	896.6	407.2	842.5	386.8	785.0	365.4
75	62	911.8	762.5	874.0	744.5	831.2	724.2	783.8	701.8	733.4	678.0
	67	988.6	603.6	945.3	586.6	896.3	567.5	842.3	546.7	784.7	525.0
	72	1077.0	436.5	1029.0	419.6	974.4	400.9	915.2	380.8	853.0	359.9
80	62	914.6	914.0	876.9	876.9	834.0	834.0	786.6	786.6	736.2	736.2
	67	994.9	757.5	952.8	739.2	905.4	718.6	853.4	696.2	798.6	672.5
	72	1077.0	596.2	1028.0	579.0	974.1	559.9	914.9	539.4	852.7	518.2
85	62	977.8	977.8	943.7	943.7	904.7	904.7	861.2	861.2	814.7	814.7
	67	998.3	912.9	956.2	894.5	908.7	873.8	856.6	850.6	801.9	801.9
	72	1081.0	750.1	1034.0	731.5	973.7	717.8	914.6	697.0	852.5	675.6

Figure 61. SCRF/SIRF 60 Fan Performance for CV or with VFD



Note: *Fan curves include refrigerant coil and internal cabinet static losses. To determine static pressure to be used with these curves, add filter, economizer, flexible horizontal discharge and heat pressure drops to external duct static pressure.*

Table 57. Hot Water Heating Capacity

Unit Size	Air Flow cFm	180 °F			200 °F		
		Capacity MBh	LAT °F	Flow Gpm	Capacity MBh	LAT °F	Flow Gpm
20 tons	8000	237.2	87.3	23.7	287.6	93.2	28.7
22 tons	8800	249.1	86.1	24.9	302.2	91.6	30.1
25 tons	10000	266.2	84.5	26.6	323.0	89.8	32.2
29 tons	11600	287.3	82.8	28.7	348.7	87.7	34.8
32 tons	12800	302.2	81.8	30.2	366.8	86.4	36.6
35 tons	14000	316.2	80.8	31.6	384.0	85.3	38.3
38 tons	15200	329.6	80.0	32.9	400.2	84.3	39.9
42 tons	16800	471.2	85.9	47.1	567.8	91.2	56.6
46 tons	18400	494.0	84.8	49.4	595.3	89.8	59.3
52 tons	20800	526.4	83.3	52.6	634.5	88.1	63.2
58 tons	23200	556.7	82.1	55.6	671.2	86.7	66.9
65 tons	26000	589.9	80.9	58.9	711.2	85.2	70.9
72 tons	28800	620.9	79.9	62.0	748.7	84.0	74.6
80 tons	29800	631.5	79.5	63.1	761.5	83.6	75.9

Note: Based on 60°F EAT with a 20°F water temperature difference.

Table 58. Steam Heating Capacity

Unit Size	Air Flow cFm	2 psi		5 psi		10 psi	
		Capacity MBh	LAT °F	Capacity MBh	LAT °F	Capacity MBh	LAT °F
20 tons	8000	257.4	89.7	271.6	91.3	291.6	93.6
22 tons	8800	272.2	88.5	287.1	90.1	308.3	92.3
25 tons	10000	292.7	87.0	308.8	88.5	331.6	90.6
29 tons	11600	317.6	85.2	335.1	86.6	359.9	88.6
32 tons	12800	334.7	84.1	353.2	85.4	379.3	87.3
35 tons	14000	350.5	83.1	369.9	84.4	397.3	86.2
38 tons	15200	365.3	82.2	385.4	83.4	414.0	85.1
42 tons	16800	500.5	87.5	528.1	89.0	567.1	91.1
46 tons	18400	526.7	86.4	555.7	87.8	596.8	89.9
52 tons	20800	563.0	85.0	594.1	86.3	638.1	88.3
58 tons	23200	596.3	83.7	629.3	85.0	675.9	86.9
65 tons	26000	631.7	82.4	666.7	83.6	716.2	85.4
72 tons	28800	663.9	81.3	700.7	82.4	752.8	84.1
80 tons	29800	674.7	80.9	712.1	82.0	765.1	83.7

Note: Based on 60°F EAT

Table 59. Electric Heat Capacity

Unit Size SCWF	Unit Size SCRF	Heat kW	Air Flow CFM	Capacity MBH	LAT
20		18	8000	61.47	67.11
22		18	8800	61.47	66.47
25	20	18	10000	61.47	65.69
29	25	23	11600	78.54	66.27
32	29	23	12800	78.54	65.68
35	30	27	14000	92.21	66.10
38	35	27	15200	92.21	65.62
42		31.5	16800	107.57	65.93
46	40	31.5	18400	107.57	64.41
52		39	20800	133.18	65.93
58	50	39	23200	133.18	65.31
65		48	26000	163.92	65.84
72		48	28800	163.92	65.27
80	60	48	29800	163.92	65.09
90		76	30000	259.54	68.01
100		76	32000	259.54	67.51
110		76	32000	259.54	67.51

1. Based on 60°F EAT
2. or unit capacities at different conditions than those listed, use TOPSS (Trane Official Product Selection Program).
3. Air temperature rise = kW x 3413 / (cfm x 1.085)

Controls

IntelliPak™ Signature Series Self-Contained Units

We've redesigned the self-contained unit with the latest control technology to make it even better! New modular DDC controls with human interface (HI) panel make self-contained units more flexible and easier to operate.

Controls are Trane-designed to work with Trane equipment for optimum efficiency. The factory installs and commissions each control component to ensure simple and reliable operation.

Furthermore, the DDC control's modular design allows greater application flexibility using up to twelve different modules, dependent upon unit options. You can order exactly what the job requires as options, instead of one large control package. And since unit features are distributed among multiple printed circuit boards, field replacement is easy.

Depending upon unit options, IntelliPak® units can operate as:

1. stand-alone
2. interface with Trane's Tracer® building management system
3. interface with a generic (non-Trane) building management system.

Available Input and Output Points

RTM Module (on all units)

Binary inputs

- Emergency stop
- External auto/stop
- Unoccupied/occupied
- Dirty filter
- VAV changeover with hydronic heat
- Units with staged heat interface have 1-3 additional points

Binary outputs

- VAV box drive max (VAV units only)
- CV Unoccupied mode indicator (CV units only)
- Alarm
- Fan run request
- Water pump request (water-cooled only)
- Units with staged heat interface have 1-3 additional points

Analog input

- Airside economizer damper minimum position

Analog output

• Outside air damper actuator

Heat Module Option

- Analog output

Generic BAS Option (GBAS)

Binary inputs

- Demand limit contacts

Binary outputs

- Dirty filter relay
- Refrigeration fail relay
- Heat fail relay
- Supply fan fail relay
- Active diagnostics

Analog inputs

- Occupied zone cooling setpoint
- Occupied zone heating setpoint
- Unoccupied zone cooling setpoint
- Unoccupied zone heating setpoint or minimum outside air flow setpoint
- Supply air cooling setpoint
- Supply air heating setpoint
- Supply air static pressure setpoint

Comparative Enthalpy Module (ECEM) Option

Analog inputs

- Return air temperature
- Return air humidity

Ventilation Override Module (VOM) Option

Binary inputs

- VOM mode A, unit off
- VOM mode B, pressurize
- VOM mode C, exhaust
- VOM mode D, purge
- VOM mode E, purge w/duct pressure control

Binary output

- V.O. relay

LonTalk® /Building Automation System

The LonTalk Communication Interface for IntelliPak self-contained (LCI-I) controller expands communications from the unit UCM network to a Trane Tracer Summit or a 3rd party building automation system, utilizing LonTalk, and allows external setpoint and configuration adjustment and monitoring of status and diagnostics. The LCI-I utilizes an FTT-10A Free Topology transceiver, which supports nonpolarity sensitive, free topology wiring, which allows the system installer to utilize star, bus, and loop architectures.This controller works in standalone mode, peer-to-peer with one or more other units, or when connected to a Trane Tracer Summit or a 3rd party building automation system that supports LonTalk.

BACnet® /Building Automation System

The BACnet Communication Interface for IntelliPak self-contained (BCI-I) controller expands communications from the unit UCM network to Tracer SC or a 3rd party building automation system, utilizing BACnet, and allows external setpoint and configuration adjustment and monitoring of status and diagnostics. The BCI-I utilizes the BACnet defined MS/TP protocol as defined in ASHRAE standard135-2004. This controller works in standalone mode, with Tracer SC or when connected to a 3rdparty building automation system that supports BACnet.

Standard IntelliPak Unit Control Features

All set-up parameters are preset from the factory, requiring less start-up time during installation.

The human interface panel is easy to read and requires less time for building maintenance personnel to learn to interact with the unit. It features a clear language display (in English, Spanish, or French) that shows all of the self-contained unit control parameters, such as system on/off; demand limiting type; night setback setpoints; and many other setpoints. All adjustments are done through the human interface key-pad. Also the human interface panel allows you to monitor diagnostic points such as; sensor failures; supply airflow loss; and inoperative refrigerant circuit. No special tools are required for servicing the unit. Diagnostics are held in memory, even during power loss. This allows the operator/servicer to diagnose the failure root cause.

IntelliPak Unit Features

- Unit mounted human interface panel with a two line x 40 character language (English, Spanish, or French) display and a 16-function keypad that includes CUSTOM, DIAGNOSTICS, and SERVICE TEST MODE menu keys on IntelliPak units
- Compressor lead/lag
- FROSTAT™ coil frost protection on all units
- Daytime warmup (occupied mode) on units with heating options and morning warmup operation on all units
- Supply air static overpressurization protection on units with variable frequency drives (VFD's)
- Supply airflow proving
- Supply air tempering control with heating option
- Supply air heating control on VAV with hydronic heating option
- Mappable sensors and setpoint sources
- Occupied/unoccupied switching
- Timed override activation
- Programmable water purge during unoccupied mode

Human Interface Panel (HI)

The human interface panel provides a 16-button keypad for monitoring, setting, editing and controlling. The HI panel is mounted in the unit's main control panel, accessible through the unit's control panel door.

The optional remote-mount version of the human interface (RHI) panel has all the functions of the unit-mounted version, except for the service mode. To use a RHI, the unit must be equipped with the remote HI interface option (model number digit 32 = 2), which includes an interprocessor communications bridge (IPCB). The RHI can be located up to 1,000 feet (304.8 m) from the unit. A single RHI can be used to monitor and control up to four self-contained units, each containing an IPCB.

The human interface panel provides a 16-button keypad for monitoring, setting, editing and controlling. The HI panel is mounted in the unit's main control panel, accessible through the unit's control panel door.

The optional remote-mount version of the human interface (RHI) panel has all the functions of the unit-mounted version, except for the service mode. To use a RHI, the unit must be equipped with the remote HI interface option (model number digit 32 = 2), which includes an interprocessor communications bridge (IPCB). The RHI can be located up to 1,000 feet (304.8 m) from the unit. A

single RHI can be used to monitor and control up to four self-contained units, each containing an IPCB.

The main menus of the human interface panels are:

STATUS is used to monitor all temperatures, pressures, humidities, setpoints, input and output status.

CUSTOM key allows the user to customize a status report - consisting of up to four screens of the data available in the main Status menu.

SETPOINT is used to edit all factory preset default setpoints.

DIAGNOSTICS allows the user to review active and historical lists of diagnostic conditions. A total of 49 different diagnostics can be read at the human interface (HI) panel and the last 20 diagnostics can be held in an active history buffer log at the HI panel.

SETUP allows the user to edit control parameters, sensor selections, setpoint source selections, output definitions, and numerous other points in this menu. All points have factory preset values to keep unnecessary editing to a minimum.

CONFIGURATION allows changing of factory-preset unit configuration information. This information can be edited only if certain options are field-installed or deleted from the unit. For example, if a Trane communication interface (TCI) module or ventilation override module (VOM) were field-installed, the unit configuration will require editing to reflect those options for proper unit operation.

SERVICE allows servicing or troubleshooting the unit by selecting component control outputs such as compressors, fans, damper position, etc. This menu is accessible only at the unit-mounted human interface panel.

Control Sequences of Operation

Morning Warmup

This feature is available on all types of factory-installed heat units and on units with no heat. This function may still be selected to support systems with heat sources not provided by the self-contained unit. At the conclusion of unoccupied mode, the selected zone is heated to the user-defined morning warmup setpoint. The unit is then released to occupied mode. There are two types of morning warmup: full capacity or cycling capacity.

Full Capacity Morning Warmup (MWU). Full capacity morning warmup uses full heating capacity to heat the zone as quickly as possible. Full heating capacity is provided until the morning warmup setpoint is met. At this point, the unit is released to daytime mode.

Cycling Capacity Morning Warmup (MWU). Cycling capacity morning warmup provides gradual heating to overcome "building sink" as the zone is heated. Normal zone temperature control with varying capacity is used to raise the zone temperature to the MWU zone temperature setpoint. Cycling capacity MWU will operate until MWU setpoint is reached or for 60 minutes. Then the unit switches to occupied mode. Cooling will suspend untill building load conditions exceed the MWU setpoint of 3 F (1.7 C), which is field adjustable.

Note: *When using the morning warmup option in a heating/cooling self-contained unit in a VAV system, it is important to maintain airflow through the unit. This can be accomplished by electrically tying the VAV boxes to the VAV drive max output relay contacts on the unit's RTM module board or by using changeover thermostats. Either of these methods will assure adequate airflow through the unit and satisfactory heating.*

Ventilation Override (VOM) Option

The user can customize up to five different override sequences for purposes of ventilation override control. If more than one VOM sequence is being requested, the sequence with the highest priority is initiated first. Priority schedule is that sequence "A" (unit off) is first, with sequence "E" (purge with duct pressure control) last.

UNIT OFF sequence "A". When complete system shut down is required, the following sequence can be used.

- Supply fan – Off
- Supply fan VFD – Off (0 Hz) (if equipped)
- Outside air dampers – Closed
- Heat – all stages – Off, Modulating heat output at 0 vdc
- Occupied/Unoccupied output – Deenergized
- VO relay – Energized
- Exhaust fan (field-installed) - Off
- Exhaust damper (field-installed) - Closed

PRESSURIZE sequence "B". This override sequence can be used if a positively pressured space is desired instead of a negatively pressurized space.

- Supply fan – On
- Supply fan VFD – On (60 Hz)\VAV boxes – Open (if equipped)
- Outside air dampers – Open
- Heat – all stages – Off, Modulating heat output at 0 vdc
- Occupied/ Unoccupied output - Energized
- VO relay - Energized
- Exhaust fan (field-installed) - Off
- Exhaust damper (field-installed) - Closed

EXHAUST sequence "C". With the building's exhaust fans running and the unit's supply fan off, the conditioned space becomes negatively pressurized. This is desirable for clearing the area of smoke when necessary; i.e. from an extinguished fire, to keep smoke out of areas that were not damaged.

