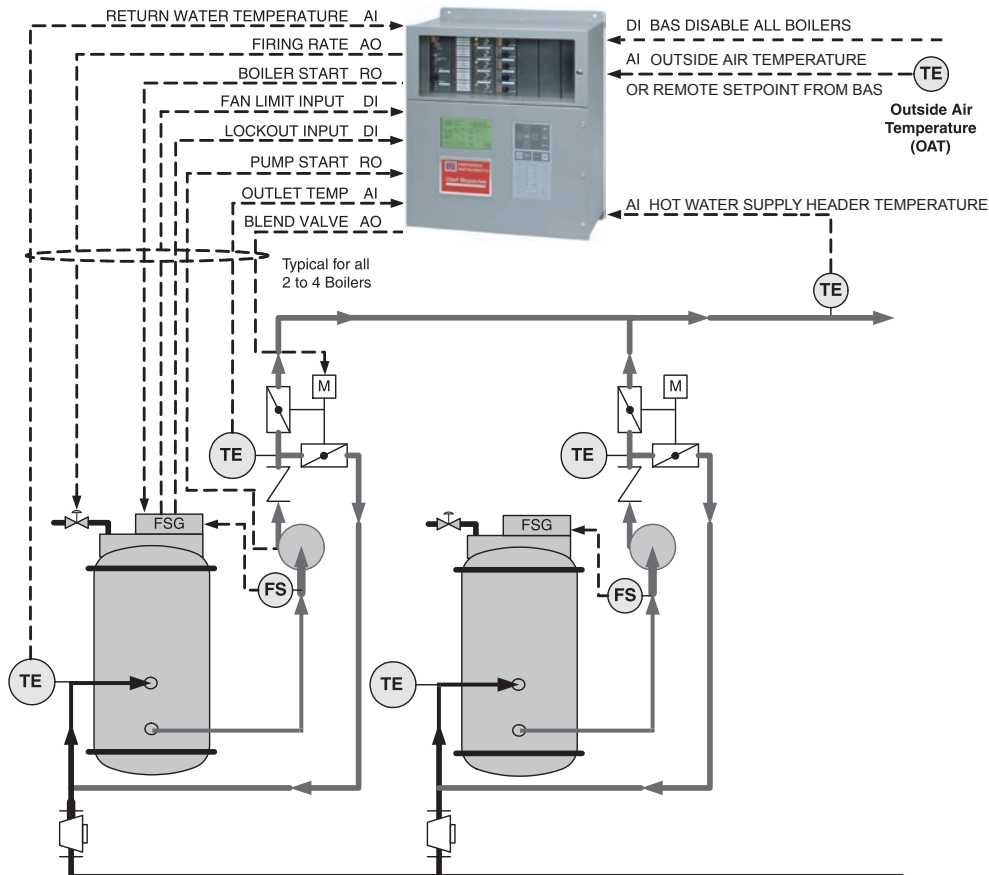


CHIEF DISPATCHER MODEL JC-CDHWTSP

Hot Water Boilers with Thermal Shock Protection Modulating Lead/Lag Controller



JC-CDHWTSP

2 to 4 Hot Water Boilers, Primary Loop Pumps and Blend Valves

Application

The Chief Dispatcher **Model JC-CDHWTSP** will optimize hot water system performance and help extend boiler life. Blend valves are used to allow off-line boiler warm-up and prevent thermal shock.

2 To 4 Modulating Boilers

Hot Water Supply (HWS) header temperature is maintained using accurate PID control. Multiple boilers are modulated in “Unison” (all at the same firing rate) to ensure even heat delivery. Lag boilers are brought up to the “Unison” firing rate using a predetermined Ramp Rate to meet the heating load with minimum overshoot. When desired, the operator may set the “Unison” firing rate manually. Each boiler has an individual boiler outlet temperature sensor. If any boiler approaches its high temperature shutdown limit, it will cut back firing rate individually to prevent a boiler trip.

Boiler Pump Sequencing

In line boiler pump sequencing keeps the lead boiler pump running (therefore water flowing past the header sensor) to ensure accurate header temperature sensing and provides pump shutdown delay for boiler cool down.

Thermal Shock Protection

Individual boiler outlet 3-way recirculating valves are automatically positioned based on the boiler start sequence, boiler outlet and return water temperatures. If the boiler return water temperature drops below a low temperature setpoint, the valve opens to allow hot boiler outlet water to

blend with cold return water temperature. The valve slowly repositions toward 0% recirculation after return water rises above setpoint. When a boiler is called to operate, the 3-way valve is set to 95% recirculation. After the boiler starts and the outlet temperature is close to supply temperature setpoint, the valve slowly repositions toward 0% recirculation.

Outdoor Reset

Energy is saved by lowering the Hot Water Supply (HWS) temperature setpoint as the outside air temperature increases. Operating cost is reduced during warmer days. When desired, the operator may set the HWS setpoint manually.

Time Of Day / Week Setback

This feature is used in heating applications to save energy by lowering the Hot Water Supply (HWS) temperature setpoint during times when the heating requirement is reduced, such as at night or on weekends and holidays.

