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FENWAL®

SERIES 05-33 208/240 VAC HOT SURFACE IGNITION SYSTEM

This hot surface ignition system provides an efficient way of igniting your gas burner application. Its wide selection of features makes it the most versatile system available.

VERSATILE TO MEET YOUR SPECIFIC NEEDS

Depending on the model selected, the ignitor may operate on 120, 208/240, or 277 VAC. Combinations of these voltages are also available, allowing use with whatever standard voltage you find at the job site. The system is available in single or multiple trial-for-ignition versions. Also selectable are nominal heat up periods of 20 or 45 seconds, quick connect or AMP MATE-N-LOK connectors, a 15 second prepurge period, a 45 second postpurge period, and inducer blower control.

AGENCY CERTIFIED

The 05-33 is an interrupted-type ignition system and conforms to ANSI Z21.20. This system is certified by the American Gas Association for use with natural or propane gas. It is also certified by the Canadian Gas Association and is a U.L. recognized component.

EFFICIENT OPERATION

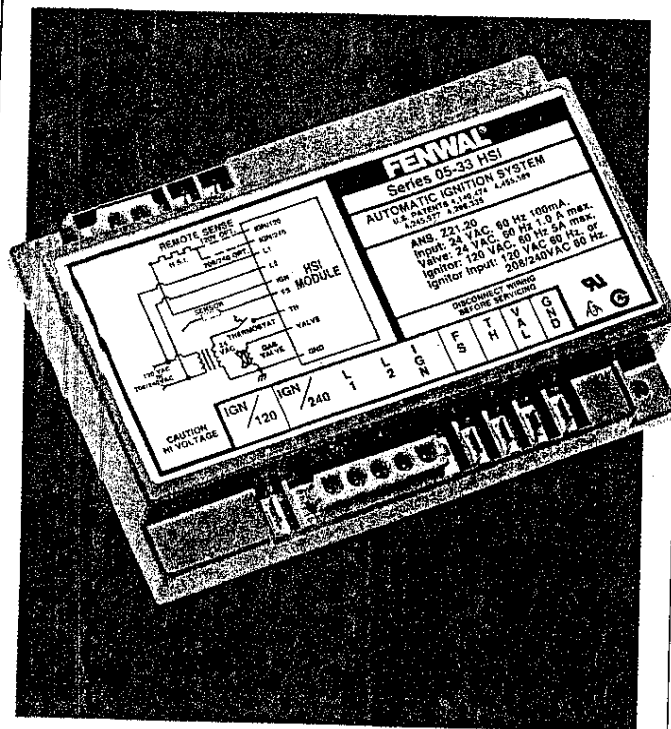
Flame sensing is achieved through the patented technique of using the hot surface element as the sensor. However, if required, a separate sensing probe can be supplied. All models utilize the principle of flame rectification to monitor the burner flame. In addition, a self diagnostic circuit checks the valve control and the flame rectification circuit before the ignition sequence is initiated.

COMPACT SIZE – EASY TO MOUNT

The electronic package measures only 3.93 × 5.68 × 1.60 in (99.8 × 144.3 × 40.6 mm) and weighs approximately 5 oz (150 g). It is not position-sensitive and may be mounted vertically or horizontally using #8 hardware. Connections may be made easily with quick connect or AMP MATE-N-LOK connectors.

ECONOMICAL SELF-CONTAINED INDUCER BLOWER CONTROL

If you use an inducer blower, there is no need to incur the cost and inconvenience of a separate control system. The Series 05-33 system has an optional inducer relay integral with its electronic package.



PRINCIPLE OF OPERATION

The Series 05-33 system combines a hot surface ignitor element with a flame detector. The hot surface ignitor is typically an electrically heated silicon carbide element which thermally ignites the gas.

Upon a call for heat, a 120 VAC hot surface ignitor is energized from a nominal 120, 208/240, or 277 VAC line and is allowed to reach ignition temperature. The gas valve is then powered with 24 VAC establishing the flame at the burner. The system then switches the element from the ignition mode to the sensing mode to monitor the continued presence of the flame.

If the flame is not established during the trial-for-ignition period, the system goes into lockout. If an established flame is extinguished for any reason, the system closes the gas valve and reactivates the hot surface element as an ignitor, initiating a new trial-for-ignition sequence.

Multi-Try Models

These models provide for three complete ignition sequences before going into lockout. If the flame is established on any of the three tries, the system will then monitor the flame for the duration of the duty cycle.

Prepurge Models

The system provides an optional purge period of 15 seconds (nominal) to clear the combustion chamber of any residual gases before the heat up period of each try for ignition. This feature is available on both single- and three-try models.

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PRINCIPLE OF OPERATION (Continued)

Inducer Blower Control Option

When the inducer option is selected, the inducer contacts are powered when the thermostat calls for heat. The blower shuts off when the thermostat is satisfied. However, when the inducer option is used in conjunction with the postpurge option, the blower stays on for an additional 45 seconds.

MOUNTING

The Series 05-33 system is not position-sensitive and may be mounted vertically or horizontally using #8 hardware.

