



Better Boilers

## DC/HC Controller



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

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

### **WHAT TO DO IF YOU SMELL GAS:**

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

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

This Manual is also available in French - contact IBC or visit our web site [www.ibcboiler.com](http://www.ibcboiler.com)

**⚠ WARNING**

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

# SAFETY CONSIDERATIONS

Installation, start-up and servicing of IBC boilers / water heaters must be done with due care and attention, and should only be performed by competent, qualified, licensed and trained heating technicians. Failure to read and comply with all instructions and applicable National and local codes may result in hazardous conditions that could result in property damage and injury to occupants which in extreme cases might result in death.

# HAZARDS & PRECAUTIONS

**⚠ DANGER**

Points out an immediately hazardous situation which must be avoided in order to prevent serious injury or death.

**⚠ WARNING**

Points out a potentially hazardous situation which must be avoided to prevent serious injury or death.

**⚠ CAUTION**

Points out a potentially hazardous situation which must be avoided to prevent possible moderate injury and/or property damage

**⚠ NOTE**


Points out installation, maintenance and operation details that will result in enhanced efficiency, longevity and proper operation of your boiler.

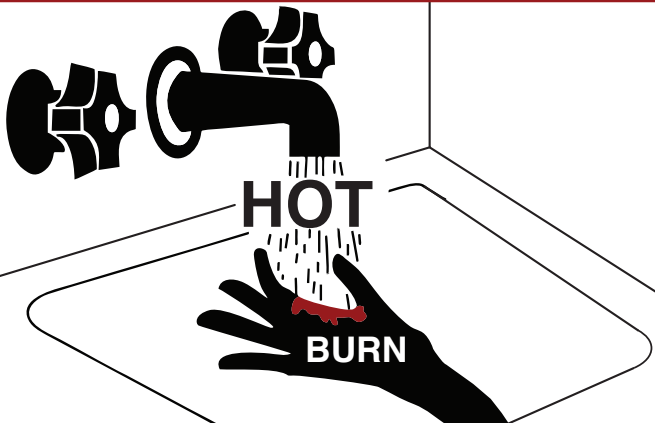
**⚠ BEST PRACTICES**

Points out recommendations for better installation.

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DANGER



- Water temperature over 125°F (52°C) can cause severe burns instantly or death from scalds.
- Children, disabled, and elderly are at highest risk of being scalded.
- See instruction manual before setting temperature at boiler.
- Feel water before bathing or showering.
- Temperature limiting valves are available, see manual.

### WATER HEATER INSTALLATION GUIDELINES



#### WARNING

- This boiler must be installed in accordance with local codes, if any; if not follow the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CAN/CSA B149.1, as applicable.
- Failure to correctly install and operate this appliance can result in severe personal injury or death.
- The water heater, if utilized, shall have a pressure relief valve installed within 6" [152mm] of the DHW HOT outlet connection.  
Refer to the Boiler User's Manual before operating relief valve.
- The water heater, if utilized, requires a pressure relief valve identified with the ASME V or HV symbol and set to relieve at or below 150psi of domestic water pressure and a minimum relieving capacity of 125,000 Btu/hr with 3/4" NPT threads. For safe operation of the water heater, the relief valve must not be removed from its designated point of installation or plugged.
- For complete information refer to installation manual.
- Read and follow warnings and instructions.

#### CAUTION

- Hotter water increases the risk of scald injury. Before changing the temperature setting, see instruction manual.

#### ADJUSTABLE TEMPERATURE SETTING

- Press the  and hold for 2 seconds, then press again. When the  LED is lit, the Domestic Hot Water temperature can be set.

# 1.0 BOILER / WATER HEATER SYSTEMS AND OPERATION

## 1.1 GENERAL

The DC series modulating condensing boilers / water heaters are designed to heat both your indoor space and your domestic hot water. The boiler / water heater’s unique heat exchanger design incorporates separate copper water ways for space heating and for domestic hot water generation.

The boiler / water heater’s control is equipped to provide outdoor reset control for the space heating load and also can provide a set-point water temperature for the space heating load. Installing the outdoor sensor is optional but recommended for additional efficiency.

The boiler / water heater is equipped with a factory installed pump. The pump is pre-wired and will operate with any call for space heating and when heating an IBC indirect water heater. The pump will not operate with a call for domestic hot water using the internal domestic hot water tankless coil.


