PARAMETER GUIDE

95M-200

GAS-FIRED DIRECT VENT MODULATING HOT WATER BOILER

⚠ WARNING

Revise boiler control parameters only if you fully understand the purpose and result of the changes and on the advice of Technical Support. Tampering without understanding the control settings in this manual will void the warranty and can result in unreliable operation, with possible severe personal injury, death, or substantial property damage.

⚠ WARNING

This document must only be used by a qualified heating installer or service technician. Read all instructions, including the Installation Manual (P/N# 240006103), the Control Manual and Operating Instructions (P/N# 240006104), the User's Information Manual (P/N# 240006106), and this Parameter Guide before attempting to program the control, and be sure to perform all steps in the order specified. Failure to comply could result in severe personal injury, death, or substantial property damage.

IMPORTANT: Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S. installations or CSA B149.1 or B149.2 for Canadian installations.

DO NOT DESTROY THESE INSTRUCTIONS!!

Please read carefully and keep in a safe place for future reference.

P/N 240006105, Rev. B [06/08]

PARAMETER GUIDE
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TABLE OF CONTENTS

Keep this manual near boiler and retain for future reference.

I - SAFETY SYMBOLS AND WARNINGS

The following defined symbols are used throughout this manual to notify the reader of potential hazards of varying risk levels.

⚠ DANGER

Indicates an *imminently* hazardous situation which, if not avoided, *will* result in death, serious injury or substantial property damage.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death, serious injury or substantial property damage.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or property damage.

IMPORTANT: Read the following instructions completely before installing!!

II - OVERVIEW OF CONTROL PARAMETERS

BOILER CONTROL PARAMETERS

This manual includes detailed explanations of the adjustable parameters. See Section III, *"Parameter Explanations,"* for more information.

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DEFAULT PARAMETER SETTINGS

1. The "Default Parameter Settings" table on the next page lists the factory default settings for this boiler at standard altitudes (up to 2000 feet). When in doubt, always restore parameters to the default settings listed.

WHEN TO CHANGE PARAMETERS

1. Factory default settings will work for most applications. There are situations, however, for which changes are desirable or even mandatory (ex: multiple boiler applications using the Honeywell AM (HAM) module).
2. Default boiler settings are satisfactory for most high-mass systems (radiant slab, cast iron radiators, most finned-tube radiation).

TYPICAL PARAMETER CHANGES

Outdoor Reset Applications: Outdoor reset operation can sometimes be improved by adjusting parameters 4, 5, 6, and 7. Parameters 9, 10, and 11 might also be modified. See "Parameter Explanations" for more information on outdoor reset.

High Altitude Installations: To ensure proper operation parameter 17 must be set to 3,200 RPM in all installations at or above elevations of 2,000 feet. Failure to do so could result in potential for severe personal injury, death or substantial property damage.

Refer to Section IV of this manual for instructions on how to change parameters.

Fan Coil Systems: Systems using fan coil units respond to heat input rapidly, and may require larger differential settings (parameters 22 - 25) for best performance. (See "Parameter Explanations" for more information on control differential and how to adjust.)

High-mass Systems: High-mass systems, such as in-slab radiant and cast iron radiator systems, respond slowly to heat input. The factory default settings will work well for most of these applications.

DO NOT CHANGE THE FOLLOWING

⚠ WARNING

Failure to comply with the following could cause equipment performance problems, resulting in potential severe personal injury, death, or substantial property damage.

- Parameter 2: Do not set for continuous DHW pump.
- Parameters 13 and 15: Do not set higher than values in the "Default Parameter Settings" Table on the next page.
- Parameters 17 and 19: Do not set lower than values in the "Default Parameter Settings" Table on the next page.
- Parameters 24, 25, 26, and 27: Do not change from default settings.
- Parameter 32: Do not change from value of 0.
- Parameter 33: Leave setting at 30° F for storage tank DW applications.
- Parameter 34 (First Digit): Do not change from value of 0.
- Parameter 34 (Second Digit): Set only at 0 (2nd CH circuit off) unless using a Honeywell AM module. With HAM, set second digit to 4 (0 - 10 V analog on HAM capacity).
- Parameter 35 (Both Digits): Do not change either digit from default setting.
- Parameters 37, 39, 40, and 41: Do not change. For future use only.
- Parameter 42 (First Digit): Do not change from default value.

DEFAULT REV C PARAMETER SETTINGS ON GASCOM SOFTWARE AND BOILER DISPLAY

DO NOT CHANGE ANY PARAMETER UNLESS THE APPLICATION REQUIRES SPECIAL SETTINGS.

	PARAMETER/DESCRIPTION	GASCOM	DISPLAY
1	T3 Set DHW	150°F	150
2	DHW System	On	01
3	CH System	On	01
4	T1 Top CH-Mode	180°F	180
5	T1 Foot CH-Mode	120°F	120
6	T4 Minimum	0°F	00
7	T4 Maximum	60°F	60
8	T4 Frost Protection	-20°F	-20
9	T4 Correction	0°F	00
10	T Blocking	60°F	60
11	Booster Time	30 Minutes	30
12	T Parallel Shift	10°F	10
13	Maximum Fan Speed CH	6000 rpm	60
15	Maximum Fan Speed DHW	6000 rpm	60
17	Minimum Fan Speed	2250 rpm	22
19	Ignition Fan Speed	3500 rpm	35
20	CH Postpump Time	0 Minutes	00
21	DHW Postpump Time	30.6 Seconds	03
22	CH Modulation Hysteresis On	4°F	04
23	CH Modulation Hysteresis Off	4°F	04
24	DHW Modulation Hysteresis On	4°F	04
25	DHW Modulation Hysteresis Off	4°F	04
26	DHW Detection Hysteresis On	4°F	04
27	DHW Detection Hysteresis Off	4°F	04
28	CH Blocking Time	10.2 Seconds	01
29	DHW Blocking Time	10.2 Seconds	01
30	DHW -> CH Blocking Time	30.6 Seconds	03
31	Modulate Back Difference T1 - T2	50°F	50
32	RMCI Address	-01	-01
33	T Plus: Setvalue Additional For DHW	30°F	30
34	2nd CH-Circuit (1st Digit)	2nd CH-Circuit Off	00
34	CH Type (2nd Digit)	Room Thermostat	00
35	DHW 3-Way Valve/Pump (1st Digit)	Hot Water Pump	13
35	DHW Type (2nd Digit)	Storage Tank w/out Tank Sensor (NTC3)	13
36	Manual Fan Speed	Negative 1%	-01
37	PWM-Pump Level (1st Digit)	3	31
37	PWM-Pump Level (2nd Digit)	1	31
38	T Set Hold Boiler Warm	40°F	40
39	T Top For 2nd CH Circuit	70°F	70
40	T Foot for 2nd CH Circuit	50°F	50
41	T Hysteresis For 2nd CH Circuit	20°F	20
42	Pump Settings For CH & DHW	00	21
42	Minimum Off Cycle	Not Active	21

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OUTDOOR RESET OPERATION

Outdoor reset adjusts the supply water temperature so the heat output from the heating units matches the heat loss as the outdoor temperature changes. The colder the outdoor temperature, the warmer the water temperature, and vice versa.

