



# Ultra *Gas-fired water boiler*

## Control Addendum Ultra Interface Kit

**WARNING** Revise module parameters **ONLY** if you fully understand the purpose and result of the changes. Tampering with control settings 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/service technician. Read all instructions, including this Addendum, the Ultra Boiler Control Supplement and the Boiler Manual before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage.

**NOTICE** 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.

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## General

### Hazard definitions

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels or to important information concerning the life of the product.

**DANGER** Indicates presence of hazards that will cause severe personal injury, death or substantial property damage.

**WARNING** Indicates presence of hazards that can cause severe personal injury, death or substantial property damage.

**CAUTION** Indicates presence of hazards that will or can cause minor personal injury or property damage.

**NOTICE** Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

## Overview

### Ultra Control Module parameters

**NOTICE** See pages 13 to 27 for detailed information on all Ultra control module parameters.

### Parameter descriptions

1. This Addendum includes explanations of the adjustable parameters (pages 13 – 27).

**WARNING** Revise module parameters **ONLY** if you fully understand the purpose and result of the changes. Tampering with control settings can result in unreliable operation, with possible severe personal injury, death or substantial property damage.

2. You will find additional information on parameters and control operation in the Ultra Control Supplement.

### Default parameter settings

1. Table 1 lists the factory default settings for all Ultra models, for standard altitudes (up to 5,500 feet) and high altitude (over 5,500 feet).
2. When in doubt, always restore parameters to the default settings listed in Table 1 (page 5).
3. You can restore factory settings by loading the parameter file supplied on the Gascom disk to the Ultra control module as described in this Addendum.

### When to change parameters

1. Factory default settings will work for most applications. There are situations for which changes are desirable or even mandatory:
  - altitudes over 5500 feet.
  - multiple boiler applications using the AM4 module.
- 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

1. Outdoor reset operation can sometimes be improved by adjusting parameters 4, 5, 6 and 7. Parameters 9, 10 and 11 might also be modified.
2. See page 14 for discussion of outdoor reset.

#### High altitude installations

1. Minimum fan speed (parameter 17) and ignition fan speed (parameter 19) **MUST** be changed for operation at altitudes over 5,500 feet.
2. See the High Altitude Kit instructions for details. Change these parameters following the High Altitude instructions, or load the correct high altitude parameter file from the Ultra Interface Kit CD. If using Gascom software to revise the parameters, use **ONLY** the values given in Table 1.
3. Also see page 17 for further discussion of fan speed parameters.

### Fan-coil systems

1. Systems using fan coil units respond to heat input rapidly, and may require larger differential settings for best performance.
2. See page 18 for discussion of control differential and how to adjust.

### High-mass systems

1. 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 & 15

- DO NOT set higher than values in Table 1.

#### Parameters 17 & 19

- DO NOT set lower than the values in Table 1.

#### Parameters 24, 25, 26 & 27

- DO NOT change from default settings.

#### Parameter 32

- DO NOT change from value of 0.

#### Parameter 33

- Leave setting at 50°F for storage tank DHW 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 an AM-4. With AM-4, set second digit to 4 (0 - 10 V analog on AM-4: capacity).

#### Parameter 35 – both digits

- DO NOT change either digit from default setting.

#### Parameters 37, 39, 40 & 41

- DO NOT CHANGE — For future use only.

#### Parameter 42 – first digit

- DO NOT change from default value.

# How to set parameters (3 methods)

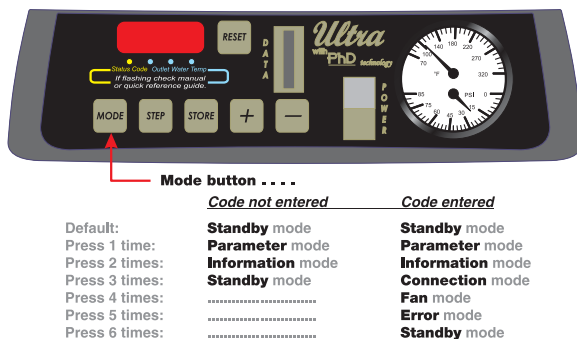
## METHOD 1 — Boiler display

With the six buttons on the front of the boiler and the proper code the boiler can be both monitored and modified using the digital display (Figure 1).

Perform the following steps with the boiler powered and in a standby condition.

1. On the boiler display in [STBY] mode
  2. Press and hold the **STEP** button. While holding the "Step" button press and hold the **MODE** button. Hold both buttons together for several seconds until "Code" is displayed. Release buttons. "Code" stays on the display.
  3. NOTE: If [CODE] is not displayed after several seconds release the buttons and press the **MODE** button several times to return to [STBY]. Repeat step two again.
  4. Press the **STEP** button once.
  5. Adjust the number displayed to [ 05 ] by using the **+** and **-** buttons.
  6. Press the "Store" button.
- NOTICE** The Ultra control module will automatically exit code mode after 10 minutes of no activity.
7. Press the mode button several times until [PARR] is displayed.
  8. 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.
  9. Use the **+** or **-** buttons to adjust to the desired value.
  10. Press the **STORE** button. Steps 8 through 10 can now be repeated for additional parameter changes. Or continue to step 11 to exit.
  11. Press the **MODE** button until [STBY] is displayed to exit.

Figure 1 Ultra boiler digital display



## METHOD 2 — Ultra Interface Kit

Using the Ultra Interface Kit and a Windows 95+ based computer with an available serial port.

### Contents of Ultra Interface Kit

1. GCI communication module with cables (Allows connection of a PC to the Ultra Control Module).
2. Gascom software (Provides Microsoft Windows user interface with Ultra Control Module).

### Computer requirements

1. PC computer with available serial port.
2. CD-ROM drive (to load software onto computer).
3. Microsoft Windows, version 95 or later.

### Purposes of the Interface Kit

1. Modify control parameters when necessary — Computer interface simplifies parameter change.
2. Monitor control operation — All boiler inputs can be viewed on-screen in both text mode and in real-time graphical display.
3. Troubleshoot boiler — Use Gascom software to download a log of error codes recorded by the Ultra Control Module.

### Using Gascom software

1. See procedures in this addendum.

### Using parameter files

1. The Gascom software disk contains parameter files for high altitude, AM4 applications, fan-coil systems and default boiler parameters.
2. See "Setting Parameters Using Gascom Software" for file listings and procedures.

## METHOD 3 — GMKEY device

1. (Not covered in this supplement) Using a GMKEY device that will flash a new set of parameters to the control. This method is currently reserved for Weil-McLain representatives. Only the first two methods of changing parameters are discussed in this document.

**NOTICE**

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

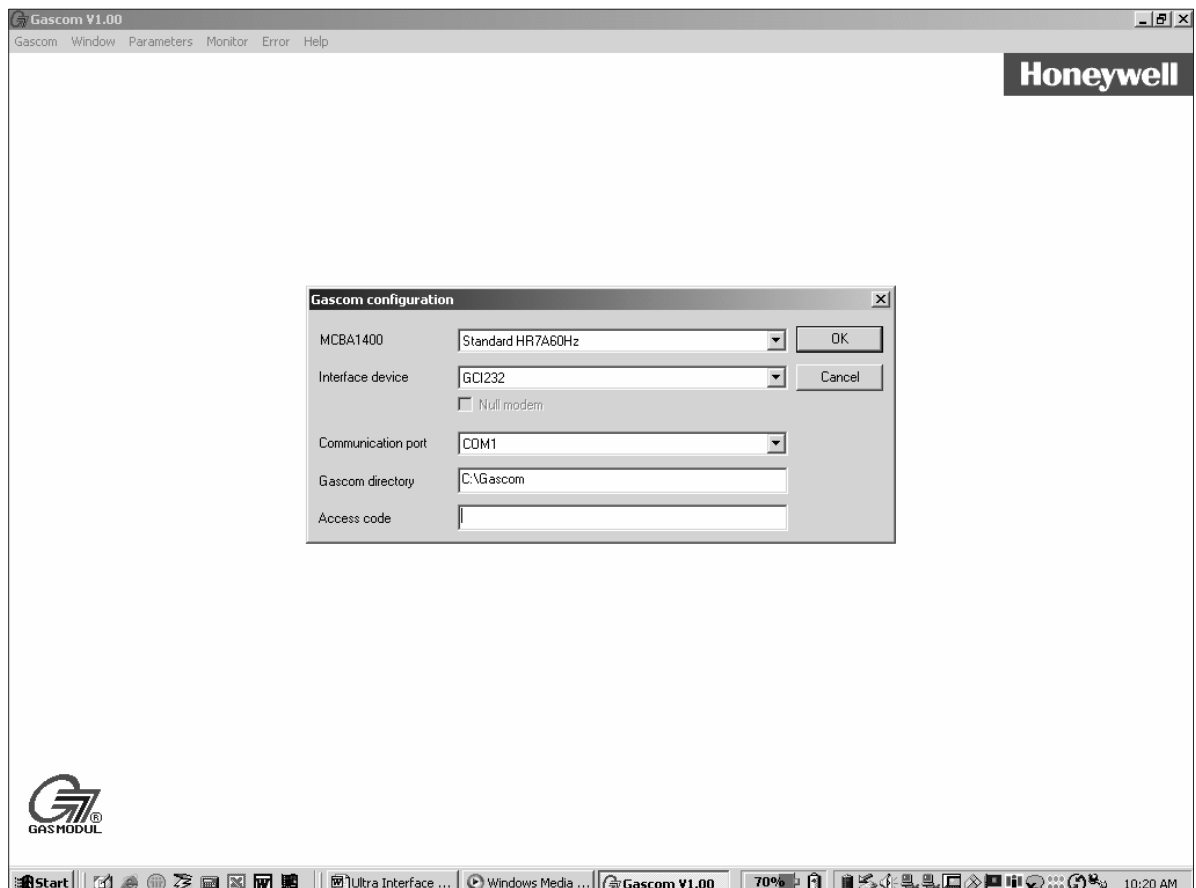
# Ultra GAS-FIRED WATER BOILER — CONTROL ADDENDUM — Ultra Interface Kit