Domestic Hot Water Priority

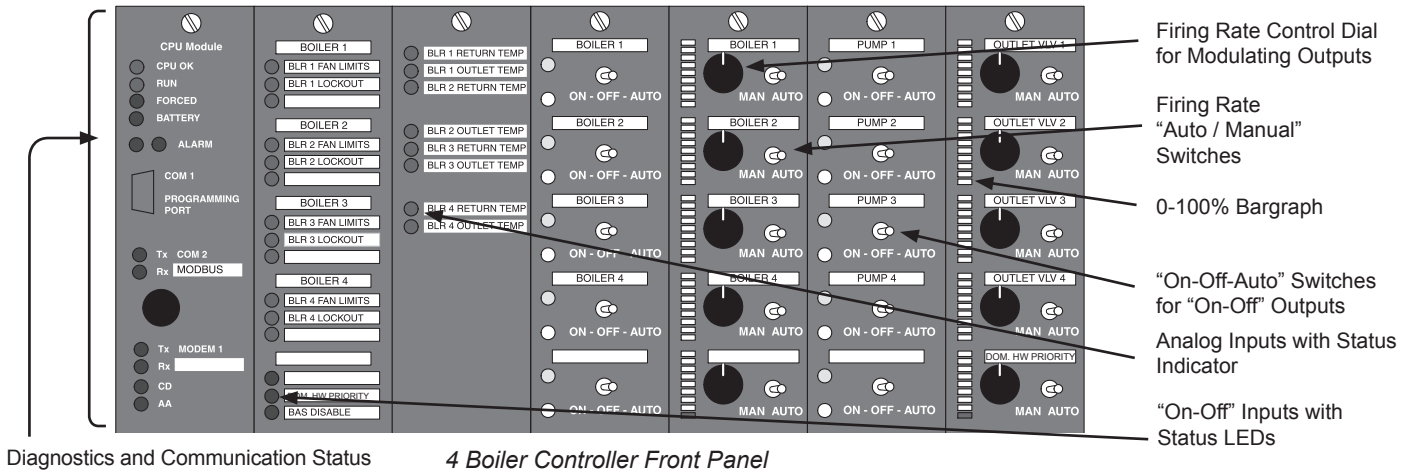
A temperature switch (thermostat) contact closure input will override the Outdoor Reset and Setback portion of the program and force the HWS temperature setpoint to a Domestic Hot Water Setpoint. A relay output is available to start a domestic hot water pump if required.

Condensing Boiler Logic (Option “-C”)

Condensing boiler logic takes full advantage of the condensing boiler design by maximizing the number of boilers running near low fire to maximize efficiency.

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Hot Water Boilers with Thermal Shock Protection Modulating Lead/Lag Controller



Specifications

Panel Details

Controller: PWC
 Case Size: 19¼" H X 18" W X 8½" D
 Enclosure Type: Wall mounted, Weight: 55 lbs.

Inputs

Hot Water Temperature: 0° to 300° F, Thermistor
 Outlet Water: Thermistor (each boiler)
 Return Water: Thermistor (each boiler)
 Outdoor Air: Thermistor (non "-BAS" version)
 BAS Reset Setpoint: 4-20 mADC ("-BAS" version)
 BAS, Boiler Disable: 120 VAC, optically isolated
 Limits: 120 VAC, optically isolated (each boiler)
 Boiler Lockout: 120 VAC, optically isolated (each boiler)
 Domestic HW Priority: 120 VAC, optically isolated

Outputs

Boiler Modulation: Isolated: 4-20 mADC or 0-135 ohm (each boiler)
 Balancing Valve: Isolated: 4-20 mADC (each boiler)
 Boiler Start: Dry contact, 8 FLA, ½ HP, 120 VAC (each boiler)
 Pump Start: Dry contact, 8 FLA, ½ HP, 120 VAC (each boiler)
 Domestic HW Circulation Pump: Dry contact, 8 FLA, ½ HP, 120 VAC

Ordering Information

Specify Chief Dispatcher Catalog Number:

JC-CDHWTSP - 2 - P

Boiler Quantity 2 to 4
 Analog Output Type 4-20 mADC - I
 0-135 ohm - P

Optional Features	Catalog Number
Historical Trending	190604
Telephone Modem	190603
Building Automation System (BAS) 4-20 mADC Setpoint	add "-BAS" suffix
Condensing Boiler Logic	add "-C" suffix
Order Sensors Separately (Quantity as Required)	Catalog Number
Hot Water Thermistor Temp. Sensor 0° to 300° F, 4½" depth	70610
Thermowell, SS, 4½" x ½ NPT	70610W
Outside Air Thermistor Temp. Sensor with weatherproof cover	70612

CHIEF DISPATCHER MODEL JC-CDHWTSP

Suggested Specifications

1. Application

Supply a fully integrated boiler hot water control system to coordinate the operation of two (select up to four) fully modulating hot water boilers, boiler water circulating pumps and boiler water flow control valves in order to maintain Hot Water Supply (HWS) temperature at setpoint and provide thermal shock protection. The control system shall be microprocessor-based and suitable for wall mounting.