- Supply fan – Off
- Supply fan VFD – Off (0 Hz) (if equipped)
- Outside air dampers – Closed
- Heat – all stages – Off, Modulating heat output at 0 vdc
- Occupied/Unoccupied output – Deenergized
- VO relay – Energized
- Exhaust fan (field-installed) - On
- Exhaust damper (field-installed) - Open

PURGE sequence "D". This sequence could be used for purging the air out of a building before coming out of unoccupied mode of operation on VAV units. Also, it can be used to purge smoke or stale air.

- Supply fan – On
- Supply fan VFD – On (60 Hz)\VAV boxes – Open (if equipped)
- Outside air damper – Open
- Heat – all stages – Off, Modulating heat output at 0 vdc
- Occupied/Unoccupied output – Energized
- VO relay – Energized
- Exhaust fan (field-installed) - On

- Exhaust damper (field-installed) - Open

PURGE WITH DUCT PRESSURE CONTROL "E". This sequence can be used when supply air control is required for smoke control.

- Supply fan – On
- Supply fan VFD – On (if equipped)
- Outside air dampers – Open
- Heat – all stages – Off, Modulating heat output at 0 vdc
- Occupied/Unoccupied output – Energized
- VO relay – Energized
- Exhaust fan (field-installed) - On
- Exhaust damper (field-installed) - Open

Note: *Each system (cooling, exhaust, supply air, etc.) within the unit can be redefined in the field for each of the five sequences, if required. Also the definitions of any or all of the five sequences may be locked into the software by simple key strokes at the human interface panel.*

Generic Building Automation System Module (GBAS) Option

The generic building automation system module (GBAS) provides broad control capabilities for building automation systems other than Trane's Tracer® system. A field provided potentiometer or a 0-5 vdc signal can be applied to any of the inputs of the GBAS to provide the following inputs and outputs.

GBAS Analog Inputs . Four analog inputs that can be configured to be any of the following:

1. Occupied zone cooling
2. Unoccupied zone cooling
3. Occupied zone heating
4. Unoccupied zone heating
5. SA cooling setpoint
6. SA heating setpoint
7. Space static pressure setpoint
8. SA static pressure setpoint

GBAS Binary Outputs . Each of the five (5) relay outputs can be mapped to any/all of the available diagnostics.

Demand Limiting Binary Input . This function is operational on units with a GBAS and is used to reduce electrical consumption at peak load times. There are two types of demand limiting, 50% and 100%. When demand limiting is needed, mechanical cooling and heating operation are either partially (50%), or completely disabled (100%) to save energy. The demand limit definition is user definable at the human interface panel. Demand limit binary input accepts a field supplied switch or contact closure. When the need for demand limiting has been discontinued, the unit's cooling/heating functions will again become fully enabled.

Evaporator Coil Frost Protection FROSTAT™

A temperature sensor on the evaporator is used to determine if the coil is getting close to a freezing condition. Mechanical cooling capacity is shed as necessary to prevent icing.

The FROSTAT™ system eliminates the need for hot gas bypass and adds a suction line surface temperature sensor mounted near the TXV bulb location to shut off the cooling when coil frosting

conditions occur. The supply fan is not shut off and will de-ice the coil. Timers prevent the compressors from rapid cycling.

Occupied/Unoccupied Switching

There are four ways to switch occupied/unoccupied:

1. Programmable night setback sensor
2. Field-supplied contact closure (hardwired binary input to RTM)
3. Tracer®
4. Factory-mounted time clock

Field Supplied Occupied/Unoccupied input on the RTM. This input accepts a field supplied switch or contacts closure such as a time clock.

Trane Tracer® System. The Trane Tracer® system can control the occupied/unoccupied status of the self-contained unit.

Factory Mounted Time Clock. A time clock can control the occupied/unoccupied status of the self-contained unit.

Timed Override Activation - ICS

This function is operational whenever the unit's RTM module board is used as the zone temperature sensor source, which can be set at the human interface panel. When this function is initiated by the push of the override button on the zone sensor, the unit will switch to the occupied mode. Unit operation (occupied mode) during timed override is terminated by a signal from Tracer.

Timed Override Activation - Non-ICS

This function is active whenever the unit's RTM module board is selected as the zone temperature source, which can be set at the human interface panel. When this function is initiated by the push of the override button on the zone sensor, the unit will switch to the occupied mode. Automatic cancellation of the timed override mode occurs after three hours of operation.

Low Ambient Compressor Lockout

This function will lock out the compressor if the outdoor air temperature is below the low ambient compressor lock-out temperature setpoint when using a field-installed outside air sensor. This setpoint is adjustable at the human interface panel. Compressors will lock out when outdoor air temperature falls below that selected temperature and will start again when the temperature rises 5° F above the setpoint.

Comparative Enthalpy Control of Airside Economizer Option

An optional comparative enthalpy system is used to control the operation of the economizer and measures the temperature and humidity of both return air and outside air to determine which source has lower enthalpy. This system allows true comparison of outdoor air and return air enthalpy by measurement of outdoor and return air temperatures and humidities.

Note: *If comparative enthalpy is not ordered, the standard method compares outdoor air enthalpy with a fixed reference enthalpy, set through the human interface panel.*

Compressor Lead/Lag

Compressor lead/lag is a user-selectable feature through the human interface panel available on all units. After each request for compressor operation, the lead refrigeration circuit or compressor switches, thereby causing a more equitable or balanced run time among compressors.

Emergency Stop Input

A binary input is provided on the unit's RTM module board for installation of a field-provided switch or contacts to immediatly shutdown all unit functions.

Water Flow Control

With compatible piping configurations, the unit can be configured to provide:

1) Constant water flow with basic or intermediate piping or 2) Variable water flow with intermediate piping only.

Constant water flow is for condenser pumping systems that are not capable of unloading the water-pumping system. Variable water flow maximizes energy saving by unloading the water pumping system.

Head Pressure Control

Water-Cooled Condensers. Units that are set up for variable water flow will modulate a water valve to maintain a user-defined condensing temperature setpoint. Condensing temperature will be referenced utilizing factory installed sensors located at each condenser.

Air-Cooled Condensers. Condenser fans will stage per a user-defined setting. If the condenser is equipped with head pressure control (air modulation on last stage of condenser capacity), the condenser airflow will modulate to maintain condensing temperature setpoint. Condensing temperature is determined by sensors located at each condenser coil.

Water Purge

This user-definable feature allows the user to select a purge schedule to automatically circulate water through the economizer and condensers periodically during non-operational times. This allows fresh chemicals to circulate in waterside heat exchangers.

Airside Options

Variable Frequency Drive (VFD) Control

Variable frequency drives are driven by a modulating 0-10 vdc signal from the RTM module. A pressure transducer measures duct static pressure, and the VFD adjusts the fan speed to maintain the supply air static pressure within an adjustable user-defined range. The range is determined by the supply air pressure setpoint and supply air pressure deadband, which are set through the human interface panel.

Variable frequency drives provide supply fan motor speed modulation. The drives will accelerate or decelerate as required to maintain the supply static pressure setpoint.

Bypass control is offered as an option to provide full nominal airflow in the event of drive failure. Manual bypass is initiated at the human interface panel. When in the bypass mode, VAV boxes will need to be fully opened. The self-contained unit will control heating and cooling functions to maintain setpoint from a user defined zone sensor. Supply air static pressure limit will be active in this mode.

Supply Air Static Pressure Limit

The opening of the VAV boxes are coordinated during unit start up and transition to/from occupied/unoccupied modes to prevent overpressurization of the supply air ductwork. However, if for any reason the supply air pressure exceeds the user-defined supply air static pressure limit that was set at the human interface panel, the supply fan/VFD is shut down. Then unit will attempt to restart, up to three times. If the overpresssurization condition still occurs on the third restart, the unit shuts down and a manual reset diagnostic sets and displays at the human interface panel.

Zone Temperature Control Unit Sequence Of Operation

1

Occupied Zone Temperature Control

Cooling/Waterside Economizer

During occupied cooling mode, the waterside economizer option and mechanical cooling function to control zone temperature. If the entering condenser water temperature is appropriate to use "free cooling," the economizer initiates to attempt to satisfy the cooling zone temperature setpoint with the compressors staging on as necessary. Minimum on/off timing of compressors prevents rapid cycling.

Waterside economizing enables when the unit's entering water temperature is below the unit's entering mixed air temperature by 4°F plus the user adjustable economizer approach temperature. The approach temperature default is 4°F and is adjustable from 0-9°F at the human interface (HI) panel. Waterside economizing disables when the unit's entering water temperature is not below the unit's entering mixed air temperature by at least the water economizer approach temperature. The approach temperature defaults to 4°F and is adjustable from 0-9°F at the HI. The economizer acts as the first stage of cooling. If the economizer is unable to maintain the zone temperature setpoint, the compressor module will bring on compressors as required to meet the setpoint.

If the unit does not include an economizer, only mechanical cooling will operate to satisfy cooling requirements.

Cooling/Airside Economizer

During occupied cooling mode, the economizer option and mechanical cooling operate to control zone temperature. If the outside air enthalpy is appropriate for airside economizing or "free cooling," the economizer initiates to satisfy the cooling zone temperature setpoint with the compressors staging on as necessary. Minimum on/off timing of compressors will prevent rapid cycling.

On units with an airside economizer, a call for cooling will modulate the fresh air dampers open. The rate of economizer modulation is based on deviation of the zone temperature from setpoint; i.e., the further away from setpoint, the faster the fresh air damper will open. First stage of cooling will start after the economizer reaches full open.

Note that the airside economizer will only function freely if ambient conditions are below the enthalpy control settings or below the return air enthalpy if unit has comparative enthalpy installed. If outside air is not suitable for "economizing," the fresh air dampers drive to the minimum open position. A field adjustable, factory default setting in the human interface panel or Tracer can provide the input to establish the minimum damper position.

At outdoor air conditions above the enthalpy control setting, only mechanical cooling is used and the fresh air dampers remain at minimum position.

If the unit does not include an airside economizer, only mechanical cooling will operate to satisfy cooling requirements.

Heating: Electric

On units with electric heating, the zone temperature can be controlled to a heating setpoint during the occupied mode by cycling a single stage electric heater. Interface is provided for field supplied single stage electric heat. The zone temperature heating setpoint and deadband are user defined at the human interface panel.

Heating: Hot Water or Steam

On units with hot water or steam heating, the zone temperature can be controlled to a heating setpoint during the occupied mode. The zone temperature heating setpoint and deadband are user defined at the human interface panel.

Supply Air Tempering

For hot water, steam, or electric heat units in the heat mode but not actively heating, if the supply air temperature drops to 10°F below the occupied zone heating temperature setpoint, one stage of heat will be brought on to maintain a minimum supply air temperature. The unit transitions out of heat mode if the supply air temperature rises to 10°F above the occupied zone heating temperature setpoint.

Auto Changeover

When the system mode is auto, the mode will change to cooling or heating as necessary to satisfy the zone cooling and heating setpoints. The zone cooling and heating setpoints can be as close as 2°F apart.

2

Unoccupied Zone Temperature Control

Cooling and Heating

Both cooling and heating modes can be selected to maintain unoccupied zone temperature deadbands. For unoccupied periods, heating, economizer operation, or compressor operation can be selectively locked out at the human interface panel.

Supply Air Temperature Control Unit Sequence Of Operation

1

Occupied Supply Air Temperature Control

Cooling/Waterside Economizer

During occupied cooling mode, the waterside economizer option and mechanical cooling are used to control the supply air temperature. The supply air temperature setpoint and deadband are user defined at the human interface panel. Waterside economizing enables when the units entering water temperature is below the units entering mixed air temperature by 4°F plus the user adjustable economizer approach temperature. The approach temperature default is 4°F and is adjustable from 0-9°F at the HI. Waterside economizing disables when the units entering water temperature is not below the units entering mixed air temperature by at least the water economizer approach temperature.

The economizer acts as the first stage of cooling. If the economizer is unable to maintain the supply air setpoint, the compressor module will bring on compressors as required to meet the setpoint. If the unit does not include an economizer, only mechanical cooling will satisfy cooling requirements.

Cooling/Airside Economizer

During occupied cooling mode of operation, the airside economizer option and mechanical cooling are used to control the supply air temperature. The supply air temperature setpoint and deadband are user-defined at the human interface panel. If the temperature of the mixed air is appropriate to use “free cooling,” the economizer initiates to satisfy the supply air setpoint. Then if required, the mechanical cooling stages on to maintain supply air temperature setpoint. Minimum on/off timing of the mechanical cooling prevents rapid cycling.

On units with an airside economizer, a call for cooling will modulate the fresh air dampers open. The rate of economizer modulation is based on deviation of the discharge temperature from setpoint, i.e., the further away from setpoint, the faster the fresh air damper will open. First stage of cooling initiates after the economizer reaches full open.

Note that the airside economizer is only allowed to function freely if ambient conditions are below the setpoint control settings or below the return air enthalpy, if unit has the comparative enthalpy option. If outside air is not suitable for “economizing,” the fresh air dampers drive to the minimum

open position. A field adjustable, factory default setting in the human interface panel or Tracer can provide the input to establish the minimum damper position.

At outdoor air conditions above the setpoint or comparative enthalpy control setting, only mechanical cooling is used and the fresh air dampers remain at minimum position.

If the unit does not include an economizer, only mechanical cooling operates to satisfy cooling requirements.

Heating: Hot Water or Steam

On units with hot water or steam heating, the supply air temperature can be controlled to a heating setpoint during the occupied mode. The supply air temperature heating setpoint and deadband are user defined at the human interface panel. VAV occupied heating on hot water and steam heat units is initiated by closing a field-supplied switch or contacts connected to a changeover input on the unit's RTM module board .

Supply Air Setpoint Reset

Supply air reset can be used to adjust the supply air temperature setpoint on the basis of a zone temperature or outdoor air temperature. Supply air reset adjustment is available from the human interface panel for supply air heating and supply air cooling control.

Reset based on outdoor air temperature

Outdoor air cooling reset is sometimes used in applications where the outdoor temperature has a large effect on building load. When the outside air temperature is low and the building cooling load is low, the supply air setpoint can be raised, thereby preventing subcooling of critical zones. This reset can lower usage of mechanical cooling, thus savings in compressor kW, but an increase in supply fan kW may occur.

Outdoor air heating reset is the inverse of cooling, with the same principles applied.

For both outdoor air cooling reset and heating reset, there are three user defined parameters that are adjustable through the human interface panel.

- Beginning reset temperature
- Ending reset temperature
- Maximum amount of temperature reset

Reset based on zone temperature

Zone reset is applied to the zone(s) in a building that tends to overcool or overheat. The supply air temperature setpoint is adjusted based on the temperature of the critical zone(s). This can have the effect of improving comfort and/or lowering energy usage. The user-defined parameters are the same as for outdoor air reset.

Supply Air Tempering (Hot Water and Steam Units Only)

When supply air temperature falls below the supply air temperature deadband low end, the heating valve modulates open to maintain the minimum supply air temperature setpoint.