**Table 1** Default parameter settings (as they appear in Gascom software and Boiler display) — **DO NOT** change any parameter unless the application requires special settings

Para. No.	Parameter description	Ultra-80 thru -230				Ultra-310 ONLY			
		Standard (to 5500 feet)		High altitude		Standard (to 5500 feet)		High altitude	
		Gascom software	Boiler display	Gascom software	Boiler display	Gascom software	Boiler display	Gascom software	Boiler display
1	T3set DHW	140 °F	140	140 °F	140	140 °F	140	140 °F	140
2	DHW System	On	1	On	1	On	1	On	1
3	CH System	On	1	On	1	On	1	On	1
4	T1 Top CH-mode	190 °F	190	190 °F	190	190 °F	190	190 °F	190
5	T1 Foot CH-mode	70 °F	70	70 °F	70	70 °F	70	70 °F	70
6	T4 minimum	32 °F	32	32 °F	32	32 °F	32	32 °F	32
7	T4 maximum	70 °F	70	70 °F	70	70 °F	70	70 °F	70
8	T4 frost protection	-22 °F	-22	-22 °F	-22	-22 °F	-22	-22 °F	-22
9	T4 correction	0 °F	0	0 °F	0	0 °F	0	0 °F	0
10	T blocking	70 °F	70	70 °F	70	70 °F	70	70 °F	70
11	Booster time	10 minutes	10	10 minutes	10	10 minutes	10	10 minutes	10
12	T parallel shift	0 °F	0	0 °F	0	0 °F	0	0 °F	0
13	Maximum fanspeed CH	5200 rpm	52	5200 rpm	52	5800 rpm	58	5800 rpm	58
15	Maximum fanspeed DHW	5200 rpm	52	5200 rpm	52	5800 rpm	58	5800 rpm	58
17	Minimum fanspeed	1300 rpm	13	2000 rpm	20	1400 rpm	14	2000 rpm	20
19	Ignition fanspeed	2700 rpm	27	3500 rpm	35	2300 rpm	23	3200 rpm	32
20	CH postpump time	0 minute	0	0 minute	0	0 minute	0	0 minute	0
21	DHW postpump time	30.6 seconds	03	30.6 seconds	03	30.6 seconds	03	30.6 seconds	03
22	CH modulation hysteresis on	8 °F	8	8 °F	8	8 °F	8	8 °F	8
23	CH modulation hysteresis off	4 °F	4	4 °F	4	4 °F	4	4 °F	4
24	DHW modulation hysteresis on	8 °F	8	8 °F	8	8 °F	8	8 °F	8
25	DHW modulation hysteresis off	4 °F	4	4 °F	4	4 °F	4	4 °F	4
26	DHW detection hysteresis on	8 °F	8	8 °F	8	8 °F	8	8 °F	8
27	DHW detection hysteresis off	8 °F	8	8 °F	8	8 °F	8	8 °F	8
28	CH blocking time	61.2 seconds	06	61.2 seconds	06	61.2 seconds	06	61.2 seconds	06
29	DHW blocking time	0 seconds	0	0 seconds	0	0 seconds	0	0 seconds	0
30	DHW -> CH blocking time	0 seconds	0	0 seconds	0	0 seconds	0	0 seconds	0
31	Modulate back difference T1 - T2	44 °F	44	44 °F	44	44 °F	44	44 °F	44
32	RMCI Address	0	0	0	0	0	0	0	0
33	Tplus: Setvalue additional for DHW	50 °F	50	50 °F	50	50 °F	50	50 °F	50
34	2nd CH-circuit (1st digit)	2nd CH-circuit off	00	2nd CH-circuit off	00	2nd CH-circuit off	00	2nd CH-circuit off	00
34	CH type (2nd digit)	room thermostat		room thermostat		room thermostat			
35	DHW 3wayvalve or pump (1st digit)	hot water pump	13	hot water pump	13	hot water pump	13	hot water pump	13
35	DHW-type (2nd digit)	storage tank without tank sensor (NTC3)		storage tank without tank sensor (NTC3)		storage tank without tank sensor (NTC3)			
36	Manual fanspeed	Negative 1%	-1	Negative 1%	-1	Negative 1%	-1	Negative 1%	-1
37	PWM-pump level (1st digit)	4	41	4	41	4	41	4	41
37	PWM-pump level (2nd digit)	1		1		1			
38	Tset hold boiler warm	32 °F	32	32 °F	32	32 °F	32	32 °F	32
39	Ttop for 2nd CH circuit	94 °F	94	94 °F	94	94 °F	94	94 °F	94
40	Tfoot for 2nd CH circuit	50 °F	50	50 °F	50	50 °F	50	50 °F	50
41	Thysterese for 2nd CH circuit	36 °F	36	36 °F	36	36 °F	36	36 °F	36
42	Pump settings for CH and DHW	2	21	2	21	2	21	2	21
42	Minimum Off Cycle	active		active		active			

## Installing Gascom software on your computer

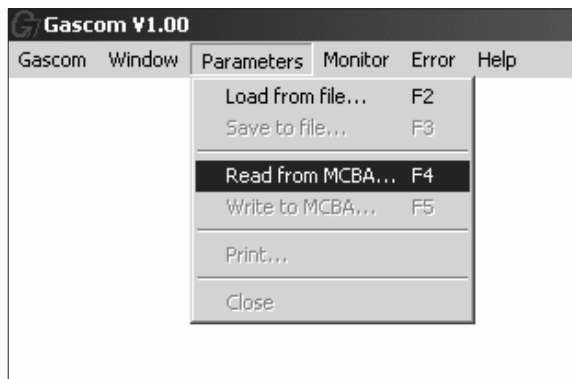
1. In order to run the Gascom it must be installed from the supplied software CD. Insert the CD into the CD-Rom drive and open it through “My Computer.” Copy the “Gascom” file folder over to a directory on your computer’s hard drive. (Write down where you put this folder for future configuration.)
2. Once you have copied the folder, navigate to it on your hard drive using “My Computer” or “Windows Explorer”. Locate the file named “gascom.exe”. Create a shortcut on the desktop to this file by clicking on it and holding the right mouse button and dragging it to the desktop. Release the mouse button and choose “Create Shortcut(s) here”. This shortcut will now be used to open the Gascom program.
3. Close all windows and use the newly created shortcut to open the Gascom program. Once Gascom is open for the first time you must configure it to work properly on your computer and with the Ultra boiler.
4. Choose “Gascom” from the menu bar and then “configuration.” A dialog box will open as shown below.
5. From the first dropdown box choose “Standard HR7A60Hz” for the MCBA1400 type. Choose from the second dropdown box “GCI232” for the Interface device. The choice for the Communication port depends on the computer being used. Choose the available serial port that you will connect the GCI Interface module to. If you do not know the name of the serial port that you will be using you can often find it using trial and error. The “Gascom directory” is the location on your computer where the Gascom program is stored. In the example below the “Gascom” folder is stored on the C: drive. If you do not know the location of the folder you may find it by right clicking on the shortcut that was created on the desktop and then choosing “Properties”. There is often a “Target” or “Start in” listing that shows the location of the file folder.
6. The last entry in the configuration menu is the “Access code” field. Entering the correct code in the location will allow access to Parameter Numbers 1 to 42. An access code is not needed in order to access parameters 1 to 4, monitor boiler performance, or view the logged error codes. THE ACCESS CODE WILL CLEAR AFTER THE PROGRAM CLOSSES.



# Setting parameters using Gascom software

## Using Gascom software

1. Connect the GCI interface module from the communications kit to the serial port on the computer. Connect the ribbon cable to the Ultra Control through the connection on the front display panel. (Series 1 boilers have the connection under the top front cover on the control itself.) Plug in the GCI power cord.
2. Make sure the power to the boiler is on.
3. Start the Gascom program and go through configuration if it has not already been completed. If the configuration was done previously choose “Read from MCBA,” as shown below.



4. If the device is connected correctly and the correct communication port is chosen the following screen will appear. This indicates that communication has been established between the Ultra’s MCBA control and the computer.



