24 VAC Intermittent Pilot Gas Ignition Control

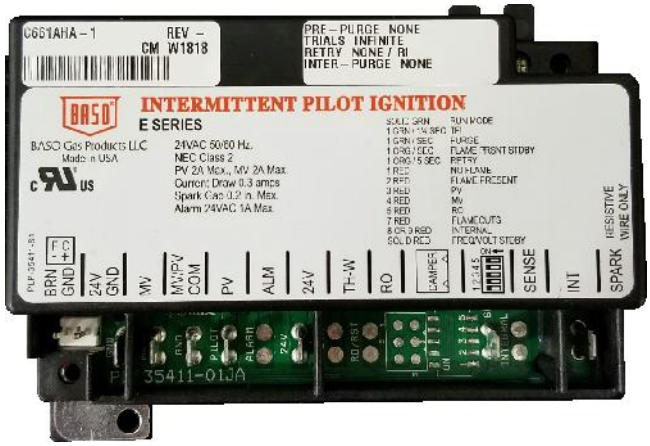
Quick Reference Guide

The Intermittent Pilot Gas Ignition 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

Input Voltage	Control: 24 VAC(18-30 VAC) 50/60 Hz
Input Current	0.3 A nominal + valves
Gas Valve Contact Rating	2 A Pilot and 2 A Main @ 24 VAC
Alarm Output	2 A @ 24 VAC
Operating Temperature	-40 to 176°F (-40 to 80°C)
Flame Detection Means	Flame Rectification
Flame Detection Type	Local/Internal or Remote/External
Minimum Flame Current	0.07 microamperes
Flame Failure Response Time	1.0 second maximum
Ignition Source	High voltage spark, capacitive discharge
Maximum Spark Gap	0.2 in. (5.1mm)
High Voltage Cable	48 in. (1219mm) max., rated 15kV min. (Resistive recomonnnended)
Flame Sense Cable	48 in. (1219mm) max. (Shielded recomonnnended)
Spark	30 sparks/second
Humidity	0% to 95% RH (non-condensing)
Gas Types	Natural, LP, or Manufactured
Trials Before 100% Shutoff *	Preset 1, 3, Continuous
Trial for Ignition Time *	Preset 4, 7, 15, 30, 50, 60, 90, 120, or 240 seconds, Continuous
Pre-Purge Time *	Preset 0, 15, 30, or 45 seconds
Inter-Purge Time *	Preset 0, 15, 30, 300, or 360 seconds
Retry Delay Period *, **	Preset 0, 5, or 60 minutes
Lockout Recovery	Power cycle/Thermostat (TH-W) cycle

*For custom timings, contact BASO Gas Products

**Retry is not available in CE ignitions.

AGENCY CERIFICATIONS

c UL us	UL 60370-1, UL 60730-2-5	File: M2926 Software conforms to UL60730 Requirement Component Recognized System (US & Canada)
CE	EN298:2012	File: 657989

WIRING

Table 1: Typical Wiring Connections

Label	Term. Type	Description
FC - +	2 pin	Flame Current test pins for measuring microamp in µAmp DC
BRN GND	Mounting Tab	Burner Ground connection*
24V GND/ BRN GND	1/4" male QC	Common side (return) of transformer connection
MV	1/4" male QC	Main Valve connection
MV/PV COM	1/4" male QC	Gas Valve common terminal
PV	1/4" male QC	Pilot Valve connection
ALM	1/4" male QC (optional)	Alarm Signal connection
24V	1/4" male QC	24V Power connection or Thermostat (TH-W) connection w/o a vent damper plug
TH-W	1/4" male QC (optional)	Thermostat "Call for Heat" connection when ignition has a vent damper plug
RO	1/4" male QC (optional)	Rollout Switch connection
DAMPER PLUG P1	6-pin keyed plug (optional)	Vent damper connection. Leave vent damper jumper plug installed if not a vent damper system.
DIP SWITCH S1	5 position (optional)	Not applicable on fixed-timing ignitions.
SENSE	1/4" male QC (optional)	For dual rod (remote/external) flame sensing, connect the flame sense wire from the burner/ignitier to this terminal.
INT	1/4" male QC (optional)	For single rod (local/internal) sensing, there will be no connection.
SPARK	1/4" male QC	High voltage sparking electrode

* If the existing system uses a burner ground wire with a quick connect terminal, this must be cut off and replaced with the ring lug terminal provided. This should then be connected to the burner ground mounting tab.