The closer the heating unit output matches the heat loss, the less the swing in the indoor temperature. You can adjust control parameters to do this as shown below.

OUTDOOR RESET TERMINOLOGY

- **Outdoor Design Temperature (ODT):** Outdoor Design Temperature for the area, used to calculate heat loss. *(Use this value for T4 minimum.)*
- **Balance Point Temperature:** Outside temperature at which building heat loss equals building heat gain from solar and internal sources. At this temperature, no space heating is required. *(Use this value for T4 maximum.)*
- **Automatic Temperature Boost:** Compensates for required pick-up times and variations in heating load requirements by automatically increasing set point temperature when a call for heat exceeds a specified time *(Parameter 11)*.

Parameters 4, 5, 6 & 7 (Outdoor reset)

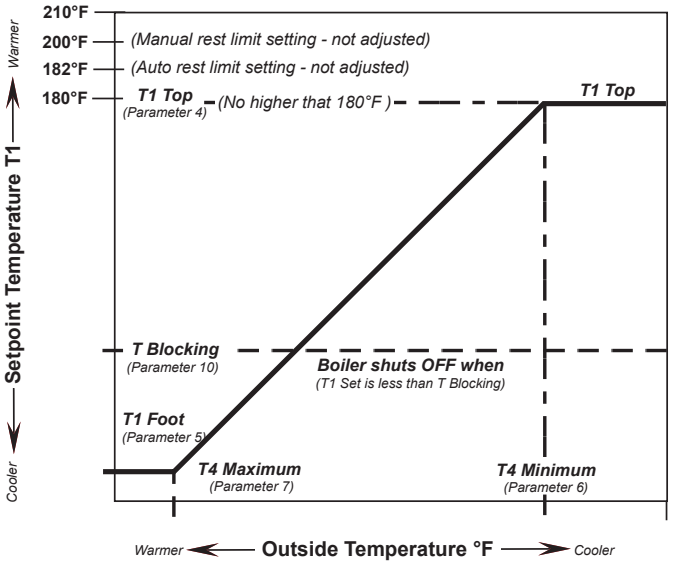
- **Fixed Temperature Operation:** If boiler is operated with constant outlet temperature (no outside temperature sensor installed), set Parameter 4 as described in this manual.
- **Outdoor Reset Operation:** Parameters 4 to 7 determine the reset curve, as shown in ***Figure #1***.
- T1 is the boiler outlet water temperature. T4 is the outside temperature.

T1 Top (Parameter 4) is the outlet water temperature the boiler tries to maintain whenever the outside tem-

Figure #1

CONTROL MODULE PARAMETERS AND OUTDOOR RESET CURVE

Outdoor Reset Example A



PARAMETER DETAILS

PARAMETER NUMBER	PARAMETER NAME	FACTORY SETTING	ADJUSTMENT RANGE
4	*T1 Top*	180°F	68 - 182°F
5	*T1 Foot*	120°F	60 - 140°F
6	*T4 Minimum*	0°F	-4 - 50°F
7	*T4 Maximum*	60°F	60 - 78°F
10	*T Blocking*	60°F	32 - 140°F (or "32" for Off)

perature is less than T4 Minimum (Parameter 6).

T1 Foot (Parameter 5) is the outlet water temperature the boiler tries to maintain whenever the outside temperature is higher than T4 Maximum (Parameter 7).

When outside temperature is between T4 Maximum and T4 Minimum, the control calculates a value for T1 Setpoint (T1 Set) between T1 Foot and T4 Top.

- The boiler may not operate all the way down to T1 foot. Parameter 10 (T Blocking) sets a minimum operating outlet water temperature. If the calculated setpoint, T1 set, is less than T blocking, the boiler shuts off.
- Set Parameters 4 to 7 as needed for the desired reset curve. Make sure to set parameters 4 and 6 so the outlet water temperature is at design water temperature when outside temperature drops to the ODT (outdoor design temperature).

Parameter 9 (T4 correction)

- Location of the outdoor sensor may sometimes cause the sensor to incorrectly detect outside temperature.
- You can set Parameter 9 to correct for this difference (up to 9° F more or less) if you believe boiler response needs to be improved. Set a negative number to reduce the outdoor temperature reading, a positive number to increase the reading.