2

Unoccupied Supply Air Temperature Control, Zone Heating, Cooling

During unoccupied mode, the unit operates to maintain zone temperature with fan cycling as needed for building load. VAV boxes drive full open. However, unit airflow modulation control operates to maintain duct static setpoint. The unit controls zone temperature within the unoccupied zone cooling and heating (heating units only) deadbands.

Daytime Warmup

During occupied mode, if the zone temperature falls to a preset, user-defined zone low limit temperature setpoint, the unit is put into daytime warmup. The system changes over to CV heating,

the VAV boxes drive full open. However, unit airflow modulation control operates to maintain duct static setpoint, and full heating capacity is provided until the daytime warmup setpoint is reached. The unit is then returned to normal occupied mode.

Zone Sensor Options

Standard on all units

Zone temperature sensor, Accessory Model Number Digit 6 = A, BAYSENS077

This wall-mounted zone sensor ships with every Signature Series unit, CV or VAV. Additional sensors are also available for order using the accessory model number. It includes an internal thermistor and should be mounted in the zone. This sensor is available for use with all zone sensor options to provide remote sensing capabilities.

CV/VAV

Programmable zone sensor, Accessory Model Number Digit 6 = G, BAYSENS119

The BAYSENS119 programmable night set back sensor provides multi functional flexibility for both Constant Volume and Variable Air Volume control. This electronic programmable sensor includes auto or manual cooling and heating changeover with 7 day programming. Five tactile feel buttons located on the sensor front panel provide interface for all programming, including initial setup for CV or VAV control. Sensor functionality includes up to four daily programmable periods for Occupied/Unoccupied operation, and Override. The dynamic LCD display indicates status for System On/Off, Heat, Cool, Fan Status, Time of Day, Occupied/Unoccupied mode, Space Temperature, Space or Discharge Air Heating and Cooling Setpoints. Additional features include Service Indication for Heat Failure, Cool Failure, Fan Failure, and Test Mode if system is operating in test mode.

A Check Filter Timer function is included. Filter service countdown time can be set in one-day increments. Activation of the Test/Configuration button located on the bottom of the sensor performs a sensor self-diagnostic routine and indicates hours in service.

When the BAYSENS119 is programmed for CV or VAV control, Night Setback is initiated through the scheduled Unoccupied time setting. When the sensor switches to Night Setback, the outdoor dampers close and heating/cooling functions are enabled/disabled based on set up parameters. As building load changes, if heating/cooling functions are enabled, the Sensor energizes self-contained unit and evaporator fan operation. The unit will cycle heating/cooling operation throughout the Unoccupied period as required to maintain Unoccupied space temperature setpoints. When the Unoccupied time period has expired, all heating/cooling functions return to normal operation.

When Night Setback options are used with VAV heating/cooling, maintain airflow through the self-contained unit by electronically tying the VAV terminals to the unoccupied output relay contacts on the self-contained units low voltage terminal board, or by using changeover thermostats. Either of these methods will assure adequate airflow through the unit and satisfactory temperature control of the space.

Refer to BAS-SVX17*-EN for complete installation, operation, and maintenance instuctions.

CV

Dual setpoint, manual/automatic changeover sensor, Accessory Model Number Digit 6 = E, BAYSENS108

This zone sensor module is for use with cooling/heating CV applications. It provides the following features and system control functions:

- System control switch (Heat/Auto/Off/Cool): Allows you to select heating mode, cooling mode, automatic selection of heating or cooling as required, or turn the system off.
- Fan control switch (Auto/On): Allows you to select automatic fan operation while actively heating or cooling or continuous fan operation.
- Dual temperature setpoint levers allow you to set different cooling (blue lever) and heating setpoints (red lever).
- Thermometer to indicate temperature in the zone.

CV

Dual setpoint, manual/automatic changeover sensor with system function lights, Accessory Model Number Digit 6 = F, BAYSENS110

This zone sensor is for use with cooling/heating CV applications. It provides the following features and system control functions:

- System control switch to select heating mode (HEAT), cooling mode (COOL), AUTO for automatic selection of heating or cooling as required, or OFF to turn the system off.
- Fan control switch to select automatic fan operation while actively heating or cooling (AUTO), or continuous fan operation (ON).
- Dual temperature setpoint levers for setting cooling (blue lever) or heating (red lever).
- Thermometer to indicate temperatuare in the zone.
- Function status indicator lights:

SYS ON glows continuously during normal operation, or blinks if system is in test mode.

COOL glows continuously during cooling cycles or blinks to indicate a cooling system failure.

HEAT glows continuously during heating cycles or blinks to indicate a heating system failure.

SERVICE blinks or glows to indicate a problem. These signals vary depending on the particular equipment used.

Integrated Comfort™ Systems Sensors for CV and VAV Applications

Zone temperature sensor w/timed override buttons and local setpoint adjustment, Accessory Model Number Digit 6 = C, BAYSENS074

This zone sensor is for use with cooling/heating ICS™. It provides the following features and system control functions:

- Remote temperature sensing in the zone
- A timed override button to move an Integrated Comfort ™ System or a building management system from unoccupied to occupied mode.
- Setpoint thumbwheel for local setpoint adjustment
- Cancel button to cancel the unoccupied override command.

Zone temperature sensor w/timed override buttons, Accessory Model Number Digit 6 = B, BAYSENS073

This zone sensor is for use with cooling/heating Integrated Comfort™ Systems (ICS). It provides the following features and system control functions:

- Remote temperature sensing in the zone
- A timed override button to move an ICS or building management system from it unoccupied to occupied mode.
- Cancel button to cancel the unoccupied override command.

Electrical Data

Selection Procedures

RLA = Rated Load Amps

Compressor LRA = Locked Rotor Amps

Fan Motor LRA = Locked Rotor Amps, N.E.C. Table 430 - 150

FLA = Full Load Amps, N.E.C. Table 430 - 150

Voltage utilization range is ±10 percent

Determination of minimum circuit ampacity (MCA)

MCA = 1.25 x largest motor amps/VFD amps (FLA or RLA) + the sum of the remaining motor amps.

Determination of max fuse (MFS) and max circuit breaker (MCB) sizes

MFS and MCB = 2.25 x largest motor amps (FLA or RLA) + the sum of the remaining motor amps.

Units with the dual power option require separate MFS and MCB calculations for each electrical circuit: 1) fans and 2) compressors.

If the rating value calulation does not equal a standard over current protective device rating, use the next lower standard rating as the maximum.

Table 60. Number of Compressors per Unit

SCRF/SIRF	20	25 - 29	30 - 35	40	50		60			
SCWF/SIWF	20 - 25	29 - 32	35 - 38	42 - 46	52 - 58	65 - 72	80	90	100	110
10	2	1	3	2	—	1	—	—	2	—
15	—	1	—	1	3	3	4	5	4	6

Table 61. Compressor Electrical Data

SCWF/SIWF						
	200V		460V		575V	
HP	RLA	LRA	RLA	LRA	RLA	LRA
10	41.4	267	18.6	142	15.8	103
15	56.9	351	25.5	197	23.1	146

SCRF/SIRF						
	200V		460V		575V	
HP	RLA	LRA	RLA	LRA	RLA	LRA
10	41.4	267	18.6	142	15.8	103
15	56.9	351	25.5	197	23.1	146

Table 62. Fan motor electrical data

		200V		460V		575V	
HP	TYPE	FLA	LRA	FLA	LRA	FLA	LRA
5	OPD	15.7	107	6.7	48	5.4	40
	TEFC	15.0	125	6.7	52	5.3	41
7.5	OPD	22.3	199	9.7	84.8	7.8	61.4
	TEFC	23.2	162	9.4	74	7.6	58.5
10	OPD	29.5	260	12.6	118	10.1	72.3
	TEFC	27.4	195	11.9	103	9.6	83.9
15	OPD	43.4	271	18.9	118	15.1	94
	TEFC	42.5	235	18.5	122.9	14.8	99
20	OPD	57.0	373	24.5	160.8	19.6	130
	TEFC	56.4	320	24.5	175	19.6	140
25	OPD	70.0	438	30.5	180	24.5	155
	TEFC	69.0	385	30	200	23.9	153
30	OPD	82.2	514	36.6	223.6	28.5	179
	TEFC	82.8	566	37.6	274	28.8	210
40	OPD	111.6	740	48.5	302	38.0	250
	TEFC	106	734	47.4	320	38.0	280
50	ODP	N/A	N/A	60.5	380	47.0	305
	TEFC	N/A	N/A	59.0	455	47.2	380
60	ODP	N/A	N/A	71.0	470	N/A	N/A

Table 63. VFD electrical data

	VFD L.I.C.					
	Without Bypass			With Bypass		
HP	200V	460V	575V	200V	460V	575V
7.5	23.8	10.6	8.8	32.2	10.6	8.8
10	32.2	14	11.1	48.3	14	16.6
15	48.3	21	16.6	61.9	21	16.6
20	61.9	27.6	21.4	78.2	27.6	21.4
25	78.2	34	26.3	92	34	26.3
30	92	41	31.2	117	41	31.2
40	117	53	39.9	139.2	53	39.9
50	NA	64	50.6	n/a	64	50.6
60	NA	77	NA	n/a	77	n/a

Note: Values are at the maximum VFD input rating and not the reduced motor values. L.I.C. = Line Input Current.

Table 64. Electric heat electrical data

Single Stage Electric Heat				
SXWF Size	SXRF Size	Heat Kw	200V Amps	460V Amps
20	-	18	50	21.7
22	-	18	50	21.7
25	20	18	50	21.7
29	25	23	63.8	27.7
32	29	23	63.8	27.7
35	30	27	75	32.5
38	35	27	75	32.5
42	-	31.5	87.4	37.9
46	40	31.5	87.4	37.9
52	-	39	108.3	46.9
58	50	39	108.3	46.9
65	-	48	133.2	57.7
72	-	48	133.2	57.7
80	60	48	133.2	57.7

Two Stage Electric Heat				
Unit Size SCWF	Heat kW	200V Amps	460V Amps	575V Amps
90	76	n/a	95.39	n/a
100	76	n/a	95.39	n/a
110	76	n/a	95.39	n/a

Note: Electric heat amperage should not be considered when determining minimum circuit ampacity. The current of the unit in the heating mode will not exceed the current of the unit in the cooling mode.

