PETRA CELEBRATING 30 YEARS

PSC4 Catalog

Air Cooled Smart Chiller

50/60 Hz - SI/IMP

Air Cooled Smart Chiller
with Hermetic Scroll Compressor

175 - 1,565 Nominal kW
(50 - 445 Nominal Tons)

AHRI CERTIFIED™ www.ahridirectory.org
Air-Cooled Chillers
AHRI Standard 550/590

PSC4 Air Cooled Smart Chiller Catalog

Petra Engineering Industries Co.

PETRA

www.petra-eng.com

These marks apply to different products manufactured by Petra Engineering Industries Co. The inclusion of these marks does not mean they apply to all the products within this publication

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Introduction

Petra Engineering Industries Company is a highly established HVAC manufacturing company that produces a wide range of sophisticated, high quality commercial and industrial HVAC equipment. Petra's products meet the requirements of globally recognized standards and procedures
To ensure the highest level of quality all procedures are carried out according to ISO 9001:2015, Quality management systems ISO 14001:2015 environmental management system. Also, all Petra's major products are UL and ETL listed. Petra's air cooled chillers are rated and certified in compliance to standard AHRI 550/590

Petra's air cooled liquid smart chillers (PSC4) with a wide range of capacities and exceptionally high efficiencies, were designed to meet customer requirements for a variety of applications

Petra PSC4 chillers offer state of the art low sound, high quality and reliability, optimized performance and a compact physical footprint

Petra PSC4 chillers with hermetic scroll compressors and R-410a HFC refrigerant are 100% factory tested and commissioned to ensure efficient performance at specified operating conditions

Outstanding Features

Superior Efficiency

The PSC4 series meets or exceeds the new ASHRAE 90.1 efficiency levels at both full and part load efficiency

Low Noise Chillers

The PSC4 chillers offer low sound power levels, measured in accordance with the BS ISO 3744 standard. The low sound power levels make the PSC4 ideal for sound sensitive applications such as schools, hospitals, and sites located in residential neighborhoods

Compact Physical Footprint

The PSC4 chillers feature compact footprints and are suitable for close-spacing installation to serve the areas that have space constraints

Quality Assurance

To ensure the best performance, all the chillers in the PSC4 series are factory-run tested, produced in an ISO 9001:2015 listed manufacturing facility & certified according to AHRI standard 550/590

Easy Installation

Installation is made quick and easy with complete factory wiring, easy lifting provisions, factory installed options and start-up. To eliminate potential start-up problems, a complete factory- test run is performed on each unit

Large Capacity Compact Footprint

Petra introduces the PSC4 chillers with nominal kW up to 1,565 (nominal tons of 445) as a single piece unit with single power entry

This unique single unit design provides the largest capacity in one chiller model with a compact footprint

Outstanding Finishing

Suction lines are insulated with closed cell foam insulation, then wrapped with a special protective material and finally epoxy coated. This gives further protection for the insulation against weather and other factors

Other exposed copper pipes and headers are epoxy coated after being cleaned, to maintain pipe material and brazing protected against external conditions

Petra paint is certified according to ASTM 117 A&B 5,000 hours salt spray test

Nomenclature

PSC

Series
Petra **S**mart **C**hiller

4

Refrigerant
R-**4**10a

200

Nominal Capacity (Tons)

50	55	65	75	85	95	105
110	115	120	125	135	145	
155	170	180	190	200	215	
225	235	250	265	285	315	
335	355	380	400	420	445	

8

No. of Compressors

2	3	4	6
8	12	16	

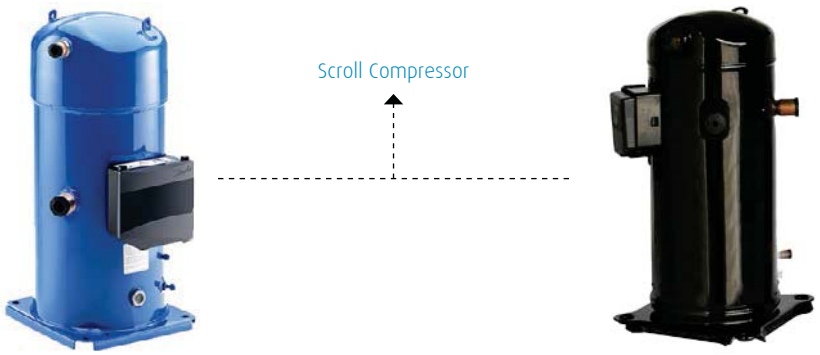
Standard Features & Benefits

Construction

- Welded structural C-channel base painted with mono component catalyzed primer sprayed paint
- Base is equipped with welded brackets for heavy duty lifting lugs
- Easily accessible system components
- Structural members are made from gauge 15 [1.8 mm (0.07 inch)] tubular cross members that are semi welded with stainless steel fasteners. All members & panels (side & roof) are painted with oven baked polyester electrostatic powder paint
- Petra paint is certified up to 5000 hours salt spray test as per ASTM 117 A&B
- Condenser coils are covered with protective panels, to ensure uniform air distribution across the coil face area & provide additional protection for coil from weather elements

Compressor

- Suction gas-cooled hermetic scroll low sound superior efficiency compressors
- Robust design of a three Teflon impregnated bearings and integral cast-iron housing for better compressor alignment
- IP 54 enclosure class of terminal box
- Scroll inherent durability with few moving parts and low motor strains
- Spiral surfaces wear in due to unique compliant design
- Mounted on a rubber-in-shear (RIS) vibration isolators
- Equipped with operating oil charge, crank case heater, crank case oil sight glass, inherent solid state motor protector, suction strainer and short cycling delay timer protection
- Maximum operating speed compressor of 2,900 / 3,500 rpm (50/60 Hz)
- Immediate internal pressure balancing (high side / low side) at shut-off
- High volumetric efficiency with no dead space design
- Minimized pressure losses with uniform gas compression in the scroll pockets at low velocities
- Minimized heat transfer losses because of a physical separation of suction and discharge gas



Condenser Coils

- Petra's V-shaped air-cooled condenser coils are designed to deliver their duties with optimum performance for all design conditions
- Coils are manufactured from seamless copper tubes mechanically expanded into aluminum fins
- Type-L, heavy wall seamless copper tubes are provided for the coil headers
- Coils are hydrostatic pressure tested in accordance with the UL1995-2000 standard
- High corrosion resistance
- All coils are air pressure tested by dry air up to 6,200 kPa (900 Psi) under water. They also undergo dry cleaning after manufacturing for optimum system cleanness

Condenser Coils

Condenser Fans & Motors

- Condenser fans shall be of the external rotor type
- External rotor motor with many attractive features such as space saving, compact design, optimum cooling, full speed controllability and low starting currents
- Sealed-for-life ball bearings fitted throughout the range with an L10 life expectancy of approximately
- Thermal contacts are fitted with external rotor motors
- Embedded deep in the windings of the motors, the contacts are bi-metal cutout design which are temperature-dependent. Should the temperature of the motor rise to the limit, the bi-metal cutouts
- activate and cut off the power, thereby providing full protection to the motor

Condenser fan & motor assembly

Coolers (Barrels)

- High efficiency direct expansion (DX) shell and tube type coolers with inner grooved tubes to optimize the cooler's efficiency
- Coolers are tested and stamped for refrigerant side design pressure of 1,500 kPa (220 Psi) and for a maximum water side working pressure of 1,000 kPa (145 Psi)
- These working pressures comply with applicable sections of the ASME standard, and the European codes of ISPESL and TUV
- Coolers are equipped with internal water baffles in the shell. They are fabricated from brass for maximum corrosion resistance
- Coolers are provided with water vents and drain connection plugs and are insulated with 19 mm (3/4 inch) closed cell foam insulation
- Cooler shall be tested & stamped in accordance withASME code

Barrels (Coolers)

Standard Features & Benefits

Refrigeration

- Liquid, discharge and suction pipes are all hard copper pipes. They are formed using automated CNC pipe bending machines in order to minimize pipe-brazed joints which in turn increases system reliability
- Epoxy paint for all exposed copper piping system
- of the refrigeration circuit
- Components of each refrigeration circuit:
  - Liquid line solenoid valve
  - Liquid line shut off valve
  - Liquid line moisture indicator sight glass
  - Filter diier
  - Fully charged unit with R-410a refrigerant
  - High safety pressure switch (capsule Type; factory pre-set)
  - Expansion valve

Electrical

- Free terminal for remote ON/OFF connection
- Free terminal for general alarm output
- Control voltage is 220-240V for all components
- Single point power connection for each electrical panel
- Circuit breaker for each compressor
- Starting contactors for compressors and condenser fan motors
- ON/OFF switch for each compressor
- Control circuit breaker for short circuit protection
- Short cycling protection for compressors (time delay)
- Control transformer mounted & wired that shall supply all unit control voltage from main unit power supply to internal components such as (not limited to) solenoid valves, compressor motor protector, compressor crank case heater and microprocessor controller
- Microprocessor controller for full management of chiller operation and safety circuits
- Power supply monitor (phase failure relay) used to protect the power circuit against over or under voltage conditions and against phase loss or loss reversing conditions

Electrical Panels

- Nema 3X with IP54 minimum enclosure standard electrical panel
- Two separate panels, one for power & the other for control
- Electrical panel is equipped with a heavy gauge galvanized steel access door
- Panel is painted with oven baked polyester electrostatic powder paint
- Each door is equipped with external handle with key & tooled latch with sealing heavy duty clip on bulb gasket between the door and the panel provides effective sealing
- All doors have multiple hinges
- Each door has a door retainer to keep door open during service
- Each door has a built-in pocket to accommodate a laminated wiring diagrams & IOM (Installation & Operation Manual) documents
- Separate electrical box for condenser fan motors located on condenser side

Optional Features

Digital scroll compressor

The Digital Scroll Compressor uses digital technology to assure stepless modulation down to 10% of the nominal capacity, enabling precise temperature control, superior comfort and energy saving. It achieves capacity modulation by averaging the two states of loaded versus unloaded operations over time. Digital scroll is a good choice for modulation where precise temperature control is employed Digital scroll is a good choice for modulation anywhere multi-evaporator systems or precise temperature control is employed. In air conditioning, there is a need for digital scroll in large commercial applications as well as in convenience stores, restaurants and other food service applications

VFD scroll compressor

With VFD Scroll Compressor energy savings are realized because the compressor speed is adapted to the actual cooling capacity and the compressor power input is directly related to this speed. Further also other motors in the system will be adjusted to actual needs. It also provides reduction of starting current by creating a current slope at motor start-up

The adaptation of compressor speed to actual needs enables a more precise process control and guarantees output values according to requirements. The number of on/off cycles is limited which reduces mechanical stress of several system components and increases in this way the total system reliability

Coil corrosion protection for condenser coil

- **Microchannel coil (MCHE)**

  Compact design aluminum microchannel coils that reduce refrigerant charge and the unit weight

- **Copper tubes Copper fins coil**

  Coils are manufactured from seamless copper tubes mechanically expanded into copper fins, with type-L, heavy wall and seamless copper tubes for the coil headers. The condenser coils are hydrostatic pressure tested in accordance with the UL 1995 -2000 standard. All coils are air pressure tested by dry air up to 6,200 kPa (900 Psi) under water. They also undergo dry cleaning after manufacturing for optimum system cleanness

- **Polyurethane Pre-coating (for aluminum fins)**

  A water based organic type pre-coated fin designed to give better retained performances compared to typical organic type. The topcoat is made of hydrophilic resin of polyvinyl Alcohol mix with hydrophilic lubricants. It provides a better level of retained as well as improvement in the area of surface friction to help lengthen the life span of a punch dies Paint is certified as per ASTM 117 A&B up to 3000 hours salt spray test

- **Polyurethane Post-coating (for aluminum & copper fins)**

  Aliphatic Acrylic Polyurethane type, with high gloss finish with exceptional weathering performance characteristics. Used extensively in virtually all industrial markets, 134 VOC provides a smooth, durable finish that has superior resistance to corrosion, abrasion and chemical exposure Paint is certified as per ASTM 117 A&B up to 3000 hours salt spray test

Optional Features

Sound reduction options

- **Low rpm condenser fan**

  Same construction and specifications as the standard fans, but with lower speed (700/900 rpm @50/60 Hz power supply)

- **Compressor jacket**

  Compressor jacket shall consist of a 9.5 mm (3/8 inch) thick closed cell rubber sound insulation material inside a sound deflecting vinyl cover to provide superior sound reduction for scroll compressors

Coil guard

A coil guard is placed on the lower part of the unit all over the perimeter to provide protection for unit components. It is fabricated from gauge 18 [1.25 mm (0.05 inch)] galvanized steel sheet metal & painted with Petra electrostatic powder paint. Coil guard is fitted in place by spring load quick turn latch and is supported upon opening by stainless steel hinges

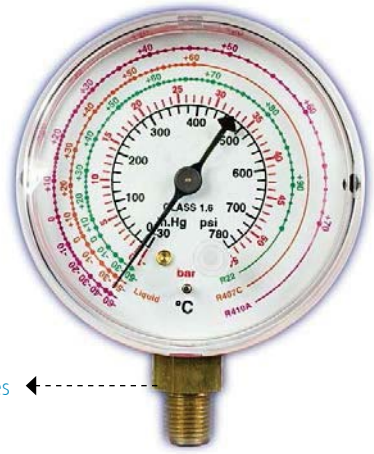
Hot gas bypass

The hot gas bypass consists of a mechanical valve capacity regulator used to adapt compressor capacity to actual evaporator load. It is installed in a bypass line between the high and low pressure sides of the refrigeration system and is designed for hot gas injection into the evaporator just after the expansion valve

The hot gas bypass valve is UL listed, file SA7200. The hot gas bypass valve allows additional capacity reduction for units operating below the minimum step of unloading for the compressor. If the hot gas bypass is installed on the lead compressor only, the “lead/lag” function (for the compressor) will be eliminated

High and low Pressure gauges

Optional pressure gauges for monitoring of refrigeration discharge and suction pressure. Additionally, the gauges are used to verify suitable refrigerant charge and proper system performance. The gauges shall be Bourdon type, stainless steel housing oil filled. Oil filled pressure gauges provide greater protection of the gauge internals from corrosive atmospheres. The gauges are provided with a dual scale of both PSI and BAR



Pressure relief valve

Pressure relief valves is complied with the requirements of the ASME (Boiler and Pressure Vessel Code SectionVIII, Division 1)

The relief valve is designed or set to open at a predetermined set pressure to protect pressure vessels and other equipment from being subjected to pressures that exceed their design limits

Water flow switch

CE & UL approved safety interlock to prevent operation of unit without evaporator water flow (available for field installation only) The water flow switch is used to ensure water flow rate of suitable amount is flowing to the Barrel (cooler), by establishing contact in an electric circuit when flow starts or stop It is a paddle type, and the paddle consists of three segments that can be removed or trimmed and sized to match the water pipe size. The paddle is made of copper alloy. Water flow switch is supplied as a loose item for field installation

Cooler cladding

Cooler cladding can be aluminum, stainless steel or painted galvanized steel {made from gauge 22 [0.7 mm (0.03 inch)}. Cladding shall be applied above barrel (cooler) insulation

Cooler insulation thickness materials

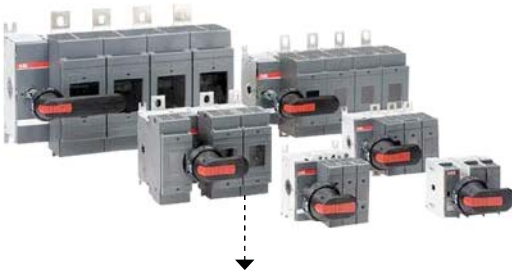
Cooler can be insulated with closed cell foam insulation of 25 mm (1 inch), 38 mm (1.5 inch) & 50 mm (2 inch) The insulation density is 48 kg/m3 (3 lb/ft3) with a K-factor of 0.035 W/(m.°K) [0.0203 BTUH/(ft.°F)]

Optional Features

Main disconnect switch

This is used to de energize the power supply to the chiller during servicing or repairing works because of the door interlock. It has an external handle that is installed on the electric panel door. Switch has to be de-energized to open electric panel

(This disconnect switch can be supplied with built in fuse or a non fuse type)



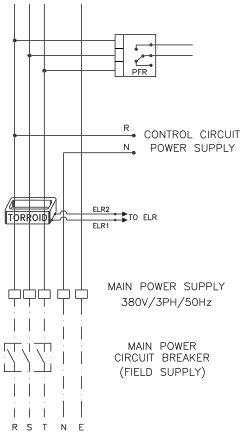
Disconnect switch

Power factor correction capacitor

Power factor correction is used to improve the power factor level . Maximizing power factor improves system reliability , minimizes voltage drops and gives better power quality. Advanced safety capacitors with harmonic filters and a main microprocessor controller are provided to manage the required capacity for the capacitor stages. Only one capacitor panel is needed for the chiller regardless the number of compressors or fans. Power factor is usually installed on a separate electrical box depending on unit size (refer to the nearest Petra sales office for more details)

Earth leakage relay

A safety device used in electrical installations with high earth impedance to prevent shock. It detects small stray voltages on the metal enclosures of electrical equipment, and interrupts the circuit if a dangerous voltage is detected earth leakage relay can be supplied for the whole unit power supply or for each compressor (refer to the nearest Petra sales office for more details)



Bulk head light for the electrical panel

IP 54 protection, class I electric safety bulk head light enclosure shall be used in electrical panel for inspection purposes. Light fixture shall be supplied without a bulb

Bulk head light

Bulk head light (for USA)

Control transformer

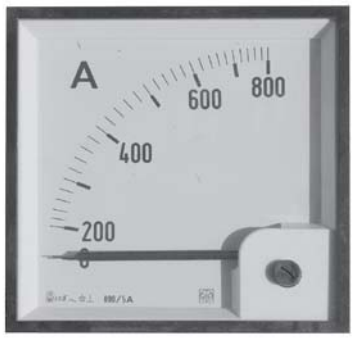
Control transformer to supply power input to auxiliary compo nents at 120 or 220 volts, such as (not limited to) bulk head light and GFI outlet

Control transformer

Ampere-meter & volt-meter

Ampere-meter & volt-meter are used to measure the power current & voltage consumption Ampere-meter is used for each phase. Voltmeter device is used to measure the voltage of the power supply between each phase and the another one and between each phase and the neutral

Ampere-meter & volt-meter

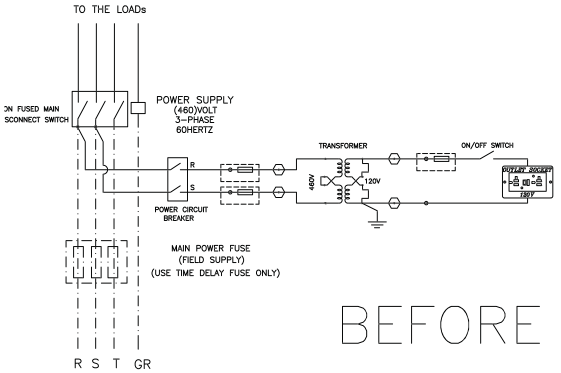


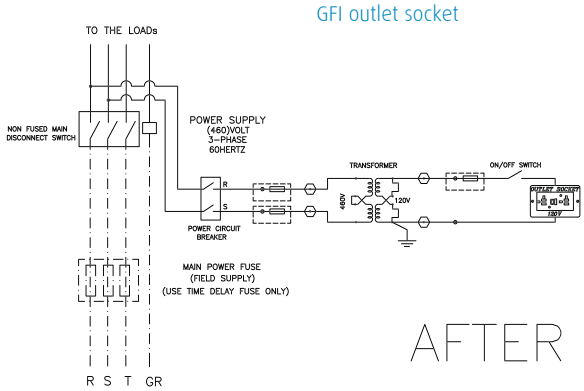
120V power supply with transformer & GFI outlet socket

The 120 volt power supply shall be connected through the trans-former to provide a 120 volt single phase circuit It can be connected before or after the disconnect

GFI socket is used to operate the electric appliances at site such as laptops, tablets and cell phones

GFI outlet socket

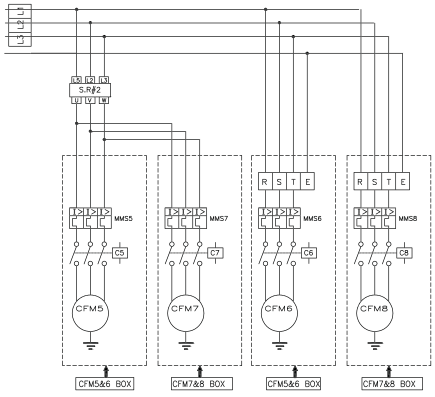




Optional Features

Speed regulator for condenser fan motors

As described in the low ambient control option, these devices are used to permit the unit to operate in low ambient temperature. Head pressure control can be controlled by varying the speed for condenser fan motors



Note

- Sample wiring diagram for speed regulator on condenser fan motor

Dual power connection

Unit shall be supplied with a dual power connection. One power entry for compressors & the second for the rest of the unit. Each power connection can be equipped with a separate main disconnect switch

Electrical component options

- External over load for each compressor
- External over load for each condenser fan motor
- Circuit breaker for each condenser fan motor
- Nema 4x electrical panels made from galvanized steel
- Nema 4x electrical panels made from stainless steel

Cooler tape heater protection down to 0°C (32°F), -18°C (0°F) & -29°C (-20°F)

Electrical resistance heating tape is wrapped around the barrel (cooler) shell to help protect the evaporator fluid contents from freezing down to 0°C (32°F) -18°C (0°F) & -29°C (-20°F) ambient temperature. The heater has to be maintained "ON" 24/7, so the power supply to chiller has to be "ON" 24/7. This device will not protect external water pipe work connected to the unit and additional frost protection measures are required at field

Low ambient control down to 0°C (32°F)

Unit shall be capable to operate down to 0°C (32°F) using a combination of on/off sequencing of condenser fans plus speed varying. This shall be controlled through pressure transmitter of each refrigerant circuit via unit controller with a speed regulator device

Low ambient control down to -17°C (0°F)

In addition to the condenser fans combination of on/off sequencing & speed varying, a flooded condenser control design is used as well to enable unit to operate to this ambient. Multiple on/off solenoid valves on each condenser with a suitable liquid receiver shall be added to control the amount of liquid flooding the condenser & maintain condenser head pressure in the allowable operating range

Microprocessor Controller

Microprocessor controller system enhances the air-cooled smart chiller operation by providing the intelligent chiller control technology. The microprocessor control helps in accurate control of various chiller operating parameters. The system provides complete status on all operation both locally and remotely. History, static and dynamic to help in commissioning, troubleshooting and evaluation. It will interface locally, remotely through ethernet connection, and also through building management systems

The Microprocessor control offers a great deal of flexibility with adjustable set points and control options that can be set prior to activating a system or even when the unit is operational. The Microprocessor controller is designed to safeguard the system being controlled, minimize the need for manual intervention, and to provide a simple but meaningful user interface

Sequence of Control - Mark V Controller

Start up

For initial startup, the following must be met:

- Control circuit breaker switched on
- Energize the microprocessor control through keypad, remote start/stop, schedu or BMS command
- Chilled Water pump running
- Flow has been proven
- All safeties condition satisfied

When the water out temperature is above the target set point, the first compressor will start after the call for cooling. The control strategy is designed to modulate the compressor(s) capacity to maintain the control sensor reading within the specified control zone. To accomplish this, the Microprocessor controller will constantly monitor the control value, its rate of change and position in relationship to the control zone and make adjustments accordingly

Capacity control

The Capacity control logic will increase or decrease the compressors capacity as followings:

A. If the Chilled Water Out temperature is above the target setpoint and the Chilled Water Rate Of Change does not indicate that the water temperature is decreasing at a Sufficient rate, the chiller's capacity control logic will ask for more capacity by adding a cooling step. Once the step control has increased, the capacity control logic has a time delay before allowing the new step to increase again. The time delay is based on how far the temperature is from the target set point

B. If the chilled water out temperature is in the control zone, special logic functions will keep the chille with in the control zone

C. If the chilled water out temperature is below the control zone and if the Chilled Water Rate of Change does not indicate that the water temperature is increasing at a sufficient rate, the chiller's capacity control logic will ask for less capacity by subtracting from the steps. Once the step has been decreased the capacity control logic has a time delay before allowing more steps to be decreased again

Chilled Water Reset

This is a function of a signal from the building management system. This value is used to adjust the control set point. The amount of the actual adjustment is proportionally based upon the associated analog input value. The analog value can be between 0 and 10 volts

Operating Schedules

Operating schedules per day of the week and 8 holidays are supported by the microprocessor controller software. Each schedule contains a start and end time. If the time and day of the Microprocessor controller clock is within these limits then the schedule is true and the system will be allowed to run. If not, the system will be off due to schedule

Microprocessor Controller

Displayed Data

- Leaving/Entering water temperature
- Ambient temperature
- Compressor discharge pressure
- Compressor suction pressure
- Suction super heat
- Chiller load percentage
- Compressor timers
- Digital input status
- Output relays status
- Protections status
- Historical alarm
- Schedule
- Adjustable set point

Safeties and Alarms

- High discharge pressure
- Low suction pressure
- Low suction temperature
- Freeze state
- Flow switch (No flow protection)
- Phase loss protection
- Motor protector
- Probe error alarm
- Compressor overload
- Condenser overload
- Compressor short circuit
- Condenser fan motor short circuit

PC Support Software

- Configuration of main unit control parameters
- Monitoring of main system variables
- Alarms management
- Simplify commissioning operations
- Customization of user interface

BMS Hard Wired

- Within the hard wire structure there are six features as follows:
  1. Unit start / stop command
  2. Compressor run status
  3. Compressor trip status
  4. Condenser fan run status
  5. Condenser fan trip status
  6. General alarm

Electronic Expansion Valve Driver (EVD)

This driver with double pole stepper motors is designed to control the electronic expansion valve in the smart chillers, it controls refrigerant super heat and optimizes the efficiency of the refrigeration circuit to guarantee the maximum flexibility

Ultra Cap Module

Ultra cap EVD module guarantees temporary power to the driver in case of power failures, for enough time to immediately close the connected electronic valves, it avoids the need to install a solenoid valve

USB in Microprocessor Controller

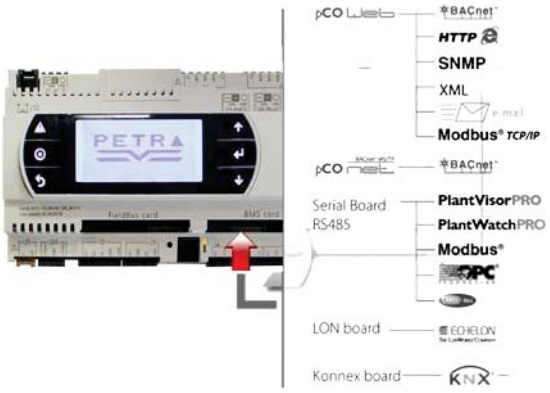
1. USB host: to connect a standard USB dongle for:
   - SW application upgrade
   - Download Pco logs

2. USB device: to connect a PC (without external convertor) for:
   - SW application upgrade
   - Download Pco logs
   - Configure and monitor the unit by commissioning tool

BMS Card

This card provides connection for:

1. Modbus RTU - RS4 85 (STANDARD)
2. PCO WEB TCP / IP (OPTIONAL)
   - TCP / IP
   - BAC NET
   - Modbus
   - SNMP
   - E-mail
3. PCO NET (BAC NET MSTP RS4 85) (OPTIONAL)
4. LON Board (OPTIONAL)
5. Konnex Board (OPTIONAL)

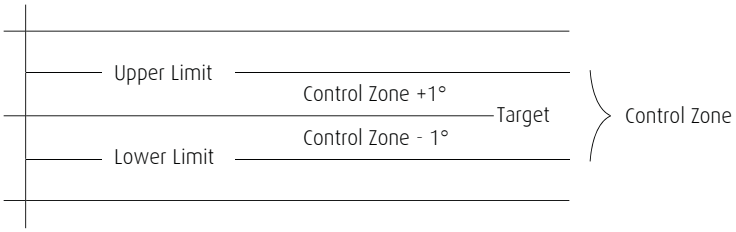


Sequence of Control - SMART LINK-II Controller (OPTIONAL)

Start up

- For initial startup, the following must be met:
- Control circuit breaker switched on
- Energize the microprocessor control through keypad, remote start/stop, schedule or BMS command
- Chilled Water pump running
- Flow has been proven
- All safeties condition satisfied

When the water out temperature is above the target set point, the first compressor will start after the call for cooling. The control strategy is designed to modulate the compressor(s) capacity to maintain the control sensor reading within the specified control zone. To accomplish this, the Microprocessor controller will constantly monitor the control value, its rate of change and position in relationship to the control zone and make adjustments accordingly



Capacity control

The Capacity control logic will increase or decrease the compressors capacity as followings:

A. If the Chilled Water Out temperature is above the target setpoint and the Chilled Water Rate of Change does not indicate that the water temperature is decreasing at a sufficient rate, the chiller's capacity control logic will ask for more capacity by adding a cooling step. Once the step control has increased, the capacity control logic has a time delay before allowing the new step to increase again. The time delay is based on how far the temperature is from the target set point

B. If the chilled water out temperature is in the control zone, special logic functions will keep the chiller with in the control zone

C. If the chilled water out temperature is below the control zone and if the Chilled Water Rate of Change does not indicate that the water temperature is increasing at a sufficient rate, the chiller's capacity control logic will ask for less capacity by subtracting from the steps. Once the step has been decreased the capacity control logic has a time delay before allowing more steps to be decreased again

Microprocessor Controller

Low water out Temperature Unload

The chiller water out temperature could cause the system to unload. When the water out temperature gets near the Freeze Set Point, the unload occurs before triggering the freeze protect safety

Chilled Water Reset

This is a function of a signal from the building management system. This value is used to adjust the control setpoint. The amount of the actual adjustment is proportionally based upon the associated analog input value. The analog value can be between 0 and 5 volts

Operating Schedules

Two operating schedules per each day of the week and 8 holidays are supported by the microprocessor controller software. Each schedule contains a start and end time. If the time and day of the Microprocessor controller clock is within these limits then the schedule is true and the system will be allowed to run. If not, the system will be off due to schedule

System Protection

Petra provides special advanced software designed to be proactive; that is, to take corrective action to keep a safety condition from occurring. If a safety does occur, the software attempts to restart the unit when the system returns to normal. This approach eliminates most, if not all of the nuisance alarms that occur

PC Support Software for Smart Link II

MCS- Connect program provides both local and remote Communications to the controller independent of the type of software. Through this program, the status of the controller can be viewed and proper authorization changes can be made to the system

The controller automatically performs history logging; this program has complete graphic functions

Displayed Data

- Leaving/Entering water temperature
- Ambient temperature
- Compressor discharge pressure/temperature [option]
- Compressor suction pressure/temperature [option]
- Compressor drawn current [option]
- Suction/Discharge super heat [if pressure/temp. sensors available]
- Saturated suction/discharge [if pressure/temp. sensors available]
- Compressor timers
- Digital input status
- Output relays status
- Protections status
- Historical alarm
- Schedule
- Adjustable setpoint

Safeties and Alarms

- High discharge pressure [if pressure/temp. sensors available]
- High discharge temperature [if pressure/temp. sensors available]
- Low suction pressure [if pressure/temp. sensors available]
- Low suction temperature [if pressure/temp. sensors available]
- Freeze state
- High ampere state [if current transformers available]
- Low discharge pressure [if pressure/temp. sensors available]
- Unsafe suction pressure [if pressure/temp. sensors available]
- Unsafe discharge pressure [if pressure/temp. sensors available]
- Flow switch (No flow protection)
- Phase loss protection
- Motor temperature
- Low motor amps [if current transformers available]
- Probe error alarm

Ethernet Port

Communications can be through the 100 MBPS Ethernet Communications port on the Controller. It is necessary to use a crossover cable when connected directly to this port from a PC BMS Communication Protocols

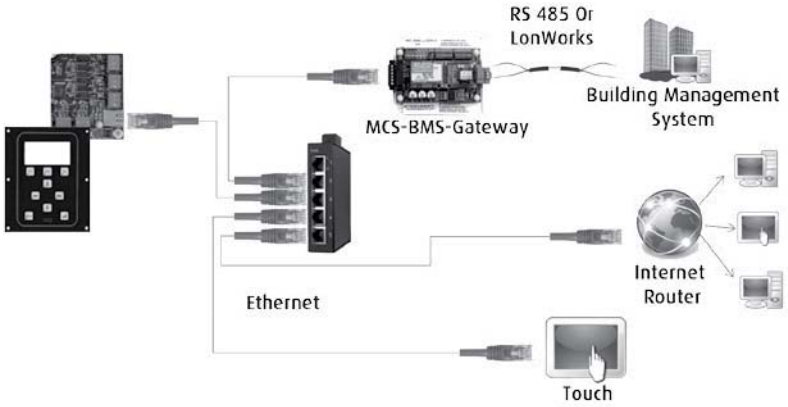
RS 485 Network

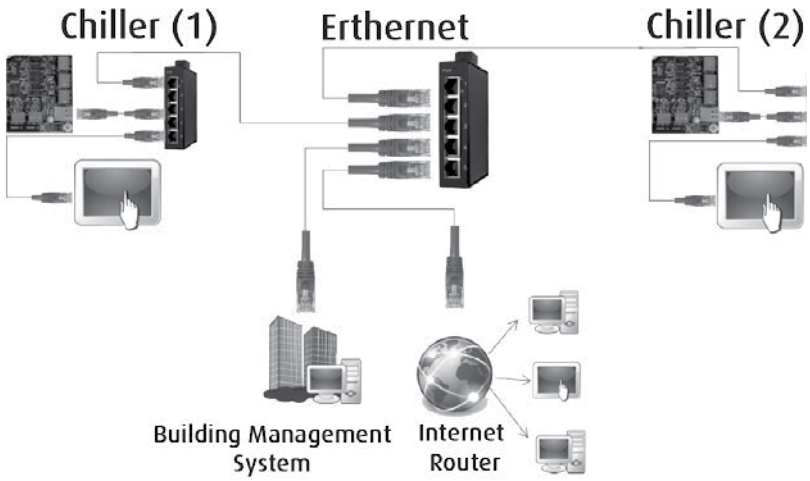
The controller RS 485 Network can support up to 20 chiller controllers and their associated I/O's. Access to this network can be local, via RS 232 connection, or remote via 14.4K Baud modem

When using the dial up through the modem, there will be no degradation in the performance of the network. Each controller in the network must be assigned to a unique address . This address will be the key in establishing communications with the appropriate Controller system. This address can be changed from the LCD/keypad of the unit. The current address of controller can be viewed or changed with factory authorization. RS 232 transmission should not exceed 9 mtr. in length and RS 485 transmission should not exceed 1000 mtr without repeater

Smart Link II controller supports the following protocols

1. Bacnet IP
2. Modbus IP
3. Modbus RTU
4. Bacnet MS/TP (need BMS gateway module)
5. Johnson N2 (need BMS gateway module)
6. Lontalk (need BMS gateway module)





Microprocessor Controller

BMS Hard wired

Within the hard wire structure there are six features as follows:

1. RUN / STOP - (BMS to controller)
2. EMER. STOP - (BMS to controller)
3. CHILLED WATER RESET - (BMS to controller)
4. DEMAND LIMITING - (BMS to controller)
5. COMPRESSOR RUN - (controller to BMS)
6. ALARM - (controller to BMS)

Petra Graphical Touch Screen [Optional]

Touch screen is an extremely high-tech user interface, with high resolution, and a microprocessor that allows the management of complex graphic images. It also displays animated icons, non-proportional fonts in Unicode format, humidity, pressure values and air speed. The touch screen function makes it easy for the user to manage more complex installation diagrams. A keypad on the side of the display can be used in all applications where the touch screen is not the preferred choice

Smart Watch Solution (Optional)

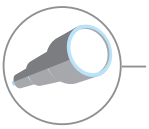
Introduction

Petra introduces the next generation of its control solutions: Smart Watch. Smart Watch is designed to make the interaction between user and HVAC units simpler and easier. Smart Watch centralizes the monitoring, operations and management of the HVAC system to achieve more efficient operations. Smart Watch has become an essential part of a modern HVAC system that contributes significantly to the savings potential and function of the building

Benefits of Using Smart Watch

- **Time Saving**

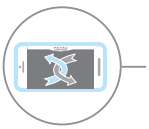
  Through smart watch, you can monitor, control and operate a large HVAC system from one central location. Viewing all system alarms from one location with the ability to reset them. This reduces troubleshooting time and man-hours



- **Monitoring**

  Creating a data logger for any variable in the system (return temperature, supply temperature, return humidity, flow rate, pressure...etc.)