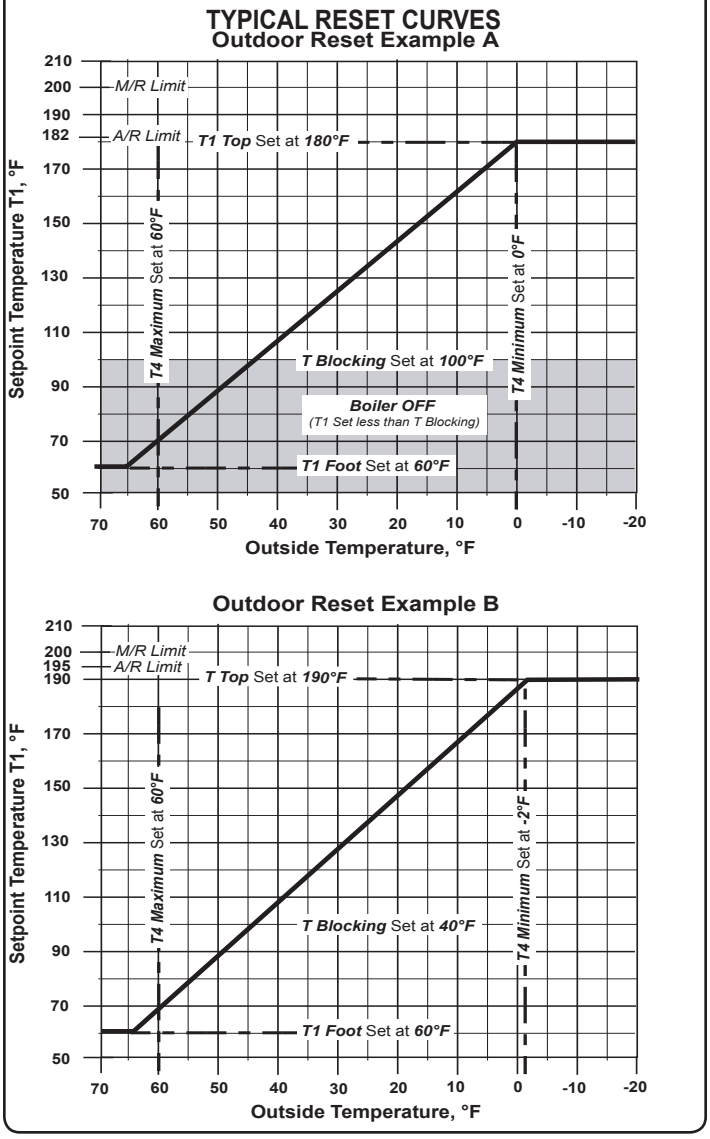
Parameter 10 (T blocking)

- Use this parameter to set a minimum operating boiler outlet water set point temperature.
- When calculated set point temperature, T set, is at or below T blocking the boiler shuts down (after operating a post pump cycle).
- To deactivate this parameter, set the value to 32.

Suggested outdoor reset settings

- T1 Top: Set to the required supply water temperature when outdoor temperature is at or below ODT .
- T1 Foot: Set so the drop in supply water temperature results in the best match of heating unit output to heat loss as the outdoor temperature rises.
- T4 Maximum: Set to the balance point temperature for the building (typically 65° F or lower).
- T4 Minimum: Set to ODT.

Figure #2



AUTOMATIC TEMPERATURE BOOST

- If the target temperature happens to be too low for the heating units to supply sufficient heat within fifteen minutes (default setting), the control “boosts” the target temperature until the supply water meets the system’s needs.
- Even if the reset parameters are optimized for the application, use of setback thermostats or the need for occasional cold start operation will require faster recovery than provided by the normal calculated supply water temperature because the curve assumes steady-state operation.
- Boost will not call for supply water temperature setpoint

greater than the value of Parameter 4 (T1 Top). There is no concern that temperature boost would supply water too hot for low-temperature systems, such as slab-type radiant heating. On hybrid systems, with finned tube radiation and radiant slab, provide additional low temperature protection for the radiant portion of the system, because Parameter 4 (T1 Top) is likely to be set higher than on a radiant-only system.

IMPORTANT: Many slab-type radiant systems won't require boost. This function can be disabled with a parameter 11 setting of "0."

Boost operation

1. In outdoor reset operation (outdoor sensor connected), the boiler control automatically increases the target outlet water temperature if a call for heat exceeds a time equal to Parameter 11 (factory default of 30 minutes).
2. At each interval of Parameter 11 of a continuous call for heat, the control module increases the target temperature by 18° F. See **Figure #3**.
3. The control module will continue increasing target temperature until it reaches the value set in Parameter 4 (T1 Top).
4. When the call for heat ends while target temperature is "boosted," the target temperature drops about 2° F for each minute the thermostat is open.
5. Range: 1-30 minutes.
6. Factory Default: 30 minutes.
7. Deactivate automatic temperature boost by setting to "0."

MAXIMUM FAN SPEED

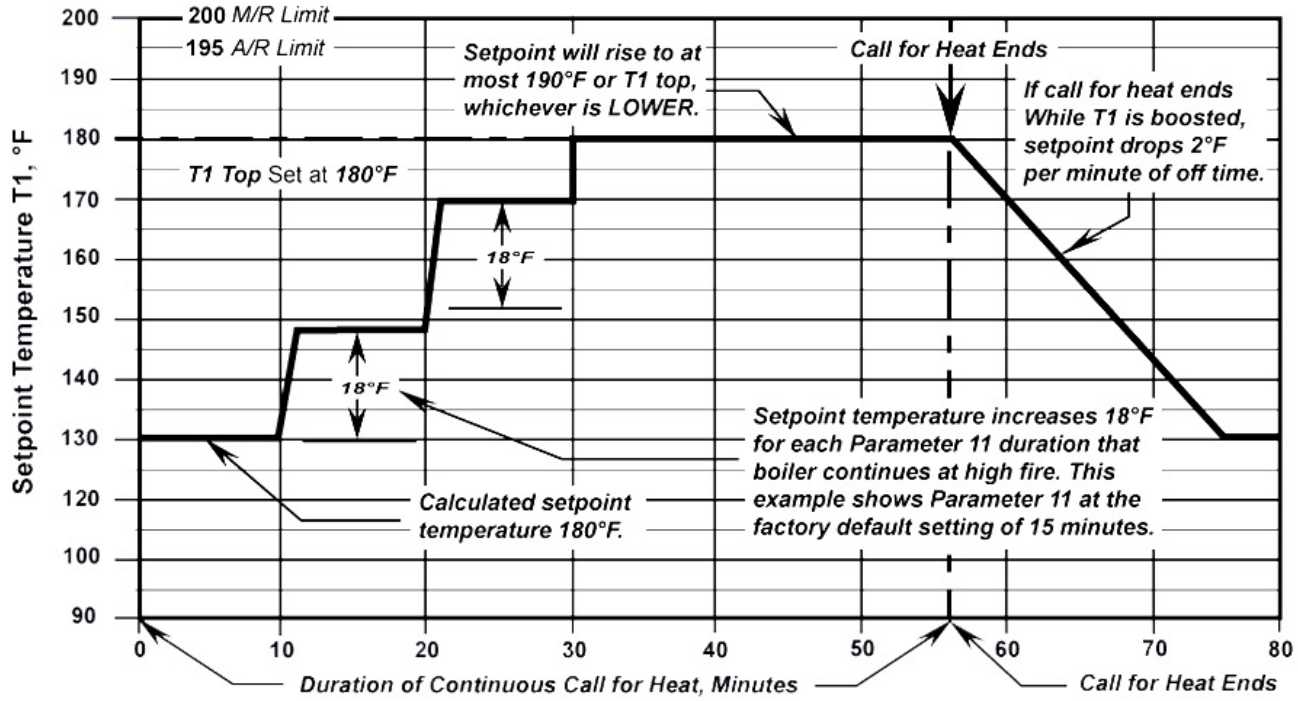
⚠ WARNING

Fan speed must be set within the limits supplied by the factory (See the *"Default Parameters Table"* in Section II*).* Setting limits above or below these factory defaults would increase or decrease boiler firing rate beyond the acceptable limit, resulting in potential for severe personal injury, death, or substantial property damage.

