

## INSTRUCTION SHEET

# *FireRight jr*

HEATING CAPACITY CONTROLLER  
for Ceramic Kilns



### GENERAL INFORMATION

The *FireRight jr* is a precision electronic heating capacity controller. The unit is specially designed for use with ceramic kilns.

The controller regulates the kiln's heating system using a method called "*time proportioning*". In this method, the heaters are repetitively switched on and off every 30-seconds, which is called the "*cycle time*". The heating rate is regulated by varying the "on" time during each 30-second cycle. This is called the "*duty-cycle*", and is usually expressed as a "%" of the cycle time.

For example, to set the kiln at "medium" heat, the *FireRight jr* can be manually set to provide a 50% duty cycle. The kiln's heaters will then be switched on for the first 15-seconds of each 30-second cycle.

Although the heat is actually produced as a series of pulses, the long thermal time constant of the kiln dampens the system, making it appear as if the heat is being provided by a constant, infinitely variable source. In the “RUN” mode, the *FireRight jr* controls the heat-up rate by automatically increasing the length of the “on” time during each successive on-off cycle. The heat-up rate is adjusted by means of a “TURN-UP TIME” dial, which has a range of zero to 10-hours.

A “SET” position on the mode switch provides a means of manually adjusting or presetting the kiln’s heating rate, which is conveniently indicated in “%” on a “bar-graph” type LED display. When released, the switch will return to the “STOP” mode, and the controller will maintain the heating duty cycle at the selected setting indefinitely. The bar-graph provides a flashing warning when the control is in the STOP mode. When ready to proceed, move the switch to the “RUN” position.

## INSTALLATION

The *FireRight jr* can be provided either as a panel suitable for flush mounting, or as a complete self-contained surface mounting controller. The flush mounting unit is usually installed on the kiln, and wired directly to a heating relay inside the kiln’s switch box. These units can be used with either 110vac or 220vac power, and are often provided on new kilns as a factory-installed option. The surface mounting unit contains its own heating relay, and is often mounted on the kiln room wall, instead of on the kiln. These units are designed for 208-240vac 50/60Hz single phase power, and will handle up to 48-amps. Please note that the operating temperature for either of these units must not exceed 50°C (131°F).

Flush mounting panels may be connected for either 110/120v or 208/240v. If using the panel mounting unit, hook it up according to diagram “C”, then jumper terminals x1 and x2 according to either diagram “A” or “B”. Surface mounting controllers are wired for 208/240vac only; make the line and kiln connections as shown in diagram “D”.

The *FireRight jr*’s on-off switching action will interfere with the operation of any motor-driven shut-off timer connected on the load side of the unit, since the timer will not run during the “off” periods. If it is not convenient to connect the heating relay downstream from the timer, it is possible to compensate for this error as noted below.

*Your electrical service carries **HIGH VOLTAGES**, which can inflict **LETHAL ELECTRICAL SHOCKS**. Improper connections can produce safety hazards, and may damage this device. If you have no wiring experience, or are unsure of your planned hook-up, **please refer wiring of this device to a skilled electrician.***

## WIRING INSTRUCTIONS

The *FireRight jr* provides a dc output suitable for driving Honeywell R8246A Quiet Heating Relays and general purpose solid state relays and power controllers.

When hooking up these units, polarity must be observed:

**Terminal 5 = (+)**  
**Terminal 6 = (-)**

The *FireRight jr* will interface with solid state relays or power controllers having standard 3-32vdc inputs. Connect **Terminal 5** to the SSR's (+) terminal, and connect **Terminal 6** to the SSR's (-) terminal.

When using Model 015005 to replace earlier models, the equivalent terminal designations are as follows:

<b>POWER CONNECTIONS</b>	
<b><u>208-240vac Power</u></b>	<b><u>110-120vac Power</u></b>
<b>L1 to "1"</b>	<b>L1 to "1"</b>
<b>L2 to "4"</b>	<b>L2 to "4"</b>
<b>Jumper "2" to "3"</b>	<b>Jumper "2" to "x1"</b>
<b>Ground to "GND"</b>	<b>Jumper "3" to "x2"</b>
	<b>Ground to "GND"</b>

## OPERATION

To operate the *FireRight jr* Heating Capacity Controller, proceed as follows:

1. Set the **TURN-UP TIME** dial to the desired turn-up period. This is the time required for the kiln to be turned up from 0% to 100% on. For example, if you normally use a three-hour "switch schedule" (on "low" for one hour, "medium" for two hours, then to "high"), set the dial at "3".
2. Move the **SET/STOP/RUN** switch to "RUN".
3. When ready to begin, move the **ON/OFF** switch to "ON".

If desired, the kiln may be manually adjusted to any heating level, and left at that level indefinitely (e.g., to "smoke out" sensible moisture prior to starting the firing). To do this:

4. Move the **ON/OFF** switch to "ON".
5. Move the **SET/STOP/RUN** switch to "SET".

6. When the duty cycle, as indicated by the bar-graph, reaches the desired level (e.g., “low” = 30% to 40%) move the **SET/STOP/RUN** switch to the “STOP” position.
7. If necessary, the control can be reset by turning it off, then back on.
8. When ready to complete the firing, move the **SET/STOP/RUN** switch to “RUN.”.

## **NOTE FOR *KilnSitters* WITH TIMERS**

To compensate a motor-driven shut-off timer for the error produced by the on/off time-proportioning action, consider the following:

During the turn-up operation, the “off” time will average out to exactly half the set “turn-up time”, so reduce the timer setting by this amount. For example, if the turn-up time is set at four hours, and the total firing time is expected to be about six hours, use a five hour shut-off timer setting to provide a seven-hour maximum allowable firing period (vis: during the first four hours, the timer will run for only 2-hours).

## **SERVICE**

Please refer questions to the kiln dealer or manufacturer from whom the control was purchased.

FireRight Controls warrants *FireRight jr* units for one-year from the date of purchase. Units which develop defects attributable to material or workmanship will be repaired or replaced without charge.

Beyond the warranty period, factory service is available a reasonable flat rates, and can be handled through your dealer, or factory-direct

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