



User's Manual for

FT SERIES

Wall-Mounted Modulating Condensing Gas Boiler (Includes Optional Floor Stand Accessory Information)

Model FTHW301 and FTHW399

- Natural Gas (NG) - Factory Configuration
- Propane Gas (LP) - Field-Convertible



FOR YOUR SAFETY: This product must be installed and serviced by a professional service technician, qualified in hot water boiler and heater installation and maintenance. Improper installation and/or operation could create carbon monoxide gas in flue gases which could cause serious injury, property damage, or death. Improper installation and/or operation will void the warranty.

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a nearby phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency, or gas supplier.

⚠ AVERTISSEMENT

Assurez-vous de bien suivre les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

Ne pas entreposer ni utiliser d'essence ou ni d'autres vapeurs ou liquides inflammables dans le à proximité de cet appareil ou de tout autre appareil.

QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:

- Ne pas tenter d'allumer d'appareils.
- Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones dans le bâtiment où vous vous trouvez.
- Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
- Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.

L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.

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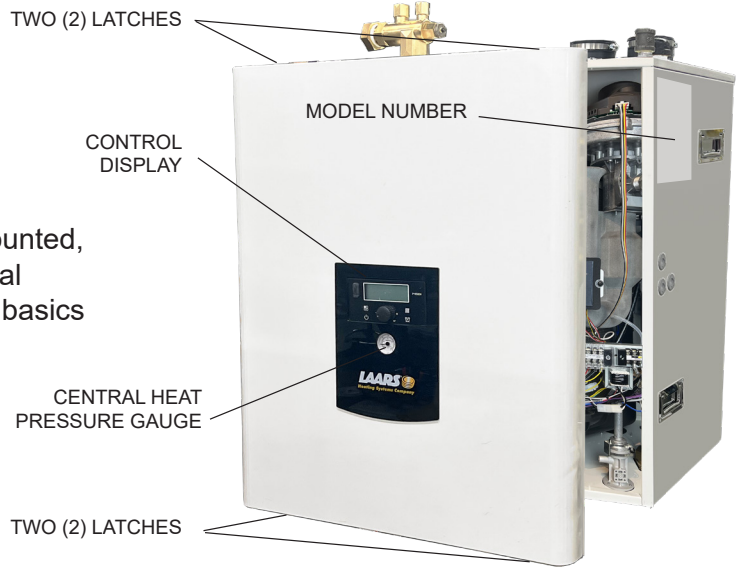
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1. Familiarizing yourself to

