

SERIES 05-30

12 VDC DIRECT SPARK IGNITION SYSTEM

This direct spark ignition system provides an efficient and reliable way of igniting your gas fired appliances in recreational vehicles and other 12 VDC applications. It also features those options most demanded by design engineers.

INNOVATIVE DESIGN FOR SAFE AND EFFICIENT OPERATION

Flame sensing is achieved through the technique of using the high voltage spark electrode as the sensor. However, if required, a separate sensing probe can be supplied. Both models utilize the principle of flame rectification to monitor the burner flame. In addition, a patented* self-monitoring safety circuit provides a type of protection not found in other ignition systems.

AGENCY CERTIFIED

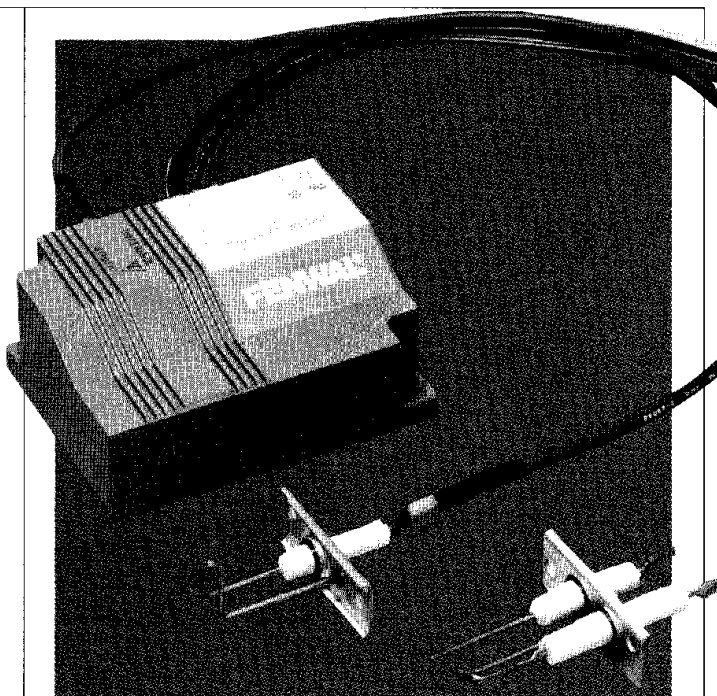
The 05-30 system is certified by the American Gas Association as conforming to ANSI Z21.20. It is also certified by the Canadian Gas Association and is a UL recognized component.

COMPACT SIZE – EASY TO MOUNT

The electronic module measures only 3.42 × 4.42 × 2.20 in (87.0 × 112.4 × 50.8 mm) and weighs approximately 6.6 oz (185 g). It is not position-sensitive and may be mounted vertically or horizontally using #6 hardware. The low voltage connections are made easily with a Molex edge connector and a ¼ inch quick connect is used for high voltage connections.

SELECT FEATURES TO MEET YOUR SPECIFIC NEEDS

Depending on the model selected, flame sensing is achieved through the high voltage electrode or a separate flame sensing electrode. The system is available in single or multiple trial-for-ignition versions. Also selectable are a 15 second prepurge period and the length of the trial-for-ignition period.



PRINCIPLE OF OPERATION

The Series 05-30 system is designed to operate on all DC power supplies common to the recreational vehicle industry (9-15 VDC from a 12-volt battery or up to 24 volt peaks delivered by a converter). To ignite the burner, it is only necessary to open the manual gas supply valve and set the thermostat to call for heat. When power is supplied to the appliance, the 05-30 control system opens the main burner gas solenoid valve and provides ignition spark. Sparking ceases as soon as a constant flame is present. If the flame is not established during the trial-for-ignition period, the system provides automatic shutdown by de-energizing the gas solenoid valve and going into lockout. The multiple trial-for-ignition model, however, provides for three complete ignition sequences before going into lockout.

Electronic flame sensing circuitry (flame rectification) then switches the ignitor from the ignition mode to the sensing mode to monitor the continued presence of the burner flame. If an established flame is extinguished for any reason, the system will retry for ignition before going into lockout. The number of retries depends on the model selected. To reactivate the ignitor, reset the thermostat by turning it down and then raise it to the desired temperature setting again.

The system provides an optional purge period of 15 seconds (nominal) to clear the combustion chamber of any residual gases before each try for ignition. This feature is available on both single- and three-try models. Models without the purge option have less than a 1.0 second delay before a single try for ignition.