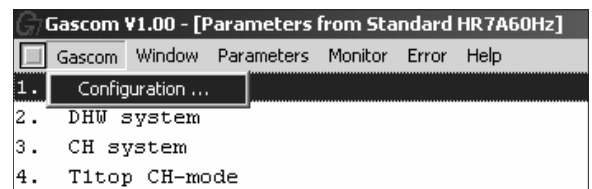
5. The first four parameters are the only parameters available to change unless an Access code is entered under the configuration menu.

**WARNING**

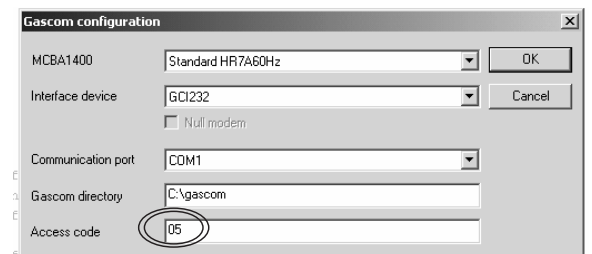
Entering the access code makes all parameters 1 through 42 available for change. Do not change any parameter that is not directly addressed in this Addendum as an acceptable change. Some parameters in the control should never be changed under any circumstance, as explained in this Addendum. After making changes to parameters, record the changes made on the last page of this supplement, and leave a copy with the boiler for future reference.

## Accessing parameters 5-42

1. If access to parameters 5-42 is needed, choose the “configuration” option from the “gascom” menu.



2. To access parameters 5-42, enter “05” in the access code box, as shown below. Choose “OK”.

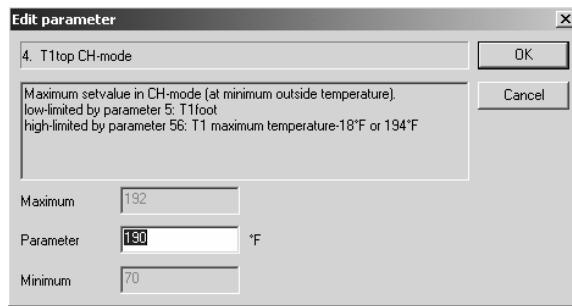


8. Parameters 1 through 42 should all be visible.

## Setting parameters using Gascom software *(cont.)*

### To change a parameter:

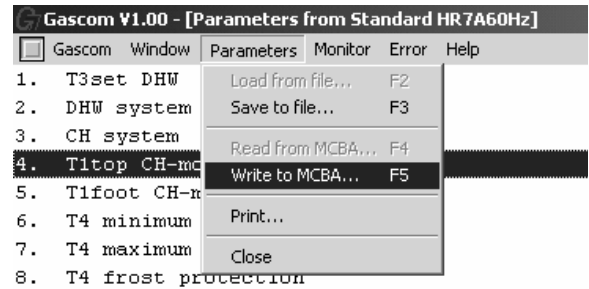
1. Choose the parameter by double-clicking (left mouse button) on its description OR highlighting it with a single click (left mouse button) and pressing “Enter.”
2. A pop-up window will appear for the parameter with a brief description of its functions and the possible settings.
3. Choose the desired setting following all instructions referring to all instructions supplied in this manual. Refer to the Parameter reference table for specific parameter information.



4. Choose “OK”. The parameter should now show the updated value in the list. If any of the parameters appear red in color this indicates an invalid entry. The parameter is out of the acceptable range and must be corrected.
5. Choose and modify parameters until all the desired settings are achieved. Correct any invalid parameters appearing in red text.

### Downloading parameters

1. The new parameters can now be downloaded to the control.
2. Choose the “Parameters” menu and then the “Write to MCBA” option.



3. The computer OVERWRITES ALL of the parameters on the control. The first digit of the front display will flash once the parameters are received.

### Restoring default settings

1. Factory default parameter files are included on the Gascom software disk. Downloading the default parameter file to the Ultra control module will undo any previously made parameter modifications.
2. To restore defaults, open the appropriate file in Gascom (“Parameters” menu, “Load from file” option) from the Gascom disk and download the parameters to the MCBA.



## Setting parameters using Gascom software *(cont.)*

### Loading parameters from a file

1. The files listed in Tables 2 and 3 (next page) are located on the Gascom software disk.
2. To load the appropriate parameter file, use the “Parameters” menu, “Load from file” option.
3. Navigate to the file and select it to load the parameters.

**WARNING**

You must be careful to select the correct file for the boiler model being used. Installing a parameter file for the wrong model could result in overfiring the boiler, resulting in possible severe personal injury, death or substantial property damage.

**Table 2** Gascom software disk parameter files for *Ultra-80 through Ultra-230* (Standard files work best for radiant slab, suspended-floor radiant, finned-tube baseboard and cast iron radiator systems; Fan-coil files work best for fan-coil systems.) The factory default file is the file named, “80-230.par.”

<ul style="list-style-type: none"> <li>[-] Ultra 80-230             <ul style="list-style-type: none"> <li>[-] Fan-coil application                 <ul style="list-style-type: none"> <li>[-] R-suffix boiler                     <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>80-230 FC R HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>80-230 FC R HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>80-230 FC R AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>80-230 FC R.par</li> </ul> </li> </ul> </li> <li>[-] Standard boiler (no R suffix)                         <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>80-230 FC HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>80-230 FC HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>80-230 FC AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>80-230 FC.par</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul>	<ul style="list-style-type: none"> <li>[-] Standard (non fan-coil application)             <ul style="list-style-type: none"> <li>[-] R-suffix boiler                 <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                     <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>80-230 R HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>80-230 R HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                     <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>80-230 R AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>80-230 R.par</li> </ul> </li> </ul> </li> <li>[-] Standard boiler (no R suffix)                     <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>80-230 HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>80-230 HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>80-230 AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>80-230.par</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul>
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2. To load the appropriate parameter file, use the “Parameters” menu, “Load from file” option.
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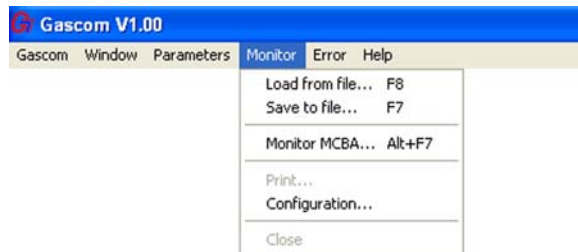
**Table 3** Gascom software disk parameter files for **Ultra-310 ONLY** (Standard files work best for radiant slab, suspended-floor radiant, finned-tube baseboard and cast iron radiator systems; Fan-coil files work best for fan-coil systems.) The factory default file is the file named, “310.par.”

<ul style="list-style-type: none"> <li>[-] Ultra 310             <ul style="list-style-type: none"> <li>[-] Fan-coil application                 <ul style="list-style-type: none"> <li>[-] R-suffix boiler                     <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>310 FC R HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>310 FC R HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>310 FC R AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>310 FC R.par</li> </ul> </li> </ul> </li> <li>[-] Standard boiler (no R suffix)                         <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>310 FC HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>310 FC HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                             <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                                 <ul style="list-style-type: none"> <li>310 FC AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                                 <ul style="list-style-type: none"> <li>310 FC.par</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul>	<ul style="list-style-type: none"> <li>[-] Standard (non fan-coil application)             <ul style="list-style-type: none"> <li>[-] R-suffix boiler                 <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                     <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                         <ul style="list-style-type: none"> <li>310 R HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                         <ul style="list-style-type: none"> <li>310 R HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                     <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                         <ul style="list-style-type: none"> <li>310 R AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                         <ul style="list-style-type: none"> <li>310 R.par</li> </ul> </li> </ul> </li> <li>[-] Standard boiler (no R suffix)                     <ul style="list-style-type: none"> <li>[-] High altitude (Over 5500-Feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>310 HA AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>310 HA.par</li> </ul> </li> </ul> </li> <li>[-] Standard altitude (to 5500 feet)                         <ul style="list-style-type: none"> <li>[-] Boiler with AM4 module                             <ul style="list-style-type: none"> <li>310 AM4.par</li> </ul> </li> <li>[-] Boiler without AM4 module                             <ul style="list-style-type: none"> <li>310.par</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul>
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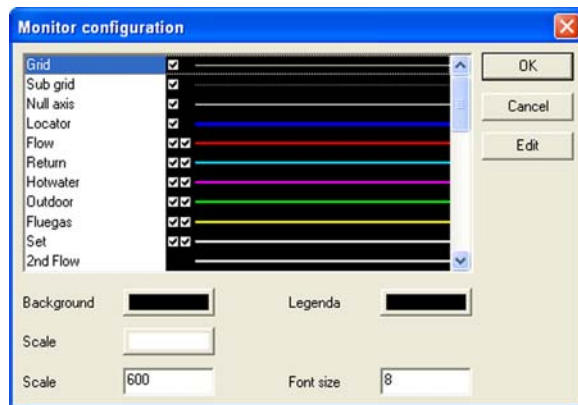
## Monitoring the MCBA and reading error logs

### Monitoring the Ultra control

1. When ready to monitor the control, select “Monitor MCBA” from the “Monitor” menu.
2. To change the setup for monitoring, select “Configuration” from the “Monitor” menu.

