

Federal Mogul FRS-4-6

Federal Mogul Auburn FRS-4-6 Flame Rod Instruction Manual

Model: FRS-4-6

1. INTRODUCTION

This manual provides essential information for the proper installation, operation, and maintenance of the Federal Mogul Auburn FRS-4-6 Flame Rod. This component is designed for use in industrial burners, boilers, and ovens to ensure reliable flame detection. Adherence to these instructions is crucial for safe and efficient performance.

2. PRODUCT OVERVIEW

The Auburn FRS-4-6 Flame Rod is a critical safety component in combustion systems, designed to detect the presence of a flame. Its robust construction ensures durability in high-temperature environments.

- **Model:** Auburn FRS-4-6 Flame Rod (CS 13040)
- **Material:** Kanthal Electrode, designed for high operating temperatures.
- **Dimensions:** 6-inch electrode length.
- **Connection:** 1/4-18 NPT thread with a 5/8-inch hex.
- **Operating Temperature:** Rated for up to 2350°F.
- **Cross-Reference:** Replaces Eclipse 13093, Crown CA434, R6002.



Figure 1: Overall view of the Auburn FRS-4-6 Flame Rod with its packaging.



Figure 2: Detailed view of the flame rod's threaded connection and Kanthal electrode.

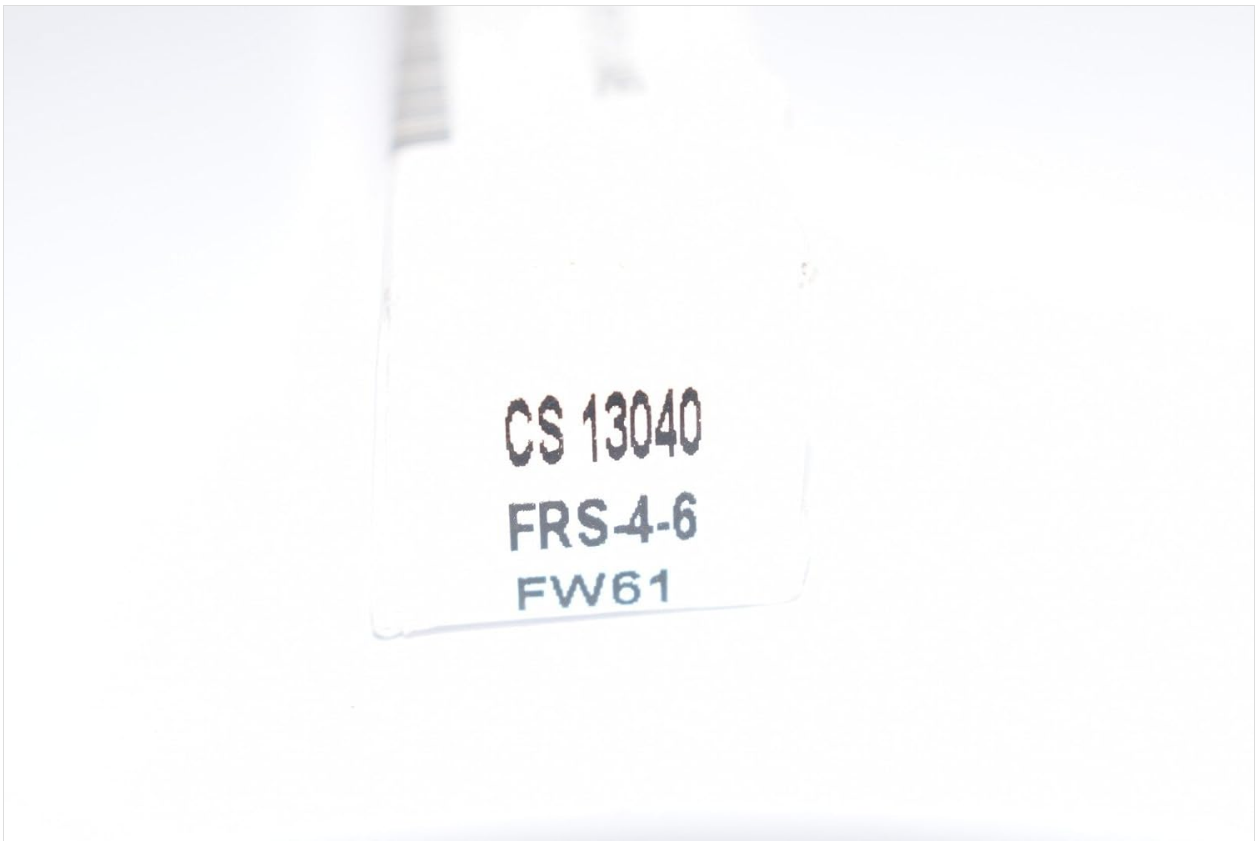


Figure 3: Close-up of the product label showing the FRS-4-6 model number.

