

# 24 VAC Intermittent Pilot Gas Ignition



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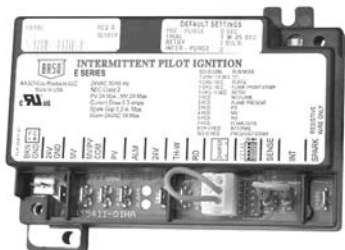
## Quick Reference Guide

The Intermittent Pilot Gas Ignition Control module is designed for indirect burner ignition and supervision. It can be used in new applications or replaces many popular flame rectification type of intermittent pilot ignition (IPI) modules, including those manufactured by Honeywell, Robertshaw, ICM, Fenwal, and Johnson Controls.

The following is an overview of the control, and is intended to only be used by Certified Service Technicians.

## APPLICATION

- Gas furnaces
- Boilers
- Water heaters
- Commercial cooking



## FEATURES

- 24 VAC microprocessor based IPI control
- System diagnostics
- Flame sensing (Local/Internal or Remote/External)
- Full time flame sensing
- Flame sense test pins
- 4 mounting hole positions, 2 that match Honeywell and Fenwal
- Built-in burner ground
- Voltage/Frequency monitoring

# SPECIFICATIONS

<b>Input Voltage</b>	Control: 24 VAC (18-30VAC) 50/60 Hz
<b>Input Current</b>	0.3 A nominal + valves
<b>Gas Valve Contact Rating</b>	2A Pilot and 2A Main @ 24 VAC
<b>Alarm Output</b>	2A @ 24 VAC
<b>Operating Temperature</b>	-40 to 176°F (-40 to 80°C)
<b>Flame Detection Means</b>	Flame Rectification
<b>Flame Detection Type</b>	Local/Internal or Remote/External
<b>Minimum Flame Current</b>	0.07 microamperes
<b>Flame Failure Response Time</b>	1.0 second maximum
<b>Ignition Source</b>	High voltage spark, capacitive discharge
<b>Maximum Spark Gap</b>	0.2 in. (5.1 mm)
<b>High Voltage Cable</b>	48 in. (1219mm) max., rated 15kV min. (Resistive recommended)
<b>Flame Sense Cable</b>	48 in. (1219mm) max (Shielded recommended)
<b>Spark</b>	30 sparks/second
<b>Humidity</b>	0% to 95% RH (non-condensing)
<b>Gas Types</b>	Natural, LP, or Manufactured
<b>Trials Before 100% Shutoff*</b>	Preset 1, 3, Cont.
<b>Trial for Ignition Time *</b>	Preset 4, 8, 15, 30, 60, 90 seconds
<b>Pre-Purge Time *</b>	Preset 0, 15, 30 or 45 seconds
<b>Inter-Purge Time *</b>	Preset 0, 15, 30, 300, 360 seconds
<b>Retry Delay Period *</b>	Preset 0, 5, or 60 minutes
<b>Lockout Recovery</b>	Power cycle / Thermostat (TH-W) cycle

\* For custom timings, contact BASO Gas Products.

## **AGENCY CERTIFICATIONS:** UL 60370-1, UL 60730-2-5

File:M2926 Software Conforms to UL 60730 Requirement Component  
Recognized System (US & Canada)