Dimensions and Weights

Figure 62. 20-38 Ton Self-Contained

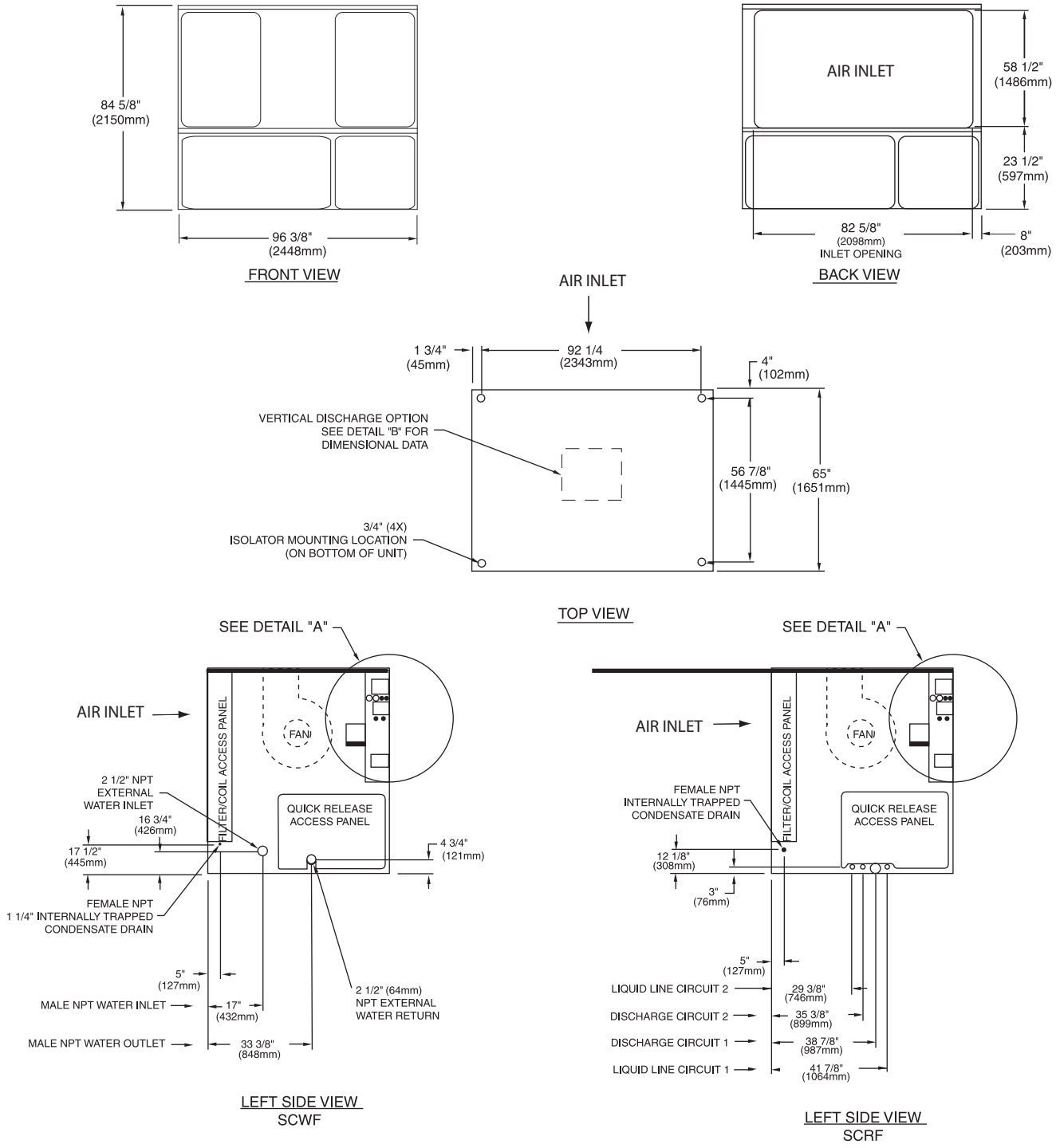


Figure 63. 40-80 Ton Self-Contained

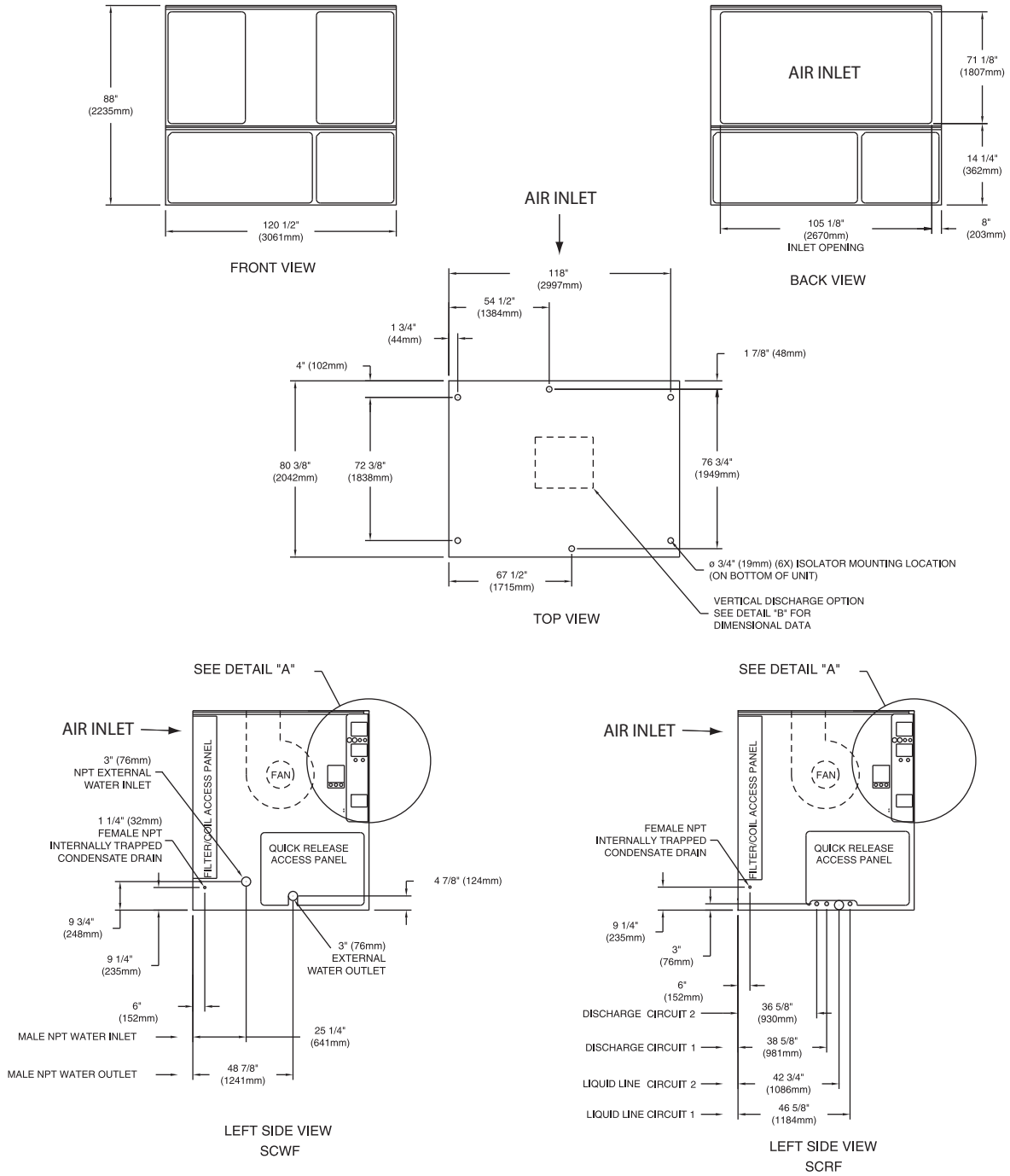


Figure 64. 90- 110 Ton Self-Contained

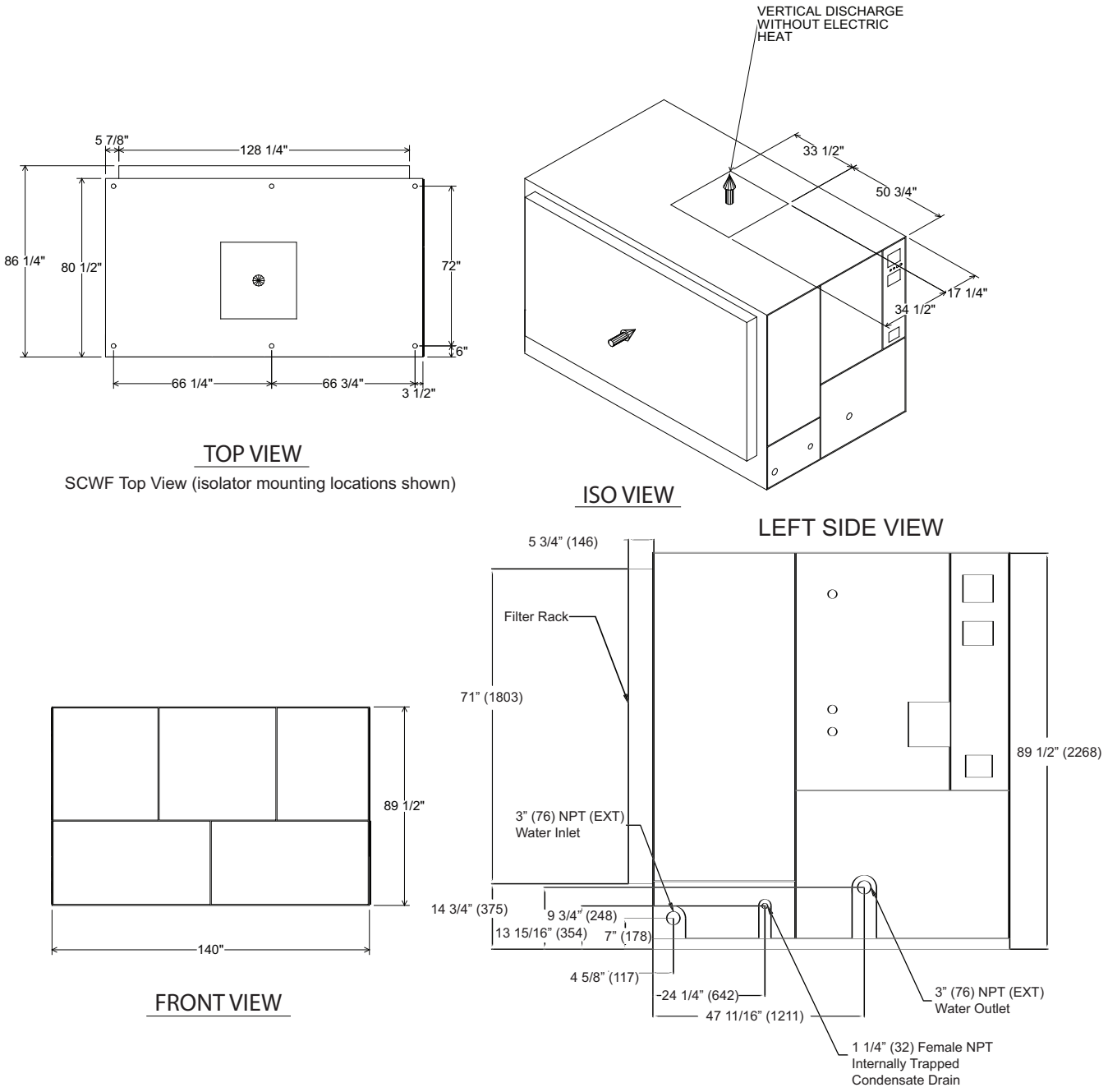


Figure 65. Detail A Electrical Connections

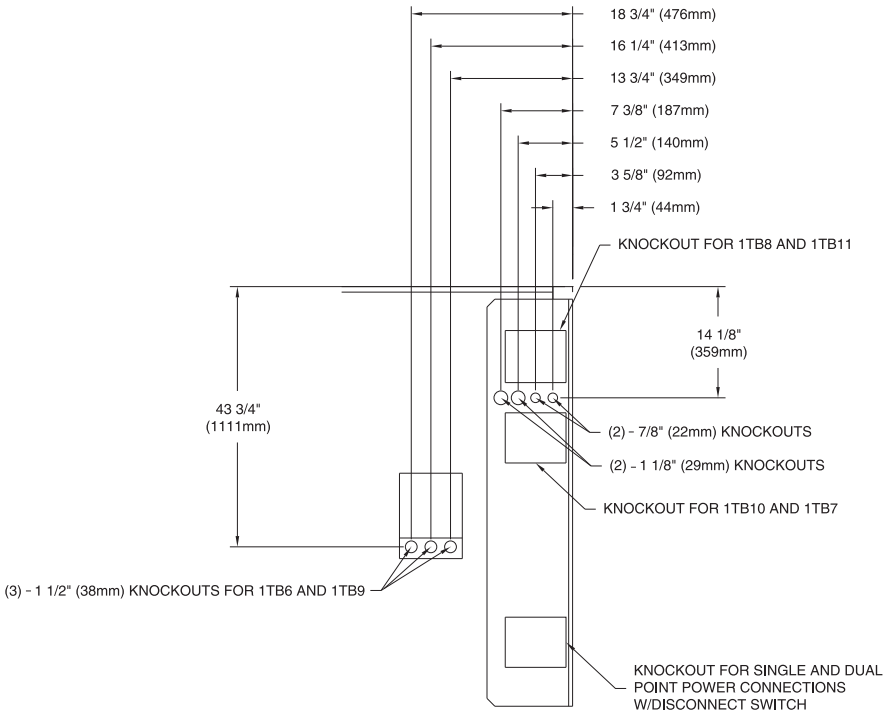


Figure 66. Discharge Dimensions - High Capacity Option

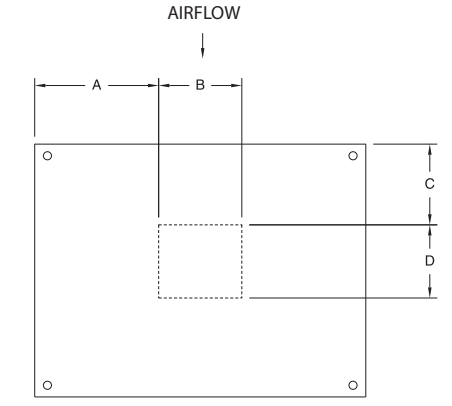


Table 1. Discharge Dimensions inches (mm)

Unit	Fan	A	B	C	D
SCWF 20-25/ SCRF 20	18 (457)	31.9 (809)	23.5 (597)	23.2 (589)	20.4 (518)
SCWF 29-32/SCRF 25-29	18 (457)	31.9 (809)	23.5 (597)	23.2 (589)	20.4 (518)
SCWF 35-38/SCRF 30-35	20 (508)	30.5 (775)	26.2 (665)	21.3 (540)	25.8 (654)
SCWF 42-58/SCRF 40-50	25 (635)	43.8 (1111)	33.0 (838)	31.5 (800)	31.5 (800)
SCWF 65-80/SCRF 60	27.5 (699)	43.5 (1105)	33.5 (851)	28.6 (727)	34.5 (876)
SCWF 90-110	27.5 (699)	50.7 (1288)	33.5 (85)1	28.8 (732)	34.5 (876)
Low Flow Fan Option - Discharge Dimensions					
Unit	**Fan**	**A**	**B**	**C**	**D**
SCWF 38	18 (457)	31.9 (810)	23.5 (597)	23.2 (589)	20.4 (518)
SCWF 46	18 (457)	44.8 (1139)	23.3 (591)	36.7 (933)	20.4 (518)
SCWF 58	18 (457)	44.8 (1139)	23.3 (591)	36.7 (933)	20.4 (518)
SCWF 72 / 80	20 (508)	43.4 (1103)	26.2 (664)	34.8 (884)	24.6 (624)

Table 2. Unit Dimensions - inches (mm)

Unit Tons	AA	AB	AC
CCRC/CIRC 20, 29	70 1/8 (1781)	7' - 4 (2235)	7' - 4 (2235)
CCRC/CIRC 35, 40	70 1/8 (1781)	10' - 10 3/4 (3321)	7' - 4 (2235)
CCRC/CIRC 50, 60	70 1/8 (1781)	14' - 8 (4470)	7' - 4 (2235)

Figure 67. CCRC/CIRC 20 and 29

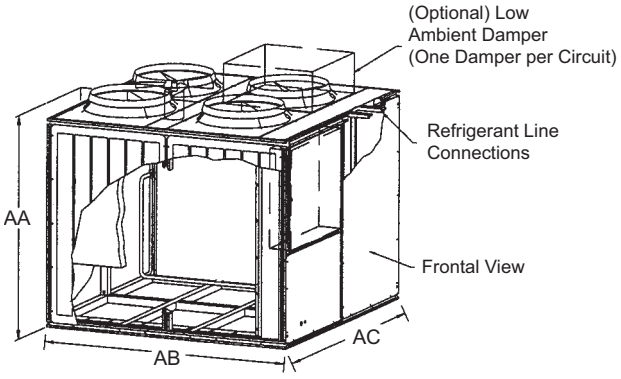


Figure 68. CCRC/CIRC 35 and 40

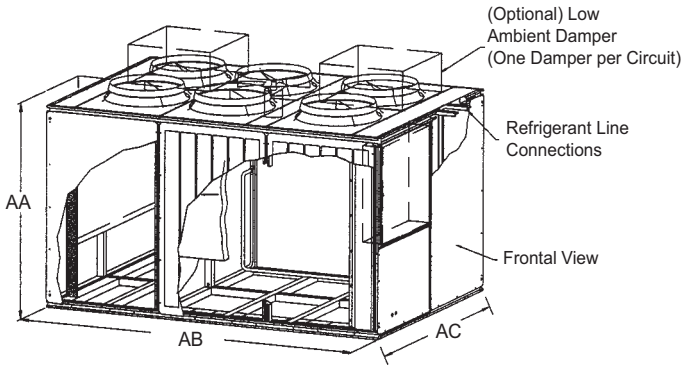
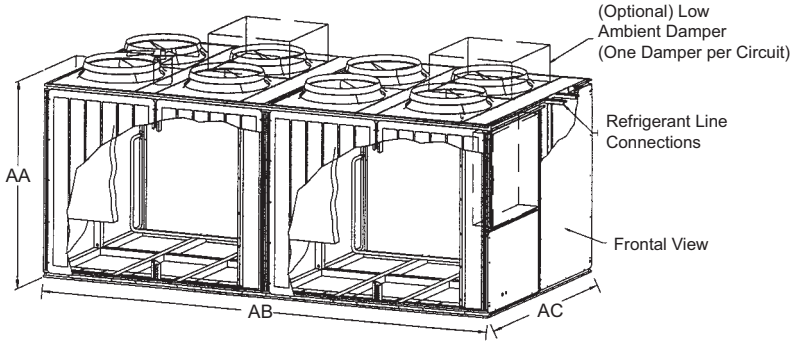