The boiler / water heater pump will operate for 10 seconds every 24 hours to help prevent pump from seizing. The pump will be energized 24 hours after the last call for heat and every 24 hours after that until the next call for heat.

The DC series boiler / water heater can generate domestic hot water in several ways. The DC series boiler / water heater can be used as a tankless water heater with or without a storage tank and also with an IBC indirect water heater.

The boiler / water heater is equipped with an electronic controller, which ignites the burner and continuously monitors the flame throughout each call for heat. The control also displays the current operating conditions of the boiler / water heater and any error messages should a problem occur.

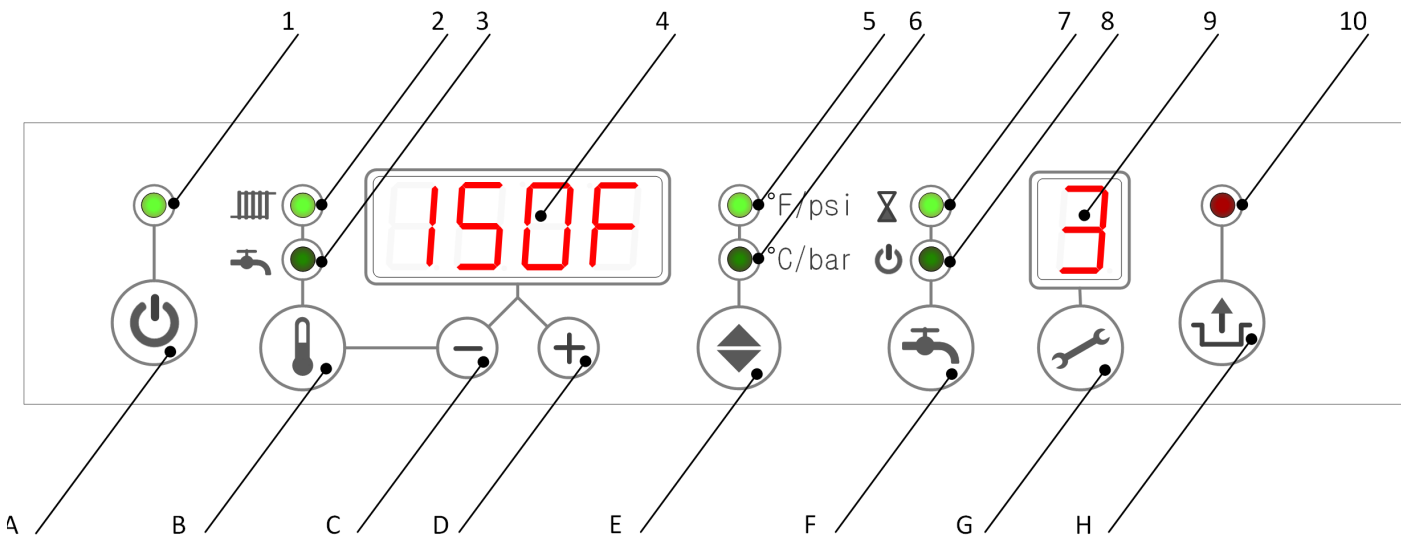
The boiler / water heater’s controller also provides frost protection. When the boiler / water heater’s heat exchanger becomes too cold the burner switches on to keep the heat exchanger warm. Please ensure that the condensate trap is protected from freezing. The boiler / water heater must be installed indoors in a heated space.

! **DANGER**



- Water temperature over 125°F (52°C) can cause severe burns instantly or death from scalds.
- Children, disabled, and elderly are at highest risk of being scalded.
- See instruction manual before setting temperature at boiler.
- Feel water before bathing or showering.
- Temperature limiting valves are available, see manual.

