



# **LAARS<sup>®</sup>** **MAGNATHERM<sup>®</sup>**

**Condensing Boiler  
and Volume Water Heater**

## **PACKED WITH FEATURES**

- Up to 96% Thermal Efficiency
- LAARS LINC™ Intuitive Touch Screen Controls
- VARI-PRIME® Pump Control
- Indoor and Outdoor

**COMMERCIAL HIGH EFFICIENCY  
1600 TO 4000 MBH SIZES**

**LAARS<sup>®</sup>**   
**Heating Systems Company**

# THE MAGNATHERM®

Boasting an AHRI certified 95% Thermal Efficiency, Laars Linc intuitive controls package, indoor and outdoor certification, and the Laars Vari-Prime control package built-in. The field proven Laars MagnaTherm is the right choice when selecting a high efficiency condensing boiler or volume water heater.



## Powerful Laars Linc Controls

A multi-color, simple to use smart touch screen display allows you to fully control and setup the MagnaTherm.

## Superior Heat Exchanger Materials

The MagnaTherm uses American produced 439 and 316 SS heat exchanger materials to withstand the extreme temperatures and caustic conditions found in high efficiency combustion chambers.

## Small Footprint with Removable Top Section

Fits through standard doorways and has an easy-to-remove top blower section that allows for passage through tight spaces and elevators.

## Easy Access

Two full-swing removable doors allow complete access to electrical, controls, gas valves and accessories from the front of the MagnaTherm for quick setup.

## Electrical Flexibility

The MagnaTherm comes with a centralized electrical load center that allows for various voltage packages (single and three phase), to better match job site requirements.

## Indoor / Outdoor Installation

## Ten Year Heat Exchanger Warranty

## Optimized Heat Transfer Technology and Extended Life

The MagnaTherm boiler's efficiency secret lies in its precise alignment of micro-finned heating tubes combined with highly engineered flue gas channels. This arrangement optimizes the flow of flue gases for maximum heat transfer and extend heat exchanger life.

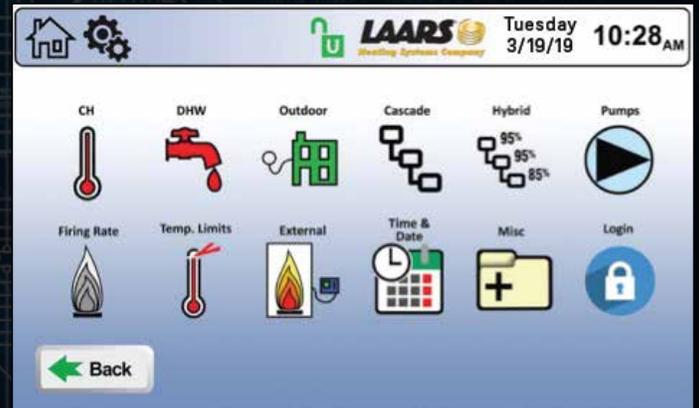
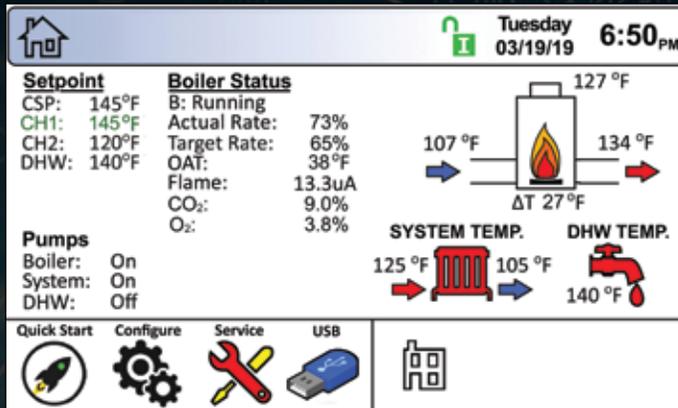
# LAARS LINC®

LAARS LINC CONTROLS  
ARE A STEP BEYOND  
SMART, THEY'RE INTUITIVE

# LAARS LINC®

Powerful control logic is easily managed via icon driven, touch screen technology. The result is an intuitive to use control system with the intelligence to manage installations from the simple to the complex.

