

MULTI BOILER SET-UP NOTES

USING A SINGLE EXTERNAL SIGNAL TO A MASTER BOILER TO OPERATE A BANK OF IBC BOILERS

These instructions are relevant to set the IBC controls to operate a multiple boiler array from a single external 0 to 10Vdc or 4-20 mA signal. Refer to separate notes when setting up opt-out applications or individual boiler control from multiple input signals.

If you define the load as “Ext. Control” we require either a 4-20 milliamp or 0-10Vdc signal applied to the “Ext. Cont.” terminals. There is an option (detailed later) to operate the master boiler with only the external control signal, but it is common practice to use the dry contact closure as an enable signal “go” and the external control signal input as a modulation signal “go hard, or soft, or somewhere in between”.

Determine the external signal to be applied. It can be either 4-20 milliamp or 0-10Vdc. Position the lower right hand circuit board jumper to the correct signal position (refer to Installation and operation manual for the boiler).

To start, select which boiler will be the **Master boiler**, and under the **Installer Setup Menu**, go to **Heat Load Configuration**.

Define Load 1 should be set to **Ext. Control**

Define Load 2 should be set to **Off**

Define Load 3 should be set to **Off**

Scroll down to **Configure Load 1**, and hit the Enter (center) key to access the Configure menu.

Set the **Maximum Supply Temp.** (41°F to 190°F selectable) higher than what the maximum design temp will be plus at least two degrees more than ½ the **Supply Diff'l Temp.**

Example: if your **Max. Control Temp.** is going to be 180°F, and the **Supply Diff'l Temp.** is going to be 6°F, you should set the **Maximum Supply Temp.** to at least 3°F plus 2°F = 5°F higher, or 185°F

Scroll down to **Ext. Input for**, and set it to **Set Point**

Scroll down to **Burner On from**, and set it to:

Choice A – **Therm.**

Setting to **Therm.**, will require a dry contact closure be applied to the **Therm. 1** terminals before the boilers will fire.

Choice B – **Ext. Cont.**

Setting to **Ext. Cont.**, eliminates the need for a dry contact closure. The boilers will start up when the control signal is increased above 2 Volts DC or 4 Milliamps, depending on the type of current signal you are using. Make sure the control signal jumper (bottom right on the circuit board) is in the correct position for your input signal. Two leftmost pins for 0-10 V or two rightmost pins for 4-20 mA

Scroll down to **Max. Control Temp.** (32°F to 190°F selectable) and set it for the required highest operating temperature the system will require the boilers will operate at that temperature when they receive the maximum control current (10V or 20 mA)

Scroll down to **Min. Control Temp.** (32°F to 190°F selectable) and set it for the required lowest operating temperature the system will require the boilers will operate at that temperature when they receive the minimum control current (0V or 0 mA if there is a Therm. contact - 2V or 4 mA if set to Ext. Cont.)

Scroll down to **Failsafe Temp.** and set it to:

Choice A – **Disable**

Setting to **Disable**, will remove this function from the control operation.

Choice B – If you deselect **Disable**, a temperature will appear on the screen. Set this temperature to a desired set point value that will allow for automatic emergency operation of the heating plant should the control signal drop to zero due to an external control failure. **Important note** – if you are using a contact closure to enable the system via the Therm 1 input, the contacts must remain closed for the **Failsafe Temp.** function to work.

Scroll down to **Supply Diff'l Temp.** (5°F to 60°F selectable) Set it as low as is practical for your system. As a rule of thumb, the more boilers there are in a system, the lower you can set the **Supply Diff'l Temp.** If the boiler water temperature rises to the **Maximum Control Temp.** setting and the boilers throttle down to their minimum firing rate, the water temperature will be able to increase by ½ the differential over the **Maximum Control Temp.** setting before the boilers are all shut down. The **Maximum Supply Temp.** must be set at least 2°F above the **Maximum Control Temp.** setting plus ½ the **Supply Diff'l Temp.** setting, or unstable operation and unnecessary shut-downs will occur.

Scroll down to **Ramp Speed.** (Auto, 1 to 10 selectable) The factory default setting is Auto. The ramp speed determines how fast the control will allow the system to heat up. Normally, the Auto setting will give satisfactory heat-up times, however it can be manually adjusted if required. Ramp speed 10 is a faster heat-up, ramp speed 1 is for a delayed heat-up. It may be useful during commissioning to set this manually to 10 in order to expedite the start-up process.

Scroll past **Priority**, this setting has no function in this single load control set-up.

Scroll down to **Pump Purge Time.** (Zero to 900 seconds selectable) The factory default setting is Zero seconds. This setting has no relevance unless the Load 1 pump relay is utilized to operate the building main circulating pump. Experience has shown that this is a function that is not often utilized in larger buildings. If it is used, the load 1 pump contact will close on a call for heat, and will open when the call for heat is removed, and after the selected **Pump Purge Time** has elapsed. **Important note** – the internal control relays of the IBC boiler are rated for a maximum current draw of 5 Amps. Most building pumps will require an isolation relay contactor sufficient to withstand higher current draws.

Scroll down to **Water Temp. from:**

Choice A – **Outlet**

Setting to **Outlet**, will control the loop temperature based on the readings from each boiler's outlet temperature sensor.

Choice B – **Sec. Loop**

Setting to **Sec. Loop**, will control the loop temperature based on the readings from a temperature sensor installed in the building loop, downstream from the boiler/building loop injection point. IBC supplies this sensor at a minimal cost.