## 1.2 CONTROL





<b>1</b>	Power Indicator	<b>A</b>	Power - ON / OFF
<b>2</b>	Space Heating	<b>B</b>	Space Heating / DHW Toggle
<b>3</b>	Domestic Hot Water	<b>C</b>	Minus
<b>4</b>	Main Display	<b>D</b>	Plus
<b>5</b>	Fahrenheit and PSI	<b>E</b>	Fahrenheit/Celsius
<b>6</b>	Celsius and Bar	<b>F</b>	Domestic Hot Water Comfort / Eco
<b>7</b>	Comfort / ECO / OFF - Indicator	<b>G</b>	Service
<b>8</b>	Comfort / ECO / OFF - Indicator	<b>H</b>	Reset Button
<b>9</b>	Service Display		
<b>10</b>	Flashes to indicate a fault		

Table 8: Controller Indicators and Buttons

**NOTE:** The control displays codes that include upper and lower case letter and a combination with a period after the letter. Example: C, c., c are all valid parameter codes. When adjusting settings, double check that you are in the correct parameter.


## 1.3 INSTALLER INTERFACE

### 1.3.1 Appliance ON/OFF

The boiler / water heater can be switched on and off with the On/Off  button. When the boiler / water heater is “ON”, the green LED above the On/Off  button will be on. When the boiler / water heater is on and there is no call for heat or DHW the displays are blank. When the boiler / water heater is “OFF” the main display reads the system pressure, e.g. “14P” for 14 psi.

If the boiler / water heater is being powered up after a power outage, the boiler / water heater will return to heating as it was when the power was removed from the boiler / water heater.

### 1.3.2 PSI and Fahrenheit / Bar and Celsius





PSI and Fahrenheit are the default setting as shipped from the factory. To change to Bar and Celsius simply press the  to toggle Fahrenheit and Celsius.

### 1.3.3 Programing Mode





There are 2 parameters available in the User Set-Up Menu.

#### USER MENU



##### Adjusting the Space Heating Water Temperature

To enter the User Menu simply hold down the Space Heating /DHW Toggle  button for 2 seconds. The LED beside the  will illuminate and the current maximum heating system water temperature will be displayed in the 4 digit display. To alter this value simply press the Plus  or the Minus  buttons.

##### Adjusting the Domestic Hot Water Temperature




Press the Space Heating /DHW Toggle  button a second time and the LED beside the  will illuminate and the current tankless domestic hot water temperature target is displayed in the Main Display. To alter this value simply press the Plus  or Minus  buttons.


##### Saving the Changes

To exit from the User Menu and save the changes press the Reset  button. Pressing the On/Off  button will also exit the User Menu but will NOT save the changes.



The Controller has four levels: User Menu, Installer Menu code (15), a Master Installer Menu code (20), RF Menu code (30),(future use.)

#### INSTALLER MENU




To enter the Installer Menu press and hold the Service  and Reset  buttons together until a “0” appears in the main display. Press the Plus  button repeatedly until “15” appears in the main display.


Press the Service  button to scroll through the parameters.

Press the Plus  or Minus  buttons to alter a parameters setting.



To exit from the Installer Menu and save the changes press the Reset  button. Pressing the On/Off  button will also exit the Installer Menu but will NOT save the changes.

#### ADVANCED INSTALLER MENU

To enter the Advanced Installer Menu press and hold the Service  and Reset  buttons together until a “0” appears in the main display. Press the Plus  button repeatedly until “20” appears in the main display.

Press the Service  button to scroll through the parameters.




Press the Plus  or Minus  buttons to alter a parameters setting.

To exit from the Advanced Installer Menu and save the changes press the Reset  button. Pressing the On/Off  button will also exit the Advanced Installer Menu but will NOT save the changes.

### 1.3.4 Table of Programmable Parameters

**NOTE**

The domestic hot water thermostat is adjusted to its lowest temperature position when shipped from the factory. It’s recommended to set the domestic hot water thermostat to 120°F/49°C as an initial setting and further adjust as required. For energy efficient operation, this setting should be set as low as practical for the consumer’s needs.