- Parameters 13 and 15 can be set to limit the maximum boiler firing rate. Boiler firing rate is proportional to the fan speed, so reducing the maximum fan speed reduces maximum input.
- Reducing maximum fan speed will be helpful for systems on which the boiler is oversized for either space heating or DHW, or both.
- Maximum fan speed can be set separately for space

Figure #3

PARAMETER 11 *(Automatic Supply Temperature Booster Operation)*



Temperature Boost Operation *(Typical)*: In this example, the boiler is operating in outdoor reset mode with a calculated setpoint temperature of 130°F. The call for heat has lasted more than 10 minutes (value of Parameter 11) and supply temperature boost has occured.

heating and DHW using Parameters 13 and 15.

Parameter 13 (space heating max. fan speed):

- Acceptable Range for Natural Gas and LP: 2250 to 6000 rpm (22 to 60 on boiler display).

NOTE: Boiler display shows fan speed in hundreds of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.

- Factory Defaults: See the "Default Parameters Table" in Section II of this manual.
- If the boiler is oversized for space heating, you can reduce the maximum fan speed during space heating operation (Parameter 13) to limit the maximum boiler input.

Parameter 15: DHW max fan speed

- Acceptable Range for Natural Gas and LP: 2250 to 6000 rpm (22 to 60 on boiler display).

NOTE: Boiler display shows fan speed in hundreds of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.

- Factory Defaults: See the "Default Parameters Table" in Section II of this manual.
- If the boiler is oversized for domestic water heating, you can reduce the maximum fan speed during DHW operation (Parameter 15) to limit the maximum boiler input.

MINIMUM FAN SPEED (PARAMETER 17)

⚠ WARNING

The fan speed must not be set below the value as supplied from the factory (see the *"Default Parameters Table"* in Section II). This would reduce boiler firing rate below the acceptable limit, resulting in potential for severe personal injury, death, or substantial property damage.

PARAMETER 17 sets the minimum fan speed. Boiler firing rate is proportional to fan speed, so increasing the minimum fan speed increases the minimum firing rate *(low fire).*

Parameter 17 sets the minimum fan speed for both DHW and space heating modes. ***Set parameter 17 to 3,200 for altitudes above 2,000 ft.***

- Acceptable Range for Natural Gas and LP: 2250 rpm (22 on boiler display).

NOTE: Boiler display shows fan speed in hundreds of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.

- Factory Defaults: See the "Default Parameters Table" in Section II of this manual.

BOILER FIRING RATE VS. RPM

% Rate	BTUH	RPM	Boiler Display
40	80,000	2250	22
50	100,000	3250	32
60	120,000	3800	38
70	140,000	4400	44
80	160,000	4750	47
90	180,000	5250	52
100	200,000	6000	60

NOTE: Results may vary depending on altitude of installation, gas calorific value, and vent length.

IGNITION FAN SPEED (PARAMETER 19)

⚠ WARNING

The fan speed must not be set BELOW the value as supplied from the factory (see the "Default Parameters Table" in Section II). This would reduce boiler firing rate below the acceptable limit, resulting in potential for severe personal injury, death, or substantial property damage.

- Parameter 19 sets the fan speed during ignition. Boiler firing rate is proportional to fan speed, so increasing the minimum fan speed increases the minimum firing rate (low fire).

IMPORTANT: Parameter 19 should only be changed where required for high altitude applications.

- Acceptable Range for Natural Gas and LP: 3000 to 3600 rpm (30 to 36 on boiler display).

NOTE: Boiler display shows fan speed in hundreds of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.

- Factory Defaults: See the "Default Parameters Table" in Section II of this manual.

DIFFERENTIAL (HYSTERESIS) SETTINGS

⚠ WARNING

Do not change the differentials (hysteresis) for domestic hot water operation (Parameters 24, 25, 26, and 27). Always use only the factory default settings for these parameters.

Space heating differentials (parameters 22 and 23)