THE FT SERIES
Boiler

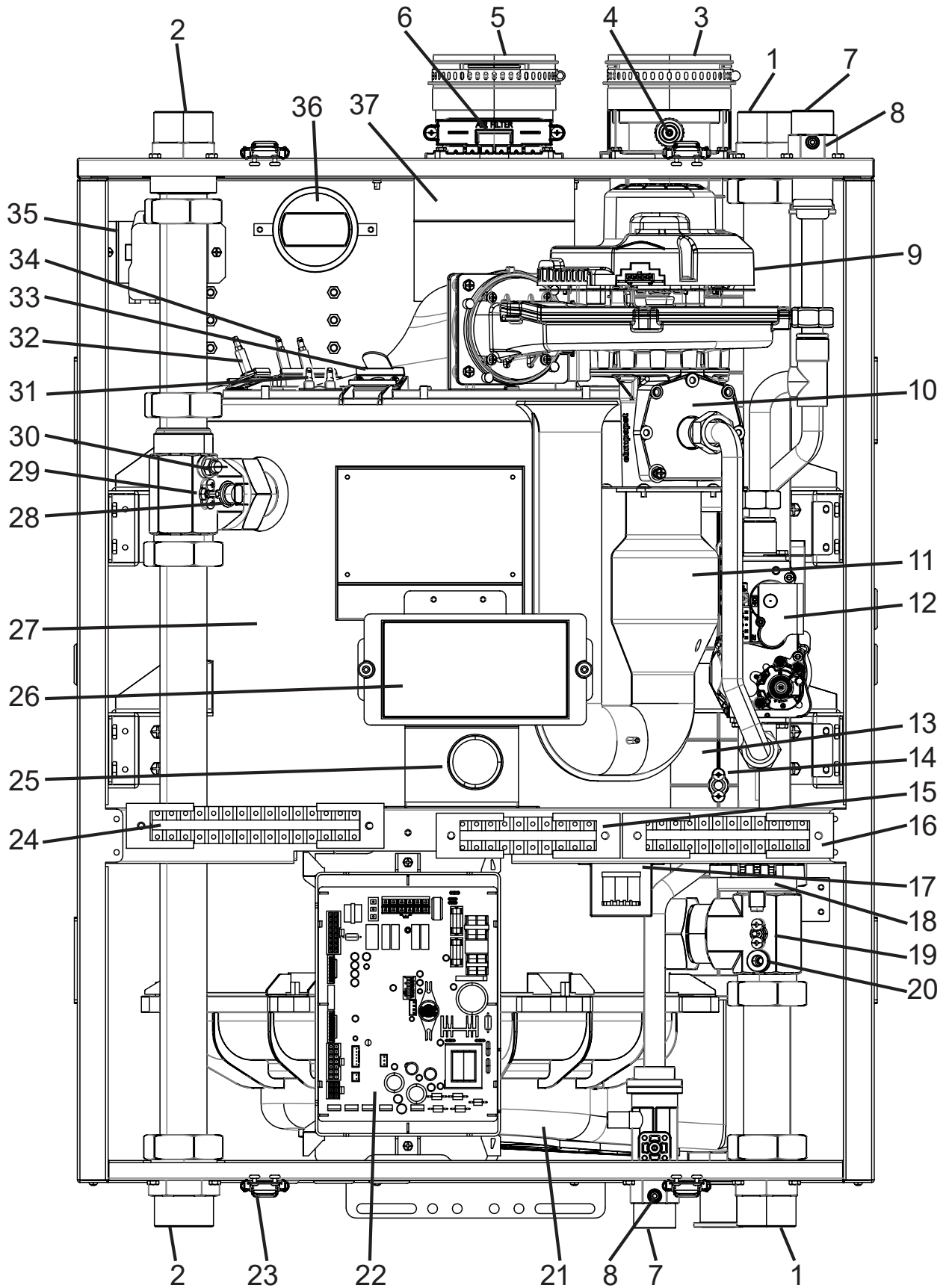
The FT Series boiler is a highly efficient, wall mounted, condensing and fully modulating, light commercial boiler. This Users Manual will guide you into the basics of operating your FT Series Boiler.

Please reference the Installation and Operation Manual for complete details. Doc # 1538



Item #	Description
1	Boiler Return Connection
2	Boiler Supply Connection
3	Vent Pipe Collar
4	Combustion Test Port
5	Air Intake Collar
6	Air Intake Screen
7	Gas Inlet Connector
8	Supply Gas Pressure Test Port
9	Blower
10	Air/Gas Venturi
11	Air Intake Attenuator
12	Gas Valve
13	Internal Exhaust Pipe
14	Sensor, Flue Gas Temperature
15	Low Voltage Terminal
16	Low Voltage Terminal
17	24V Transformer
18	Air Pressure Switch

19	Sensor, Return Water Temperature
20	Pressure Gauge Probe
21	Condensate Pan
22	Main PCB (NGTB-1000C)
23	Front Door Latches (4)
24	120V Terminal Block
25	Pressure Gauge
26	Control Panel and Display
27	Heat Exchanger
28	Sensor, Overheat Shut-Off Switch
29	Sensor, Supply Water Temperature
30	Sensor, Low Water Cut-Off (LWCO)
31	Thermal Fuse
32	Sensor, Flame Detecting
33	Sight Glass
34	Igniter
35	Ignition Transformer
36	Sensor, CO2 Flue Gas Recirculation
37	Air Intake Deflector



2. Caring For Your FT Series Boiler

Your FT Series boiler will require very little maintenance. However, as with any fine appliance there are certain steps that should be taken to ensure continuing optimum performance.

2.1 General Care

Keep the area around the FT Series boiler clean and free from combustible materials, gasoline and other flammable liquids and vapors.

The FT Series Boiler must be completely isolated and protected from any source of corrosive chemical fumes such as trichlorethylene, perchlorethylene, chlorine, etc.

Keep bottom and top openings on the boiler free for proper ventilation of interior components.

