24 VAC Direct Spark Gas Ignition Control with Inducer

Quick Reference Guide

The Direct Spark Gas Ignition Control module is designed for direct burner ignition and supervision. It can be used in new applications or replaces many popular flame rectification type of direct spark ignition (DSI) modules, including those manufactured by Honeywell, Robert Shaw, 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 DSI 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
- Combustion Blower Relay

SPECIFICATIONS

Input Voltage	Control: 24 VAC(18-30 VAC) 50/60 Hz
Input Current	0.3 A nominal + valves
Gas Valve Contact Rating	4A @ 24 VAC
Inducer (Combustion Blower) Contact Rating	0.5A @ 120V FLA; 3A LRA 0.25A @ 230V FLA; 1.5A LRA
Alarm Output	2A @ 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. (5.1 mm)
High Voltage Cable	48 in. (1219 mm) max., rated 15kV min. (Resistive recommended)
Flame Sense Cable	48 in. (1219 mm) max., rated 15kV min. (Shielded recommended)
Spark	30 sparks/second
Humidity	0% to 95% RH (non-condensing)
Gas Types	Natural, LP, or Manufactured
Trials Before 100% Shutoff *	Preset 1 thru 9 trials
Trial for Ignition Time *	Preset 4, 8, 11, 21, or 30 seconds
Pre-Purge Time *	Preset 0, 4, 10, 15, or 30 seconds
Inter-Purge Time *	Preset 0, 10, 15, 30, 60, 90, 240, or 300 seconds
Retry Delay Period *, **	Preset 0, 5*, or 60* minutes
Lockout Recovery	Power cycle / Thermostat (TH-W) cycle

*For custom timings, contact BASO Gas Product.
**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 0086 19	EN298:2012	File: 704826

WIRING

TABLE 1: Typical Wiring Connections

Label	Term. Type	Description
FC - +	2 pin	Flame Current test pins for measuring microamps in µAmp DC with a microammeter
BRN GND	Mounting Tab (Lower left)	Burner Ground connection*
24V GND BRN GND	1/4" male QC	Common (neutral) connection
VLV COM	1/4" male QC	Gas Valve common terminal
24V	1/4" male QC	24V Power connection
IND 120V	1/4" male QC	Inducer (Combustion Blower Relay) connection
L 120V	1/4" male QC	L1 (hot) 120V connection
VLV	1/4" male QC	Valve connection
ALM	1/4" male QC	Alarm Signal connection
TH-W	1/4" male QC (optional)	Thermostat “Call for Heat” signal connection
APS	1/4" male QC (optional)	Pressure Switch connection
DIP SWITCH S1	5 position DIP switch (optional)	32 selectable timings of the most popular settings
SENSE	1/4" male QC (optional)	For dual rod (remote/external) flame sensing, connect the flame sense wire from burner/igniter 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 ignition has a burner ground wire, this can be connected to either the 24V GND terminal using a double terminal or to the burner ground mounting tab with a screw.