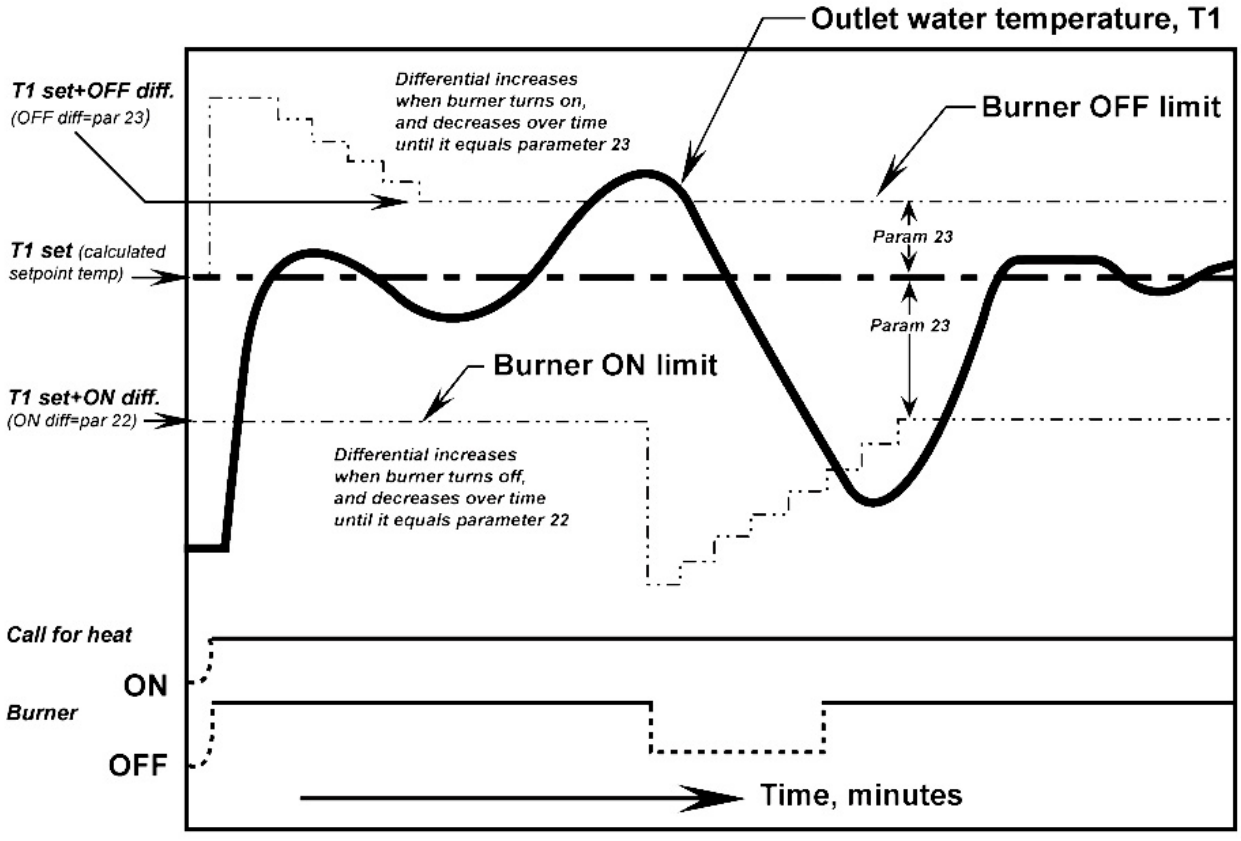
- The term “differential” is also referred to as “hysteresis.”
- Parameter 22 is the “On” differential. The water temperature must be at least Parameter 22 less than the calculated setpoint temperature for the boiler to turn on.
- Parameter 23 is the “Off” differential. When the boiler is firing, the water temperature must rise at least Parameter 23 above the calculated setpoint temperature for the boiler to turn off.
- See Figure #4 for an explanation of the “On” and “Off” differentials of the boiler control. Note that the differentials are greater when a heat call starts or stops, as shown. The differentials decrease with time until they equal Parameters 22 and 23.

Setting “OFF” differential (parameter 23)

- The factory default setting for Parameter 23 is 4° F. This works well for most applications.
- For low mass systems (fan coil), performance can be improved by increasing Parameter 23. This compensates for the quicker system temperature response of low-mass systems.
- When setting Parameter 23, make sure that Parameter 23 plus Parameter 4 is not over 193° F to avoid possible nuisance lockouts.

Figure #4

PARAMETERS 22 AND 23 (SPACE HEATING ON AND OFF DIFFERENTIALS *(Hysteresis)*)

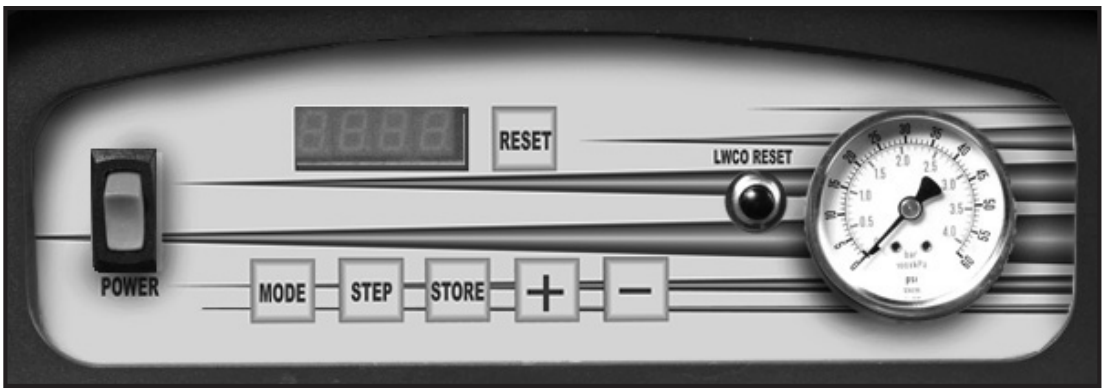


IV- HOW TO SET PARAMETERS

BOILER DISPLAY

Using the six buttons on the front of the boiler *(below)* and the proper code, the boiler can be both monitored and modified using the digital display.

Perform the following steps with the boiler powered on and in standby **[STBY]** mode:



1. Press and hold the “STEP” button.
2. While holding the “STEP” button down, press and hold the “MODE” button.
3. Hold both buttons down together for several seconds until [CODE] appears on the display.
4. Release “STEP” and “MODE” buttons. [Code] will stay lit on on the display.

NOTE: If [CODE] is not displayed after several seconds, release “STEP” and “MODE” buttons and press “MODE” several times to return display to [STBY]. Then repeat step 2 again.

5. Press the “STEP” button once. Display will show “C” and a random number.
6. Adjust the number displayed to [C-05] by using the “+” and “-” buttons.
7. Press the “STORE” button.

IMPORTANT: The boiler control will automatically exit [CODE] mode after 10 minutes of no activity.

8. Press the “MODE” button several times until [PARA] is displayed.
9. Press the “STEP” button several times until [P-XX] is displayed. The XX represents the parameter that will be changed. The parameter’s value will then be displayed.

Note: for parameter 1-4 display will read “1.”, then the parameter setting.

10. Use the “+” or “-” buttons to set the desired value.
11. Press the “STORE” button. Steps 9-11 can now be repeated for additional parameter changes or continue to step 12 to exit.

IMPORTANT: Store <u>MUST</u> be pressed after <u>EVERY</u> parameter change. The change is accepted if the display blinks twice.

12. Press the “RESET” button to exit.

IMPORTANT: After making changes to parameters, record the changes made on the last page of this manual and leave a copy with the boiler for future reference.

