



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

*High Turndown  
Condensing Firetube Boiler*

95% Thermal Efficiency

20:1 Modulation

TRU TRAC<sup>™</sup> O<sub>2</sub> Trim

LAARS LINC<sup>®</sup> Intuitive Touch Screen Controls

CF-Tech<sup>™</sup> Contoured Flue Tube Technology

Indoor/Outdoor Rated



**Heating Systems Company**

A subsidiary of **BRADFORD WHITE<sup>®</sup>** Corporation

**COMMERCIAL HIGH EFFICIENCY**

# MAGNATHERM<sup>®</sup> FT ADVANTAGE

Every MagnaTherm FT boiler is equipped with a robust Laars CF-Tech™ firetube heat exchanger, a precision high turndown combustion control and the Laars Tru Trac oxygen trimming system.

## MAGNATHERM FT ADVANTAGE

Modern heating appliances are expected to respond to a dynamic range of operational demands, all the while maintaining optimal performance with ultra-high efficiencies.

The MagnaTherm FT meets the challenge by deploying a powerful array of solution based design considerations and proprietary control algorithms. This powerful array of capabilities results in a boiler that performs optimally under all manner of variable conditions and offers exceptional efficiency and reliability.

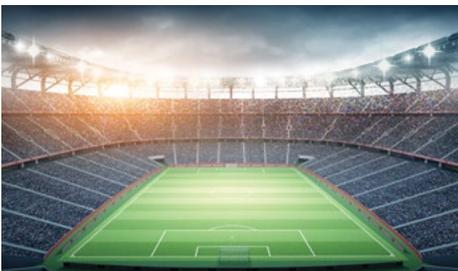
All in, the MagnaTherm FT is the ideal commercial boiler for use in full-flow variable primary systems or can be deployed to maximize primary-secondary installations via the Laars proprietary Vari-Prime<sup>®</sup> Delta-T control.



- 1) Superior Firetube Stainless Steel Heat Exchanger
  - 95% AHRI Certified Thermal Efficiency
  - Resistant to corrosive condensate and flue gasses
  - Long life design allows for “flexing” of the heat exchanger, reducing stress



- 2) 20:1 Turndown with Low NOx Combustion
- 3) Tru Trac O<sub>2</sub> Trim Control
  - High accuracy air-to-fuel ratio gas control system
  - Proprietary algorithms optimize combustion process
  - High efficiency maintained throughout the entire modulation range



- 4) Laars Linc<sup>®</sup> Intuitive to Use Control System
  - Icon driven, easy to navigate menu structure
  - Large color touchscreen
- 5) Vertical Configuration
  - Small footprint takes up less floor space
  - Fits through doors and into tight mechanical rooms
- 6) Optional voltage packages

# INDUSTRY LEADING TECHNOLOGY

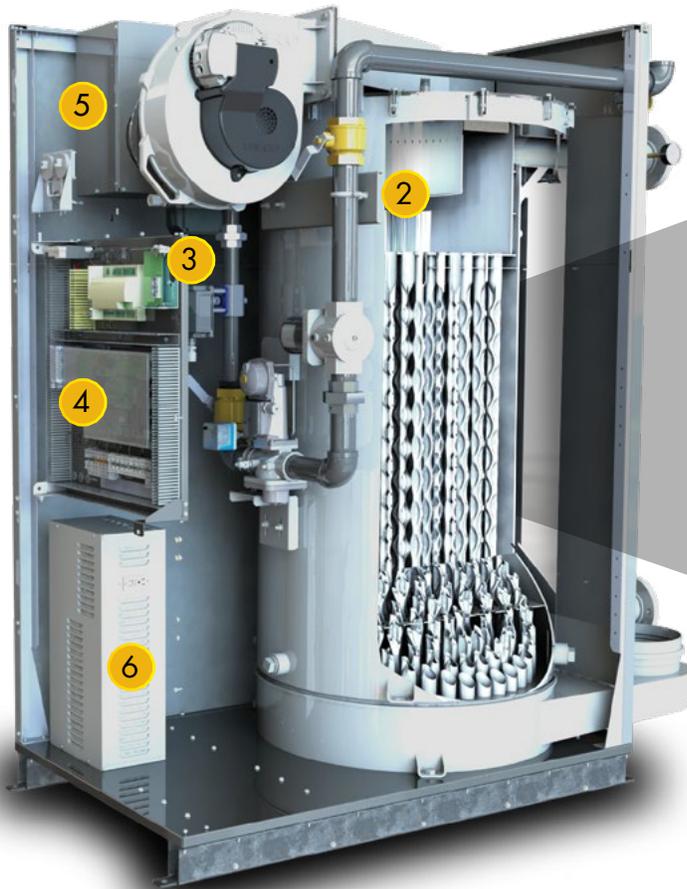
The advanced MagnaTherm FT commercial firetube boiler can be installed in a wide range of commercial heating applications, offering years of highly efficient trouble free operation.