  Monitor the status of the unit devices (compressor, heater, humidifier, valve, and damper). This enables engineers and technicians to achieve a better understanding of their building and/or plant



- **Flexibility**

  The smart watch will give you the flexibility to change the set points for any unit, enable/disable any unit, heating/cooling selection for any unit and duty/standby functionality with time scheduling

- **Cost Reduction**

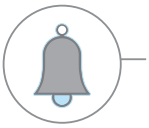
  Using the network and serial communication dramatically reduce cabling and installation between units

- **Reporting**

  Excel sheets can be created that show the system`s behavior such as alarms log, temperatures, humidity...etc. and send them by email daily, weekly...etc.

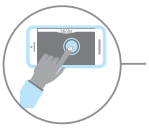
- **Graphical Analysis**

  You can get trends showing the temperature, humidity...etc. variations over a pre-set time period



- **Alarms Management & Notifications**

  Unit`s alarms can be fully monitored and reported in a user-friendly manner. All alarms can be sent via e-mail or mobile. Alarms can be automatically classified as high priority and low priority



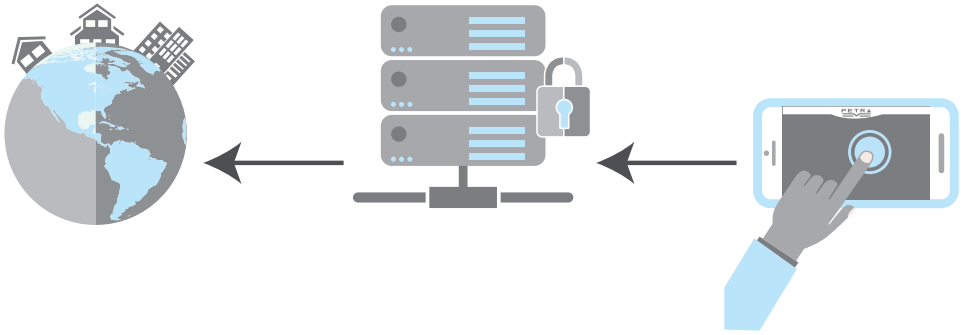
- **PC and Mobile WEB Interface**

  Using your Smart Phone or Tablet, you can control the system remotely

Smart Watch Solution (Optional)

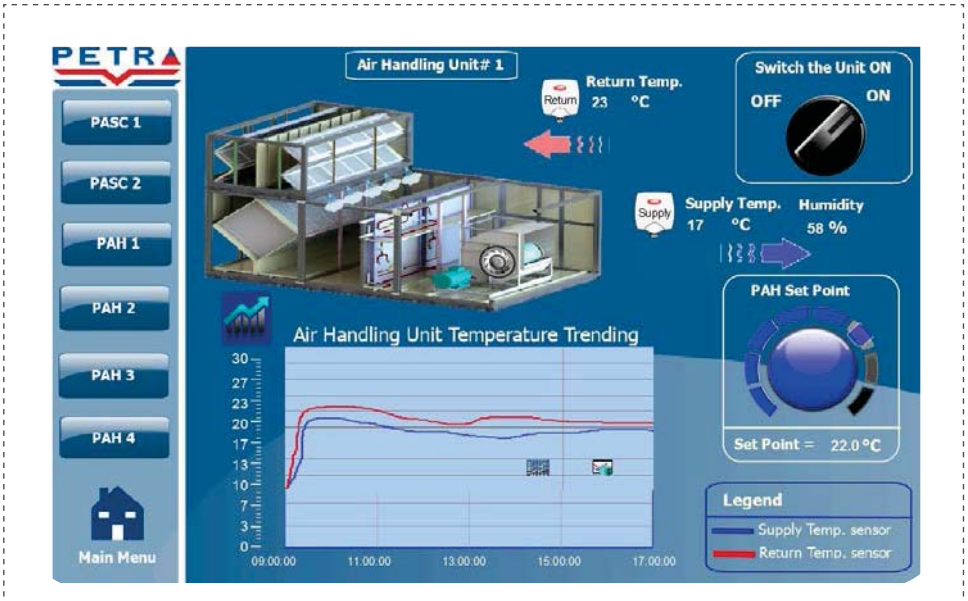
Smart Watch Features

- Compatible with BMS system
- Compatible with SCADA system
- Touch screen up to 13.3”
- Providing full details about your system
- Ability to control multi HVAC units in your system (chillers, package units, air handling units, close control units, ducted split units, fan coil units, exhaust fans...etc.)
- Using the Smart Watch, you can now exploit a new platform of services using the latest technologies available in the market and widely used in other applications
- Cloud computing, wireless connectivity & internet of things (IOT) in the HVAC units becomes a reality with this smart control system
- Security of the communications and data is the most top priority
- All systems will be secure with very well-known strong security methods
- Improve customer service levels through faster troubleshooting



Smart Watch Insight

User friendly management station for the control, monitoring and analyzing for all integrating HVAC systems

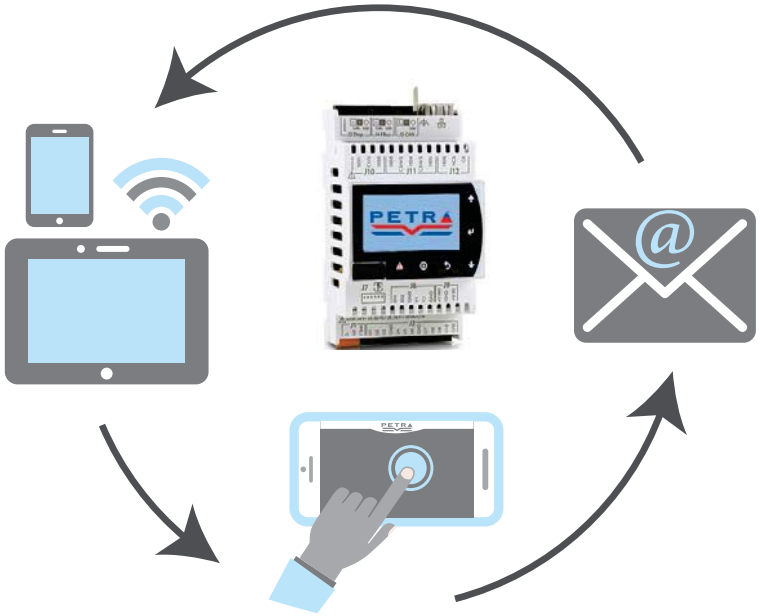


Web User Interfaces

Through this system, you can control your units through BMS, your smart phone or any hand help device

Also, through this system you will be able to send information through email alerts

You will be able to send the type of problem through an email alert



Technical Specifications

Power Supply	220-240Vac/1Ph/60Hz
Touch Keypad Type	TFT
Touch Keypad Resolution	800 x 1280, WVGA
Operating Temperature	0ºC to 50ºC
Storage Temperature	-20 ºC to 70 ºC
Operating and Storage Humidity	5 to 85% relative humidity
Interfaces	Modbus Port / USB Port

Physical Data - SI

PSC4		50	55	65	75	85	95	105	110
COMPRESSOR									
Type		Hermetic Scroll							
Qty		1+1	2	2+1	4	2+2	4	2+2	1+3
Oil charge (Ckt1/Ckt2)	Liter	6.8/6.3	6.3/6.3	9.4/6.3	9.4/9.4	9.4/13.6	13.6/13.6	13.6/12.6	13.6/12.6
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		2	2	2	2	2	2	2	2
Refrigerant charge @50Hz	kg	30	33	39	44	49	55	61	64
Refrigerant charge @60Hz	kg	36	39	46	51	57	64	71	74
CONDENSER COIL									
Qty (Ckt1/Ckt2)		1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2
Total face area	m^2	6.4	6.4	12.8	12.8	12.8	12.8	12.8	12.8
Max working refrigeration pressure	kPa	4,100							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2)		1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	mm	900							
Total air flow rate (50Hz)	L/s	17,275	17,275	35,861	35,861	34,550	34,550	34,550	34,550
Total air flow rate (60Hz)	L/s	19,499	19,499	40,437	40,437	38,998	38,998	38,998	38,998
Motor power (50/60Hz)	kW	1.45/2.30							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	1	1	1	1
Net fluid volume	Liter	62	62	62	105	105	151	151	151
Designed refrigeration pressure	kPa	1,500							
Max water pressure	kPa	1,000							
Water connection size	mm	100	100	100	125	125	150	150	150
Water connection type		Grooved Coupling							
Drain connection size	mm	12.5							

Legend

- Ckt : Refrigeration circuit

PSC4		115	120	125	135	145	155	170	180
COMPRESSOR									
Type		Hermetic Scroll							
Qty		4	4+2	2+4	6	4+2	3+3	6	8
Oil charge (Ckt1/Ckt2/Ckt3/Ckt4)	Liter	12.6/12.6	9.4/9.4 /13.6	9.4/13.6 /13.6	13.6/13.6 /13.6	13.6/13.6 /12.6	13.6/13.6 /12.6	12.6/12.6 /12.6	13.6/13.6 /13.6/13.6
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		2	3	3	3	3	3	3	4
Refrigerant charge @50Hz	kg	63	68	71	77	81	84	87	100
Refrigerant charge @60Hz	kg	74	78	82	90	95	98	102	117
CONDENSER COIL									
Qty (Ckt1/Ckt2/Ckt3/Ckt4)		2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2/2	2/2/2/2
Total face area	m^2	12.8	19.1	19.1	19.1	19.1	19.1	19.1	25.5
Max working refrigeration pressure	kPa	4,100							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2/Ckt3/Ckt4)		2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2/2	2/2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	mm	900							
Total air flow rate (50Hz)	L/s	34,550	51,824	51,824	51,824	51,824	51,824	51,824	69,099
Total air flow rate (60Hz)	L/s	38,998	58,497	58,497	58,497	58,497	58,497	58,497	77,997
Motor power (50/60Hz)	kW	1.45/2.30							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	1	1	1	1
Net fluid volume	Liter	151	151	137	137	137	240	240	234
Designed refrigeration pressure	kPa	1,500							
Max water pressure	kPa	1,000							
Water connection size	mm	150	150	150	150	150	200	200	200
Water connection type		Grooved Coupling							
Drain connection size	mm	12.5							

Legend

- Ckt : Refrigeration circuit

Physical Data - SI

PSC4		190	200	215	225	235	250	265	285
COMPRESSOR									
Type		Hermetic Scroll							
Qty		6+2	4+4	2+6	8	8+4	4+8	12	8+4
Oil charge (Ckt1/Ckt2/Ckt3 /Ckt4/Ckt5/Ckt6)	Liter	13.6/13.6 /13.6/12.6	13.6/13.6 /12.6/12.6	13.6/12.6 /12.6/12.6	12.6/12.6 /12.6/12.6	9.4/9.4 /9.4/9.4 /13.6/13.6	9.4/9.4 /13.6/13.6 /13.6/13.6	13.6/13.6 /13.6/13.6 /13.6/13.6	13.6/13.6 /13.6/13.6 /12.6/12.6
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		4	4	4	4	6	6	6	6
Refrigerant charge @50Hz	kg	100	108	115	121	128	133	141	150
Refrigerant charge @60Hz	kg	117	126	134	140	149	156	165	174
CONDENSER COIL									
Qty (Ckt1/Ckt2/Ckt3 /Ckt4/Ckt5/Ckt6)		2/2/2/2	2/2/2/2	2/2/2/2	2/2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2
Total face area	m^2	25.5	25.5	25.5	25.5	38.3	38.3	38.3	38.3
Max working refrigeration pressure	kPa	4,100							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2/Ckt3 /Ckt4/Ckt5/Ckt6)		2/2/2/2	2/2/2/2	2/2/2/2	2/2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	mm	900							
Total air flow rate (50Hz)	L/s	69,099	69,099	69,099	69,099	103,649	103,649	103,649	103,649
Total air flow rate (60Hz)	L/s	77,997	77,997	77,997	77,997	116,995	116,995	116,995	116,995
Motor power (50/60Hz)	kW	1.45/2.30							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	2	2	2	2
Net fluid volume	Liter	234	234	241	241	303	303	274	274
Designed refrigeration pressure	kPa	1,500							
Max water pressure	kPa	1,000							
Water connection size	mm	200	200	200	200	150	150	150	150
Water connection type		Grooved Coupling							
Drain connection size	mm	12.5							

Legend

- Ckt : Refrigeration circuit

PSC4		315	335	355	380	400	420	445
COMPRESSOR								
Type		Hermetic Scroll						
Qty		4+8	12	16	12+4	8+8	4+12	16
Oil charge (Ckt1/Ckt2/Ckt3/Ckt4/ Ckt5/Ckt6/ Ckt7 Ckt8)	Liter	13.6/13.6 /12.6/12.6 /12.6/12.6	12.6/12.6 /12.6/12.6 /12.6/12.6	13.6/13.6 /13.6/13.6 /13.6/13.6 /13.6/13.6	13.6/13.6 /13.6/13.6 /13.6/13.6 /12.6/12.6	13.6/13.6 /13.6/13.6 /12.6/12.6 /12.6/12.6	13.6/13.6 /12.6/12.6 /12.6/12.6 /12.6/12.6	12.6/12.6 /12.6/12.6 /12.6/12.6 /12.6/12.6
REFRIGERANT								
Refrigerant type		R-410a						
No. of refrigerant circuits		6	6	8	8	8	8	8
Refrigerant charge @50Hz	kg	163	175	190	201	217	229	242
Refrigerant charge @60Hz	kg	189	203	221	234	252	268	280
CONDENSER COIL								
Qty (Ckt1/Ckt2/Ckt3 Ckt4/Ckt5/Ckt6/ Ckt7/Ckt8)		2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2
Total face area	m^2	38.3	38.3	51.0	51.0	51.0	51.0	51.0
Max working refrigeration pressure	kPa	4,100						
CONDENSER FAN								
Type		Direct Drive External Rotor						
Qty (Ckt1/Ckt2/Ckt3/Ckt4/Ckt5/ Ckt6/ Ckt7/Ckt8)		2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100						
No of blades		5						
Nominal Diameter	mm	900						
Total air flow rate (50Hz)	L/s	103,649	103,649	138,198	138,198	138,198	138,198	138,198
Total air flow rate (60Hz)	L/s	116,995	116,995	155,994	155,994	155,994	155,994	155,994
Motor power (50/60Hz)	kW	1.45/2.30						
COOLER								
Type		DX Shell & Tube						
Qty		2	2	2	2	2	2	2
Net fluid volume	Liter	480	480	468	468	468	482	482
Designed refrigeration pressure	kPa	1,500						
Max water pressure	kPa	1,000						
Water connection size	mm	200	200	200	200	200	200	200
Water connection type		Grooved Coupling						
Drain connection size	mm	12.5						

Legend

- Ckt : Refrigeration circuit

Physical Data - IMP

PSC4		50	55	65	75	85	95	105	110
COMPRESSOR									
Type		Hermetic Scroll							
Qty		1+1	2	2+1	4	2+2	4	2+2	1+3
Oil charge (Ckt1/Ckt2)	gal	1.8/1.7	1.7/1.7	2.5/1.7	2.5/2.5	2.5/3.6	3.6/3.6	3.6/3.3	3.6/3.3
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		2	2	2	2	2	2	2	2
Refrigerant charge @50Hz	lb	67	73	86	96	108	120	134	140
Refrigerant charge @60Hz	lb	78	86	101	111	125	140	157	164
CONDENSER COIL									
Qty (Ckt1/Ckt2)		1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2
Total face area	ft^2	68.6	68.6	137.2	137.2	137.2	137.2	137.2	137.2
Max working refrigeration pressure	psig	600							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2)		1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	inch	36							
Total air flow rate (50Hz)	cfm	36,607	36,607	75,992	75,992	73,214	73,214	73,214	73,214
Total air flow rate (60Hz)	cfm	41,321	41,321	85,691	85,691	82,641	82,641	82,641	82,641
Motor power (50/60Hz)	HP	2.0/3.0							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	1	1	1	1
Net fluid volume	gal	16.4	16.4	16.4	27.7	27.7	40.0	40.0	40.0
Designed refrigeration pressure	psig	220							
Max water pressure	psig	145							
Water connection size	mm	4	4	4	5	5	6	6	6
Water connection type		Grooved Coupling							
Drain connection size	inch	1/2							

Legend

- Ckt : Refrigeration circuit

PSC4		115	120	125	135	145	155	170	180
COMPRESSOR									
Type		Hermetic Scroll							
Qty		4	4+2	2+4	6	4+2	3+3	6	8
Oil charge (Ckt1/Ckt2/Ckt3/Ckt4)	gal	3.3/3.3	2.5/2.5 /3.6	2.5/3.6 /3.6	3.6/3.6 /3.6	3.6/3.6 /3.3	3.3/3.3 /3.3	3.3/3.3 /3.3	3.6/3.6 /3.6/3.6
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		2	3	3	3	3	3	3	4
Refrigerant charge @50Hz	lb	139	150	156	170	180	185	193	221
Refrigerant charge @60Hz	lb	163	172	181	198	209	214	224	258
CONDENSER COIL									
Qty (Ckt1/Ckt2/Ckt3/Ckt4)		2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2/2	2/2/2/2
Total face area	ft^2	137.2	205.8	205.8	205.8	205.8	205.8	205.8	274.4
Max working refrigeration pressure	psig	600							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2/Ckt3/Ckt4)		2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2/2	2/2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	inch	36							
Total air flow rate (50Hz)	cfm	73,214	109,821	109,821	109,821	109,821	109,821	109,821	146,428
Total air flow rate (60Hz)	cfm	82,641	123,962	123,962	123,962	123,962	123,962	123,962	165,283
Motor power (50/60Hz)	HP	2.0/3.0							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	1	1	1	1
Net fluid volume	gal	40.0	40.0	36.2	36.2	36.2	63.4	63.4	61.8
Designed refrigeration pressure	psig	220							
Max water pressure	psig	145							
Water connection size	mm	6	6	6	6	6	8	8	8
Water connection type		Grooved Coupling							
Drain connection size	inch	1/2							

Legend

- Ckt : Refrigeration circuit

Physical Data - IMP

PSC4		190	200	215	225	235	250	265	285
COMPRESSOR									
Type		Hermetic Scroll							
Qty		6+2	4+4	2+6	8	8+4	4+8	12	8+4
Oil charge (Ckt1/Ckt2/Ckt3/Ckt4/ Ckt5/Ckt6)	gal	3.6/3.6 /3.6/3.3	3.6/3.6 /3.3/3.3	3.6/3.3 /3.3/3.3	3.3/3.3 /3.3/3.3	2.5/2.5 /2.5/2.5 /3.6/3.6	2.5/2.5 /3.6/3.6 /3.6/3.6	3.6/3.6 /3.6/3.6 /3.6/3.6	3.6/3.6 /3.6/3.6 /3.3/3.3
REFRIGERANT									
Refrigerant type		R-410a							
No. of refrigerant circuits		4	4	4	4	6	6	6	6
Refrigerant charge @50Hz	lb	221	239	253	267	283	294	312	332
Refrigerant charge @60Hz	lb	258	278	295	309	330	343	363	383
CONDENSER COIL									
Qty (Ckt1/Ckt2/Ckt3/Ckt4/Ckt5/ Ckt6)		2/2/2/2	2/2/2/2	2/2/2/2	2/2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2
Total face area	ft^2	274.4	274.4	274.4	274.4	411.7	411.7	411.7	411.7
Max working refrigeration pressure	psig	600							
CONDENSER FAN									
Type		Direct Drive External Rotor							
Qty (Ckt1/Ckt2/Ckt3/Ckt4/Ckt5/ Ckt6)		2/2/2/2	2/2/2/2	2/2/2/2	2/2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2 /2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100							
No of blades		5							
Nominal Diameter	inch	36							
Total air flow rate (50Hz)	cfm	146,428	146,428	146,428	146,428	219,642	219,642	219,642	219,642
Total air flow rate (60Hz)	cfm	165,283	165,283	165,283	165,283	247,925	247,925	247,925	247,925
Motor power (50/60Hz)	HP	2.0/3.0							
COOLER									
Type		DX Shell & Tube							
Qty		1	1	1	1	2	2	2	2
Net fluid volume	gal	61.8	61.8	63.7	63.7	80.0	80.0	72.4	72.4
Designed refrigeration pressure	psig	220							
Max water pressure	psig	145							
Water connection size	mm	8	8	8	8	6	6	6	6
Water connection type		Grooved Coupling							
Drain connection size	inch	1/2							

Legend

- Ckt : Refrigeration circuit

PSC4		315	335	355	380	400	420	445
COMPRESSOR								
Type		Hermetic Scroll						
Qty		4+8	12	16	12+4	8+8	4+12	16
Oil charge (Ckt1/Ckt2/Ckt3/Ckt4/ Ckt5/Ckt6/ Ckt7/Ckt8)	gal	3.6/3.6 /3.3/3.3 /3.3/3.3	3.3/3.3 /3.3/3.3 /3.3/3.3	3.6/3.6 /3.6/3.6 /3.6/3.6 /3.6/3.6	3.6/3.6 /3.6/3.6 /3.6/3.6 /3.3/3.3	3.6/3.6 /3.6/3.6 /3.3/3.3 /3.3/3.3	3.6/3.6 /3.3/3.3 /3.3/3.3 /3.3/3.3	3.3/3.3 /3.3/3.3 /3.3/3.3 /3.3/3.3
REFRIGERANT								
Refrigerant type		R-410a						
No. of refrigerant circuits		6	6	8	8	8	8	8
Refrigerant charge @50Hz	lb	359	385	418	443	478	505	533
Refrigerant charge @60Hz	lb	417	448	488	516	556	590	618
CONDENSER COIL								
Qty (Ckt1/Ckt2/Ckt3/Ckt4/Ckt5/ Ckt6/ Ckt7/Ckt8)		2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2
Total face area	ft^2	411.7	411.7	548.9	548.9	548.9	548.9	548.9
Max working refrigeration pressure	psig	600						
CONDENSER FAN								
Type		Direct Drive External Rotor						
Qty (Ckt1/Ckt2/Ckt3/Ckt4/Ckt5/ Ckt6/ Ckt7/Ckt8)		2/2/2 /2/2/2	2/2/2 /2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2	2/2/2/2 /2/2/2/2
Nominal speed (50/60Hz)	rpm	900/1,100						
No of blades		5						
Nominal Diameter	inch	36						
Total air flow rate (50Hz)	cfm	219,642	219,642	292,856	292,856	292,856	292,856	292,856
Total air flow rate (60Hz)	cfm	247,925	247,925	330,566	330,566	330,566	330,566	330,566
Motor power (50/60Hz)	HP	2.0/3.0						
COOLER								
Type		DX Shell & Tube						
Qty		2	2	2	2	2	2	2
Net fluid volume	gal	126.8	126.8	123.6	123.6	123.6	127.4	127.4
Designed refrigeration pressure	psig	220						
Max water pressure	psig	145						
Water connection size	mm	8	8	8	8	8	8	8
Water connection type		Grooved Coupling						
Drain connection size	inch	1/2						

Legend

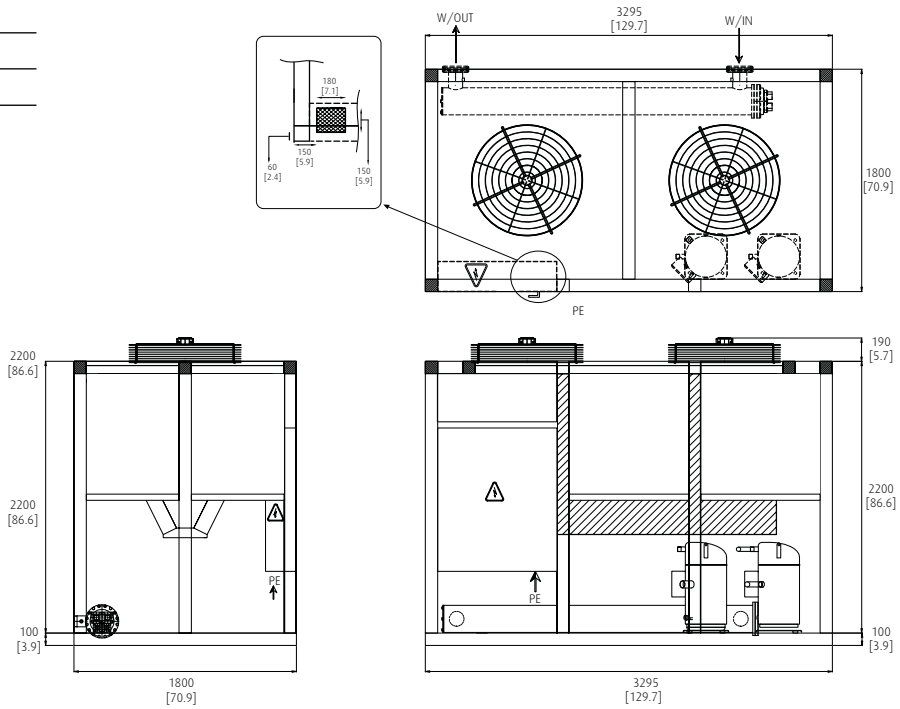
- Ckt : Refrigeration circuit

Model Layout

Model

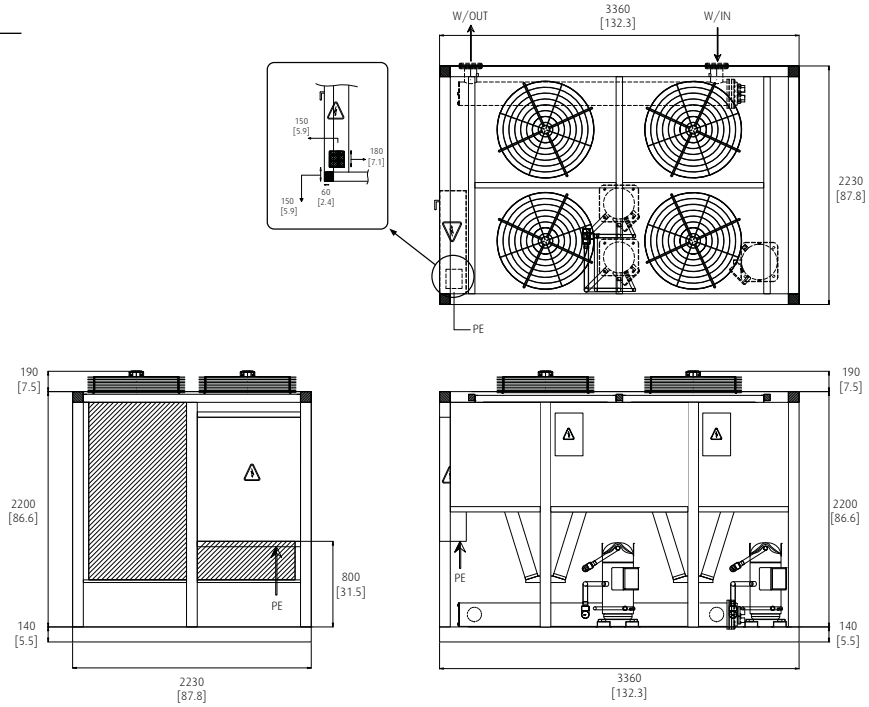
PSC4 50

PSC4 55



Model

PSC4 65



Note

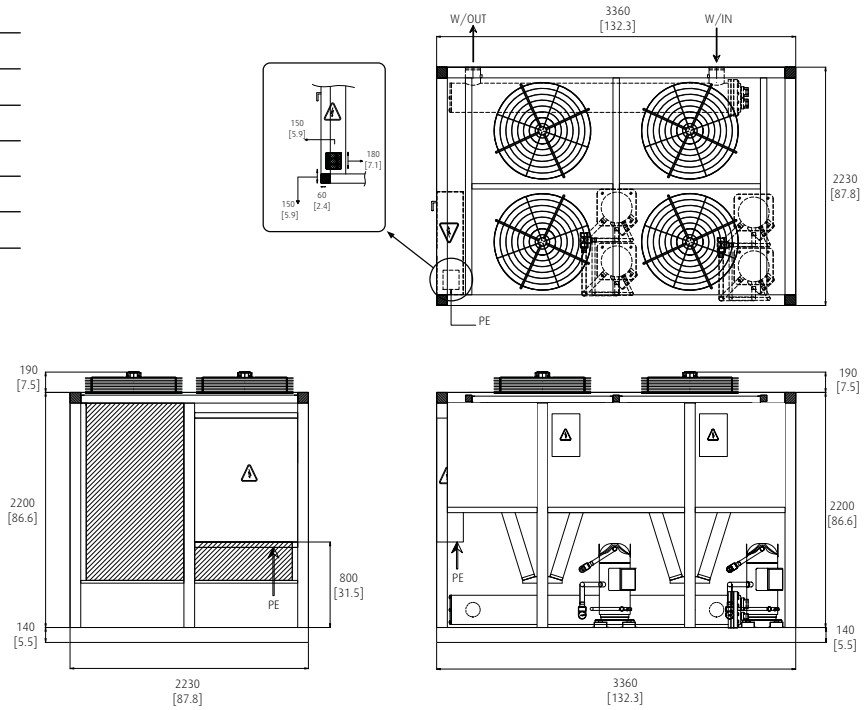
- Unit clearance
- Top: no obstacles
- Sides: 1.8 m (6 ft)

Legend

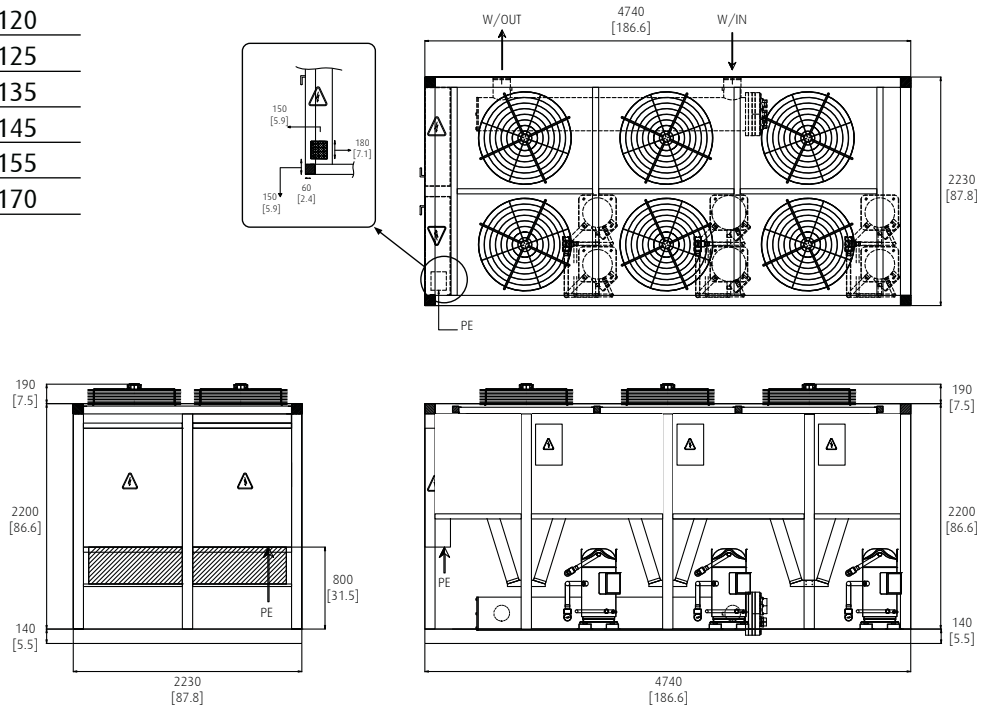
- W / OUT : Cooler (Barrel) water outlet
- W / IN : Cooler (Barrel) water inlet
- PE : Power entry

- All dimensions are in mm [inch]

