

FENWAL[®]

SERIES 05-27

24VAC Direct Spark Ignition System
with 15 or 30 second Pre-Purge and
3 Trials for Ignition

FEATURES

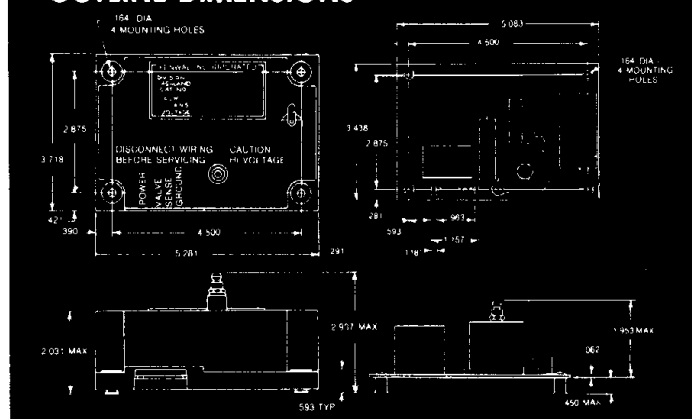
- ★ UL COMPONENT RECOGNIZED
- ★ 24VAC OPERATION
- ★ CONFORMS TO ANSI Z21.20,
AGA CERTIFICATION
- ★ POSITIVE IGNITION/PROOF OF FLAME
- ★ FAIL SAFE ON COMPONENT
MALFUNCTION
- ★ SPARK INTERRUPTION UPON IGNITION
- ★ COMPATIBLE WITH NIGHT
SETBACK THERMOSTATS

GENERAL

The Fenwal Series 05-27 Direct Spark Ignition System offers an alternative to piloted ignition systems on gas fired equipment burning natural, manufactured or LP gases at input rates up to 400,000 BTU per hour.

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OUTLINE DIMENSIONS



PRINCIPLE OF OPERATION

The Series 05-27 flame monitoring gas ignitor is designed to provide a total of three pre-purge and trial for ignition periods before lockout occurs. It operates on 24 volts AC and is AGA design certified to comply with the requirements of ANS Z21.20. When powered from a thermostat, the pre-purge feature provides a delay period of 15 or 30 seconds before trial for ignition begins.

Once the flame is established, sparking is terminated. The system will then keep the valve energized while monitoring the flame by the flame rectification method. A second purge period and trial for ignition is provided if the flame is not initially established. A third sequence is introduced if required. If the flame is still not established, the unit will then go into "lockout." Reset from lockout is accomplished by interrupting power to

the system. If the flame is established and proven during any ignition period the valve will remain energized and sparking will cease without any further action. If the flame is lost during the normal heat cycle, a new trial for ignition sequence will commence.

These ignitors are compatible with most night setback thermostats. Consult factory for additional information.

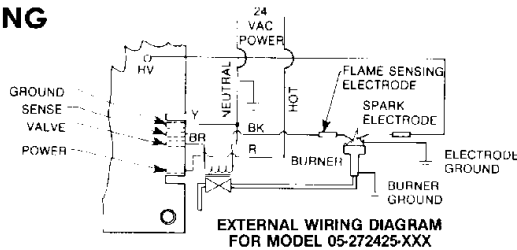
NOTICE: An annual inspection and test, conducted prior to the start of the heating season by qualified gas service personnel, is required to verify that the automatic gas ignition system, all associated components (i.e., fan and limit switches), and the appliance combustion chamber components operate according to the manufacturer's specifications. Components that have been physically damaged or that otherwise fail to perform their function according to specification must be replaced immediately to avoid creating a fire, explosive and/or toxic hazards that can result in property damage, personal injury or even death.

MOUNTING

The Series 05-27 is not position sensitive and can be mounted vertically or horizontally. The case, or printed circuit board, may be mounted with #6 hardware. Integral standoffs on the bottom of the PC board provide proper electrical and thermal isolation between the board and the mounting surface. See outline dimensions on page 1.

WARNING: Direct Vent, Sealed Combustion, Forced Draft, or similar types of appliances require the use of a gasket material suitable for use at temperatures up to 600°F. The gasket is to be installed between the electrode mounting brackets and the mating surfaces of the combustion chamber to reliably contain the toxic products of combustion and fuel gases within the combustion chamber. An incomplete seal could allow these gases to escape from the combustion chamber and to accumulate in occupied areas, creating hazardous conditions that may result in property damage, personal injury or even death from fire, explosion and/or toxic gases.

