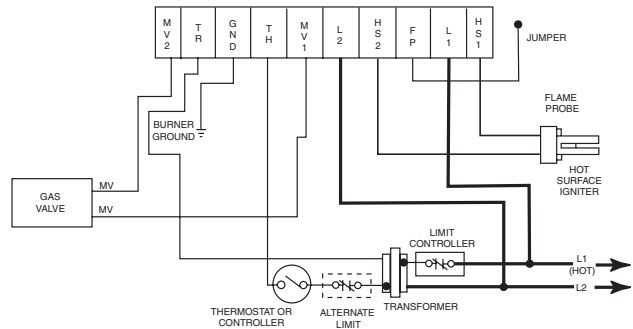
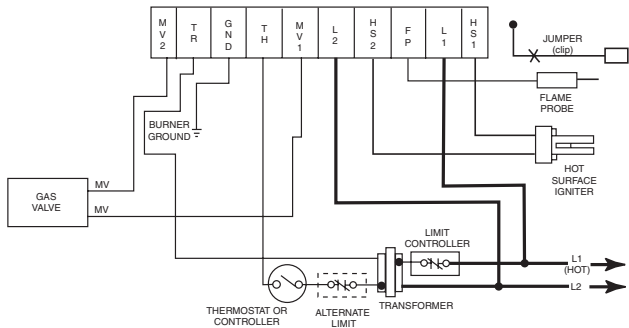


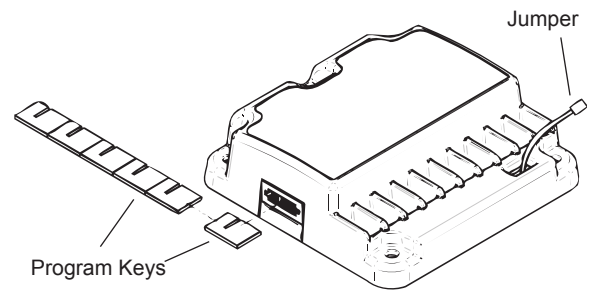
**Fig. 1 – Typical hookup for White-Rodgers replacement with indirect sense using flame probe**



**Fig. 2 – Typical hookup for competitive replacement with direct flame sense through ignitor**



**Fig. 3 – Typical hookup for competitive replacement with indirect sense using flame probe**



**Fig. 4 – Program Key installation/Jumper for models with indirect sense clip jumper**

**Terminal Wiring Cross Reference**

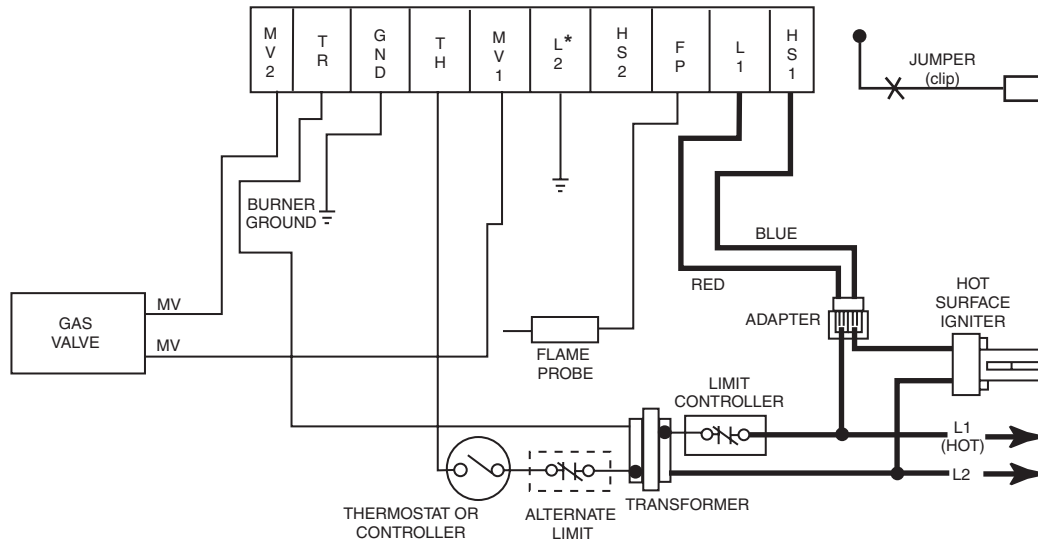
| Terminal Function                      | Original Control              |                            |                                       | Replacement Control |
|--|-------------------------------|----------------------------|---------------------------------------|---------------------|
|  | Honeywell S89 / S890 Terminal | Robertshaw HS780 Terminal  | Old White-Rodgers 50E / F47 Terminal  | 50E47-843           |
| Burner Ground Connection               | GND (BURNER) <sup>a</sup>     | TR (GND CLIP) <sup>b</sup> | GND                                   | GND                 |
| Transformer Secondary (unswitched leg) | 24V (GND) <sup>a</sup>        | GND                        | TR                                    | TR                  |
| Main Valve Common                      | VALVE (GND) <sup>a</sup>      | — <sup>c</sup>             | MV <sup>a</sup> (next to TR terminal) | MV2                 |
| Transformer Secondary (switched leg)   | 24V <sup>a</sup>              | TH                         | TH                                    | TH                  |
| Main Valve Operator                    | VALVE                         | VALVE <sup>d</sup>         | MV <sup>d</sup>                       | MV1                 |
| 120 Vac Neutral Leg                    | L2 120V NEUTRAL               | L2                         | —                                     | L2 <sup>e</sup>     |
| Power Supply                           |                               |                            |                                       |                     |
| 120 Vac Hot Leg                        | L1 120V HOT                   | L1                         | L <sup>f</sup>                        | L1 120V HOT         |
| Power Supply                           |                               |                            |                                       |                     |
| Hot Surface Igniter Element            | HSI 120V                      | IGN                        | —                                     | HS2                 |
| Hot Surface Igniter Element            | HSI 120V                      | IGN                        | IGN <sup>g</sup>                      | HSI                 |
| Flame Sensor                           | SEN <sup>h</sup>              | RS <sup>h</sup>            | FP <sup>i</sup>                       | FP <sup>h</sup>     |