Model
PSC4 75
PSC4 85
PSC4 95
PSC4 105
PSC4 110
PSC4 115



Model
PSC4 120
PSC4 125
PSC4 135
PSC4 145
PSC4 155
PSC4 170



Note

- Unit clearance
- Top: no obstacles
- Sides: 1.8 m (6 ft)

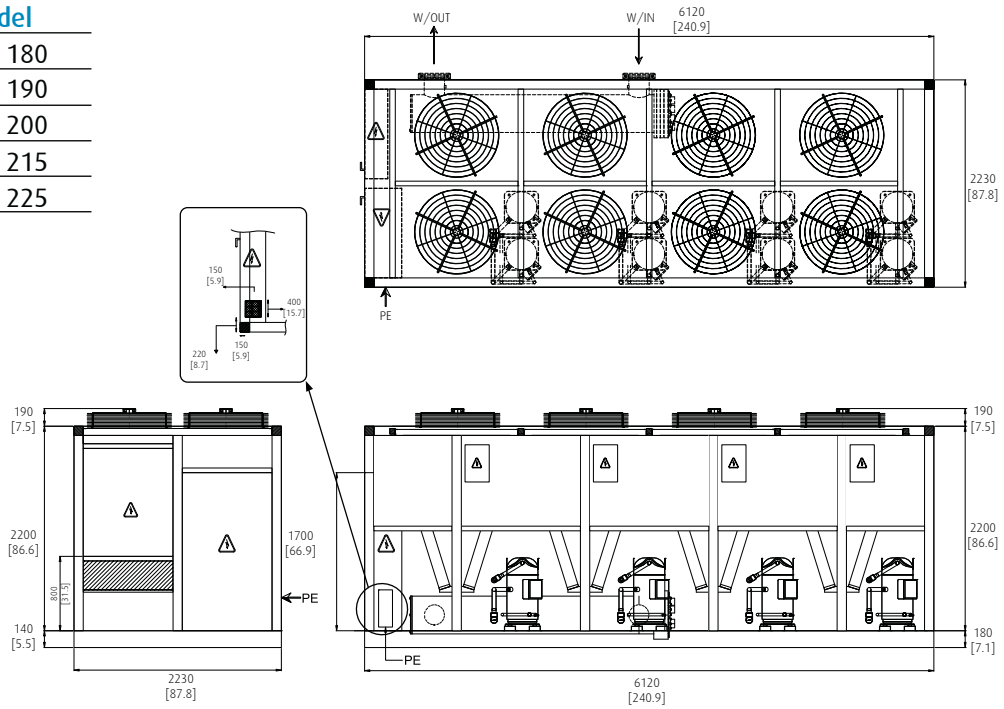
Legend

- W / OUT : Cooler (Barrel) water outlet
- W / IN : Cooler (Barrel) water inlet
- PE : Power entry

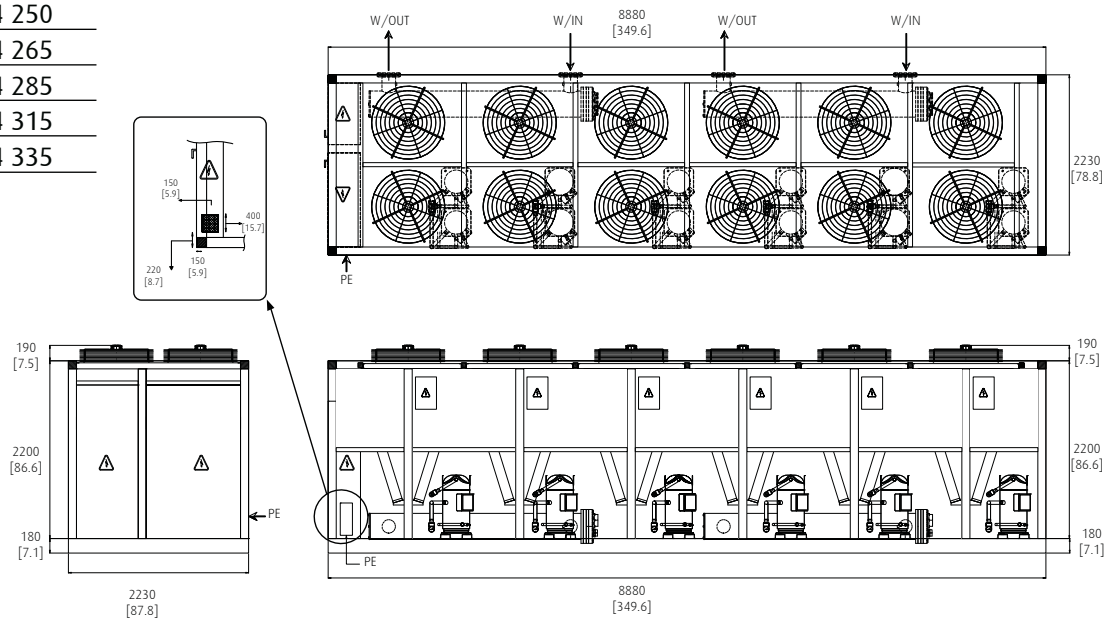
- All dimensions are in mm [inch]

Model Layout

Model
PSC4 180
PSC4 190
PSC4 200
PSC4 215
PSC4 225



Model
PSC4 235
PSC4 250
PSC4 265
PSC4 285
PSC4 315
PSC4 335



Note

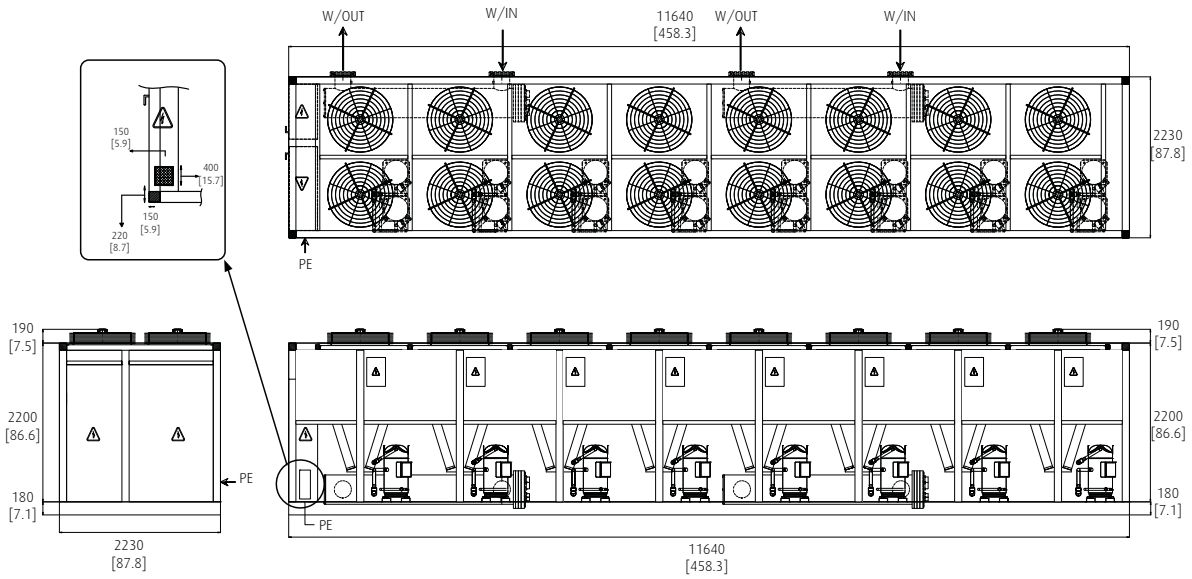
- Unit clearance
- Top: no obstacles
- Sides: 1.8 m (6 ft)

Legend

- W / OUT : Cooler (Barrel) water outlet
- W / IN : Cooler (Barrel) water inlet
- PE : Power entry

- All dimensions are in mm [inch]

Model
PSC4 355
PSC4 380
PSC4 400
PSC4 420
PSC4 445



Note

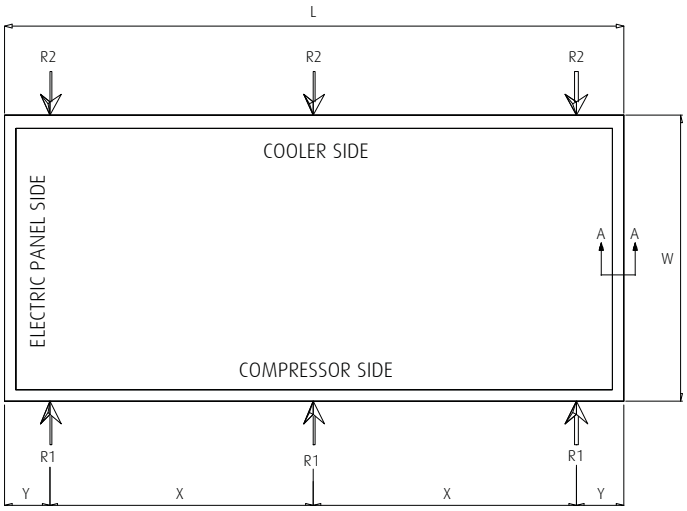
- Unit clearance
- Top: no obstacles
- Sides: 1.8 m (6 ft)

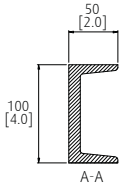
Legend

- W / OUT : Cooler (Barrel) water outlet
- W / IN : Cooler (Barrel) water inlet
- PE : Power entry

- All dimensions are in mm [inch]

Load Distribution





MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
50	3295	129.7	1800	70.9	1408	55.4	240	9.4
55	3295	129.7	1800	70.9	1408	55.4	240	9.4

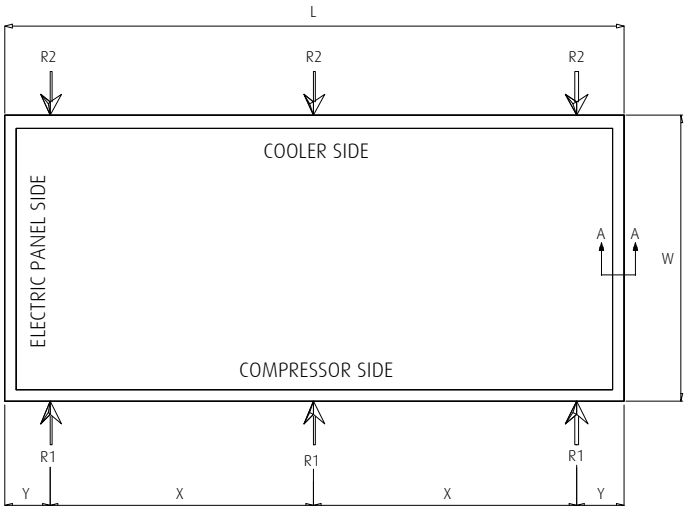
MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
50	280	617	258	569	1615	3,561	320	706	295	650	1845	4,068
55	285	628	263	580	1645	3,627	325	717	300	662	1875	4,134

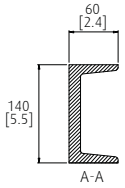
Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content





MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
65	3360	132.3	2230	87.8	1440	56.7	240	9.4
75	3360	132.3	2230	87.8	1440	56.7	240	9.4
85	3360	132.3	2230	87.8	1440	56.7	240	9.4
95	3360	132.3	2230	87.8	1440	56.7	240	9.4
105	3360	132.3	2230	87.8	1440	56.7	240	9.4
110	3360	132.3	2230	87.8	1440	56.7	240	9.4
115	3360	132.3	2230	87.8	1440	56.7	240	9.4

MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
65	425	937	394	869	2457	5,418	485	1,069	449	990	2802	6,178
75	467	1,030	430	948	2691	5,934	527	1,162	485	1,069	3036	6,694
85	498	1,098	459	1,012	2872	6,333	578	1,274	533	1,175	3332	7,347
95	537	1,184	497	1,096	3102	6,840	617	1,360	571	1,259	3562	7,854
105	550	1,213	509	1,122	3177	7,005	630	1,389	583	1,286	3637	8,020
110	555	1,224	513	1,131	3204	7,065	636	1,402	588	1,297	3632	8,097
115	560	1,235	517	1,140	3231	7,124	640	1,411	591	1,303	3691	8,139

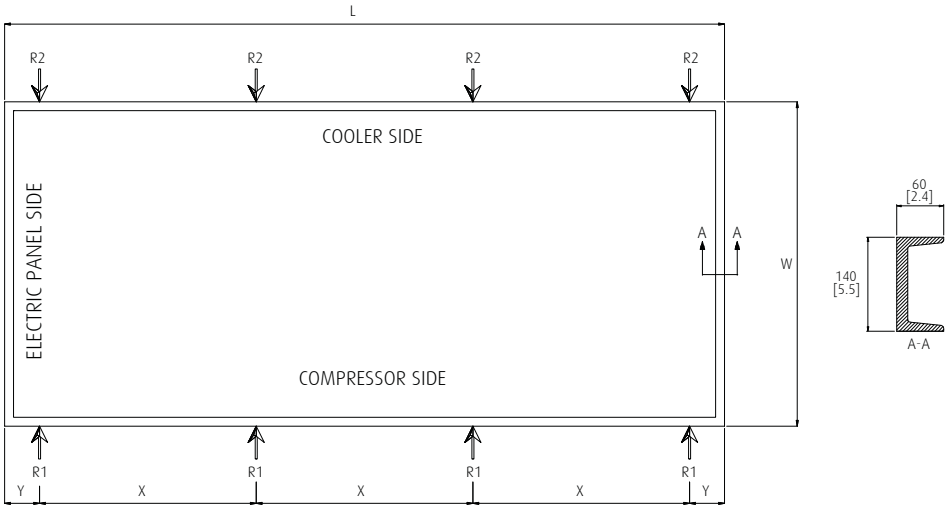
Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content

Load Distribution



MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
120	4740	186.6	2230	87.8	1420	55.9	240	9.4
125	4740	186.6	2230	87.8	1420	55.9	240	9.4
135	4740	186.6	2230	87.8	1420	55.9	240	9.4
145	4740	186.6	2230	87.8	1420	55.9	240	9.4
155	4740	186.6	2230	87.8	1420	55.9	240	9.4
170	4740	186.6	2230	87.8	1420	55.9	240	9.4

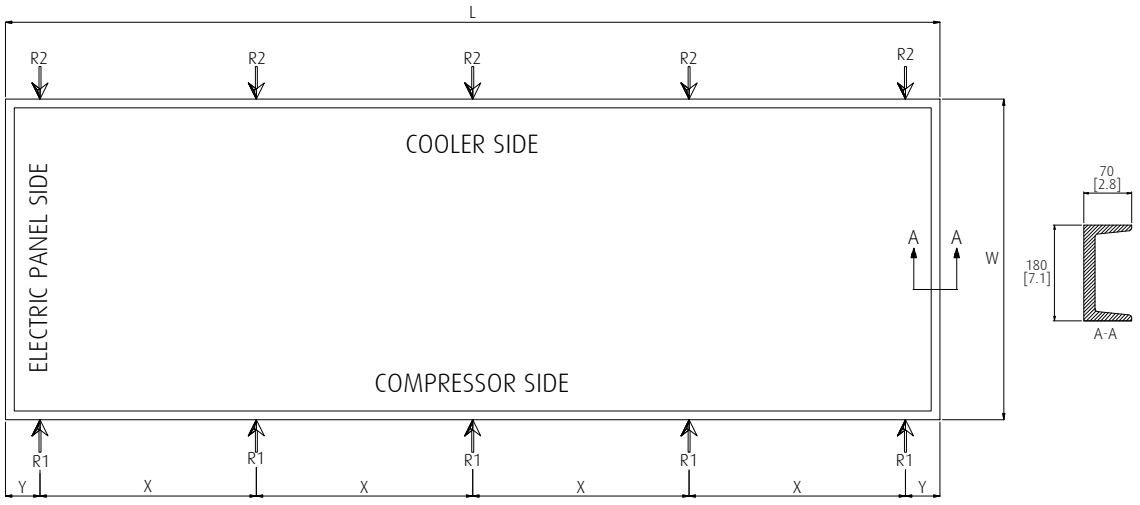
MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
120	547	1,206	504	1,111	4204	9,270	637	1,405	587	1,294	4894	10,791
125	554	1,222	512	1,129	4264	9,402	644	1,420	595	1,312	4954	10,924
135	562	1,239	519	1,144	4324	9,534	652	1,438	602	1,327	5014	11,056
145	569	1,255	525	1,158	4376	9,649	659	1,453	608	1,341	5066	11,171
155	589	1,299	543	1,197	4528	9,984	679	1,497	626	1,380	5220	11,510
170	618	1,363	570	1,257	4752	10,478	708	1,561	653	1,440	5442	12,000

Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content



MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
180	6120	240.9	2230	87.8	1410	55.5	240	9.4
190	6120	240.9	2230	87.8	1410	55.5	240	9.4
200	6120	240.9	2230	87.8	1410	55.5	240	9.4
215	6120	240.9	2230	87.8	1410	55.5	240	9.4
225	6120	240.9	2230	87.8	1410	55.5	240	9.4

MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
180	623	1,374	576	1,270	5995	13,219	719	1,585	664	1,464	6915	15,248
190	629	1,387	581	1,281	6050	13,340	725	1,599	669	1,475	6970	15,369
200	635	1,400	587	1,294	6110	13,473	731	1,612	675	1,488	7030	15,501
215	648	1,429	598	1,319	6230	13,737	744	1,641	686	1,513	7150	15,766
225	653	1,440	603	1,330	6280	13,847	749	1,652	691	1,524	7200	15,876

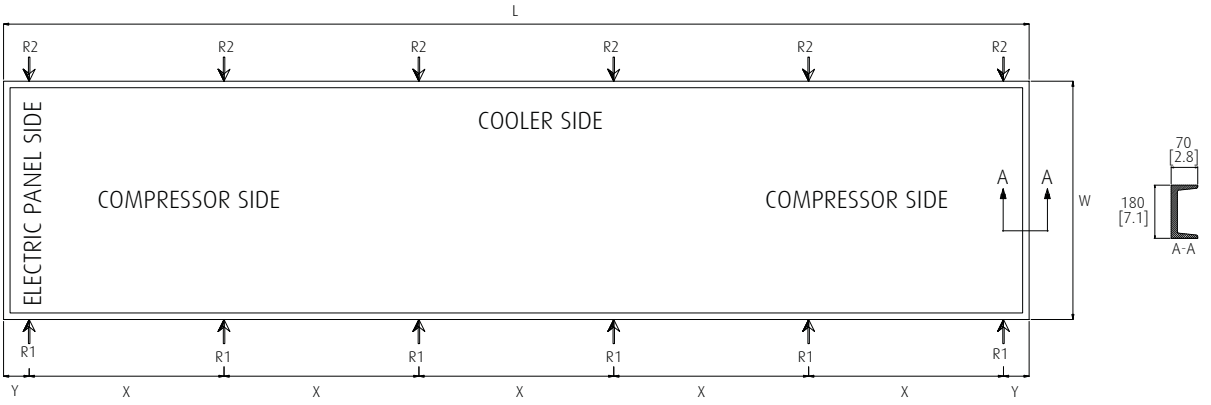
Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content

Load Distribution



MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
235	8880	349.6	2230	87.8	1680	66.1	240	9.4
250	8880	349.6	2230	87.8	1680	66.1	240	9.4
265	8880	349.6	2230	87.8	1680	66.1	240	9.4
285	8880	349.6	2230	87.8	1680	66.1	240	9.4
315	8880	349.6	2230	87.8	1680	66.1	240	9.4
335	8880	349.6	2230	87.8	1680	66.1	240	9.4

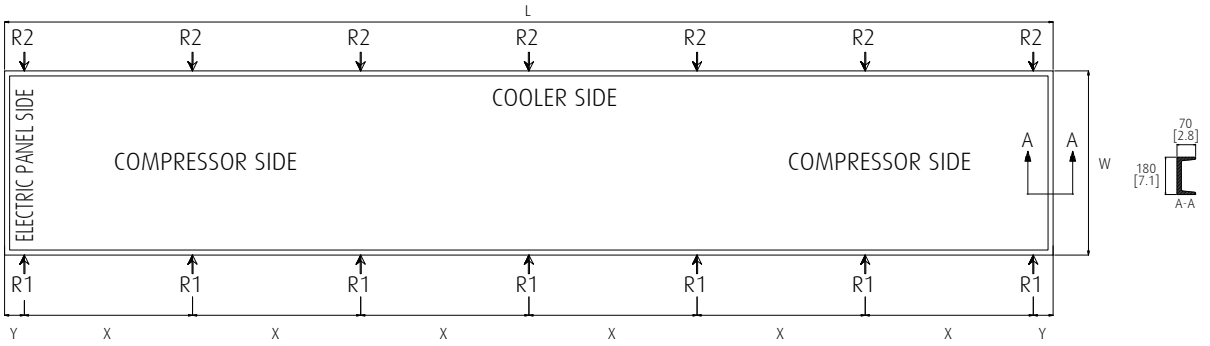
MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
235	733	1,616	677	1,493	8460	18,654	853	1,881	787	1,735	9840	21,697
250	743	1,638	687	1,515	8580	18,919	863	1,903	798	1,760	9960	21,962
265	754	1,663	696	1,535	8700	19,184	874	1,927	806	1,777	10080	22,226
285	763	1,682	705	1,555	8806	19,417	883	1,947	815	1,797	10186	22,460
315	817	1,801	754	1,663	9426	20,784	937	2,066	864	1,905	10806	23,827
335	828	1,826	764	1,685	9552	21,062	948	2,090	874	1,927	10932	24,105

Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content



MODEL (PSC4)	L		W		X		Y	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
355	11640	458.3	2230	87.8	1860	73.2	240	9.4
380	11640	458.3	2230	87.8	1860	73.2	240	9.4
400	11640	458.3	2230	87.8	1860	73.2	240	9.4
420	11640	458.3	2230	87.8	1860	73.2	240	9.4
445	11640	458.3	2230	87.8	1860	73.2	240	9.4

MODEL (PSC4)	Copper tubes Aluminum fins coil						Copper tubes Copper fins coil					
	R1		R2		Total		R1		R2		Total	
	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]	kg	[lb]
355	856	1,887	791	1,744	11530	25,424	993	2,190	917	2,022	13370	29,481
380	865	1,907	798	1,760	11641	25,668	1002	2,209	924	2,037	13481	29,726
400	873	1,925	806	1,777	11753	25,915	1010	2,227	932	2,055	13593	29,973
420	890	1,962	823	1,815	11991	26,440	1027	2,265	949	2,093	13831	30,497
445	899	1,982	830	1,830	12103	26,687	1036	2,284	956	2,108	13943	30,744

Legend

L: BASE LENGTH
W: BASE WIDTH
X: DISTANCE BETWEEN SUPPORTS
Y: DISTANCE BETWEEN SUPPORTS
R1: LOADS ON COMPRESSOR SIDE
R2: LOADS ON COOLER SIDE

Note

- load points & total weights are operating point including barrel (cooler) fluid content

Selection Procedure

Before you proceed with unit selection, the capacity should be corrected according to the location where the chiller will be installed

Altitude Correction Factors:

Since air density decreases at elevations above sea level, the fans provide less air mass over the condenser so unit performance should be corrected when operated substantially above sea level

Selection:

To select any chiller from the PSC4 series, the following should be provided:

- Design capacity in kW (Tons) of refrigeration
- Entering and leaving water temperature in °C (°F)
- Entering condenser air temperature in °C (°F)
- Altitude of space where chiller is to be installed

Example:

Design capacity	845 kW (240 Tons)
EWT/LWT	12.2/6.7 °C (54/44 °F)
Entering condenser air	35 °C (95 °F)
Altitude	305 m (1000 ft)
Power supply	380V/3Ph/60Hz
Fouling factor (Cooler)	0.00010 ft^2.hr.°F/BTU (0.000018 m^2.°C/W)

Altitude Meter [ft]	Correction Factor	Compressor Power Factor
Sea Level	1.000	1.000
305 (1000)	0.995	1.005
610 (2000)	0.990	1.010
915 (3000)	0.985	1.015
1220 (4000)	0.980	1.020
1525 (5000)	0.973	1.025
1830 (6000)	0.976	1.030
2135 (7000)	0.960	1.035
2440 (8000)	0.950	1.040

Selection Procedure:

The capacity should be corrected at 305 m (1000 ft)
Correction of capacity: 845 (240) / 0.995
= 850 kW (241 Tons)

Result of selection:

From the performance table on page 62 and the pressure drop curves on page 68, the operating data for the selected unit:

Unit:	PSC4 235
Capacity:	850 kW (241 Tons)
Power input:	230x1.005 = 231 kW
Barrel (Cooler) flow rate:	37 L/s (582 GPM)
Barrel (Cooler) pressure drop:	41 kPa (6 psi)

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Performance - 50 Hz - SI

Leaving Water Temperature = 4 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	154	7	43	145	6	47	136	6	51	127	6	56	118	5	62
55	169	7	47	159	7	52	149	7	57	139	6	62	128	6	69
65	197	9	51	186	8	55	175	8	61	163	7	68	152	7	75
75	218	10	57	207	9	63	195	9	69	182	8	76	170	7	85
85	245	11	64	232	10	70	218	10	77	204	9	85	190	8	94
95	275	12	73	261	11	80	245	11	89	229	10	97	211	9	107
105	307	13	84	289	13	92	273	12	101	255	11	111	235	10	122
110	324	14	88	304	13	96	286	12	106	266	12	117	247	11	128
115	337	15	93	319	14	102	298	13	113	278	12	124	257	11	136
120	357	16	91	336	15	100	315	14	110	294	13	122	274	12	135
125	388	17	94	367	16	103	343	15	114	320	14	125	299	13	138
135	410	18	110	387	17	120	363	16	133	338	15	146	315	14	160
145	440	19	119	416	18	131	389	17	144	366	16	158	337	15	175
155	456	20	126	429	19	138	402	18	153	378	16	167	348	15	185
170	512	22	138	479	21	153	451	20	167	421	18	184	389	17	203
180	545	24	147	518	23	161	483	21	177	453	20	194	419	18	213
190	577	25	157	543	24	172	515	22	188	478	21	207	443	19	228
200	608	27	166	575	25	182	541	24	200	502	22	220	466	20	242
215	647	28	180	610	27	197	574	25	217	535	23	238	497	22	261
225	678	30	187	635	28	207	600	26	226	558	24	249	516	23	274
235	714	31	166	672	29	182	631	28	200	588	26	222	547	24	246
250	755	33	182	715	31	200	670	29	220	625	27	243	581	25	267
265	821	36	200	773	34	219	726	32	242	677	30	265	630	28	291
285	881	39	223	832	36	245	778	34	269	733	32	295	674	30	326
315	973	42	243	915	40	267	864	38	293	808	35	322	747	33	356
335	1,024	45	276	958	42	305	903	39	335	842	37	367	777	34	405
355	1,090	48	270	1,036	45	296	967	42	326	906	40	358	838	37	393
380	1,154	50	291	1,086	48	319	1,029	45	348	956	42	384	887	39	422
400	1,216	53	332	1,150	50	363	1,081	47	399	1,004	44	439	932	41	485
420	1,294	57	350	1,220	54	383	1,148	50	423	1,069	47	464	994	43	508
445	1,357	59	374	1,269	56	414	1,199	53	452	1,117	49	498	1,033	45	548

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 5 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	158	7	43	150	7	47	141	6	52	131	6	56	122	5	62
55	174	8	47	163	7	52	154	7	57	143	6	63	133	6	69
65	203	9	51	192	8	56	180	8	62	169	7	68	156	7	75
75	227	10	58	214	9	63	201	9	69	187	8	77	175	8	85
85	255	11	64	240	10	71	226	10	78	211	9	86	197	9	95
95	283	12	74	269	12	81	252	11	89	235	10	98	220	10	107
105	316	14	84	298	13	92	282	12	102	262	11	111	244	11	122
110	332	15	88	314	14	98	294	13	107	275	12	118	254	11	129
115	348	15	94	328	14	103	308	13	114	286	12	125	263	12	138
120	366	16	92	345	15	101	326	14	111	304	13	123	283	12	136
125	401	17	95	377	17	104	353	16	115	332	14	126	307	13	139
135	421	18	111	398	17	121	374	16	134	349	15	146	325	14	161
145	455	20	121	428	19	132	404	18	145	376	16	159	349	15	175
155	467	20	128	444	19	140	417	18	154	389	17	169	361	16	185
170	525	23	140	496	22	154	465	20	168	434	19	185	399	17	204
180	565	25	148	531	23	162	498	22	178	467	20	195	436	19	214
190	594	26	158	564	25	173	528	23	189	495	22	208	455	20	229
200	626	27	168	595	26	183	555	24	202	521	23	221	480	21	243
215	667	29	181	632	27	199	590	26	219	552	24	240	511	22	263
225	697	31	188	657	29	208	620	27	228	575	25	251	532	23	276
235	733	32	168	691	30	184	652	28	202	607	27	224	567	25	247
250	779	34	184	733	32	202	692	30	221	643	28	244	601	26	268
265	842	37	202	796	35	221	749	33	243	698	31	266	651	28	292
285	909	40	225	857	37	247	808	35	271	752	33	297	698	30	327
315	1,001	44	245	944	41	269	891	39	295	826	36	326	771	34	357
335	1,049	46	280	992	43	308	930	41	337	869	38	371	798	35	408
355	1,129	49	272	1,063	46	299	996	44	328	935	41	360	872	38	395
380	1,188	52	292	1,128	49	320	1,056	46	351	990	43	385	911	40	425
400	1,252	55	335	1,189	52	366	1,110	49	403	1,041	45	442	960	42	486
420	1,334	58	352	1,264	55	386	1,180	52	426	1,104	48	468	1,022	45	512
445	1,393	61	377	1,313	57	417	1,240	54	456	1,149	50	502	1,065	46	553

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 50 Hz - SI

Leaving Water Temperature = 6 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	163	7	43	155	7	47	145	6	52	135	6	57	126	5	63
55	179	8	48	169	7	53	159	7	58	148	6	63	137	6	70
65	210	9	52	198	9	56	187	8	62	174	8	68	162	7	76
75	233	10	58	220	10	64	208	9	70	194	8	77	180	8	85
85	262	11	65	248	11	71	233	10	78	218	10	86	203	9	95
95	293	13	75	276	12	82	261	11	90	244	11	98	225	10	108
105	325	14	85	309	13	93	288	13	103	270	12	112	250	11	123
110	341	15	90	324	14	98	305	13	108	282	12	119	263	11	130
115	359	16	95	337	15	104	318	14	114	294	13	126	273	12	138
120	378	17	93	358	16	102	336	15	112	315	14	124	291	13	137
125	410	18	96	389	17	105	366	16	116	342	15	127	319	14	139
135	435	19	112	413	18	122	386	17	134	362	16	147	336	15	162
145	468	20	122	442	19	134	414	18	146	387	17	161	359	16	176
155	486	21	128	456	20	141	429	19	155	401	17	170	370	16	186
170	540	24	141	511	22	154	479	21	169	447	19	186	414	18	205
180	581	25	149	549	24	164	518	22	179	482	21	196	447	20	216
190	614	27	159	579	25	174	547	24	191	509	22	209	472	21	230
200	645	28	168	611	27	185	572	25	203	533	23	223	496	22	245
215	687	30	182	649	28	200	612	27	219	567	25	241	528	23	264
225	721	31	191	677	30	209	638	28	229	593	26	252	549	24	277
235	757	33	169	717	31	185	672	29	203	630	27	225	582	25	249
250	800	35	186	760	33	203	711	31	223	667	29	245	618	27	270
265	869	38	204	825	36	222	772	34	244	724	32	268	672	29	294
285	937	41	227	885	38	249	829	36	273	774	34	300	719	31	329
315	1,029	45	248	975	43	271	918	40	298	859	37	327	794	35	359
335	1,080	47	281	1,021	45	308	958	42	339	895	39	372	828	36	409
355	1,163	51	274	1,097	48	301	1,035	45	330	964	42	362	895	39	397
380	1,229	54	295	1,158	51	322	1,093	47	354	1,019	44	388	945	41	426
400	1,289	56	337	1,222	53	370	1,143	50	406	1,067	47	447	991	43	489
420	1,373	60	355	1,297	57	390	1,224	53	427	1,135	50	470	1,055	46	514
445	1,442	63	381	1,353	59	419	1,275	56	458	1,187	52	504	1,099	48	554

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 7 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	168	7	44	159	7	48	149	6	52	140	6	57	130	6	63
55	185	8	48	174	8	53	163	7	58	152	7	64	141	6	70
65	216	9	52	205	9	57	192	8	62	180	8	69	167	7	76
75	240	10	59	228	10	64	214	9	71	200	9	78	187	8	86
85	271	12	66	255	11	72	241	10	79	224	10	87	209	9	96
95	302	13	75	286	12	82	268	12	90	251	11	99	234	10	109
105	337	15	86	317	14	94	298	13	103	278	12	113	258	11	124
110	352	15	91	334	14	99	312	14	109	292	13	119	270	12	131
115	369	16	96	347	15	105	328	14	115	305	13	126	281	12	139
120	391	17	94	370	16	103	348	15	113	325	14	124	302	13	137
125	426	18	97	402	17	106	378	16	116	354	15	127	328	14	140
135	449	20	113	425	18	123	400	17	135	373	16	148	346	15	162
145	484	21	123	456	20	134	428	19	148	402	17	161	372	16	177
155	500	22	130	472	20	142	442	19	156	412	18	171	383	17	187
170	557	24	142	526	23	156	494	21	171	461	20	188	424	19	206
180	599	26	150	567	25	164	533	23	180	498	22	198	463	20	216
190	632	28	160	598	26	176	562	24	192	526	23	211	489	21	232
200	666	29	170	630	27	186	589	26	205	552	24	224	513	22	245
215	708	31	185	670	29	202	626	27	222	587	25	243	544	24	267
225	740	32	193	697	30	212	657	28	232	609	27	255	564	25	279
235	781	34	170	739	32	186	696	30	205	649	28	226	604	26	249
250	831	36	187	783	34	204	735	32	225	686	30	247	642	28	271
265	898	39	205	849	37	224	799	35	246	746	32	270	692	30	295
285	968	42	229	911	40	250	856	37	275	803	35	301	744	32	330
315	1,064	46	249	998	44	274	947	41	300	882	38	330	820	36	362
335	1,115	49	284	1,053	46	312	988	43	343	921	40	376	848	37	412
355	1,198	52	277	1,133	49	303	1,066	46	332	995	43	365	926	40	399
380	1,263	55	296	1,196	52	325	1,125	49	357	1,051	46	391	977	42	429
400	1,333	58	340	1,259	55	372	1,179	51	410	1,103	48	448	1,026	45	491
420	1,416	62	359	1,340	58	393	1,252	55	432	1,173	51	473	1,087	47	519
445	1,480	64	385	1,394	61	424	1,313	57	464	1,219	53	510	1,128	49	558

