

CONTROL SYSTEM SPECIFICATION: HWRQ PLATINUM AS MANUFACTURED BY HEAT-TIMER CORPORATION 20 NEW DUTCH LANE, FAIRFIELD, NJ 07004

The contractor shall furnish and install a microprocessor based Multi-Stage Sequencing control system. The control shall be pre-engineered and programmed exclusively for the operation of modular hot water heating systems. It shall incorporate the following six integrated functions:

Outdoor temperature cutoff with a minimum and a maximum limit; day/night heat level programming; optimum start/stop; sequencing and lead/lag; and adjustable hot water outdoor reset or set point. The control panel shall be of modular construction to facilitate field modification, upgrading or repair. It shall include the following:

General

The control shall operate on 120 VAC, with a maximum power of 30 watts. The control shall operate between 20 and 130°F with an operating humidity of 20 to 80% RH (non condensing) with a storage temperature of no less than -4 to 180°F.

Display

The control shall have a four line by 20-character VFD display capable of displaying both numbers and characters. The display shall be visible with no ambient light. All control operation information shall be available for display.

During times of inactivity, or 15 minutes after last user entry, the display shall enter a lower power mode. In this mode, the display shall reduce visible light output. The control shall exit this mode whenever button or digital encoder activity is sensed.

User Information Entry

The control shall use five push buttons and one rotary digital encoder for user parameter entry. User parameter entry shall be accomplished using a menu system.

Network / Communications Capability

The control shall optionally be capable of communicating to the Internet using a high-speed Internet connection. The connection can be either direct to the Internet or through a router that is configured and supplied by Heat-Timer.

The control shall optionally be capable of communicating to Heat-Timer Visual Gold Plus Software. This connection shall be either using a direct connection RS232 to PC with Visual Gold Plus software or using a dialup modem to dial into the control from a computer using Visual Gold Plus software. Either communication option provides: Remote Adjustments, Overrides, History Reports and Alarm Capabilities.

The control shall optionally be capable of communicating to external Energy Management Systems or Building management Systems using XML protocol. This connection shall be using either RS232 or RS485.

Memory & Backup

The control shall store all configuration and settings on EE Prom. In case of power failure, the control should be able to retrieve all of its latest settings.

Outputs

The control shall have the capability of providing five independent outputs. A LED shall indicate which outputs are energized. The outputs include:

1. A pump relay shall control the system circulator based on an outdoor temperature set point.
2. An auxiliary clock relay shall provide a time-of-day switching function.
3. One relay shall be provided for direct burner control.
4. Two relays shall be provided for control of a "floating" type motorized valve.
5. One relay shall provide domestic hot water pump/pump starter control.

Sensors

Standard sensor inputs shall be of the thermistor type. Operating temperature range shall be -30° to 250°F. The control shall have the capability of connecting to a variety of Heat-Timer Network Sensors types. The network sensor types that the control can monitor shall include temperature, pressure, Stack, Oil Level, and Pulse Meter Interface. In addition, the control must have the capability of interfacing with Heat-timer Wireless Sensors.

Hydronic Outdoor Reset

The control shall be capable of resetting the temperature of heating water based on the outside temperature. All the following shall be user adjustable:

Reset Ratio:

The control shall provide adjustable reset ratios from 4:1 (Outdoor Temperature: Water Temperature) to 1:3

Offset:

The control shall provide an integral offset adjustment to parallel shift the selected reset curve. The range of settings shall be -40°F to 40°F.

Outdoor Cutoff:

The control shall provide an adjustable outdoor temperature cutoff with a range of -30°F to 75°F, with two additional settings, ON and OFF.

Minimum Water Temperature:

The control shall provide a minimum water temperature set point to limit the computed water temperature. The range of settings shall be 70°F to 170°F.

Maximum Water Temperature:

The control shall provide a maximum water temperature set point to limit the computed water temperature. The range of settings shall be 90°F to 240°F.

Additional Outputs

The control must be able to accept 24 additional stages using an extension module to increase the capacity by an additional eight stages per extension. All of the functions of the extension module shall be displayed on the HWRQ Platinum display. Extension shall communicate to the HWRQ Platinum using RS485.

Boiler Lockout Inputs

The control shall be capable of accepting dry closure type boiler lockout inputs when used with the extension module. Each lockout input shall control the operation of a single boiler regardless of the number of stages the boiler has.