## ADVANCED EASE OF USE FUNCTIONALITY:



- **HOME SCREEN BOILER STATUS:** The home screen shows the operational status of the boiler; all set points, status of each pump, and boiler run status.
- **QUICK START CONFIGURATOR:** Simply touch the "Quick Start" icon on the home screen to access the most commonly-used parameters for systems that don't require advanced set up.
- **USB DATA CONNECTION:** The USB connection allows for easy transfer of parameter sets from one boiler to another and for the boiler's history data to be transferred to a USB memory device.
- **MULTIPLE PUMP CONTROL:** System pump, boiler pump and domestic water pump operation, each with time delay.
- **VARI-PRIME PUMP CONTROL:** The MagnaTherm boiler's combustion modulation is matched to the rate of a variable speed boiler pump. This unique on board control mirrors a heating system's profile during varying load conditions to optimize overall efficiency. A variable speed pump's yearly watt usage can be dramatically reduced with a payback realization in as little as one year.
- **LAARS LINC CONTROL TO DISPLAY HANDSHAKE:** If for any reason a display or control board needs to be replaced, the parameter set is automatically transferred from the remaining display or control board to the replaced component. Parameters are stored on both the display and control to auto populate either one!
- **INTELLIGENT REDUNDANCY:** Laars Linc cascade logic includes a built-in redundancy; via either a lag unit's internal setpoint, or a configurable redundant leader. A bank of boilers will continue to operate even if the master control goes down, keeping buildings warm and hot water flowing!
- **AUTO CONFIGURING CASCADE:** Up to 8 units can be automatically configured by simply connecting the controls and selecting the master boiler. The intelligence of Laars Linc takes over to auto configure the remaining follower boilers. No need to register each follower!
- **BacNET MSTP AND MODBUS ON BOARD**

# VARI-PRIME®

## CONTROL TECHNOLOGY

Laars Vari-Prime flow control matches the modulation rate of a MagnaTherm's combustion system to the rate of a variable speed boiler pump. This unique on board control allows the MagnaTherm boiler to mirror the heating system's profile during varying load conditions and optimize overall efficiency.

Boiler pumps are often sized for the maximum flow that a boiler needs, but boilers rarely operate at maximum capacity. A pump's power consumption can drop by as much as 50% with only a 20% reduction in speed. The payback for the variable speed pump, when installed with a Vari-Prime equipped MagnaTherm setup can be realized in as little as one year!

## Vari-Prime Pump Control Energy Savings Example

Typical boiler pump energy use seen over a full heating season located in upstate New York (September through April).

When an On/Off Boiler Pump is used - kWh consumed	18,773
When the Laars Vari-Prime is used - kWh consumed	5,540
Annual Vari-Prime kWh savings	13,233
Annual Percent Pump Electrical Savings	70%
Annual Dollar Savings*	\$1,818

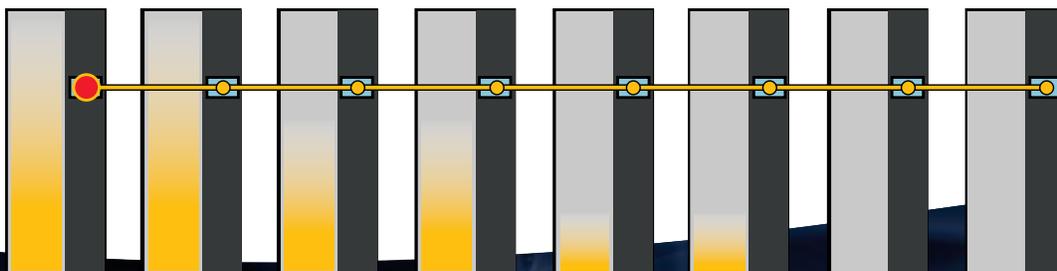
*A Three Million BTU/hr MagnaTherm using Vari-Prime pump control and a Goulds 22SH variable speed boiler pump were used in this example.*

*\*2021 US Average of 13.72 cents per kWh used, source US Energy Information Administration.*

*See Laars Vari-Prime white paper 9185 for complete details.*

## Lead Lag Cascading of up to 8 MagnaTherms

The advanced MagnaTherm control system also includes a cascading feature that allows for up to eight units to be lead lagged together. This results in a modulating heating cell of up to 32 million BTU/hr with a combined 40:1 turndown. Also included is an auto rotation function that periodically changes lead boiler to evenly spread service between all boilers.



## -sizing data

Model	Minimum Input Rate		Maximum Input Rate		Minimum Output Rate		Maximum Output Rate		Thermal Efficiency (%)		Combustion Efficiency (%)
	MBH	kw	MBH	kw	MBH	kw	MBH	kw	VWH	Boiler	Boiler
<b>1600</b>	320	93.8	1600	469	304	89.1	1520	445	96	95	96.0
<b>2000</b>	400	117.2	1999	586	379	111.0	1895	555	96	95	93.6
<b>2500</b>	500	146.5	2499	732	475	139.2	2374	696	96	95	93.8
<b>3000</b>	600	175.8	3000	879	563	165.0	2814	825	95	95	93.8
<b>3500</b>	700	205.1	3500	1025	655	191.9	3276	960	96	95	93.6
<b>4000</b>	800	234.4	4000	1172	760	222.7	3800	1113	96	95	93.1

