

# COMPAX FLUID TO FLUID HEAT PUMP/ CHILLER

## Fluid to Fluid Heat Pump/Chiller Specifications

### 1 General Specifications

- .1 Furnish and install Compax fluid to fluid heat pump/ chiller units as indicated on the plans with capacities and characteristics as listed in the schedules.
- .2 Cabinets shall be 18ga. galvanized satin coat steel with a baked powder coat finish. Heavy gauge base with integral welded steel frame shall support the major components. Cabinet shall be internally insulated with ½” acoustical insulation for improved thermal and acoustic performance. All cabinet panels shall be removable for service access to all internal components.
- .3 Compressors shall be hermetically sealed, high efficiency scroll type with integral overload protection. Compressor shall be designed for low temperature operation. The system shall incorporate tube in shell heat exchangers, thermostatic expansion valves and microprocessor controls.

### 2 Heat Exchangers

- .1 Refrigerant to fluid heat exchangers shall be tube-in-shell type with non clogging enhanced tubes on the water side. The heat exchangers can be used as evaporator or condenser as required. Both heat exchangers feature copper tubes for the fluid and steel shells for refrigerant.
- .2 Both heat exchangers are insulated to prevent condensation and heat loss on reversing models. On non-reversing models only evaporators are insulated.
- .3 Heat exchangers shall be designed for working pressures of 600 psi on the refrigerant side, and 300 psi on the water side.

### 3 Refrigerant Circuit

- .1 Refrigerant circuit shall be constructed in accordance with design requirements for R410A refrigerant. Circuit shall include in addition to the basic components, a sight glass, balanced port thermal expansion valve(s) and a filter dryer.
- .2 Safety devices shall include a high and low pressure cutout, loss of charge disable, high and low fluid temperature shutdown and high discharge gas temperature protection.

- .3 Reversing Valve on the CMM unit shall be a four way, spool type valve with electric or pressure activated pilot. The valve shall be fully serviceable. Sealed bodied valves are not acceptable.
- .4 The complete circuit shall be pressure tested for leaks with a helium mass Spectrometer, fully evacuated and factory charged to the prescribed level. Following, the unit shall undergo a 30 minute run test during which time performance characteristics shall be recorded.

#### 4 Controls

- .1 Microprocessor based control systems and all controlled components shall operate on 24 volt AC power. Controller shall be able to communicate with Modbus RTU to building Automation systems. BACnet MSTP and other open communication protocols are possible via gateway.
- .2 The microprocessor controller shall have the following features:
  - Built-in temperature control for heating or cooling mode.
  - Anti-recycle protection
  - Intelligent lockout protection of low or high refrigerant pressure
  - Built-in alarm system for controlling fluid temperatures
  - Compressor shutdown on low fluid flow
- .4 An alpha-numerical LCD display module provides information on:
  - Entry and exit fluid temperatures for both heat exchangers
  - The current heating and cooling set points.
  - The status of control inputs in the unit
  - Current and previous alarm status
  - The current network address and operating state of the Compax unit
- .5 The control inputs are:
  - Supply and return temperature for both heat exchangers
  - Compressor discharge gas temperature
  - Heating and cooling call
  - Flow status
  - High and low pressure switch
  - Auxiliary alarm contact

The control outputs are:

- System lockout relay
- Heat exchanger isolation valve interlock
- Compressor's 1 and 2
- Reversing valve (where applicable)
- Heat exchanger pump interlock

## 5 Warranty

The manufacturer's limited warranty states that its products are free from defects in parts and factory workmanship for a period of 12 months from start-up date or 18 months from shipping date. A 5 year warranty option is provided for the compressor and refrigeration circuit (parts only).

## 6 Options

- .1 **Tag Unit:** Provides tagging of units per schedule.
- .2 **Extended 5 Year Compressor Warranty:** Extends compressor warranty 48 months on parts only. Freight extra and no labour.
- .3 **Extended 5 year Refrigerant Circuit Warranty:** Extends refrigerant cycle component warranty 48 months on parts only. Freight extra and no labour.
- .4 **Extended Electronic Control Board Warranty:** Extends electronic control board warranty 12 months.
- .5 **Two Stage Cooling:** Incorporates two-step compressors for dual capacity operation on certain models only (units 045 to 075).
- .6 **Electronic Expansion Valve:** Provides an electronically controlled expansion valve on CMS units. 1 for 1 circuit and 2 for 2 circuit units.
- .7 **Extended Range Operation:** Extends the source heat exchanger entry operating temperature range. Extended range operation protects the refrigeration cycle components under extreme operating conditions. One condition is if the evaporator fluid is excessively hot (above 80°F) for long periods or if the condenser fluid is below 60°F for long periods. This option provides condenser head pressure control and/or evaporator pressure control. An additional 3-way valve and pump will be provided for source recirculation. Field installed by others. Refer to recirculation schematic for details.
- .8 **Crankcase Heater:** Provides a crankcase heater for the compressor to prevent mixing of refrigerant with compressor oil on an off cycle (units 045 to 175).

- .9 **Low Source Temperature:** Changes low temperature safety cut-out to allow heating when source is below freezing (0°C or 32°F). This option must have source fluid freeze protection to 20°F or lower.
- .10 **Unit Set-up For 230-240 Volt Power Supply:** Tap transformers to 230 – 240 Volt power supply (small units 045 to 085 only).
- .11 **Mount 3rd Party DDC Controllers:** Mounts and wires third party controller and sensors, control box included where required. This controller is in addition to native controllers and components that may already be installed.
- .12 **Flow Switches Both Circuits:** Provides 2 flow switches to prevent loss of flow in fluid line. Shipped loose, installed by others.
- .13 **Unit Mounted BACnet Gateway:** Provides unit mounted BACnet gateway and BAS connection points. Display is ordered separately.
- .14 **Controls Integration with Building Automation Systems (BAS):** Provide assistance integrating CGC provided Modbus to BACnet or TCP/IP with BAS. Includes custom programming of BAS points. Does not include site visits.
- .15 **Hose Connections:** Provides 12" flexible hose connections for attaching unit's fluid lines to building loop.
- .16 **ON/OFF Control Valve:** Provides an electrically controlled shutoff valve on fluid line of either one of the heat exchangers. Shipped loose, installed by others.
- .17 **Cupro-Nickel Heat Exchanger:** Cupro-Nickel fluid lines are placed on either one of the heat exchanger units.
- .18 **Wet 24V AC Output for Pump or Valve Control:** Allows for pumps or valves rated at 10 VA or less to be connected to the unit control board.
- .19 **Flow Control Valve:** Provides an electrically controlled flow valve on fluid line of either one of the heat exchangers.
- .20 **Combined Options:** A combination of the ON/OFF control valve and the flow control valve on either one of the heat exchangers.