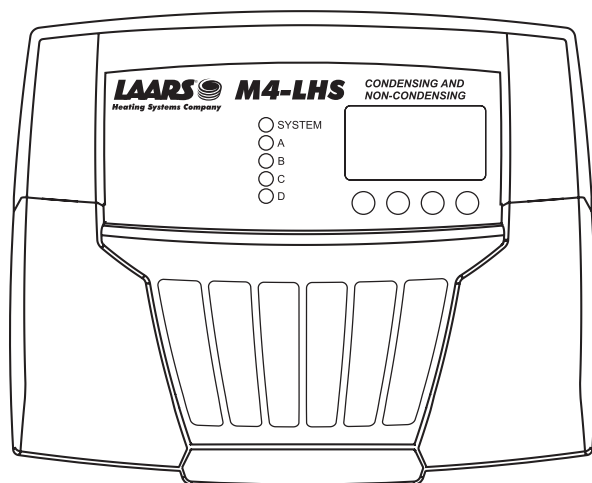


## LAARS M4<sup>®</sup>-LHS



Date:

Project #:

Engineer:

Prepared By:

Bid Date:

## Control for Condensing, Non-Condensing, Modulation and Stage-Fired Boilers

CA009200

**Submittal Data**



Project Name:

Location:

Contractor:

### Standard Equipment

- Multiple boiler control, used to lead-lag modulating, stage-fired, condensing and non-condensing boilers
- Controls up to four stages (one modulating boiler is one stage)
- Ready to use with Laars X-BAC BACnet interface module
- Ready to use with up to two M4EXT extension modules for control of up to 16 modulating stages
- Ready to use with XSIG module to accept external 4-20mA control signal
- Outdoor reset or setpoint control
- System water temperature sensor
- System water temperature sensor well
- Outdoor air temperature sensor
- Outdoor air temperature sensor clip

### Features

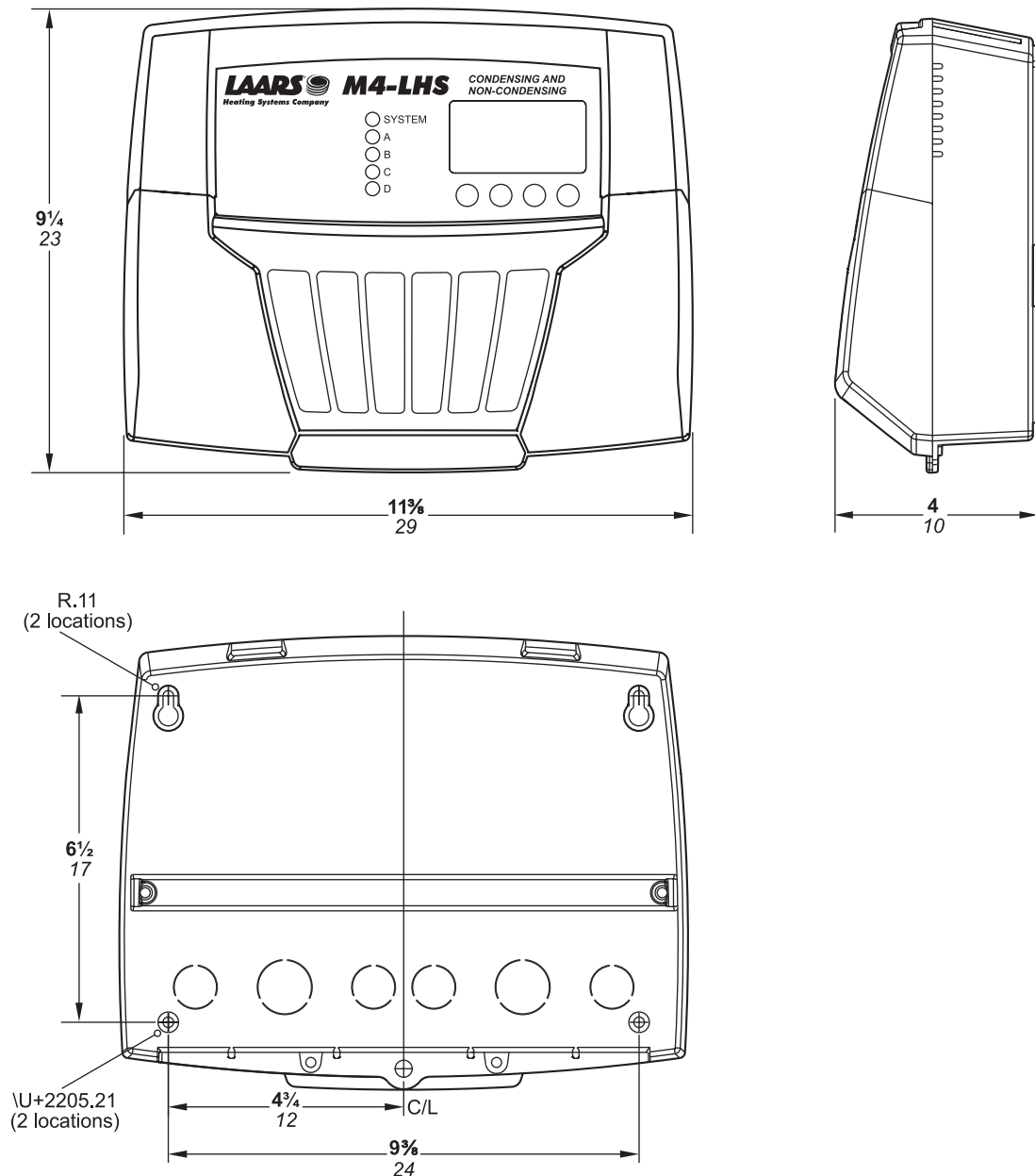
- Operates two groups of boilers - condensing and non-condensing - each with independent configuration - to achieve the highest system efficiency
- Chooses condensing or non-condensing groups based on system temperature
- Controller works with either stage-fired or modulated boilers
- Controls 0-5V, 1-5V, 0-10V, 2-10V and 4-20mA boilers, or stage-fired boilers, in any combination
- Lo/Hi/Lo/Hi sequencing fires lag boiler after the lead boiler reaches full fire capacity - Lo/Lo/Hi/Hi sequencing provides an opportunity for higher boiler efficiency to bring on the lowest firings stages of all the boiler before moving any of them to higher firing rates
- Parallel or normal modulation provides efficient, smooth, and adjustable modulation that can fit most applications whether the boilers are to sequence normally (one after another) or in parallel
- Each boiler can be set for one of three rotation modes; timed (one hour to sixty days), manual, or last-on/last-off
- Each boiler can be set individually to be automatically operated, fully on, manually adjusted, off or be considered a standby boiler. The standby boiler is used as a backup with an adjustable standby delay. This feature is great for using less efficient boilers (with lower initial purchase cost) for periods of high demand only
- Soft-off feature, lag delay and last stage hold assist in minimizing boiler short-cycling
- Adjustable ignition start point and modulation start point
- Adjustable purge delay feature to match the boiler's pre-purge time
- Adjustable minimum and maximum system temperature protect boilers or system
- Communicates with EMS (energy management system) by adding the XSIG 4-20mA interface module, and has shutdown and prove inputs for the EMS
- Domestic hot water with or without priority
- Outdoor reset allows the controller to adjust system water temperature based on outdoor air temperature for fuel savings
- Built-in day/night schedule with adjustable night setback for fuel savings
- External setback signal is accepted for applications that do not follow a pre-determined schedule
- Summer shutdown with domestic water override
- Brightly lit LCD, visible with no ambient light
- Graphics that display in plain English
- Graphical history displayed on the screen shows system and outdoor temps for last 24 hours
- Settings can be copied from one boiler to another for easy programming
- Memory and backup with lithium battery to store information for 100 days
- Locking NEMA-1 enclosure - controller has an integral programming switch that can only be accessed when wiring cover has been unlocked and removed
- UL Listed, tested per standard 916