Do not obstruct or block a free flow of air to the boiler to ensure proper ventilation.

If desired, clean the jacket surfaces with a damp cloth and mild detergent. Do not use flammable cleaning materials.

If sidewall vented, keep the vent terminal clear of obstructions — do not allow snow to cover the vent terminal. Clean the intake screen often, and then develop an appropriate maintenance schedule.

2.2 Annual Inspection of Flue and Vents

Visually inspect the vent pipe once a year. Should any deterioration exist, have the affected parts replaced by a qualified service person.

2.3 In the Event of a Power Failure

The FT Series boiler can not be operated during an electrical power outage. If there is an extended power outage with danger from freezing, then the FT Series Boiler (and all other water systems) should be drained completely. When draining the boiler, turn off main electrical disconnect switch. When placing back in service, refer to Section 3 of this Manual for instruction. All draining and filling must only be done by a qualified service person.

2.4 Full Service Every Year

In addition to the annual visual inspections, a qualified service agency should conduct a detailed inspection of all flue product carrying areas of the boiler and its venting system.

3. Shut Down and Restart

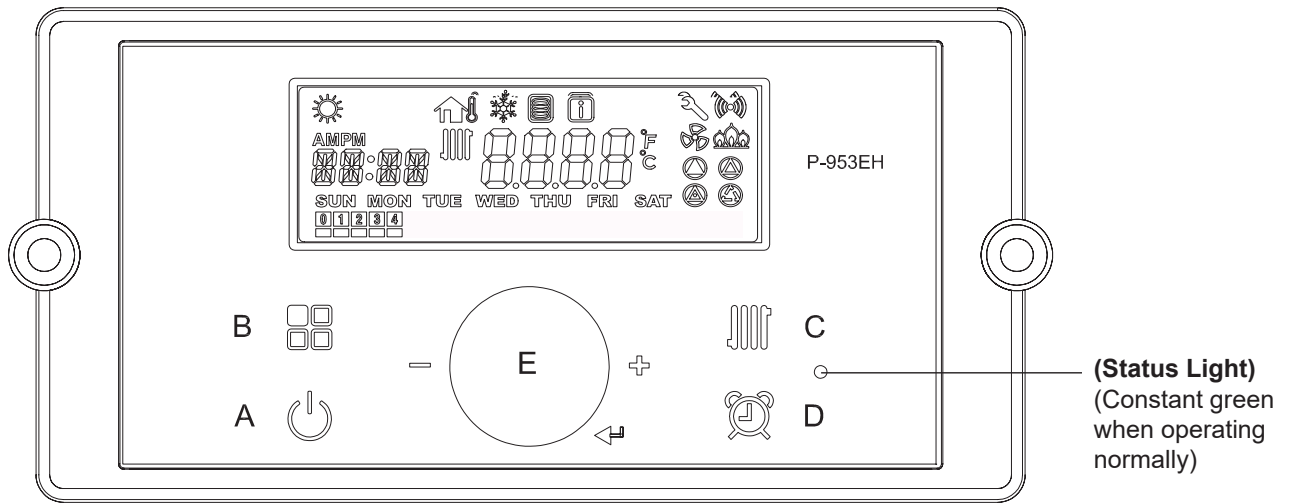
3.1 To Start the FT Series boiler

If drained, please refer to the Install and Operating Manual to ensure that the complete 'Setup' procedure has been followed before starting this boiler. A complete 'Setup' must be performed by a qualified service person.

3.2 Shutting Down the FT Series boiler

1. Turn off the main electrical disconnect switch.
2. Close all manual gas valves.
3. If freezing is anticipated, drain the FT Series Boiler and be sure to also protect building piping from freezing. All water must be removed from heat exchanger and condensate trap or else damage from freezing may occur. Please refer to the Install and Operating Manual, Doc # 1483 This step to be performed by a qualified service person.

4. The Control Display and Operation



The Control Display

The Control Display has a Control Dial (E), 4 Buttons (A,B,C,D), and a Liquid Crystal Display (with 72 back lit segments). This section of this manual gives instruction on how to navigate into the many functions of the Boiler and to change temperature set points, set system variables and controller parameters.

