

# **CONTROL SYSTEM SPECIFICATION: MODEL EPU & EPU-CH**

**AS MANUFACTURED BY HEAT-TIMER CORPORATION  
20 NEW DUTCH LANE, FAIRFIELD, NJ 07004**

## **A WEATHER ACTUATED CONTROLLER FOR STEAM HEATING SYSTEMS**

A) **Outdoor Temperature Sensor**

Shall be of the solid state (thermistor) type, enclosed in a weather tight housing.

B) **Heating System Sensor**

Shall be of the solid state (thermistor) strap-on-type mounted in a moisture resistant enclosure. Operating temperature range shall be 70°F to 230°F.

### **Control Panel**

- 1) The control panel shall be capable of establishing two heat levels; Day and Night.
  - 1a) A 24 hour clock shall be provided to switch between Day & Night operation. It shall be capable of multiple Day/Night operations for a 24 hour period. Indication of Day or Night mode shall be provided.
- 2) A morning boost period shall be provided for recovery from setback temperatures. The duration shall be field adjustable in 50 minute increments. During this time the steam source will not be cycled.
- 3) The control shall include separate Day & Night thermostats. The temperature range for each shall be: 50-65°F Day; off, & 15-55°F Night. When the outdoor temperature is above the respective thermostat setting the heat source shall be deactivated. Indication of Day or Night mode shall be provided.
- 4) The control shall be provided with a "Shift" lever to manually switch between the Day & Night heat levels.
- 5) A bypass/automatic switch shall be provided. In the bypass mode the output contacts shall be closed, and remain that way.

- 6) Separate heat adjustment settings for Day & Night operation shall be provided to change the proportion of on to off time at any outside temperature.
- 7) A heat on/off switch shall be provided for summer shutdown.
- 8) A heating system sensor setpoint adjustment knob shall be provided on the panel.
- 9) **EPU-CH ONLY:** A Thermal Lockout of boiler operation, based on heating system temperature shall be provided to avoid unnecessary overheating. The heating system sensor temperature must fall 30°F below its setpoint (XYZ setting) before the boiler will restart. A white light on the panel shall indicate that the heating system sensor is still satisfied.
- 10) The total cycle time shall be factory configured *for* 30 or 60 min. Typically a 30 min. cycle time is used when the steam is supplied to baseboard, convectors or AHU's. A 60 min. cycle is used when the steam is supplied to cast iron radiators.
- 11) Indicating Lights shall be provided to signify:
  - 1a) Red: Weather calls for Heat (Steam Source Activated)
  - 1b) White: Indoor Element satisfied
  - 1c) Yellow: Control in Cycle
- 12) A sensor adjustment shall be provided to calibrate the control to 55°F outdoor temperature
- 13) A surface mounted locking steel enclosure, NEMA 1 type, minimum 18 gauge, shall be provided.
- 14) Output shall be a SPST normally open contact.
- 15) **EPU ONLY:** The control shall accept a direct-acting pressure switch (in lieu of the solid state heating system sensor) which will indicate that heat circulation has been established.
- 16) The control shall be UL Listed under Temperature Regulating Equipment. [If installed in NYC the following statement shall be included: Approved by the City of NY, Department of General Services (Electrical Division) for installation in NYC.]
- 17) An OPTIONAL "Day Omitting Device" shall be available to hold the control in the setback mode for any selected 24 hour period.

## **SEQUENCE OF OPERATION**

On a drop in outside temperature below the respective thermostat setpoint the steam source shall be activated. When heat has been established in the building, as indicated by the heating system sensor (or pressure switch on EPU only) the "on" portion of the cycle will commence. The steam source shall remain activated for a period of time determined by the outside air temperature and the respective heat adjustment setting. The control shall then assume the "off" portion of the cycle (steam source deactivated) and remain in this mode until the total cycle period has elapsed. The "on" plus "off" period always equal the total cycle period, i.e. 60 minutes.

On the EPU-CH model, if at the end of the total cycle period a sufficient level of heat remains in the system, the steam source will not be re-activated (Thermal Lockout). As soon as the system temperature drops 30°F below the heating system sensor setpoint the steam source will be activated and the control will seek to re-establish heat circulation and commence another cycle.

## **IMPORTANT INSTALLATION INSTRUCTIONS**

The outdoor temperature sensor must be installed on the north side of the building, away from direct sunlight, building exhausts or any heat source that may adversely effect its readings. The heating system sensor must be located where it can adequately sense when steam has completely filled the system and where it cools at a rate similar to the entire piping system. Wiring to the weatherhead and heating system sensor can be 18-2 wire. The wiring inside the building to the sensors need not be in conduit unless otherwise specified on a particular job for vandalism reasons. The wiring to the weatherhead outside the building must be in solid 1/2" conduit and the conduit bent so that the vertically mounted weatherhead is a minimum of 4 " away from the wall.

**115 V power input to the control must be supplied from a separate branch circuit that is not normally interrupted.**

## **TYPICAL INITIAL SETTING OF CONTROL KNOBS**

Check calibration and set "Day Thermostat" at 55° and "Night Thermostat" at 40°. Set "Day Heat Adjustment" between C and D. Set "Night Heat Adjustment" at B.

The following steps incorporate the only acceptable procedure for determining the most effective heating system sensor set point for a specific building. There is no way of determining the optimum heating system set point without "asking" the building. It can only be determined by actual testing. Follow these steps one by one. Do not deviate from this procedure.

- 1) Turn the system off and let the building cool down.
- 2) Turn the Heating System Sensor Adjustment knob to Z.
- 3) Start the heating system.
- 4) Go to the farthest radiator (determined by the longest piping distance) and ascertain that it is hot. Wait until it becomes hot even if it takes time.
- 5) Finally turn the Adjustment knob counter-clockwise from Z towards y very slowly until the amber or amber & white light goes on. When that happens, you've reached the optimum set point for the heating system.