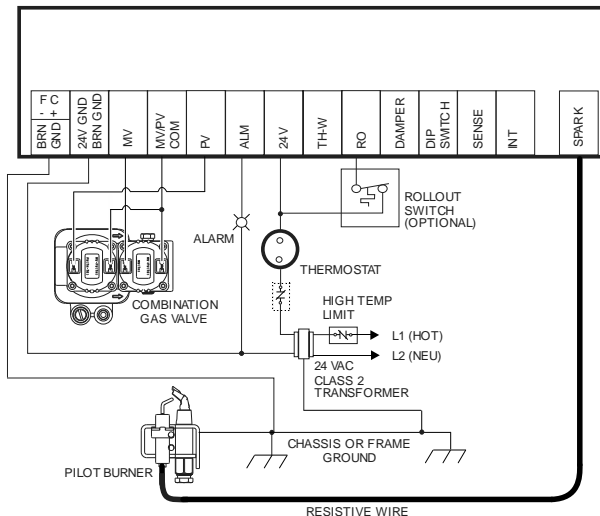
# WIRING

**Table 1: Typical Wiring Connections.**

Label	Term. Type	Description
BRN GND	Mounting Tab	Burner Ground connection*
FC	2 Pin	Flame Current measuring for microammeter probes in $\mu$ Amp DC
24V GND BRN GND	¼" male QC	Common side (return) of transformer connection
MV	¼" male QC	Main Valve connection
MV/PV COM	¼" male QC	Gas Valve common terminal
PV	¼" male QC	Pilot Valve connection
ALM	¼" male QC	Alarm Signal
24V	¼" male QC	24V Power Transformer connection
TH-W	¼" male QC	Thermostat "Call for Heat" signal
RO	¼" male QC	Roll-out connection
DAMPER P1	6-pin keyed plug	Vent Damper connection. Leave Vent Damper Jumper Plug installed if not a Vent Damper system
DIP SWITCH S1	N/A	Not applicable on fixed timing ignitions.
SENSE	¼" male QC	For dual rod (remote/external) flame sensing, connect the flame sense wire from burner/igniter to this terminal
INT	¼" male QC	For single rod (local/internal) sensing, there will be no connection .
SPARK	¼" male QC	High voltage sparking electrode

\* If the existing system uses a burner ground wire, this can be attached to the 24V GND / BRN GND terminal using the supplied dual spade connector, or otherwise connected to the burner ground mounting tab.

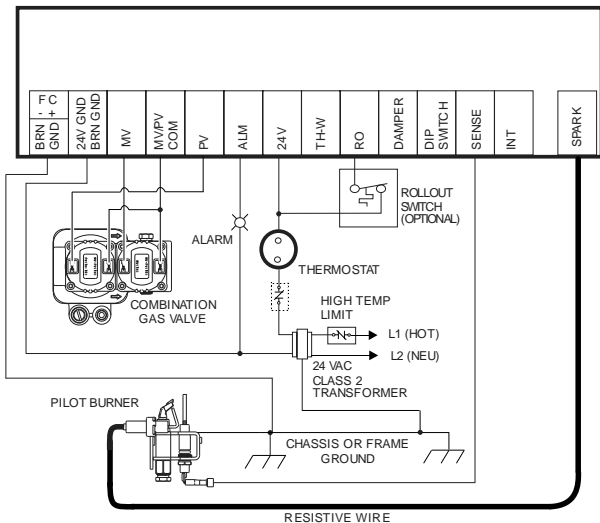
**Figure 1: Wiring for 1 Rod Flame Sense used for Local (Internal) Sense**



A rollout switch (a normally closed set of contacts) is positioned to detect flames rolling out of the combustion chamber. If rollout occurs, the switch contacts open and the control immediately goes into a lockout condition. The main and pilot valves also close so that the system is not allowed to function. A vent damper jumper plug that jumpers pins 2 and 3 of the damper connection, is supplied with controls ordered with a vent damper system. The control will operate normally with this plug in place, remove this plug to connect a vent damper. Once a vent damper has been connected to the control, and the power cycled, an internal fuse will blow\* and the control can then *only* be used with a vent damper connected.

**\*Note:** it is normal to hear a defined pop when the fuse blows.

**Figure 2: Wiring for 2 Rod Flame Sense used for Remote (External) Sense**



See notes on rollout switch and vent damper jumper plug on previous page.

**Warning:** Risk of explosion or fire. Do not install the control in an area that is exposed to water (ex. dripping, spraying or rain). Do not use the control if it has been exposed to water. Exposure to water may cause a malfunction and can lead to an explosion, which can lead to severe personal injury or death.

# LED STATUS AND TROUBLESHOOTING

The ignition control has a multi-colored (GREEN, ORANGE, and RED) LED which will flash different colors and codes to show status of the ignition, and will help troubleshoot the control.