V - PARAMETER REFERENCE TABLE

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
1	T3 Set	Storage DHW: 68° to 158°F Instantaneous DHW: 104° to 150°	68 to 158 104 to 150	1	Setting			• T3 is the DHW temperature by an immersion sensor. • DO NOT CHANGE this parameter from the factory setting. (Boiler outlet water temperature setpoint in DHW mode is determined by adding Parameter 1 to Parameter 33.) • If applied for instantaneous DHW operation (not recommended), set Parameter 35 for the correct configuration.
2	DHW System	DHW OFF	0	2	Blank	Blank	Value	• Parameter 2 determines whether DHW heating is activated. The boiler will not operate in DHW mode if this parameter is set to “0” or “3”. • **WARNING-** It is not recommended to set this parameter to either “2” or “3” (continuous DHW pump). This could result in a hazardous condition, because it causes constant circulation between the boiler and the DHW heater.
		DHW ON	1					
		DHW OFF + pump constant	2					
		DHW ON + pump constant	3					
3	CH System	CH OFF	0	3	Blank	Blank	Value	• Parameter 3 determines whether the boiler will operate in central heating mode. • Select “1” to cycle the boiler circulator on central heating calls. • Select “2” or “3” to maintain constant boiler circulation operation.
		CH ON	1					
		CH OFF + boiler pump constant	2					
		CH ON + boiler pump constant	3					
4	T1 Top	120° to 194°F	68 TO 182	4	Setting			• Constant Boiler Temperature operation (outside sensor not connected): T1 Top is the target outlet water temperature at all times. • Outside reset (outside sensor connected): T1 Top is the maximum water temperature based on outdoor air temperature.
5	T1 Foot	60° to 140°F	60 to 140	Initial reading:				• T1 Foot applies only in outdoor reset operation.
				P	.	0	5	
				After 2 to 3 seconds:				• T1 Foot is the minimum target temperature for all outside temperatures.
				Blank	Setting			
6	T4 Minimum	-4° to 50°	-4 to 50	Initial reading:				• T4 Minimum applies only in outdoor reset operation. • T4 Minimum is the outside temperature at which the target outlet water temperature is at maximum.
				P	.	0	6	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
7	T4 Maximum	60° to 78°F	60 to 78	Initial reading:				• T4 Maximum applies only in outdoor reset operation • T4 Maximum is the outside temperature at which the target outlet water temperature is at minimum.
				P	.	0	7	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		

V - PARAMETER REFERENCE TABLE *Continued*

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
8	T4 Frost Protection	-22° to 50°F	-22 to 50	Initial reading:				When outside temperature drops to this number, the boiler circulator will run constantly.
				P	.	0	8	
				After 2 to 3 seconds:				
				Blank	Setting			
9	T4 Correction	-8° to 10°F	-8 to10	Initial reading:				Use this parameter to modify the outside temperature reading if needed to correct for outside sensor location. Use only if sensor is providing a false reading.
				P	.	0	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
10	T Blocking	32° (off) 34° - 140°F	32 (off) 34 - 140	Initial reading:				When the target outlet water temperature is less than this setting, the boiler shuts off.
				P	.	1	0	
				After 2 to 3 seconds:				
				Blank	Setting			
11	Booster Time	0 (no booster) 1 to 30 (minutes)	0 to 30	Initial reading:				• If a call for heat causes the boiler to remain at high fire for a time equal to Parameter 11, the control module increases outlet water temperature setpoint by 18°F. For each additional Parameter 11 time the heat call continues, the set point is increased another 18°F (never exceeding Parameter 4 + Parameter 23 (hysteresis off))
				P	.	1	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		• To deactivate booster operation, set this parameter to 0.
12	T Parallel Shift	0 to 144°F	0 to 144	Initial reading:				• The value of Parameter 12 reduces the calculated setpoint temperature by the amount set when the call for heat is from outdoor temperature.
				P	.	1	2	
				After 2 to 3 seconds:				• We recommend not changing this parameter from the factory default of 0 (no parallel shift).
				Blank	Setting			
13	Maximum fan speed CH	2250 to 6000	22 to 60 (100's of rpm)	Initial reading:				• Use this parameter to change the maximum boiler input for central heating (CH). Never above default value .
				P	.	1	3	• When in central heating mode, the boiler fan speed will not exceed this setting. Increasing fan speed increases boiler input; decreasing fan speed decreases boiler input.
				After 2 to 3 seconds:				• Never set below low fire setting or above maximum value shown at left.
				Blank	Setting			
15	Maximum fan speed DHW	2250 to 6000	22 to 60 (100's of rpm)	Initial reading:				• Use this parameter to change the maximum boiler input for domestic water heating (DHW)-NEVER above default value.
				P	.	1	5	• Boiler fan speed will not exceed this setting in DHW mode. Increasing fan speed increases boiler input; decreasing fan speed increases fan speed decreases input.
				After 2 to 3 seconds:				
				Blank	Blank	Setting		•NEVER set below low fire setting or above the maximum value shown at left.

V - PARAMETER REFERENCE TABLE *Continued*

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
17	Minimum fan speed DHW	2250 to 6000	22 to 60 (100's of rpm)	Initial reading:				• Use this parameter to increase the minimum input of the boiler. Increasing fan speed increases boiler input; decreasing fan speed decreases input. • NEVER set outside values shown at left.
				P	.	1	7	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
19	Ignition fan speed	3000 to 3600	30 to 36 (100's of rpm)	Initial reading:				• Use this parameter to increase the minimum input of the boiler during ignition. • Increasing fan speed increases boiler input; decreasing fan speed decreases input. • SET ONLY at recommended (default) values.
				P	.	1	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
20	Postpump time CH	0 (10 seconds) 1 to 99 (minutes)	0 to 99	Initial reading:				Parameter 20 is the length of time the boiler circulator continues to operate after completing a central heating cycle.
				P	.	2	0	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
21	Postpump time DHW	0 to 306 seconds	0 to 30 (times 10.2 seconds)	Initial reading:				Parameter 21 is the length of time the boiler circulator continues to operate after completing a DHW cycle.
				P	.	2	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
22	CH Modulation differential ON	0 to 36°F	0 to 36	Initial reading:				• Differential may also be referred to as "hysteresis" •This is the temperature the boiler water must drop below setpoint temperature to turn the boiler on.
				P	.	2	2	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
23	CH Modulation differential OFF	0 to 18°F	0 to 18	Initial reading:				• Differential may also be referred to as "hysteresis" • This is the temperature the boiler water must not must rise above setpoint temperature to turn the boiler off. • As outlet temperature increases, the control module reduces boiler input. If temperature continues to rise with boiler with minimum input, the boiler will shut down when the temperature reaches setpoint temperature plus Parameter 23.
				P	.	2	3	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
24	DHW Modulation differential ON	-2° to 54°F	-2 to 54	Initial reading:				• Differential may also be referred to as "hysteresis" • This is the temperature boiler water must drop below setpoint temperature to turn the boiler on. Boiler outlet water setpoint temperature is 180°F during DHW mode.)
				P	.	2	4	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
25	DHW Modulation differential OFF	-6° to 54°F	-6 to 54	Initial reading:				• Differential may also be referred to as "hysteresis" • This is the temperature boiler water must rise above setpoint temperature to turn the boiler off. (As outlet temp. increases, the control module reduces boiler input. If temperature continues to rise with boiler at minimum input, the boiler will shut down when the temperature reaches setpoint temperature plus Parameter 23.)
				P	.	2	5	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		