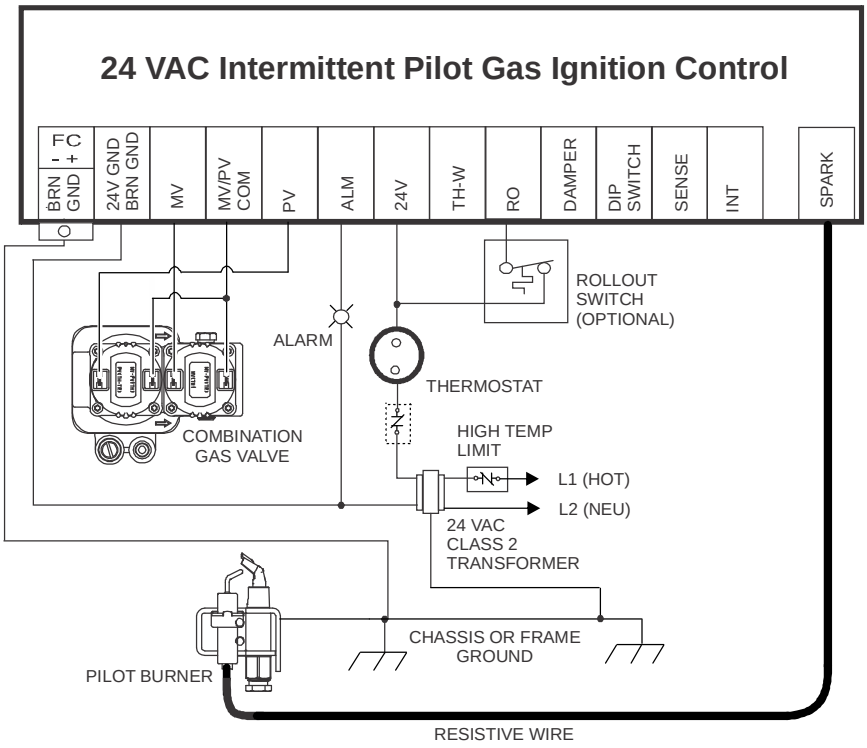


Figure 1: Wiring for 1 Rod Flame Sense used for Local (Internal) Sense

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 then can *only* be used with a vent damper connected.