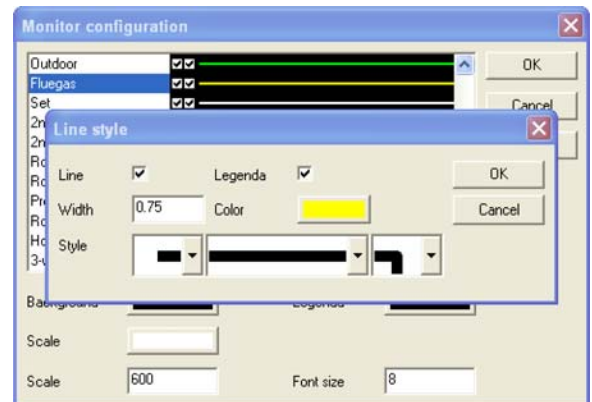


3. You will see the dialog box like the one below.



4. Scroll down the list and select the parameters you want to monitor.
5. The check mark boxes indicate which parameters will be shown on the monitor display. The first check box means a line will show for the parameter. The second check box means the parameter will be shown in the legend. Check boxes are enabled or disabled by clicking on “Edit.”
6. Click on “Edit” to add or change check boxes for parameters.
  - You can change the line end style, make it solid or dashed, and change the way corners appear.

- You can also change line color.
  - Enable the parameter to show on the display by clicking to cause a check next to “Line.” To prevent the parameter from showing on the monitor, remove the check mark.
  - Enable the parameter to be listed in the legend by clicking to cause a check next to “Legend.” To prevent the parameter from showing in the legend, remove the check mark.
  - Click “OK” to accept the changes and return.
7. Adjust monitor background, scale, legend and font size in the dialog box below.
  8. When all changes are made, click “OK” to set the configuration.
  9. Select “Save to file” to save the configuration to disk. Select “Load from file” to use an existing configuration.



10. From the “Monitor” menu, you can also:
  - Save a configuration file to disk.
  - Print the configuration.

### Reviewing error logs

1. Use the “Error” menu in Gascom to load the error log from the control module (MCBA) or from a file you have saved.
2. From the “Error” menu, you can also:
  - Save an error log to disk.
  - Print an error log.
  - Clear the control module error log.

## **Notes**

## Parameter explanations

**WARNING**

Revise module parameters **ONLY** if you fully understand the purpose and result of the changes. Tampering with control settings 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/service technician. Read all instructions, including this Addendum, the Ultra Boiler Control Supplement and the Boiler Manual before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage.

**NOTICE**

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.

## Parameter explanations *(continued)*

### Outdoor reset operation

1. 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.
2. The closer the heating unit output matches the heat loss, the less the swing in indoor temperature. You can adjust Ultra control parameters to do this, as discussed below.
3. Outdoor reset terms:
  - ODT — ODT is the outdoor design temperature for the area, used to calculate heat loss. (Use this value for  $T4_{\text{minimum}}$ .)
  - 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  $T4_{\text{maximum}}$ .)
4. Automatic temperature boost — Automatic temperature boost compensates for required pick-up times and variations in heating load requirements by automatically increasing setpoint temperature when a call for heat exceeds a specified time (parameter 11). See page 16 for further discussion.

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

1. Fixed-temperature operation:
  - a. If boiler is operated with constant outlet temperature (no outside temperature sensor installed), set parameter 4 as described in the Ultra Control Supplement.
2. Outdoor reset operation:
  - a. Parameters 4 to 8 determine the reset curve, as shown in Figure 1.
3.  $T1$  is the boiler outlet water temperature.  $T4$  is the outside temperature.
  - $T1_{\text{top}}$  is the outlet water temperature the boiler tries to maintain whenever the outside temperature is less than  $T4_{\text{minimum}}$ .  
 $T1_{\text{top}}$  is parameter **4**.  
 $T4_{\text{minimum}}$  is parameter **6**.
  - $T1_{\text{foot}}$  is the outlet water temperature the boiler tries to maintain whenever the outside temperature is higher than  $T4_{\text{maximum}}$ .  
 $T1_{\text{foot}}$  is parameter **5**.  
 $T4_{\text{maximum}}$  is parameter **7**.

- When outside temperature is between  $T4_{\text{maximum}}$  and  $T4_{\text{minimum}}$ , the control calculates a value for  $T1$  setpoint ( $T1_{\text{set}}$ ) between  $T1_{\text{foot}}$  and  $T4_{\text{top}}$ .
4. The boiler may not operate all the way down to  $T1_{\text{foot}}$ . Parameter 10,  $T_{\text{blocking}}$ , sets a minimum operating outlet water temperature. If the calculated setpoint,  $T1_{\text{set}}$ , is less than  $T_{\text{blocking}}$ , the boiler shuts off.
  5. 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 ( $T4_{\text{correction}}$ )

1. Location of the outdoor sensor may sometimes cause the sensor to incorrectly detect outside temperature.
2. 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 ( $T_{\text{blocking}}$ )

1. Use this parameter to set a minimum operating boiler outlet water setpoint temperature.
2. When calculated setpoint temperature,  $T_{\text{set}}$ , is at or below  $T_{\text{blocking}}$  the boiler shuts down (after operating a postpump cycle).
3. To deactivate this parameter, set the value to 32.

### Suggested outdoor reset settings

1.  $T1_{\text{top}}$  — Set to the required supply water temperature when outdoor temperature is at or below ODT (outdoor design temperature).
2.  $T1_{\text{foot}}$  — 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.
3.  $T4_{\text{maximum}}$  — Set to the balance point temperature for the building (typically 65°F or lower).
3.  $T4_{\text{minimum}}$  — Set to the outdoor design temperature.

# Parameter explanations (continued)

Figure 1 Outdoor reset curve and control module parameters

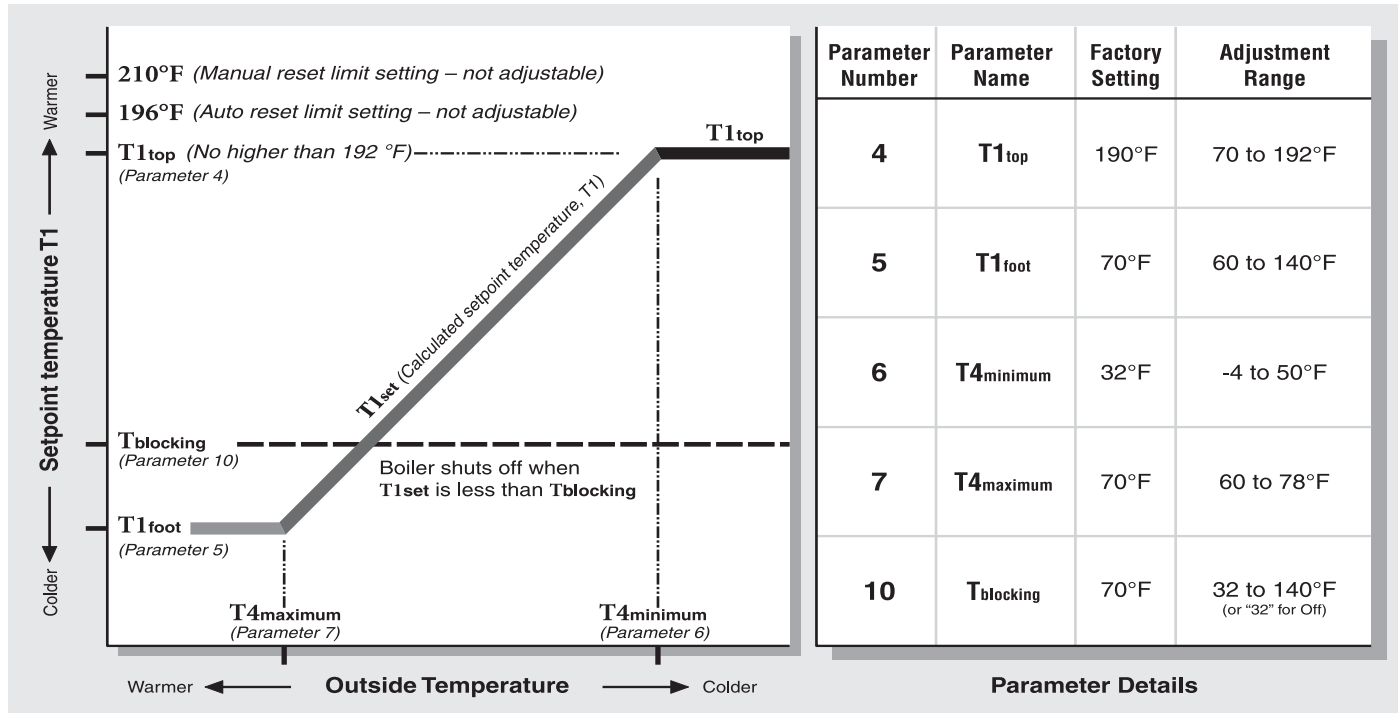
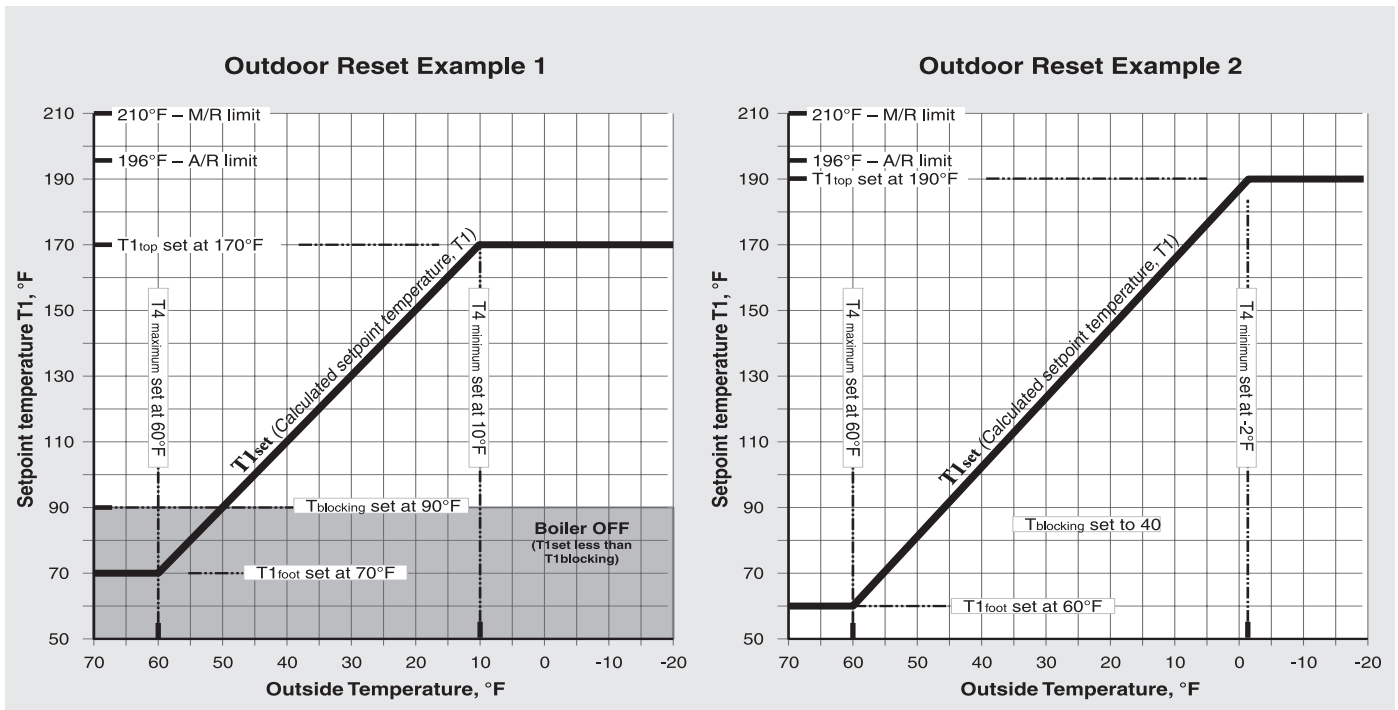