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 50 Hz - SI

Leaving Water Temperature = 8 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	174	8	44	164	7	48	155	7	52	143	6	58	133	6	63
55	190	8	49	179	8	53	168	7	59	158	7	64	145	6	70
65	223	10	52	210	9	57	199	9	63	186	8	69	173	8	76
75	249	11	59	235	10	65	222	10	71	207	9	78	193	8	86
85	278	12	66	263	11	72	247	11	80	232	10	87	215	9	96
95	311	14	76	293	13	83	277	12	91	260	11	100	241	10	109
105	347	15	87	327	14	95	308	13	104	287	12	114	267	12	125
110	363	16	91	342	15	100	322	14	110	301	13	120	279	12	132
115	378	16	97	358	16	106	335	15	116	313	14	127	290	13	140
120	403	18	94	380	17	104	359	16	113	334	15	125	312	14	138
125	438	19	98	415	18	107	389	17	117	363	16	128	340	15	141
135	462	20	114	438	19	124	413	18	136	383	17	149	357	15	164
145	496	22	124	470	20	136	441	19	149	412	18	163	383	17	178
155	513	22	131	487	21	143	454	20	157	426	18	173	395	17	188
170	573	25	144	543	24	157	508	22	173	473	21	189	440	19	207
180	618	27	152	583	25	166	549	24	182	513	22	199	477	21	218
190	653	28	162	618	27	177	579	25	194	541	24	212	503	22	233
200	685	30	172	650	28	188	608	26	206	568	25	226	528	23	247
215	732	32	185	687	30	203	648	28	223	604	26	245	561	24	268
225	762	33	195	716	31	213	674	29	234	631	27	256	584	25	280
235	806	35	172	761	33	188	719	31	206	669	29	227	624	27	251
250	854	37	188	809	35	206	756	33	226	710	31	249	660	29	273
265	925	40	207	876	38	226	825	36	247	766	33	272	714	31	298
285	992	43	231	939	41	253	882	38	278	824	36	304	767	33	332
315	1,091	48	252	1,034	45	276	977	42	301	909	39	332	845	37	363
335	1,146	50	288	1,085	47	314	1,015	44	345	947	41	377	880	38	413
355	1,236	54	280	1,167	51	306	1,098	48	335	1,026	45	367	953	41	402
380	1,307	57	299	1,235	53	328	1,157	50	360	1,081	47	392	1,006	44	432
400	1,370	59	344	1,299	56	376	1,217	53	412	1,136	49	453	1,055	46	494
420	1,463	63	361	1,374	60	396	1,296	56	435	1,207	52	477	1,121	49	522
445	1,525	66	389	1,432	63	426	1,348	59	468	1,262	55	512	1,168	51	560

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 10 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	184	8	45	173	8	49	162	7	54	141	6	60	131	6	66
55	202	9	50	190	8	54	177	8	60	167	7	65	154	7	71
65	236	10	53	224	10	58	211	9	64	198	9	70	185	8	77
75	263	11	60	249	11	66	235	10	72	219	10	79	192	8	90
85	282	12	67	271	12	73	264	11	81	247	11	88	230	10	97
95	329	14	77	311	14	84	293	13	92	274	12	101	256	11	110
105	365	16	88	337	15	95	315	14	105	295	13	115	281	12	127
110	382	17	93	352	15	101	331	14	110	320	14	122	295	13	133
115	401	17	99	379	16	108	356	15	118	332	14	129	308	13	141
120	429	19	96	405	18	105	382	16	115	357	15	127	334	14	139
125	467	20	99	438	19	109	412	18	119	386	17	130	358	16	143
135	492	21	115	464	20	126	434	19	138	395	17	150	367	16	165
145	511	22	125	483	21	136	469	20	151	436	19	165	408	18	180
155	544	24	133	501	22	144	484	21	159	451	19	175	417	18	191
170	588	26	145	574	25	160	535	23	175	487	21	190	467	20	209
180	652	28	154	621	27	168	580	25	184	542	24	201	491	21	219
190	671	29	162	653	28	180	595	26	196	557	24	213	535	23	236
200	729	31	175	684	30	191	647	28	209	602	26	230	558	24	251
215	767	33	190	707	31	205	665	29	225	640	28	248	576	25	270
225	783	34	196	737	32	215	716	31	238	667	29	260	621	27	283
235	858	37	175	810	35	190	764	33	209	714	31	231	668	29	253
250	906	39	191	858	37	209	808	35	229	756	33	252	699	30	277
265	984	43	210	927	40	229	868	38	251	790	34	273	735	32	299
285	1,022	44	233	965	42	255	938	40	281	872	38	308	816	35	336
315	1,155	50	256	1,092	48	281	1,034	45	307	962	42	336	893	39	367
335	1,176	51	290	1,149	50	320	1,071	47	351	974	42	380	935	40	418
355	1,304	57	283	1,243	54	309	1,160	51	339	1,085	47	371	982	42	404
380	1,342	58	301	1,307	57	333	1,189	52	363	1,113	48	395	1,070	46	437
400	1,458	63	349	1,367	59	383	1,293	56	418	1,205	52	459	1,116	48	502
420	1,534	67	370	1,415	61	399	1,330	58	437	1,281	56	482	1,152	50	525
445	1,566	68	393	1,475	64	429	1,431	62	475	1,333	58	519	1,242	54	567

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 50 Hz - IMP

Leaving Water Temperature = 40 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	44.6	108	42	41.7	101	47	39.1	94	52	36.0	87	58	33.3	80	64
55	48.8	118	47	45.9	111	52	42.7	103	58	39.5	95	64	36.0	87	71
65	57.1	137	50	53.5	129	56	50.0	121	62	46.5	112	69	42.6	103	78
75	63.4	154	57	59.9	144	63	55.8	134	70	51.5	125	78	47.6	115	88
85	71.2	173	64	67.0	162	71	62.4	151	78	58.2	140	87	53.3	129	97
95	79.6	192	73	74.7	181	81	70.0	168	90	64.9	157	100	59.9	144	110
105	89.2	215	83	83.4	202	92	78.3	188	102	72.1	174	114	66.0	160	126
110	93.8	226	87	87.7	212	97	81.8	197	108	75.4	183	120	69.3	167	133
115	97.7	236	93	91.9	221	103	85.1	206	114	79.1	190	127	72.2	175	140
120	103.5	249	91	96.8	234	101	90.1	218	112	83.6	202	125	77.4	186	140
125	112.0	271	94	105.6	254	104	98.5	238	115	91.5	220	128	83.8	203	143
135	118.9	286	109	111.5	270	121	104.0	250	135	96.1	233	149	88.6	213	166
145	127.9	309	118	119.7	289	132	111.5	270	146	103.5	250	162	95.1	229	180
155	131.9	318	126	124.2	299	139	115.2	279	155	106.8	257	172	97.6	237	190
170	148.3	356	138	138.3	334	153	129.6	312	169	119.2	288	188	109.4	264	208
180	158.2	383	146	149.5	360	161	138.7	335	179	128.7	310	199	117.6	285	221
190	167.8	404	155	156.7	380	172	146.8	354	191	136.2	327	212	124.3	301	235
200	176.7	425	165	165.2	399	183	154.4	372	203	143.0	344	225	130.8	316	250
215	187.9	452	179	175.7	426	198	164.3	396	220	151.8	367	243	139.3	335	271
225	196.7	474	186	184.4	443	207	171.3	414	230	159.0	382	255	145.2	351	282
235	207.0	497	165	193.6	467	183	180.2	437	204	167.2	404	228	154.7	372	255
250	219.6	529	181	206.1	496	200	191.4	463	223	177.2	428	249	164.0	394	276
265	237.9	573	199	223.0	539	220	208.1	501	245	192.2	465	271	177.2	426	301
285	255.8	618	221	239.5	577	247	223.0	541	273	207.1	499	303	190.1	457	336
315	282.6	679	241	263.9	638	268	248.2	596	297	228.5	552	330	210.1	506	367
335	296.7	712	275	276.6	669	306	259.3	623	339	238.4	577	376	218.7	527	417
355	316.3	766	268	298.9	719	296	277.3	671	330	257.5	620	366	235.2	570	406
380	335.7	809	288	313.4	760	319	293.7	708	354	272.4	654	393	248.7	602	436
400	353.5	850	330	330.3	797	366	308.8	744	406	286.1	688	450	261.5	631	500
420	375.8	905	348	351.4	851	385	328.6	791	428	303.6	735	474	278.7	670	527
445	393.4	948	372	368.8	887	414	342.6	829	459	318.0	764	509	290.5	702	564

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 42 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	46.1	111	43	43.5	104	47	40.5	97	52	37.6	90	58	34.3	83	64
55	50.6	122	47	47.3	114	52	44.4	107	58	40.7	98	65	37.5	90	71
65	58.9	142	51	55.5	134	56	51.6	125	63	48.1	116	70	44.4	107	78
75	66.0	158	58	61.8	149	63	57.6	139	70	53.8	129	79	49.3	119	88
85	74.2	178	64	69.4	167	71	65.0	156	79	59.9	145	88	55.4	133	98
95	82.4	199	74	77.7	187	82	72.3	174	91	67.4	162	100	61.9	149	111
105	92.2	222	84	86.2	208	93	80.6	194	103	74.5	180	114	68.7	166	126
110	96.4	233	88	91.0	218	98	84.4	204	109	78.0	188	121	71.6	173	133
115	100.6	243	94	94.7	228	104	88.6	212	115	81.3	196	128	74.9	180	142
120	106.6	257	92	99.9	242	102	93.8	226	113	86.4	209	126	79.8	193	141
125	116.5	280	94	109.1	264	104	101.5	245	116	94.6	228	129	87.2	209	144
135	122.8	296	110	115.1	278	122	107.7	259	135	99.9	240	150	91.6	221	166
145	132.5	318	120	123.9	299	133	115.8	279	147	106.6	258	164	98.4	237	181
155	136.2	329	127	128.4	309	140	119.8	288	156	110.4	267	173	101.7	245	191
170	152.8	368	139	143.8	345	154	133.4	322	170	123.6	297	190	112.6	272	210
180	164.5	395	147	153.7	371	163	143.3	346	180	132.9	320	200	122.6	295	222
190	173.3	418	156	162.7	392	174	151.6	366	192	140.3	338	214	129.3	311	237
200	182.4	439	166	170.8	413	184	159.4	384	205	147.9	356	227	136.2	327	251
215	194.4	468	180	183.0	439	199	169.3	409	222	156.8	377	246	143.9	348	271
225	202.4	489	188	190.2	458	209	178.0	427	231	163.3	395	257	150.6	361	284
235	213.2	514	167	199.9	483	185	187.5	451	205	172.9	418	229	159.6	385	256
250	226.9	547	182	212.0	513	202	198.5	478	225	184.5	443	250	168.8	408	278
265	245.5	593	200	230.2	556	222	215.4	518	246	199.8	479	273	183.1	442	302
285	265.0	636	224	247.8	598	248	231.6	557	275	213.3	515	306	196.8	474	338
315	291.3	701	244	275.0	659	270	255.1	615	300	235.8	570	333	216.8	523	370
335	305.6	736	278	287.6	690	307	266.8	645	341	247.1	593	379	225.1	544	420
355	328.9	790	270	307.5	742	300	286.6	693	332	265.8	640	369	245.2	590	408
380	346.5	837	290	325.4	784	322	303.1	732	357	280.7	676	397	258.6	621	439
400	364.7	878	333	341.7	826	368	318.8	769	409	295.8	711	453	272.4	653	501
420	388.8	936	350	366.0	878	387	338.7	818	432	313.6	755	479	287.7	696	528
445	404.8	978	377	380.4	916	418	356.1	855	462	326.7	789	514	301.1	723	568

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 50 Hz - IMP

Leaving Water Temperature = 44 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	47.6	114	43	44.9	108	48	41.6	100	53	38.6	93	59	35.6	86	65
55	52.0	125	48	49.0	118	53	45.7	110	59	42.4	102	65	38.9	93	72
65	61.2	147	51	57.3	138	57	53.7	129	63	49.8	120	70	45.9	110	79
75	68.2	164	58	64.0	154	64	59.9	144	71	55.6	133	79	51.3	123	89
85	76.5	184	65	72.1	173	72	66.9	161	80	62.3	150	88	57.3	138	99
95	85.7	205	74	80.3	193	82	75.1	180	91	69.4	167	101	64.2	154	112
105	95.1	229	85	89.6	215	94	83.7	201	104	77.1	186	115	70.9	170	128
110	99.7	240	89	93.8	226	99	87.4	210	110	80.5	194	121	74.2	179	134
115	104.8	251	94	97.6	235	105	91.1	219	116	84.5	203	129	77.2	185	143
120	110.9	266	92	104.2	249	102	96.8	233	114	89.7	216	127	83.0	200	141
125	120.3	289	96	113.3	272	105	105.8	253	117	98.1	235	130	90.0	217	144
135	127.4	305	111	119.8	287	123	111.1	268	137	103.1	248	151	94.9	228	167
145	136.7	328	121	128.7	309	134	119.2	288	149	111.2	266	165	102.1	244	182
155	141.2	340	128	132.5	319	142	123.5	297	157	114.1	275	174	104.9	253	193
170	158.7	380	140	147.2	355	156	137.9	332	172	127.6	307	191	116.7	281	211
180	169.7	409	148	159.5	382	164	148.9	357	182	138.1	331	202	127.1	304	223
190	178.9	430	159	168.6	404	175	157.2	377	194	146.1	350	214	132.9	321	239
200	188.1	454	168	177.6	425	186	165.4	396	206	152.9	366	229	139.8	338	253
215	200.6	483	182	188.1	453	201	175.6	422	223	162.9	390	247	149.8	359	273
225	209.8	503	191	197.2	472	211	182.8	441	234	169.4	408	258	155.0	373	286
235	221.8	532	168	208.4	499	186	193.6	466	207	179.5	432	231	166.0	399	257
250	233.9	563	185	220.4	529	204	205.9	493	227	189.9	458	252	175.8	421	280
265	254.8	611	202	239.5	573	224	222.2	535	248	206.2	496	275	189.8	457	304
285	273.3	656	226	257.3	617	249	238.3	576	277	222.3	532	307	204.1	489	340
315	300.5	723	247	282.2	679	273	265.1	635	302	245.2	587	336	225.6	540	371
335	317.3	760	280	294.3	710	312	275.7	663	345	255.2	614	381	233.4	562	423
355	339.3	818	272	318.9	765	303	297.8	713	335	276.2	661	371	254.1	609	411
380	357.7	860	294	337.2	808	325	314.3	753	360	292.2	700	397	265.7	642	442
400	376.2	909	335	355.2	851	371	330.9	792	412	305.8	732	458	279.6	675	505
420	401.1	965	354	376.2	905	392	351.2	844	434	325.8	781	481	299.5	717	531
445	419.6	1005	381	394.4	944	421	365.7	881	467	338.8	815	517	310.1	746	573

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 46 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	49.4	118	43	46.2	111	48	43.2	104	53	39.8	96	59	36.8	88	65
55	53.9	129	48	50.6	121	53	47.2	113	59	43.7	105	65	39.9	96	72
65	63.3	152	52	59.5	143	57	55.6	134	63	51.8	124	71	47.6	114	79
75	70.8	169	58	66.4	159	65	62.0	149	72	57.7	138	80	53.2	128	89
85	79.3	190	65	74.2	179	72	69.4	166	80	64.5	154	89	59.4	143	99
95	88.8	212	75	83.0	199	83	77.4	187	92	72.1	172	102	66.3	159	113
105	98.7	236	86	92.8	222	94	86.1	207	105	79.9	191	116	73.4	176	128
110	103.4	247	90	97.0	232	100	90.0	217	110	83.6	200	123	76.8	184	135
115	108.1	259	95	101.0	242	106	94.2	226	117	87.2	209	130	79.6	191	144
120	114.5	274	94	107.7	258	103	100.3	240	115	93.1	224	128	85.8	206	143
125	124.8	298	96	117.1	281	106	109.7	262	118	101.2	243	131	93.7	224	145
135	132.0	315	112	123.5	296	124	115.4	277	137	106.6	256	152	98.4	236	168
145	141.7	339	122	132.3	319	135	123.9	296	150	114.9	275	166	105.9	253	183
155	146.5	350	129	137.3	329	143	127.8	307	158	118.6	283	175	108.8	261	194
170	162.9	392	141	152.9	367	157	142.1	340	175	131.8	316	192	120.7	289	213
180	175.9	421	149	164.9	394	166	154.1	369	183	142.8	342	203	130.6	315	225
190	185.8	444	160	174.4	418	176	162.8	389	196	150.3	362	216	138.7	332	239
200	195.6	468	169	183.3	439	187	171.2	409	208	157.5	379	230	145.1	348	254
215	207.7	498	184	194.7	467	203	182.1	435	225	167.9	402	250	154.6	370	275
225	216.8	520	192	202.6	487	213	188.9	453	236	175.6	420	261	160.2	384	289
235	229.1	549	170	215.3	516	188	200.7	481	209	186.3	447	232	171.6	412	259
250	243.3	581	186	228.9	547	205	212.5	511	228	197.9	474	253	181.5	436	282
265	264.0	631	204	246.9	591	226	230.8	553	250	213.2	512	277	196.8	471	306
285	283.4	678	228	264.6	637	252	247.9	592	280	229.7	550	309	211.9	506	341
315	311.7	748	248	292.8	701	275	274.3	655	304	252.6	605	339	232.8	557	374
335	325.8	784	283	305.7	733	314	284.3	681	350	263.7	633	385	241.3	578	426
355	351.7	843	275	329.9	789	306	308.2	738	337	285.6	683	374	261.2	630	414
380	371.6	888	296	348.8	835	327	325.6	778	363	300.5	723	401	277.5	664	443
400	391.3	935	339	366.7	878	375	342.4	818	415	314.9	759	460	290.3	696	509
420	415.3	995	357	389.4	935	395	364.2	870	438	335.8	804	486	309.3	739	536
445	433.7	1040	384	405.2	974	426	377.9	906	472	351.1	840	521	320.4	768	578

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 50 Hz - IMP

Leaving Water Temperature = 48 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	51.1	122	44	47.9	114	49	44.5	107	54	41.4	99	59	38.1	91	66
55	55.7	133	49	52.4	125	54	48.8	117	60	45.0	108	66	41.4	99	73
65	65.5	157	52	61.3	148	58	57.6	138	64	53.5	128	71	49.3	118	79
75	73.2	175	59	68.7	164	65	64.2	153	72	59.8	143	80	55.0	131	90
85	81.5	196	66	76.9	184	73	72.0	172	81	66.9	160	90	61.5	148	100
95	91.3	219	76	86.2	206	84	80.5	192	93	74.8	179	102	68.6	164	113
105	102.0	244	86	95.0	229	96	89.2	213	106	82.7	197	117	76.1	182	129
110	106.6	255	91	99.7	240	101	93.4	223	112	86.5	207	123	79.2	189	136
115	111.3	266	97	104.6	251	107	97.4	233	118	90.3	216	131	82.8	198	144
120	118.5	283	95	111.4	266	104	103.9	249	115	96.6	231	129	89.0	213	144
125	129.0	308	97	121.3	290	107	112.7	271	119	105.0	251	132	96.9	231	146
135	136.1	325	113	127.8	305	125	118.9	285	139	110.7	265	153	102.0	244	169
145	145.8	350	123	137.5	328	136	128.1	306	151	118.8	284	167	108.7	262	184
155	151.1	361	130	141.1	338	145	132.3	316	160	122.5	293	177	112.6	270	195
170	168.0	401	144	157.8	377	159	147.3	352	175	136.2	326	194	125.2	299	214
180	181.9	434	151	170.5	407	167	159.2	380	185	147.3	354	204	136.1	325	226
190	191.7	458	161	180.4	431	178	167.2	401	198	155.9	372	218	143.2	342	241
200	201.8	482	171	188.7	451	190	175.4	422	210	163.3	391	232	149.9	359	256
215	213.8	512	186	201.3	480	206	187.8	448	227	173.9	415	251	159.4	383	277
225	223.3	535	195	210.1	502	215	195.8	468	238	180.6	431	264	165.9	398	290
235	237.0	566	172	222.9	532	189	207.9	498	210	193.3	462	234	178.1	425	261
250	251.2	601	188	236.0	566	207	220.7	527	230	204.3	488	256	188.3	450	284
265	272.2	650	206	255.5	610	228	237.7	570	252	221.5	529	278	204.0	487	308
285	291.7	700	230	275.1	656	254	256.1	611	282	237.5	568	311	217.5	523	344
315	320.4	771	251	302.6	723	278	282.4	674	308	262.2	626	340	239.2	576	377
335	336.0	802	289	315.6	754	318	294.6	704	351	272.4	651	388	250.5	598	428
355	363.8	868	278	341.1	815	308	318.5	760	341	294.6	709	375	272.3	650	415
380	383.4	916	299	360.8	861	330	334.5	803	367	311.8	744	404	286.4	684	447
400	403.7	965	342	377.4	902	380	350.8	843	420	326.7	781	464	299.8	717	513
420	427.6	1025	362	402.5	961	400	375.7	897	442	347.8	831	488	318.8	765	538
445	446.5	1070	389	420.2	1003	430	391.7	935	475	361.1	862	528	331.7	796	579

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 50 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	52.7	126	44	49.3	118	49	45.9	110	54	42.6	102	60	39.3	94	66
55	57.6	137	49	54.0	129	54	50.1	121	60	46.6	111	67	42.9	102	73
65	67.5	162	53	63.8	152	58	59.7	142	64	55.5	133	72	51.1	122	80
75	75.3	181	60	70.6	170	66	66.5	159	73	61.4	148	81	56.9	136	91
85	84.3	202	67	79.3	190	74	74.6	178	81	68.9	165	91	63.9	152	100
95	94.1	226	76	88.5	213	84	82.7	199	93	76.6	184	103	70.9	170	114
105	104.6	251	87	98.0	236	97	91.8	219	107	85.2	203	118	78.1	188	130
110	109.4	262	93	102.8	246	102	96.0	230	112	89.4	213	124	81.7	196	137
115	114.9	275	98	107.5	257	108	100.6	240	119	93.0	222	132	84.8	203	146
120	122.7	292	95	115.3	276	105	107.8	257	117	100.1	239	130	92.4	221	144
125	132.6	319	98	124.7	298	109	116.4	280	120	107.9	259	133	100.1	238	147
135	139.6	336	115	132.1	316	126	122.6	295	140	114.1	272	154	105.7	252	170
145	150.4	360	125	141.6	338	137	132.3	315	153	121.8	292	169	113.1	270	186
155	156.3	373	131	145.5	348	146	136.8	326	161	126.7	302	178	115.7	278	196
170	173.0	414	145	162.4	388	160	151.4	364	177	140.3	335	195	129.0	307	216
180	186.4	449	153	175.6	419	169	164.4	395	185	151.8	365	206	140.3	335	227
190	197.6	471	163	186.1	445	180	172.7	413	199	160.6	384	219	148.1	353	243
200	208.4	497	173	194.7	467	191	182.6	435	211	169.1	403	234	154.8	371	258
215	219.5	528	188	207.4	494	207	193.8	462	228	179.1	429	253	164.7	394	278
225	229.7	552	197	216.0	516	217	201.8	481	241	186.2	446	265	171.3	408	293
235	245.3	585	173	230.6	552	190	215.5	514	212	200.2	477	236	184.8	441	262
250	259.6	621	189	244.2	582	209	228.3	544	232	211.7	504	257	194.1	466	285
265	279.3	672	208	264.2	633	229	245.1	590	254	228.2	545	280	211.3	504	309
285	300.9	719	232	283.3	676	256	264.5	630	285	243.6	584	315	226.1	539	346
315	330.2	794	255	310.5	747	281	291.3	694	310	268.9	646	344	247.2	593	379
335	345.9	828	291	324.8	776	321	302.8	727	354	280.7	670	391	258.0	615	432
355	372.8	897	281	351.3	837	311	328.8	789	342	303.7	731	379	280.7	670	418
380	395.1	942	302	372.2	889	333	345.5	825	369	321.1	768	406	296.1	707	450
400	416.7	993	347	389.5	933	383	365.2	870	422	338.2	806	467	309.6	742	515
420	439.1	1056	367	414.8	989	403	387.6	923	445	358.1	857	493	329.3	788	541
445	459.3	1104	394	432.1	1032	434	403.6	962	481	372.4	891	531	342.6	816	586

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - SI

Leaving Water Temperature = 4 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	180	8	53	169	7	58	160	7	63	148	7	69	138	6	75
55	197	9	59	185	8	65	175	8	70	162	7	77	150	7	84
65	230	10	63	216	10	69	204	9	75	190	8	83	177	8	91
75	256	11	71	241	11	77	226	10	85	211	9	93	198	9	102
85	287	13	79	270	12	87	255	11	95	237	10	104	222	10	114
95	321	14	91	304	13	100	286	12	109	267	12	119	248	11	130
105	359	16	104	339	15	114	318	14	125	296	13	137	276	12	148
110	376	17	110	355	16	121	335	15	132	311	14	144	288	13	156
115	396	17	117	371	16	128	348	15	140	324	14	153	300	13	166
120	414	18	113	390	17	124	369	16	135	343	15	149	318	14	163
125	452	20	117	427	19	128	402	18	139	373	16	153	347	15	167
135	478	21	136	449	20	149	424	18	163	394	17	178	366	16	195
145	513	23	149	486	21	163	454	20	178	425	19	195	393	17	212
155	534	23	157	501	22	172	470	21	188	439	19	205	407	18	224
170	595	26	174	563	25	191	526	23	207	491	21	227	453	20	247
180	637	28	182	603	26	198	561	25	218	528	23	238	490	21	259
190	674	29	195	636	28	213	595	26	233	557	24	254	514	23	278
200	710	31	207	670	29	226	627	28	247	588	26	269	541	24	294
215	756	33	225	713	31	246	672	29	268	623	27	293	577	25	319
225	790	35	236	744	33	258	699	31	281	650	28	307	599	26	335
235	829	36	206	780	34	225	738	32	246	685	30	271	637	28	296
250	878	38	226	826	36	247	776	34	270	725	32	297	678	30	324
265	956	42	248	899	39	271	849	37	296	789	35	324	732	32	354
285	1,026	45	278	971	42	304	908	40	332	850	37	363	786	34	396
315	1,138	50	305	1,075	47	333	1,013	44	363	945	41	397	877	38	432
335	1,189	52	348	1,125	49	381	1,052	46	415	981	43	453	906	40	494
355	1,275	56	335	1,205	53	366	1,123	49	402	1,057	46	438	980	43	478
380	1,347	59	361	1,272	56	394	1,191	52	432	1,114	49	470	1,029	45	515
400	1,420	62	413	1,340	59	452	1,255	55	494	1,177	51	539	1,083	48	588
420	1,512	66	438	1,425	63	479	1,345	59	522	1,246	55	570	1,154	51	621
445	1,580	69	472	1,489	65	516	1,398	61	562	1,301	57	614	1,198	53	669

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 5 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	184	8	54	175	8	58	164	7	64	153	7	70	143	6	76
55	204	9	60	192	8	65	180	8	71	168	7	78	155	7	84
65	237	10	64	224	10	69	210	9	76	196	9	83	183	8	91
75	264	12	71	249	11	78	233	10	85	219	10	93	203	9	103
85	295	13	80	280	12	87	262	11	96	245	11	105	229	10	115
95	333	14	92	314	14	100	293	13	110	275	12	120	257	11	130
105	371	16	105	350	15	115	326	14	127	307	13	137	283	12	150
110	389	17	112	367	16	122	343	15	133	321	14	145	297	13	158
115	405	18	118	381	17	130	359	16	141	333	15	154	309	14	167
120	427	19	114	404	18	125	379	17	136	353	15	150	331	14	164
125	465	20	118	441	19	129	413	18	141	386	17	154	361	16	168
135	491	21	138	466	20	150	435	19	164	407	18	180	381	17	195
145	532	23	150	498	22	165	469	20	180	438	19	195	407	18	214
155	549	24	159	517	23	174	485	21	190	452	20	207	421	18	225
170	617	27	176	577	25	192	541	24	210	507	22	228	470	20	248
180	658	29	184	619	27	200	583	25	219	545	24	239	505	22	260
190	697	30	196	657	29	215	614	27	234	575	25	256	535	23	278
200	732	32	209	690	30	229	650	28	249	604	26	271	561	24	296
215	779	34	228	738	32	248	687	30	272	642	28	296	599	26	321
225	817	36	238	769	34	260	718	31	285	671	29	309	624	27	335
235	853	37	208	809	35	227	758	33	247	707	31	273	661	29	298
250	906	40	228	856	37	249	804	35	272	750	33	298	696	31	326
265	982	43	250	932	41	273	871	38	298	815	36	326	762	33	354
285	1,064	46	280	996	44	307	938	41	336	876	38	364	813	35	399
315	1,173	51	307	1,111	48	336	1,040	46	366	975	43	399	903	39	436
335	1,234	54	351	1,155	51	384	1,083	47	420	1,014	44	456	939	41	496
355	1,316	57	338	1,237	54	369	1,167	51	403	1,091	47	441	1,010	44	480
380	1,394	61	363	1,313	57	398	1,227	54	434	1,149	50	474	1,071	47	516
400	1,465	64	417	1,379	60	457	1,299	56	499	1,208	53	543	1,122	49	593
420	1,558	68	443	1,476	64	483	1,374	60	529	1,283	56	576	1,198	52	624
445	1,634	71	476	1,538	67	521	1,436	63	569	1,341	59	618	1,249	54	670

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - SI

Leaving Water Temperature = 6 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	191	8	54	180	8	59	170	7	64	157	7	70	147	6	76
55	210	9	60	198	9	66	184	8	72	173	8	78	160	7	85
65	245	11	64	231	10	70	217	9	77	203	9	84	189	8	92
75	272	12	72	256	11	79	241	11	86	225	10	94	210	9	104
85	306	13	81	288	13	88	272	12	96	253	11	105	235	10	115
95	341	15	93	323	14	101	304	13	111	283	12	121	264	12	132
105	380	17	107	360	16	116	338	15	127	314	14	139	294	13	150
110	398	17	113	378	16	123	356	15	134	330	14	146	307	13	158
115	417	18	120	395	17	131	367	16	143	344	15	155	319	14	169
120	442	19	115	415	18	126	392	17	137	367	16	151	340	15	165
125	481	21	119	453	20	130	428	19	142	398	17	155	371	16	169
135	509	22	138	479	21	151	450	20	166	422	18	180	390	17	197
145	547	24	151	516	22	166	483	21	180	451	20	198	419	18	215
155	563	25	161	533	23	175	500	22	192	465	20	209	432	19	227
170	629	28	179	596	26	194	560	24	212	520	23	230	482	21	250
180	677	30	185	640	28	202	599	26	221	561	24	241	522	23	262
190	715	31	198	675	29	217	635	28	237	596	26	257	549	24	280
200	755	33	211	707	31	231	666	29	252	623	27	274	578	25	298
215	805	35	230	759	33	250	713	31	273	661	29	298	613	27	324
225	834	37	242	791	35	262	741	32	287	694	30	312	638	28	339
235	883	38	210	830	36	229	784	34	250	734	32	274	680	30	300
250	932	41	230	884	38	250	829	36	275	774	34	300	720	32	327
265	1,018	44	251	957	42	274	901	39	301	845	37	328	780	34	358
285	1,094	48	282	1,032	45	309	966	42	336	901	39	369	838	37	401
315	1,205	53	311	1,141	50	339	1,076	47	369	998	44	404	929	41	439
335	1,259	55	357	1,193	52	389	1,119	49	424	1,040	46	460	964	42	500
355	1,354	59	340	1,279	56	372	1,199	52	407	1,122	49	444	1,045	46	483
380	1,430	63	366	1,351	59	402	1,270	55	438	1,191	52	477	1,099	48	519
400	1,511	66	423	1,415	62	462	1,332	58	503	1,245	54	548	1,157	50	596
420	1,611	70	447	1,517	66	486	1,425	62	532	1,322	58	580	1,226	54	630
445	1,667	73	484	1,582	69	524	1,482	64	574	1,387	60	623	1,277	56	677

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 7 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	196	9	55	185	8	60	175	8	65	163	7	71	152	7	77
55	215	9	61	203	9	66	190	8	73	178	8	79	165	7	85
65	252	11	65	238	10	71	224	10	77	210	9	84	196	9	92
75	280	12	73	265	12	79	248	11	87	234	10	95	218	9	104
85	314	14	82	298	13	89	278	12	97	261	11	106	243	11	116
95	352	15	94	332	14	102	313	14	112	292	13	122	273	12	133
105	393	17	108	372	16	117	347	15	128	324	14	140	301	13	152
110	413	18	114	390	17	124	364	16	135	340	15	148	318	14	159
115	430	19	121	404	18	132	380	16	144	356	15	156	330	14	170
120	456	20	116	430	19	127	406	18	138	377	16	152	353	15	166
125	493	22	120	468	20	131	440	19	143	412	18	156	384	17	170
135	522	23	140	492	21	153	463	20	167	434	19	182	401	18	199
145	563	24	153	530	23	167	497	22	183	465	20	199	431	19	217
155	583	25	162	546	24	177	514	22	193	479	21	211	447	19	228
170	650	28	180	612	27	196	574	25	214	537	23	232	500	22	251
180	700	30	186	655	29	204	620	27	222	581	25	242	537	23	265
190	736	32	200	693	30	219	653	28	238	609	27	260	568	25	282
200	774	34	214	732	32	233	685	30	254	642	28	277	599	26	299
215	827	36	232	779	34	253	732	32	276	682	30	300	634	28	326
225	862	38	244	813	35	265	760	33	290	711	31	314	662	29	340
235	912	40	211	859	37	231	812	35	251	753	33	276	706	31	302
250	965	42	232	907	40	253	852	37	277	799	35	301	745	32	329
265	1,044	46	254	984	43	279	926	40	303	867	38	330	803	35	361
285	1,127	49	286	1,059	46	311	995	43	342	931	40	372	863	38	404
315	1,245	54	314	1,177	51	342	1,109	48	372	1,033	45	407	961	42	441
335	1,301	57	360	1,224	53	393	1,148	50	428	1,074	47	463	999	43	502
355	1,399	61	343	1,310	57	376	1,241	54	410	1,161	50	446	1,075	47	488
380	1,473	64	371	1,386	60	406	1,307	57	441	1,218	53	481	1,137	49	523
400	1,549	67	428	1,464	64	465	1,371	60	508	1,284	56	554	1,198	52	598
420	1,655	72	451	1,558	68	493	1,464	64	537	1,364	59	585	1,267	55	634
445	1,723	75	488	1,627	71	530	1,521	66	580	1,423	62	628	1,324	57	681