WIRING



CAUTION: Do not apply power to control unit until wiring is completed and electrode is properly connected and grounded.

LOW VOLTAGE CONNECTOR AND ASSEMBLY

(Fenwal P/N 05-127324-024): Standard connected with 24 inch lead wires. Other lead wire lengths are available.

Insert plastic connector onto edge of PC board as shown in Figure 1. (Connector will not fit if reversed.) Connect leads as follows (See Figure 3):

- Red wire to 24VAC supply
- Brown wire to valve
- Black wire to flame sensing electrode
- Yellow wire to 24VAC ground

NOTE: If low voltage connector assembly and lead wires are not ordered from Fenwal, component parts may be procured using Table 1.

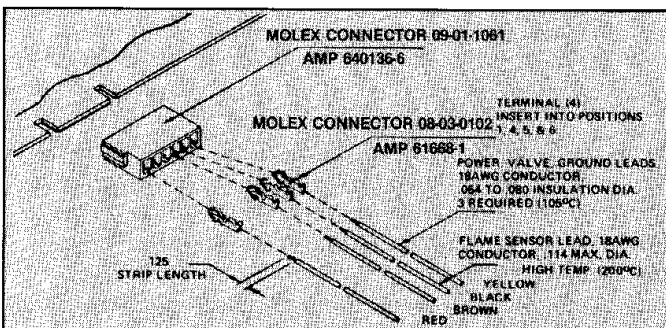


FIGURE 1

HIGH VOLTAGE ASSEMBLY

(5mm Silicon Rubber Insulated Wire)

Connect the female spark plug connector to the High Voltage Terminal on top of the control. Attach .250" female quick connect terminal to the High Voltage Electrode (See Figure 2B).

CAUTION: HIGH VOLTAGE

WARNING: Do not apply power to input terminals unless electrode is properly connected and grounded.

TABLE 1

6-pin edge connector	AMP#640136-6 with terminals #61668-1 Molex #09-01-1061 with terminals #08-03-0102
High Voltage lead wire	5mm High Voltage Cable with Silicon Rubber Insulated Rated 250 °C 20GA Conductor-Stranded. Radix #3257 or G.E. UL Style 3244.
Terminals HV wire	.250" female quick connect, and spark plug type female connector
Insulator Boot (straight)	Jamak (Detroit Silicon Div.) #935.
Flame sensing lead wire	18AWG stranded wire with insulation rated at 200°C. Tensoline #726TX33UL

ELECTRODE

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" above the base of the flame (Figure 2A).

IMPORTANT: Ceramic insulators should not be within or close to the flame pattern. Study the illustrations below before positioning the electrodes.

NOTE: Electrode assemblies should not be adjusted or disassembled. Electrodes should have a spark gap spacing of $0.125" \pm 0.032"$. If this spacing is not as specified, return the electrode assembly to Fenwal for replacement. Electrodes are NOT field adjustable.

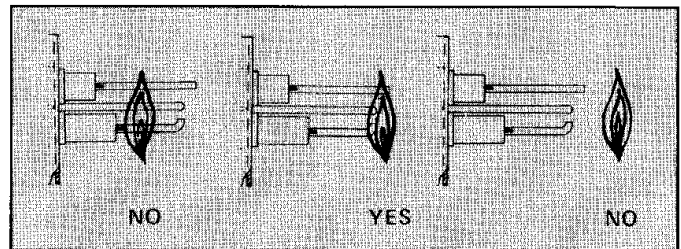


FIGURE 2A

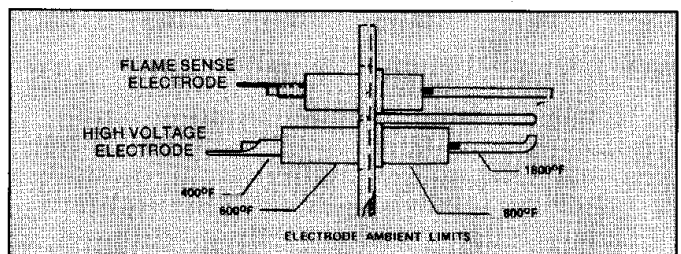


FIGURE 2B

PRELIMINARY SYSTEM CHECKS

The system must be checked after installation and before gas supply is turned on.

Be sure that input is polarized as shown in Figure 3 and the installation is electrically grounded.