Figure 2 Typical reset curves



## Parameter explanations *(continued)*

### Automatic temperature boost

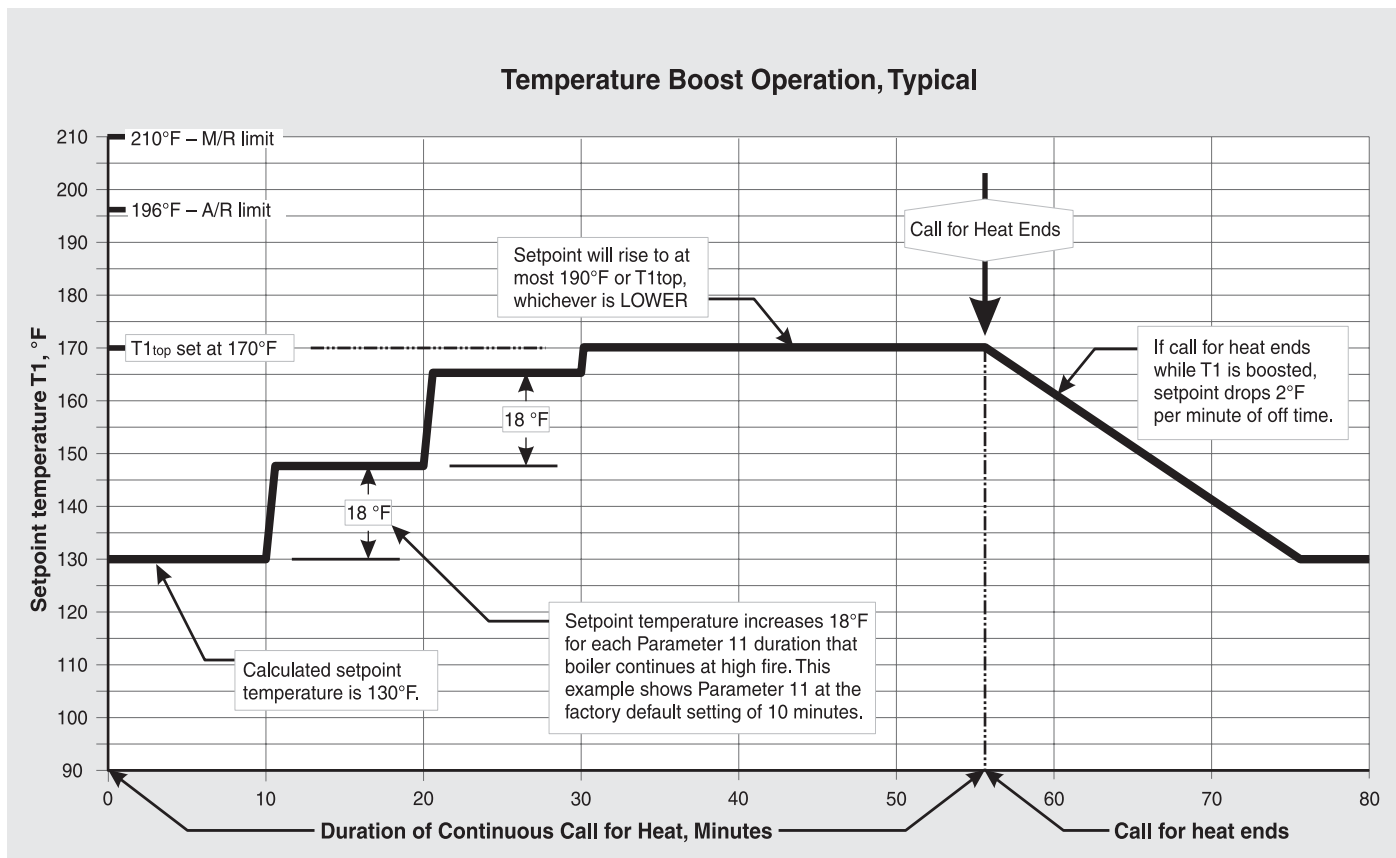
1. If the target temperature happens to be too low for the heating units to supply sufficient heat within ten minutes (default setting), the control “boosts” the target temperature until the supply water meets the system’s needs.
2. Even if the reset parameters are optimized for the application, use 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.
3. Boost will not call for supply water temperature setpoint greater than the value of parameter 4 ( $T_{1top}$ ). 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 ( $T_{1top}$ ) is likely to be set higher than on a radiant-only system.

**NOTICE** Many slab-type radiant systems won’t require boost. This function can be disabled with a parameter setting of “0.”

### Boost operation

1. In outdoor reset operation (outdoor sensor connected), the Ultra control module automatically increases the target outlet water temperature if a call for heat exceeds a time equal to parameter 11 (factory default of 10 minutes for most Ultra boilers).
2. At each interval of parameter 11 of a continuous call for heat, the control module increases the target temperature by 18°F.
3. The control module will continue increasing target temperature until it reaches the value set in parameter 4 ( $T_{1top}$ ).
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 to 30 minutes.
6. Factory default setting = 10 minutes.
7. Deactivate automatic temperature boost by setting to “0.”

**Figure 3** Parameter 11 — Automatic supply temperature boost operation — In the example below, the boiler is operating in outdoor reset mode, with a calculated setpoint temperature of 130°F. The call for heat has lasted for more than 10 minutes (value of parameter 11), and supply temperature boost has occurred.





## Parameter explanations *(continued)*

### Maximum fan speed

1. **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.
2. Reducing maximum fan speed will be helpful for systems on which the boiler is oversized for either space heating or DHW, or both.
3. The maximum fan speed can be set separately for space heating and DHW using parameters 13 and 15.

**WARNING** The fan speed **must not be set ABOVE** the value as supplied from the factory (also listed in Table 1, page 5). This would increase boiler firing rate beyond the acceptable limit, resulting in potential for severe personal injury, death or substantial property damage.

**WARNING** The fan speed **must not be set BELOW** the value as supplied from the factory (also listed in Table 1, page 5). This could result in potential for severe personal injury, death or substantial property damage.