Figure 69. CCRC/CIRC 50 and 60



Refrigerant and Electrical Connections

Figure 70. Front View Looking at Control Panel

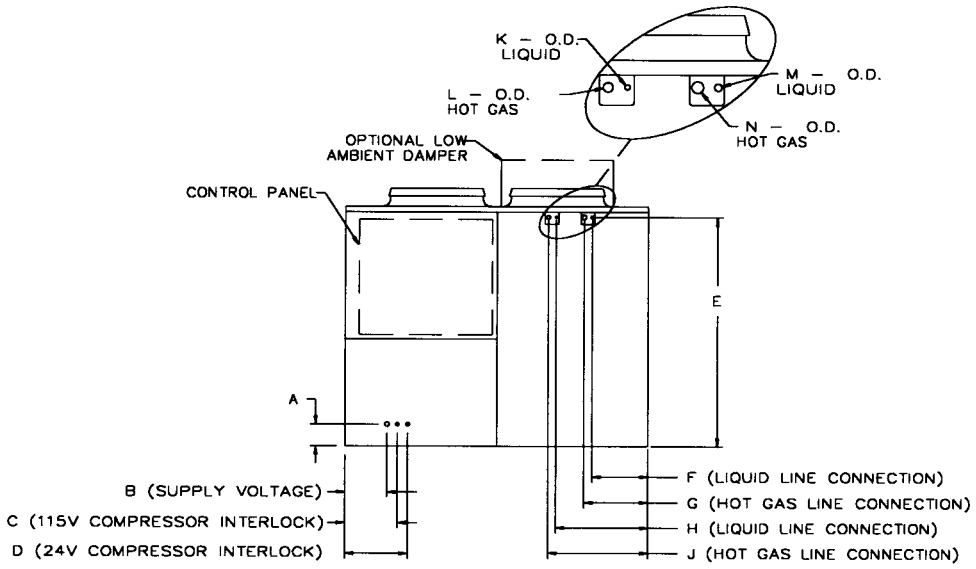


Table 3. Electrical Connections - inches (mm)

Unit	A	B	C	D
CCRC/CIRC 20-32	6 3/8 (162)	12 1/4 (311)	15 1/4 (387	18 1/4 (464)
CCRC/CIRC 35-40	6 3/8 (162)	12 1/4 (311)	15 1/4 (387	18 1/4 (464)
CCRC/CIRC 50-60	6 3/8 (162)	12 1/4 (311)	15 1/4 (387	18 1/4 (464)

Table 4. Refrigerant Connections - inches (mm)

Unit	E	F	G	H	J	K	L	M	N
CCRC/CIRC 20-29	66 7/8 (1699)	14 3/8 (365)	18 1/2 (470)	24 3/4 (629)	29 (737)	5/8 (16)	7/8 (22)	5/8 (16)	7/8 (22)
CCRC/CIRC 30-50	66 7/8 (1699)	14 3/8 (365)	18 1/2 (470)	24 3/4 (629)	29 (737)	7/8 (22)	1 3/8 (35)	5/8 (16)	7/8 (22)
CCRC/CIRC 60	66 7/8 (1699)	14 3/8 (365)	18 1/2 (470)	24 3/4 (629)	29 (737)	7/8 (22)	1 3/8 (35)	7/8 (22)	1 3/8 (35)

Hot Water Coil

Figure 71. Hot Water Coil

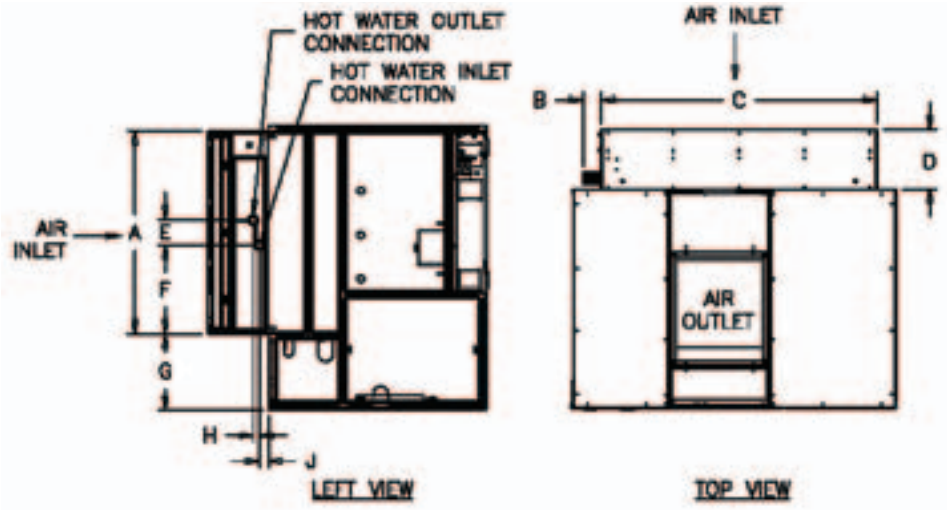


Table 5. Hot Water Coil Piping Locations, inches

Unit Tons & Model	Coil	A	B	C	D	E	F	G	H	J
25 - 35 SXRF 29 - 38 SXWF	Std	60 3/8	5 9/32	82 7/8	18	7 1/2	18 7/8	22 3/8	1 3/4	2 3/8
20 SXRF 20 - 25 SXWF	Std	60 3/8	5 9/32	82 7/8	18	7 1/2	26 1/2	22 3/8	1 3/4	2 3/8
25 - 35 SXRF 29 - 38 SXWF	Hi-cap	60 3/8	5 1/2	82 7/8	18	7 1/2	18 7/8	22 3/8	2 3/4	3 1/2
20 SXRF 20 - 25 SXWF	Hi-cap	60 3/8	5 1/2	82 7/8	18	7 1/2	26 1/2	14 1/8	12 3/4	2 1/2
42 - 80 SXRF/SXWF	Std	72 7/8	3 11/16	104 5/8	18	7 1/2	32 3/4	22 3/8	2 3/4	3 1/2
42 - 80 SXRF/SXWF	Hi-cap	72 7/8	3 7/8	104 5/8	18	7 1/2	32 3/4	14 1/8	2 3/4	3 3/8

Notes:
1. All coils are factory mounted. The control valve ships loose.
2. All pricing connections are 1 1/2" (38.1mm) NFT (EXT) for 1 row coils and 2 1/2" (50.8mm) NPT (EXT) for 2 row coils (high capacity).

Steam Coil

Figure 72. Steam Coil

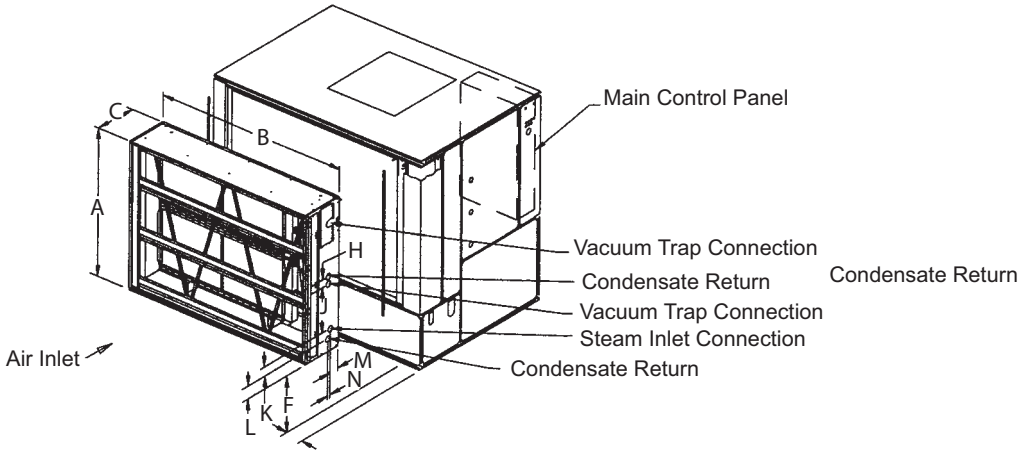


Table 6. Piping Locations For Steam Coils - inches (mm)

	A	B	C	D	E	F	G	H	J	K	L	M	N
Unit Sizes 20 - 38	60 3/8 (1534)	82 7/8 (2105)	18 (457)	—	—	22 3/8 (568)	—	3 (76)	18 1/2 (470)	3 7/8 (98)	5 (127)	4 3/8 (111)	1 1/4 (32)
Unit Sizes 42 - 80	72 7/8 (1851)	105 1/4 (2680)	18 (457)	—	—	13 1/4 (337)	—	3 (76)	22 1/8 (562)	6 3/8 (162)	5 3/8 (137)	4 3/8 (111)	1 1/4 (32)

Notes:
1. All coils are factory mounted, piped, and wired.
2. All piping connections are 1-1/2" (38.1mm) female NPT fittings.

Flexible Horizontal Discharge Plenum

Table 7. Plenum Dimensions -inches (mm)

Unit		A	B	C	Weight
Unit Sizes 20-38	Low	64 7/8 (1648)	95 7/8 (2435)	24 5/8 (625)	325 lbs. (147.4 kg)
	Std.	64 7/8 (1648)	95 7/8 (2435)	32 3/8 (822)	430 lbs. (195.0 kg)
	Ext.	64 7/8 (1648)	95 7/8 (2435)	45 (1143)	705 lbs. (320.0 kg)
Unit Sizes 42-80	Low	80 3/8 (2042)	119 7/8 (3045)	21 1/8 (537)	390 lbs. (176.9 kg)
	Std.	80 3/8 (2042)	119 7/8 (3045)	28 5/8 (727)	540 lbs. (244.9 kg)
	Ext.	80 3/8 (2042)	119 7/8 (3045)	45 (1143)	705 lbs. (320.0 kg)
* Unit Sizes 90-110	Low	80 1/2 (2044)	140 (3556)	19 5/8 (498)	430 lbs. (195.0 kg)
	Std.	80 1/2 (2044)	140 (3556)	27 3/4 (704)	595 lbs. (269.9 kg)
	Ext.	80 1/2 (2044)	140 (3556)	431/2 (1104.9)	795 lbs. (360.6 kg)

Note: * For 90-110 ton, plenum ship separate with field cut holes. Factory cut holes available as a design special only.

Figure 73. Plenum dimensions

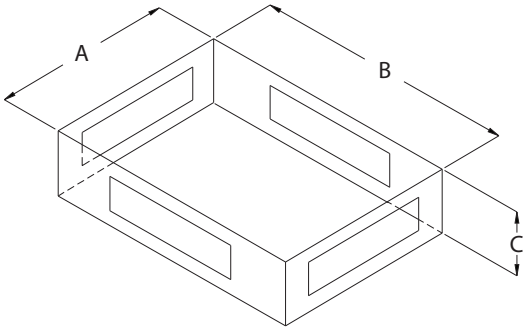
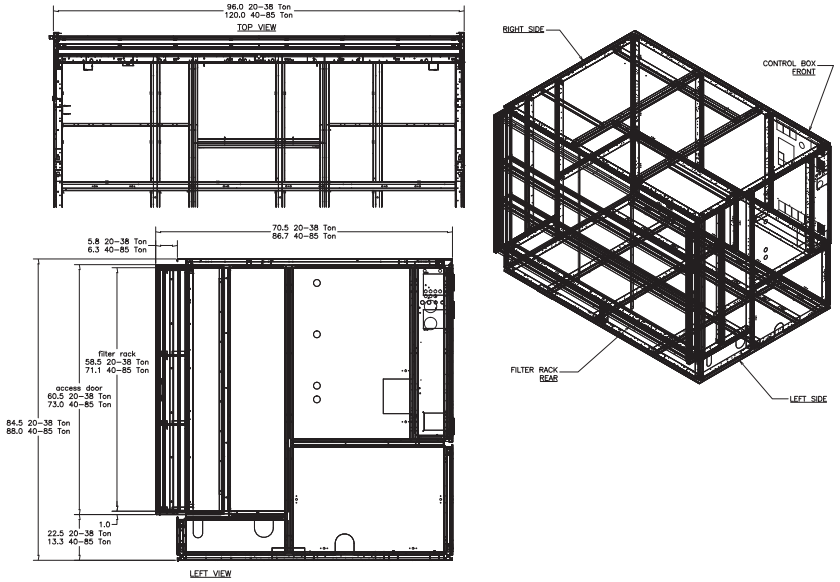


Figure 74. 6-Inch Filter Rack Option



Airside Economizer

Figure 75.

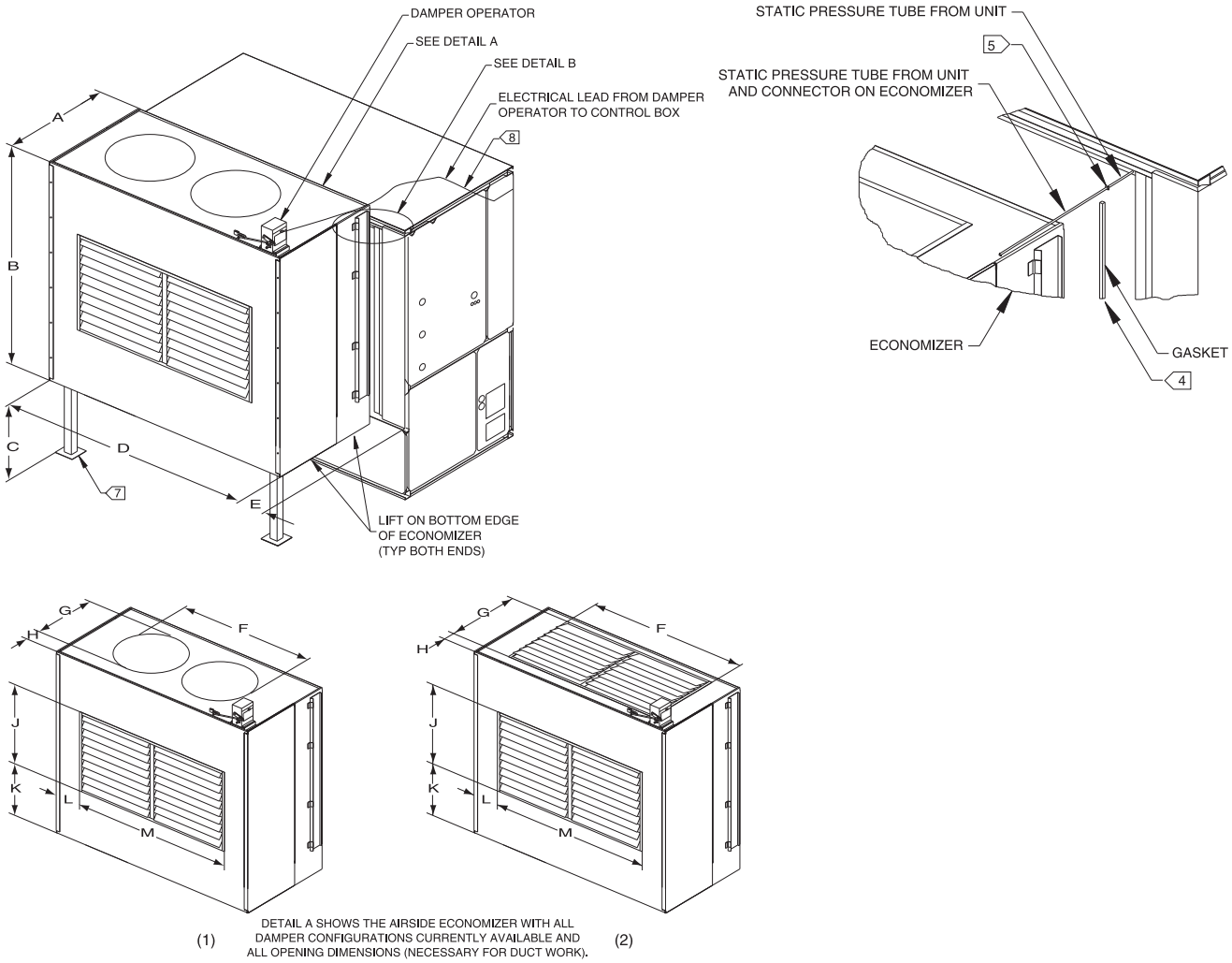


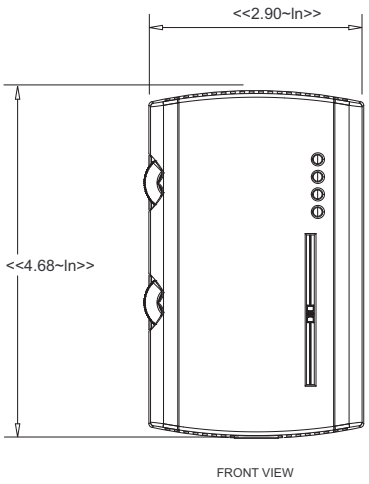
Table 8. Airside Economizer Dimensions - English - (inches)