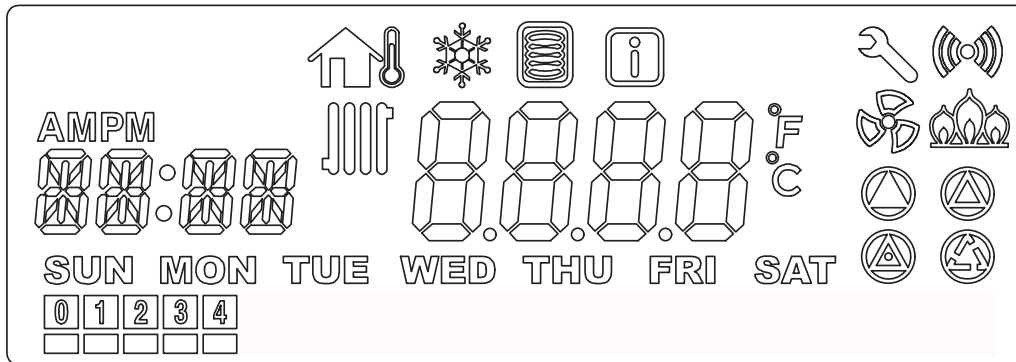
Buttons			Functionality	
			PRESS (Tap)	PRESS and HOLD (5 seconds)
A		Display Power	Turns control Display ON/OFF	
B		Modes	Tap to return to menu	(If Display Power was on) Status Display Mode (If Display Power was off) Installer Mode
C		Heating Water	CH set point change mode (Maximum 82°C (180°F))	(Only functional when no outdoor sensor is connected)
D		Time/Date Set	No Change	To SET: Year/Month/Week/Day/Time/Min
E		Scroll/ Select	Menu select or value up(+) /down(-) or setting dial	














- Temperature Specifications
 Operating ambient Temperature Range : -10 to 60°C.
 Operating Relative Humidity up to: 90% at 40°C.
 Shipping & Storage Temperature Range of : -20 to 80°C.

WARNING

Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that may have been under water.