WIRING

WARNINGS:

The Series 05-33 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 person.
2. Before wiring system, shut off gas supply and remove both line power to the ignitor (120, 208/240, or 277 VAC) and thermostat power (24 VAC).
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 local sensing systems, Figure 2 for remote sensing systems, and Figure 3 for the optional inducer.

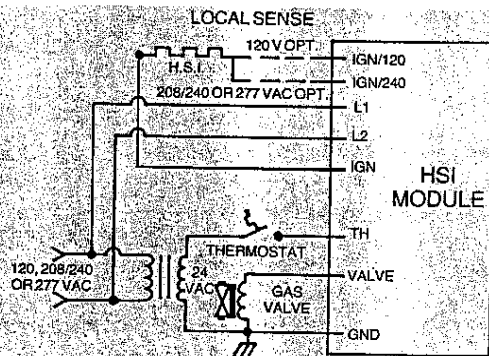


Figure 1: Wiring Diagram - Local Sensing Systems

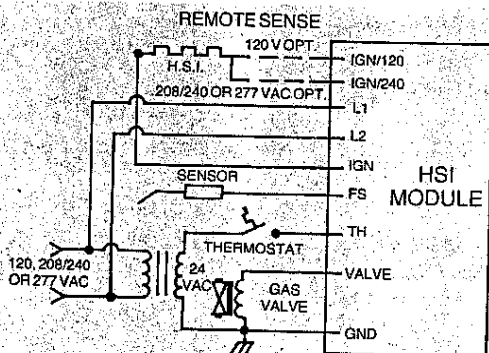


Figure 2: Wiring Diagram - Remote Sensing Systems

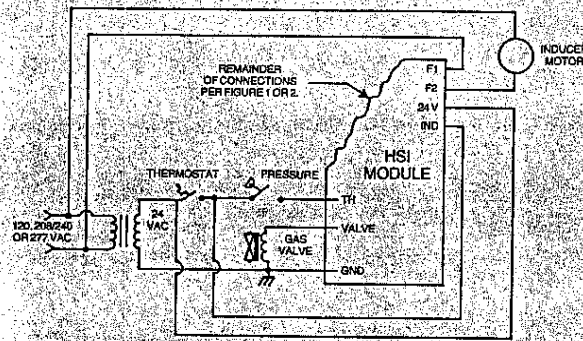


Figure 3: Wiring Diagram - Inducer

SILICON CARBIDE IGNITOR

Proper location of the silicon carbide ignitor is important to achieve optimum system performance for both ignition and flame sensing. See Figure 4.

INITIAL OPERATION

1. Check installation. Mount and position the ignitor per Figure 4.
2. With gas supply manually shut off, apply power to appliance and cycle thermostat above room temperature.
3. Insure that the ignitor "glows" during the heat up period (see Specifications section) and the trial-for-ignition period. In three-try ignition systems, the ignitor will automatically recycle three times, then lockout.
4. Set the thermostat to the lowest setting.
5. Wait 15 seconds, then manually open the gas supply and advance the thermostat above room temperature to recycle the system.
6. Check that ignition occurred. The ignitor "glow" should diminish once the flame has been established. At this stage, the ignitor acts as the sensing element if the local sensing option was selected.
7. If the system ignites but fails to "hold-in," check for proper grounding of the 24 volt circuit (the ground should be common between the module and the burner). Also check the element position per Figure 4.

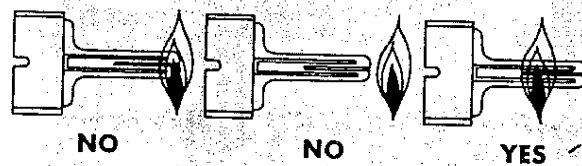


Figure 4: Ignitor Location

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SAFETY CHECKS

1. Manually shut off gas supply. Apply power to appliance and cycle thermostat above room temperature. After the system locks out, check that there is no voltage across the gas valve terminals with a suitable voltmeter. Next, set the thermostat to its lowest setting.
2. Wait 15 seconds, then manually open the gas supply and reactivate the system by advancing the thermostat to a setting above room temperature. The ignitor should glow brightly during the heat-up period, then diminish after the flame has been established.

While the system is operating, manually shut off the gas supply. Following a short delay, the ignitor will re-energize and glow brightly. The ignition control will continue to cycle for the specified number of trial-for-ignition periods and then lockout. Check again that there is no voltage across the valve terminals after lockout.

SERVICE CHECKS

Symptom	Cause/Cure
1. Dead	<ol style="list-style-type: none"> A. Check for 24 VAC from thermostat to ground. B. Check system wiring. C. Check thermostat, transformer, circuit breaker, etc.
2. Hot surface element does not heat but unit cycles.	<ol style="list-style-type: none"> A. No line voltage. B. Check system wiring. C. Check circuit breaker and line voltage power source. D. Check for broken or cracked hot surface element.
3. Hot surface element heats up but "0" voltage at valve during tries for ignition.	<ol style="list-style-type: none"> A. Check wiring between valve and module. B. Check valve ground.
4. Hot surface element heats, 24 volts to valve, flame established but does not hold-in.	<ol style="list-style-type: none"> A. Check ground between module and burner. B. Hot surface element improperly located. C. Check system ground (24 VAC supply). D. Burner out of adjustment.
5. Hot surface element heats, 24 volts to valve but system fails to ignite.	<ol style="list-style-type: none"> A. Gas supply off. B. Check gas valve. C. Burner out of adjustment (orifice plugged). D. Hot surface element incorrectly located.