Model	Product Weight		Operating Weight		Shipping Weight		Water Content		Available Voltages							
	lbs	kg	lbs	kg	lbs	kg	gal	l	Voltage	Phase	Model Size					
											1600	2000	2500	3000	3500	4000
<b>1600</b>	1390	630	1562	709	1590	721	22	83	<b>120V</b>	Single	✓	✓	-	-	-	-
<b>2000</b>	1390	630	1562	709	1590	721	22	83	<b>220/240V</b>	Single	✓	✓	-	-	-	-
<b>2500</b>	1785	810	2039	925	1985	900	31	117	<b>208V</b>	Single	✓	✓	-	-	-	-
<b>3000</b>	1785	810	2039	925	1985	900	31	117	<b>208V</b>	Three	-	✓	✓	✓	✓	✓
<b>3500</b>	2278	1033	2742	1244	2748	1124	56	212	<b>480V</b>	Three	-	✓	✓	✓	✓	✓
<b>4000</b>	2278	1033	2742	1244	2748	1124	56	212	<b>600V</b>	Three	-	✓	✓	✓	✓	✓

## Boiler Water Flow Requirements

Model	Temperature Rise in °F							
	25°F		30°F		35°F		40°F	
	Flow	Head Loss	Flow	Head Loss	Flow	Head Loss	Flow	Head Loss
	GPM	Feet	GPM	Feet	GPM	Feet	GPM	Feet
<b>1600</b>	122	19.4	100	14.0	87	10	76	8
<b>2000</b>	150	30	128	23.5	109	17.1	95	13.6
<b>2500</b>	190	34	158	23.6	136	17.6	119	13.6
<b>3000</b>	226	47	190	34.2	164	25.8	142	18.9
<b>3500</b>	266	41	222	30.6	190	23.6	166	18.6
<b>4000</b>	300	48	255	38.2	218	28.5	190	22.5

Model	Temperature Rise in °C							
	14°C		17°C		19°C		22°C	
	Flow	Head Loss	Flow	Head Loss	Flow	Head Loss	Flow	Head Loss
	LPM	m	LPM	m	LPM	m	LPM	m
<b>1600</b>	462	5.9	379	4.3	329	3	288	2.5
<b>2000</b>	568	9.2	485	7.2	413	5.2	360	4.2
<b>2500</b>	719	10.0	599	7.0	514	5.0	449	4.1
<b>3000</b>	856	14.3	719	10.4	621	7.9	538	5.8
<b>3500</b>	1007	12.0	839	9.0	719	7.0	629	6.0
<b>4000</b>	1136	14.6	965	11.6	825	8.7	719	6.9

## Water Heater Flow Requirements

Model	Temp Rise °F (°C)	Flow GPM (LPM)	Head Loss Feet (m)	Grains Per Gallon
<b>1600</b>	20 (12)	177 (670)	43.9 (13.4)	10
<b>2000</b>	20 (12)	177 (670)	43.9 (13.4)	10
<b>2500</b>	25 (14)	220 (833)	46 (14)	10
<b>3000</b>	25 (14)	220 (833)	46 (14)	10
<b>3500</b>	30 (17)	266 (1006)	41.2 (12.6)	10
<b>4000</b>	30 (17)	266 (1006)	41.2 (12.6)	10

## DIMENSIONAL DATA

Model	A	B	C	D	E	G	H	J	K
1600	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)	67.4 (171)
2000	29.3 (75)	79.8 (20)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)	67.4 (171)
2500	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)	76.4 (194)
3000	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)	76.8 (195)
3500	34.5 (88)	97.0 (246)	52.0 (133)	70.0 (178)	60.8 (154)	80.8 (205)	28.8 (73)	26.5 (67)	85.6 (217)
4000	34.5 (88)	97.0 (246)	52.0 (133)	70.0 (178)	60.8 (154)	80.8 (205)	28.8 (73)	26.5 (67)	85.6 (217)

Model	N	P	Q	R	S	T	U	Knockdown Height
1600	30.4 (77)	16.0 (41)	23.0 (58)	10.2 (26)	14.0 (36)	13.0 (33)	6.3 (16)	60.8 (154)
2000	30.4 (77)	16.0 (41)	23.0 (58)	10.2 (26)	14.0 (36)	13.0 (33)	6.3 (16)	60.8 (154)
2500	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)	18.3 (46)	14.8 (38)	6.0 (15)	71.0 (180)
3000	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)	18.3 (46)	14.8 (38)	6.0 (15)	71.0 (180)
3500	40.0 (102)	21.6 (55)	30.7 (78)	13.0 (33)	16.0 (41)	17.4 (44)	6.7 (17)	80.8 (205)
4000	40.0 (102)	21.6 (55)	30.7 (78)	13.0 (33)	16.0 (41)	17.4 (44)	6.7 (17)	80.8 (205)

Models 3500 and 4000 differ from the other sizes in the location of their Air Inlet and Gas Supply.