*U. S. Patent 4,455,589

SERIES 05-30

MOUNTING

The Series 05-30 System is not position-sensitive and may be mounted vertically or horizontally using #6 hardware.

CAUTION: Although the 05-30 System is epoxy coated to ensure proper operation up to 90% relative humidity, it was not designed to work directly exposed to or immersed in water. If these conditions occur, recycle the unit to the OFF condition and have it inspected by a qualified technician before recycling.

WIRING

WARNINGS:

The Series 05-30 System uses voltages of shock hazard potential and operates in the presence of combustible gas. Failure to observe the following warnings could result in shock, fire, or explosion causing severe injury or death.

1. Wiring and initial operation must be done by a qualified technician.
2. Before wiring system, manually shut off gas supply and remove power.
3. Do not reapply power until all wiring is connected and system is properly grounded.
4. Perform "Initial Operation" before turning on gas supply.

Connect wiring to the system using wiring diagrams: Figure 1 for a system using a separate sensing probe and Figure 2 for the single spark and sense system.

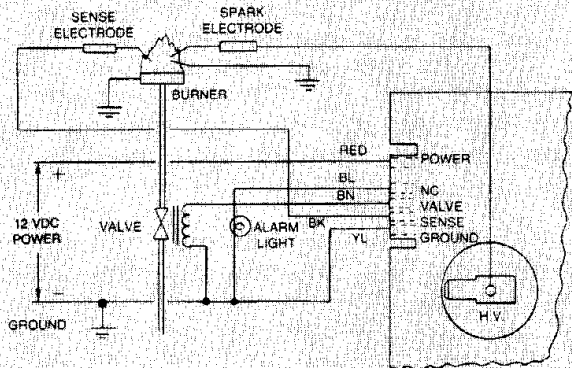


Figure 1: System with Separate Sensing Probe

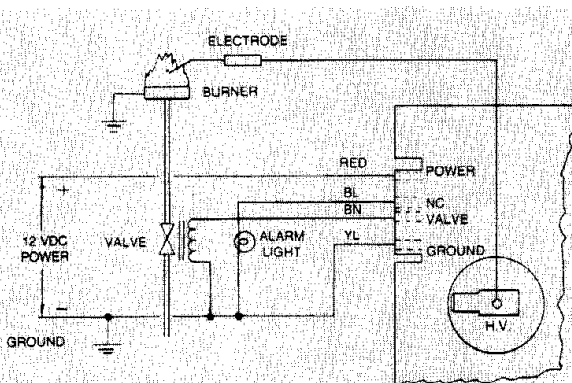


Figure 2: System with Single Spark and Sense

PROPER ELECTRODE LOCATION

Proper location of the electrode assembly is important for optimum system performance. It is recommended that electrode assemblies be mounted temporarily using clamps or other suitable means so that the system can be checked before permanently mounting the assembly. The electrode assembly should be located so that the tips are inside the flame envelope and about 1/2 inch above the base of the flame. See Figure 3.

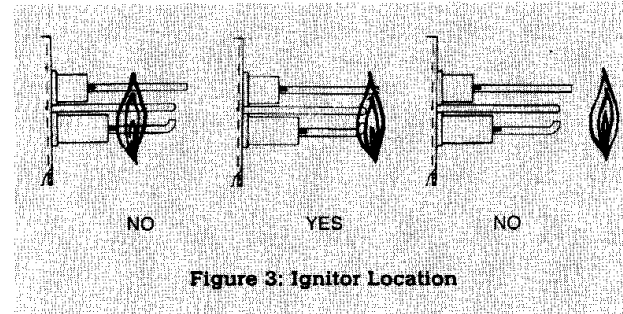


Figure 3: Ignitor Location

CAUTIONS:

1. Ceramic insulators should not be in or close to the flame.
2. Electrode assemblies should not be adjusted or disassembled. Electrodes should have a gap spacing of 0.125 ± 0.031 in (3.12 ± 0.81 mm). If this spacing is not correct, return the electrode to Fenwal for replacement.
3. Exceeding temperature limits can cause nuisance lockouts and premature electrode failure.