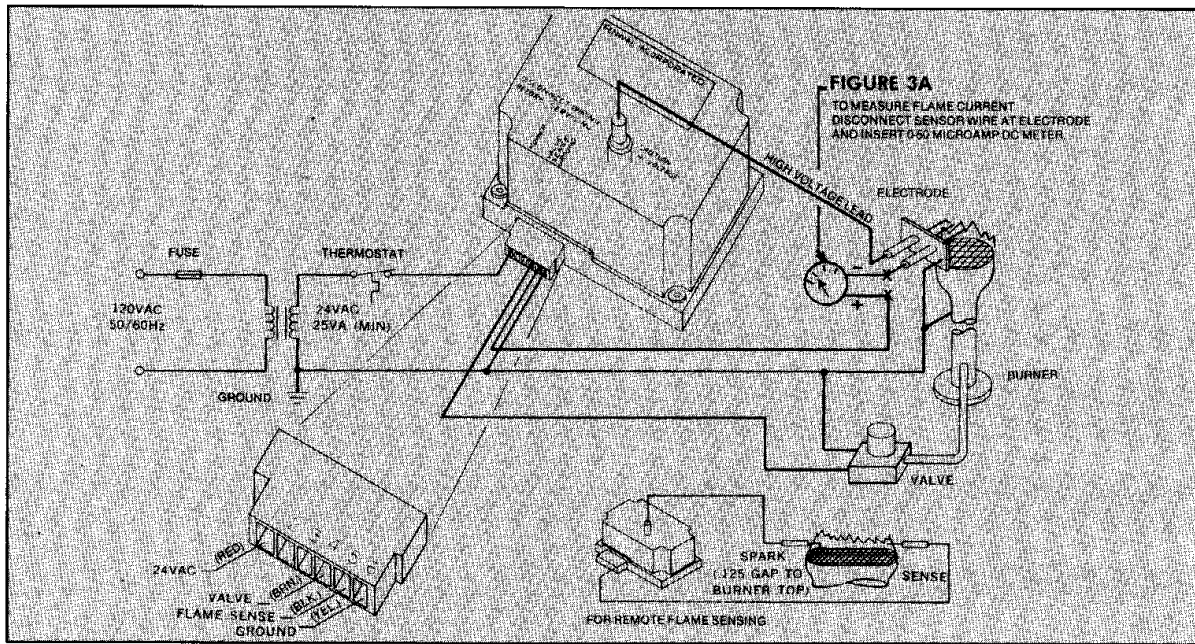


FIGURE 3

INITIAL OPERATION

1. Check installation, mounting, and electrode gap to insure conformance to specifications.
2. With the gas supply shut off, apply electrical power to the system by advancing the thermostat above room ambient.
3. Check to insure that a spark is being produced at the electrode during the trial-for-ignition period specified for the unit. The ignitor will lock out after three trial-for-ignition periods. Set the thermostat below ambient temperature.

NOTE: Pre-purge units have a typical delay of 15 or 30 seconds before ignition sparks occur. This 15 or 30 second purge will occur before each of the 3 trials for ignition.

4. Manually open the gas supply line and advance the thermostat to recycle the unit.
5. Check that ignition has been accomplished within the trial period. Sparking will cease a few seconds after establishing the flame.
6. If system ignites but fails to hold in, check for 5 microamp minimum flame sense current and check to assure the system is properly grounded per Figure 3.
7. For multiple unit installation, assure that all units are powered by a common supply voltage and all are correctly polarized and grounded.

SAFETY CHECKS

1. Manually shut off gas supply and apply power to the control unit by advancing the thermostat above room ambient. After the control unit has locked out, check that there is no voltage between "Valve" and "Ground" with a suitable volt-meter. Set thermostat below ambient temperature.
2. Manually open the gas supply valve and reactivate control unit by raising the thermostat above room

temperature. Sparking should occur after the purge period, and cease when the flame is established. While running, manually close the gas supply valve. Sparking should start as soon as the flame is extinguished. The spark should remain on for the trial-for-ignition period. Lockout will occur after two additional pre-purge and trial-for-ignition periods. Check that there is no voltage between "Valve" and "Ground" as described above.