4. The Control Display and Operation (continued)

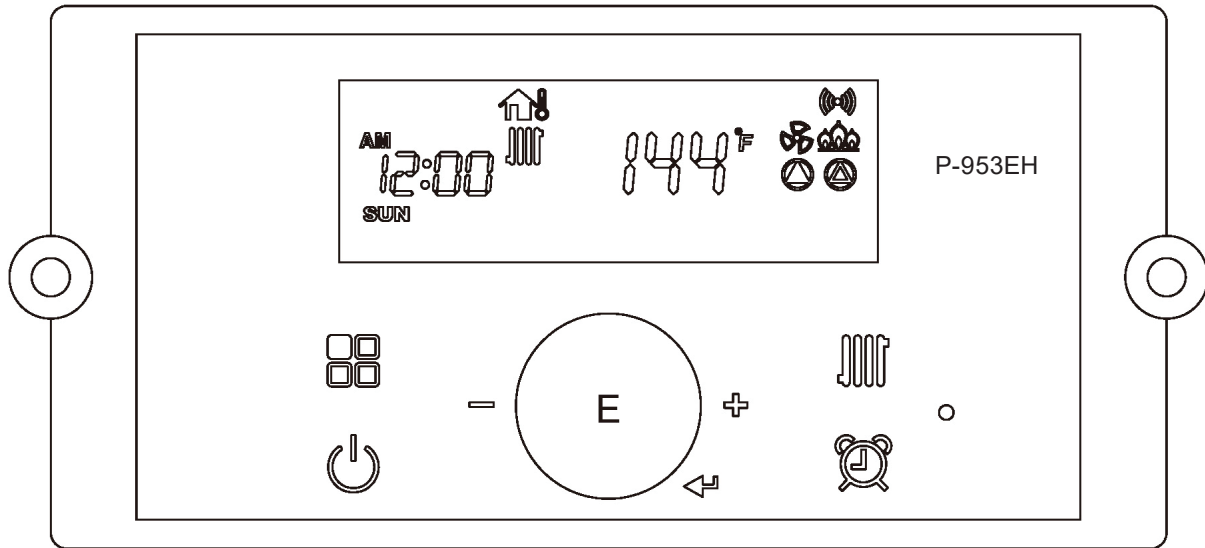








Symbol	Name	Description
	Service Reminder Mode	Service Reminder Mode Indication
	Outside Temperature Mode	Outside Temp Setting Indication
	Anti-freeze Mode	Anti-Freeze Mode Indication
	Storage Mode	Storage Mode Indication
	Informations Mode	Information Mode Indication
	Communication State	Communication State Indication
	Time /FGR reading/ FGR accumulator counter	Display cycles through actual time, Flue Gas Recirc (FGR) reading and FGR accumulator counter when burner is operating
	Fan Operating Mode	Fan Operating Mode Indication
	Flame Signal	Flame Signal Indication
	System Pump Mode	System Pump Indication
	DHW Pump Mode	DHW Pump Indication
	Boiler Pump Mode	Boiler Pump Mode Indication
	L-TT Pump Mode	L-TT Pump Mode Indication
	Celsius Mode	Indicated as Celsius Temperature
	Fahrenheit Mode	Indicated as Fahrenheit Temperature
	Heat Demand Mode	Heat Demand Mode Indication
	Day Mode	Current Day Mode Indication
	Cascade System Connecting Mode	Cascade System Connecting Mode Indication
	Cascade System Operating Mode	Cascade System Operating Mode Indication

The LCD will illuminate when a user action is detected (a button is pressed) and will turn back off after 20 seconds.

■ Operating Mode

After the Power is turned on, and/or the Control Display is turned on , the Control Display will go through a 'Start Up' checklist and briefly show a sequence of diagnostic codes before entering into the 'Operating Mode'. It will then display the following information.



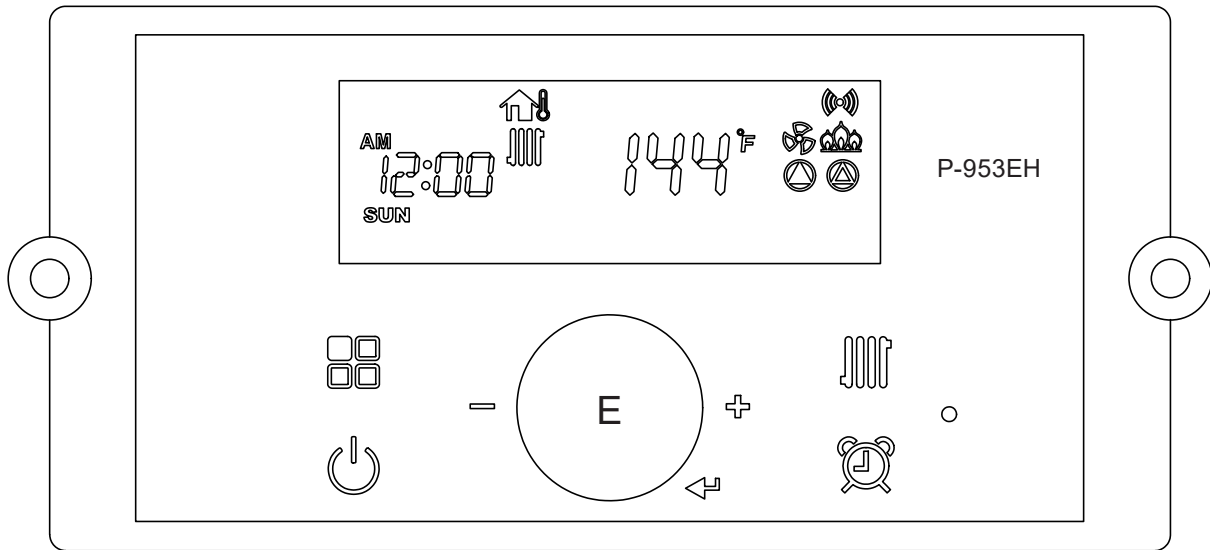
Indicator	Indicator
Current Operating Temperature Set point	144°F
If the Fan is operating	
If a flame is detected	
Celsius or Fahrenheit	°C or °F
Time /CO2 reading/ CO2 accumulator counter	AMPM 00:00
If Outdoor Temperature Sensor is Operating	
If there is a demand for Central Heat (CH)	
If boiler pump is operating	
If communication state is activated	

The Control Display can operate through user and service modes that have specific LCD outputs and dedicated controls:

- Set-Point change mode
- Error mode
- Outside Temperature mode
- Lock mode
- Status Display mode
- Installer mode


* Control Display will not allow changing of button in case of lock mode activation.