INITIAL OPERATION

1. Check installation. Locate and mount electrode and check electrode gap per previous section.
2. With gas supply manually shut off, apply power to system and advance thermostat above ambient temperature.
3. Ensure that a spark is being produced at electrode during trial-for-ignition period. System should lock out after the period. In three-try ignition version, system will automatically recycle three times, then lock out.
4. Reset thermostat to below room temperature.
5. Wait 15 seconds, then manually open gas supply and advance thermostat above ambient temperature to recycle system.
6. Check that ignition occurred. Sparking should cease a few seconds after flame has been established. At this stage, electrode acts as the sensing element.
7. If system ignites but fails to "hold-in", check input voltage and polarity and that system is properly grounded.
8. For multiple unit installations, ensure that all units are powered by a common supply voltage and that all are correctly polarized and grounded.

SERIES 05-30

SAFETY CHECKS

1. Manually shut off gas supply. Apply power to system and advance thermostat above room temperature. After system locks out, check that there is no voltage across Valve and Ground terminals with a suitable voltmeter. Next, set thermostat to its lowest setting.
2. Wait 15 seconds, then manually open gas supply and reactivate system by advancing thermostat above room temperature. Sparking should occur and immediately cease when flame is established. While system is operating, manually shut off gas supply. Sparking should promptly reappear when flame is extinguished. Sparking should continue during specified number of trial-for-ignition periods and then lockout. Check again that there is no voltage across Valve and Ground terminals after lockout.

SERVICE CHECKS

Flame current is the current which passes through the flame from the sensor to ground to complete the primary safety circuit. The minimum flame current necessary to keep the system from lockout is two microamps. To measure flame current, DISCONNECT INPUT VOLTAGE, then insert a 0-50 μ A DC meter in series with the sensor electrode and wire per Figure 4 or 5. Meter should read 2 μ A or higher. If meter reads below "0" on scale, meter leads are reversed. Disconnect power and reconnect meter leads for proper polarity.

CAUTION: When monitoring flame current on a single spark and sense model, use a 1.5 μ F bypass capacitor to protect the meter from damage. See Figure 5.

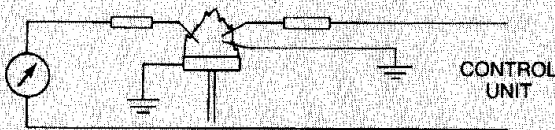


Figure 4: System with Separate Sensing Probe

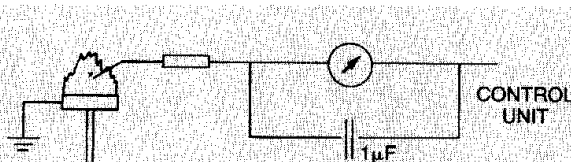


Figure 5: System with Single Spark and Sense

REPAIRS

WARNING: The Fenwal Series 05-30 Direct Spark Ignition System module is not repairable. Any modifications or repairs to it will invalidate the Fenwal standard warranty, as well as agency certifications. More importantly, it CAN LEAD TO EXPLOSIVE HAZARDS WHICH CAN RESULT IN INJURY OR EVEN DEATH. Faulty units under the warranty should be returned to Fenwal for replacement.

SPECIFICATIONS

Size

3.42 × 4.42 × 2.00 in
(87.0 × 112.4 × 50.8 mm)

Weight Approximately 6.6 oz (185 g)

Input Voltage

9 to 15 VDC or 24 volt peaks maximum derived from unfiltered full wave rectified alternating current

Input Current Drain

60 mA for 9 VDC input (excluding valve)
150 mA for 24 volt peak (excluding valve)

Valve Output 1 Amp maximum

Prepurge

None or 15 seconds depending on model.
Note: Without purge there is less than 1.0 second delay before a single try for ignition.

Ambient Temperature Limits

-40 to +155°F (-40 to +65°C)

Tries for Ignition

Available in one- or three-try versions.

Trial-for-Ignition Periods (±20%)

3.3, 4.7, 6.8, 10.0, or 12.0 seconds, depending on model.

Reset

After lockout, the control system will reset fully by interrupting power for 1.0 second minimum.

Flame Failure Retry

When loss of flame occurs after the initial try for ignition, the control system provides one retry on single-try models and two retries on three-try models.

Flame Current 2 microamps minimum

Flame Failure Response Time Within 0.8 second

Spark Rate

20 sparks per second minimum at 9 VDC input
25 to 35 sparks per second typical at VDC nominal

Types of Gas Natural, LP, or manufactured

Connections

Low voltage: Molex edge connector
High voltage: 1/4 inch quick connect
Flame Sense: Through low or high voltage connector depending on model.