Unit Model	A	B	C	D	E	F (1)	F (2)	G (1)	G (2)	H (1)	H (2)	J	K	L	M
20 SXWF	44	74	22 3/8	81 3/4	8 3/4	66 3/4	49 3/4	23 1/4	20 1/2	9 3/4	11 1/8	20 1/2	22 1/4	16	49 3/4
20 SXRF 25 SXRF	44	74	22 3/8	81 3/4	8 3/4	68 5/8	49 3/4	28 1/8	20 1/2	7 1/4	11 1/8	20 1/2	22 1/4	16	49 3/4
22 SXWF 29 SXWF	44	74	22 3/8	81 3/4	8 3/4	68 5/8	49 3/4	28 1/8	20 1/2	7 1/4	11 1/8	20 1/2	22 1/4	16	49 3/4
29 SXRF 32 SXWF	44	74	22 3/8	81 3/4	8 3/4	74 1/4	62 3/4	23 1/4	20 1/2	9 3/4	11 1/8	20 1/2	22 1/4	9 1/2	62 3/4
30 SXRF 35 SXRF	44	74	22 3/8	81 3/4	8 3/4	73 1/2	62 3/4	33	20 1/2	4 7/8	11 1/8	20 1/2	22 1/4	9 1/2	62 3/4
35 SXWF 38 SXWF	44	74	22 3/8	81 3/4	8 3/4	73 1/2	62 3/4	33	20 1/2	4 7/8	11 1/8	20 1/2	22 1/4	9 1/2	62 3/4
42 SXWF	57 3/8	86 1/2	13 1/4	104 3/8	8 7/8	83 5/8	63 1/2	33	26	2 1/2	15	26	24 3/4	20 3/8	63 1/2
40 SXRF 46 SXWF	57 3/8	86 1/2	13 1/4	104 3/8	8 7/8	94 1/8	63 1/2	28 1/8	26	6 7/8	15	26	24 3/4	20 3/8	63 1/2
50 SXRF 60 SXRF 52-80 SXWF	57 3/8	86 1/2	13 1/4	104 3/8	8 7/8	96 5/8	63 1/2	52	37 1/2	1 7/8	9 1/4	37 1/2	19	20 3/8	63 1/2

Table 9. Airside Economizer Dimensions - Metric - (mm)

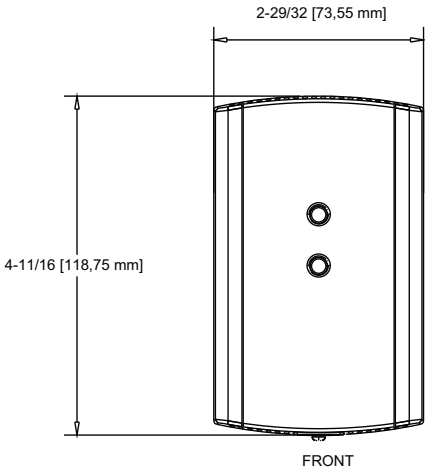
Unit Model	A	B	C	D	E	F (1)	F (2)	G (1)	G (2)	H (1)	H (2)	J	K	L	M
20 SXWF	1118	1880	568	2076	222	1695	1264	591	521	248	283	521	565	406	1264
20 SXRF 25 SXRF	1118	1880	568	2076	222	1743	1264	714	521	184	283	521	565	406	1264
22 SXWF 29 SXWF	1118	1880	568	2076	222	1743	1264	714	521	184	283	521	565	406	1264
29 SXRF 32 SXWF	1118	1880	568	2076	222	1886	1594	591	521	248	283	521	565	241	1594
30 SXRF 35 SXRF	1118	1880	568	2076	222	1867	1594	838	521	124	283	521	565	241	1594
35 SXWF 38 SXWF	1118	1880	568	2076	222	1867	1594	838	521	124	283	521	565	241	1594
42 SXWF	1457	2197	337	2651	225	2124	1613	838	660	64	381	660	629	518	1613
40 SXRF 46 SXWF	1457	2197	337	2651	225	2390	1613	714	660	175	381	660	629	518	1613
50 SXRF 60 SXRF 52-80 SXWF	1457	2197	337	2651	225	2454	1613	1321	953	48	235	953	483	518	1613

Field Installed Zone Sensors



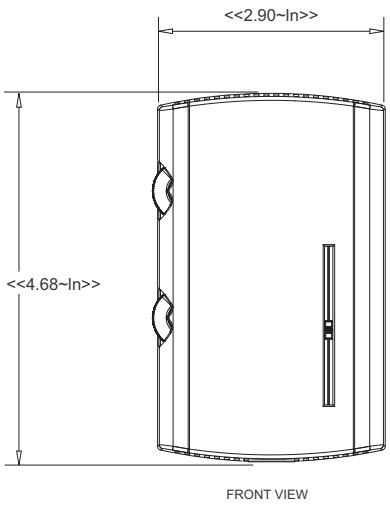
Dual Setpoint, Manual/Automatic Changeover Sensor With System Function Lights

BAYSENS110



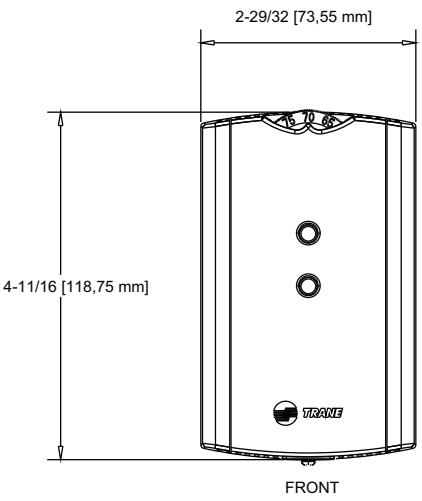
Zone Temperature Sensor W/Timed Override Buttons

BAYSENS073



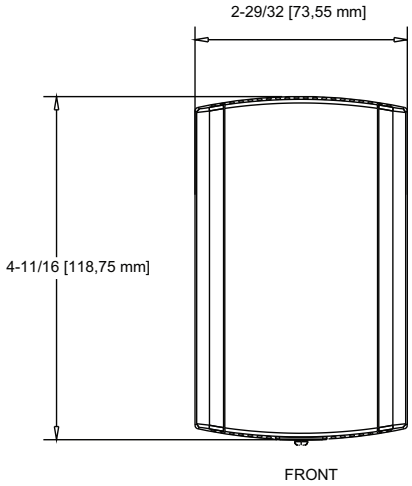
Dual Setpoint, Manual/Automatic Changeover Sensor

BAYSENS108

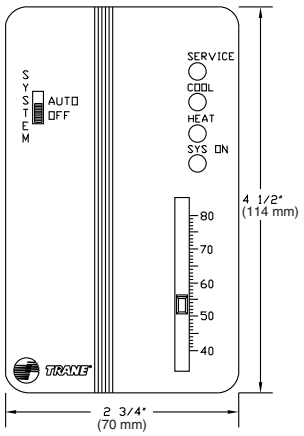


Zone Temperature Sensor W/Timed Override Buttons and Local Setpoint Adjustment

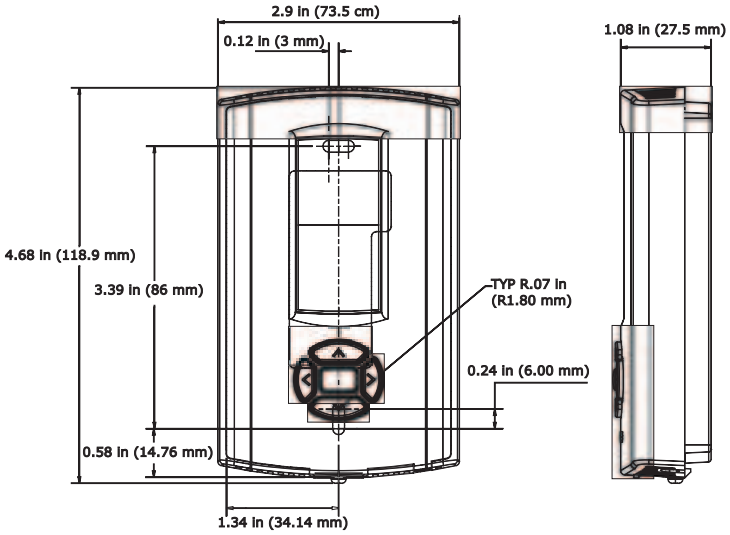
BAYSENS074



Zone Temperature Sensor Only BAYSENS077



Single Setpoint Sensor With System Function Lights BAYSENS021



Zone sensor mounting hole locations for: BAYSENS119

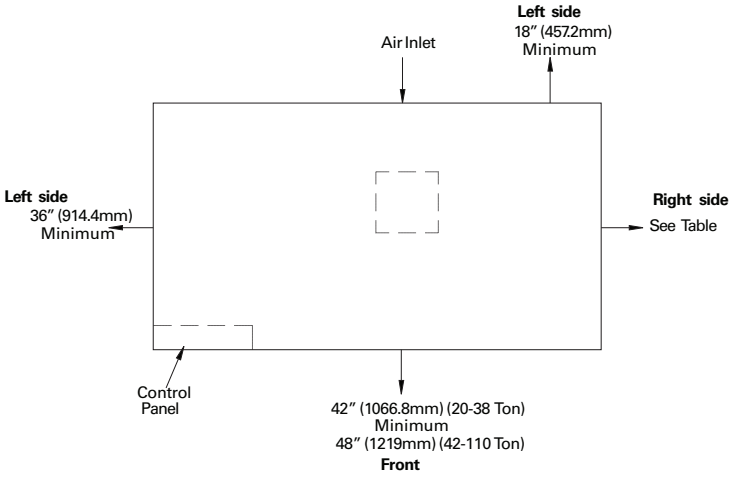
Service Clearances

Self-Contained Models SCWF, SIWF, SCRF, SIRF

Table 10. Service/Code Clearance Requirements

Side	Distance	Purpose
Front	42 in. (1066 mm) (20-38 Ton)	NEC code requirement
	48 in. (1219 mm) (42-80 Ton)	Fan service/removal
Left	36 in. (914 mm)	Filter, refrigeration and waterside component service
Right	9 in. (229 mm)	Non VFD w/ open return
	18 in. (457 mm) (20 - 80 ton)	Non VFD w/ ducted return
	9 in. (229 mm) (90 -110 ton)	w/ VFD 7.5 to 50 HP
	36 in. (914 mm)	w/ VFD 25 to 50 HP
Inlet	18 in. (457 mm)	Provides uniform airflow

Figure 76. Top View SCWF, SCRF, SIWF, SIRF



Note: *Units (20 - 80) with VFD contain a swing out door. Allow 48" mimimum clearance.*

Remote Air-Cooled Condensers Models CCRC,CIRC

Figure 77. Top View CCRC,CIRC 20, 29

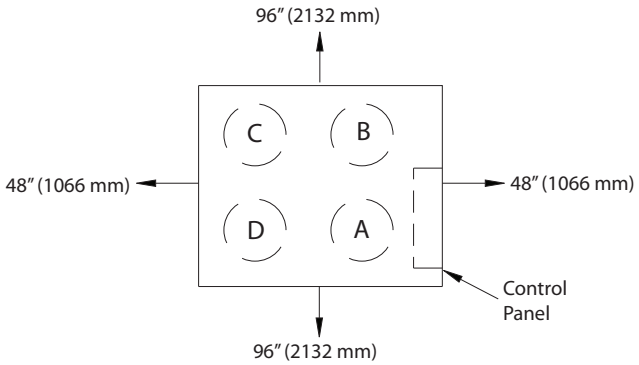


Figure 78. Top View CCRC,CIRC 35, 40

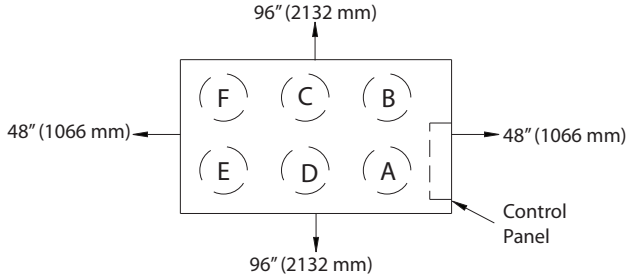
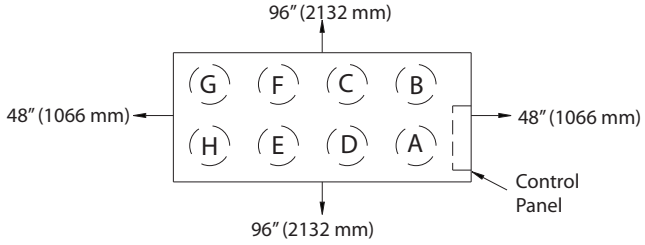