## ADVANCED FIRETUBE TECHNOLOGY

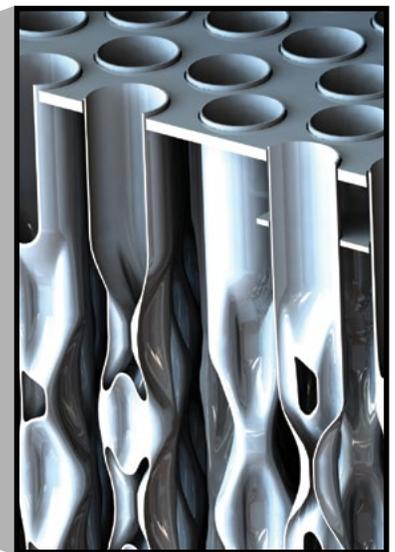
At the heart of the MagnaTherm FT is the robust, highly efficient Laars CF-Tech (contoured flue tube) firetube heat exchanger. The Laars MagnaTherm FT utilizes contoured flue tubes to not only help increase efficiency but to also extend the life of the heat exchanger.

Laars CF-Tech designed flue tubes produce turbulent flow characteristics that ensure heat is evenly distributed throughout the flue gas, thereby maximizing heat transfer into the water. Designs with straight flue tubes often pass hotter flue gasses down the center of the tubes, reducing overall efficiency.

Contoured tubes also allow the heat exchanger to flex due to thermal cycling that naturally occurs during operation. This extends heat exchanger life by minimizing stresses caused by the thermal cycling.



### LAARS CF-Tech™ Contoured Flue Technology



Laars CF-Tech flue tubes evenly distribute heated flue gas via turbulent mixing to produce the highest heat transfer possible.

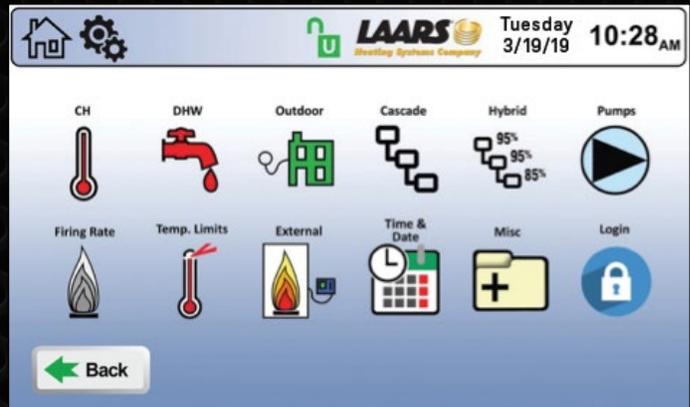
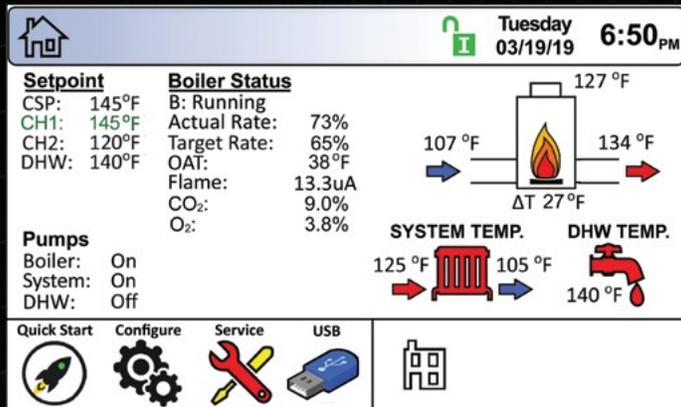
# LAARS LINC®