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - SI

Leaving Water Temperature = 8 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	203	9	55	192	8	60	180	8	65	168	7	72	156	7	78
55	222	10	62	209	9	67	196	9	73	183	8	80	170	7	86
65	261	11	65	246	11	71	231	10	78	216	9	85	201	9	93
75	289	13	74	274	12	80	257	11	88	241	10	96	223	10	105
85	325	14	82	306	13	89	288	12	98	270	12	107	251	11	117
95	364	16	94	343	15	103	322	14	113	300	13	123	281	12	134
105	403	18	109	382	17	118	357	16	130	336	15	141	311	14	153
110	425	18	115	399	17	125	376	16	136	351	15	148	325	14	161
115	442	19	122	417	18	133	391	17	145	366	16	157	337	15	171
120	469	20	118	443	19	128	415	18	140	390	17	153	365	16	167
125	512	22	121	483	21	132	454	20	144	425	18	158	396	17	172
135	538	23	141	509	22	154	479	21	168	447	19	183	416	18	200
145	579	25	154	547	24	169	514	22	184	478	21	201	446	19	218
155	596	26	164	564	24	179	530	23	195	494	21	213	461	20	229
170	669	29	182	633	27	198	593	26	215	555	24	233	513	22	254
180	718	31	188	680	29	205	637	28	224	596	26	244	555	24	266
190	760	33	203	717	31	220	675	29	239	630	27	262	586	25	285
200	800	35	216	752	33	234	708	31	256	659	29	279	612	27	302
215	849	37	236	800	35	256	754	33	278	704	31	302	656	28	327
225	890	39	247	838	36	268	786	34	291	733	32	317	681	29	344
235	937	41	214	886	39	233	830	36	255	779	34	278	730	32	303
250	991	43	234	937	41	255	880	38	278	824	36	304	769	33	331
265	1,076	47	257	1,019	44	280	957	42	305	895	39	333	832	36	363
285	1,157	50	288	1,093	47	315	1,028	44	344	955	42	374	893	39	406
315	1,287	56	316	1,209	53	344	1,141	49	376	1,068	46	409	991	43	445
335	1,338	58	364	1,265	55	396	1,185	52	430	1,110	48	467	1,027	44	507
355	1,437	63	345	1,360	59	378	1,274	55	413	1,192	52	449	1,109	48	490
380	1,519	66	376	1,435	62	408	1,349	59	443	1,259	55	485	1,172	51	527
400	1,600	69	431	1,504	66	468	1,415	61	512	1,317	57	558	1,224	53	604
420	1,697	74	459	1,601	70	499	1,509	65	542	1,409	61	588	1,311	57	638
445	1,780	77	493	1,677	73	536	1,571	68	583	1,466	64	634	1,362	59	688

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 10 °C

Model (PSC4)	Ambient Temperature (°C)														
	30			35			40			45			50		
	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)	T. CAP (kW)	WFR (L/s)	PI (kW)
50	215	9	56	202	9	61	190	8	67	178	8	73	166	7	78
55	234	10	63	221	10	69	208	9	75	194	8	81	180	8	87
65	275	12	67	261	11	73	246	11	79	229	10	86	215	9	94
75	308	13	76	291	13	82	274	12	89	256	11	97	239	10	106
85	345	15	84	326	14	91	306	13	100	287	12	109	268	12	118
95	387	17	96	362	16	105	331	14	113	309	13	124	300	13	135
105	427	19	111	405	17	121	381	16	132	355	15	143	332	14	155
110	449	19	118	424	18	128	397	17	139	373	16	151	346	15	164
115	467	20	126	441	19	136	415	18	147	386	17	160	361	16	173
120	499	22	120	470	20	130	443	19	142	416	18	155	386	17	169
125	526	23	122	514	22	134	481	21	146	453	20	159	421	18	174
135	572	25	144	538	23	157	508	22	171	475	21	186	441	19	202
145	613	26	158	578	25	172	545	24	187	509	22	204	474	21	220
155	634	27	168	599	26	182	558	24	199	523	23	215	489	21	234
170	711	31	185	664	29	202	628	27	219	585	25	238	546	24	257
180	764	33	192	721	31	209	675	29	227	636	27	248	590	26	270
190	806	35	206	759	33	223	715	31	244	668	29	266	621	27	289
200	847	37	220	799	35	239	748	32	261	701	30	282	652	28	307
215	901	39	240	853	37	260	794	35	283	747	32	307	694	30	333
225	939	41	252	882	38	274	832	36	297	776	34	323	719	31	348
235	999	43	217	939	41	236	886	38	259	832	36	282	773	34	307
250	1,057	46	238	996	43	260	936	40	283	877	38	308	816	35	337
265	1,145	49	261	1,076	47	285	1,016	44	311	950	41	339	882	38	368
285	1,227	53	295	1,156	50	322	1,090	47	349	1,019	44	380	948	41	411
315	1,362	59	323	1,286	56	352	1,206	52	383	1,130	49	416	1,053	45	451
335	1,423	61	371	1,328	58	405	1,257	54	438	1,169	51	477	1,092	47	513
355	1,528	66	353	1,442	62	385	1,350	59	419	1,271	55	456	1,180	51	496
380	1,613	70	381	1,517	66	414	1,431	62	453	1,335	58	492	1,243	54	536
400	1,693	73	440	1,599	69	479	1,496	65	522	1,402	61	564	1,304	56	613
420	1,802	78	467	1,706	74	506	1,587	69	552	1,494	65	598	1,387	60	648
445	1,879	81	505	1,764	77	548	1,665	72	594	1,552	67	646	1,439	63	696

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 5.5°C cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - IMP

Leaving Water Temperature = 40 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	52.2	126	53	49.0	118	58	45.8	110	64	42.1	102	71	38.7	94	78
55	57.1	138	59	53.8	129	65	49.7	120	72	46.0	111	79	42.3	102	86
65	66.5	161	63	62.7	151	69	58.3	141	76	54.3	131	85	50.0	120	94
75	74.2	179	71	69.5	167	78	64.8	156	86	60.3	145	95	55.5	134	105
85	83.1	201	79	78.1	188	87	72.8	176	96	67.4	163	107	61.9	150	118
95	93.0	225	91	88.0	211	100	81.8	197	110	76.0	183	122	69.6	169	134
105	104.9	252	103	97.8	236	115	91.0	220	127	84.3	203	140	77.3	187	153
110	109.1	264	110	102.4	248	121	95.4	229	134	88.2	214	147	81.1	195	161
115	114.7	276	116	106.9	258	129	99.6	240	142	91.9	222	156	84.3	204	171
120	120.3	290	113	112.9	272	124	105.5	254	137	97.4	235	152	90.2	217	169
125	131.0	316	116	123.3	297	128	115.0	278	141	106.5	257	157	98.1	237	173
135	138.6	334	136	129.3	313	150	121.3	292	165	112.4	271	182	103.3	249	201
145	148.9	361	148	140.0	337	164	130.4	314	180	120.3	291	199	110.3	267	219
155	154.2	372	157	144.3	349	173	135.0	325	191	124.3	301	210	114.7	275	231
170	172.6	418	173	162.2	391	191	150.6	363	211	139.3	337	231	126.7	307	255
180	184.2	446	181	173.4	418	200	161.9	390	220	149.8	362	243	137.6	333	267
190	195.7	472	194	182.9	442	214	170.8	413	236	158.4	381	260	145.2	350	286
200	205.6	496	206	192.7	466	227	179.3	434	251	166.5	402	276	151.6	367	304
215	219.2	531	223	205.6	498	246	191.5	461	273	177.4	428	299	162.2	392	329
225	229.5	554	235	214.6	519	259	200.1	481	286	184.3	446	313	169.1	408	344
235	240.6	580	205	225.8	544	226	211.0	508	249	194.9	470	277	180.4	433	307
250	254.8	616	224	238.1	576	248	223.8	538	273	206.0	499	303	189.9	458	335
265	277.2	667	246	258.6	627	272	242.5	584	300	224.8	542	331	206.5	498	365
285	297.9	721	276	280.0	674	305	260.9	629	336	240.5	581	372	220.7	535	408
315	330.5	796	303	310.6	747	335	289.6	699	368	268.8	645	406	245.9	595	445
335	345.3	837	347	324.4	782	382	301.3	727	422	278.7	673	462	253.4	614	509
355	368.4	893	333	346.8	836	368	323.8	780	406	299.6	724	447	275.1	666	492
380	391.5	943	359	365.8	884	397	341.6	825	437	316.8	762	482	290.4	701	530
400	411.1	992	413	385.3	932	455	358.5	868	501	333.1	803	551	303.2	735	608
420	438.5	1063	435	411.1	996	480	382.9	923	531	354.8	855	583	324.4	783	641
445	459.0	1108	470	429.1	1037	518	400.2	962	572	368.5	893	627	338.2	816	687

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 42 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	53.6	130	54	50.7	122	59	47.0	114	65	43.5	105	72	40.3	97	78
55	59.4	143	59	55.4	134	65	51.5	124	72	47.8	115	79	43.7	105	87
65	69.3	166	63	64.8	156	70	60.5	145	77	56.2	135	85	51.8	125	94
75	76.4	185	72	72.0	173	79	66.9	162	87	62.4	150	96	57.5	138	106
85	86.0	208	80	80.8	194	88	75.0	182	97	69.8	169	107	64.3	155	119
95	96.9	233	91	90.3	218	101	84.2	204	112	78.4	189	123	72.1	173	135
105	107.5	260	105	101.1	243	116	93.8	227	128	87.4	211	140	80.3	193	154
110	113.0	272	111	106.2	255	123	98.5	238	135	91.1	219	149	83.8	202	163
115	118.6	285	118	110.1	266	130	103.0	248	143	95.3	229	157	87.2	209	173
120	124.0	300	114	117.0	282	125	109.3	262	138	100.7	244	153	92.9	225	170
125	135.2	327	118	127.3	307	129	118.4	286	143	110.1	266	158	101.4	245	174
135	143.0	345	137	134.7	324	150	125.7	301	167	115.5	279	184	106.9	258	202
145	154.9	371	149	144.0	348	165	134.7	325	182	124.6	300	201	114.4	275	221
155	159.4	383	159	149.9	360	175	138.9	336	193	128.5	311	212	117.9	285	233
170	179.0	430	176	168.0	403	193	155.6	376	212	143.8	347	234	131.8	318	256
180	191.7	460	182	178.4	431	202	167.3	403	222	155.4	374	245	143.2	344	269
190	202.6	488	195	190.1	456	216	176.3	427	237	163.3	394	262	150.2	363	288
200	212.3	512	209	199.6	481	229	186.1	447	253	172.2	414	278	157.9	380	306
215	226.9	547	226	213.1	512	249	197.3	478	275	182.7	441	302	168.1	405	331
225	236.9	570	238	222.3	534	262	205.7	498	288	190.9	461	316	174.6	421	347
235	248.0	600	207	233.9	563	228	218.6	525	252	201.4	487	279	185.9	449	309
250	263.7	634	227	247.8	595	250	229.9	555	277	214.0	515	305	196.7	475	337
265	285.9	690	249	269.4	648	274	251.4	603	303	230.9	558	335	213.8	516	367
285	309.7	743	279	288.1	696	309	269.4	649	339	249.2	600	374	228.8	551	412
315	341.8	823	306	321.6	773	337	298.6	722	371	276.5	668	409	254.1	613	450
335	357.9	860	351	336.0	805	387	311.1	752	425	287.6	694	467	263.6	636	512
355	383.4	920	336	356.9	863	372	334.7	807	408	310.8	747	450	286.3	688	495
380	405.1	975	362	380.2	913	399	352.6	853	440	326.5	789	485	300.5	726	533
400	424.6	1024	417	399.1	961	459	372.2	895	506	344.3	828	557	315.8	759	612
420	453.7	1093	441	426.2	1024	485	394.7	955	535	365.4	883	589	336.2	811	644
445	473.8	1141	476	444.6	1068	524	411.3	995	577	381.7	922	631	349.1	842	693

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - IMP

Leaving Water Temperature = 44 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	55.8	134	54	52.4	126	59	48.7	117	66	45.2	108	72	41.6	100	79
55	61.0	147	60	57.2	137	66	53.3	128	73	49.2	119	80	45.2	109	87
65	71.5	172	64	67.1	161	71	62.8	151	78	58.4	140	86	53.8	129	95
75	79.3	190	73	74.7	179	79	69.6	168	87	64.5	155	97	59.8	143	107
85	89.4	214	80	83.5	201	89	78.0	188	98	72.6	174	108	66.8	161	119
95	99.5	240	92	93.9	226	102	87.6	210	112	81.3	195	124	74.8	179	136
105	111.1	268	106	104.4	251	117	97.0	233	130	90.2	217	142	82.7	199	156
110	116.6	281	112	109.3	263	124	101.7	245	137	94.1	227	150	87.1	208	163
115	121.5	292	120	114.0	274	132	106.2	256	144	98.3	237	158	90.5	217	174
120	129.0	311	115	120.7	291	127	112.7	271	140	104.7	252	154	96.6	232	171
125	140.5	337	119	132.0	316	131	123.2	295	144	114.3	274	159	105.5	253	175
135	148.4	356	138	139.1	334	152	129.6	311	168	120.1	289	185	111.0	266	203
145	159.3	383	151	149.3	359	167	139.4	334	184	129.3	310	202	118.3	285	222
155	164.4	396	161	154.4	372	176	144.1	346	195	133.1	320	214	122.0	293	235
170	183.1	442	179	173.0	415	195	161.1	387	215	149.4	359	235	136.8	328	258
180	197.2	475	185	185.4	446	203	172.7	416	224	159.9	386	247	147.8	355	271
190	209.1	502	198	196.1	471	218	182.7	439	240	169.2	407	264	155.7	374	290
200	220.4	528	211	207.0	496	231	191.4	462	255	177.3	427	281	163.3	391	309
215	235.1	563	229	219.0	529	252	204.6	491	278	189.7	455	305	173.8	418	334
225	245.8	589	240	228.3	551	265	213.3	513	291	198.0	476	318	181.6	435	349
235	258.1	621	208	241.3	582	230	225.5	543	254	209.4	504	281	193.2	464	311
250	272.1	655	229	256.2	616	252	238.9	574	278	221.7	533	307	204.0	490	339
265	296.8	713	251	278.3	668	277	259.2	622	306	240.2	577	337	222.0	531	370
285	318.5	766	282	298.6	718	311	278.7	667	344	258.6	619	377	236.6	570	414
315	352.5	850	309	330.2	796	341	308.3	743	375	286.9	688	413	264.0	634	452
335	366.1	884	358	346.1	830	391	322.1	773	430	298.9	718	469	273.6	656	515
355	394.4	949	340	370.8	892	374	345.4	832	413	319.9	771	455	295.5	710	500
380	418.1	1004	366	392.1	942	403	365.4	878	445	338.5	814	489	311.3	748	538
400	440.7	1055	421	414.0	991	463	382.8	925	511	354.5	854	562	326.6	783	617
420	470.3	1127	445	438.0	1057	491	409.2	982	541	379.3	911	593	347.7	836	650
445	491.5	1177	480	456.5	1102	530	426.5	1025	582	395.9	952	636	363.1	871	697

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 46 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	57.6	138	55	54.2	129	60	50.5	121	66	46.4	112	73	43.1	103	79
55	63.0	151	61	59.1	141	67	54.8	132	74	51.0	122	81	46.8	112	88
65	74.2	178	64	69.1	167	71	64.9	155	78	60.2	145	87	55.4	134	96
75	82.4	197	73	76.8	185	80	72.2	173	88	66.9	160	98	61.5	148	108
85	92.4	221	81	86.5	208	89	80.6	193	99	75.2	180	109	69.3	166	120
95	103.3	248	93	96.7	232	103	90.6	217	113	83.6	201	125	77.6	186	137
105	115.1	276	108	107.8	259	118	100.5	241	130	93.2	223	143	85.7	206	157
110	120.5	289	114	112.8	271	125	105.6	253	137	97.6	234	151	89.1	215	166
115	126.0	302	121	118.3	283	133	109.8	263	146	101.4	244	160	92.5	223	176
120	133.6	320	116	125.3	300	128	116.8	280	141	108.4	260	156	100.2	240	172
125	144.7	349	120	136.7	327	132	127.0	305	146	118.3	283	160	109.1	262	176
135	153.4	367	139	143.5	344	154	134.3	321	169	124.0	298	187	114.4	274	205
145	164.4	394	153	154.5	370	169	143.8	345	186	133.1	320	204	123.0	295	223
155	170.1	408	162	159.8	383	178	148.6	357	196	137.8	330	216	126.5	304	236
170	190.3	456	180	178.5	429	197	166.4	399	217	154.1	369	238	141.0	338	260
180	204.6	491	186	191.5	460	205	179.2	429	226	165.3	397	249	152.7	367	273
190	215.9	518	200	202.7	485	220	188.8	453	242	175.4	420	266	161.4	387	292
200	227.1	545	213	212.7	512	234	199.1	476	258	183.7	441	283	168.2	406	310
215	241.5	581	232	227.0	544	255	211.8	506	280	196.2	470	307	179.7	431	337
225	252.1	607	243	237.4	567	267	220.6	528	294	204.1	489	322	187.0	447	353
235	267.2	640	211	250.5	600	232	233.5	560	256	216.8	520	284	200.3	479	313
250	282.6	677	231	265.7	637	254	247.6	594	280	229.3	551	309	211.7	507	341
265	306.8	735	253	286.9	689	280	268.6	643	308	247.9	595	340	228.9	549	373
285	328.9	789	286	309.1	739	315	287.6	690	346	266.3	641	380	246.0	589	416
315	365.1	876	313	342.1	823	344	319.0	764	380	296.4	708	417	272.4	654	456
335	380.7	912	360	357.0	857	395	332.8	798	434	308.2	738	475	282.1	675	521
355	409.2	982	342	383.1	920	378	358.4	858	416	330.5	795	459	305.4	733	503
380	431.7	1035	370	405.4	970	408	377.6	906	449	350.9	841	493	322.9	773	541
400	454.2	1089	426	425.4	1023	468	398.2	952	515	367.4	882	566	336.4	812	621
420	482.9	1162	451	453.9	1088	496	423.6	1012	546	392.4	941	597	359.4	861	656
445	504.3	1214	486	474.9	1135	535	441.1	1057	588	408.2	978	644	373.9	894	706

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Performance - 60 Hz - IMP

Leaving Water Temperature = 48 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	59.6	142	55	56.0	134	61	51.8	125	67	48.4	116	73	44.4	106	80
55	65.1	156	62	60.7	146	68	56.8	136	74	52.5	125	82	48.4	116	89
65	76.2	183	65	71.6	172	72	67.1	161	79	62.3	149	87	57.7	138	96
75	84.8	204	74	79.9	191	81	74.6	178	89	69.3	166	98	64.0	153	109
85	95.3	229	82	89.7	214	90	83.7	200	100	77.5	186	110	71.7	171	121
95	107.0	255	94	100.5	240	104	93.5	225	114	87.1	208	126	80.3	192	138
105	118.9	284	109	110.8	267	120	104.0	249	131	96.5	230	144	88.5	213	158
110	124.2	297	115	116.6	279	127	109.0	261	139	100.9	242	152	92.6	222	166
115	129.3	311	123	121.6	291	135	113.5	271	148	104.2	251	162	96.5	230	177
120	137.8	330	118	129.6	310	129	120.8	289	142	112.5	268	157	103.7	248	173
125	150.4	359	121	141.3	337	133	131.9	315	147	121.8	293	161	112.8	269	178
135	158.6	379	141	148.4	355	155	138.2	332	171	128.7	308	188	118.5	284	206
145	169.4	408	155	159.9	382	170	148.8	356	187	137.5	329	206	127.0	304	225
155	175.4	422	164	164.3	393	181	154.1	368	198	142.6	341	217	131.3	314	238
170	196.2	469	183	184.4	440	200	172.1	411	219	158.7	379	241	144.7	349	263
180	211.7	505	188	198.5	474	207	185.1	443	228	172.0	411	250	157.9	378	276
190	223.4	533	202	209.7	501	222	195.3	467	244	181.2	433	268	165.8	399	294
200	235.1	562	215	219.6	525	238	205.2	491	260	189.8	456	285	175.3	419	312
215	250.0	597	235	234.1	560	258	218.4	522	283	202.6	484	310	185.6	444	340
225	261.0	624	246	244.5	583	271	226.7	546	297	210.3	502	326	192.6	461	356
235	275.6	659	214	259.3	620	235	241.7	578	259	224.9	537	286	207.4	496	315
250	292.6	700	233	274.9	658	256	255.9	612	283	237.1	568	312	218.2	526	343
265	317.1	757	256	296.9	710	283	276.3	664	311	257.5	616	342	236.9	567	375
285	338.7	816	288	319.7	764	317	297.5	713	349	275.0	658	385	254.0	607	420
315	377.4	904	315	354.0	847	348	329.9	787	384	305.8	734	419	282.5	676	459
335	392.4	938	365	368.8	881	400	344.2	822	438	317.3	758	481	289.5	697	526
355	423.4	1011	346	397.0	947	382	370.2	886	420	344.0	822	461	315.8	756	508
380	446.8	1066	375	419.4	1002	411	390.6	934	453	362.5	866	497	331.6	799	546
400	470.2	1125	429	439.2	1050	475	410.4	982	520	379.6	911	570	350.5	838	624
420	499.9	1194	457	468.3	1121	502	436.9	1044	551	405.2	968	603	371.2	888	662
445	521.9	1248	493	489.0	1167	542	453.4	1092	593	420.7	1004	652	385.2	922	712

Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Leaving Water Temperature = 50 °F

MODEL (PSC4)	AMBIENT TEMPERATURE (°F)														
	85			95			105			115			125		
	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)	T. CAP (Tons)	WFR (GPM)	PI (kW)
50	61.5	147	56	57.4	138	61	53.8	128	68	50.0	119	74	45.9	110	81
55	67.0	160	63	62.9	150	69	58.8	140	75	54.1	130	82	49.8	120	90
65	78.8	189	66	74.4	177	73	69.6	166	80	64.7	154	88	59.6	142	97
75	88.1	210	75	82.8	197	82	77.0	184	90	72.0	172	99	66.5	158	109
85	98.8	236	83	92.8	221	91	86.4	207	101	80.6	192	110	74.3	177	122
95	110.3	263	95	103.2	247	105	96.5	231	115	89.5	214	127	82.9	198	139
105	122.1	293	110	115.1	274	121	107.5	256	133	99.4	238	146	91.8	219	159
110	127.8	307	116	120.6	287	128	112.3	268	140	104.0	248	154	95.4	228	169
115	134.0	319	124	125.4	299	136	116.9	280	149	108.0	259	163	99.6	238	178
120	142.9	341	119	133.8	321	130	125.3	299	144	116.3	278	158	107.6	257	174
125	154.9	370	122	146.0	348	135	136.0	326	148	126.6	302	163	116.9	279	179
135	163.6	390	143	153.2	367	157	143.2	341	173	133.0	317	190	122.3	294	207
145	175.8	419	157	164.6	392	172	153.0	368	189	142.3	340	208	130.7	313	227
155	181.1	432	167	170.3	406	182	158.3	380	200	147.2	351	220	134.9	322	241
170	203.1	484	184	189.1	454	202	177.1	422	222	163.7	391	242	150.9	360	264
180	218.4	520	190	205.2	489	209	189.9	456	231	177.5	423	253	163.8	392	277
190	230.6	550	204	216.0	519	223	202.0	481	247	186.6	446	271	172.2	411	297
200	241.4	580	218	227.4	542	239	210.7	504	264	196.2	470	287	180.3	430	316
215	257.7	614	238	242.3	578	260	224.4	539	286	209.1	499	313	191.0	458	343
225	269.1	642	250	251.1	602	274	235.3	561	299	217.5	518	329	199.7	478	358
235	285.8	681	216	267.5	642	236	250.6	597	261	232.6	555	288	215.3	515	316
250	300.5	722	236	282.2	679	259	265.0	632	285	244.9	586	315	226.7	541	346
265	327.2	780	260	306.4	733	285	286.3	682	315	266.1	634	345	244.7	587	377
285	351.6	838	292	329.3	785	322	306.0	736	352	284.7	679	388	261.4	627	424
315	389.7	929	320	365.8	872	352	340.9	814	386	316.7	755	423	292.3	697	462
335	406.3	968	368	378.3	908	405	354.2	845	443	327.3	783	485	301.8	719	529
355	436.8	1041	351	410.4	978	385	379.7	913	425	355.1	847	466	327.5	783	509
380	461.3	1100	379	432.0	1038	414	403.9	963	457	373.2	893	502	344.4	821	550
400	482.8	1160	435	454.8	1084	479	421.5	1007	528	392.3	941	575	360.7	860	632
420	515.3	1229	463	484.5	1155	507	448.7	1078	556	418.2	997	609	382.1	916	668
445	538.3	1283	499	502.2	1203	548	470.7	1123	599	434.9	1036	657	399.5	956	715

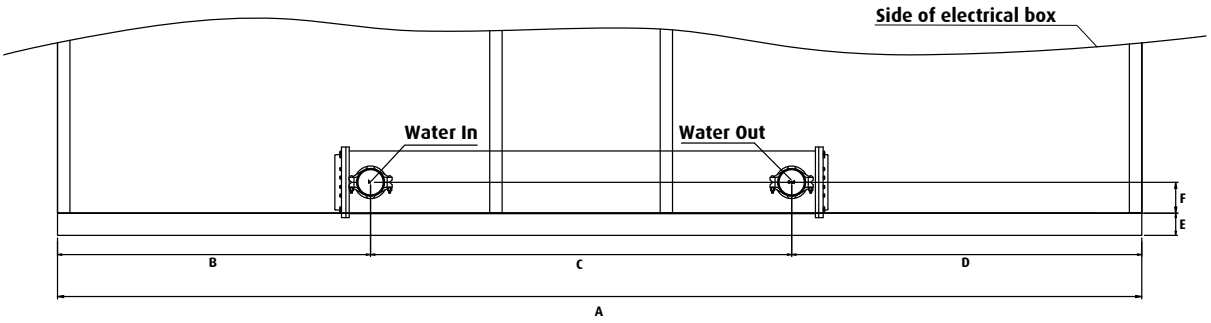
Legend

T. CAP : Total Capacity
WFR : Water Flow Rate
PI : Compressor Power Input

Note

- Ratings based on 10°F cooler water temperature difference between inlet and outlet water temperature
- Power input in this page should not be used for cable or breaker selection. MCA and MOP values in the electrical data section should be referred for the same

Cooler Connections

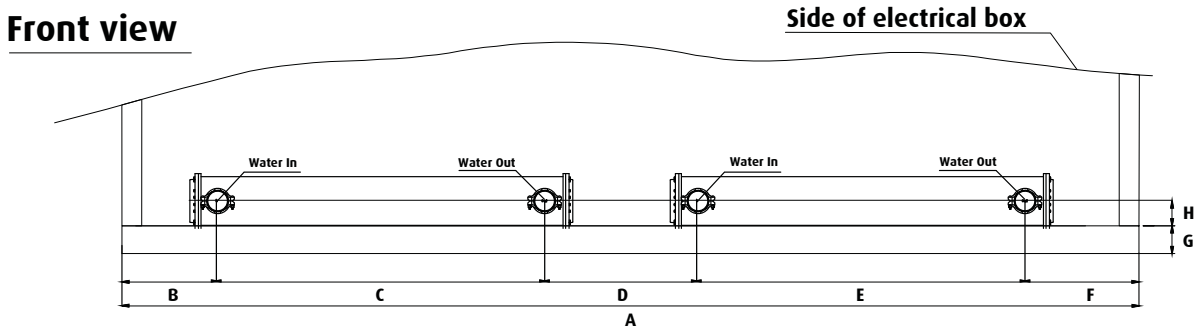


MODEL (PSC4)	A		B		C		D		E		F		Water In Connection Diameter		Water Out Connection Diameter	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
50	3295	130	750	30	2300	91	245	10	100	4	115	5	100	4	100	4
55	3295	130	750	30	2300	91	245	10	100	4	115	5	100	4	100	4
65	3360	132	770	30	2300	91	290	11	140	6	115	5	100	4	100	4
75	3360	132	740	29	2280	90	340	13	140	6	165	6	125	5	125	5
85	3360	132	740	29	2280	90	340	13	140	6	165	6	125	5	125	5
95	3360	132	750	30	2250	89	360	14	140	6	190	7	150	6	150	6
105	3360	132	750	30	2250	89	360	14	140	6	190	7	150	6	150	6
110	3360	132	750	30	2250	89	360	14	140	6	190	7	150	6	150	6
115	3360	132	750	30	2250	89	360	14	140	6	190	7	150	6	150	6
120	4740	187	1740	69	2250	89	750	30	140	6	150	6	150	6	150	6
125	4740	187	1740	69	2250	89	750	30	140	6	150	6	150	6	150	6
135	4740	187	1740	69	2250	89	750	30	140	6	150	6	150	6	150	6
145	4740	187	1740	69	2250	89	750	30	140	6	150	6	150	6	150	6
155	4740	187	1740	69	2250	89	750	30	140	6	150	6	200	8	200	8
170	4740	187	1790	70	2200	87	750	30	140	6	170	7	200	8	200	8
180	6120	241	3170	125	2200	87	750	30	180	7	170	7	200	8	200	8
190	6120	241	3170	125	2200	87	750	30	180	7	170	7	200	8	200	8
200	6120	241	3170	125	2200	87	750	30	180	7	170	7	200	8	200	8
215	6120	241	2935	116	2200	87	685	27	180	7	170	7	200	8	200	8
225	6120	241	2935	116	2200	87	685	27	180	7	170	7	200	8	200	8

Note

- Water connections are victaulic coupling
- Water connections are shipped loose & tied inside chiller enclosure

Front view



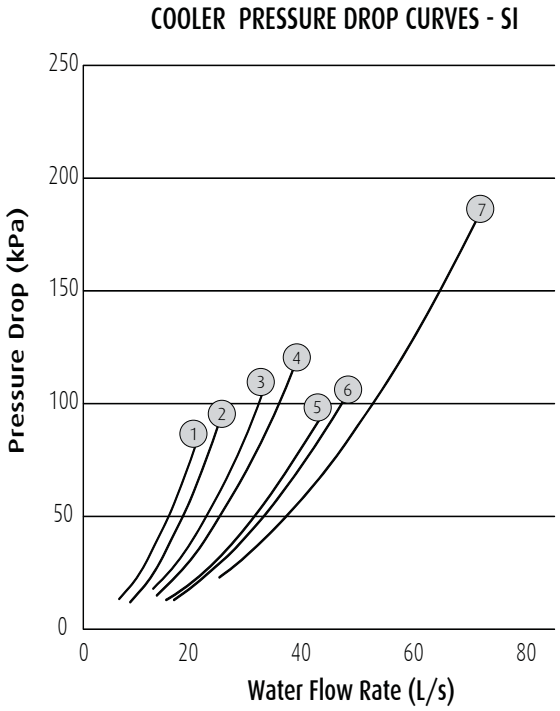
MODEL (PSC4)	A		B		C		D		E		F		Water In Connection Diameter		Water Out Connection Diameter	
	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]	mm	[Inch]
235	8880	350	1740	69	2250	89	1890	74	2250	89	750	30	180	7	150	6
250	8880	350	1740	69	2250	89	1890	74	2250	89	750	30	180	7	150	6
265	8880	350	1740	69	2250	89	1890	74	2250	89	750	30	180	7	150	6
285	8880	350	1740	69	2250	89	1890	74	2250	89	750	30	180	7	150	6
315	8880	350	1790	70	2200	87	1940	76	2200	87	750	30	180	7	170	7
335	8880	350	1790	70	2200	87	1940	76	2200	87	750	30	180	7	170	7
355	11640	458	3170	125	2200	87	3320	131	2200	87	750	30	180	7	170	7
380	11640	458	3170	125	2200	87	3320	131	2200	87	750	30	180	7	170	7
400	11640	458	3170	125	2200	87	3320	131	2200	87	750	30	180	7	170	7
420	11640	458	685	27	2500	98	3020	119	2500	98	2935	116	180	7	170	7
445	11640	458	685	27	2500	98	3020	119	2500	98	2935	116	180	7	170	7

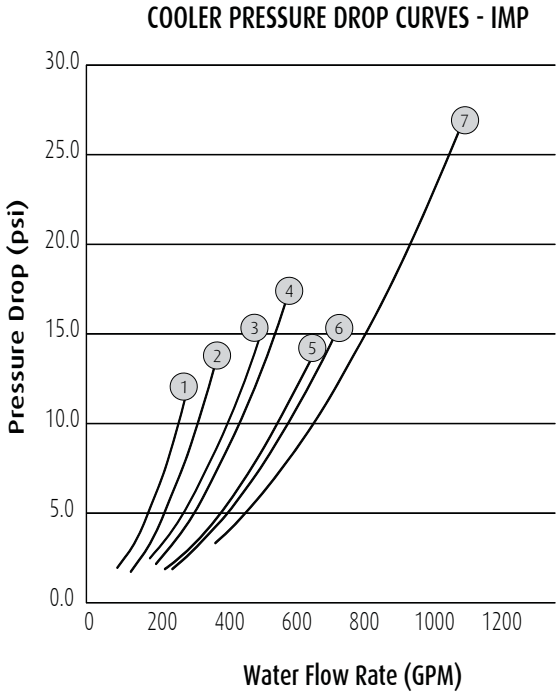
MODEL (PSC4)	Water In Connection Diameter		Water Out Connection Diameter	
	mm	[Inch]	mm	[Inch]
235	150	6	150	6
250	150	6	150	6
265	150	6	150	6
285	150	6	150	6
315	200	8	200	8
335	200	8	200	8
355	200	8	200	8
380	200	8	200	8
400	200	8	200	8
420	200	8	200	8
445	200	8	200	8