## BACnet Interface

When used with Laars X-BAC module, the variable list available to the BACnet network from the M4-LHS shall be:

- 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

## Dimensions



## Specifications

<b>Voltage Input</b>	120VAC 60Hz
<b>Power Consumption</b>	12 VA Max
<b>Operating Temperature</b>	20°F to 130°F
<b>Operating Humidity</b>	20% to 80%
<b>Dimensions</b>	11-3/8" wide x 9-1/4" high x 3-3/4" deep
<b>Weight</b>	2.5 pounds
<b>Lead Stage Rotation</b>	Time (1 to 1440 hours [60 days]), manual, last-on
<b>Staging Boiler Modes</b>	Auto, standby, on, off
<b>Modulating Boiler Modes</b>	Auto, manual, standby, on, off
<b>Switch Between Boiler Group Modes</b>	System/Return Temp
<b>Ignition Start Point</b>	1% to 50%
<b>Modulation Start Point</b>	0% to 100%
<b>Standby Time</b> (PID only)	1 to 60 minutes
<b>Purge Delay</b>	0.0 to 10.0 minutes Switch between boiler group modes: Outdoor Temp or System/Return Temp
<b>Lag Delay</b>	0 to 60 minutes
<b>Modulating Signals Available</b>	0-5V, 1-5V, 0-10V, 2-10V and 4-20mA
<b>Sequencing Output Types</b>	On/Off, 2-Stage, 3-Stage, or 4-Stage
<b>Output Relay Ratings</b>	1 Amp inductive, 6Amp resistive at 120VAC 60Hz, 15A total for all circuits
<b>Modulation Modes</b>	Normal or parallel
<b>Sequencing Modes</b>	Lo/Hi/Lo/Hi or Lo/Lo/Hi/Hi
<b>Pump Output</b>	1 N.O. SPST
<b>Add-on M4EXT Extension Panels</b>	Up to two M4EXT panels using included RS485
<b>Temperature Display</b>	Fahrenheit or Celsius
<b>Display</b>	Graphical alphanumeric (7 rows x 21 characters each)
<b>LED</b>	1 system output relay, 4 boiler output relays
<b>Sensor Ranges</b>	-35°F to 250°F
<b>Outdoor Cutoff Range</b>	20°F to 100°F, ON and OFF
<b>Set Point</b>	70°F to 250°F
<b>External Set Point</b>	-10°F to 240°F using XSIG 4-20mA interface (optional)
<b>Domestic Water</b>	With or without priority
<b>Reset Ratio Range</b> (Outdoor Reset only)	(1:4) to (4:1) (outdoor : system water), and custom ratio
<b>Offset Adjustment</b> (Outdoor Reset only)	-40°F to 40°F
<b>Minimum Target</b> (Outdoor Reset only)	70°F to 170°F
<b>Maximum Target</b> (Outdoor Reset only)	90°F to 240°F
<b>Last Stage Hold</b> (PID only)	0°F to 30°F
<b>Pump Run-On</b>	0 to 360 minutes
<b>Night Setback</b>	0°F to 75°F
<b>Schedules</b>	1 Day and 1 Night (setback) settings per day
<b>Power Backup</b>	Lithium coin battery, 100 days minimum 5 year replacement (maintains clock in power outage)
<b>External Inputs</b>	Shutdown input and prove input (dry contacts only)
<b>Seasons</b>	Winter and Summer



*Laars Heating Systems Company reserves the right to change specifications, components, features, or to discontinue products without notice.*



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