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

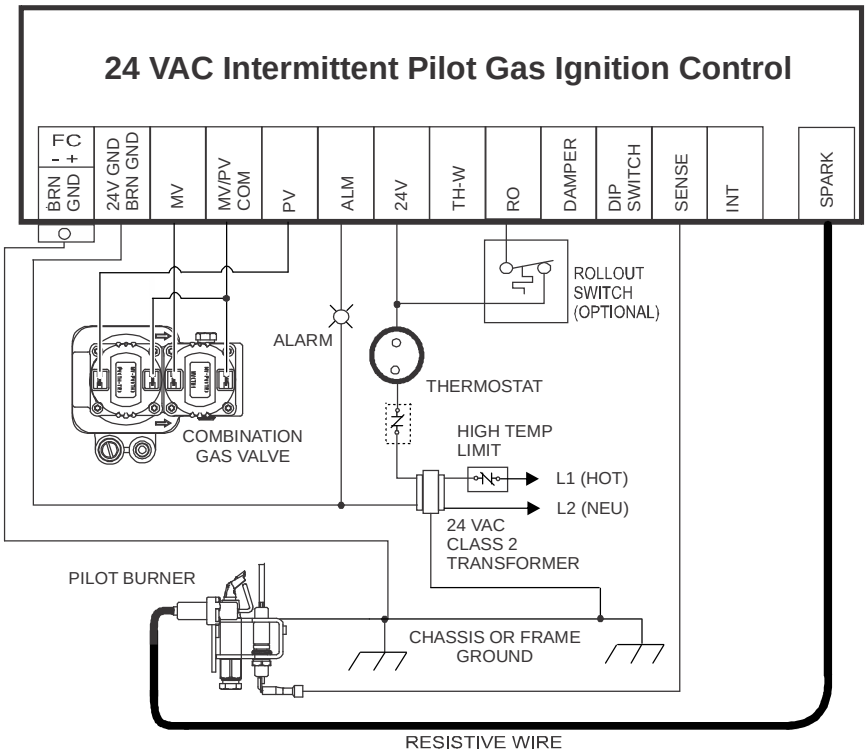


Figure 2: Wiring for 2 Rod Flame Sense used for Remote (External) Sense

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

Warning: Do not install the control in areas that can be exposed to dripping water, steam cleaning, heavy dust, grease, or corrosive chemicals. If the controls can be subjected to this type of environment, use a NEMA 4 rated enclosure to protect the ignition control module.
If not properly protected from the above environment, the control will prematurely fail or malfunction. Excessive high temperatures can damage the ignition control and cause it to malfunction. Make sure the ambient temperature around the ignition does not exceed the rated temperature for the control.

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 2: GREEN LED Indications of Normal Operation

Flash	Indication
1 blink every 5 sec.	Waiting for "Call for Heat"
1 blink every 1 sec.	Pre-purge, Inter-purge, Post-purge
rapid flashing	Trial for Ignition (TFI)
on solid	RUN (Flame, Main valve on)

Table 3: ORANGE LED Indications

Flash	Indication	Error Type
1 blink every 5 sec.	Retry	Standby
1 blink every 1 sec.	Flame Present	Standby
1 blink every 1 sec.	Pressure Present	Standby

Table 4: RED LED Indications of ERROR Codes (100% Lockout)

Flash	Indication	Error Type
1 blink	No flame in trial time	100% Lockout
2 blinks	Flame sense stuck	100% Lockout
3 blinks	PV relay circuit	100% Lockout
4 blinks	MV relay circuit	100% Lockout
5 blinks	Rollout switch	100% Lockout
6 blinks	Pressure switch	100% Lockout
7 blinks	Repetitive flame loss	100% Lockout
8 or 9 blinks	Internal control	100% Lockout
on solid	Line voltage/Frequency	Standby

Note: There is a one-second pause after each flash code.

TROUBLESHOOTING GUIDE

1. No power up
    - Faulty 24 VAC wiring
    - Thermostat or transformer
    - Faulty control
    - Safety limits
2. Control LED is blinking RED
    - Determine error code, refer to error codes (Table 4), 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. Burner does not light during trial for ignition time
    - Faulty valve wiring
    - Bad Gas Valve
    - Faulty Control
5. Burner lights but gas valve turns off after TFI
    - Weak flame, flame not in contact with the spark electrode of 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” (13mm) in the flame. See Figure 3.
    - 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.