Figure 79. Top View CCRC,CIRC 50, 60



Weights

Table 11. Unit Weights - SCWF/SCRF/SIWF/SIRF

	Unit Size	Base Weight lbs. (kg)	Airside Economizer lbs. (kg)	2-Row Waterside Economizer lbs. (kg)	4-Row Waterside Economizer lbs. (kg)	Heating Coil Box lbs. (kg)	6-Row Evap. Coil lbs. (kg)	6-inch filter rack lbs. (kg)
SCWF/SIWF	20	3102 (1407)	430 (195)	140 (64)	340 (154)	460 (209)	-	212 (96)
	22	3102 (1407)	430 (195)	140 (64)	340 (154)	460 (209)	-	212 (96)
	25	3170 (1438)	430 (195)	140 (64)	340 (154)	460 (209)	144 (65)	212 (96)
	29	3326 (1508)	500 (227)	190 (86)	390 (177)	460 (209)	-	212 (96)
	32	3514 (1594)	500 (227)	190 (86)	390 (177)	460 (209)	132 (60)	212 (96)
	35	3721 (1688)	500 (227)	280 (127)	505 (229)	460 (209)	-	212 (96)
	38	3819 (1732)	500 (227)	280 (127)	505 (229)	460 (209)	138 (63)	212 (96)
	42	4615 (2093)	640 (290)	255 (116)	505 (229)	600 (272)	-	257 (117)
	46	4705 (2134)	640 (290)	255 (116)	505 (229)	600 (272)	170 (77)	257 (117)
	52	4892 (2219)	700 (318)	335 (152)	665 (302)	600 (272)	-	257 (117)
	58	5142 (2332)	700 (318)	335 (152)	665 (302)	600 (272)	216 (98)	257 (117)
	65	5371 (2436)	800 (363)	335 (152)	665 (302)	600 (272)	-	257 (117)
	72	5491 (2490)	800 (363)	335 (152)	665 (302)	600 (272)	216 (98)	257 (117)
	80	5814 (2637)	800 (363)	335 (152)	665 (302)	600 (272)	-	257 (117)
	90	6330 (2871)	-	-	1015 (460)	-	255 (116)	-
	100	6840 (3103)	-	-	1015 (460)	-	255 (116)	-
	110	6852 (3108)	-	-	1015 (460)	-	255 (116)	-

Table 11. Unit Weights - SCWF/SCRF/SIWF/SIRF (continued)

	Unit Size	Base Weight lbs. (kg)	Airside Economizer lbs. (kg)	2-Row Waterside Economizer lbs. (kg)	4-Row Waterside Economizer lbs. (kg)	Heating Coil Box lbs. (kg)	6-Row Evap. Coil lbs. (kg)	6-inch filter rack lbs. (kg)
SCRF/SIRF	20	2887 (1310)	430 (195)	-	-	460 (209)	-	-
	25	3041 (1379)	500 (227)	-	-	460 (209)	-	-
	29	3231 (1465)	500 (227)	-	-	460 (209)	-	-
	30	3321 (1506)	500 (227)	-	-	460 (209)	-	-
	35	3421 (1552)	500 (227)	-	-	460 (209)	-	-
	40	4294 (1948)	640 (290)	-	-	600 (272)	-	-
	50	4731 (2146)	700 (318)	-	-	600 (272)	-	-
	60	5288 (2399)	800 (363)	-	-	600 (272)	-	-

Notes:
1. All unit weights include refrigerant, water, and controllers, electric heat and valves.
2. Add 150 lbs. to total weight to obtain approximate shipping weight.
3. Flexible horizontal discharge plenum option weights: 45-inch plenum = 705 lbs., Standard height plenum = 430 lbs., Low height plenum = 325 lbs.

Table 12. Unit Weights - CCRC/CIRC

Unit Size	Shipping Weight lbs (kg).	Operating Weight lbs.(kg)
CCRC/CIRC 20	2030 (920)	1906 (865)
CCRC/CIRC 29	2084 (945)	1960 (890)
CCRC/CIRC 32	2138 (970)	2014 (915)
CCRC/CIRC 35	3018 (1370)	2833 (1285)
CCRC/CIRC 40	3072 (1395)	2887 (1310)
CCRC/CIRC 50	3995 (1810)	3695 (1675)
CCRC/CIRC 60	4275 (1940)	3975 (1805)

Table 13. VFD Weights

Without Bypass

	200V		460V		575V	
HP	LBS	Kg	LBS	Kg	LBS	Kg
7.5	126	57.153	114	51.710	114	51.710
10	126	57.153	114	51.710	126	57.153
15	152	68.946	126	57.153	126	57.153
20	152	68.946	126	57.153	126	57.153
25	152	68.946	126	57.153	126	57.153
30	177	80.286	152	68.946	152	68.946
40	177	80.286	152	68.946	152	68.946
50	NA	NA	152	68.946	152	68.946
60	NA	NA	177	80.286	NA	NA

With Bypass

	200V		460V		575V	
HP	LBS	Kg	LBS	Kg	LBS	Kg
7.5	215	97.522	170	77.111	170	77.111
10	215	97.522	215	97.522	215	97.522
15	220	99.790	215	97.522	215	97.522
20	220	99.790	215	97.522	215	97.522
25	250	113.398	215	97.522	215	97.522
30	250	113.398	220	99.790	220	99.790
40	290	131.542	220	99.790	220	99.790
50	NA	NA	250	113.398	250	113.398
60	NA	NA	250	113.398	NA	NA

Note: Weights include swing out door.

Mechanical Specifications

Signature Series Self-Contained Units

Cabinet

The unit framework shall be formed structural steel members of sturdy-gauge galvanized steel. Exterior panels shall be fabricated from industrial-gauge galvanized steel. The fan and compressor sections shall be insulated with ¾-inch (19 mm) of 1.75 lb./cu. ft. (28 kg./cu. ft.) density fiberglass insulation.

The unit shall be provided with removable panels to allow service access to compressors, condensers, fan motor, fan bearings, coils, and valves. Removable panels shall be secured with quick-acting fasteners. The refrigerant sight glasses shall be accessible during operation. The control panel door shall have lift-off hinges.

The unit cabinet and any insulated ship-separate modules for indoor installation shall be wrapped on top and 4 sides with a recyclable, transparent, seven-mil-thick, low-density polyethylene heat-shrink film. The film shall have adequate transparency for unit nameplates and labels to be readable through the film.

Cabinet corners shall have protective padding in place to prevent damage to the film.

All seams and edges in the film shall be heat welded and adequately taped to minimize unit exposure to rain, snow, ice and road grime during shipping.

Compressors

Units shall have multiple compressors with independent circuits for water-cooled units and manifolded circuits for air-cooled units. Compressors shall be manufactured by the unit manufacturer. Scroll compressors shall be heavy duty suction cooled type with suction screen, centrifugal oil pump with dirt separator, oil charging valve, and oil sight glass. Protective devices for low pressure, high pressure, and motor temperature shall be provided. The compressors shall be mounted on isolators for vibration isolation.

Condenser (SCWF/SIWF only)

One condenser shall be provided for each compressor. The condensers shall be shell-and-tube design with removable heads and mechanically cleanable tubes. Tubes shall be ¾-inch (19mm) OD and constructed of copper. Condenser waterside working pressure shall be 400 psig. All condenser water piping including, cleanouts, shall be factory installed to provide single connections for water inlet and outlet.

Evaporator

The evaporator coil shall be seamless copper tubes expanded into aluminum fins. Tubes shall be ½-inch (13mm) OD with internally enhanced surfaces. Coil shall have staggered tube arrangement with intertwined circuiting and no more than 12 fins per inch.

The drain pan shall be positively sloped in all directions to ensure proper condensate removal. The drain pan shall be fabricated of galvanized steel and insulated with ¾-inch (19 mm) of 1-lb. (0.5 kg) density fiberglass. Drain piping, including a trap with cleanout, shall be provided with a single-point connection to the unit's exterior.

Refrigerant Circuit (SCWF only)

Refrigerant circuits shall be independent and completely piped including sight glasses, distributors, thermal expansion valves with adjustable superheat and external equalizer, and high pressure relief valves with ½-inch (13 mm) flare connection. Filter driers ship loose for field installation. Unit shall be provided with adequate means of frost control. The circuits shall be factory dehydrated, charged with oil and R-410A refrigerant. Compressors shall be mounted on rubber-in-shear isolators for vibration isolation.

Refrigerant Circuit (SCRF/SIRF only)

Two refrigerant circuits shall be piped to the unit's exterior. The refrigerant piping includes filter driers (shipped loose for field installation), sight glasses, distributors, thermal expansion valves with adjustable superheat and external equalizer. Unit shall be provided with adequate means of frost control. The circuits shall be factory tested, dehydrated and then charged with dry nitrogen. Compressors shall be mounted on rubber-in-shear isolators for vibration isolation.

Supply Fan

The supply fan shall be a single forward curved medium pressure fan secured to a solid steel shaft with grease lubricated bearings designed for 200,000 hours. Both fan bearings shall have greaselines extended to a common location. The drive components shall include fixed pitch sheaves and multiple V-belt sized for 130% nominal motor horsepower. All drive components shall be accessible without using scaffolds or ladders.

Supply fan motors are either open drip-proof or totally enclosed fan cooled. The motors shall have a standard NEMA T-frame and a service factor of 1.15. All 60 Hz motors meet the Energy Independence and Security Act of 2007 (EISA).

The entire fan assembly, including drive components, shall be mounted on a common base. The fan base shall be isolated inside the unit. The entire assembly shall be statically and dynamically balanced at the factory.

Filters

Two-inch (51 mm) throwaway fiberglass filters shall be provided for installation during construction. Optional two-inch and four-inch filter racks may also be provided.

Unit Controls - DDC

Microprocessor controls shall be provided to control all unit functions. The control system shall be suitable to control CV or VAV applications. The controls shall be factory-installed and mounted in the main control panel. All factory-installed controls shall be fully commissioned (run tested) at the factory. The unit shall have a human interface panel with 16-key keypad, a

two line, 40 character clear language (English, French, or Spanish) display as standard to provide the operator with full adjustment and display of control data functions. The unit controls shall be used as a stand-alone controller or as part of a building management system involving multiple units.

The unit shall be equipped with a complete microprocessor control system. This system shall consist of temperature and pressure (thermistor and static pressure transducer) sensors, printed circuit boards (modules) and a unit mounted human interface panel. Modules (boards) shall be individually replaceable for service ease. All microprocessors, boards, and sensors shall be factory mounted, wired, and tested.

The microprocessor boards shall be stand-alone DDC controls not dependent on communications with an on-site PC or building management network. The microprocessors shall be equipped with on-board diagnostics, indicating that all hardware, software, and interconnecting wiring are in proper operating condition.

The modules (boards) shall be protected to prevent RFI and voltage transients from affecting the board's circuits. All field wiring shall be terminated at a separate, clearly marked terminal strip. Direct field wiring to the I/O boards is not acceptable.

The microprocessor's memory shall be nonvolatile EEPROM type requiring no battery or capacitive backup, while maintaining all data.

Zone sensors shall be available in several combinations with selectable features depending on sensor.

The human interface panel's keypad display character format shall be 40 characters x two lines. The character font shall be 5 x 7 dot matrix plus cursor. The display shall be supertwist liquid crystal

display (LCD) with blue characters on a gray/green background which provides high visibility and interface ease. The display format shall be in clear language: English, French, or Spanish.

The keypad shall be equipped with 16 individual touch sensitive membrane key switches. The switches shall be divided into four separate sections and password protected to prevent tampering by unauthorized personnel. The six main menus shall be STATUS, SETPOINTS, DIAGNOSTICS, SETUP, CONFIGURATION, and SERVICE MODE.

Agency Listing

The unit shall have the US/Canada Underwriter's Laboratory agency listing.

Remote Air-Cooled Condenser

Cabinet

The unit framework shall be formed structural steel members of sturdy-gauge galvanized steel. Panels and access doors shall be sturdy-gauge galvanized steel. The unit exterior shall be phosphatized and finished with air-dried enamel paint.

Refrigerant Circuits and Controls

All sizes shall have dual refrigerant circuits and shall include an integral subcooling circuit for each circuit. All necessary controls to run unit fans shall be factory installed. The control panel shall include fan motor contactors, terminal block connection for compressor interlock, and 115-volt control power transformer.

Condenser Coils

The condenser coil arrangement shall be slab type. Coils shall be seamless

3/8-inch (10mm) OD copper tubes expanded into aluminum fins. Each circuit shall include an integral subcooler. The coil shall be leak tested at 650 psig air pressure.

Condenser Fans and Motor

Vertical discharge direct drive fans shall be statically and dynamically balanced at the factory. Motors shall be three-phase with permanently lubricated ball bearings, built-in current and thermal overload protection and weathertight rain slinger over the fan shaft.

Protective Coating (Option)

Unit

The unit's interior and exterior shall have a 4 to 6 mil coat of protective coating applied with an air-dry process.

Condenser Coils

The condenser coil shall have a 4 to 6 mil coat of protective coating applied by a multiple dip-and-bake process.

Low Ambient Operation Option

Standard ambient control allows operation down to 45°F by cycling the condenser fans. Low ambient control damper shall allow the unit to operate down to 0°Fby utilizing additional fan cycling and an external damper assembly. The low ambient control damper shall include an industrial-gauge damper assembly. The damper is controlled by the air-cooled unit's DDC controller.

Louvered Coil Guards Option

The unit coils shall be covered with a factory installed decorative louvered grill type panel for protection.

Agency Listing

The unit shall have the US/Canada Underwriter's Laboratory agency listing.

Self-Contained Options

Air Volume/Temperature Control

Zone Temperature Control

This option includes a zone sensor, microprocessor unit control module, a microprocessor compressor controller, and a unit-mounted human interface panel. The unit operates at a design airflow based on the fan and motor drive selections.

Supply Air Temperature Control With Variable Frequency Drive

This option controls the VAV self-contained unit from the discharge air temperature using a factory mounted variable frequency drive (VFD). The VFD safely varies the fan motor speed to allow the motor to meet the dynamic requirements at the motor shaft and meet the system static. Other control components include a discharge air microprocessor controller and discharge air sensor. The microprocessor controller coordinates the economizer control and the stages of cooling with discharge air temperature reset capabilities. Includes factory installed and tested variable frequency drive (VFD) to provide supply fan motor speed modulation. The VFD receives 0-10vdc signal from the unit microprocessor based upon supply static pressure and causes the drive to accelerate or decelerate as required to maintain the supply static pressure setpoint.

Supply Air Temperature Control With Variable Frequency Drive with Bypass

Manual bypass control provides full nominal airflow and zone temperature control in the event of a drive failure. The VFD with bypass is factory mounted completely wired and tested. A motor overload relay and fuses are provided to properly size motor protection during both drive and bypass modes.

High Capacity Coils

The high capacity coil option (6 row evap) is a standard option on unit sizes 25, 32, 38, 46, 58, 72.

The high capacity coil option (8 row evap) is a standard option on unit sizes 90, 100, 110.

Economizer

The waterside economizer takes advantage of cooling tower water to either pre-cool the entering air to aid the mechanical cooling process or, provides total system cooling if the water temperature is low enough. Waterside economizing enables when the unit's entering water temperature is below the unit's entering mixed air temperature by a minimum of 4°F plus the economizer's approach temperature. The approach temperature default is 4°F and is adjustable from 0 to 9°F. Waterside economizing disables when the unit's entering water temperature is not below the unit's entering mixed air temperature by at least the water economizer approach temperature. The economizer acts as the first stage of cooling. If the economizer is unable to maintain the supply air setpoint, the unit control module brings on compressors as required to meet the setpoint.