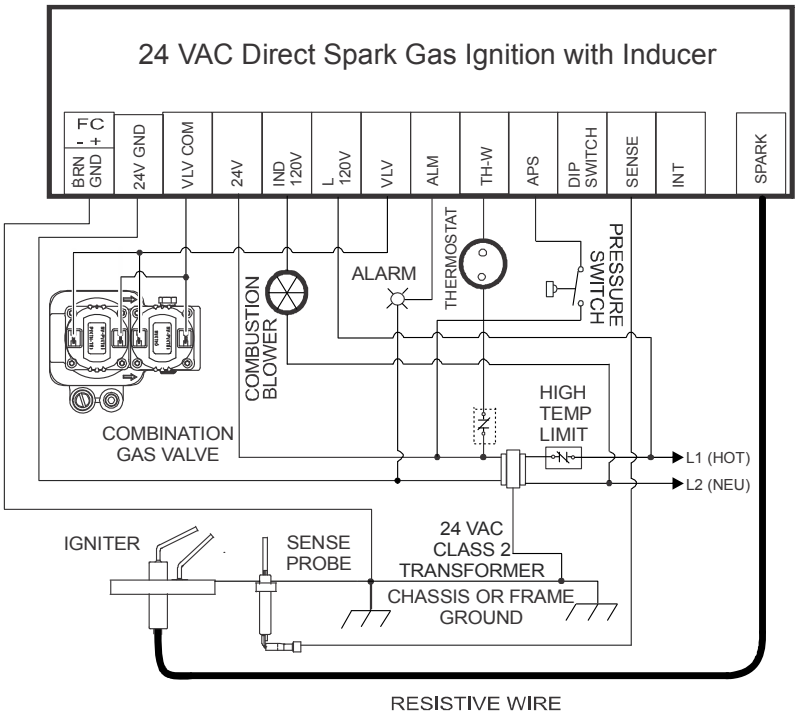

Figure 1: Wiring for 1 Rod Flame Sense used for Local (Internal) Sense

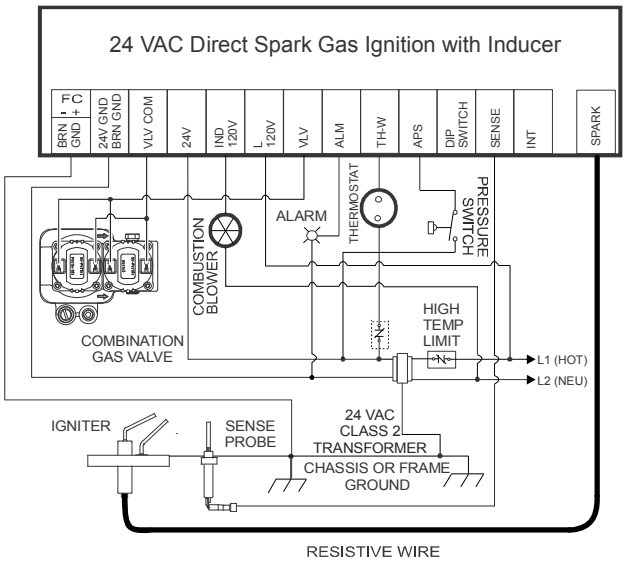

Figure 2: Wiring for 2 Rod Flame Sense used for Remote (External) Sense

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
On 1/2 sec, Off 4-1/2 sec	Waiting for "Call for Heat"
On 1/2 sec, Off 1/2 sec	Pre-purge, Inter-purge, Post-purge
On 1/2 sec, Off 1/2 sec	Trial for Ignition (TFI)
On Solid	RUN (Flame, Main valve on)

Table 3: ORANGE LED Indications

Flash	Indication	Error Type
On 1/2 sec, Off 4-1/2 sec	Retry	Standby
On 1/2 sec, Off 1/2 sec	Flame Present	Standby
On 1/2 sec, Off 1/2 sec	Pressure Present	Standby

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

Flash	Indication	Error Type
1 flash	No flame in trial time	100% Lockout
2 flashes	Flame sense stuck	100% Lockout
3 flashes	Valve relay circuit	100% Lockout
4 flashes	Inducer (Blower) relay 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/Frequency	Standby

Note: There is a one-second pause after each flash code, and then the flash code is repeated.

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.

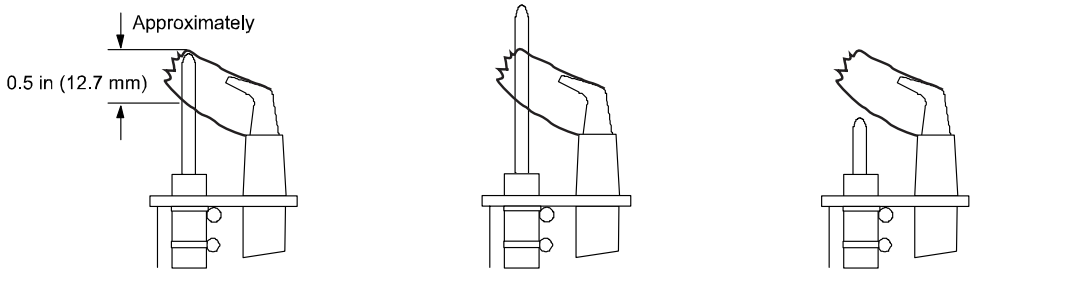

Figure 3: Proper Flame Sensor Position

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 flame lit and main gas flowing
- Set meter to DC µAmp scale.
- Make sure meter leads are positioned correctly [+/-].
- Recommended Minimum Flame Sense Current of 0.8 µAmp DC.

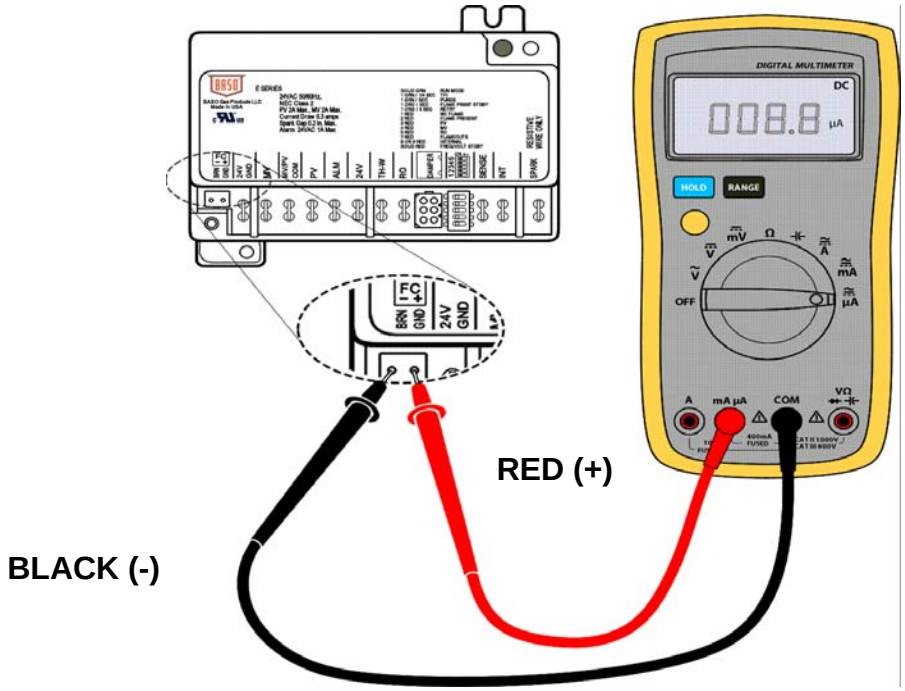

Figure 4: Microammeter Connection

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.