**Table 3: GREEN LED Indications of Normal Operation**

Flash	Indication
On ½ sec, Off 4-½ sec	Waiting for "Call for Heat"
On ½ sec, Off ½ sec	Pre-purge, Inter-purge, Post-purge
On ¼ sec, Off ¼ sec	Trial for Ignition (TFI)
On Solid	RUN (Flame, Pilot/Main valves on)

**Table 4: ORANGE LED Indications**

Flash	Indication	ERROR Type
On ½ sec, Off 4-½ sec	Retry	Standby
On ½ sec, Off ½ sec	Flame present	Standby
On ½ sec, Off ½ sec	Pressure present	Standby

**Table 5: RED LED Indications of ERROR Codes (100% Lockout).**

Flash	Error Indications	ERROR Type
1 flash	No flame in trial time	100% Lockout
2 flashes	Flame sense stuck	100% Lockout
3 flashes	Valve/Pilot relay circuit	100% Lockout
4 flashes	MV/Inducer circuit	100% Lockout
5 flashes	Rollout error	100% Lockout
6 flashes	Pressure switch	100% Lockout
7 flashes	Repetitive flame loss	100% Lockout
8 or 9 flashes	Internal control	100% Lockout
Solid On	Line voltage/Freq.	Standby

Note: 1 second pause after each flash code.

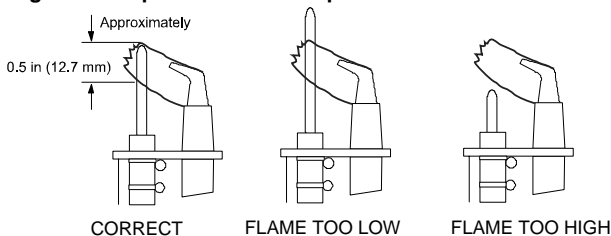
# TROUBLESHOOTING GUIDE

## Symptom                      Possible Cause

1. No power up
  - Faulty 24 VAC wiring
  - Thermostat or transformer
  - Faulty control
2. Control LED is blinking RED
  - Determine error code, refer to error codes (TABLE 5), also refer to the troubleshooting flow chart in the installation instructions
3. No spark during Trial for Ignition (TFI) time
  - Faulty spark electrode wiring
  - Spark gap too wide
  - Faulty control
4. Pilot/Burner does not light during trial for ignition time
  - Faulty valve wiring
  - Bad Gas Valve
  - Faulty control
5. Pilot/Burner lights but Gas Valve turns off after TFI
  - Weak flame, Flame not in contact with the spark electrode or flame sensor. Check that Flame Sensor tip is in the flame. For proper sensing the rod tip must be  $3/8"$  (10mm) to  $1/2"$  (13 mm) in the flame. See figure 1.
  - Dirty or corroded flame sensor
  - Faulty flame sensor wiring
  - Poor burner ground

**Note:** For more information on BASO ignitions and other products, plus complete installation instructions, please visit us at [www.baso.com](http://www.baso.com).

**Figure 1: Proper Flame Sensor position**

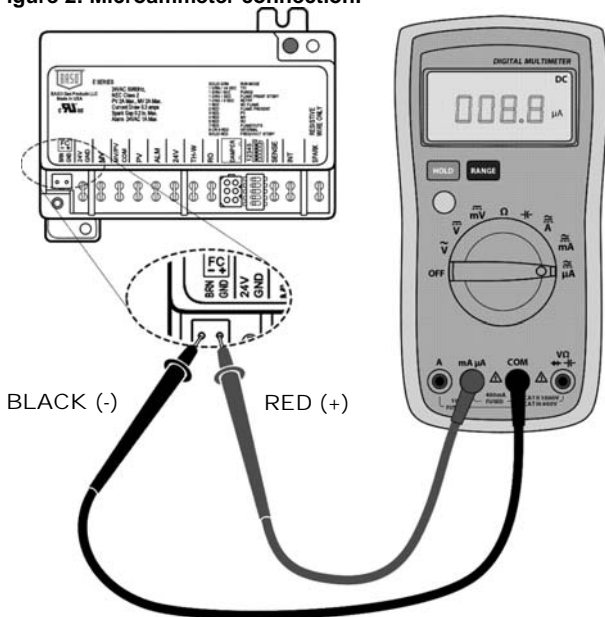


# FLAME CURRENT MEASUREMENT

Flame current of the device can be measured using a standard microammeter by simply touching the meter leads to the 2 PIN labeled FC, as shown in Figure 2.

- Flame current must be measured with pilot valve lit but no main gas flowing.
- Set meter to DC  $\mu$ Amp scale.
- Make sure meter leads are positioned correctly [+/-].
- Recommended Minimum Pilot Only Flame Sense Current of 0.8  $\mu$ Amp DC.

**Figure 2: Microammeter connection.**



2 year warranty