The waterside economizer includes a coil, modulating valves, controls, and piping with cleanouts. All components are factory installed in the unit cabinet. The coil construction is ½-inch (13mm) OD seamless copper tubes expanded into aluminum fins. The evaporator and economizer coils share a common sloped (IAQ) drain pan. Drain pan options are either galvanized or stainless steel and insulated and internally trapped.

The waterside economizer coil options have either two or four rows with no more than 12 fins per inch. The tubes are arranged in a staggered pattern to copper supply and return headers with removable cleanout and vent plugs. The optional mechanically cleanable economizer has removable cast iron headers to allow easy mechanical cleaning of the tubes. The waterside working pressure is rated for 400 psig (2758 kPa).

Airside Economizer

Units with the airside economizer option are equipped with the necessary control sequences to use outside air for the first stage of cooling, in occupied or unoccupied mode and when ambient conditions are favorable for economizing. Inherent in the unit controller is the ability to suppress the setpoint below the normal unit setpoint. This allows the building to improve comfort levels when possible, and at the same time, optimize building mechanical cooling operation for peak operating efficiency. An outside air temperature and relative humidity sensor are provided to allow monitoring of reference enthalpy and are field installed. Economizer operation enables when the outside air enthalpy is less than 25 BTU's/lb. default (adjustable 19-28 BTU's/lb.). During occupied mode, the outside air damper opens to 15% (adjustable 0-100%) for ventilation purposes. Also, the ability to alter the outside air damper position to compensate for VAV supply air modulation is inherent in the unit controls, and can be enabled by the operator.

The mixing box fabrication is sturdy-gauge galvanized steel. Opposed low leak damper blades are fabricated from sturdy-gauge galvanized steel and rotate on rustproof nylon bushings. A factory installed 24V modulating spring return actuator controls both damper positions.

Comparative Enthalpy Control

Units with comparative enthalpy control are equipped with the necessary control sequences to allow using outside air for the first stage of cooling, in occupied or unoccupied mode and when ambient conditions are favorable for economizing. Inherent in the unit controller is the ability to suppress the setpoint below the normal unit setpoint. This allows the building to improve comfort levels when possible, and at the same time, optimize building mechanical cooling operation for peak operating efficiency. A factory-installed control board, with field-installed outside and return air temperature and relative humidity sensors, allows monitoring of outside and return air. Economizer operation enables when the outside air enthalpy is 3 BTU's/lb. less than the return air enthalpy. During occupied mode, the outside air damper opens to 15% (adjustable 0-100%) for ventilation purposes. Also, the ability to alter the outside air damper position to compensate for VAV supply air modulation is inherent in the unit controls, and can be enabled by the operator.

The mixing box fabrication is sturdy-gauge galvanized steel. Opposed low leak damper blades are fabricated from sturdy-gauge galvanized steel and rotate on rustproof nylon bushings. A factory installed 24V modulating spring return actuator controls both damper positions.

Standard Two-Position Damper Interface

Units with the two-position damper interface are provided with a 0-10 VDC control output suitable for controlling a field-provided modulating actuator. In occupied mode, the output drives to the maximum position.

Airside Economizer Interface

Units with airside economizer interface are equipped with the necessary control sequences to allow using outside air for the first stage of cooling, in occupied or unoccupied mode and when ambient conditions are favorable for economizing. Inherent in the unit controller is the ability to suppress the setpoint below the normal unit setpoint. This allows the building to improve comfort levels when possible, and at the same time, optimize building mechanical cooling operation for peak operating efficiency. An outside air temperature and relative humidity sensor are provided for field installation to monitor reference enthalpy. Economizer operation enables when the outside air enthalpy is less than 25 BTU's/lb. (adjustable 19-28 BTU's/lb). During occupied mode, the outside air damper opens to 15% (adjustable 0-100%) for ventilation purposes. Also, the ability to alter the outside air damper position to compensate for VAV supply air modulation is inherent in the unit controls, and can be enabled by the operator. An analog 2-10 VDC output (adjustable (0-10 VDC) is provided to modulate the field-provided 30 second damper actuators (adjustable 1-255 seconds).

Airside Economizer Interface with Comparative Enthalpy

Units with airside economizer interface and comparative enthalpy are equipped with the necessary control sequences to allow using outside air for the first stage of cooling, in occupied or unoccupied

mode and when ambient conditions are favorable for economizing. Inherent in the unit controller is the ability to suppress the setpoint below the normal unit setpoint. This allows the building to improve comfort levels when possible, and at the same time, optimize building mechanical cooling operation for peak operating efficiency. A factory-installed control board, with outside and return air temperature and relative humidity sensors, are provided for monitoring outside and return air. The sensors are field installed. Economizer operation enables when the outside air enthalpy is 3 BTU's/lb. less than the return air enthalpy. During occupied mode, the outside air damper opens to 15% (adjustable 0-100%) for ventilation purposes. Also, the ability to alter the outside air damper position to compensate for VAV supply air modulation is inherent in the unit controls, and can be enabled by the operator. An analog 2-10 VDC output (adjustable (0-10 VDC) is provided to modulate the field-provided 30-second damper actuators (adjustable 1-255 seconds).

Basic Water Piping

This option is available on units without a waterside economizer and with condenser water applications above 54°F that do not require condensing pressure control. Left hand water connections and piping are extended to the unit exterior. Manifold piping is factory installed.

Intermediate Water Piping

This option provides condensing temperature control when the unit is configured (user defined at the HI) for variable water flow with or without a waterside economizer. A two-way modulating control valve is wired and installed in the unit to maintain a specific range of water temperature rise through the condenser when entering fluid temperature is less than 58°F. This option allows the compressor to operate with entering fluid temperature down to 35°F.

Waterside Economizer Flow Control

Units equipped with a waterside economizer can be set from the human interface panel for variable or constant water flow.

Constant Water Flow

Two-way modulating control shutoff valves are wired, controlled, and installed in the unit. One valve is located in the economizer's water inlet, and the other is in the condenser bypass water inlet. When the waterside economizer enables, the two-way valve modulates to maintain the discharge air temperature setpoint. As the economizer valve opens, the condenser bypass valve closes, and vice versa. Full water flow is always maintained through the condensers. Both valves will close in the event of a power failure.

Variable Water Flow

Two-way modulating control shutoff valves are wired, controlled, and installed in the unit. One valve is located in the economizer's water inlet, and the other is in the condenser bypass water inlet. When the economizer valve is active, the condenser bypass valve closes. The economizer valve modulates, thus water flow through the unit modulates. If the water is cool enough for economizing, but mechanical cooling is also required, the economizer valve fully opens to establish full water flow through the condensers. Whenever the water is too warm for economizing and there is a call for cooling, the economizer valve fully closes and the bypass valve fully opens, establishing full water flow through the condensers. Full water flow is always maintained through the condensers when mechanical cooling is required. Both valves close whenever cooling is not required and in the event of a power failure.

Water Flow Switch

A water flow switch is factory installed in the condenser water pipe within the unit. Whenever the flow switch detects a water flow loss prior to or during mechanical cooling, compressor operation locks out and a diagnostic code displays. If water flow is restored, the compressor operation automatically restores.

Service Valves

Service valves are factory installed on each circuit before and after the compressor to allow compressor isolation for servicing.

Heating Coils

Electric Heat

A single stage electric heating coil and controls are factory installed inside the unit casing at the fan discharge. An open construction type coil is provided. Power to the electric heater is factory wired to the unit's single-point power connection.

Hot Water

The hot water heating assembly includes the coil and filter section and is factory installed on the unit's inlet. A three-way modulating valve with actuator ships with the hot water coil rack option. The coil is a Trane type 5W, constructed of 5/8-inch (16 mm) OD copper tubes arranged in a parallel pattern. The copper tubes are expanded into aluminum fins positioned continuously across the entire coil width, not exceeding 12 fins per inch. A one row or two row (high capacity) coil is available. The coil casing is galvanized steel. Coil performance is rated at a maximum working pressure of 200 psig in accordance with ARI Standard 410. Supply and return water header connections are steel pipe and are accessed from the unit's left side.

Steam

The steam heating assembly includes the coil and filter section, factory installed on the unit's inlet. A two-way modulating valve, actuator, and manifold piping are also factory installed. Also, connections are provided for field installing a vacuum breaker. The coil is a Trane type NS, constructed of one inch (25 mm) OD copper tubes arranged in a parallel pattern. The copper tubes are expanded into aluminum fins positioned continuously across the entire coil width, not exceeding 42 fins per foot. The coil casing is sturdy-gauge steel. Coil performance is rated at a maximum working pressure of 100 psig in accordance with ARI Standard 410. Supply and return steam header connections are female tapered NPT and are accessed from the unit's left side. Factory provided controls limit the steam coil leaving air temperature to no more than 105°F at all operating conditions.

Single Stage Electric Heat Interface

A heat control module will be factory installed and wired for customer supplied and powered electric heat. This module will allow the unit to stage the customer-provided electric heat. Single stage electric heat control will be accomplished with one dry binary output rated at one amp for 115 VAC.

Hydronic Heating Control Interface

A heat control module will be factory installed and wired for customer supplied hydronic heating. This control will be accomplished with a dry binary output, 0-10 VDC analog control signal.

Time Clock

A factory-installed programmable time clock is wired to the unoccupied mode binary input to provide on/off control. The timer is accessible without opening the control panel door, and is a seven-day type with a maximum of four operations per day. A permanent built-in rechargeable battery pack is provided.

Low Entering Air Temperature. Protection Device

A thermostat limit switch is factory mounted on the unit's entering air side with a capillary tube serpentine across the coil face. If the temperature falls below 35°F, the fan shuts down and the waterside economizer and/or hydronic heat valve option opens to allow full water flow. The heat output also energizes. A manual reset is required. Note: this option is standard on units with a waterside economizer or hydronic heat.

Non-fused Disconnect Switch

The unit has a factory mounted non-fused disconnect switch accessible without opening the control panel door.

Dual Point Power Terminal Blocks

Two separate power terminal blocks are available to bring power to the unit; one terminal block provides power to the compressors and the other provides power to the fan motor and controls.

Note: *A single point power terminal block is standard.*

Flexible Horizontal Discharge Plenum

Low and Standard Height

Units are provided with a factory installed horizontal discharge plenum that permits multi-directional duct connections. The plenum is insulated with two inches (51 mm) of 1.75 lb. (0.79 kg) density fiberglass for sound attenuation. Discharge openings can either be field cut or factory cut based on duct dimensions supplied by the customer. A two-inch duct collar is provided for field duct connections. On unit sizes 20-38 tons, the low height plenum is 24 5/8 inches (625 mm) and the standard height plenum is 32 3/8 inches (822 mm). On unit sizes 42-80 tons, the low height plenum is 21 1/8 inches (537 mm) and the standard height plenum is 28 5/8 inches (727 mm).

Extended Height

Units are provided with a horizontal discharge plenum that permits multi-directional duct connections. 20-80 Ton extended plenum height is 45", 90-110 Ton extended plenum height is 431/2". The plenum is insulated with four inches (102 mm) of 1.75 lb. (0.79 kg) density fiberglass for sound attenuation. Double-wall perf is also available. Discharge openings can either be field cut or factory cut based on duct dimensions supplied by the customer. A two-inch duct collar is provided for field duct connections.

High Duct Temperature Thermostat

A factory-supplied temperature limit switch with reset element detects the supply air duct temperature. This sensor should be field-installed downstream from the unit's discharge in the supply air duct. If the supply air duct temperature exceeds 240°F, the unit shuts down and displays a diagnostic. A manual reset is required at the unit. The high duct temperature can be adjusted at the thermostat.

Plenum High Static Switch

A factory supplied sensor provides additional protection from ductwork over-pressurization. This sensor should be field-installed downstream of the unit's discharge in the supply air duct.

Protective Coating

- Cabinet

  The unit exterior and exposed interior surfaces have a four to six mil coat of protective coating.

- Coils

  A three to five mil coat of protective coating is applied to the coil using a multiple dip-and-bake process.

Cupro-Nickel Condenser

One condenser is provided for each compressor. The condensers are a shell-and-tube design with removable heads to allow mechanical tube cleaning. Tubes are ¾-inch (19mm) OD and constructed of copper cupro-nickel (90/10).

Stainless Steel Drain Pan

The drain pan is positively sloped, fabricated from 304L stainless steel, and insulated with ¾-inch (19 mm) of 1-lb. (0.5 kg) density fiberglass. The drain pan contains a factory piped trap with cleanout.

Dirty Filter Sensor

A factory installed pressure switch senses the pressure differential across the filters. When the differential pressure exceeds 0.9-inches (23 mm) WG, contact closure occurs.

A field installed indicator device may be wired to relay terminals that indicate when filter service is required. Contacts are rated at 115 VAC and are powered by a field supplied transformer.

Filters

Medium Efficiency

Two-inch (51 mm) medium efficiency throwaway fiberglass filters are installed in the unit filter section. Optional two-inch and four-inch filter racks may also be provided. Four-inch cartridge filters must be field purchased for installation.

Remote Human Interface Panel

The remote human interface panel (RHI) can perform all the same functions as the unit mounted human interface panel, except the service mode function. A single RHI can monitor and control up to four units. The panel includes a 2 x 40 character clear language (English, Spanish, or French) display, a red LED light to indicate an alarm condition, a simple 16-key keypad for making unit setpoint and configuration changes, and hinged access door. The panel can be mounted up to 5,000 feet (1524 m) from the unit and is wired to the inter-processor communications bridge (IPCB) mounted in the unit with twisted wire pair communication wiring and 24V wiring.

Generic Building Automation System Module (GBAS)

The GBAS module is for use with a non-Trane building management system. The module provides a binary input for demand limiting, four analog inputs for setpoint adjustment, and five relay outputs for diagnostic reporting. Inputs can use a potentiometer or 0-5 vdc signal.

Ventilation Override Module (VOM)

The VOM allows you to program the unit with up to five ventilation sequences: smoke purge, evacuation, pressurization, purge, and purge with duct control. Typically, a hard-wire short from a smoke detector or fire control panel will cause a binary input on the VOM to close, thus causing the programmed sequence to occur.

Trane Communication/LCI-I

The Trane Communication/LCI-I option (COMM5) provides interface to a Trane Integrated Comfort™ system (ICS). It allows remote control and monitoring of the self-contained unit using a personal computer with Tracer® building management software.

BACnet Building Automation System

The BACnet® Communication Interface for IntelliPak self-contained(BCI-I) controller expands communications from the unit UCM network to Tracer SC or a 3rd party building automation system, utilizing BACnet, and allows external setpoint and configuration adjustment and monitoring of status and diagnostics.

Wireless Comm Interface - Field Installed

Trane Wireless Comm interface – Provides wireless communication between the Tracer™ SC, Tracer Unit Controllers and BACnet Communication Interface (BCI) modules.

Notes

Notes

Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.Trane.com.

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