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 ignitor from lockout is five microamps. To measure flame current, DISCONNECT INPUT (24VAC) VOLTAGE then remove low voltage sensing lead wire from sense electrode terminal and insert a 0-50 DC microamp meter in series with the sense electrode and sensing wire (See Figure 3A). Connect the input voltage and adjust the thermostat to ignite the burner, the meter reading should be 5 microamps or higher. If the scale below "0" on meter, the leads are reversed. Disconnect power and reconnect leads for proper polarity.

If the flame current reading is less than 5 microamps reposition the electrode in the flame to get a higher reading.

REPAIRS

The Fenwal Series 05-27 Direct Spark Ignition Systems are not repairable. Any modifications or repairs to the Series 05-27 will invalidate Fenwal's standard warranty as well as agency certifications. Faulty units should be returned to the factory for repair or replacement.

SPECIFICATIONS

IGNITION CONTROLS	FENWAL PART NO.	COMMENTS
With case	05-272426-XXX	
Without case	05-272425-XXX	
PRE-PURGE DELAY TIME:	05-27242X-0XX	15 seconds nominal
	05-27242X-2XX	30 seconds nominal
TRIAL FOR IGNITION (Flame Establishing Period)	05-27242X-X00	3.3 seconds
	05-27242X-X01	4.7 seconds
Nominal:	05-27242X-X02	5.6 seconds
NOTE: Lookout occurs after three purge and trial for ignition periods.	05-27242X-X03	6.8 seconds
	05-27242X-X05	10.0 seconds
	05-27242X-X06	12.0 seconds
IGNITION MEANS:		Interrupted
FLAME FAILURE RE-IGNITION TIME:		Less than .8 seconds
INPUT VOLTAGE:		24VAC, 60Hz. Operating Range 20 to 28 VAC
INPUT CURRENT DRAIN:		90mA Ignitor current drain only. (300mA momentary during ignition) Does not include valve power.
AMBIENT RANGE:		- 40 to 150 °F.
MOISTURE RESISTANCE:		to 90% humidity. Control is moistureproof but not waterproof and must be protected against direct exposure to water.
TYPES OF GAS:		Natural, LP, Manufactured
VALVE RELAY CONTACT RATING:		1.0A continuous @ 24VAC
ELECTRODE	05-100000-411 (Typical)	Spark Gap .125 ± .031" (H.V. to GND) second insulated probe for flame sensing. Quick connect terminals for lead wire connections. Other terminations and configurations available. Consult factory.
LEAD WIRE & CONNECTORS		
HIGH VOLTAGE ASSEMBLY:	**05-127328-0XX	5mm silicone insulated stranded wire rated at 200°C supplied with ¼" quick connect and spark plug-type terminals. (Wire rated at 250°C available.) Designate length in last two digits of catalog number. Max. length, 48". Assembled.
LOW VOLTAGE ASSEMBLY:	**05-127324-4XX	6-pin plastic edge connector with four LEAD wires for input power, valve, ground (rated 105°C) and flame sensing (rated 200°C). Assembled.
INSULATOR BOOT: (straight) (90°)	05-115548-000 05-115548-001	Provides electrical and environmental protection of electrode high voltage terminal.

Specifications subject to change without notice.

HOW TO ORDER

1. Select control unit by catalog number from Specifications section above. Select desired trial-for-ignition period by adding appropriate three digit suffix.
EX: 05-272426-XX3 = Control Module with case and 6.8 second trial for ignition period.

2. Standard electrode assembly is catalog number 05-100000-411. For other probe configurations, consult factory.

**3. Order High and Low Voltage Cable Assemblies by catalog number. Designate length of lead wires, in inches, in last two digits. EX: 05-127328-024 = High Voltage Cable Assembly, with terminals 24" long.

CAUTION: Fenwal Series 05-27 Direct Spark Ignition Systems are designed for use only on new products by original equipment manufacturers of gas fired appliances. They may be used only as such, or as an exact replacement for an existing Fenwal spark ignitor. Any substitution or application must be expressly approved by Fenwal or the manufacturer of the equipment. Improper substitutions or applications may result in malfunction of equipment such as loss of flame sensing safety circuit creating an explosive atmosphere or otherwise resulting in a hazardous condition which could cause personal injury or death.

The information herein is to assist customers in determining whether our products are suitable for their applications. We request that customers inspect and test our products before use and satisfy themselves as to the contents and suitability.

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This literature is provided for informational purposes only. KIDDE-FENWAL, INC. assumes no responsibility for the product's suitability for a particular application. The product must be properly applied to perform as described herein.

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

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