4. The Control Display and Operation (continued)



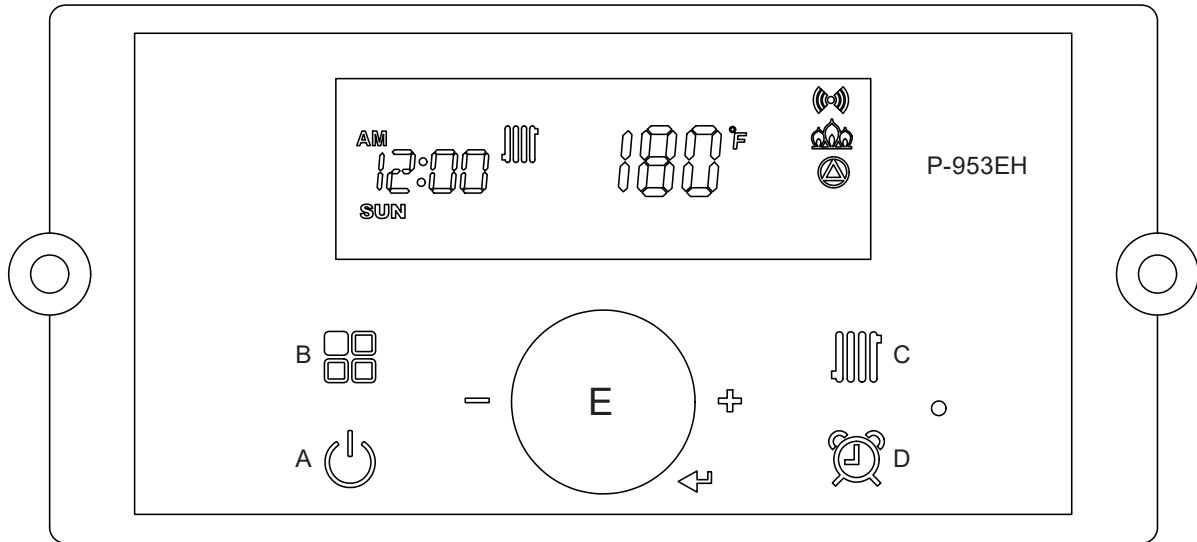
The P-953EH Control Display does NOT have a daily timer or programmable thermostat.

Setting the Clock.

- a. Press and hold the  'Clock button' for about 5 seconds. Set the 'Year' by turning the dial **E**. And then, press the dial **E** to Save.
- b. Set the '**MON**' (Month) by turning the dial **E** to the desired month number. Then press the dial **E** to Save.
- c. Set '**DATE**' (1-31, Day of the Month) by turning the dial **E**. Then press the dial **E** to Save.
- d. Set '**HOUR**' (1-24, Hour of the Day) by turning the dial **E**. Then press the dial **E** to Save.
- e. Set '**MIN**' (1-60, Minute of the Hour) by turning the dial **E**. Then press the dial **E** to Save.
- f. Set '**HOUR**' (1-24, Hour of the Day) by turning the dial **E**. Then press the dial **E** to Save.

To Exit at any time, tap the  button.

- CH set point Change Mode (This mode is only functional when the outdoor sensor (O/S) is not connected.)
- In accordance with the United States Energy Policy and Conservation Act, this boiler is equipped with outdoor reset capability, a feature that saves energy by reducing boiler water temperature as heating load decreases



To change the high temperature CH Setpoint:

- Press the C button once: The CH icon, 1:Ht and its current setpoint value will appear.
- Turn dial E clockwise to increase, and counterclockwise to decrease its value to reach desired set point.
- Press dial E to save the value and exit.

To change the low temperature CH Setpoint (if applicable):

- Press the C button twice: The CH icon, 2:Lt and its current setpoint value will appear.
- Turn dial E clockwise to increase, and counterclockwise to decrease its value to reach desired set point.
- Press dial E to save the value and exit.