2. Boiler Modulation

The control system shall incorporate a "cascade with cutback" HWS temperature PID control scheme. The HWS temperature shall be compared with a setpoint to establish a target boiler firing rate. If an individual boiler outlet temperature exceeds a pre-set maximum setpoint, that boiler's firing rate shall be automatically cutback by a PID loop to prevent a high temperature trip. Boilers shall be modulated in "Unison" (all at the same firing rate). Modulation signals shall be 4-20 mADC or 0-135 ohm (as required by the boiler) and shall be electrically isolated channel-channel and channel-ground.

3. Hot Water Supply (HWS) Temperature Setpoint

When the HWS Temperature control loop is in the "automatic" mode, the control system shall establish the HWS temperature setpoint based on the time of day, day of the week and the outside air temperature. When in "manual" mode the operator may set the HWS temperature via a front panel display. All temperatures and time/date data must be field adjustable through "fill-in-the-blanks" style displays. Alternately, the control system shall accept a 4-20mADC outdoor air temperature reset setpoint signal from an external Building Automation System (BAS).

4. Boiler Sequence

The control system shall utilize both HWS temperature and boiler firing rate percent to start and stop the boilers and shall minimize the total number of boilers in operation. The controller shall start and stop boilers when the HWS temperature is outside the adjustable temperature limit for longer than the adjustable time delay. In order to minimize header temperature deviations, the control system shall start and stop the next boiler when the "lead" boiler is at an adjustable firing rate limit for longer than the adjustable time delay. The control system shall monitor both boiler lockout and limit circuits to automatically skip over boilers that are powered down for maintenance, tripped or otherwise will not start. The lead boiler shall either automatically rotate on a time of day, day of week (or month) schedule, or shall be manually selected by the operator. The boiler shall be run at low fire for warm-up for a preset low fire hold time. The control system shall reduce the firing rate to a minimum before stopping a boiler to prevent accumulation of fuel in the furnace.

5. Boiler Pump Sequence

Include independently operated primary water pump control. System must keep at least one pump running to ensure water is always moving past the header temperature sensor.

6. Boiler Water Flow Control Valve Sequence

Provide control for an electric actuator, slow opening (2 minute), flow balancing, two valve assembly for each boiler. The valve assembly shall link a boiler outlet valve and boiler water recirculation valve so that they operate as a single unit. The valves shall be arranged so that as one valve closes, the other valve opens, ensuring a continuous

flow of water through the boiler. The assembly shall accept a single 4-20 mADC signal to position both valves. This valve shall prevent water from flowing through off-line boilers (and lowering the HWS temperature), allow boiler warm-up to return water temperature before the boiler starts, continue water flow for an adjustable cool down period after the boiler has stopped, and ensure water is always moving past the header temperature sensor even after the last boiler has been stopped. Slowly jog open the valve over a 10-minute period (adjustable) to prevent boiler thermal shocking. If the boiler return water temperature is 50° F (adjustable) below the boiler outlet water temperature, the valve shall slowly jog closed, causing boiler outlet water to blend with the excessively cold return water. When the return water temperature returns to an acceptable range, the boiler outlet valve shall slowly jog open.

7. Operator Controls, Trends, Indications and Alarms

The control system shall include an 16 line x 40 character (or greater) LCD display for boiler sequence control and status, alarm and event summaries, and setup menus for easy operation, tuning and troubleshooting. Alarms, events and operator actions shall be logged with Time/Date stamp and English language description. The control system shall include a minimum of 200-point memory. The control system shall include a minimum 100 x 150 pixel historical trending display or a paperless chart recorder or other videographic hardware to permit the logging of at least 32 data points for at least 45 days. Provide a minimum of 4 "pens" per chart with 8-minute through 24-hour chart "width" selections available.

8. Reliability

Include hardwired backup stations to permit manual operation of the plant should the control system require service. Manual operation must be possible when the microprocessor is not functioning. Hardwired "Hand-Off-Auto" control switches must be wired directly into every boiler and pump Start/Stop circuit. Each 4-20 mADC or 0-135 ohm modulating control output must include a hardwired manual backup station with Auto/Manual switch, output control knob and output level indicator (bargraph, analog meter or digital display).

9. Communication

The Control System shall have the ability of simultaneously communicating to a Data Acquisition System (DAS), Building Automation System (BAS) or Building Management System (BMS) via RS485 Modbus protocol and to a Personal Computer and an alphanumeric pager via standard telephone lines. The individual boiler limits, lockout, start/stop, warm standby, and firing rate status shall be readable. Header setpoint, plant firing rate, boiler quantity called to start, boiler selected as lead and all setup parameters shall be readable and writable.

10. Quality Assurance

The control system shall be manufactured and labeled in accordance with UL508 requirements (CSA C22.2 #14 for use in Canada). Inspection and labeling shall be supervised by UL or other OSHA approved Nationally Recognized Test Lab (NRTL). The control system shall be a Preferred Instruments, Danbury, CT, Model JC-CDHWTSP-x-P ('x' = boiler quantity from 2 to 4; "-P" for 0-135 ohm; "-I" for 4-20 mADC).