PARAMETER	DESCRIPTION	DEFAULT	RANGE / OPTIONS
<b>USER SET UP</b>			
	Boiler / Water Heater Supply Temperature	180°F (82°C)	86°F (30°C) to 194°F (90°C)
	Tankless Domestic Hot Water Temperature	120°F (49°C)	104°F (40°C) to 149°F (65°C)
<b>15 - INSTALLER SET UP MENU</b>			
1	System Type (SEE CHART BELOW FOR ADDITIONAL DETAILS)	DC series = 0 HC series = 1	DC - 0 – Both Space Heating and Tankless DHW HC - 1 – Space Heating and Indirect DHW Tank. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. DC - 2 – Tankless DHW Only HC - 3 – Space Heating Only DC - 4 – Space Heating and Tankless DHW with a Storage Tank. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. DC - 5 – Tankless DHW with a Storage Tank Only. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. DC – 6 – Space Heating, Indirect DHW Tank and Tankless DHW
5	Min Heating Curve Supply Water Temp	90F (32°C)	50°F (10°C) to 194°F (90°C) Must be at least 18°F (10°C) lower than Parameter “5.”
5.	Max Heating Supply Water Temp	194°F (90°C)	Range 86°F (30°C) to 194°F (90°C)
6	Min Outdoor Design Temp	14°F (-10°C)	Range to -22°F (-30°C) to 55°F (13°C)
7	Summer Shut Down Temperature	64°F (18°C)	Range 59°F (15°C) to 86°F(30°C) Pump and burner will not operate if the Outdoor Temperature is above this setting
8	Internal Boiler / Water Heater Pump Post Purge	1 min	Range 0 min to 15 min
9	External DHW Pump Post Purge	1 min	Range 0 min to 15 min
L	Indirect Tank Temperature if using a sensor. Note: Use only IBC 10KΩ Sensor	140°F (60°C) Fixed tank differential of 9°F (5°C) below the set-point, must use an IBC 10KΩ tank sensor	104°F - 149°F (40°C – 65°C)
L.	Tankless DHW with Storage Tank offset temperature (Boiler / Water Heater operates at the Tankless Domestic Hot Water Temperature setting plus this offset temperature to efficiently generate DHW)	18°F (10°C)	2°F – 27°F (1°C – 15°C) Fixed tank differential of 9°F (5°C) below the set-point, must use an IBC 10KΩ tank sensor.
n	Boiler / Water Heater Water Supply Temp for heating Indirect DHW Tank	170°F (77°C)	Range 149°F (65°C) to 194°F (90°C)
n.	Comfort and ECO Comfort Mode: Heat exchanger temperature maintained while in standby	110°F (43°C)	Range 0 or 104°F – 149°F (40°C – 65°C) <b>NOTE:</b> If set to 0 then the temperature will be the same as the temperature set for the Tankless DHW in the user menu.
O.	Space Heating Delay (min)	0 min	Range 0 – 15 min: The Boiler / Water Heater will not respond to a Space Heating call for X min.




**NOTE:** The control displays codes that include upper and lower case letter and a combination with a period after the letter. Example: C, c., c are all valid parameter codes. When adjusting settings, double check that you are in the correct parameter.



o	Space Heating Delay after heating DHW	0 min	Range 0 – 15 min: The boiler / water heater will not respond to a call for heat after the tankless DHW call for heat has ended for X min.
<b>20 - ADVANCED INSTALLER MENU</b>			
3	Maximum Power available for Space Heating	100%	Parameter “c” value to 100%
3.	Max Pump Speed (PWM) Space Heating Only	100%	For use only with a PWM style pump (Terminal X4.5)
4	Max DHW power	Model Dependent	HC 13-50, HC/DC 15-95, HC/DC 15-96, HC/DC 20-125 = 100 HC/DC 33-160 = 77
C	Burner Modulation (Ramp up) with a Space Heating Demand	1	0 = OFF 1 = ON 2 = Open Therm control
c	Min fan speed in Space Heating	Model Dependent	HC 13-50 = 28% HC/DC 15-95, HC/DC 15-96 = 18% HC/DC 20-125 = 20% HC/DC 33-160 = 22%
c.	Min Pump Speed (PWM)	Space Heating Only	40%
d	Min Fan power during Tankless DHW	Model Dependent	Range – 18-50% HC/DC 15-95 and HC/DC 15-96 = 18% HC/DC 20-125 = 20% HC/DC 33-160 = 22%
E	Minimum Space Heating Temperature with an Open Therm heating demand	104°F (40°C)	50°F – 140°F (10°C – 60°C) Only for use with an Open Therm thermostat
E.	Open Therm or RF Space Heating Control	1	0 = Ignore a call for heat if the target temperature is less than “E” 1 = Answer a call for heat with a temperature equal to “E” 2 = Answer a call for heat with a temperature equal to that set in the user menu “Boiler Maximum Temperature”
F	Fan RPM at Burner Start for Space Heating	Model Dependent	50-100% of High Fire HC 13-50 = 70 HC/DC 15-95, HC/DC 15-96 = 60 HC/DC 20-125 and HC/DC 33-160 = 40 (Range = 40-70)
F.	Fan RPM at Burner Start for Tankless DHW	Model Dependent	50-100% of High Fire HC/DC 15-95 = 60 HC/DC 15-96 = 60 HC/DC 20-125 and HC/DC 33-160 = 40 (Range = 40-70)
h	Max Fan Speed Adjustment	Model Dependent	Range: 40-50 HC 13-50 = 47 HC/DC 15-95 , HC/DC 20-125, HC/DC 33-160 = 65 HC/DC 15-96 = 66
o.	DHW ECO mode Learning Days	3 days	Range 1 to 10: Number of days the ECO mode uses to learn the Tankless DHW usage habits. Rolling counter. If set to 0 Opentherm will control Eco Comfort Mode Occupied or Un-Occupied.