Note

- Water connections are victaulic coupling
- Water connections are shipped loose & tied inside chiller enclosure
- These chillers are shipped on a flat rack (not in container)
- To remove cooler tubes, the whole cooler assembly must be removed from chiller
- Hashed lines are supplied by installer at site

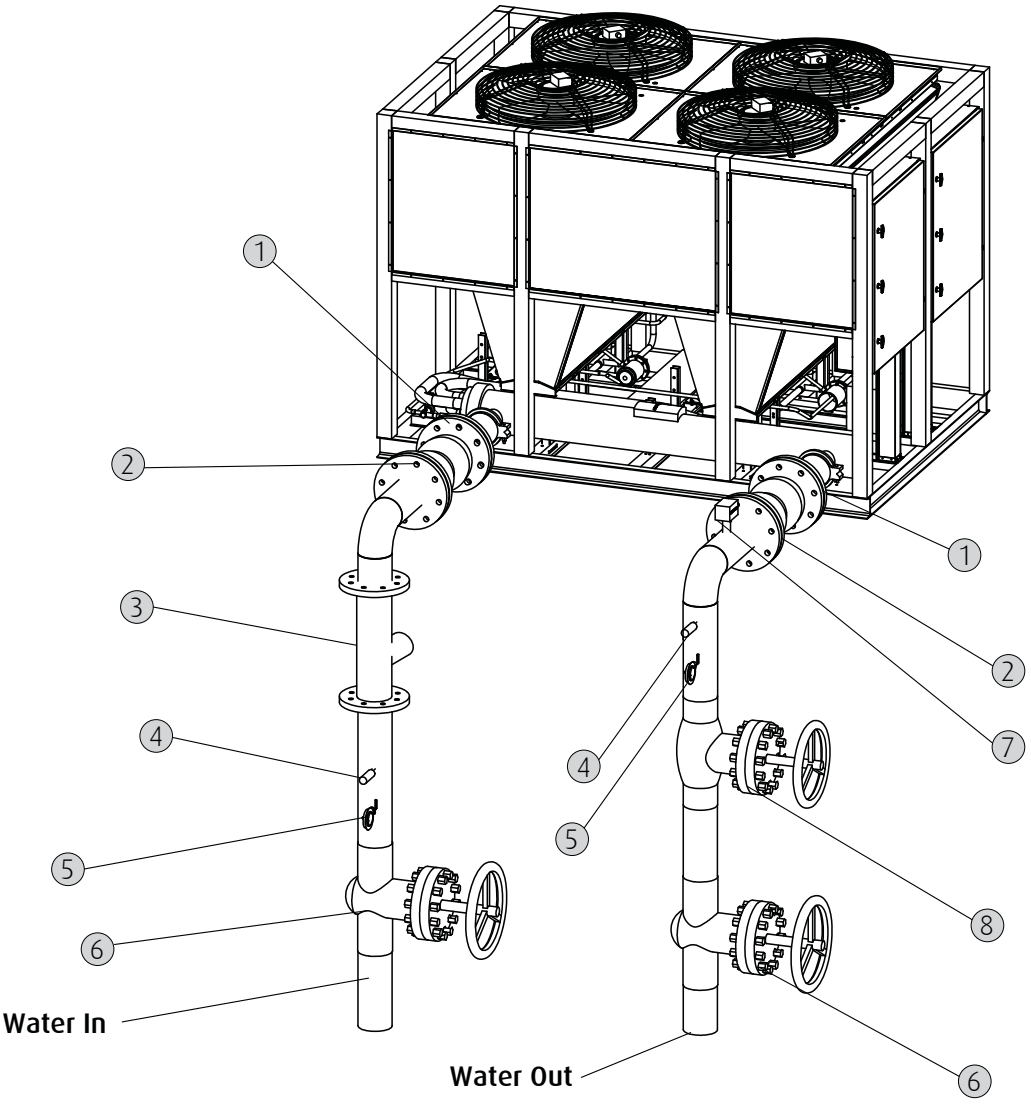
Pressure Drop Curves





	(PSC4)
1	(50,55,65)
2	(75,80)
3	(95,105,110,115,120,235,250)
4	(125,135,145,265,285)
5	(155,170,315,335)
6	(180,190,200,355,380,400)
7	(215,225,420,445)

Typical piping

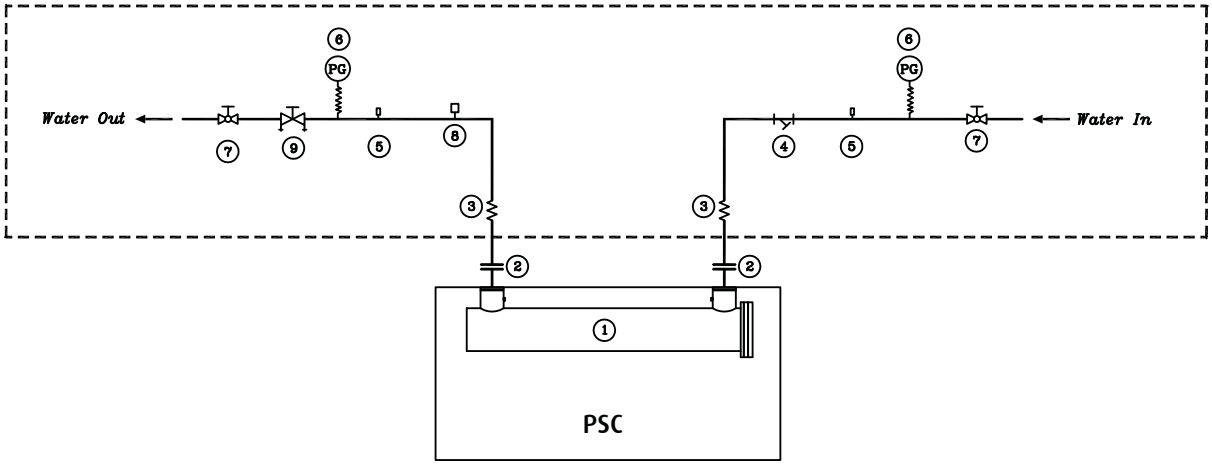


	COMPONENTS
1	Flange adapter
2	Flexible joint
3	Strainer
4	Thermometer
5	Pressure gauge
6	Valve
7	Flow switch
8	Balancing valve

Note

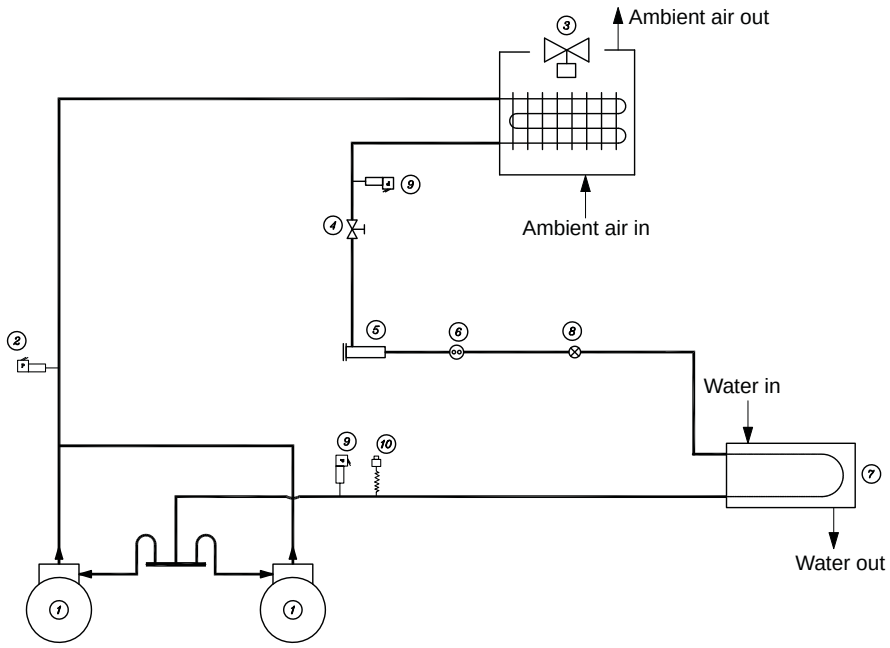
- Piping shown are general points of connection guides only and are not intended for a specific installation
- Piping shown are for a quick overview of system and are not in accordance with recognized standards
- All piping must follow standard piping techniques. Refer to appropriate ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) handbook for details

Water Schematic Diagram

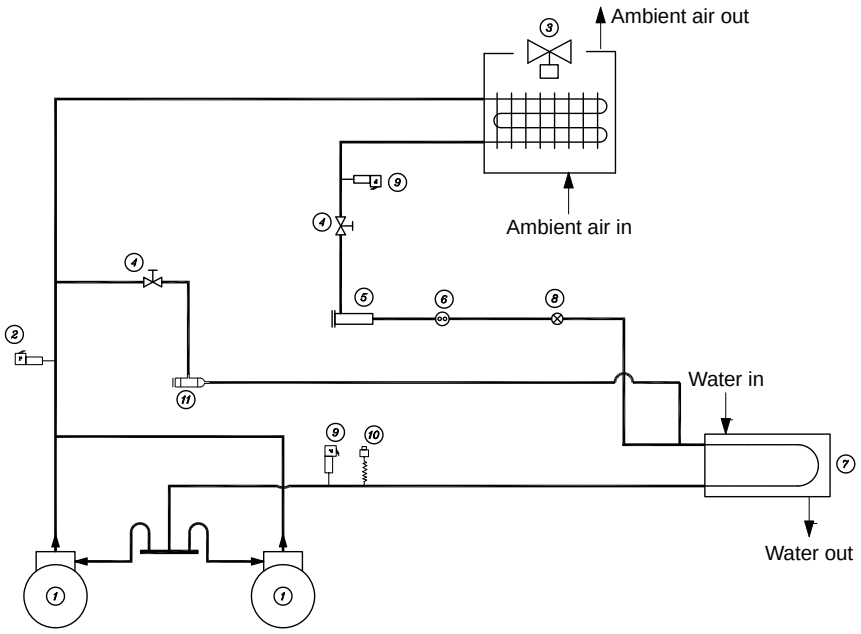


	ITEM
1	Cooler
2	Flange
3	Flexible joint
4	Strainer
5	Thermometer
6	Water pressure gauge
7	Valve
8	Flow switch
9	Balancing Valve

Refrigeration Schematic Diagram



- ## HGBP Schematic Piping (Optional)



	ITEM
1	Scroll compressor
2	High pressure switch
3	Condenser coil
4	Shut off valve
5	Filter drier
6	Sight glass

	ITEM
7	Barrel (Cooler)
8	Expansion valve
9	Charging nipple
10	Low pressure switch
11	Mechanical hot gas valve

Sound Data - 380V/3Ph/50Hz

Model (PSC4)	Sound Power (dBA)								
	Band Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	Total
50	61	68	78	84	88	88	83	74	93
55	61	68	78	84	88	89	84	75	93
65	64	71	80	85	89	89	85	75	94
75	64	71	80	85	89	89	85	75	94
85	64	71	80	85	89	89	85	75	94
95	64	71	81	86	90	89	85	76	94
105	64	71	81	87	91	91	86	77	96
110	64	71	81	87	91	91	86	77	96
115	64	71	81	87	91	92	87	78	96
120	64	71	81	87	91	92	87	78	96
125	66	73	82	87	91	91	87	77	96
135	66	73	82	87	91	91	87	78	96
145	66	73	83	88	92	92	88	78	97
155	66	73	83	88	92	92	88	78	97
170	66	73	83	89	93	94	89	80	98
180	67	73	83	89	93	94	89	80	98
190	67	74	84	89	93	93	89	79	98
200	67	74	84	90	94	94	89	80	99
215	67	74	84	90	94	94	90	81	99
225	67	74	84	90	94	95	90	81	99
235	67	74	84	90	94	95	90	81	99
250	69	76	85	90	94	94	90	81	99
265	69	76	85	90	94	94	90	81	99
285	69	76	86	91	95	95	91	81	100
315	69	76	86	92	96	96	92	82	101
335	69	76	86	92	96	97	92	83	101
355	70	77	87	92	96	96	91	82	101
380	70	77	87	92	96	96	92	82	101
400	70	77	87	93	97	97	92	83	102
420	70	77	87	93	97	97	92	83	102
445	70	77	87	93	97	98	93	84	102

Note

- Sound data is calculated based on standard components design
- Sound data shall be as per AHRI 370 and ISO BS 3744 standard
- Sound data are ±2 dBA

Sound Data - 460-380V/3Ph/60Hz

Model (PSC4)	Sound Power (dBA)								
	Band Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	Total
50	66	72	79	85	89	90	85	76	94
55	66	72	79	86	90	91	86	77	95
65	69	75	81	87	91	92	87	78	96
75	69	75	81	87	91	91	86	77	96
85	69	75	81	87	91	92	87	78	96
95	69	75	82	88	92	92	87	78	97
105	69	75	82	88	92	93	88	79	97
110	69	75	82	88	92	93	88	79	97
115	69	75	82	89	93	94	89	80	98
120	71	77	83	89	93	93	88	79	98
125	71	77	83	89	93	94	89	80	98
135	71	77	83	90	94	94	89	80	99
145	71	77	83	90	94	94	89	80	99
155	71	77	83	90	94	94	89	80	99
170	71	77	84	91	95	95	90	81	100
180	72	78	85	91	95	95	90	81	100
190	72	78	85	91	95	96	91	82	100
200	72	78	85	91	95	96	91	82	100
215	72	78	85	92	96	96	91	82	101
225	72	78	85	92	96	97	92	83	101
235	74	80	86	92	96	97	92	83	101
250	74	80	86	93	97	97	92	83	102
265	74	80	86	93	97	97	92	83	102
285	74	80	86	93	97	97	92	83	102
315	74	80	87	94	98	98	93	84	103
335	74	80	87	94	98	98	93	84	103
355	75	81	88	94	98	98	93	84	103
380	75	81	88	94	98	98	93	84	103
400	75	81	88	94	98	99	94	85	103
420	75	81	88	95	99	99	94	85	104
445	75	81	88	95	99	100	95	86	104

Note

- Sound data is calculated based on standard components design
- Sound data shall be as per AHRI 370 and ISO BS 3744 standard
- Sound data are ±2 dBA

Electrical Data

MODEL (PSC4)	POWER SUPPLY (V/Ph/Hz)	SUPPLIED VOLTAGE		COMPREDDOR			CONDENSOR FAN MOTOR			MCA	MOP	MDS
		MIN	MAX	No.	RLA (A)	LRA	NO.	kW	FLA (A)			
50	380-420 / 3 / 50	357	440	1+1	53.3+40.7	310+272	2	1.45	3.5	114.3	150	125
	208-230 / 3 / 60	196	244	1+1	110.2+88.4	599+605	2	0.70	2.1	239.0	300	250
	380 / 3 / 60	357	403	1+1	66.7+50.9	358+353	2	2.05	3.9	142.1	200	160
	460 / 3 / 60	432	488	1+1	55.1+42.1	310+272	2	2.30	4.0	119.0	150	125
55	380-420 / 3 / 50	357	440	2	53.3	310	2	1.45	3.5	126.9	175	160
	208-230 / 3 / 60	196	244	2	110.2	599	2	0.70	2.1	260.8	350	400
	380 / 3 / 60	357	403	2	66.7	358	2	2.05	3.9	157.9	200	200
	460 / 3 / 60	432	488	2	55.1	310	2	2.30	4.0	132.0	175	160
65	380-420 / 3 / 50	357	440	1+2	53.3+33.1	310+225	4	1.45	3.5	146.8	200	160
	208-230 / 3 / 60	196	244	1+2	110.2+70.8	599+505	4	0.70	2.1	305.0	400	400
	380 / 3 / 60	357	403	1+2	66.7+40.7	358+290	4	2.05	3.9	180.4	225	200
	460 / 3 / 60	432	488	1+2	55.1+33.6	310+225	4	2.30	4.0	152.1	200	160
75	380-420 / 3 / 50	357	440	4	33.1	225	4	1.45	3.5	154.7	175	200
	208-230 / 3 / 60	196	244	4	70.8	505	4	0.70	2.1	326.6	350	400
	380 / 3 / 60	357	403	4	40.7	290	4	2.05	3.9	188.6	225	250
	460 / 3 / 60	432	488	4	33.6	225	4	2.30	4.0	158.8	175	200
85	380-420 / 3 / 50	357	440	2+2	40.7+33.1	272+225	4	1.45	3.5	171.8	200	200
	208-230 / 3 / 60	196	244	2+2	88.4+70.8	605+505	4	0.70	2.1	366.2	450	400
	380 / 3 / 60	357	403	2+2	50.9+40.7	353+290	4	2.05	3.9	211.5	250	250
	460 / 3 / 60	432	488	2+2	42.1+33.6	272+225	4	2.30	4.0	177.9	200	200
95	380-420 / 3 / 50	357	440	4	40.7	272	4	1.45	3.5	187.0	225	250
	208-230 / 3 / 60	196	244	4	88.4	605	4	0.70	2.1	401.4	450	630
	380 / 3 / 60	357	403	4	50.9	353	4	2.05	3.9	231.9	250	400
	460 / 3 / 60	432	488	4	42.1	272	4	2.30	4.0	194.9	225	250
105	380-420 / 3 / 50	357	440	2+2	53.3+40.7	310+272	4	1.45	3.5	215.3	250	250
	208-230 / 3 / 60	196	244	2+2	110.2+88.4	599+605	4	0.70	2.1	450.4	500	630
	380 / 3 / 60	357	403	2+2	66.7+50.9	358+353	4	2.05	3.9	267.5	300	400
	460 / 3 / 60	432	488	2+2	55.1+42.1	310+272	4	2.30	4.0	224.2	250	250
110	380-420 / 3 / 50	357	440	3+1	53.3+40.7	310+272	4	1.45	3.5	227.9	250	250
	208-230 / 3 / 60	196	244	3+1	110.2+88.4	599+605	4	0.70	2.1	472.2	500	630
	380 / 3 / 60	357	403	3+1	66.7+50.9	358+353	4	2.05	3.9	283.3	300	400
	460 / 3 / 60	432	488	3+1	55.1+42.1	310+272	4	2.30	4.0	237.2	250	400

Legend

- kW: Nominal Output Power (for each Fan motor)
- RLA: Rated Load Ampere
- FLA: Full Load Ampere (for each Fan motor)
- MOP: Maximum Overcurrent Protection
- MDS: Non-Fused Main Disconnect Switch
- LRA: Locked Rotor Ampere
- MCA: Minimum Circuit Ampacity
- PW: Part winding connection
- Y-D: Star-Delta connection

Note

- MCA is based on 125% of the RLA for the largest motor plus 100% of the RLA/FLA for all other loads included in the circuit (NEC-Article 430-24)
- MOP is based on 225% of the RLA for the largest motor plus 100% of the RLA for all other loads included in the circuit (NEC-Article 440-22)
- MDS is based on 115% of the total summation of RLA/FLA for all loads included in the circuit (NEC-Article 440- 12A1)

MODEL (PSC4)	POWER SUPPLY (V/Ph/Hz)	SUPPLIED VOLTAGE		COMPREDDOR			CONDENSOR FAN MOTOR			MCA	MOP	MDS
		MIN	MAX	No.	RLA (A)	LRA	NO.	kW	FLA (A)			
115	380-420 / 3 / 50	357	440	4	53.3	310	4	1.45	3.5	240.5	250	400
	208-230 / 3 / 60	196	244	4	110.2	599	4	0.70	2.1	494.0	600	630
	380 / 3 / 60	357	403	4	66.7	358	4	2.05	3.9	299.1	350	400
	460 / 3 / 60	432	488	4	55.1	310	4	2.30	4.0	250.2	300	400
120	380-420 / 3 / 50	357	440	2+4	40.7+33.1	272+225	6	1.45	3.5	245.0	250	400
	208-230 / 3 / 60	196	244	2+4	88.4+70.8	605+505	6	0.70	2.1	520.6	600	630
	380 / 3 / 60	357	403	2+4	50.9+40.7	353+290	6	2.05	3.9	300.7	350	400
	460 / 3 / 60	432	488	2+4	42.1+33.6	272+225	6	2.30	4.0	253.1	300	400
125	380-420 / 3 / 50	357	440	4+2	40.7+33.1	272+225	6	1.45	3.5	260.2	300	400
	208-230 / 3 / 60	196	244	4+2	88.4+70.8	605+505	6	0.70	2.1	555.8	600	630
	380 / 3 / 60	357	403	4+2	50.9+40.7	353+290	6	2.05	3.9	321.1	350	400
	460 / 3 / 60	432	488	4+2	42.1+33.6	272+225	6	2.30	4.0	270.1	300	400
135	380-420 / 3 / 50	357	440	6	40.7	272	6	1.45	3.5	275.4	300	400
	208-230 / 3 / 60	196	244	6	88.4	605	6	0.70	2.1	591.0	600	800
	380 / 3 / 60	357	403	6	50.9	353	6	2.05	3.9	341.5	350	400
	460 / 3 / 60	432	488	6	42.1	272	6	2.30	4.0	287.1	300	400
145	380-420 / 3 / 50	357	440	2+4	53.3+40.7	310+272	6	1.45	3.5	303.7	350	400
	208-230 / 3 / 60	196	244	2+4	110.2+88.4	599+605	6	0.70	2.1	640.1	700	800
	380 / 3 / 60	357	403	2+4	66.7+50.9	358+353	6	2.05	3.9	377.1	400	630
	460 / 3 / 60	432	488	2+4	55.1+42.1	310+272	6	2.30	4.0	316.4	350	400
155	380-420 / 3 / 50	357	440	3+3	53.3+40.7	310+272	6	1.45	3.5	316.3	350	400
	208-230 / 3 / 60	196	244	3+3	110.2+88.4	599+605	6	0.70	2.1	661.9	700	800
	380 / 3 / 60	357	403	3+3	66.7+50.9	358+353	6	2.05	3.9	392.9	450	630
	460 / 3 / 60	432	488	3+3	55.1+42.1	310+272	6	2.30	4.0	329.4	350	400
170	380-420 / 3 / 50	357	440	6	53.3	310	6	1.45	3.5	354.1	400	400
	208-230 / 3 / 60	196	244	6	110.2	599	6	0.70	2.1	727.3	800	1,000
	380 / 3 / 60	357	403	6	66.7	358	6	2.05	3.9	440.3	500	630
	460 / 3 / 60	432	488	6	55.1	310	6	2.30	4.0	368.4	400	630
180	380-420 / 3 / 50	357	440	8	40.7	272	8	1.45	3.5	363.8	400	630
	208-230 / 3 / 60	196	244	8	88.4	605	8	0.70	2.1	780.7	800	1,000
	380 / 3 / 60	357	403	8	50.9	353	8	2.05	3.9	451.1	500	630
	460 / 3 / 60	432	488	8	42.1	272	8	2.30	4.0	379.3	400	630

Legend

- kW: Nominal Output Power (for each Fan motor)
- RLA: Rated Load Ampere
- FLA: Full Load Ampere (for each Fan motor)
- MOP: Maximum Overcurrent Protection
- MDS: Non-Fused Main Disconnect Switch
- LRA: Locked Rotor Ampere
- MCA: Minimum Circuit Ampacity
- PW: Part winding connection
- Y-D: Star-Delta connection

Note

- MCA is based on 125% of the RLA for the largest motor plus 100% of the RLA/FLA for all other loads included in the circuit (NEC-Article 430-24)
- MOP is based on 225% of the RLA for the largest motor plus 100% of the RLA for all other loads included in the circuit (NEC-Article 440-22)
- MDS is based on 115% of the total summation of RLA/FLA for all loads included in the circuit (NEC-Article 440- 12A1)

Electrical Data

MODEL (PSC4)	POWER SUPPLY (V/Ph/Hz)	SUPPLIED VOLTAGE		COMPREDDOR			CONDENSOR FAN MOTOR			MCA	MOP	MDS
		MIN	MAX	No.	RLA (A)	LRA	NO.	kW	FLA (A)			
190	380-420 / 3 / 50	357	440	2+6	53.3+40.7	310+272	8	1.45	3.5	392.1	400	630
	208-230 / 3 / 60	196	244	2+6	110.2+88.4	599+605	8	0.70	2.1	829.7	1,000	1,000
	380 / 3 / 60	357	403	2+6	66.7+50.9	358+353	8	2.05	3.9	486.7	500	630
	460 / 3 / 60	432	488	2+6	55.1+42.1	310+272	8	2.30	4.0	408.6	450	630
200	380-420 / 3 / 50	357	440	4+4	53.3+40.7	310+272	8	1.45	3.5	417.3	450	630
	208-230 / 3 / 60	196	244	4+4	110.2+88.4	599+605	8	0.70	2.1	873.3	1,000	1,000
	380 / 3 / 60	357	403	4+4	66.7+50.9	358+353	8	2.05	3.9	518.3	600	630
	460 / 3 / 60	432	488	4+4	55.1+42.1	310+272	8	2.30	4.0	434.6	450	630
215	380-420 / 3 / 50	357	440	6+2	53.3+40.7	310+272	8	1.45	3.5	442.5	450	630
	208-230 / 3 / 60	196	244	6+2	110.2+88.4	599+605	8	0.70	2.1	916.9	1,000	1,250
	380 / 3 / 60	357	403	6+2	66.7+50.9	358+353	8	2.05	3.9	549.9	600	630
	460 / 3 / 60	432	488	6+2	55.1+42.1	310+272	8	2.30	4.0	460.6	500	630
225	380-420 / 3 / 50	357	440	8	53.3	310	8	1.45	3.5	467.7	500	630
	208-230 / 3 / 60	196	244	8	110.2	599	8	0.70	2.1	960.5	1,000	1,250
	380 / 3 / 60	357	403	8	66.7	358	8	2.05	3.9	581.5	600	800
	460 / 3 / 60	432	488	8	55.1	310	8	2.30	4.0	486.6	500	630
235	380-420 / 3 / 50	357	440	4+8	40.7+33.1	272+225	12	1.45	3.5	479.8	500	630
	208-230 / 3 / 60	196	244	4+8	88.4+70.8	605+505	12	0.70	2.1	1,019.1	1,200	1,250
	380 / 3 / 60	357	403	4+8	50.9+40.7	353+290	12	2.05	3.9	588.7	600	800
	460 / 3 / 60	432	488	4+8	42.1+33.6	272+225	12	2.30	4.0	495.7	500	630
250	380-420 / 3 / 50	357	440	8+4	40.7+33.1	272+225	12	1.45	3.5	510.2	600	630
	208-230 / 3 / 60	196	244	8+4	88.4+70.8	605+505	12	0.70	2.1	1,089.5	1,200	1,250
	380 / 3 / 60	357	403	8+4	50.9+40.7	353+290	12	2.05	3.9	629.5	700	800
	460 / 3 / 60	432	488	8+4	42.1+33.6	272+225	12	2.30	4.0	529.7	600	630
265	380-420 / 3 / 50	357	440	12	40.7	272	12	1.45	3.5	540.6	600	630
	208-230 / 3 / 60	196	244	12	88.4	605	12	0.70	2.1	1,159.9	1,200	1,600
	380 / 3 / 60	357	403	12	50.9	353	12	2.05	3.9	670.3	700	800
	460 / 3 / 60	432	488	12	42.1	272	12	2.30	4.0	563.7	600	800
285	380-420 / 3 / 50	357	440	4+8	53.3+40.7	310+272	12	1.45	3.5	594.1	600	800
	208-230 / 3 / 60	196	244	4+8	110.2+88.4	599+605	12	0.70	2.1	1,252.6	1,200	1,600
	380 / 3 / 60	357	403	4+8	66.7+50.9	358+353	12	2.05	3.9	737.5	800	1,000
	460 / 3 / 60	432	488	4+8	55.1+42.1	310+272	12	2.30	4.0	619.0	700	800

Legend

- kW: Nominal Output Power (for each Fan motor)
- RLA: Rated Load Ampere
- FLA: Full Load Ampere (for each Fan motor)
- MOP: Maximum Overcurrent Protection
- MDS: Non-Fused Main Disconnect Switch
- LRA: Locked Rotor Ampere
- MCA: Minimum Circuit Ampacity
- PW: Part winding connection
- Y-D: Star-Delta connection

Note

- MCA is based on 125% of the RLA for the largest motor plus 100% of the RLA/FLA for all other loads included in the circuit (NEC-Article 430-24)
- MOP is based on 225% of the RLA for the largest motor plus 100% of the RLA for all other loads included in the circuit (NEC-Article 440-22)
- MDS is based on 115% of the total summation of RLA/FLA for all loads included in the circuit (NEC-Article 440- 12A1)

MODEL (PSC4)	POWER SUPPLY (V/Ph/Hz)	SUPPLIED VOLTAGE		COMPREDDOR			CONDENSOR FAN MOTOR			MCA	MOP	MDS
		MIN	MAX	No.	RLA (A)	LRA	NO.	kW	FLA (A)			
315	380-420 / 3 / 50	357	440	8+4	53.3+40.7	310+272	12	1.45	3.5	644.5	700	800
	208-230 / 3 / 60	196	244	8+4	110.2+88.4	599+605	12	0.70	2.1	1,339.8	1,600	1,600
	380 / 3 / 60	357	403	8+4	66.7+50.9	358+353	12	2.05	3.9	800.7	1,000	1,000
	460 / 3 / 60	432	488	8+4	55.1+42.1	310+272	12	2.30	4.0	671.0	700	800
335	380-420 / 3 / 50	357	440	12	53.3	310	12	1.45	3.5	694.9	700	800
	208-230 / 3 / 60	196	244	12	110.2	599	12	0.70	2.1	1,427.0	1,600	2,000
	380 / 3 / 60	357	403	12	66.7	358	12	2.05	3.9	863.9	1,000	1,000
	460 / 3 / 60	432	488	12	55.1	310	12	2.30	4.0	723.0	800	1,000
355	380-420 / 3 / 50	357	440	16	40.7	272	16	1.45	3.5	717.4	800	1,000
	208-230 / 3 / 60	196	244	16	88.4	605	16	0.70	2.1	1,539.2	1,600	2,000
	380 / 3 / 60	357	403	16	50.9	353	16	2.05	3.9	889.5	1,000	1,250
	460 / 3 / 60	432	488	16	42.1	272	16	2.30	4.0	748.1	800	1,000
380	380-420 / 3 / 50	357	440	4+12	53.3+40.7	310+272	16	1.45	3.5	770.9	800	1,000
	208-230 / 3 / 60	196	244	4+12	110.2+88.4	599+605	16	0.70	2.1	1,631.9	2,000	2,000
	380 / 3 / 60	357	403	4+12	66.7+50.9	358+353	16	2.05	3.9	956.7	1,000	1,250
	460 / 3 / 60	432	488	4+12	55.1+42.1	310+272	16	2.30	4.0	803.4	1,000	1,000
400	380-420 / 3 / 50	357	440	8+8	53.3+40.7	310+272	16	1.45	3.5	821.3	1,000	1,000
	208-230 / 3 / 60	196	244	8+8	110.2+88.4	599+605	16	0.70	2.1	1,719.1	2,000	2,000
	380 / 3 / 60	357	403	8+8	66.7+50.9	358+353	16	2.05	3.9	1,019.9	1,200	1,250
	460 / 3 / 60	432	488	8+8	55.1+42.1	310+272	16	2.30	4.0	855.4	1,000	1,000
420	380-420 / 3 / 50	357	440	12+4	53.3+40.7	310+272	16	1.45	3.5	871.7	1,000	1,000
	208-230 / 3 / 60	196	244	12+4	110.2+88.4	599+605	16	0.70	2.1	1,806.3	2,000	2,500
	380 / 3 / 60	357	403	12+4	66.7+50.9	358+353	16	2.05	3.9	1,083.1	1,200	1,250
	460 / 3 / 60	432	488	12+4	55.1+42.1	310+272	16	2.30	4.0	907.4	1,000	1,250
445	380-420 / 3 / 50	357	440	16	53.3	310	16	1.45	3.5	922.1	1,000	1,250
	208-230 / 3 / 60	196	244	16	110.2	599	16	0.70	2.1	1,893.5	2,000	2,500
	380 / 3 / 60	357	403	16	66.7	358	16	2.05	3.9	1,146.3	1,200	1,600
	460 / 3 / 60	432	488	16	55.1	310	16	2.30	4.0	959.4	1,000	1,250

Legend

- kW: Nominal Output Power (for each Fan motor)
- RLA: Rated Load Ampere
- FLA: Full Load Ampere (for each Fan motor)
- MOP: Maximum Overcurrent Protection
- MDS: Non-Fused Main Disconnect Switch
- LRA: Locked Rotor Ampere
- MCA: Minimum Circuit Ampacity
- PW: Part winding connection
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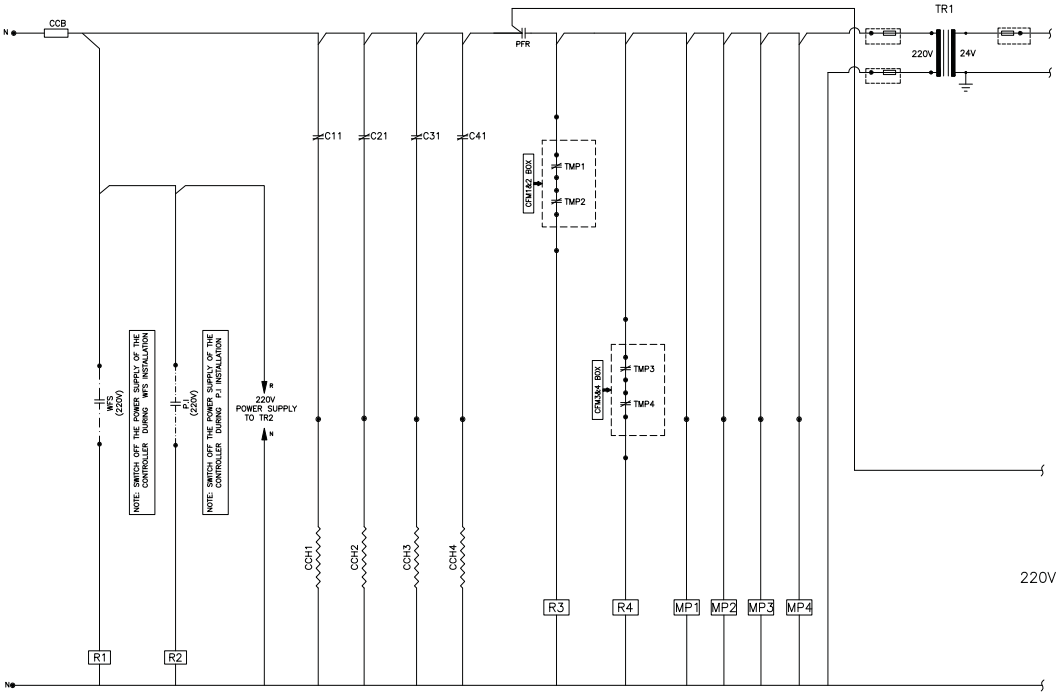
Note

