HPM1 Water Source Heat Pump Controller

Self-Contained Interoperable Controller Model UCP-1

SUPERSEDES: February 21, 2012   EFFECTIVE: June 11, 2012

Job: _____   Engineer: _____

Contractor: _____   Rep: _____

Date: _____   Tag/Item #: _____

HPM1

The HPM1 is a self-contained microprocessor-based controller for liquid-to-liquid heat pumps. Applications include two pipe single tank, two pipe two tank, and four pipe two tank hydronic HVAC systems. The HPM1 communicates with multiple zone controller units to identify heat or cool demands. In response, it energizes up to three heat pump compressor stages and a single stage of supplemental heat. The HPM1 may communicate with a GHP ground source flow controller to deliver ground temperature liquid as efficiently as possible.

Overview

The iWorx® HPM1 Heat Pump Master controller is a stand-alone microprocessor based controller for water to water heat pumps. The application includes water to water heat pumps (with reversing valve), a geothermal loop controller and a variety of hydronic zone controllers.

The HPM1 determines demand for hydronic heating and cooling via communication over a LON network with associated iWorx® zone controllers (like the BZU, DXU and FCU, etc). Digital inputs are provided to monitor Equipment Status (pump proof), High Pressure, Low Pressure, Heating Demand, and Cooling Demand. Analog inputs are provided for the Geothermal Loop Temperature, Load Loop Temperature, Heating and/or Cooling Tank Temperatures and Heat Pump Power Consumption.

The HPM1 incorporates digital outputs in the form of Triacs for up to three Heat Pump Stages, Emergency Heat (such as a fossil fuel boiler or resistive heating element), a Reversing Valve, and Circulator Pumps. An analog output is also provided to control a Modulating Heat Pump.

The controller is based on LONWORKS® networking technology. The controller can be networked to a higher-level control system for monitoring and control applications.

Features

- Two Stage (4 or 2 pipe systems with 2 tanks), Three Stage (2 pipe, 1 tank systems) or Modulating Heat Pump Control
- Demand Aggregation from Hydronic Controllers over a LON network
- Communication with Ground Source Pump Controller (GPH1) over a LON network
- Configurable for 4 or 2 pipe systems with 2 tanks, or 2 pipe systems with 1 tank
- Automatic or Manual heat/cool changeover
- Emergency Heating Output
- Configurable heating/cooling medium setpoints
- Automatic and Configurable Reversing valve control
- Equipment status input for safety interlocks or main plant synchronization
- Analog input to monitor Heat Pump power consumption
- LONWORKS interface to building automation systems and host products
- Automatic configuration with the LCI2
- Alarm/Event Reporting

SPECIFICATIONS

Electrical

Inputs

Ground Temperature, Tank Temperature, Heating Tank Temperature, Cooling Tank Temperature
• Precon Type III 10K thermistor
• Taco VTS sensor

Power Transducer
• 0 - 10 Volts DC

Equipment Status, Heat Demand, Cool Demand, Low Pressure Alarm, High Pressure Alarm
• Dry Contact
• 5 Volts DC Max

Outputs

Heat Pump Stage 1, Heat Pump Stage 2, Heat Pump Stage 3, Cooling Load Circulator, Tank Select, Heating Load Circulator, Load Circulator, Auxiliary Heat, Reversing Valve, Ground Demand, Tank Circulator
• 24 Volts AC
• 1 Amp at 50 °C, 0.5 Amps at 60 °C, limited by Class 2 supply

Modulated Heat Pump
• 0-10 Volts DC
• 2K Ohm minimum

Power

Power Requirements
• 24VAC (20VAC to 28VAC), requires an external Class 2 supply

Power Consumption
• 7.2W with no external loads, maximum limited by the Class 2 supply rating

Recommended Sensor Wire

Cable Type	Pairs	Details	Taco Catalog No.
18AWG	1	Stranded Twisted Shielded Pair, Plenum	WIR-018

FTT-10A Network

• Speed: 78KBPS
• 42.4 Volts DC max
• Cabling: Maximum node-to-node distance: 1312 feet (400 meters)
• Maximum total distance: 1640 feet (500 meters)

Cable Type	Pairs	Details	Taco Catalog No.
Level 4 22AWG (0.65mm)	1	Unshielded, Plenum, U.L. Type CMP	WIR-022

For detailed specifications, refer to the *FTT-10A Free-Topology Transceiver User's Guide* published by Echelon Corporation (www.echelon.com/support/documentation/manuals/transceivers).

Mechanical

Housing
• Dimensions: 5.55" (141mm) high, 6.54" (166 mm) wide, 1.75" deep (44 mm)
• ABS

Weight
• Controller Weight: 0.70 pounds (0.32 kilograms)
• Shipping Weight: 1.0 pounds (0.46 kilograms)

Electronics
• Processor: 3150 Neuron 10 MHz
• Flash: 48 Kilobytes
• SRAM: 8 Kilobytes
• Termination: 0.197" (5.0 mm) Pluggable Terminal Blocks, 14-22 AWG

Environmental
• Temperature: 32 °F to 140 °F (0 °C to 60 °C)
• Humidity: 0 to 90%, non-condensing

Agency Listings
• UL Listed for US and Canada, Energy Management Equipment PAZX and PAZX7.

Agency Compliances
• FCC Part 15 Class A

CONTROLS MADE EASY®

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