V - PARAMETER REFERENCE TABLE *Continued*

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
26	DHW detection differential ON	-2° to 54°F	-2 to 54	Initial reading:				• Differential may also be referred to as “hysteresis” • This parameter has no effect unless a DHW sensor is used - not recommended (use an aquastat instead). • This is the temperature the DHW water must drop below DHW setpoint temperature to turn the boiler on.
				P	.	2	6	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
27	DHW detection differential OFF	-2° to 54°F	-2 to 54	Initial reading:				• Differential may also be referred to as “hysteresis” • This parameter has no effect unless a DHW sensor is used - not recommended (use an aquastat instead). • This is the temperature the DHW water must rise above DHW setpoint temperature to turn the boiler off.
				P	.	2	7	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
28	Blocking time CH	0 to 306 seconds	0 to 30 (times 10.2 seconds)	Initial reading:				Parameter 28 is the minimum time between consecutive central heating cycles. After a call for heat is satisfied, the boiler will remain off for at least the blocking time before starting another cycle.
				P	.	2	8	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
29	Blocking time DHW	0 to 306 seconds	0 to 30 (times 10.2 seconds)	Initial reading:				Parameter 29 is the minimum time between consecutive DHW heating cycles. After the DHW call for heat is satisfied the boiler will remain off for at least the blocking time before starting another DHW cycle.
				P	.	2	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
30	Blocking time DHW to CH	1 to 306 seconds	0 to 30 (times 10.2 seconds)	Initial reading:				Parameter 30 is the minimum wait time after a DHW call before the boiler will start on a call for central heating. If a DHW call is satisfied and a central heating call starts, the boiler will shut down and wait the blocking time before starting.
				P	.	3	0	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
31	T1 - T2 difference for modulating back	10° to 72°	10 to 72	Initial reading:				• If the difference between boiler outlet water temperature (T1) and return temperature (T2) is larger than parameter 31, the boiler is forced to low fire. • DO NOT set higher than factory defaults.
				P	.	3	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
32	RMCI address	-1 (RMCI off) 0 to 7 B87 (address)	-1 (RMCI off) 0 to 7 (address)	Initial reading:				DO NOT CHANGE this parameter. It is intended for use with an RMCI 1400 interface device, currently not available.
				P	.	3	2	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
33	T Plus (setvalue addition for DHW)	0° to 54°F	0 to 54	Initial reading:				• Parameter 33 sets the target boiler outlet water temperature in DHW mode. Add parameter 33 to parameter 1 to determine the target temperature • Factory default is 150°F for parameter 1 and 30° for parameter 33, for a total of 180°F as the DHW boiler outlet water temperature.
				P	.	3	3	
				After 2 to 3 seconds:				
				Blank	Setting			

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
34 (1st digit)	2nd CH circuit CH type	0 to 8 (see right)	0 to 8	Initial reading:				First digit (2nd circuit): • DO NOT CHANGE parameter 34 first digit. Second central heating circuit operation is not currently supported . • 0 (2nd CH circuit off) - No second CH circuit operation (LEAVE AS IS) • 1 (2nd CH circuit as slave) • 2 (2nd CH as master) • 3 (2nd CH circuit as slave, T set also by potmeter) - 2nd heating circuit as slave, with setpoint temperature with setpoint temperature determined by potentiometer. • 4 (2nd CH circuit as master, T set also by potmeter) - 2nd heating circuit as master, with setpoint temperature determined by potentiometer. • 5 (2nd CH circuit as slave, active during HW) 2nd heating circuit as slave, during DHW. • 6 (2nd CH circuit as slave, active during HW) - 2nd heating circuit as master, during DHW . • 7 (2nd Ch circuit as slave, T set also by potmeter, active during HW) - 2nd heating circuit as slave, during DHW, with setpoint temperature determined by potentiometer. • 8 (2nd CH circuit as master, T set also by potmeter, active during HW) - 2nd heating circuit as slave, during DHW, with set point temperature dtermined by potentiometer.
				P	.	3	4	
34 (2nd digit)	CH Type	0 to 6 (see right)	0 to 6	After 2 to 3 seconds:				Second Digit (CH Type): • 0 (room thermostat) - Central heating opertion controlled by room thermostat • 1 (outside temperature) - DO NOT SELECT - Central heating operation controlled by outside sensor (not currently supported) • 2 (0 - 10 V analog on MCBA: Capacity) - DO NOT SELECT - central heating boiler input controlled with 0 - 10 V input to control module (not currently supported) • 3 (0 - 10 v analog on MCBA: temperature) - DO NOT SELECT - Central heating boiler outlet temperature controlled with 0 - 10 vdc input to control module (Not currently supported) • 4 (0 to 10 V analog on HAM: capacity) - Select this value when using HAM module to interface with multiple boiler controller. See HAM instructions. • 5 (0 - 10 V analog on HAM temperature) - DO NOT SELECT - Central heating boiler outlet temperature controlled with 0 - 10 vdc input HAM module, but controls temperature setpoint. See HAM instructions. • 6 (+/- control) - DO NOT SELECT - Central heating mode controlled with +/- input to control module (not currently supported)
				Blank	Blank	Digit 1	Digit 2	