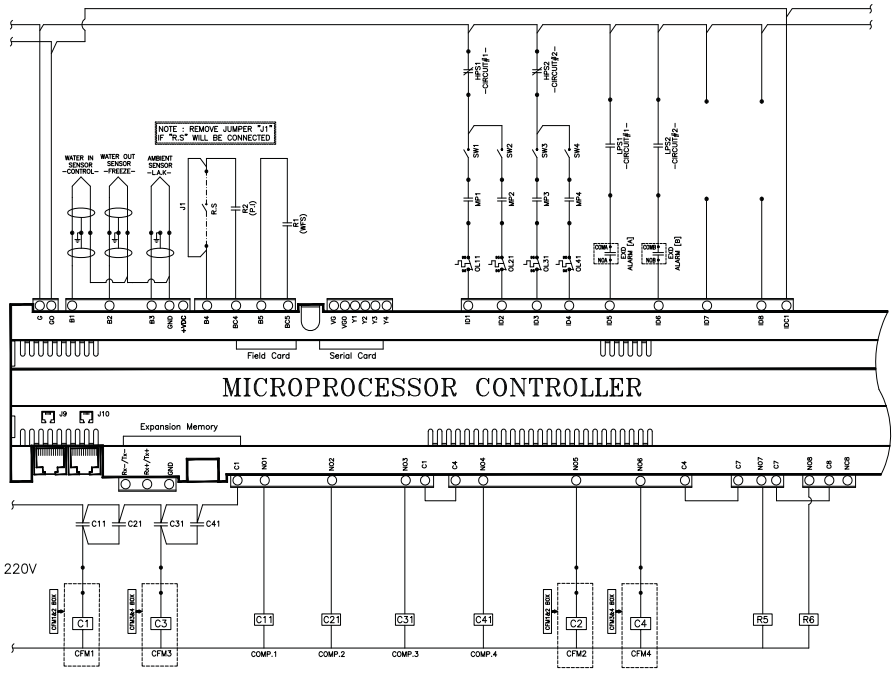
- MCA is based on 125% of the RLA for the largest motor plus 100% of the RLA/FLA for all other loads included in the circuit (NEC-Article 430-24)
- MOP is based on 225% of the RLA for the largest motor plus 100% of the RLA for all other loads included in the circuit (NEC-Article 440-22)
- MDS is based on 115% of the total summation of RLA/FLA for all loads included in the circuit (NEC-Article 440- 12A1)

Typical Wiring - 380~415V/3Ph/50Hz

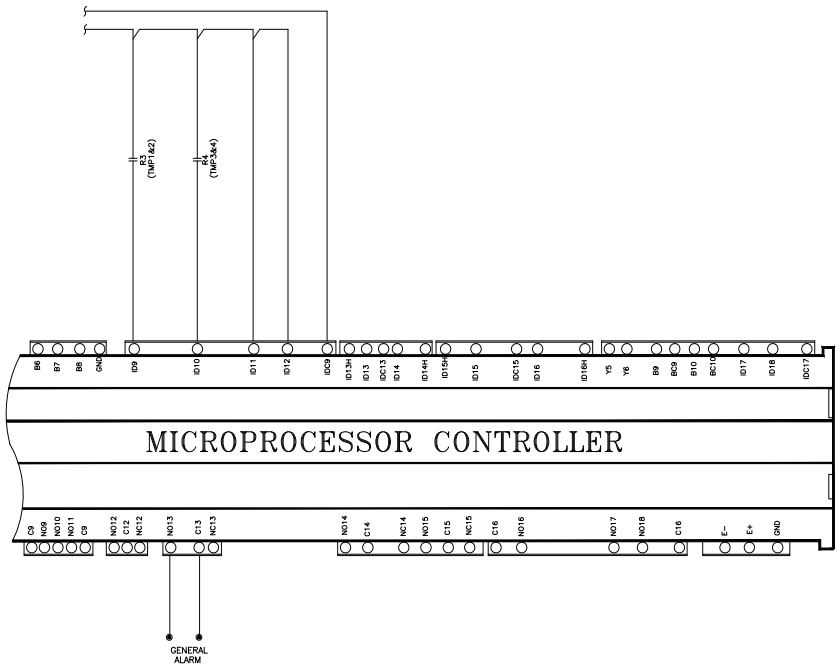
- Control Diagram



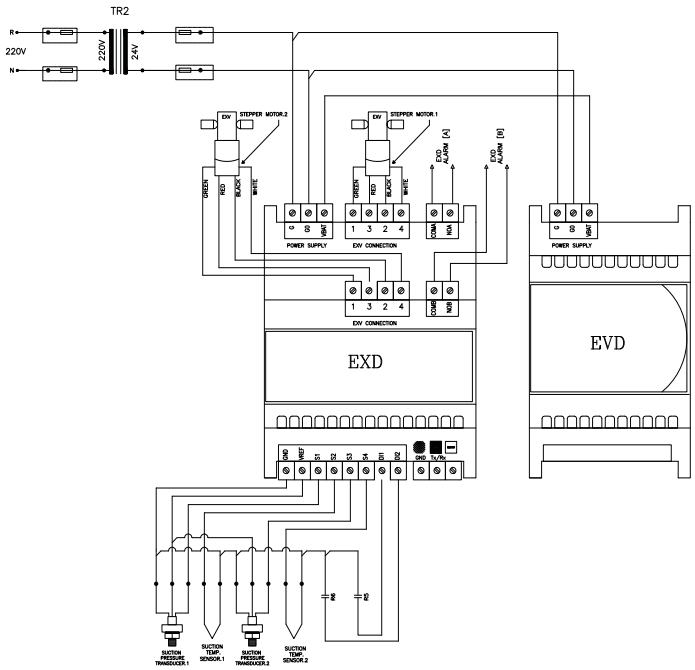
- Control Diagram



- ## Control Diagram

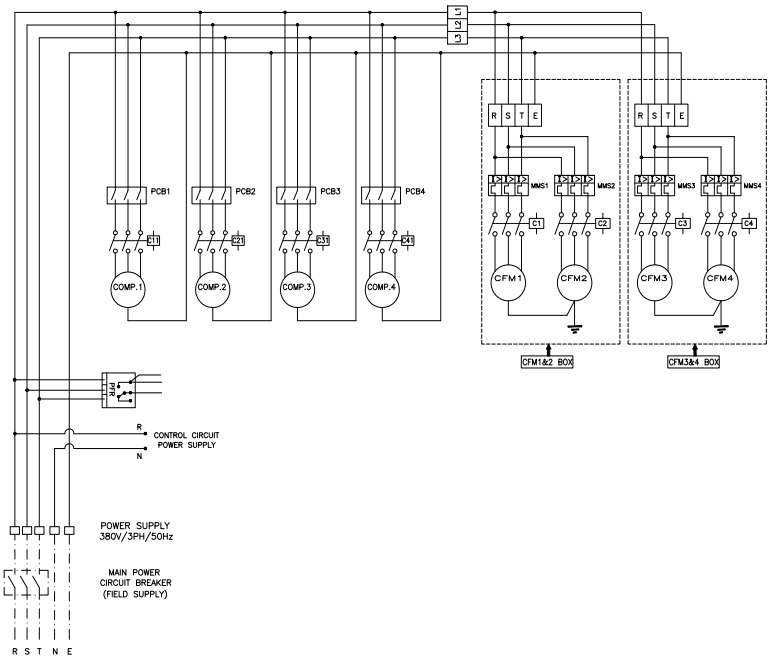


- ## Electronic Expansion Valve Drive



Typical Wiring - 380~415V/3Ph/50Hz

- ## Power Diagram



- ## Lists & Tables

LEGEND			
C	CONTACTOR	PCB	POWER CIRCUIT BREAKER
CCB	CONTROL CIRCUIT BREAKER	HPS	HIGH PRESSURE SWITCH
CCH	CRANKCASE HEATER	LPS	LOW PRESSURE SWITCH
CFM	CONDENSER FAN MOTOR	MP	MOTOR PROTECTOR
WFS	WATER FLOW SWITCH	P.I	PUMP INTERLOCK
COMP.	COMPRESSOR	PFR	PHASE FAILURE RELAY
TR	TRANSFORMER	TMP	THERMAL MOTOR PROTECTOR
SW	ON/OFF SWITCH	EXD	ELECTRONIC EXPANSION VALVE DRIVE
R	CONTROL RELAY	EXV	ELECTRONIC EXPANSION VALVE
R.S	REMOTE SWITCH	Wn	WIRING NUMBER
L.A.K	LOW AMBIENT KIT	◎n	TERMINAL NUMBER
MMS	MANUAL MOTOR STARTER	— · — · —	FIELD CONNECTION (BY OTHERS)

ERROR CONDITION

1 * ANY ABNORMAL CONDITION COULD HAPPENED THE CONTROLLER WILL AUTOMATICALLY SWITCH OFF THE CONCERNED CIRCUIT OR THE WHOLE CHILLER DEPENDING ON ALARM TYPE, THEN IT WILL GIVE ALARM MESSAGE AND THE CONTROLLER WILL ENERGIZE THE GENERAL ALARM RELAY.

2 * IF THIS CONDITION HAPPENED, PUSH THE ALARM BUTTON TO DISPLAY THE ALARM MESSAGE.

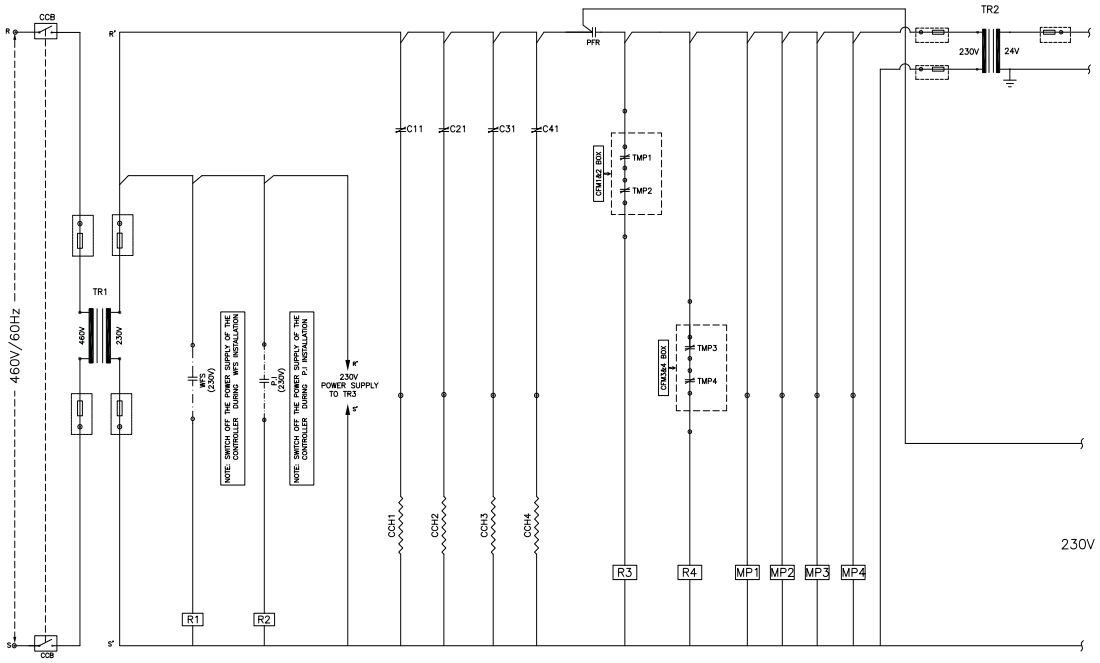
3 * AFTER FIXING THE ALARM,TO RESET THE ALARM PUSH ALARM BUTTON AGAIN.

ACCESS TO SET POINT

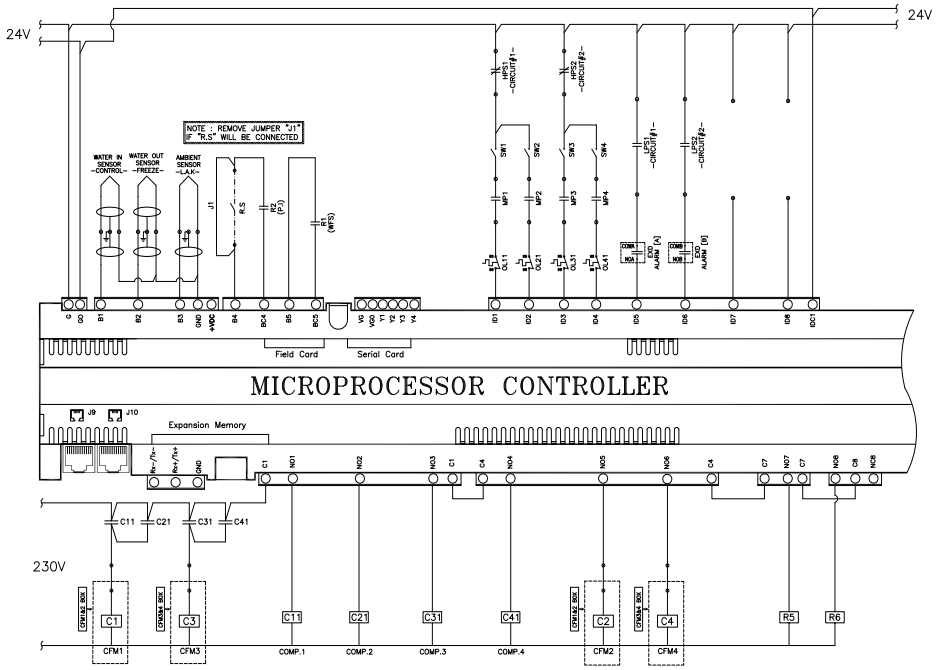
PRESS PROG. BUTTON (Prg) ON THE CONTROLLER KEYPAD, AND THEN PRESS (Esc)
SELECT THE (SETPOINT) AND THEN PRESS ENTER (↵)
GO TO THE (COMPRESSORS PROPORTIONAL BAND CHANGE SETPOINT) BY PRESSING (↓) BUTTON
AND THEN PRESS (↵) TO ENABLE MODIFYING THE VALUE
NOW YOU CAN CHANGE IT BY PRESSING (↑) AND (↓) AND THEN PRESS (↵) TO SAVE
THEN PRESS (Esc) TO EXIT TO THE MAIN MENU

Typical Wiring - 460V/3Ph/60Hz

- Control Diagram



- Control Diagram



Typical Wiring - 460V/3Ph/60Hz

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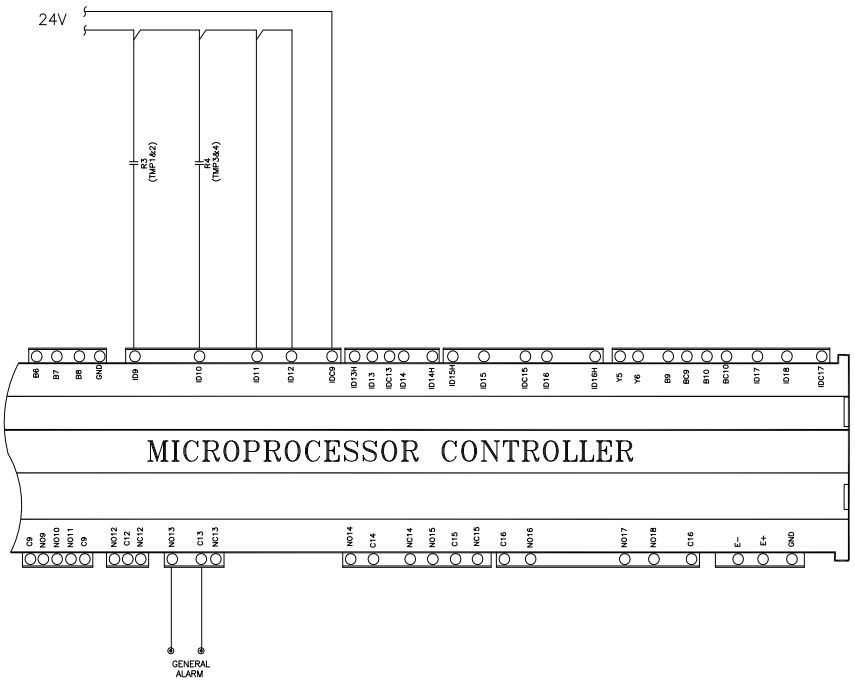
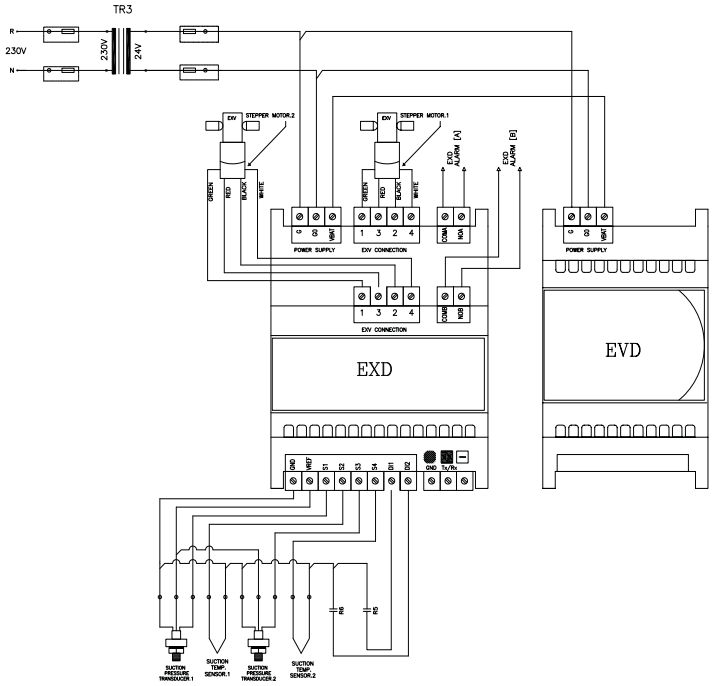
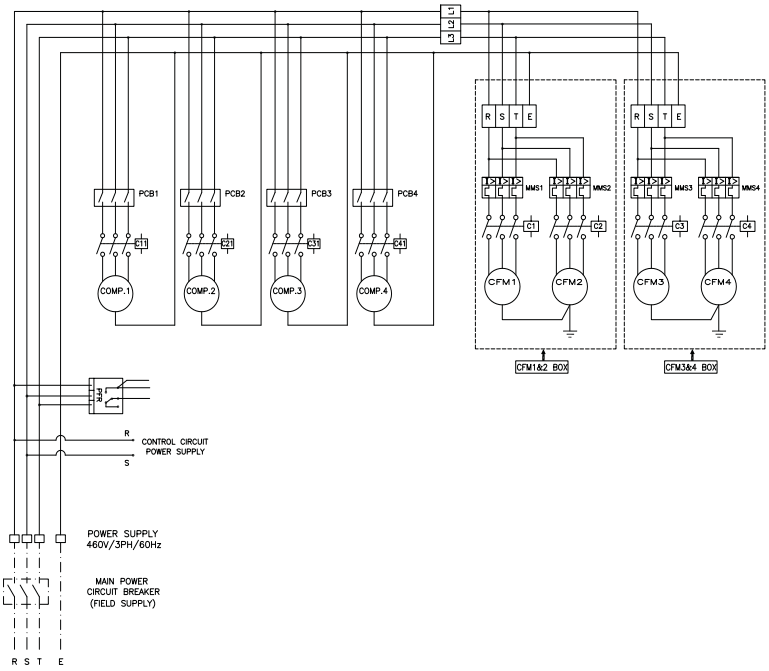


- ## Electronic Expansion Valve Drive



• Power Diagram



• Lists & Tables

LEGEND			
C	CONTACTOR	PCB	POWER CIRCUIT BREAKER
CCB	CONTROL CIRCUIT BREAKER	HPS	HIGH PRESSURE SWITCH
CCH	CRANKCASE HEATER	LPS	LOW PRESSURE SWITCH
CFM	CONDENSER FAN MOTOR	MP	MOTOR PROTECTOR
WFS	WATER FLOW SWITCH	P.I	PUMP INTERLOCK
COMP.	COMPRESSOR	PFR	PHASE FAILURE RELAY
TR	TRANSFORMER	TMP	THERMAL MOTOR PROTECTOR
SW	ON/OFF SWITCH	EXD	ELECTRONIC EXPANSION VALVE DRIVE
R	CONTROL RELAY	EXV	ELECTRONIC EXPANSION VALVE
R.S	REMOTE SWITCH	Wn	WIRING NUMBER
L.A.K	LOW AMBIENT KIT	⊙n	TERMINAL NUMBER
MMS	MANUAL MOTOR STARTER	- · - · -	FIELD CONNECTION (BY OTHERS)

ERROR CONDITION

1 * ANY ABNORMAL CONDITION COULD HAPPENED THE CONTROLLER WILL AUTOMATICALLY SWITCH OFF THE CONCERNED CIRCUIT OR THE WHOLE CHILLER DEPENDING ON ALARM TYPE, THEN IT WILL GIVE ALARM MESSAGE AND THE CONTROLLER WILL ENERGIZE THE GENERAL ALARM RELAY.

2 * IF THIS CONDITION HAPPENED, PUSH THE ALARM BUTTON TO DISPLAY THE ALARM MESSAGE.

3 * AFTER FIXING THE ALARM,TO RESET THE ALARM PUSH ALARM BUTTON AGAIN.

ACCESS TO SET POINT

PRESS PROG. BUTTON (Prg) ON THE CONTROLLER KEYPAD, AND THEN PRESS (Esc)
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Typical Wiring - 208V/3Ph/60Hz

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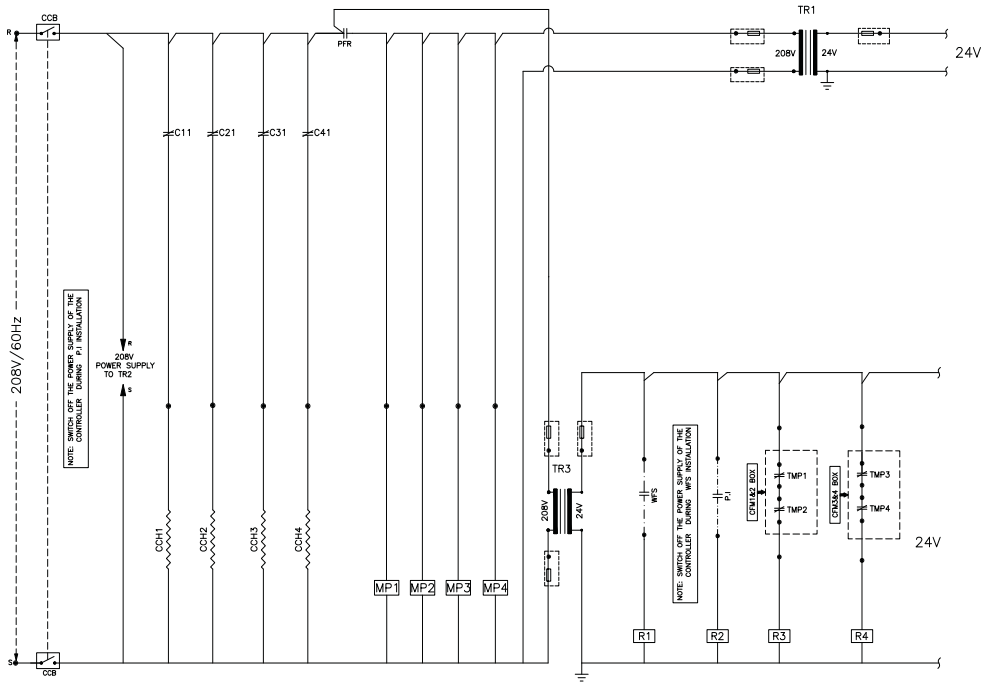

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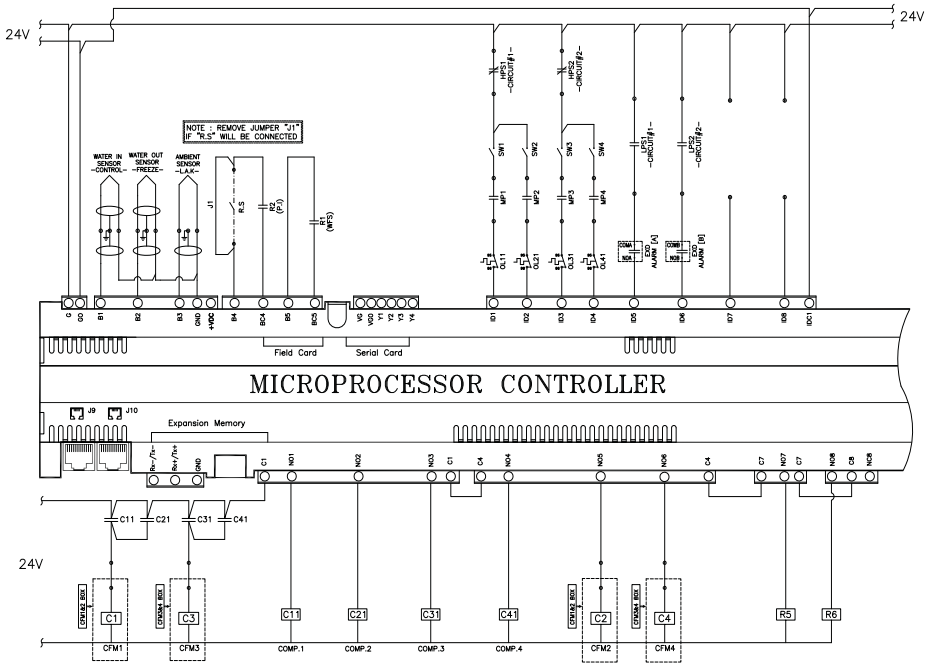
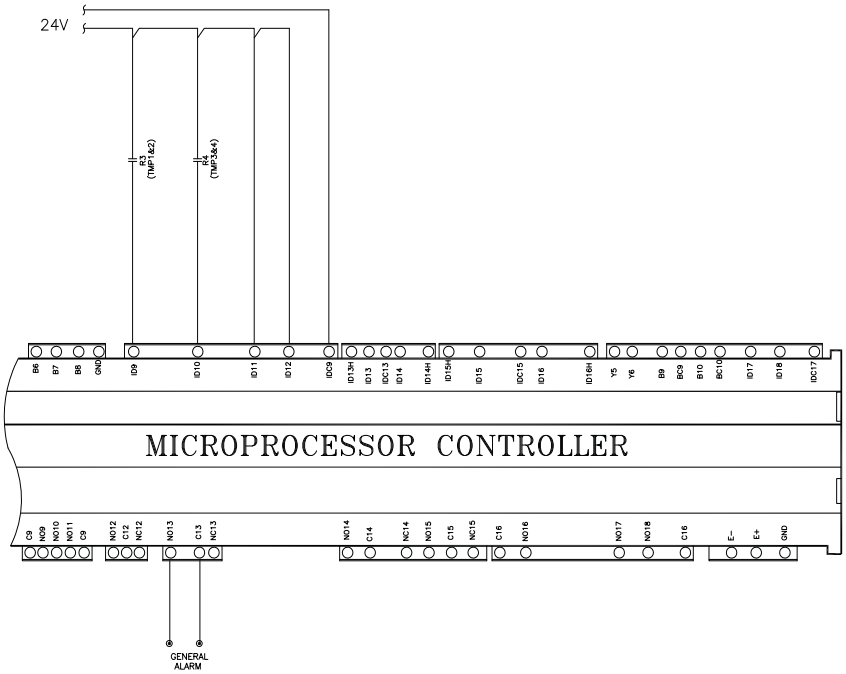


- ## Control Diagram



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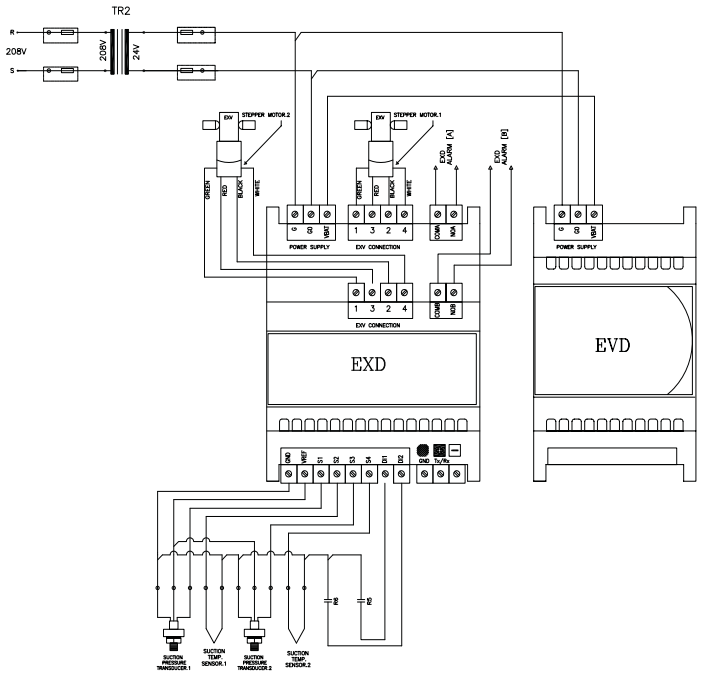

Typical Wiring - 208V/3Ph/60Hz

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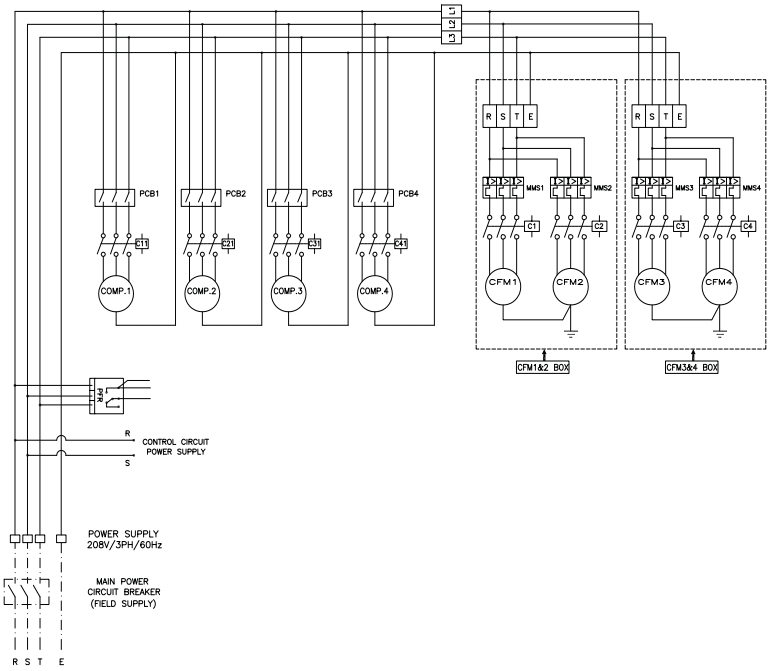

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THEN PRESS (Esc) TO EXIT TO THE MAIN MENU

Application Data

Unit Leveling

Unit must be leveled when installed to ensure proper oil returnto the compressor

Fluid Temperature

1. Maximum leaving chilled fluid temperature for unit is 10ºC (50ºF). For continuous operation, it is recommended that return fluid temperature does not exceed 16ºC (60ºF) (If continuous operation is required for return water temperature above 16ºC (60ºF) please refer to Petra nearest sales office)
2. Minimum leaving chilled fluid temperature for a standard unit is 4ºC (40ºF) (for lower leaving temperature contact Petra nearest sales office)

Barrel (Cooler) Flow Range

Chiller ratings and performance data pertain to a fluid temperature rise of 5.5ºC (10°F). Chillers may be suitable for operation in a range from 3ºC (5.4°F)to 9ºC (16°F) temperature rise without adjustment and provided flow limits are within the minimum limits (for larger or smaller temperature rise, a mixing loop is required; please contact Petra nearest sales office)

Minimum Cooler Flow

Is based on the maximum permissible temperature rise across the cooler of 9ºC (16°F)

Fluid loop volume

To obtain proper temperature control, the loop fluid volume must be at least 297 (L/s)/kW (5 GPM/Ton) based on a 5.5ºC (10°F) temperature rise for chiller nominal capacity in air conditioning applications, taking into consideration the minimum system volume

Cooler protection:

Protection against low ambient freeze-up is required for ambient temperatures below 0ºC (32°F) protection should be in the form of:

1. Inhibited ethylene glycol or any other suitable glycol (please contact Petra nearest sales office
2. Cooler is equipped with an electric tape heat that prevents freeze-up (Optional)

High Ambient Temperature

High outdoor ambient chiller start-up and operation is possible for chillers at ambient temperatures up to 52ºC (125°F) at nominal voltage (for standard units) (for higher ambient temperatures, please contact Petra nearest sales office)

Condenser Airflow

Any restrictions on the unit's fan airflow will affect the unit's capacity, condenser head pressure, and compressor power input. Such restrictions -not providing vertical clearance or lateral clearance, insufficient unit-to-unit clearance- will cause warm air re-circulation or coil starvation. Minimum required operational and maintenance clearances around the unit are shown in the figure on page 89