Sensor

Single spark and sense using high voltage spark electrode as the sensing element. Remote sensing using a separate sensing element.

Enclosure Gray ABS fire retardant plastic

Specifications subject to change without notice.

WARNING: Operation outside specifications could result in failure of the Fenwal product and other equipment with injury to people and property.

SERIES 05-30

HOW TO ORDER

1. Order Series 05-30 Direct Spark Ignition System module by Catalog Number selecting: Single spark and sense or separate sensing electrode, Number of tries for ignition, Prepurge period, and Trial-for-ignition (TFI) time

05-306 X X 6- X 5 X

4 = Separate Sensing Electrode

6 = Single Spark and Sense Electrode

3 = Single Try-for-Ignition

7 = Three Tries-for-Ignition

1 = 15 Second Prepurge

7 = No Prepurge

0 = 3.3 Second TFI

1 = 4.7 Second TFI

3 = 6.8 Second TFI

5 = 10.0 Second TFI

6 = 12.0 Second TFI

Example: 05-306676-753 = Series 05-30 Direct Spark Ignition System module with single spark and sense, three tries for ignition, no prepurge, and 6.8 second trial-for-ignition period.

2. Order Electrode by consulting Fenwal.

3. Order high voltage cable assembly and one of two low voltage cable assemblies by specifying the part number as follows:

High Voltage Assembly

5 mm stranded wire rated at 480°F (250°C). Supplied with ¼ inch quick connect. Maximum length is 48 in (120 cm). Specify Part Number 05-125948-1XX*

Low Voltage Assembly for Separate Sensing Electrode Models

A 6-pin plastic edge connector with five lead wires for input power, valve, ground, flame sensing, and alarm circuits. Maximum length is 48 in (120 cm). Specify Part Number 05-127694-0XX*

Low Voltage Assembly for Single Spark and Sense Models

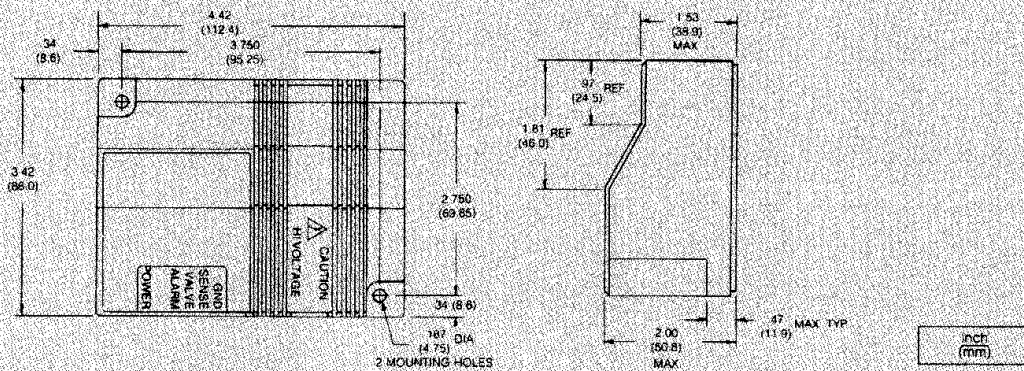
A 6-pin plastic edge connector with four lead wires for input power, ground, and alarm circuits. Maximum length is 48 in (120 cm). Specify Part Number 05-127971-0XX*

*Specify length of lead wire (in inches) as last two digits of part number suffix.

Example: 05-125948-124 = High voltage cable assembly with 24 inch long lead wires.

WARNING: The Series 05-30 Direct Spark Ignition System is designed for use on new products by manufacturers of gas-fired equipment. It may only be used as such or as a replacement for an existing Fenwal spark ignitor. Any substitution or application must be expressly approved by Fenwal or the manufacturer of the equipment. Improper substitution or application may result in malfunction of equipment such as loss of flame sensing safety circuit creating an explosive atmosphere.

OUTLINE DIMENSIONS



This literature is provided for informational purposes only. KIDDE-FENWAL, INC. assumes no responsibility for the products suitability for a particular application. This product must be properly applied to work correctly.

If you need more information on this product, or if you have a particular problem or questions, contact KIDDE-FENWAL, INC., Ashland, MA 01721; telephone (508) 881-2000.