Choice C – **DHW**

Not applicable to this application

Load configuration is now complete for the Master boiler – continue with Master Boiler Installer Setup Menu

To continue with the Master boiler setup, go back to the general **Installer Setup Menu**.

Scroll down past the **Logs** menu (not applicable for this set-up), optional stop and adjust the **Contrast Adjustment** if required (adjusting the contrast of the display screen can make it easier to read), optional stop at **Select Temp Scale** (F° or C° as desired). Scroll down past the **Password On/Off** menu (see installation manual for instructions regarding this setting).

Scroll down to the **Altitude** setting. (000 feet to 8000 feet selectable) Factory default 000 feet. Enter the altitude of the boiler plant (5 = 500 feet, 15 = 1,500 feet, 30 = 3,000 feet, etc.).

Scroll down to **Load Control** (Pumps or Valves selectable) The factory default setting is **Pumps**. This setting has no relevance unless the building pump will be operated from the IBC Master boiler contacts. It should be left at the default setting.

Scroll down to **Prim. Pump Purge Time** (60 to 900 seconds selectable) The factory default setting is 300 seconds. This setting determines how long the boiler's own pump will operate after it shuts down its burner. A boiler (primary) pump purge, helps reduce temperature in the boiler after it shuts down, by moving the excess heat into the main loop.

Scroll down to **Pump Purge** The factory default setting is **Off**. Turn this to **On**, if you want to enable the **Prim. Pump Purge Time** setting.

Scroll down past **VS Output for...** (not relevant to this application), Scroll down past **Min. Variable Speed %** (not relevant to this application) , Scroll down past **Max. Variable Speed %** (not relevant to this application) , Scroll down past **Air Sensor** The factory default setting is **Stack Temp**. (active in SL 80-399 boilers, inactive with all other IBC boiler models). Do not change this setting. Note: Boiler models other than the SL 80-399 can be fitted with optional stack temperature sensors – contact the Factory for more information.

Scroll down to **MultiBoiler Config**. And press the Enter key to access this menu.

Follow these next crucial steps for the Master Boiler Only

Master Boiler setting. Factory default is **Off**, turn this setting to **On**. All other boilers will be set to Off.

Scroll down to **Boiler ID**. This must be set to **1** (one) for the Master Boiler Only. All other boilers will have a different ID number, none of which can be #1.

Scroll down to **Staging Delay (hh:mm)** (00:00 to 23:59 selectable) The Factory default setting is **00:10** (10 minutes) Staging delay is normally the time it takes the system fluid to make one complete circuit from the boiler, back to the boiler. Each additional boiler will be held off until the delay has timed out.

Scroll down to **Boiler Rotation** Factory default is **Off**, turn to **On** if equal run time rotation is desired. Maximum 48 hour run-time difference between boilers is invoked.

Scroll down to **FixedLead** Factory default is **On**, turn this to **Off** unless you want the same boiler to be the lead boiler every time there is a new call for heat. In conjunction with the next **Firing** setting, a smaller lead boiler can be used to allow for micro load management in warmer weather to avoid short-cycling

Scroll down to **Firing** Factory default is **FirstOn/FirstOff**, this will operate a fixed lead boiler as the first to fire, and will aid in equal run-time by turning it off first when more than one boiler is firing. Setting this to **FirstOn/LastOff**, will keep the lead boiler firing whenever there is a call for heat – not normally recommended.

Scroll down past **FixedFire Boilers Sel.** **** (not relevant to this application).

Scroll down to **Add Boiler Level** (40 to 60 selectable) Factory default 60. This is the percentage firing rate at which we bring on additional boilers. For example when set at 60, and a SL 80-399 lead boiler reaches approximately 240,000 Btuh, another boiler will be brought on.

Scroll down to **Drop Boiler Level** (20 to 30 selectable) Factory default 25. This is the percentage firing rate at which we turn off a boiler as the plant throttles down. For example when set at 25 and an additional SL 80-399 boiler throttles down to approximately 100,000 Btuh, it will be shut down.

To continue with the Master boiler setup, go back to the general **Installer Setup Menu**.

Scroll down past **Load Pairing** (not relevant to this application), Scroll down past **Cleaning Menu** (not relevant to this set-up procedure).

Scroll down to **System Information** and enter the software version on the start-up sheet for the boiler

The Master Boiler set-up is now complete - To continue the multi-boiler plant set-up:

Go to the next boiler in line and under the **Installer Setup Menu**, go to **Heat Load Configuration**.

Define Load 1 should be set to **Off**

Define Load 2 should be set to **Off**

Define Load 3 should be set to **Off**

After this step, press the Left (4) Key, to re-enter **Installer Setup Menu**.

Enter **Multi Boiler Config**. and set the Master Boiler setting to **Off**.

Scroll down to **Boiler ID** and set the number to **2**.

To continue the boiler plant set-up, go to the next boiler in line and under the **Installer Setup Menu**, go to **Heat Load Configuration**.

Define Load 1 should be set to **Off**

Define Load 2 should be set to **Off**

Define Load 3 should be set to **Off**

After this step, press the Left (4) Key, to re-enter **Installer Setup Menu**.

Enter **Multi Boiler Config**. and set the Master Boiler setting to **Off**.

Scroll down to **Boiler ID** and set the number to **3**.

Repeat this step for each additional boiler, giving a different ID# to each boiler until you have configured them all.

Ensure that the boiler net wiring is complete as per the Multi-boiler tech memo instructions and ensure that the intermediate circuit board jumpers have been removed as instructed in the memo.

Test the operation of the boiler plant by enabling the master boiler and applying a variety of external input current signals to ensure correct operation.