

ITP Water Source Heat Pump Specifications

Heat Pump Units –General

1. Provide CGC/ITP water source heat pump units where shown.
2. Heat Pump units shall be heating/air conditioners of types, sizes and performances shown in Heat Pump Unit Schedule. **Each H.P.U. shall be certified in accordance with U.L and C.S.A standards.**
3. Units shall be complete with factory sealed DX (R-22) refrigeration circuit with water-cooled heat exchanger capable of cooling with condenser water entering at a maximum of 52 C (125 F). Unit heating shall be hot water and scheduled to increase capacity as the outdoor temperature drops per schedule as selected by the operator. Compressor operation in heating will not be approved.
4. Refrigeration circuit shall include high efficiency hermetic compressor and thermal expansion valve. Capillary tube shall not be approved. Refrigeration circuit shall include filter drier, access ports, high and low pressure switches. A unit mounted solid state controller shall monitor the safety devices which include discharge air temperature as well as low and high water temperature. Controller shall accept signal from multiple 24-volt thermostat configurations and set fan speed to correspond to cooling or heating operation based on set point differential.
5. Water heating circuit shall include multi-circuit heating coil with capacities as shown in the schedule and include changeover valve.
6. All internal refrigeration piping shall be hard-drawn, cold-formed seamless copper tubing. All connections shall be brazed.
7. Each heat pump unit shall be built so that all electrical components not integral part of hermetic circuit can be replaced through service

- access panels. **Condensate drain to be accessible through easily removable access panels.** Each unit shall include 24 volt control circuit suitable for field connection.
8. Each unit shall be complete with disposable filters. Provide spare set of filters for each heat pump.
 9. **Each unit water-to-refrigerant heat exchanger shall incorporate serpentine self venting water coil and be suitable for 250psi water circuit design pressure.**
 10. Where alternate units supplied exceed electrical load requirement indicated, supplier shall ensure that all electrical devices such as disconnects, circuit breakers, and wiring are adequately sized to accommodate these loads. Advise Engineer of such changes for their review as part of Shop Drawings processing.
 11. Where alternate units supplied exceed water pressure drops indicated, supplier shall ensure that all piping, circulating pumps, and other associated equipment is adequately sized to accommodate these pressure drops, as well as any changes to pump motors and associated electrical hardware. Advise Engineer of such changes for their review as part of Shop Drawings processing.
 12. Each unit shall also have following features and components:
 - a) Heating or cooling shall be available to space at any time.
Each unit shall include 24 volt control circuit suitable for field connection.
 - b) Suction side protection on cooling mode of operation.
 - c) Safety cut-outs shall be monitored by a lock out sequence that will automatically re-set twice prior to permanent lock out requiring manual reset.
 - d) Controls to allow unit start-up and operation at 4.4 C (40 F) Ambient with 26.6 C (80 F) water.
 - e) Temperature at application flow rate of 0.19 L/s per 3.5 KW

- f) Equipment shall be specifically built for voltage shown in Heat Pump Schedule and guaranteed to start and operate with variations of plus or minus 10%.
- g) Solid state control logic board.
- h) Low pressure ignore during first two minutes of compressor operation to eliminate nuisance trip-outs.
- i) Anti short-cycle protection.
- j) Random start of compressor to reduce current inrush to building on system re-start after a power failure.

THERMOSTATS:

The thermostat shall be a mechanical or electronic type thermostat as selected below with the described features:

a. Single Stage Standard Manual Changeover

Thermostat shall be a single-stage, vertical mount, manual changeover with HEAT-OFF-COOL system switch and fan ON-AUTO switch. Thermostat shall have a mechanical temperature indicator and set-point indication selection for °F or °C. Thermostat shall only require 4 wires for connection.

or

b. Single Stage Digital Manual Changeover

Thermostat shall be a single-stage, digital, manual changeover with HEAT-OFF-COOL system switch and fan ON-AUTO switch. Thermostat shall have a back-lit LCD display with temperature in °F or °C and set-point(s). Thermostat shall only require 4 wires for connection.

c. Automatic Changeover with Night Set Back

Thermostat shall be multi-stage manual or automatic changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Thermostat shall have and LCD display with temperature,

set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. Thermostat shall provide optional extended end of cycle fan operation, heating set-point range limit, cooling set-point range limit, temperature display offset, temperature display disable, keypad lockout, dead-band range setting, and inter-stage differential settings. The thermostat shall revert to occupied setpoint when the override key is pressed. Contractor to provide connection wiring from the time clock to the unit controls.

d. Programmable

Thermostat shall be 7 day programmable (with up to 4 set-points per day), multi-stage (3H/2C), manual or automatic changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to indicate specific fault condition(s). Thermostat shall provide optional extended end of cycle fan operation, heating set-point range limit, cooling set-point range limit, temperature display offset, temperature display disable, keypad lockout, dead-band range setting, and inter-stage differential settings.

Warranty:

Each unit shall have 1 year from start-up or 18 months from shipping (whichever comes first) parts and labour warranty, F.O.B. supplier local service centre.

Option: Each unit shall have extended 4 year compressor warranty parts only for a total of 5 years, F.O.B. supplier local service centre.

Option: Each unit shall have extended 4 year warranty on complete refrigeration circuit, coils, reversing valve and compressor, parts only for a total of 5 years, F.O.B. supplier local service centre.