**NOTE:** The control displays codes that include upper and lower case letter and a combination with a period after the letter. Example: C, c., c are all valid parameter codes. When adjusting settings, double check that you are in the correct parameter.



P	Space Heating Delay after the boiler / water heater reaches the target temperature	2 min	Range 0 – 15 min: The boiler / water heater will remain off for X min to help reduce short cycling when the heating load is smaller than the min firing rate.
P.	Heat Exchanger Size Reference	Model Dependent	HC 13-50 = 24 HC/DC 15-95 and HC/DC 15-96 = 30 HC/DC 20-125 and HC/DC 33-160 = 36

<b>PARAMETER 1 SETTINGS</b>	<b>LOAD PRIORITY: 0 = HIGHEST</b>	<b>PARAMETER NUMBER 1: DETAILED DESCRIPTION</b>
0	0 = Tankless DHW 1 = Space Heating	DC Models – Both Space Heating and Tankless DHW <ul style="list-style-type: none"> <li>• Internal Boiler / Water Heater Pump is enabled with a call for Space Heating</li> <li>• Internal Boiler / Water Heater Pump is disabled with a call for Tankless DHW</li> </ul>
1	0 = Indirect DHW Tank Sensor or Aquastat 1 = Space Heating	HC Models – Space Heating and Indirect DHW Tank. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. <ul style="list-style-type: none"> <li>• Aquastat or Sensor connected to X4.9 and X4.10</li> <li>• Internal Boiler / Water Heater Pump is enabled for both Space Heating and for DHW heating</li> <li>• External Pump Terminals 4,5,6 (120Vac - 1Amp Max) enabled with a call for DHW</li> </ul>
2	0 = Tankless DHW	DC Models – Tankless DHW Only <ul style="list-style-type: none"> <li>• DHW only, Space Heating Disabled</li> <li>• Internal Pump disabled</li> </ul>
3	0 = Space Heating	HC Models – Space Heating Only <ul style="list-style-type: none"> <li>• Internal Boiler / Water Heater Pump is enabled with a call for Space Heating</li> </ul>
4	0 = DHW Storage Tank Sensor or Aquastat 1 = Space Heating	DC Models – Space Heating and Tankless DHW with a Storage Tank. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. <ul style="list-style-type: none"> <li>• Aquastat or Sensor connected to X4.9 and X4.10</li> <li>• External Pump Terminals 4,5,6 (120Vac - 1Amp Max) enabled with a call for DHW</li> <li>• Internal Boiler / Water Heater Pump is enabled with a call for Space Heating</li> <li>• Internal Boiler / Water Heater Pump is disabled with a call for Tankless DHW</li> <li>• External DHW Pump is enabled with a call for Tankless DHW</li> </ul>
5	0 = DHW Storage Tank Sensor or Aquastat	DC Models – Tankless DHW with a Storage Tank Only. DHW must be turned on by pressing the Tap  . Bottom LED must be ON. <ul style="list-style-type: none"> <li>• Space Heating is disabled</li> <li>• Aquastat or Sensor connected to X4.9 and X4.10</li> <li>• External Pump Terminals 4,5,6 (120Vac - 1Amp Max) enabled with a call for DHW</li> <li>• Internal Boiler / Water Heater Pump disabled</li> <li>• Internal Boiler / Water Heater Pump is disabled with a call for Tankless DHW</li> </ul>

**NOTE:** The control displays codes that include upper and lower case letter and a combination with a period after the letter. Example: C, c., c are all valid parameter codes. When adjusting settings, double check that you are in the correct parameter.

