



# Q347A,D Igniter Q347B,C Igniter-Sensors

INSTALLATION INSTRUCTIONS

## APPLICATION

The Q347 is used with S87A, B, C, D, J, K, S89E,F, or S825 Direct Spark Ignition (DSI) modules. Refer to Table 1 for specifications.

Table 1. Q347 Specifications.

Model	Function	Used With
Q347A	Igniter only. Provides spark to ignite main burner flame.	Q354A Flame Sensor. S87C,D,K DSI module. S89E,F DSI module.
Q347B,C	Igniter-Sensor. Provides spark to ignite and sense main burner flame.	S87A,B,J DSI module.
Q347D	Igniter only.Provides spark to ingnite main burner.	Q354A Flame Sensor. S825 system control.

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings and description given in the instructions to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After completing installation, use these instructions to check out product operation.

### WARNING

**Fire or Explosion Hazard**  
**Can cause property damage, severe injury, or death.**

Follow these warnings exactly:

1. Disconnect power supply before removing any connectors to prevent electrical shock or equipment damage.
2. Disconnect gas supply before beginning installation. If installing a gas control, perform Gas Leak Test according to manufacturer instructions.

Follow appliance manufacturer instructions if available; otherwise, use instructions provided below as a guide.

### Location

1. Disconnect power supply.
2. In replacement applications, remove old Q347.
3. The Q347 spark gap is factory-adjusted to 0.164 in. [4.17 mm]. If necessary, adjust spark gap by bending the ground strap. Refer to Fig. 1.
4. Position Q347 for easy access and observation. In replacement applications, position new Q347 in the same location and orientation as the original one.
5. Mount Q347 on main burner using the mounting bracket. Mounting surfaces other than the main burner may shift, bend, or warp as furnace expands and contracts while operating. In replacement applications, use existing mounting bracket and existing mounting surface.

NOTE: On multiple burner systems using S87A, B, or J, the Q347 can be mounted at one end of the row of burners and the Q354A can be mounted at the other end. The ignition modules must provide enough time for all burners to ignite prior to lock-out, while meeting all applicable safety standards.

6. Ensure that main burner flame is not blocked by the outer electrode. Mount Q347 as shown in Fig. 2.
7. Mount Q347B,C so the ignition flame remains properly positioned with respect to the main burner flame. Refer to Fig. 2.

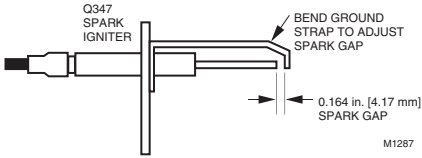


Fig. 1. Adjust Q347 spark gap.

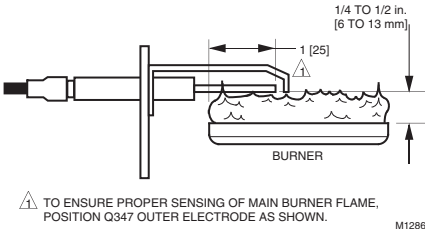


Fig. 2. Mount Q347 with respect to main burner flame.

## WIRING

All wiring must comply with applicable electrical codes and ordinances.

Follow circuit diagrams provided in the DSI module instructions. If not available, refer to Fig. 3, 4, 5, or 6.

Connect the ground wire as follows:

### IMPORTANT

1. The Q347, ignition module, and main burner must have a common ground.
2. Use thermoplastic insulated wire with a minimum rating of 221° F [105° C] for the ground wire. Asbestos insulated wire is not acceptable.
1. Attach female quick-connect to one end of the wire and connect it to male quick-connect marked "GND" on the ignition module.
2. Strip the other end and fasten under Q347 mounting screw.
3. If necessary, use shield to protect ground wire from radiant main burner heat.

Connect ignition cable (Part No. 392125-2) as follows:

### IMPORTANT

The ignition cable length must not exceed 3 feet [0.9 mm].

1. Connect one end of the ignition cable to stud terminal on igniter electrode.
2. Connect other end of ignition cable to the igniter terminal on the ignition module.
3. Use ceramic or plastic insulators to prevent ignition cable from contacting metal surfaces.

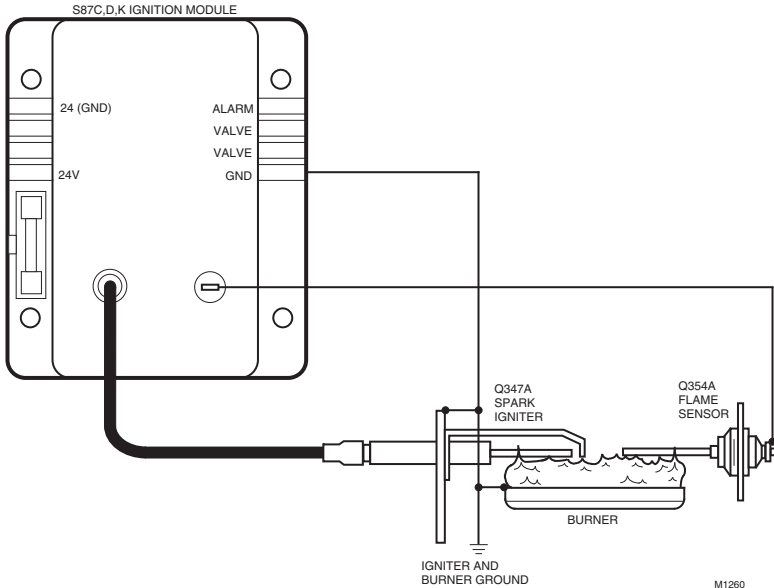


Fig. 3. Q347A; S87C, D, K; and Q354A typical wiring connections.

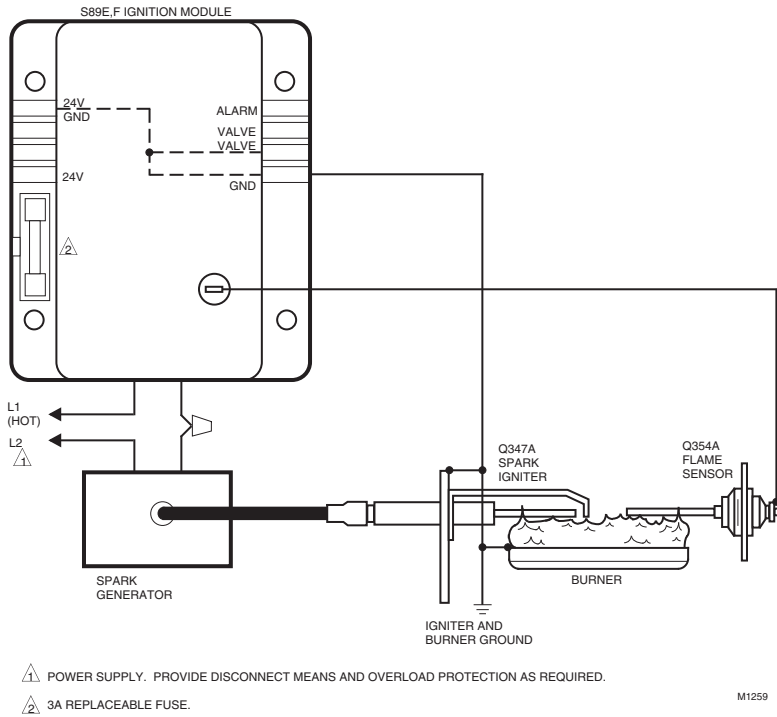


Fig. 4. Q347A; S89E, F; and Q354A typical wiring connection.

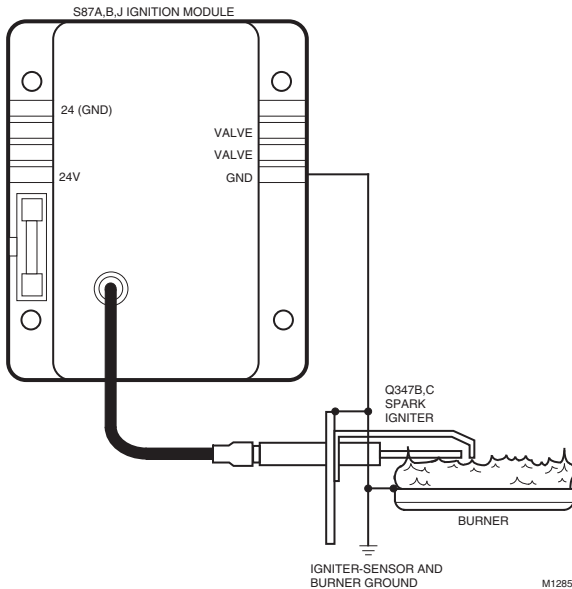


Fig. 5. Q347B,C and S87A, B, J typical wiring connections.

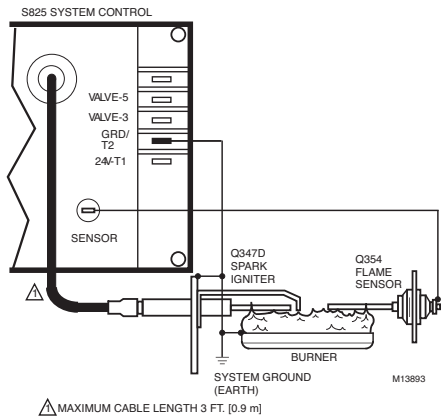


Fig. 6. Q347D and S825 typical wiring connections.

CHECKOUT

Since the application and controls used may differ, follow the CHECKOUT procedures for the ignition module and the appliance manufacturer instructions. However, the following procedures must be performed during all CHECKOUT procedures.

Start System

- 1. Ensure the power and gas supply are turned on.
- 2. Set thermostat to call for heat and watch for spark at the igniter. (S87J and K models provide a 30 second delay before spark startup for prepurge.)
- 3. Time the length of the spark operation. It must be within the lockout timing period. Refer to Table 2.

Table 2. Ignition Module Lockout Times.

Specified Lockout Time (stamped on ignition module)	Safety Lockout Time Not to Exceed
4.0 seconds	5.0 seconds
6.0 seconds	7.0 seconds
11.0 seconds	15.0 seconds
15.0 seconds	21.0 seconds
21.0 seconds	35.0 seconds

- 4. Ensure that the system starts as follows:
  - Spark turns on.
  - Gas valve opens.
  - Burner ignites after gas reaches the main burner.
  - Spark igniter shuts off.

NOTE: If the gas control has been replaced or serviced, lightoff may not be satisfactory until air has been purged from the gas line of the gas input and combustion air have been adjusted (see manufacturer instructions).

Reset Ignition Module After Lockout

If the ignition module goes into safety lockout, it will remain locked out until the system is reset.

To reset the system, adjust the thermostat setting below room temperature, wait 30 seconds, and move the thermostat setting above room temperature to call for heat. Normal ignition should occur as described above.

IMPORTANT

If adjusting the thermostat does not reset the ignition module, turn appliance power off for one minute, then turn power on.

SERVICE

Measuring Flame Current (Q347A)

The ignition module provides alternating current to the flame sensor which the burner flame rectifies to direct current.

When the Q347A ignites the main burner flame, flame current is measured by the Q354A to assure flame presence. Ensure the flame current is at least 0.8  $\mu$ A for S89E,F and at least 1.5  $\mu$ A for S87C,K for proper appliance operation.

Measure flame current as follows:

- 1. Connect a dc microammeter in series with the flame signal ground wire.
  - Disconnect Q354A from sensor terminal on ignition module.
  - Connect red lead (positive lead) of microammeter to quick-connect sensor terminal on ignition module.
  - Connect black lead (negative lead) of microammeter to free end of Q354A leadwire.
- 2. Restart the system and read the meter. The flame sensor current must be at least 0.8  $\mu$ A for S89E,F or 1.5  $\mu$ A for S87C,K and steady.
  - If the reading is less than 0.8  $\mu$ A for S89E,F or 1.5  $\mu$ A for S87C,K or unsteady, see "Low or Unsteady Flame Current" on page 5.

Measuring Flame Current (Q347B,C)

The ignition module provides alternating current to the flame sensor which the burner flame rectifies to direct current. The level of flame current is measured by the Q347B,C to assure flame presence. The flame signal back to the S87A, B, J must be at least 1.5  $\mu$ A to assure proper appliance operation.

Measure the flame current as follows:

- 1. Connect a meter (dc microammeter scale) in series with the flame signal ground wire.
  - Disconnect the ground wire at the ignition module.
  - Connect the red (positive) meter lead to the free end of the ground wire.
  - Connect the black (negative) meter lead to the quickconnect ground terminal on the ignition module.
- 2. Restart the system and read the meter. The flame sensor current must be at least 1.5  $\mu$ A and steady.
  - If the reading is less than 1.5  $\mu$ A or unsteady, see "Low or Unsteady Flame Current" on page 5.
  - If a flame is present at sensor and a reading of 0  $\mu$ A is obtained, check for a secondary ground connection to the 24V (GND) terminal. If a secondary connection exists, temporarily remove connection and measure flame current.

## Low or Unsteady Flame Current

If the S87A,B,C,D,J,K flame current is less than  $1.5\ \mu\text{A}$  or S89E,F flame current is less than  $0.8\ \mu\text{A}$ , or burner flame is unsteady check the burner flame, flame sensor location, and electrical connections as follows.

### Burner Flame

The flame sensor must be constantly immersed in flame. Check burner flame conditions as shown in Fig. 7.

### Flame Sensor Location

The flame signal is best when about 1 in. [25 mm] of flame rod is immersed in the burner flame. Refer to Fig. 1. A bent flame rod, bent mounting bracket, or cracked ceramic insulator can affect flame signal. Straighten mounting bracket or replace igniter-sensor if necessary.

### Electrical Connections and Shorts

Connections at the flame sensor must be clean and tight. If wiring needs replacement, use moisture-resistant No. 18 wire rated for continuous duty up to  $221^\circ\text{F}$  [ $105^\circ\text{C}$ ].

#### CHECK BURNER FLAME CONDITIONS

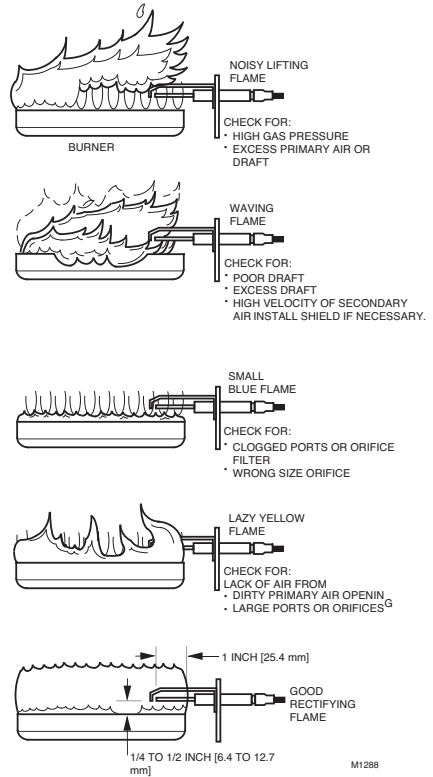


Fig. 7. Checking burner flame conditions.







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[www.resideo.com](http://www.resideo.com) 60-1018-04 M.S. Rev. 06-20 | Printed in United States