Rotation Modes

The control shall be capable of the following boiler rotation options:

Manual Rotation:

Rotation among boilers is changed manually

Time Rotation:

Adjustable in one-hour increments from 1 hour to 41 days

First-On/First-Off:

If "A" is the lead stage, then, when adding stages, it shall sequence in the following order: A, B, C, and then D. When less load is needed, the reduction of stages sequence shall be in the same order: A, B, C, then D, leaving "E" as the lead stage.

Auto/Bypass Switch

An auto/bypass switch shall be integrated into the control to select the required operating mode. The auto mode shall allow the HWRQ to regulate the heating system. In the Bypass position, all output burners shall be turned on and the circulating pump shall be energized.

A non-resettable counter shall record the cumulative hours and minutes in the open (burner on) position. The accumulated time in bypass shall be stored indefinitely in EE prom.

Domestic Hot Water with or without Priority

The control shall be capable of increasing system temperature based on domestic hot water call. In addition, it shall allow for optional priority of the domestic hot water over the heating hot water or running them both.

External Shutdown

This feature can be used whenever it is desired to turn off the HWRQ Platinum from a remote location or another controller. When the shutdown feature is enabled by a dry contact, the Burner and Motorized Valve Open (OUTPUT) relays shall de-energize, while the Motorized Valve Close Relay shall energize. The Pump relay shall continue to be energized for the period of the System Run-On. The shutdown signal must be a dry contact only.

System Prove

The control shall be capable of accepting a dry closure type system prove input. This shall prevent any stages from activating until the contact is closed.

Enclosure

A surface mounted, locking steel enclosure NEMA 1 type, minimum 18 gauge shall be provided.

Security

The control shall have a locking mechanism using a key to provide security against manual tampering. In addition, the control shall provide the capability of having a locking password that will prohibit unauthorized users from modifying settings.

Summer/Winter

An integral summer/winter option shall be provided for summer shutdown. In the summer mode the control panel will not activate the heating system.

Time Clock

A digital, 7 day electronic time clock shall be incorporated to switch between the Normal (Day) and Save (Night) modes of operation. The clock shall be capable of four separate Normal (Day)/Save (Night) schedules per day and each day can be programmed independently. The normal/save schedule shall be stored in EE Prom indefinitely. Copy and erase functions shall be provided to facilitate programming.

Shift & Extended Day

The control shall provide a "Shift" function that allows for manual or remote switching between Day and Night settings. An Extended Day setting shall be available to switch from Night settings to Day settings for a predetermined period of time that is adjustable from 1 to 4 hours.

Battery

A lithium "coin" type battery shall be included to maintain all system parameters in the event of a power failure. Storage capacity shall be 100 days.

Night Setback

The control shall provide an integral night setback adjustment. The range of settings shall be 0° to -80°F. The setting selected is the degree of water temperature drop, during the night mode, from the computed day water temperature.

Boost (Optimum Start/Stop)

The control shall incorporate two separate field selectable "boost" functions. During the "boost" period the hot water temperature will be elevated above the "computed day" level. The range of adjustment shall be 0 to 60°F. The boost choices shall be:

1. Vari-Boost shall provide for a variable warm-up period based on outside temperature.
2. Vari-Boost with Early Shutdown shall provide an automatically variable warm-up with an automatically variable early switch to the setback mode based on outside temperature.

The Off, Vari-Boost or Vari-Boost & Early Shutdown setting shall be selectable on the control panel.

Sequence of Operation

On a drop in outside temperature below the system set point, the circulating pump shall immediately be activated. In addition, the control shall calculate the computed water temperature (based on the selected reset ratio, offset, time-of-day and exact outside temperature) and sequence boiler stages to achieve it. When the outside temperature rises to the system and pump set point plus 2°F, the circulating pump and burner (or valve) shall be de-energized.

Consideration

The control must be installed in accordance with the manufacturer's instructions and all applicable codes & regulations. If field support is needed, please contact local Heat-Timer Representative for assistance.

Regulatory Approvals

The control shall be UL Listed, Tested per standard 916, Temperature Indicating and Regulating Equipment. It shall also be approved for use in NYC by the City of New York, Department of Environmental Protection.