6	0 = Tankless DHW 1 = Indirect DHW Tank Sensor or Aquastat 2 = Space Heating	DC Models – Space Heating, Indirect DHW Tank and Tankless DHW <ul style="list-style-type: none"> <li>• External Pump Terminals 4,5,6 (120Vac - 1Amp Max) enabled with a call for DHW</li> <li>• Internal Boiler / Water Heater Pump is enabled for both Space Heating and for Indirect DHW</li> <li>• Internal Boiler / Water Heater Pump is disabled with a call for Tankless DHW</li> </ul>
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**NOTE ON CHECKING FLAME CURRENT:**

Allow the boiler / water heater to ignite / run against a large load, to maintain high fire. Enter the High Fire Manual Mode by pressing both the Service  and Plus **+** buttons together twice. “H” will be showing in the service display. Allow the boiler / water heater to operate at High Fire for 3 minutes to stabilize. (The boiler / water heater will operate in manual mode for 10 minutes then switch back to the normal operating mode. To extend manual mode operation, press the Service  and Plus **+** together twice while the boiler / water heater is operating in manual mode to reset the timer for 10 more minutes.)

Pressing and holding **+** for more than 2 seconds while in the Service Mode will display the Flame Current in DC microamps. Expect approximately 9.8µA at High Fire (minimum 6.5µA or greater at Low).


## 1.4 TANKLESS DOMESTIC HOT WATER MODES

### 1.4.1 Tankless Domestic Hot Water - Standard, Comfort and ECO Comfort Modes

**Standard Mode (both LEDs are off):** The boiler / water heater's heat exchanger will not maintain its domestic hot water temperature between demands for hot water. The boiler / water heater will respond to a call for domestic hot water as a priority over the space heating demand. When the domestic hot water demand is satisfied the boiler / water heater will return to the space heating load if the load is still calling.

**Comfort Mode (the bottom LED is on):** The boiler / water heater's heat exchanger will maintain the pre-programmed temperature set in parameter n. or as set for the Tankless hot water temperature. This temperature will be the minimum temperature of the heat exchanger at all times unless the boiler / water heater is heating a lower temperature load.

**ECO Comfort Mode (the top LED is on):** This mode operates like the Comfort Mode but has the added advantage of learning when the domestic hot water is used. During the low use periods the boiler / water heater's heat exchanger is allowed to cool.

To toggle between the 3 modes simply press the Domestic Hot Water Comfort / Eco  button.

## 1.5

## ADDING DOMESTIC HOT WATER STORAGE

### 1.5.1 Tankless Domestic Hot Water with a Storage Tank

The DC series boiler / water heater has the ability to connect a domestic hot water storage tank to the boiler / water heater to provide larger volumes of domestic hot water during peak demands.

The storage tank will be piped to the boiler / water heater's domestic hot and cold water piping connections (*see Figure #30 in Installation Manual*). A bronze or stainless steel pump must be installed to circulate water from the storage tank through the boiler / water heater's domestic hot water coil. The pump and the tank aquastat can be wired directly to the boiler / water heater's control for ease of installation.

Alternately, the pump and aquastat can be wired together without connecting to the boiler / water heater. When the pump is energized, the flow of water through the domestic hot water coil

**⚠ WARNING**

The correct 10KΩ temperature sensor (or aquastat) must be used to operate the indirect water heater properly. If the incorrect sensor is used the domestic hot water may overheat causing serious injury or death.

**1.6**

in the boiler / water heater will be sensed by the flow sensor and activates the boiler / water heater. The boiler / water heater will switch off its internal pump and operate at its programmed water temperature.

**1.5.2 Domestic Hot Water with an IBC Indirect Water Heater**

The DC series boiler / water heater can be connected to an IBC indirect water heater. Connect the IBC indirect water heater’s boiler supply and boiler return connections to the boiler / water heater’s primary loop (see *Figure #28 in Installation Manual*). Properly sized piping must be installed. A properly sized pump must also be installed between the boiler / water heater and the IBC indirect water heater.