Altitude correction factors

Capacity correction and compressor power factors must be applied to standard ratings at altitudes above sea level using the multipliers on the right

Altitude Meter [ft]	Correction Factor	Compressor Power Factor
Sea Level	1.000	1.000
305 (1000)	0.995	1.005
610 (2000)	0.990	1.010
915 (3000)	0.985	1.015
1220 (4000)	0.980	1.020
1525 (5000)	0.973	1.025
1830 (6000)	0.976	1.030
2135 (7000)	0.960	1.035
2440 (8000)	0.950	1.040

Application Data

MODEL (PSC4)	Nominal water flow rate				Minimum water flow rate				Minimum loop volume			
	50 Hz		60 Hz		50 Hz		60 Hz		50 Hz		60 Hz	
	L/s	GPM	L/s	GPM	L/s	GPM	L/s	GPM	Liter	gallon	Liter	gallon
50	7	108	8	126	5	75	6	88	2,044	540	2,385	630
55	7	118	9	137	5	82	6	96	2,233	590	2,593	685
65	9	138	10	161	6	97	7	113	2,612	690	3,047	805
75	10	154	11	179	7	108	8	125	2,915	770	3,388	895
85	11	173	13	201	8	121	9	141	3,274	865	3,804	1,005
95	12	193	14	226	9	135	10	158	3,653	965	4,278	1,130
105	14	215	16	251	9	150	11	176	4,069	1,075	4,751	1,255
110	14	226	17	263	10	158	12	184	4,278	1,130	4,978	1,315
115	15	235	17	274	10	165	12	192	4,448	1,175	5,186	1,370
120	16	249	18	291	11	175	13	204	4,713	1,245	5,508	1,455
125	17	272	20	316	12	190	14	221	5,148	1,360	5,981	1,580
135	18	287	21	334	13	201	15	234	5,432	1,435	6,322	1,670
145	19	309	23	359	14	216	16	251	5,848	1,545	6,795	1,795
155	20	319	23	372	14	223	16	260	6,038	1,595	7,041	1,860
170	22	355	26	415	16	249	18	291	6,719	1,775	7,855	2,075
180	24	382	28	446	17	268	20	312	7,230	1,910	8,441	2,230
190	25	404	30	471	18	283	21	330	7,647	2,020	8,915	2,355
200	27	425	31	496	19	298	22	347	8,044	2,125	9,388	2,480
215	29	453	33	529	20	317	23	370	8,574	2,265	10,012	2,645
225	30	472	35	551	21	331	24	386	8,934	2,360	10,429	2,755
235	31	499	37	582	22	349	26	407	9,445	2,495	11,016	2,910
250	33	529	39	616	23	370	27	431	10,012	2,645	11,659	3,080
265	36	573	42	668	25	401	30	468	10,845	2,865	12,643	3,340
285	39	617	45	718	27	432	32	503	11,678	3,085	13,590	3,590
315	43	679	50	796	30	475	35	557	12,851	3,395	15,066	3,980
335	45	710	52	830	31	497	37	581	13,438	3,550	15,709	4,150
355	48	765	56	892	34	535	39	624	14,479	3,825	16,883	4,460
380	51	808	59	942	36	566	42	659	15,293	4,040	17,829	4,710
400	54	851	63	991	38	595	44	694	16,107	4,255	18,757	4,955
420	57	905	67	1,057	40	634	47	740	17,129	4,525	20,006	5,285
445	60	944	70	1,102	42	661	49	772	17,867	4,720	20,858	5,510

Note

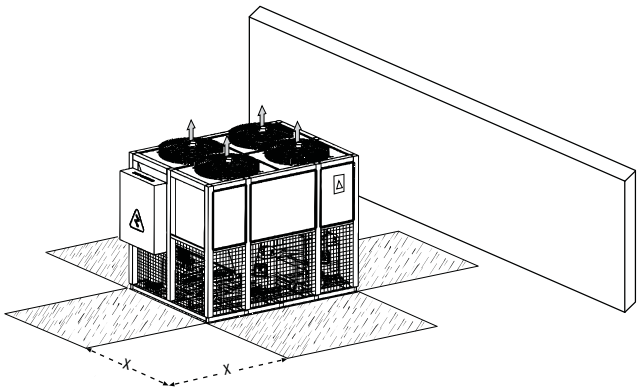
Nominal water flow rate is based on AHRI condition of 35 °C (95 °F) ambient and leaving water temperature of 6.7°C (44°F) and inlet water temperature of 12.2°C (54°F)
Minimum water flow rate is based on leaving water temperature of 4°C (40°F) and inlet water temperature of 13°C (55°F)
Minimum cooler loop volume is based on normal air conditioning application

Unit Clearance

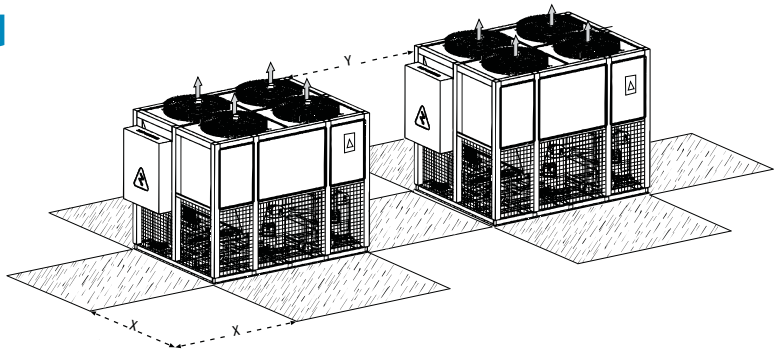
When locating the chiller, pay particular attention to the clearances between the unit and adjacent objects. The relevant electrical code (NEC or CEC) requires a minimum of 36 inches (100 cm) of service space between the face of any electrical enclosure and any wall or obstruction.

Provide sufficient clearance to ensure full access door swings, panel removal and room for piping and wiring ducting. There must be no obstructions to prevent airflow through hoods or louvers. Allow a distance equivalent to the horizontal width of the louver between the louver and any wall facing the louver.

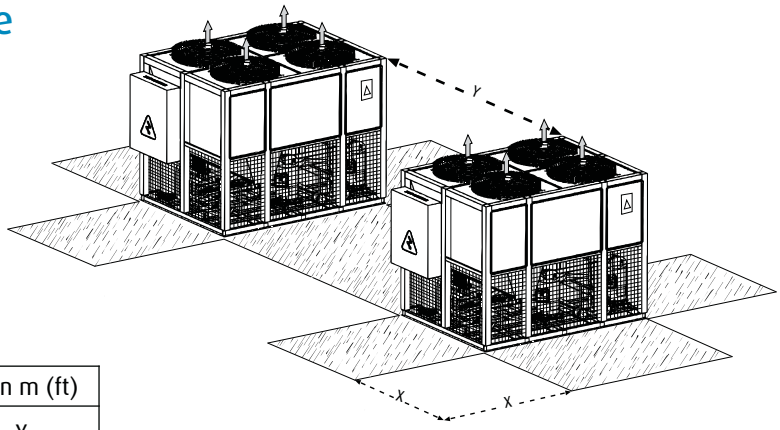
· Single unit



· End-to-end



· Side-by-side



Clearance Dimension m (ft)	
X	Y
1.8 (5.9)	2.5 (8.2)

Legend

- Free Space For Service
- Electric Box
- No Obstacles

Note

- Unit must be leveled
- Service area above is the minimum accepted
- Condenser fan level must be higher than louver or wall level to avoid any short air circulation to condenser coil
- For any other site installation requirements or multiple chiller installation, please contact your nearest Petra sales office

Guide Specification

Part 1 — General

1.01 SYSTEM DESCRIPTION

A. This section includes a microprocessor controlled air-cooled liquid chiller with scroll hermetic compressors, suitable for outdoor installation with low sound fans. Chiller will have the scheduled capacities as shown and indicated on the plans tables and drawings

1.02 QUALITY ASSURANCE

A. Chiller unit shall be designed, manufactured, tested, rated and certified in accordance with the applicable section of the following standards and codes:

1- AHRI 550/590, "Water Chilling Package Using the Vapor Compression Cycle" latest edition
2- AHRI 370, "Sound Rating of Large Outdoor Refrigeration and Air-Conditioning Equipment"
3- ASHRAE 90.1, "Energy Standard for Buildings Except Low-Rise Residential Buildings"
4- ANSI/ASHRAE 15, "Safety Code for Mechanical Refrigeration". Comply with ASHRAE guideline 3 for refrigerant leaks, recovery, handling and storage requirements
5- ANSI/ASHRAE 34, "Number Designation and Safety Classification of Refrigerants"
6- ANSI/NFPA 70, "National Electrical Code (NEC)"
7- OSHA, "Occupational Safety and Health Act"
8- ASME Compliance: Fabricate and label water chiller heat exchangers (Barrel) to comply with "ASME Boiler and Pressure Vessel Code: Section VIII, Division I"
9- Manufactured in a facility registered to ISO 9001-2015, "Manufacturing Quality Standard" that define, establish, and maintain an effective quality assurance system for manufacturing and service industries and ISO 14001-2015, "Environmental Management System" that identify and control the environment impact and constantly improve the organization environmental performance
10- Conform to UL 1995-2000 under "Intertek Testing Services" for construction of chillers and bear the ETL/cETL mark

B. Factory Run Test

1- Unit shall be full load run tested at the factory. This includes pressure testing, evacuation of refrigeration circuits and charging afterward with refrigerant and oil. The run test will be carried out in a controlled environment based on the ambient design temperature, entering and leaving water temperatures and with water flowing through the barrel (Evaporator)

1.03 DELIVERY, STORAGE AND HANDLING

A. Unit controls shall be capable of withstanding 65.5 °C (150 °F) storage temperatures in the control compartment

B. Unit shall be delivered to job site fully assembled with all interconnecting refrigeration piping and internal wiring ready for field installation and charged with refrigerant and oil by the manufacturer

C. Unit to have a protective transparent shipping cover over the whole. This cover shall be secured to the unit base through special welded steel rods with nylon robes. Barrel opening shall be protected with plastic caps

D. Unit shall be stored and handled per unit manufacturer's recommendations

1.04 WARRANTY

A. Manufacturer shall warrant the equipment (parts only) against defects of workmanship and/or material for a period of eighteen (18) months from date of shipment or twelve (12) months from date of start-up, whichever occurs first

Part 2 — PRODUCTS

2.01 APROVED MANUFACTURERS

A. The design shown on the Plans & Drawings is based on PETRA model PSC4 chiller manufactured by Petra Engineering Industries Co. Alternate equipment will be acceptable if the manufacturer's equipment meets the scheduled performance and complies with these specifications. If equipment manufactured by a manufacturer other than that scheduled is utilized, then the Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:

1- Electrical power requirements, wire and conduit sizes, circuit breakers and feeders sizes and overcurrent protection size
2- Structural supports for units
3- Chiller physical size on plant layout and apace availability
4- Water piping sizes and water connection locations on the unit
5- Compliance with the proper international codes such as AHRI, ANSI, NFPA, UL and ASME
6- Site noise considerations

B. The Mechanical Contractor shall be Responsible for all costs incurred by the General contractor, Subcontractors, and Consultants to modify the building provisions to accept the furnished alternate equipment

2.02 GENERAL

A. Description:

1- Furnish, install and commission a factory assembled single piece chassis air cooled scroll compressor chiller unit that is charged and run tested in the factory as specified herein and shown on the Drawings. Chiller shall include, but is not limited to: scroll hermetic compressors, a complete refrigeration system with multiple refrigerant circuits, shell and tube DX type barrel (evaporator), air-cooled condenser, a full charge of R-410a refrigerant, flanged on lubrication system, interconnecting wiring, safety and operating controls and all special features as specified herein or required for safe and automatic operation

B. Unit Paint and Color:

1- Unit panels, structural members, control and electrical boxes shall be constructed of a minimum of G-60-90 galvanized steel that shall be coated with a polyester oven baked powder paint that meets a minimum 5,000 hours salt spray tested in accordance with the ASTM B117 standard. Color code will be RAL 9002 (White Gray). Any other paint process that meets less than 5,000 hours shall not be accepted

C. Unit Base Structure and Finish:

1- Unit will be supported by a structural welded steel C-channel of heights of 100 mm (3.1"),140 mm (5.5") and 180 mm (7.1"). The base shall incorporate cross members to support internal components and will be equipped with screwed-in lifting lugs (eye bolts) of suitable loading capacity. Each lifting lug will be fitted on a welded bracket to the side of the C- channel. The base members will be coated with mono component catalyzed primer sprayed paint. Welded rods inside the C-channel shall be added to tie-in the unit roof cover for shipment purposes

2- OPTIONAL: Sprayed base by two layers of the same color epoxy paint

D. Unit Structure and Cabinet:

1- Frames shall be made of semi-welded structure of galvanized steel tubes of 50 mm (4") cross section and gauge 15 (1.8 mm {0.071"}) wall thickness

2- A protective panel made from gauge 18 (1.25 mm {0.051"}) thickness galvanized steel is fitted on the whole unit perimeter (upper level) to ensure a uniform air distribution across the condenser coil face area and provide additional protection for the coils from the weather elements

3- All self-tapping screws and Bolts/Nuts used shall be made from Stainless steel with a built in rubber retainer included

4- All electrical panels are made from gauge 18 (1.25 mm {0.051"}) thickness galvanized

5- OPTIONAL: A Coil guard made from gauge 18 (1.25 mm {0.051"}) thickness galvanized steel is fitted on the whole unit perimeter (lower level) to provide a protective barrier for the chiller components. The coil guards are secured in place with a spring loaded quick turn latches and supported upon opening by a Stainless Steel hinges}

E. Compressors:

1- Fully hermetic scroll type compressors

2- Direct drive compressor, 2900/3500 rpm (50/60 power supply cycle). Motor shall be protected by internal thermal protection

3- A crank-case heater is fitted to the compressor to heat up the oil before startups. It is recommended to turn on the chiller controls before at least 24-hours to energize the crank case heater

4- Compressor starting shall be direct on line

5- Compressor shall be supported by rubber-in-shear vibration isolators and provided with ample space around it for service and removal

F. Barrels (Evaporator Cooler):

1- Shall be a shell-and-tube, Direct Expansion (DX) type. It will be mechanically cleanable tubes removable head(s). Water in the shell and refrigerant in tubes

2- Tubes shall be internally enhanced seamless copper type rolled into tube sheets. Baffles shall be provided in the shell to ensure maximum water distribution for best heat transfer

3- Cooler will be designed with refrigeration circuits

4- Shall be insulated with a closed cell foam insulation of 19 mm (3/4") thickness with a maximum K factor of 0.035 W/(m-K°) {0.020 BTUH/(ft-°F)}

4- OPTIONAL: Shall be insulated with a closed cell foam insulation of 25 mm (1") thickness with a maximum K factor of 0.035 W/(m-K°) {0.020 BTUH/(ft-°F)}

Guide Specification

4- OPTIONAL: Shall be insulated with a closed cell foam insulation of 38 mm (1 1/2") thickness with a maximum K factor of 0.035 W/(m-K°) {0.020 BTUH/(ft-°F)}

4- OPTIONAL: Shall be insulated with a closed cell foam insulation of 50 mm (2") thickness with a maximum K factor of 0.035 W/(m-K°) {0.020 BTUH/(ft-°F)}

5- Cooler shall have a built on drain and vent connection

6- It shall be equipped with Victaulic-type water connections that are supplied as loose items and shipped within the chiller enclosure

7- Cooler shall be tested and stamped in accordance with ASME Code for refrigerant. Refrigerant side design working pressure shall be 1000 kPa (145 psig) and the maximum water side design working pressure shall be 1500 kPa (220 psig)

8- OPTIONAL: Anti-freeze protection tape heater to protect the cooler down to 0°C (32°F). Heater will be energized directly from unit electrical panel and requires no external power supply. Anti-freeze tape heater that requires an external power supply is not accepted. Unit must be kept ON to enable this protection 24/7

8- OPTIONAL: Anti-freeze protection tape heater to protect the cooler down to -17°C (0°F). Heater will be energized directly from unit electrical panel and requires no external power supply. Anti-freeze tape heater that requires an external power supply is not accepted. Unit must be kept ON to enable this protection 24/7

8- OPTIONAL: Anti-freeze protection tape heater to protect the cooler down to -29°C (-20°F). Heater will be energized directly from unit electrical panel and requires no external power supply. Anti-freeze tape heater that requires an external power supply is not accepted. Unit must be kept ON to enable this protection 24/7

9- OPTIONAL: Aluminum protective Cladding cover that shall be applied above barrel (cooler) insulation. Aluminum cladding shall be of gauge 22 [0.7 mm (0.03")] thick

9- OPTIONAL: Stainless steel protective Cladding cover that shall be applied above barrel (cooler) insulation. Aluminum cladding shall be of gauge 22 [0.7mm (0.03")] thick

9- OPTIONAL: Painted galvanized steel protective Cladding cover that shall be applied above barrel (cooler) insulation. Aluminum cladding shall be of gauge 22 [0.7 mm (0.03")] thick

10- OPTIONAL: Water flow switch shall be supplied as a loose item to be field installed by contractor. Flow switch shall be of the paddle type. The paddle shall be made from copper alloy. Switch shall be SPDT, IP 42 protection, with operating range of water temperature of -20°C to 80°C (-4°F to 176°F)

G. Condenser Coils:

1- Coils shall be fabricated from internally enhanced seamless copper tubes, mechanically expanded into aluminum alloys fins

2- Tubes are made from seamless copper of the L-type and of with a nominal wall thickness of 0.4 mm (0.016") and a nominal diameter of 9.5 mm (3/8")

3- OPTIONAL: Fins are made from Aluminum alloy of and manufactured in a sinusoidal shape with ripple edges to maximize the heat transfer. Each tube opening in the fin has a full height collar to allow the tube to expand using the collar material and reduce any fin failure at the expansion point. Aluminum fins have a nominal wall thickness of 0.12 mm (0.005"). Flat fin design is not accepted

3- OPTIONAL: Post Coated Fins are made from Aluminum alloy and sprayed on with a polyurethane coat that provides a protection up to 3,000-hour salt spray tested in accordance with the ASTM B117 standard. Finns shall be manufactured in a sinusoidal shape with ripple edges to maximize the heat transfer. Each tube opening in the fin has a full height collar to allow the tube to expand using the collar material and reduce any fin failure at the expansion point. Aluminum fins have a nominal wall thickness of 0.12 mm (0.005"). Flat fin design is not accepted

3- OPTIONAL: Pre Coated Fins are made from Aluminum alloy that is pre-painted (pre coated) with a polyurethane coat that provides a protection up to 3,000-hour salt spray tested in accordance with the ASTM B117 standard. Finns shall be manufactured in a sinusoidal shape with ripple edges to maximize the heat transfer. Each tube opening in the fin has a full height collar to allow the tube to expand using the collar material and reduce any fin failure at the expansion point. Aluminum fins have a nominal wall thickness of 0.12 mm (0.005"). Flat fin design is not accepted

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3- OPTIONAL: Fins are made from Copper alloy and manufactured in a sinusoidal shape with ripple edges to maximize the heat transfer. Each tube opening in the fin has a full height collar to allow the tube to expand using the collar material and reduce any fin failure at the expansion point. Aluminum fins have a nominal wall thickness of 0.10 mm (0.004"). Flat fin design is not accepted

3- OPTIONAL: Post Coated Fins are made from Copper alloy and sprayed on with a polyurethane coat that provides a protection up to 3,000-hour salt spray tested in accordance with the ASTM B117 standard. Finns shall be manufactured in a sinusoidal shape with ripple edges to maximize the heat transfer. Each tube opening in the fin has a full height collar to allow the tube to expand using the collar material and reduce any fin failure at the expansion point. Aluminum fins have a nominal wall thickness of 0.10 mm (0.004"). Flat fin design is not accepted

4- OPTIONAL: Coils shall be fitted with galvanized steel end plates all around that are made from gauge 16 (1.5 mm {0.0635"}). All plates have full height collars for tubes penetration, to prevent any tube damage and thus leakage

4- OPTIONAL: Coils shall be fitted with Stainless steel end plates all around that are made from gauge 16 (1.5 mm {0.0635"}). All plates have full height collars for tubes penetration, to prevent any tube damage and thus leakage

5- Assemble coils shall be pressure tested at the factory by dry air under water at a pressure of 3,100 kPa (450 psig). Then cleaned and dehydrated in a drying room up to a temperature of 40 °C (105 °F) to evaporate any oil or water residuals

H. Condenser Fans:

1- Fans are of the low noise, external rotor type with the stator in the center and the rotor on the exterior

2- Fan, motor protection grill and electrical junction box are manufactured in one single piece assembly

3- Fan shall be of the direct drive, 5-blade, airfoil cross section, and axial type blades

4- Motors are TEFC, IP 54 protection with class F motor insulation with inherent motor protection imbedded inside the windings

5- Motor shall have a sealed for life ball bearing with a life expectancy of L40, 40,000 hours of operation. Motor nominal speed is 900/1100 RPM (50/60 HZ power supply)

6- Assembly is statically and dynamically balanced and can be replaced as one single piece

7- Fans shall be protected by coated steel wire safety guards

8- OPTIONAL: Ultra low sound fans with reduced speed (700/900 RPM {50/60 HZ power supply})

9- OPTIONAL: Speed control for condenser fan motors shall be carried out by speed regulators

I. Refrigeration Circuits and Components:

1- Refrigerant used shall be R-410a

2- Refrigeration circuit components shall include replaceable-core filter drier, moisture indicating sight glass, expansion valve, discharge & suction compressor service nipples, liquid line service valve and a complete operating charge of refrigerant R-410a and compressor oil

3- Each compressor shall be equipped with an external high pressure cut outs

4- All suction lines shall be sand papered, insulated with closed cell foam insulation, wrapped with protective material and finally epoxy coated

5- All other exposed refrigeration pipes shall be sand papered cleaned and epoxy coated afterwards

6- All safety devices and valves are marked after unit run test to indicate factory position for each component

7- OPTIONAL: Mechanically controlled Hot Gas By Pass (HGBP) valve to enable compressor to operate below its minimum load point

8- OPTIONAL: Pressure Relief Valve with a brass body, a pressure setting of 3100 kPa (450 psig), a working temperature range between -40°C and 107°C (-40°F and 225°F) and conforms to ASME VIII, Division I. The valve is a conventional back pressure dependent type and therefore required to discharge to atmosphere

9- OPTIONAL: High and low pressure gauges for each refrigeration circuit. Gauges shall be Bourdon type with stainless steel housing oil filled

J. Acoustical Data:

1- Provide acoustical sound power or sound pressure level data in decibels (dB) at the scheduled eight (8) octave band center frequencies and/or at 1/3 of each octave band upon request. A-weighted sound data alone is not acceptable

2- Supplied equipment shall not exceed scheduled sound power or sound pressure level data at any load point. The mechanical Contractor shall be responsible for any additional costs associated with equipment deviation

3- Acoustical performance ratings shall be in accordance with AHRI 370 and ISO BS 3744 Standards

4- OPTIONAL: Ultra low sound fans with reduced speed (700/900 RPM {50/60 HZ power supply}) to meet the specified sound levels scheduled in the plans at full load and all other load points (if requested)

4- OPTIONAL: Compressor Jacket to meet the specified sound levels scheduled in the plans at full load and all other load points (if requested). Compressor jacket shall consists of a 9.5 mm (3/8") thick closed cell rubber sound insulation material encapsulated in a sound deflecting vinyl cover

4- OPTIONAL: Ultra low sound fans with reduced speed (RPM) & Compressor jacket to achieve the requested sound rating in the plans

Guide Specification

K. Operating Characteristics:

1- Unit shall be capable of starting and running at outdoor ambient temperatures from 7°C (45°F) to 52 °C (125°F) for all sizes, without any additional added accessory

1- OPTIONAL: Low ambient control down to 0°C (32°F):

a. Unit shall be capable of starting and running at outdoor ambient from 0°C (32°F) to 52 °C (125°F) for all sizes. Working down to a low ambient of 0°C (32°F) shall be achieved by a combination of on/off condenser fans sequencing plus speed varying using a speed regulator option. This shall be controlled through a pressure transmitter for each refrigerant circuit via the unit controller

1- OPTIONAL: Low ambient control down to -17°C (0°F):

a. Unit shall be capable of starting and running at outdoor ambient temperatures from -17°C (0°F) to 52 °C (125°F) for all sizes. Working down to a low ambient of -17°C (0°F) shall be achieved by a combination of on/off condenser fans sequencing, speed varying using a speed regulator option and a flooded condenser design. Flooded condenser control shall be obtained by adding multiple of solenoid valves on each condenser with a suitable liquid received to control the amount of liquid flooding the condenser coils and maintain a workable head pressure. This shall be controlled through a pressure transmitter for each refrigerant circuit via the unit controller.

2- Unit shall be capable of starting up with 35°C (95°F) entering fluid temperature to the cooler

L. Power & Electrical:

1- Power/Control Panel:

a. Factory installed and wired IP 54 (NEMA3R) panel, that shall be made from welded G-60/90 (as a minimum) galvanized steel gauge 18 (1.25 mm {0.05"}). Panel shall be equipped with lockable and gasket sealed access doors with a minimum of two external handles and multiple hinges

a. OPTIONAL: Factory installed and wired IP 66 (NEMA 4X) panel, that shall be made from fully welded all around G-60/90 (as a minimum) galvanized steel gauge 12 (3 mm{0.12"}). Panel shall be equipped with lockable and gasket sealed access doors with a minimum of two external handles and multiple hinges

a. OPTIONAL: Factory installed and wired IP 66 (NEMA 4X) panel, that shall be made from fully welded all around Stainless steel gauge12 (3 mm {0.12"}). Panel shall be equipped with lockable and gasket sealed access doors with a minimum of two external handles and multiple hinges

b. Panel doors shall be provided with a door retainer for each door to keep the door open during service

c. Unit shall be provided with two separate panels, one for control and one for power

d. Panel door shall be provided with a pocket to place the laminated wiring diagrams and IOM manuals

e. Panel shall have a transparent solid PVC NFPA rated piece to cover the power input bus bars

f. All bus brass bars shall be coated with a zinc coat to prevent brass corrosion

g. Panel shall have one power entry either from the side or bottom

h. Condenser fan motors shall have a separate dedicated electrical boxes located on condense side and fully wired to the main panel

2- Main Power and Control components:

a. Compressor electronic current monitoring overload motor protector

b. Free terminal for ON/OFF unit connection

c. Free terminal for general alarm output

d. Interlock for pump and water flow switch e. Circuit breaker for each compressor

f. Starting contactors for each compressor and condenser fan motors

g. Manual motor starter for condenser fans h. ON/OFF switch for each compressor

I. Control circuit breaker for short circuit protection

j. Short cycling protection timer for each compressor

k. Control transformer mounted and wired that shall supply all unit control voltage from the main unit power supply to internal components such as (not limited to) solenoid valves, compressor motor protector, compressor crank case heater and Microprocessor controller

l. Power supply monitor (Phase Failure Relay) to protect power circuit against over voltage, under voltage, phase loss, phase imbalance and phase reversing conditions

m. Control transformer for the secondary and controller voltages

n. Microprocessor controller

o. All running wiring inside panels must be contained within PVC trunks

p. All wires connection shall be marked with a clear and typed on tags to identify each wire

q. An extra loop of wires must be provided for each power connection to a circuit breaker, contactor or motor start to allow for a clamp on measuring current device to be installed during start up and service

r. Full documentation shall be provided inside the electrical panel pocket. This shall include (not limited to) a laminated wiring diagram, IOM manual, hard copy of wiring diagram, and quality check list

s. OPTIONAL: Power Factor correction capacitor:

1- Provide unit with power factor correction capacitors upon request to maintain a displacement power factor of 95% at all load conditions

2- The installing contractor shall be responsible for any and all additional cost to furnish and install power factor correction capacitors if they are requested and not factory mounted and wired

t. OPTIONAL: Earth Leakage Relay:

1- Provide unit with an earth leakage relay for the unit power supply to shut down the unit if the amount of leakage is above the set point

2- Provide unit with an earth leakage relay for the each compressor power supply to shut down the associated compressor if the amount of leakage is above the set point

u. OPTIONAL: External over load for each compressor

v. OPTIONAL: External over load for condenser fan motor

w. OPTIONAL: Circuit breaker for condenser fan motor

x. OPTIONAL: Control transformer to supply power input to auxiliary components at 120 or 220 volt, such as bulk head light and GFI outlet

y. OPTIONAL: Bulk Head Light for electrical panel:

1- IP 54 protection, class I electric safety bulk head light fixture shall be installed in the electrical panel for inspection purposes. The bulb shall be supplied at field by the installing contractor

z. OPTIONAL: Ampere-meter and Volt-meter:

1- Shall be mounted on power panel exterior door. Ampere-meter shall be provided for each phase and the Volt-meter shall be provide for one phase

aa. OPTIONAL:120 Volt power supply with Transformer and GFI outlet socket. A 120 volt power supply shall be connected through a transformer to provide a 120 volt circuit, to connect a female GFI outlet socket to provide connection to site appliances such as laptop, tablet or cell phone. 120 volt power circuit shall be connected after the unit main disconnect switch, so as to be OFF upon main disconnect switch OFF position

ab. OPTIONAL: 120 Volt power supply with Transformer and GFI outlet socket. A 120 volt power supply shall be connected through a transformer to provide a 120 volt circuit, to connect a GFI outlet socket to provide connection to site appliances such as laptop, tablet or cell phone. 120 volt power circuit shall be connected before the unit main disconnect switch, so as to be ON upon main disconnect switch OFF position

3- Power Entry:

a. Provide a SINGLE point power entry connection to chiller, that shall be of THREE phase as per scheduled voltage

b. Terminal Block connections shall be provided at the point of incoming single point connection for

c. The incoming power wiring must comply with local codes

d. OPTIONAL: A Main Non-Fused Disconnect Switch lockable external handle shall be supplied to isolate the unit power voltage for servicing. Disconnect switch shall be provided for all power connections to the unit

e. OPTIONAL: A Main Fused Disconnect Switch lockable external handle shall be supplied to isolate the unit power voltage for servicing. Disconnect switch shall be provided for all power connections to the unit

f. OPTIONAL: Provide a DUAL point power connection to chiller, that shall be of THREE phase as per scheduled voltage. One connection shall be for compressors and the second connection shall be for the rest of the unit. Each power connection can be equipped with a separate main disconnect switch

4- Power and Control wiring:

a. All power & control wiring from the electrical power and control panels shall be routed through metal duct in the unit base and shall be connected to each components through and PCV, UV-stabilized, non-metallic conduit beside each component

5- Minimum Circuit Ampacity (MCA):

a. Supplied equipment shall not exceed the scheduled Minimum Circuit Ampacity (MCA). The mechanical Contractor shall be responsible for any additional costs associated with equipment deviation in this matter

6- Control Circuit components:

a. Unit control circuit shall include the following minimum components:

1- Microprocessor with non-volatile memory. Battery backup system shall not be accepted

2- Separate terminal block for power and controls

3- Separate 220 volt power supply to serve all controllers, relay, control controllers, relays and control components

4- ON/OFF control by the controller keypad

5- Replaceable solid-state controller

6- Pressure sensors installed to measure suction & discharge. Thermistors installed to measure barrel (cooler) entering and leaving fluid temperatures and outside air temperature

b. Microprocessor controller shall contain the following:

1- Microprocessor main board designed to supervise and monitor the unit with access port for external connection to a laptop

2- I/O expansion board with additional input/ output terminals

3- LCD screen display with I/O status and ability to adjust set point. The LCD consists of a liquid crystal display) with adjustable contrast and backlighting

Guide Specification

c. Displayed data on the LCD display:
1- Leaving and return water temperatures
2- Ambient temperature
3- Compressor discharge pressure and temperature
4- Compressor suction pressure and temperature
5- Compressor drawn current
6- Suction and discharge super heat
7- Compressor load percentage
8- Saturated suction and discharge
9- Compressor oil differential
10- Compressor times
11- Digital inputs status
12- Output relays status
13- Protection status
14- Historical alarms
15- Schedules
16- Adjustable set point

d. Unit controls shall include the following functions:
1- Automatic circuit lead/lag
2- Capacity control based on leaving chilled fluid temperature and compensated by rate of change of leaving fluid temperature
3- Limiting the chilled fluid temperature pull- down rate at start-up to an adjustable range to prevent excessive demand spikes at start-up
4- Seven-day time schedule. Two operating schedules per day of the week and 8- holiday shall be supported by the microprocessor
5- Leaving and return chilled fluid temperature reset from BMS system
6- Chilled water pump and water flow interlock connection
7- Barrel (cooler) freeze protection by energizing tape heaters (if installed)
8- High discharge pressure protection
9- Low leaving water temperature protection
10- Unloaded start for all compressors

e. LCD display panel features:
1- Display shall allow access to configuration, maintenance, alarm history, set points, time schedule and status data
2- Display shall have one button for chiller ON/OFF
3- Display shall include three levels of password protection against unauthorized access to programming files and imbedded set points
4- Display shall allow for easy connection of a portable hand held technician tool such as a laptop to access information and upload and/ or download chiller settings

f. Safeties and Alarms:
1- Cutout and unloading
2- High discharge pressure
3- High discharge temperature
4- Low suction pressure
5- Low suction temperature
6- Freeze state
7- High ampere state
8- Low discharge pressure
9- Unsafe suction pressure
10- Unsafe discharge pressure
11- Flow switch (no flow protection)
12- Phase loss protection
13- Low oil differential pressure
14- Unsafe oil pressure
15- Low oil level
16- Motor temperature
17- Low motor amps
18- Probe error alarm

g. Supporting protocols:
1- Bacnet IP
2- Bacnet MS/TP with a BMS gateway module
3- Modbus IP
4- Modbus RTU
5- Johnson N2 with a BMS gateway
6- Lontalk with a BMS gateway

Part 3 — EXECUTION

3.01 INSTALLATION

A. General:
1- Rig and Install in full accordance with manufacturer's requirements, Project drawings, and contract documents

B. Location
1- Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per manufacturer instructions. Adjust and level chiller on support structure

C. Components:
1- Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller

D. Electrical
1- Coordinate electrical requirements and connections for all power feeds with Electrical Contractor

E. Controls:
1- Coordinate all control requirements and connections with Controls Contractor

F. Finish:
1- Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish