

parts4heating **FENWAL**<sup>®</sup>  
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## SERIES 05-34 PROVED HOT SURFACE IGNITION SYSTEM

This proved hot surface ignition system is the solution for direct burner ignition on appliances rated over 400,000 BTUs and provides an efficient way of igniting your gas burner. Its wide selection of features makes it the most versatile system available.

### VERSATILE TO MEET YOUR SPECIFIC NEEDS

Depending on the model selected, this proved ignition system module can be factory preset to work with any manufacturer's 120 VAC silicon carbide ignitor. It's designed for igniting systems above 400,000 BTUs, but can be used on any gas-fired appliance. The system is available in single or multiple trial-for-ignition models, with options including prepurge and postpurge periods, inducer blower control and diagnostic outputs.

### AGENCY CERTIFIED

The 05-34 is a proved interrupted-type ignition system and conforms to ANSI Z21.20 and UL 372. 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

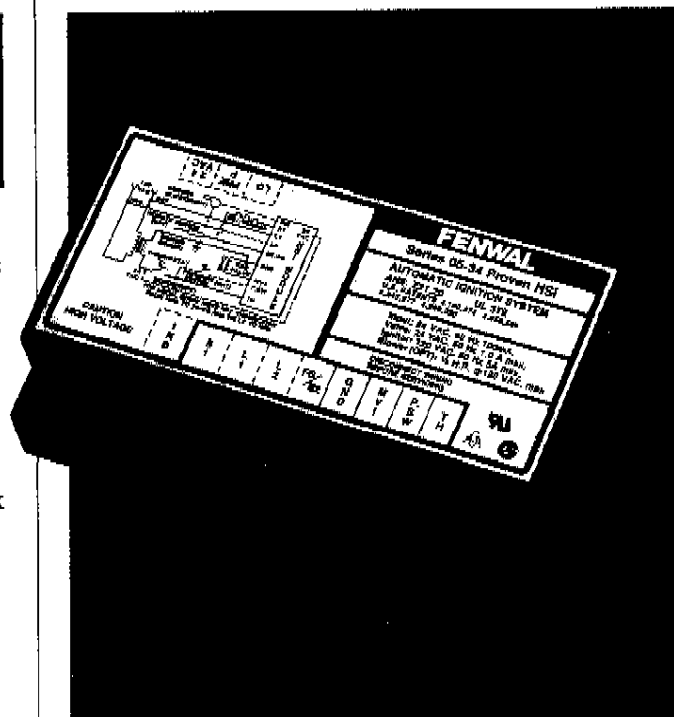
Flame sensing is achieved through the patented technique of using the hot surface element as the sensor. However, if required, a separate sensing probe can be supplied. All models utilize the principle of flame rectification to monitor the burner flame. In addition, a self diagnostic circuit checks the 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 6 oz (180 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 05-34 system has an optional inducer relay integral with its electronic package.



### PRINCIPLE OF OPERATION

The Series 05-34 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, the hot surface ignitor is energized from a nominal 120 VAC line and is proven to be capable of ignition. 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 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 or 30 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 15 or 30 seconds, depending on the model selected.

#### Diagnostic Output Option

Models are provided with outputs used to indicate a prepurge or lockout condition. Both outputs are rated 24 VAC, 500 mA with a maximum inrush current of 2 A.

### MOUNTING

The Series 05-34 system is not position-sensitive and may be mounted vertically or horizontally using #8 hardware.

### 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 proving 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.

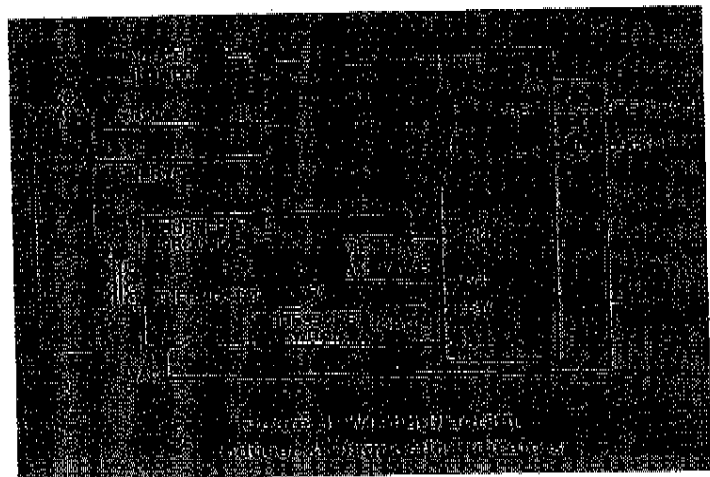
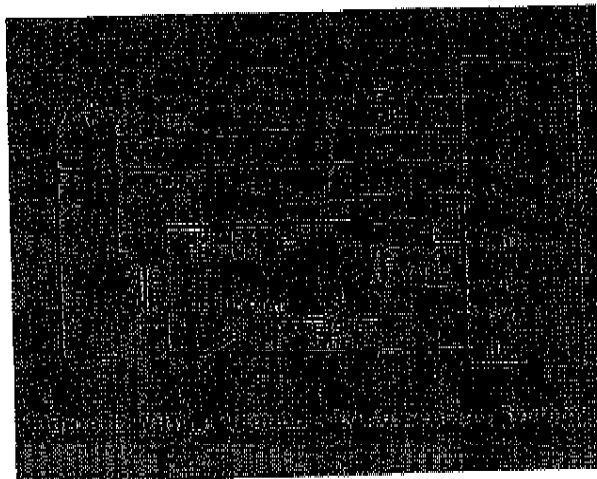
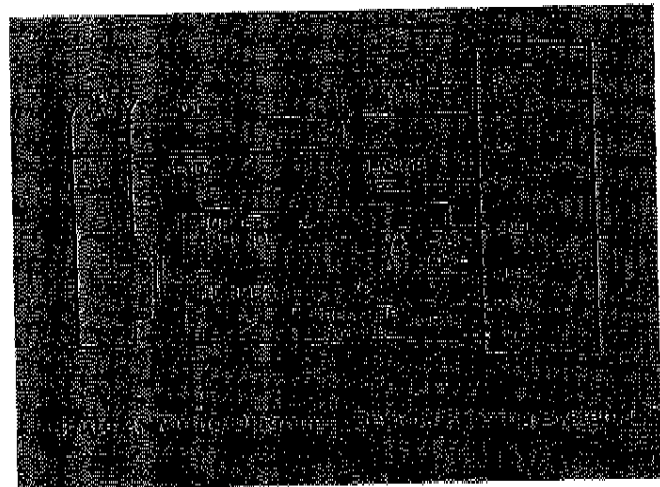
### WIRING

#### WARNINGS:

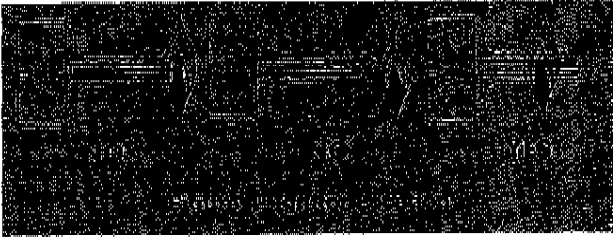
*The Series 05-34 system uses voltages of shock hazard potential and operates in the presence of combustible gas. Failure to observe the following warnings could result in shock, fire, or explosion causing severe injury or death.*

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 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.



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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 proving 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	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.	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.	A. Check wiring between valve and module. B. Check valve ground. C. Check ignitor current.
4. Hot surface element heats, 24 volts to valve, flame established but does not hold-in.	A. Check ground between module and burner. B. Hot surface element (or remote sensor) 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.	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 05-34 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 x W x D)

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

**Weight** Approximately 6 oz (180 g)

#### Input Voltage

Ignitor: 120 VAC, 50/60 Hz

Thermostat: 24 VAC, 50/60 Hz (Operating range 20-28 VAC)

#### Input Current Drain (24 VAC)

100 mA, does not include valve power

#### Diagnostic Outputs

Prepurge and lockout

24 VAC, 500 mA, inrush 2 A maximum

#### Valve Rating

24 VAC, 1.0 A maximum, inrush 2 A maximum

**Ignitor Proving Current** (See How to Order)

**Inducer Contact Rating** 10 A at 250 VAC (1/3 hp)

#### Ambient Temperature Limits

-40 to +165°F (-40 to +70°C)

#### System Check Circuit

Checks ignitor proving, valve control, and flame rectification circuits before ignition sequence is initiated.

#### Tries for Ignition

Available in one- or three-try versions.

#### Trial-For-Ignition Periods (lockout time)

2.0, 4.0 or 7.0 seconds, depending on model.

#### Prepurge

None, 15 or 30 seconds, depending on model.