### Parameter 13 — Space heating max fan speed

1. Acceptable range:
  - Ultra-80 to 230: 1300 to 5200 rpm (13 to 52 on boiler display).
  - Ultra-310: 1400 to 5800 rpm (14 to 58 on boiler display).
  - Boiler display shows fan speed in 100's of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.
2. Factory default — see Table 1, page 5..
3. 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

1. Acceptable range:
  - Ultra-80 to 230: 1300 to 5200 rpm (13 to 52 on boiler display).
  - Ultra-310: 1400 to 5800 rpm (14 to 58 on boiler display).
  - Boiler display shows fan speed in 100's of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.
2. Factory default — see Table 1, page 5..
3. 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 — param. 17

1. **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).

**WARNING** The fan speed **must not be set BELOW** the value as supplied from the factory (also listed in Table 1, page 5). This would reduce boiler firing rate below the acceptable limit, resulting in potential for severe personal injury, death or substantial property damage.

2. Parameter 17 sets the minimum fan speed for both DHW and space heating modes.
3. Acceptable range:
  - Ultra-80 to 230: 1300 to 5200 rpm (13 to 52 on boiler display).
  - Ultra-310: 1400 to 5800 rpm (14 to 58 on boiler display).
  - Boiler display shows fan speed in 100's of rpm. A value of 48 would mean a speed of 100 x 48, or 4800 rpm.
4. Parameter 17 must be increased for high altitude applications (default values are listed in Table 1, page 5). See the High Altitude (over 5500 feet) Instructions and the Parameter reference table in this Addendum for details.
5. Factory default — see Table 1, page 5.

### Ignition fan speed — param. 19

1. **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).

**WARNING** The ignition fan speed **must not be set BELOW** the value as supplied from the factory (also listed in Table 1, page 5). This would reduce boiler firing rate below the acceptable limit during ignition, resulting in potential for severe personal injury, death or substantial property damage.

2. Parameter 19 should **only be changed** where required for high altitude applications.
3. Acceptable range:
  - Ultra-80 to 230: 1300 to 5200 rpm (13 to 52 on boiler display).
  - Ultra-310: 1400 to 5800 rpm (14 to 58 on boiler display).
  - Boiler display shows fan speed in 100's of rpm. A value of 27 would mean a speed of 100 x 27, or 2700 rpm.
4. Factory default — see Table 1, page 5.

**Table 4** Boiler firing rate vs RPM

% Rate	RPM (Ultra 80-230)	RPM (Ultra 310)
20 (minimum)	1300	1400
40	2400	2600
50	2900	3100
60	3400	3700
80	4500	4900
maximum	5200	5800

## Parameter explanations *(continued)*

### Differential (hysteresis) settings

**WARNING** DO NOT change the differentials (hysteresis) for DHW operation (parameters 24, 25, 26 and 27). Always use only the factory default settings for these parameters.

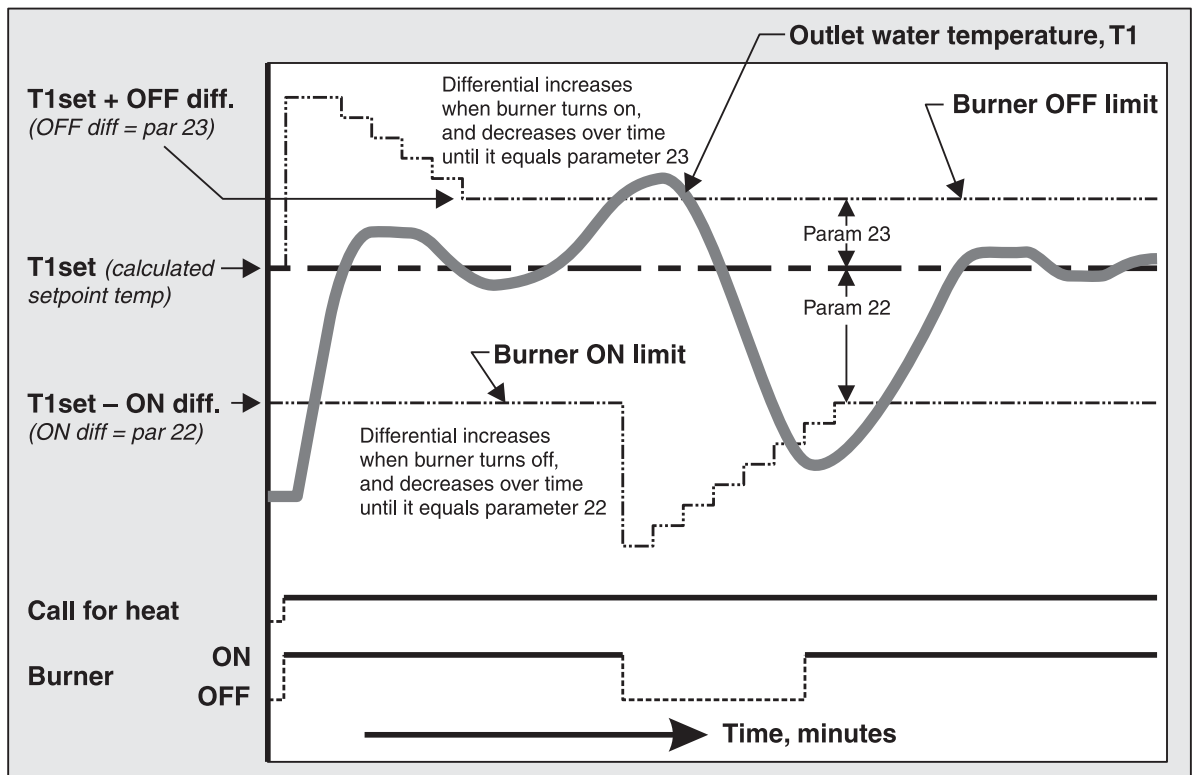
### Space heating differentials (parameters 22 and 23)

1. The term, “differential,” is also referred to as “hysteresis.”
2. 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.
3. 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.
4. See Figure 4 for an explanation of the “ON” and “OFF” differentials of the Ultra control module. 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)

1. The factory DEFAULT setting for parameter 23 is 4°F. This works well for most applications.
2. 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. The “fan coil” parameter files on the Gascom disk have parameter 23 set at 16°F, with parameter 4 set at 180°F, to allow adequate time for the boiler to modulate.
3. When setting parameter 23, make sure that parameter 23 plus parameter 4 is not over 203°F to avoid possible nuisance lockouts.

**Figure 4** Space heating on and off differentials (hysteresis) — Parameters 22 and 23



## Parameter reference table

Para.	Name	Range		Boiler display				Description	
		Gascom software	Boiler display	Display position:					
				1st	2nd	3rd	4th		
1	T3set	Storage DHW: 68 to 142 °F	68 to 142	1	Setting				<ul style="list-style-type: none"> <li>T3 is the DHW temperature detected by an immersion sensor.</li> <li>DO NOT CHANGE this parameter from factory setting of 140°F. (Boiler outlet water temperature setpoint in DHW mode is determined by adding parameter 1 to parameter 33.)</li> <li>If applied for instantaneous DHW operation (not recommended), set parameter 35 for the correct configuration.</li> </ul>
		Instantaneous DHW: 104 to 150 °F	104 to 150						
2	DHW System	DHW OFF	0	2	Blank	Blank	Value	<ul style="list-style-type: none"> <li>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.”</li> <li><b>WARNING</b> — Weil-McLain DOES NOT recommend setting 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.</li> </ul>	
		DHW ON	1						
		DHW OFF + pump constant	2						
		DHW ON + pump constant	3						
3	CH System	CH OFF	0	3	Blank	Blank	Value	<ul style="list-style-type: none"> <li>Parameter 3 determines whether the boiler will operate in central heating mode.</li> <li>Select “1” to cycle the boiler circulator on central heating calls.</li> <li>Select “2” or “3” to maintain constant boiler circulator operation.</li> </ul>	
		CH ON	1						
		CH OFF + boiler pump constant	2						
		CH On + boiler pump constant	3						
4	T1 <sub>top</sub> (see page 14)	70 to 192 °F	70 to 192	4	Setting			<ul style="list-style-type: none"> <li>Constant boiler temperature operation (outside sensor not connected): T1<sub>top</sub> is the target outlet water temperature at all times.</li> <li>Outdoor reset (outside sensor connected): T1<sub>top</sub> is the maximum target temperature for all outside temperatures.</li> </ul>	
5	T1 <sub>foot</sub> (see page 14)	60 to 140°F	60 to 140	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 5, T1<sub>foot</sub>, applies only in outdoor reset operation.</li> <li>T1<sub>foot</sub> is the minimum target temperature for all outside temperatures.</li> </ul>	
				P	.	0	5		
				After 2 to 3 seconds:					
Blank	Setting								
6	T4 minimum (see page 14)	-4 to 50 °F	-4 to 50	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 6, T4 minimum, applies only in outdoor reset operation.</li> <li>T4 minimum is the outside temperature at which the target outlet water temperature is at maximum.</li> </ul>	
				P	.	0	6		
				After 2 to 3 seconds:					
				Blank	Blank	Setting			