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.
- **VARI-PRIME® PUMP CONTROL:** This unique fixed Delta-T control functionality is included on MagnaTherm FT boilers and works in conjunction with a variable speed boiler pump. As the boiler's firing rate changes, the Vari-Prime control modulates the signal to a variable speed boiler pump to ensure a user-programmable temperature rise is maintained across the boiler. Pump electrical savings as high as 70% can be realized via this configuration vs. constant speed pump installations.
- **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!
- **MULTIPLE PUMP CONTROL:** System pump, boiler pump and domestic water pump operation, each with time delay.
- **BacNET MSTP AND MODBUS RTU ON BOARD**



## Electric Air-to-Fuel Ratio Combustion Management

Every MagnaTherm FT boiler is equipped with the unique Tru Trac O<sub>2</sub> trimming system that actively manages combustion over the entire turndown range to dramatically reduce boiler energy consumption.

# TRU TRAC™ High Turndown Oxygen Trimming Technology

Each MagnaTherm FT unit is equipped with the proprietary Laars Tru Trac O<sub>2</sub> combustion control system. Tru Trac Electronic Air-to-Fuel Ratio control algorithms actively manage the combustion process to optimize efficiency and emission levels.

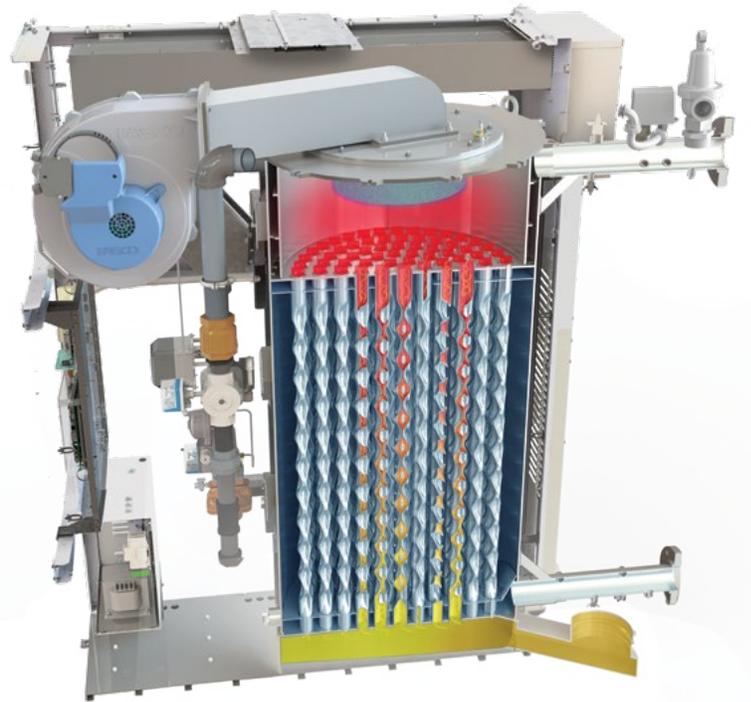
Oxygen levels produced during combustion are monitored in real time, throughout the entire turndown range of the MagnaTherm FT. Adjustments to the air-to-fuel mixture are made to maintain ideal performance. No longer compromise between turndown, efficiency and clean emission levels.

### TRU TRAC REAL TIME COMBUSTION MANAGEMENT:

- Maintains ideal oxygen levels to optimize operation
- Quickly adjusts to counteract environmental fluctuations
- Increases thermal efficiency throughout entire 20:1 range
- Increases runtime availability
- Reduces maintenance required over time

### POOR AIR-TO-FUEL RATIO CONTROL CAN RESULT IN:

- Unstable flame formation, reducing efficiency
- Increased emissions
- Less time at condensing operation (lower dew points)
- Increased maintenance issues
- Increased downtime



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## SIZING DATA

Model	Minimum Input Rate		Maximum Input Rate		Minimum Output Rate		Maximum Output Rate		Thermal Efficiency	Combustion Efficiency	Modulation Turndown Ratio
	MBH	kw	MBH	kw	MBH	kw	MBH	kw	%	%	
1000	65	19.1	999	293	62	18.1	950	278	95.8	96.1	15:1
1500	75	22.0	1500	440	71	20.8	1425	418	95.9	96.3	20:1
2000	100	29.3	1999	586	95	27.8	1900	557	95.4	95.5	20:1
3000	150	44.0	3000	879	143	41.9	2850	835	95.9	95.9	20:1