#### Postpurge

None, 15 or 30 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.)

**Flame Current** .75 microamp minimum

#### Moisture Resistance

Each module is conformal coated to operate to 95% R.H. However, care must be taken to protect the module from direct exposure to water.

**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

**SERIES 05-34****HOW TO ORDER (Continued)****05-34XXXX-XXX**

## Proved Hot Surface Ignition

- 0 = Without Inducer Relay (Standard)
- 1 = Inducer Without Postpurge
- 2 = Inducer With Postpurge (15 second)
- 3 = Inducer With Postpurge (30 second)

- 0 = Local Sense Without Purge & Lockout Indicators
- 1 = Remote Sense
- 2 = Local Sense With Purge & Lockout Indicators
- 3 = Remote Sense

- 2 = Single Try
- 6 = Three Try

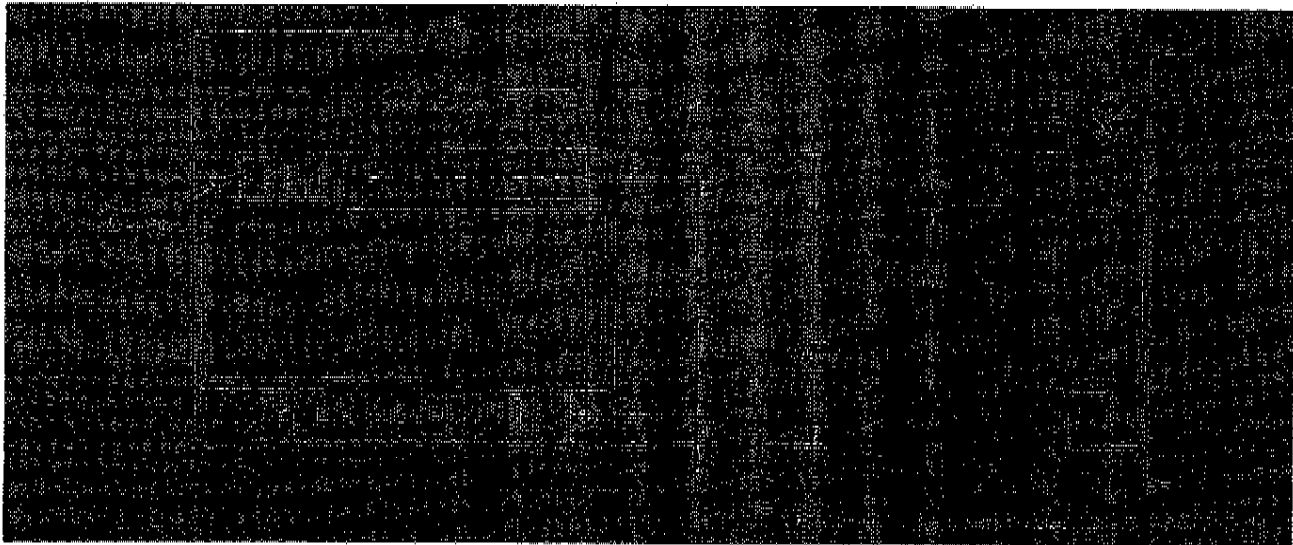
- 1 = With All Quick Connect Connectors Without Pressure Switch Input
- 2 = With AMP MATE-N-LOK Connectors
- 3 = With All Quick Connect Connectors With Pressure Switch Input
- 4 = With AMP MATE-N-LOK Connectors

- 0 = No Prepurge
- 1 = 15 Second Prepurge
- 2 = 30 Second Prepurge
- 1 = 2.1 5 = 2.9
- 2 = 2.3 6 = 3.1
- 3 = 2.5 7 = 3.3
- 4 = 2.7 8 = 3.5

Proving Current (in amps)

- 1 = 2.0 Second TFI
- 2 = 4.0 Second TFI
- 3 = 7.0 Second TFI

**Example:** 05-342223-152 = Series 05-34 Proved Hot Surface Ignition System with inducer with 15 second postpurge, local sensing with purge and lockout indicators, single try for ignition, with quick connect connectors and pressure switch, 15 second prepurge, 2.9 amps proving current, 4.0 second trial-for-ignition period.

**OUTLINE DIMENSIONS**

This literature is provided for informational purposes only. Actual performance is based on proper application of the product by a qualified professional. Nothing herein shall constitute a warranty, expressed or implied, including any warranty of merchantability of fitness for a particular purpose.

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