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
7	T4 maximum (see page 14)	60 to 78 °F	60 to 78	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 7, T4 maximum, applies only in outdoor reset operation.</li> <li>T4 maximum is the outside temperature at which the target outlet water temperature is at minimum.</li> </ul>
				P	.	0	7	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
8	T4 frost protection	-22 to 50 °F	-22 to 50	Initial reading:				<ul style="list-style-type: none"> <li>When outside temperature drops to this number, the boiler circulator will run constantly.</li> </ul>
				P	.	0	8	
				After 2 to 3 seconds:				
				Blank	Setting			
9	T4 correction (see page 14)	- 8 to 10 °F	- 8 to 10	Initial reading:				<ul style="list-style-type: none"> <li>Use this parameter to modify the outside temperature reading if needed to correct for outside sensor location.</li> </ul>
				P	.	0	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
10	T blocking (see page 14)	32 (off) 34 – 140 °F	32 (off) 34 – 140	Initial reading:				<ul style="list-style-type: none"> <li>When the target outlet water temperature is less than this setting, the boiler shuts off.</li> </ul>
				P	.	1	0	
				After 2 to 3 seconds:				
				Blank	Setting			
11	Booster time (see page 16)	0 (no booster) 1 to 30 (minutes)	0 to 30	Initial reading:				<ul style="list-style-type: none"> <li>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 setpoint is increased another 18°F (never exceeding Parameter 4 + Parameter 23 [hysteresis off]).</li> <li>To deactivate booster operation, set this parameter to 0.</li> </ul>
				P	.	1	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
12	T parallel shift	0 to 144 °F	0 to 144	Initial reading:				<ul style="list-style-type: none"> <li>The value of parameter 12 reduces the calculated setpoint temperature by the amount set when the call for heat is from outdoor temperature.</li> <li>Weil-McLain recommends not changing this parameter from its factory default of 0 (no parallel shift).</li> </ul>
				P	.	1	2	
				After 2 to 3 seconds:				
				Blank	Setting			
13	Maximum fan speed CH (see page 17)	Ultra-80 to 230: 1300 to 5200 rpm  Ultra-310: 1400 to 5800 rpm	13 to 52 (100's of rpm)  14 to 58 (100's of rpm)	Initial reading:				<ul style="list-style-type: none"> <li>Use this parameter to change the maximum boiler input for central heating (CH) — NEVER above default value .</li> <li>When in central heating mode, the boiler fan speed will not exceed this setting. Increasing fan speed increases boiler input; decreasing fan speed decreases input.</li> <li>NEVER set below low fire setting or above the maximum value shown at left.</li> </ul>
				P	.	1	3	
				After 2 to 3 seconds:				
				Blank	Setting			

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
15	Maximum fan speed DHW (see page 17)	Ultra-80 to 230: 1300 to 5200 rpm	13 to 52 (100's of rpm)	Initial reading:				<ul style="list-style-type: none"> <li>Use this parameter to change the maximum boiler input for domestic water heating (DHW) — NEVER above default value .</li> <li>Boiler fan speed will not exceed this setting in DHW mode. Increasing fan speed increases boiler input; decreasing fan speed decreases input.</li> <li>NEVER set below low fire setting or above the maximum value shown at left.</li> </ul>
				P	.	1	5	
		Ultra-310: 1400 to 5800 rpm	14 to 58 (100's of rpm)	After 2 to 3 seconds:				
				Blank	Blank	Setting		
17	Minimum fan speed DHW (see page 17)	Ultra-80 to 230: 1300 to 5200 rpm	13 to 52 (100's of rpm)	Initial reading:				<ul style="list-style-type: none"> <li>Use this parameter to increase the minimum input of the boiler. (Parameter 17 must be increased when the boiler is used at high altitude, per the high altitude instructions. High-altitude control modules are factory-set for the correct value.) Increasing fan speed increases boiler input; decreasing fan speed decreases input.</li> <li>NEVER set below minimum value shown at left.</li> </ul>
				P	.	1	7	
		Ultra-310: 1400 to 5800 rpm	14 to 58 (100's of rpm)	After 2 to 3 seconds:				
				Blank	Blank	Setting		
19	Ignition fan speed (see page 17)	Ultra-80 to 230: 1300 to 5200 rpm	13 to 52 (100's of rpm)	Initial reading:				<ul style="list-style-type: none"> <li>Use this parameter to increase the minimum input of the boiler during ignition. (Parameter 19 must be increased when the boiler is used at high altitude, per the high altitude instructions. High-altitude control modules are factory-set with the correct value.)</li> <li>Increasing fan speed increases boiler input; decreasing fan speed decreases input.</li> <li>SET ONLY at recommended (default) values (Table 1) .</li> </ul>
				P	.	1	9	
		Ultra-310: 1400 to 5800 rpm	14 to 58 (100's of rpm)	After 2 to 3 seconds:				
				Blank	Blank	Setting		
20	Postpump time CH	0 (10 seconds) 1 to 99 (minutes)	0 to 99	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 20 is the length of time the boiler circulator continues to operate after completing a central heating cycle.</li> </ul>
				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:				<ul style="list-style-type: none"> <li>Parameter 20 is the length of time the boiler circulator continues to operate after completing a DHW cycle.</li> </ul>
				P	.	2	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
22	CH modulation differential ON (see page 18)	0 to 36 °F	0 to 36	Initial reading:				<ul style="list-style-type: none"> <li>Differential may also be referred to as “hysteresis.”</li> <li>This is the temperature the boiler water must drop below setpoint temperature to turn the boiler on.</li> </ul>
				P	.	2	2	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
<b>23</b>	<b>CH modulation differential OFF</b> <i>(see page 18)</i>	0 to 18 °F	0 to 18	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>Differential may also be referred to as “hysteresis.”</li> <li>This is the temperature the boiler water must rise above setpoint temperature to turn the boiler off.</li> <li>As outlet temperature 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.</li> </ul>
				P	.	2	3	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		
<b>24</b>	<b>DHW modulation differential ON</b> <i>(see page 18)</i>	-2 to 54 °F	-2 to 54	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>Notice: Differential may also be referred to as “hysteresis.”</li> <li>This is the temperature the boiler water must drop below setpoint temperature to turn the boiler on. (Boiler outlet water setpoint temperature is 195°F during DHW mode.)</li> </ul>
				P	.	2	4	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		
<b>25</b>	<b>DHW modulation differential OFF</b> <i>(see page 18)</i>	-6 to 54 °F	-6 to 54	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>Notice: Differential may also be referred to as “hysteresis.”</li> <li>This is the temperature the boiler water 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 at minimum input, the boiler will shut down when the temperature reaches setpoint temperature plus parameter 23.)</li> </ul>
				P	.	2	5	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		
<b>26</b>	<b>DHW detection differential ON</b>	-6 to 54 °F	-6 to 54	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>Notice: Differential may also be referred to as “hysteresis.”</li> <li>This parameter has no effect unless a DHW sensor is used — not recommended (use an aquastat instead).</li> <li>This is the temperature the DHW water must drop below DHW setpoint temperature to turn the boiler on.</li> </ul>
				P	.	2	6	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		
<b>27</b>	<b>DHW detection differential OFF</b>	-6 to 54 °F	-6 to 54	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>Notice: Differential may also be referred to as “hysteresis.”</li> <li>This parameter has no effect unless a DHW sensor is used — not recommended (use an aquastat instead).</li> <li>This is the temperature the DHW water must rise above DHW setpoint temperature to turn the boiler off.</li> </ul>
				P	.	2	7	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		
<b>28</b>	<b>Blocking time CH</b>	0 to 306 seconds	0 to 30 (times 10.2 seconds)	<i>Initial reading:</i>				<ul style="list-style-type: none"> <li>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.</li> </ul>
				P	.	2	8	
				<i>After 2 to 3 seconds:</i>				
				Blank	Blank	Setting		

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
29	Blocking time DHW	0 to 306 seconds	0 to 30 (times 10.2 seconds)	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 29 is the minimum time between consecutive DHW heating cycles. After a DHW call for heat is satisfied the boiler will remain off for at least the blocking time before starting another DHW cycle.</li> </ul>
				P	.	2	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
30	Blocking time DHW to CH	0 (switch to CH with burner on)	0 to 30 (times 10.2 seconds)	Initial reading:				<ul style="list-style-type: none"> <li>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.</li> </ul>
				P	.	3	0	
		After 2 to 3 seconds:						
		1 to 306 seconds		Blank	Blank	Setting		
31	T1-T2 difference for modulating back	10 to 72 °F	9 to 72	Initial reading:				<ul style="list-style-type: none"> <li>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.</li> <li>DO NOT set higher than factory default shown in Table 1.</li> </ul>
				P	.	3	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
32	RMCI address	-1 (RMCI off)	-1 (RMCI off) 0 to 7 (address)	Initial reading:				<ul style="list-style-type: none"> <li>DO NOT CHANGE this parameter. It is intended for use with an RMCI 1400 interface device, currently not available.</li> </ul>
				P	.	3	2	
		After 2 to 3 seconds:						
		0 to 7 (address)		Blank	Blank	Setting		
33	Tplus (Setvalue addition for DHW)	0 to 54 °F	0 to 54	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 33 sets the target boiler outlet water temperature in DHW mode. Add parameter 33 to parameter 1 to determine the target temperature.</li> <li>Factory default is 140°F for parameter 1 and 50°F for parameter 33, for a total of 190°F as the DHW boiler outlet water temperature.</li> </ul>
				P	.	3	3	
				After 2 to 3 seconds:				
				Blank	Setting			