Model	Product Weight		Operating Weight		Shipping Weight		Water Content	
	lbs	kg	lbs	kg	lbs	kg	gal	l
1000	1300	590	1934	878	1450	658	76	288
1500	1450	658	2292	1041	1600	726	101	382
2000	1750	795	2717	1234	1950	885	116	439
3000	2050	931	3292	1495	2250	1022	149	564

## ELECTRICAL DATA

Voltage	1000			1500			2000			3000		
	Current			Current			Current			Current		
	FLA	MCA	MOP									
120V, 1 phase	5.0	6.2	15.0	6.2	7.8	15.0	7.8	9.7	20.0	N/A	N/A	N/A
208V, 1 phase	2.9	3.6	15.0	3.6	4.5	15.0	4.5	5.6	15.0	N/A	N/A	N/A
220/240V, 1 phase	2.7	3.4	15.0	3.4	4.2	15.0	4.3	5.3	15.0	N/A	N/A	N/A
208V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	3.3	4.1	15.0	4.5	5.6	15.0
480V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	1.5	1.9	15.0	2.1	2.6	15.0
600V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	1.1	1.4	15.0	1.4	1.8	15.0

FLA - Full Load Amperage | MCA - Minimum Circuit Ampacity | MOP - Maximum Over-current Protection

## VENTING DATA

Model	Vent / Air Connector Size		Air Pipe Size		Maximum Ducted Air Pipe Length		Category IV Vent Pipe Size		Maximum Category IV Vent Pipe Length		Typical Category II Vent Pipe Size***	
	inches	cm	inches	cm	ft*	m	inches	cm	ft*	m	inches	cm
1000	6	15	6	15	100	30.5	6	15	100	30.5	12	30
1500	8	20	8	20	100	30.5	8	20	100	30.5	14	36
2000	8	20	8	20	100	30.5	8	20	100	30.5	18	46
3000	10	25	10	25	100	30.5	10	25	100	30.5	22	56

\*Equivalent Feet: Equivalent Feet: To calculate maximum equivalent length, measure the linear feet of the pipe and add 5 feet (1.5m) for each elbow used.

\*\*\*Category II: Category II pipe size may vary. Draft must remain between -0.01 and -0.001" w.c..

- Notes:
1. Installations in the U.S. require exhaust vent pipe that is CPVC complying with ANSI/ASTM D1785 F441, stainless steel complying with UL1735, or polypropylene complying with ULC S636.
  2. Installations in Canada require exhaust vent pipe that is certified to ULC S636.
  3. Intake (air) pipe must be PVC or CPVC that complies with ANSI/ASTM D1785 F441, ABS that complies with ANSI/ASTM D1527, stainless steel, or galvanized material.