3. SPECIFICATIONS

Specification	Detail
Brand	Federal Mogul
Manufacturer	Federal Mogul
Model Name	FRS-4-6 Auburn Flame Rod (Probe)
Item Model Number	FRS-4-6
Material	Metal (Kanthal)
Electrode Length	6 inches
Operating Temperature	Up to 2350°F
Hex Size	5/8 inches
Thread Size	1/4-18 NPT
Number of Pieces	1
Item Weight	0.01 Ounces
Package Dimensions	8.27 x 1.46 x 1.42 inches
ASIN	B011ACSSFA
Discontinued	No

Specification	Detail
Batteries Required	No

4. SETUP AND INSTALLATION

Safety First: Always ensure that the power to the appliance is disconnected before attempting any installation or maintenance. Failure to do so can result in serious injury or death. Installation should only be performed by a qualified technician.

- Preparation:** Identify the location of the existing flame rod or the designated installation point in the combustion chamber. Ensure the area is clean and free of debris.
- Removal of Old Rod (if applicable):** Carefully disconnect any wiring from the old flame rod. Use an appropriate wrench to unscrew the old rod from its mounting.
- Inspection:** Inspect the new Auburn FRS-4-6 Flame Rod for any signs of damage. Verify that the electrode is straight and the ceramic insulator is intact.
- Installation:** Thread the new flame rod into the mounting hole. Hand-tighten first, then use a wrench to secure it firmly. Do not overtighten, as this can damage the ceramic insulator or the mounting threads.
- Wiring:** Connect the flame sensor wire to the terminal on the flame rod. Ensure a secure and clean connection. Refer to the appliance's specific wiring diagram for correct connection points.
- Positioning:** Ensure the tip of the flame rod is positioned correctly within the flame path, as specified by the appliance manufacturer. Improper positioning can lead to unreliable flame detection.
- Final Check:** Double-check all connections and ensure the flame rod is securely mounted and properly positioned before restoring power to the appliance.

5. OPERATING PRINCIPLES

The Auburn FRS-4-6 Flame Rod operates on the principle of flame rectification. When a flame is present, it ionizes the gases between the flame rod and the grounded burner assembly. This ionization allows a small electrical current to flow, which is then detected by the flame safeguard control. The control unit interprets this current as the presence of a flame, allowing the burner to continue operation. If the flame is lost, the current ceases, and the control unit initiates a safety shutdown sequence.

6. MAINTENANCE

Regular inspection and maintenance are essential for the reliable operation and longevity of the flame rod.

- Visual Inspection:** Periodically inspect the flame rod for signs of carbon buildup, corrosion, or physical damage to the electrode or ceramic insulator.
- Cleaning:** If carbon buildup is present, carefully clean the ceramic insulator and electrode with fine sandpaper or a wire brush. Ensure no abrasive particles remain. Excessive carbon can create a short circuit, preventing proper flame detection.
- Electrode Condition:** Check for erosion or bending of the electrode tip. A severely eroded tip may not adequately extend into the flame, leading to intermittent or no flame signal.
- Wiring:** Verify that the wiring connection to the flame rod is clean, tight, and free from corrosion or damage.
- Replacement:** Flame rods are wear items. Replace the FRS-4-6 flame rod if it shows significant erosion,

cracking of the ceramic, or if cleaning does not resolve flame detection issues. The lifespan can vary depending on operating conditions.

7. TROUBLESHOOTING

If the burner fails to ignite or experiences nuisance shutdowns, the flame rod may be a contributing factor. Consider the following troubleshooting steps:

- **No Flame Signal:**

- Check for proper positioning of the flame rod within the flame.
- Inspect the flame rod for carbon buildup and clean if necessary.
- Verify the integrity of the wiring from the flame rod to the control unit.
- Check for a good ground connection for the burner assembly.
- Test the flame rod for continuity and insulation resistance.

- **Intermittent Flame Signal:**

- Ensure the flame is stable and consistently engulfs the flame rod tip.
- Clean the flame rod and check for hairline cracks in the ceramic insulator.
- Verify stable voltage supply to the control unit.

- **Short Cycling:**

- This can indicate an intermittent flame signal or a faulty flame rod. Follow steps for intermittent signal.

If troubleshooting does not resolve the issue, consult a qualified service technician or the appliance manufacturer's service manual.

8. WARRANTY AND SUPPORT

For specific warranty information regarding your Federal Mogul Auburn FRS-4-6 Flame Rod, please refer to the documentation provided at the time of purchase or contact Federal Mogul directly. For technical support or assistance with installation and troubleshooting, it is recommended to consult a certified HVAC or industrial burner technician.

Federal Mogul Contact Information: Please refer to the official Federal Mogul website or product packaging for the most current contact details.