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
34 1st digit	2nd CH circuit	0 to 8 (see right)	0 to 8	Initial reading:				First digit (2nd CH circuit): <ul style="list-style-type: none"> <li>• DO NOT CHANGE parameter 34 first digit. Second central heating circuit operation is not currently supported.</li> <li>• 0 (2nd CH circuit off) — No second CH circuit operation (LEAVE AS IS)</li> <li>• 1 (2nd CH circuit as slave)</li> <li>• 2 (2nd CH circuit as master)</li> <li>• 3 (2nd CH circuit as slave, Tset also by potmeter) — 2nd heating circuit as slave, with setpoint temperature determined by potentiometer</li> <li>• 4 (2nd CH circuit as master, Tset also by potmeter) — 2nd heating circuit as master, with setpoint temperature determined by potentiometer</li> <li>• 5 (2nd CH circuit as slave, active during HW) — 2nd heating circuit as slave, during DHW</li> <li>• 6 (2nd CH circuit as slave, active during HW) — 2nd heating circuit as master, during DHW</li> <li>• 7 (2nd CH circuit as slave, Tset also by potmeter, active during HW) — 2nd heating circuit as slave, during DHW, with setpoint temperature determined by potentiometer</li> <li>• 8 (2nd CH circuit as master, Tset also by potmeter, active during HW) — 2nd heating circuit as slave, during DHW, with setpoint temperature determined by potentiometer</li> </ul>
				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): <ul style="list-style-type: none"> <li>• 0 (room thermostat) — Central heating operation controlled by room thermostat</li> <li>• 1 (outside temperature) — DO NOT SELECT — Central heating operation controlled by outside sensor (not currently supported)</li> <li>• 2 (0 - 10 V analog on MCBA: capacity) — DO NOT SELECT — Central heating boiler input controlled with 0 - 10 vdc input to control module (not currently supported)</li> <li>• 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)</li> <li>• 4 (0 - 10 V analog on AM-4: capacity) — Select this value when using AM4 module to interface with multiple boiler controller. See AM4 instructions.</li> <li>• 5 (0 - 10 V analog on AM-4: temperature) — DO NOT SELECT — Central heating boiler outlet temperature controlled with 0 - 10 vdc input to AM-4 module, but controls temperature setpoint. See AM4 instructions.</li> <li>• 6 (+/- control) — DO NOT SELECT — Central heating mode controlled with +/- input to control module (not currently supported)</li> </ul>
				Blank	Blank	Digit 1	Digit 2	



## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description		
		Gascom software	Boiler display	Display position:						
				1st	2nd	3rd	4th			
35 1st digit	3-Way valve	0 to 2 (see right)	0 to 2	Initial reading:				First digit (3-way valve): <ul style="list-style-type: none"> <li>• Ultra control module readout: Initial reading: P . 35 (indicates parameter 35) After 2 to 3 seconds, changes to parameter setting: Positions 1, 2 = blank Position 3 = Parameter 35 first digit (3-way valve or pump) Position 4 = Parameter 35 second digit (DHW type)</li> <li>• DO NOT CHANGE parameter 35 first digit. 3-way valve operation is not currently supported.</li> <li>• 0 (3-way valve normally open) — Switch to DHW from CH with normally open 3-way valve</li> <li>• 1 (hot water pump) — Use DHW circulator in DHW mode</li> <li>• 2 (3-way valve normally closed) — Switch to DHW from CH with normally closed 3-way valve</li> </ul> Second digit (CH type): <ul style="list-style-type: none"> <li>• 0 (instant water heater with NTC3) — DO NOT SELECT — Instantaneous water heater with sensor (not currently supported)</li> <li>• 1 (instant water heater without NTC3) — DO NOT SELECT — Instantaneous water heater without sensor (not currently supported)</li> <li>• 2 (storage tank with NTC3) — DO NOT SELECT — Storage tank with sensor (not currently supported)</li> <li>• 3 (storage tank without NTC3) — DO NOT CHANGE — Storage tank with aquastat</li> <li>• 4 (instant water heater with NTC3 + anti condensing) — DO NOT SELECT — Instantaneous water heater with sensor; anticondensate mode (not currently supported)</li> <li>• 5 (instant water heater without NTC3 + anti condensing) — DO NOT SELECT — Instantaneous water heater without sensor; anticondensate mode (not currently supported)</li> <li>• 6 (storage tank with NTC3 + anti condensing) — DO NOT SELECT — Storage tank with sensor; anticondensate mode (not currently supported)</li> <li>• 7 (storage tank without NTC3 + anti condensing) — DO NOT SELECT — Storage tank with aquastat; anticondensate mode (not currently supported)</li> <li>• 8 (plate heat exchanger) — DO NOT SELECT — Plate heat exchanger (not currently supported)</li> <li>• 9 (external heat request) — DO NOT SELECT — External heat request, from RMCI (not currently supported)</li> </ul>		
				P	.	3	5			
35 2nd digit	CH type	0 to 9 (see right)	0 to 9	After 2 to 3 seconds:						
				Blank	Blank	Digit 1	Digit 2			
36	Manual fanspeed	-1 (auto operation) 0 to 100 (%)	-1 (auto) 0 to 100 (%)	Initial reading:				<ul style="list-style-type: none"> <li>• 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.</li> </ul>		
				P	.	3	6			
				After 2 to 3 seconds:						
				Blank	Blank	Setting				

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
37 1st digit	PWM-level CH-pump	1 to 4 (pump speed)	1 to 4	Initial reading:				<ul style="list-style-type: none"> <li>This function is not currently supported.</li> </ul>
				P	.	3	7	
37 2nd digit		1 to 4 (pump speed)	1 to 4	After 2 to 3 seconds:				
				Blank	Blank	Digit 1	Digit 2	
38	T hold	32 (feature off)	32 (feature off)	Initial reading:				<ul style="list-style-type: none"> <li>Parameter 38 sets a minimum standby temperature for the boiler. If boiler outlet or return water temperature is sensed at less than T<sub>hold</sub>, the boiler fires (without pump operating) to bring temperature up to T<sub>hold</sub>.</li> </ul>
				P	.	3	8	
		32 to 176 °F	32 to 176	After 2 to 3 seconds:				
				Blank	Blank	Setting		
39	T6 top 2nd CH circuit	50 to 176 °F	50 to 176	Initial reading:				<ul style="list-style-type: none"> <li>This function is not currently supported.</li> <li>Sets maximum target boiler temperature during call for heat from 2nd CH circuit (same function as T<sub>1top</sub> for first CH circuit).</li> </ul>
				P	.	3	9	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		
40	T6 foot 2nd CH circuit	50 to 94 °F	50 to 94	Initial reading:				<ul style="list-style-type: none"> <li>This function is not currently supported.</li> <li>Sets minimum target boiler temperature during call for heat from 2nd CH circuit (same function as T<sub>1foot</sub> for first CH circuit).</li> </ul>
				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:				<ul style="list-style-type: none"> <li>This function is not currently supported.</li> <li>T<sub>6differential</sub> is the differential (hysteresis) for call for heat from 2nd CH circuit when 2nd CH circuit is master. Boiler starts when outlet temperature drops T<sub>6differential</sub> below target outlet temperature.</li> </ul>
				P	.	4	1	
				After 2 to 3 seconds:				
				Blank	Blank	Setting		

## Parameter reference table *(continued)*

Para.	Name	Range		Boiler display				Description
		Gascom software	Boiler display	Display position:				
				1st	2nd	3rd	4th	
42 1st digit	Special pump CH / DHW	0, 1, 2, or 3 (See right)	0 to 3	Initial reading:				First digit (Special pump CH/DHW): <ul style="list-style-type: none"> <li>• 0 — NOT RECOMMENDED Normal circulator operation for both CH and DHW.</li> <li>• 1 — NOT RECOMMENDED Boiler circulator off on CH call for heat. Normal circulator operation on DHW.</li> <li>• 2 — RECOMMENDED SETTING Boiler circulator normal operation. DHW circulator 5-second delay before starting.</li> <li>• 3 — NOT RECOMMENDED Boiler circulator off on CH call for heat. DHW circulator 5-second delay before starting.</li> </ul>
				P	.	4	2	
42 2nd digit	Low/Off cycle	0 (feature off) 1 (feature on)	0 or 1	After 2 to 3 seconds:				Second digit (Low/off cycle): <ul style="list-style-type: none"> <li>• 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.</li> <li>• The boiler will return to normal (modulating) operation if the burner is either off or on for at least 9 minutes.</li> </ul>
				Blank	Blank	Digit 1	Digit 2	

*Ultra* GAS-FIRED WATER BOILER — CONTROL ADDENDUM — Ultra Interface Kit

<b>Installation information</b>	
Boiler model	
Boiler CP number	
Boiler location	
Boiler location (continued)	
Altitude of location	
System type (brief description)	
Is an AM-4 installed?	
Installer/technician	
Installer/technician company name	
Company address	
Company address (continued)	
Installation or service date	
Installation or service date	
Installation or service date	

Parameter number changed	Original value	New value	Date of change	Reasons for changing parameter



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