<table>
<tr><th rowspan="3">Para.</th><th rowspan="3">Name</th><th colspan="2">Range</th><th colspan="4">Boiler Display</th><th rowspan="3">Description</th></tr>
<tr><th rowspan="2">Gascom Software</th><th rowspan="2">Boiler Display</th><th colspan="4">Display Position</th></tr>
<tr><th>1st</th><th>2nd</th><th>3rd</th><th>4th</th></tr>
<tr><td rowspan="2">35
(1st digit)</td><td rowspan="2">3-Way Valve</td><td rowspan="2">0 to 2
(see right)</td><td rowspan="2">0 to 2</td><td colspan="4">Initial reading:</td><td rowspan="2">First digit (3-way valve):
• Control module readout: Initial reading - P.35 (indicates Parameter 35) after 2 to 3 second, change the parameter setting:
Position 1,2 = blank
Position 3 = Parameter 35 first digit (3 way valve or pump)
Position 4 = Parameter 35 second digit (DHW type)
• DO NOT CHANGE Parameter 35 first digit . 3 way valve operation is not currently supported.
• 0 (3 way valve normally open) - Switch to DHW from CH with normally open 3 way valve
• 1 (hot water pump) - Use DHW circulator in DHW mode
• 2 (3-way valve normally closed) - Switch to DHW from CH with normally closed 3 way valve</td></tr>
<tr><td>P</td><td>.</td><td>2</td><td>9</td></tr>
<tr><td rowspan="2">35
(2nd digit)</td><td rowspan="2">CH type</td><td rowspan="2">0 to 9 (see right)</td><td rowspan="2">0 to 9</td><td colspan="4">After 2 to 3 seconds:</td><td rowspan="2">Second digit (CH type):
• 0 (instant water heater with NTC3) - DO NOT SELECT - instantaneous water heater with sensor (not currently supported)
• 1 (instant water heater without NTC3) - DO NOT SELECT - Instantaneous water heater without sensor (not currently supported)
• 2 (storage tank with NTC3) - DO NOT SELECT- Storage tank with sensor (not currently supported)
• 3 (storage tank without NTC3) - DO NOT SELECT - Storage tank with aquastat
• 4 (instant water heater with NTC3 + anti-condensing) -
DO NOT SELECT - Instantaneous water heater with sensor; anticondensate mode (not currently supported)
• 5 (instantaneous water heater without NTC3 + anti condensing) - DO NOT SELECT - Instantaneous water heater without sensor; anticondensate mode (not currently supported)
• 6 (storage tank with NTC3 + anticondensing - DO NOT SELECT - Storage tank with sensor; anticondensate mode (not currently supported)
• 7 (storage tank without NTC3 + anticondensing) - DO NOT SELECT - Storage tank with aquastat; anticondensate mode (not currently supported)
• 8 (plate heater exchanger) - DO NOT SELECT - Plate heater exchanger (not currently supported)
• 9 (external heat request) - DO NOT SELECT - External heat request, from RMCI (not currently supported)</td></tr>
<tr><td>Blank</td><td>Blank</td><td>Digit 1</td><td>Digit 2</td></tr>
</table>

Para.	Name	Range		Boiler Display				Description
		Gascom Software	Boiler Display	Display Position				
				1st	2nd	3rd	4th	
36	Manual fan-speed	-1 (auto operation) 0 to 100 (%)	-1 (auto) 0 to 100 (%)	Initial reading:				Use this parameter, if desired, to manually set the boiler at a fixed input. The manual operation will only continue for 15 minutes. The control module then returns to automatic operation.
				P	.	3	6	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
37 (1st digit) 37 (2nd digit)	PWM level CH-pump	1 to 4 (pump speed)	1 to 4	Initial reading:				This function is not currently supported.
				P	.	3	7	
				After 2 to 3 seconds:				
				Blank	Blank	Digit 1	Digit 2	
38	T Hold	32 (feature off) 32 to 176° F	32 (feature off) 32 to 176	Initial reading:				Parameter 38 sets minimum standby temperature for boiler. If boiler outlet or return water temperature is sensed at less than T Hold, the boiler fires (without pump operating to bring temperature up to T Hold).
				P	.	3	7	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
39	T6 Top 2nd CH circuit	50 to 176° F	50 to 176	Initial reading:				• This function is not currently supported. • Sets max. target boiler temperature during call for heat from 2nd CH circuit (same function as T1 Top for first CH circuit).
				P	.	3	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
40	T6 Foot 2nd CH circuit	50 to 70° F	50 to 70	Initial reading:				• This function is not currently supported. • Sets min. target boiler temperature during call for heat from 2nd CH circuit (same function as T1 Foot for first CH circuit).
				P	.	4	0	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
41	T6 Differential 2nd CH circuit	2 to 54° F	2 to 54	Initial reading:				• This function is not currently supported. • T6 Differential is the differential (hysteresis) for call for heat from 2nd CH circuit is master. Boiler starts when outlet temperature drops T6 Differential below target outlet temperature.
				P	.	4	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
42 (1st digit) 42 (2nd digit)	Special pump CH/DHW Low/Off cycle	0, 1, 2, or 3 (see right) 0 (feature off) 1 (feature on)	0 to 3 0 or 1	Initial reading:				First digit (Special pump CH/DHW): • 0 - NOT RECOMMENDED Normal circulator operation for CH and DHW • 1 - NOT RECOMMENDED Boiler circulator off on CH call for heat. Normal circulator operation on DHW. • 2 - RECOMMENDED SETTING Boiler circulator normal operation. DHW circulator 5-second delay before starting. • 3 - NOT RECOMMENDED Boiler circulator off on CH call for heat. DHW circulator 5-second delay before starting. Second digit (Low/Off) cycle): • If boiler continues firing at low fire for 3 minutes or longer, the boiler will begin cycling like an on/off boiler, firing only at low fire, for cycle times of 10 minutes. • The boiler will return to normal (modulating) operation if the burner is either off or on for at least 9 minutes.
				P	.	4	2	
				After 2 to 3 seconds:				
				Blank	Blank	Digit 1	Digit 2	

VI - PARAMETER CHANGE RECORD

Parameter No. Changed	Original Value	New Value	Date of Change	Reason for Parameter Change