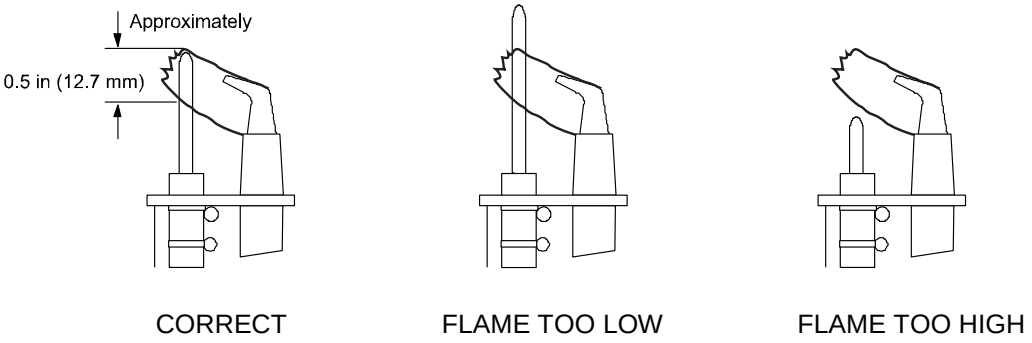


Figure 3: Proper Flame Sensor Position

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 4.

- Flame current must be measured with pilot valve lit but no main gas flowing.
- Set meter to DC µAmp scale.
- Make sure meter leads are positioned correctly [+/-].
- Typical Pilot Only Flame Sense Current of 0.4 to 1.0 µAmp DC.

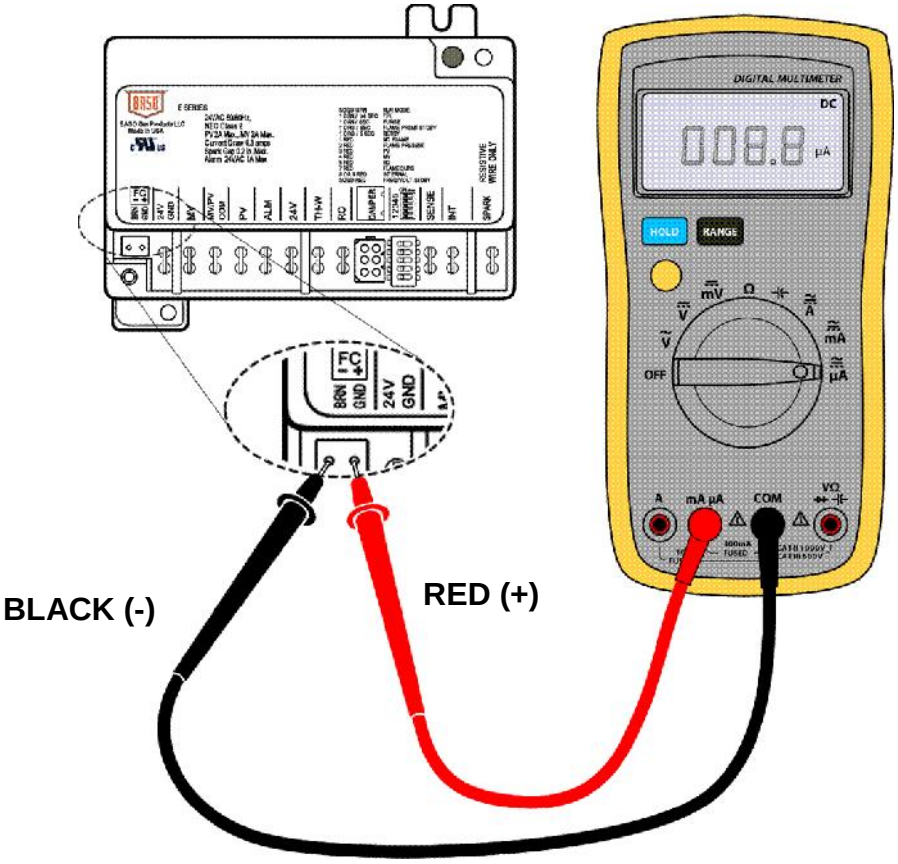


Figure 4: Microammeter Connection

Important: Preventative maintenance programs are an important part of maintaining optimum and safe function of you BASO Products. Any attempt to repair this assembly voids the manufacturer's 2 year warranty. For a replacement control, contact the original equipment manufacturer or nearest BASO Gas Products distributer.

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