# WATER FLOW REQUIREMENTS

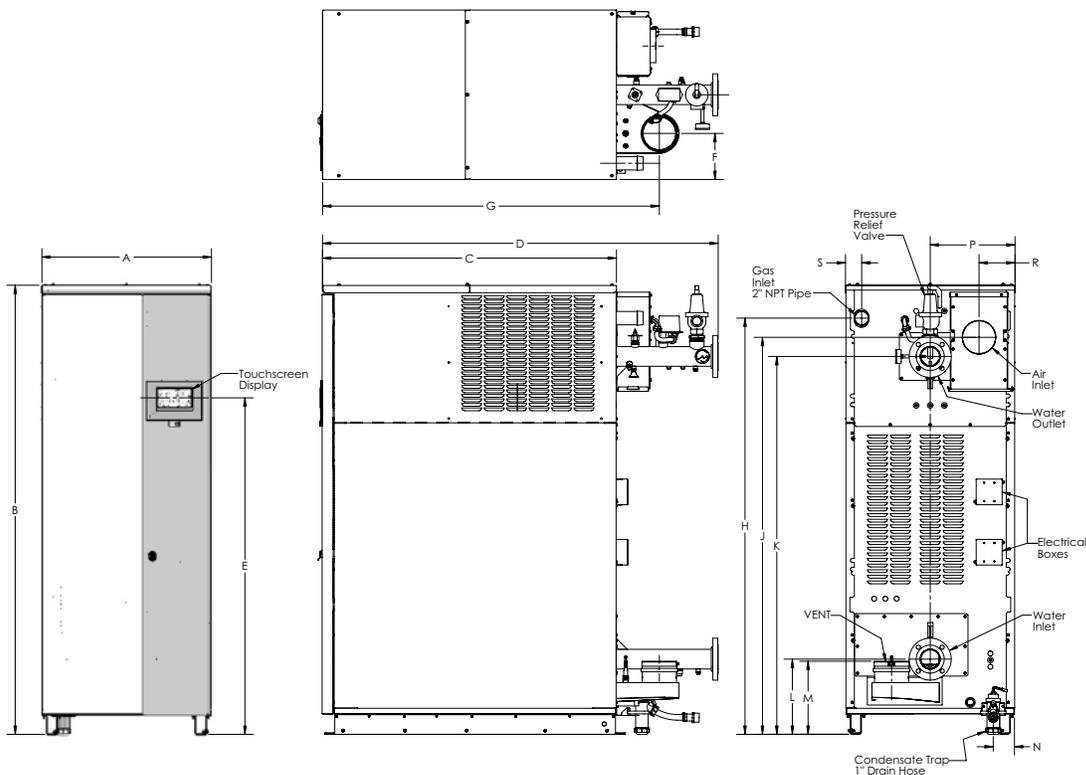
Model	Temperature Rise																							
	20°F (11°C)				30°F (17°C)				40°F (22°C)				50°F (28°C)				60°F (33°C)				70°F (39°C)			
	Water Flow		Headloss*		Water Flow		Headloss*		Water Flow		Headloss*		Water Flow		Headloss*		Water Flow		Headloss*		Water Flow		Headloss*	
	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m
1000	95	360	1.9	0.6	63	240	1.1	0.3	48	180	0.7	0.2	38	144	0.5	0.2	32	121	0.4	0.1	27	102	0.3	0.1
1500	142	538	3.4	1.0	95	360	1.6	0.5	71	270	0.9	0.3	57	216	0.6	0.2	48	182	0.5	0.2	41	155	0.3	0.1
2000	190	719	4.5	1.4	127	480	2.1	0.6	95	360	1.2	0.4	76	288	0.8	0.2	63	239	0.6	0.2	54	204	0.4	0.1
3000	285	1079	7.0	2.1	190	719	3.5	1.1	142	538	2.1	0.6	114	432	1.4	0.4	95	360	1.0	0.3	81	307	0.8	0.2

\*Headloss is for boiler only (no piping)

# DIMENSIONAL DATA

Model	"A"		"B"		"C"		"D"		"E"		"F"		"G"		"H"	
	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)
1000	30.2	(76.7)	80.0	(203)	52.4	(133)	70.5	(179)	60.0	(152)	8.2	(20.9)	60.0	(152)	74.2	(188)
1500	30.2	(76.7)	80.0	(203)	52.4	(133)	70.5	(179)	60.0	(152)	7.8	(19.7)	60.3	(153)	74.2	(188)
2000	34.6	(87.9)	80.0	(203)	56.3	(143)	73.3	(189)	60.0	(152)	9.1	(23.0)	63.1	(160)	73.6	(187)
3000	34.6	(87.9)	80.0	(203)	56.3	(143)	75.5	(192)	60.0	(152)	8.4	(21.4)	65.4	(166)	73.6	(187)

Model	"J"		"K"		"L"		"M"		"N"		"P"		"R"		"S"	
	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)	in	(cm)
1000	70.8	(180)	67.3	(171)	13.4	(34.0)	13.0	(33.1)	3.8	(9.6)	15.1	(38.4)	6.4	(16.3)	2.9	(7.3)
1500	70.8	(180)	67.3	(171)	13.4	(34.0)	13.0	(33.1)	3.8	(9.6)	15.1	(38.4)	6.4	(16.3)	2.7	(6.9)
2000	72.0	(183)	67.3	(171)	13.4	(34.0)	13.0	(33.1)	3.8	(9.6)	17.3	(44.0)	8.2	(20.9)	3.8	(9.5)
3000	72.0	(183)	68.4	(174)	14.4	(36.6)	14.0	(35.5)	3.8	(9.6)	17.3	(44.0)	8.2	(20.9)	3.6	(9.1)





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