REPAIRS

WARNING: The Fenwal Series 05-33 Hot Surface Ignition system module is not repairable. Any modifications or repairs to it will invalidate the Fenwal standard warranty, as well as agency certifications AND MAY CREATE HAZARDOUS CONDITIONS THAT COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR EVEN DEATH FROM FIRE, EXPLOSION, AND/OR TOXIC GASES. Faulty units should be replaced with a new unit.

SPECIFICATIONS

Size (H × W × D)

3.93 × 5.68 × 1.60 in
(99.8 × 144.3 × 40.6 mm)

Weight Approximately 5 oz (140 g)

Input Voltage

Ignitor: 120, 208/240, or 277 V, 50/60 Hz
Thermostat: 24 V, 50/60 Hz (Operating range 20-28 VAC)

Input Current Drain

100 mA, does not include valve power

Valve Rating

24 VAC, 1.0 A maximum, inrush 2 A maximum

Ignitor Heat-Up Time

20 seconds nominal (18-28 seconds)
45 seconds nominal (30-60 seconds)

Inducer Contact Rating 8 A at 250 VAC (1/4 hp)

Ambient Temperature Limits

-40 to +160°F (-40 to +70°C)

System Check Circuit

Checks valve control circuit and flame rectification circuit before ignition sequence is initiated.

Tries for Ignition

Available in one- or three-try versions.

Trial-For-Ignition Periods (lockout time)

1.5, 3.0, 5.0, 7.0, 10.0, or 15.0 seconds, depending on model.

Prepurge

None or 15 seconds, depending on model.

Postpurge

None or 45 seconds, depending on model.

Retry for Ignition

Loss of flame will result in one retry for ignition. (Two retries on three-trial-for-ignition model.)

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

HOW TO ORDER

Order by Catalog Number selecting:

- Inducer relay and postpurge
- Ignitor input voltage and local or remote sense
- Number of tries for ignition
- Terminal board connector type
- Prepurge period
- Heat-up time
- Trial-for-ignition (TFI) time

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HOW TO ORDER (Continued)

2 3 6 1 1 0 1
 05 - 33 XXXXX - XXX

208/240 VAC Hot Surface Ignitor

- 0 = Without Inducer Relay
- 1 = Inducer Without Postpurge
- 2 = Inducer With Postpurge

- 0 = 120/208/240 VAC, Local Sense
- 1 = 120/208/240 VAC, Remote Sense
- 2 = 208/240 VAC, Local Sense
- 3 = 208/240 VAC, Remote Sense
- 4 = 120 VAC, Local Sense
- 5 = 120 VAC, Remote Sense
- 6 = 277 VAC, Local Sense
- 7 = 277 VAC, Remote Sense

- 2 = Single Try For Ignition
- 6 = Three Tries For Ignition

- 1 = With Quick Connect Connectors
- 2 = With AMP MATE-N-LOK Connectors

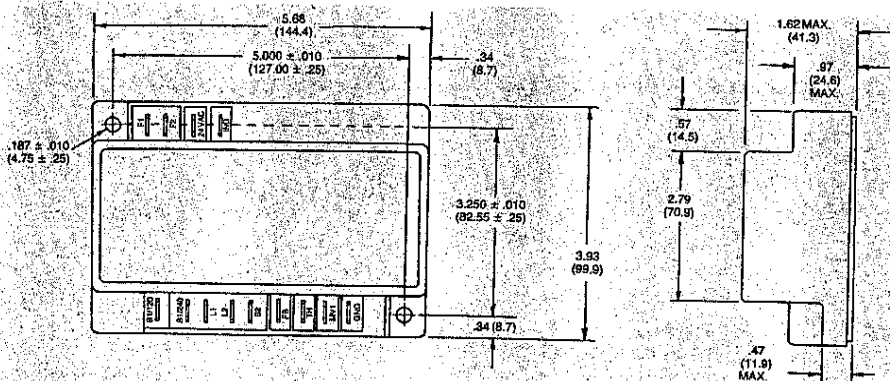
- 0 = No Prepurge
- 1 = 15 Second Prepurge

- 0 = 20 Second Heat-up
- 1 = 45 Second Heat-up

- 0 = 1.5 Second TFI
- 1 = 3.0 Second TFI
- 2 = 5.0 Second TFI
- 3 = 7.0 Second TFI
- 4 = 10.0 Second TFI
- 5 = 15.0 Second TFI

Example: 05-331261-003 = Series 05-33 Hot Surface Ignition system with inducer relay but without postpurge, 208/240 VAC line voltage, local sensing, three tries for ignition, quick connects, no prepurge, 20 second heatup, and 7.0 second trail-for-ignition period.

OUTLINE DIMENSIONS



Dimensions in parentheses are in millimeters.

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.