

# Laars Modulating Control

Model M4-LHS

## Specification

Date: Bid Date:  
Project #: Location:  
Project Name: Engineer:  
Contractor: Prepared By:

Contractor shall supply and install Qty.: \_\_\_\_\_ Laars M4-LHS multiple boiler control, part number CA009200.

Control shall be capable of controlling both condensing and non-condensing boilers, to maximize efficiency in a hybrid multiple boiler system. The control shall determine which group of boilers in a hybrid system to use as lead boilers, based on a target temperature. This allows the user to take advantage of very high efficiencies associated with condensing boilers used with lower water temperatures, while at the same time lowering first costs of multiple boiler systems, by using non-condensing boilers to assist the condensing units when system temperatures are higher.

The control shall operate on 120 VAC, with a maximum power consumption of 12 VA. 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.

The control shall have an alphanumeric digital display that names each parameter in simple English and shows precise values. The menu system shall be easy-to-use without specialized codes or keyboard commands. LEDs on the front panel shall indicate which boiler stages are activated.

Control shall be able to control modulating boilers and stage-fired boilers, and distinguish between them, and control up to 4 "stages" (one modulating boiler is one stage). The control shall be able to be used with extension modules that will extend the number of stages of control to sixteen.

The control shall be able to recognize single-stage, two-stage, three-stage and four-stage boilers, and mixtures of multiple boilers with different numbers of stages.

The control shall support modulating outputs 0-5V, 0-10V, 1-5V, 2-10V and 4-20mA, and shall be able to control multiple modulating boilers, each with a different modulating signal.

The control shall have the ability to stage modulating boilers in normal or parallel modes. In normal mode, it shall allow the modulation to increase on the lead boiler until it reaches its modulation start point, then will start the next boiler. In parallel mode, the control shall modulate all of the modulating boilers together, keeping them in lower firing rates, to maximize system efficiency with boilers that are most efficient at lower firing rates, typical of condensing boilers.

The control shall have three modes of rotation; manual, last on, or time. The time mode shall rotate the lead stage based on a user-selected time period.

The control shall have outdoor reset that allows the setpoint to change based on outdoor temperature. There shall be minimum and maximum water temperatures associated with the outdoor reset function. The control shall have a night setback schedule, daytime schedule, morning boost option, and season setting (summer / winter). The control shall be able to display a graphical history of the system and outdoor temperatures for the previous 24 hours.

The control shall have PID type logic that allows it to detect the rate of change in the system, and react quickly to quick changes in the system, or make gradual adjustments to slow changes in the system.

The control shall have an output that can be used to activate a system pump, combustion air damper, or other function that is required when any stage is active. This output shall energize whenever the outdoor temperature is below the outdoor cutoff setting. A system prove input shall check the status of components activated by the system output before the stages can be activated.

The control shall be able to have a domestic water call from an indirect domestic water system wired so as to provide DHW priority.

The control shall have a "program / run" toggle switch that is located under the wiring enclosure, to help prevent accidental changes to controller program.

A maintenance menu in the control shall allow the user to calibrate the sensors, and to adjust the output modulation trim to match a stage output percent to a burner.

The control shall be able to accept a 4-20mA signal from an external source, through a Laars X-SIG module (ordered separately) for remote setpoint.

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The control shall be able to send the following variables through a Laars X-BAC (ordered separately) to a BACnet network system:

- Operation mode
- Outdoor temperature
- System temperature
- Output status
- Control status
- Season
- Reset ratio
- Offset
- Outdoor cutoff
- Minimum water temp.
- Maximum water temp.
- Setback
- Purge delay
- System run-on
- Rotation time
- Standby time
- Last stage hold
- Condensing unit lead stage
- Non-condensing unit lead stage
- Reaction time
- Minimum run time
- Gain
- Lag delay
- Soft off
- Set time
- Day schedule
- Night schedule