

Guide Specifications WT025-071 Two-Stage, Water-to-Water Reverse Cycle Chillers and Low Temperature Boilers

General

Units shall be ETL listed for safety on all models. Each unit shall be run tested at the factory, pallet-mounted and stretch-wrapped. The units shall be manufactured in an ISO 9001 certified facility, designed to operate with entering fluid temperatures between 20°F (-7°C) and 120°F (49°C) as manufactured by FHP Manufacturing in Fort Lauderdale, Florida. Refrigerant shall be R-410A.

Casing and Cabinet

The cabinet shall be fabricated from G-90 galvanized sheet metal for corrosion protection. All interior surfaces are lined with ½" thick, 1.5lb/cu ft density micromat multi-density, coated fiberglass insulation for thermal insulation and acoustical attenuation. All units shall allow sufficient service access to replace the compressor without unit removal. The compressor shall be covered with a multi-density sound absorbing blanket (option) and have a floating base pan to minimize noise transmission.

Refrigeration Circuits

All units shall contain a hermetically sealed refrigerant circuit including a two stage scroll compressor, bidirectional thermal expansion valve metering device, coaxial style fluid-to-refrigerant heat exchangers, refrigerant reversing valve and service ports. Compressor shall be high efficiency, two stage scroll type, designed for heat pump duty, quiet operation and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the chiller cycle. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupro-nickel) inner tube and steel outer tube with a designed refrigerant working pressure of 600 PSIG (4100kPa) and a designed water side working pressure of no less than 450 PSIG (3100 kPa). Due to their susceptibility to fouling, brazed plate heat exchangers are not acceptable. The fluid-to-refrigerant heat exchangers shall be insulated to prevent condensation at low fluid temperatures.

Electrical

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include comfort alert module, compressor contactor, 24V transformer, reversing valve coil and solid state lockout controller (UPM) The UPM controller shall include the following features: Anti-short cycle time delay, random start, brown out/surge/power interruption protection, 120 second low pressure switch bypass timer, shutdown on high or low refrigerant pressure safety switch inputs, shutdown for the freezestat, 24 VAC alarm output for remote fault indication, unit reset at thermostat or disconnect, ability to defeat time delays for servicing and automatic intelligent reset. The UPM shall automatically reset after a safety shut down and restart the unit, if the cause of the shut down no longer exists, after the anti-short cycle and random start timers expire. Should a fault re-occur within 60 minutes after reset, then a permanent lockout will occur. A LED shall annunciate the following alarms: high refrigerant pressure, low refrigerant pressure and low water temperature (when equipped with the optional low water temperature sensor). The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset. Safety devices include a low pressure cutout set a 40 PSIG (280 kPa) for loss of charge protection (freezestat and/or high discharge gas temperature sensor are not acceptable) and a high pressure cutout control set at 600 PSIG (4100 kPa). An optional energy management relay that allows unit control by an external source shall be factory installed. A terminal block with screw terminals shall be provided for control wiring.

Piping

Water piping connections shall be female pipe thread with a single set of source and load connections flush mounted to the unit cabinet.

Heat Recovery Package

208/230 volt units shall be equipped with an optional factory installed internal heat recovery kit for domestic hot water production. This kit shall include a vented, double walled coaxial water to refrigerant heat exchanger, circuit breaker protected circulating pump, high water temperature.

DDC Controls

Unit shall be equipped with a factory installed DDC control capable of interfacing with BACnet™, Modbus, N2 or Lon works® (with optional card). The controller shall be preprogrammed to control the unit and monitor the safety controls. The unit shall be able to operate as a stand-alone or be integrated into the building management system. A leaving water sensor shall be installed in the unit. Unit mounted disconnect: A non-fused factory mounted disconnect shall be installed on the unit.

Guide Specifications WW120-420 Modular Reverse Cycle Chillers/Low Temperature Boiler

General

Units shall be ETL listed for safety on all models. Each unit shall be run tested at the factory. Each unit shall be pallet mounted and stretch wrapped. The units shall be designed to operate with entering fluid temperatures between 20°F (-7°C) and 120°F (49°C) as manufactured by FHP Manufacturing in Fort Lauderdale, Florida. Refrigerant shall be R-410A.

Casing and Cabinet

The cabinet shall be fabricated from G-90 galvanized sheet metal for corrosion protection and shall be supported by a full angle iron frame. The interior shall be insulated with 1/2" (12.7mm) thick, multi-density, coated, glass fiber. All units shall allow front service access to replace the compressor and/or electrical components without unit removal.

Refrigeration Circuits

All units shall contain a sealed refrigerant circuit including hermetic scroll compressor(s), bidirectional thermal expansion valve metering device(s), coaxial style fluid-to-refrigerant heat exchangers, refrigerant reversing valve(s) and service ports. Compressor shall be high efficiency, designed for heat pump duty with refrigerant R-410A, and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the chiller cycle. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupro-nickel) inner tube and steel outer tube with a designed refrigerant working pressure of 600 PSIG (4100 kPa) and a designed water side working pressure of no less than 450 PSIG (3100 kPa). Due to their susceptibility to fouling, brazed plate heat exchangers are not acceptable. The fluid-to-refrigerant heat exchangers shall be insulated to prevent condensation at low fluid temperatures.

Electrical

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include compressor contactors, 24V transformer, reversing valve coils and a solid state lock-out control circuit (UPM). The UPM controller shall include the following features: Anti-short cycle time delay, random start, interstage delay, brown out/surge/power interruption protection, 120 second low pressure switch bypass timer, shutdown on high or low refrigerant pressure safety switch inputs, shutdown for the optional freezestat, 24 VAC alarm output for remote fault indication, unit reset at thermostat or disconnect, ability to defeat time delays for servicing, time delay between stages and automatic intelligent reset. The UPM shall automatically reset after a safety shut down and restart the unit, if the cause of the shut down no longer exists, after the anti-short cycle and random start timers expire. Should a fault reoccur within 60 minutes after reset, then a permanent lockout will occur. A LED shall annunciate the following alarms for each refrigerant circuit: high refrigerant pressure, low refrigerant pressure and low water temperature (when equipped with the optional low water temperature sensor). The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset. Safety devices include a low pressure cutout set at 20 PSIG (140 kPa) for loss of charge protection (a freezestat used for loss of charge protection is not acceptable) and a high pressure cutout control set at 600 PSIG (4100 kPa). An optional energy management relay to allow unit control by an external source shall be factory installed.

Piping

Water piping connections at the rear of the unit, shall be female pipe thread with a single set of source and load connections per unit.

DDC Controls

Unit shall be equipped with a factory installed DDC control capable of interfacing with BACnet™, Modbus, N2 or Lon works® (with optional card). The controller shall be preprogrammed to control the unit and monitor the safety controls. The unit shall be able to operate as a stand-alone or be integrated into the building management system. A leaving water sensor shall be installed in the unit. Unit mounted disconnect: A non-fused factory mounted disconnect shall be installed on the unit.