- <sup>a</sup> Remove quick-connect and replace with the included 1/4" quick-connect.
- <sup>b</sup> Use green adapter cable (provided) to connect terminal to chassis ground.
- <sup>c</sup> Do not use the MV2 terminal. MV2 and TR are interconnected in the appliance wiring.
- <sup>d</sup> Remove quick-connect and replace with the included 3/16" quick-connect.
- <sup>e</sup> Ground this terminal using green adapter cable if model being replaced does not have 120V neutral power supply connection.
- <sup>f</sup> Use the red wire on the included adapter cable.
- <sup>g</sup> Use the blue wire on the included adapter cable.
- <sup>h</sup> On indirect sense models, remove jumper quick-connect from FP terminal, cut jumper wire at circuit board and discard.  
On direct sense models, jumper connected to FP terminal, see figure 4.
- <sup>i</sup> Remove jumper from FP terminal, cut jumper wire at circuit board and discard.

**Select and insert the correct program key to match the application.**

**YELLOW FLASHING INDICATOR: IMPROPER POLARITY LOCKOUT**

**RED SOLID INDICATOR LIGHT: INTERNAL FAULT OR REVERSED CONNECTIONS AT GAS VALVE**



**\* NOTE:** Ground this terminal if model being replaced does not have 120V neutral

**YELLOW FLASHING INDICATOR (IMPROPER POLARITY LOCKOUT):** Yellow indicator will flash if the polarity is not correct as diagrammed above on both the primary and secondary of the system transformer.

To check the polarity on the primary of the transformer it can be tested at the module. The L1 terminal on the module should be 120 volts (Hot) and should measure 120 volts to GND.

To check the secondary of the transformer, module terminal L1 should measure approximately 95 volts to TH. If the reading is approximately 120 to 150 volts the secondary is not phased correctly. To correct this condition, reverse the secondary wires on the system transformer. Note: TR on this module is tied to GND. Some systems may have more than one ground. When you reverse the 24 volt secondary be sure that only the TR and GND leads are grounded.

**RED SOLID INDICATOR LIGHT (INTERNAL FAULT OR REVERSED CONNECTIONS AT GAS VALVE):** A solid red indicator light means internal module fault or reversed connections at the gas valve. Before replacing the module, reverse low voltage connections to gas valve.

At installation, this module has a self-test and requires all system components (Transformer, Ignitor, Gas Valve and Flame Sensor) to be attached and turned on for it to operate. Gas valves with an Electric "On/Off" switch must be turned "ON". A lockout condition on this control during self-test will not damage equipment or the control.

## OPERATION

In a typical application the 50E47-843 is designed to energize the ignitor and gas valve and monitor the flame sensor. It is a 100% shut off design that locks out the gas valve if the burner does not light within the trial for ignition period. The ignition sequence begins with a call for heat from the room thermostat. The thermostat applies power to the control. After pre-purge interval, the ignitor warms up for the selected time. The control energizes the gas valve for the selected trial for ignition period. If the burner lights within the allowed period the gas valve will remain open until the call for heat is satisfied. During the trial for ignition period the ignitor is turned off. If the burner does not light, the control will either go into lockout or make two more ignition retries depending on the options selected. The control can be reset from lockout by cycling the thermostat to remove power for a minimum of 3 seconds. It includes a system analysis / troubleshooting LED that indicates normal operation, lockout, weak flame signal or internal control fault.

## TROUBLESHOOTING

For proper control operation, the control must be electrically connected to the gas valve and all the ignitor wiring connectors plugged in. Gas valves with an electric "ON/OFF" switch must have the switch set to "ON".

The light on the control provides a self-diagnosis indication. If the red light on the module is on continuously, the fault is likely to be internal to the module. To make sure, interrupt the line or 24 volt thermostat power for a few seconds and then restore. If the internal fault is indicated again, and flame sensor is not shorted to ground, replace the control. A flashing light indicates the problem is most likely in the external components or wiring (see chart below). Proceed as follows:

Three visual checks

- 1) The ignitor will warm up and glow red
- 2) The main burner flame will ignite
- 3) The main burner flame will continue to burn after the ignitor is turned off

Troubleshooting the system consists of checking for these three visual indications. The chart on the next page defines the proper action if any of these indications do not occur.

| LED                      | Condition   |
|--------------------------|---|
| Green<br>Solid On        | Normal  |
| Green<br>Rapid Flashing  | Weak flame signal   |
| Red<br>Rapid Flash       | Control in lockout<br>Flame sensed when<br>there should be none |
| Red<br>1 Flash           | Control in lockout<br>Ignition retries exceeded                 |
| Red<br>2 Flash           | Control in lockout<br>Ignition recycles exceeded                |
| Yellow<br>Solid On       | Internal self check   |
| Yellow<br>Rapid Flashing | Improper Polarity   |
| OFF                      | Internal Failure  |
| Red<br>Solid On          | Gas valve miswired or<br>Internal error detected                |