Indicate	Indicator
Table 22. Current CH Temperature Set point	180°F
Table 23. Celsius or Fahrenheit	°C or °F
Table 24. If Communication state is activated	(Ⓜ)
Table 25. If flame is detected	🔥
Time /CO2 reading/ CO2 accumulator counter	AM PM 88:88
Table 26. If CH pump is operating	⊕
Table 27. If there currently a Demand for Central Heat (CH)	📶

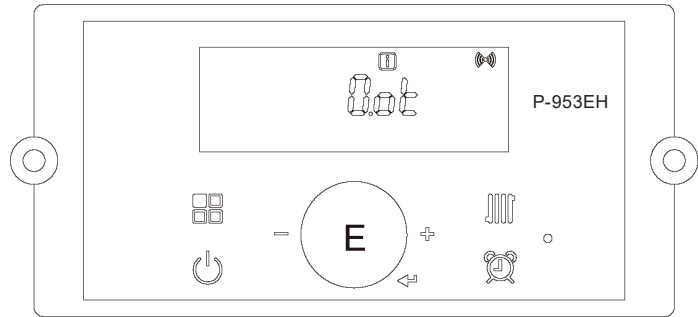
Default value for CH 1:Ht is 140°F (60°C). Factory set range is 130°F to 180°F (54°C - 82°C). This range can be adjusted per Installer Modes P6 and P7.
 If applicable, default value for CH 2:Lt is 140°F (60°C). Factory set range is 130°F to 180°F (54°C - 82°C). This range can be adjusted per Installer Modes P40 and P41.

Status Display Mode

To view any Status Parameter,

Press and Hold Button B  to get into the Status Display Mode.

Rotate Dial E until you find the Parameter that you wish to view. Tap Dial E to enter that Parameter as required. Press Dial E to save and to exit the Status Information Menu. To go to the Operation Screen, Press button B.



Digital Display		Status Display Parameter	Description	
O: ot		Outdoor temperature	Current outdoor sensor temperature	
A: In		0-10 V display	Current voltage of (0-10V input)	
b: tt	1: CH	CH target temperature	Current CH target temperature	
	2: dH	DHW target temperature	Current DHW target temperature	
	3: SY	SYSTEM target temperature	Current SYSTEM target temperature	
	4: Lt	LT/T target temperature	Current LT/T target temperature	
C: It		CH water return temperature	Current CH water return temperature	
d: Fr		Fan Speed (rpm)	Current Fan Speed (rpm)	
E: oP		CH supply temperature (Operating temperature)	Current heating temperature	
F: Eh		Exhaust gas temperature	Current exhaust gas temperature	
H: dH		Indirect DHW tank temperature * If a temperature sensor is not connected then it will display with 0°F (0°C).	Current DHW tank temperature	
L: rt	1: PH	Burner Operation Time	Time for supply power	Unit : 1000hour
	2: rh		Time for burner operation	Unit : 1hour
	3: rH		Time for burner operation	L: rt on display on sub menu Unit : 1,000hour
	4: It		Cycle for ignition	Cycle : 10 times the displayed unit
	5: IH		Cycle for ignition	Cycle : 10,000 times the displayed unit
	6: C2		Current accumulated count	Cycle : Increase by 1 at the time of operation above the ppm reference value (Display accumulative count / 10)
M: CC	SELF	Percentage of self units running.	Percentage of self units running.	
	ALL	Capacity for all operating cascade units	Percentage of all cascade units running. This screen shows the overall cascade power output. The range of this value of boilers communicating with the Master x 100. For example, if 4 boilers are connected and communicating, the maximum cascade power is 400% . Range: 0-100%	
	F1 - F14	Capacity for individual boilers	Percentage of each cascade units running. Ex. F1, F2, ...	
N: st		System Temperature (cascade mode) * If system temperature sensor is not connected then it will display with 0°F (0°C).	Current System Temperature (cascade mode)	
O: Lt		L-TT Temperature (L-TT mode)	Current LT/T target temperature (L-TT mode)	
P: FM		Volt Flame Current Volt	Current Volt Flame Current Volt	
r: AP		APS Volt Current air pressure sensor Volt	Current air pressure sensor Volt	
S: C2		Flue Gas Recirc Current sensor ppm	Current flue gas recirc (FGR) sensor ppm Ex. Ppm = 6000 Marked as 600	