**SPACE HEATING**

**1.6.1 Overview**

The DC series boiler / water heater is designed to be installed in a primary/secondary type piping system. The boiler / water heater comes complete with a factory installed boiler / water heater pump. The pump is designed to circulate heating system water through the boiler / water heater’s heat exchanger and primary loop piping only. The building’s distribution piping system requires a dedicated pump or pumps to provide circulation of the space heating water through the heating system. The building pump or pumps will require a separate control system or relays to operate the pumps.

Zoning of the space heating system can be accomplished many ways. Several control packages are available from your local wholesaler and offer an easy method of connecting the zoning system to the boiler / water heater. Example piping and electrical drawing are available at [www.ibcboiler.com](http://www.ibcboiler.com)

The boiler / water heater supplies heat to the space using an Outdoor Reset Curve. With an outdoor sensor installed the boiler / water heater will automatically adjust its space heating water temperature based on the parameters programmed into the boiler / water heater. See *Section 1.3.4 for parameter information*. If the Outdoor Sensor is not installed, the boiler / water heater will use the temperature set in the User Set Up menu “Boiler Supply Temperature” to supply hot water to the space heating system.


# 1.7 SEQUENCE OF OPERATION

**NOTE**

The boiler / water heater is equipped with a Frost Protection feature. This feature will operate the boiler pump and the burner to help protect the boiler / water heater from freezing. If the boiler / water heater is in a hard lock-out condition the burner will not operate, however the boiler / water heater pump will operate. IBC is not responsible for damages to the boiler, and/or related components, nor property damages that may result from freezing conditions.

The boiler / water heater will operate in a similar way for both a space heating and a domestic hot water call for heat. When the boiler / water heater is powered up the controller enters a self diagnostic mode and displays 2 in the Service Display.

The Sequence of Operation is as follows:

1. The boiler / water heater receives a call for heat from closing terminals X4.6 and X4.7 (24 volts). The boiler / water heater can also receive a call from Domestic Hot Water heating from the internal flow sensor, or from a 10KΩ sensor or aquastat (X4.9 and X4.10 in 24V terminal).
2. The boiler / water heater does a safety check and energizes the fan for a pre-purge (Service Display = 3)
3. Once the 5 second pre-purge is complete, the boiler / water heater enters a 5 second trial for ignition (Service Display = 4). If the boiler / water heater fails to ignite, the boiler / water heater will complete a 5 second inter-purge then another 5 second trial for ignition. This is repeated 4 times before a hard lock out occurs. The Reset button  must be pressed to reset the controller and allow for another attempt.
4. Once the burner is lit and flame has been proven the boiler / water heater operates as it is programmed (Service Display = 5 for Space Heating or 6 for Domestic Hot Water)
5. If the boiler / water heater reaches its target temperature and there is still a call for heat or hot water. (Service Display = 1)
6. After the call for heat is satisfied, the boiler / water heater pump will operate for an adjustable amount of time (Service Display = 0)
7. If the burner is on to maintain the heat exchanger temperature for DHW Comfort mode or for Freeze Protection mode (Service Display = 7)
8. If the burner is on for Frost Protection (Service Display = 9)



MAIN DISPLAY	SERVICE DISPLAY	DESCRIPTION
[Pressure]	-	The boiler / water heater is OFF. Press the On/Off button to turn on the boiler / water heater
(blank)	(blank)	No Call for Heat - Standby
XXX	0	Boiler / water heater pump running – pump post purge
XXX	1	Boiler / water heater water temperature reached target – boiler / water heater pump is energized, call for heat still present
XXX	2	Self-test – When power is applied to the boiler / water heater the controller enters a self diagnostic mode for 5 seconds
XXX	3	Fan Pre-purge , Inter-purge and Post-purge
XXX	4	Trial for Ignition and Flame Proving
XXX	5	Heating – Space Heating
XXX	6	Heating – DHW
XXX	7	Burner on for Comfort mode or Freeze Protection mode

Table 9: Operating Display and Service Display Codes.

# REVISION HISTORY

**R1 (JUNE 2017)**

Initial release

**R2 (MAY 2018)**

**ADDITION OF NEW MODELS HC/DC 15-95, HC/DC 15-96**

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**120-292-A-R2**

**88035702**

May 2018

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