



# Spark Electrodes/Flame Sensors For Gas Ignition Systems

ELECTRONIC  
EQUIPMENT

ACOUSTIC

WEIGHING

ANTI-TILTING

VALVES

TEMPERATURE

DETECT  
A FIRE®

FLOW/  
RATE

DENSITY

INTERFACE

PRESSURE

LEVEL



## Description

Fenwal electrodes and sensors are an integral part of the ignition system for gas-fired equipment and ensure reliable ignition, optimal performance and long service life over a wide range of operating conditions. Fenwal uses only high-quality materials such as glazed Alumina ceramics and certified rod materials suitable for up to 2175° F (1190° C). Fenwal electrodes are RoHS compliant and CSA certified. Design, configuration and application are key factors in selecting the proper electrode. Rely on Fenwal's experience to provide our full range of gas ignition controls and accessories for your gas-fired equipment application.

**Spark electrodes** typically have a 0.125" ±.03" gap between the high voltage (HV) rod tip and the ground rod or burner. To facilitate consistent sparking, the gap should be from a sharp edge to a sharp edge. Position this "spark gap" at the optimal location in the burner for reliable lighting of the gas.

**IMPORTANT:** High efficiency and modulating-condensing appliances may use mesh burners. These often use larger spark gaps and may need special consideration in the system design. Consult FENWAL CONTROLS for guidance and best practices.

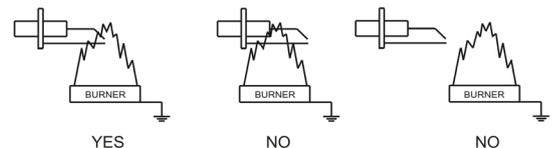
**Flame sensors** are single rods used in the flame rectification circuit of the ignition control to confirm the presence (or absence) of flame. Position this sensor so that it is well exposed to the flame over some length (not just the tip) to reliably complete the flame safeguard circuit.

In **Local Sense**, or "spark and sense" systems, the HV electrode rod performs both spark and sense functions.

For **Remote Sense** systems, a separate rod is used to sense the flame, which may be placed remotely from the spark electrode, or integrated with it on the same mounting bracket.

Please refer to pages 2-15 for a wide range of designs that are in production and available for sampling. Please contact your local sales representative or Sales Manager for samples, or detailed dimensions on any electrode of interest. Fenwal can provide custom design electrodes to meet your appliance or burner application for annual volumes  $\geq 2000$ .

Proper location of electrode assembly is important for optimum system performance. The electrode assembly should be located so that the tips are inside the flame envelope and about 1/2-inch (1.2 cm) above the base of the flame as shown below.



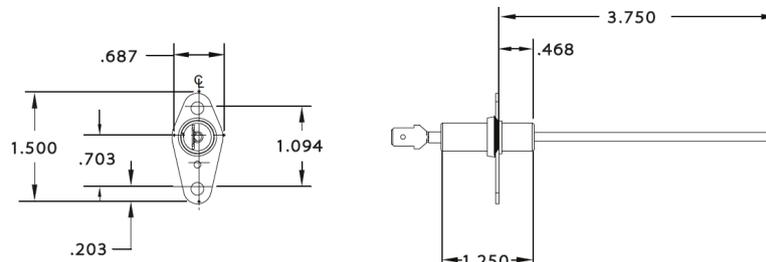
- Ceramic insulators must not be in or close to the flame.
- Electrode assemblies must not be adjusted or disassembled. Electrodes are NOT field-adjustable.
- Electrodes should have a gap spacing of  $0.125 \pm 0.031$  in ( $3.12 \pm 0.81$  mm), unless otherwise specified by the appliance manufacturer. If spacing is not correct, the assembly must be replaced.
- Exceeding temperature limits can cause nuisance lockouts and premature electrode failure.
- Electrodes must be located where they are not exposed during normal operation.

**IMPORTANT:** Always ensure a good ground path that matches burner ground to control ground. Consult FENWAL CONTROLS with any questions or to confirm best solutions for your Ignition problems.

# Single rod electrodes/remote flame sense rods

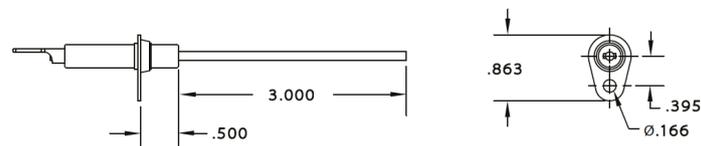
Note: All dimensions featured in the following figures are in inches.

22-100001-062



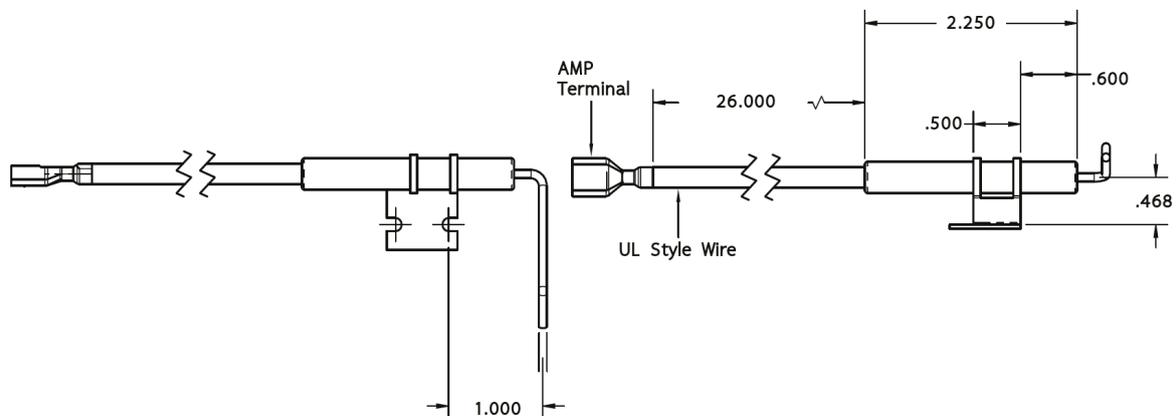
**QC Male Terminal .250 X .032**  
**Ø .114" Wire**

22-100001-225



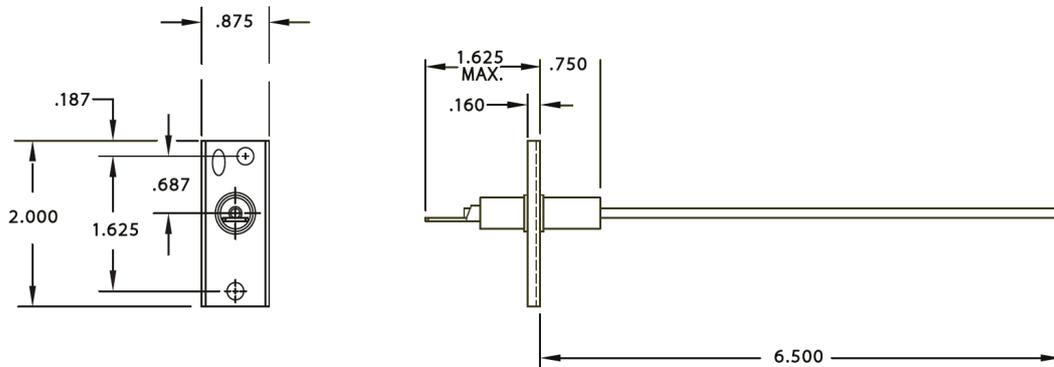
**QC Male Terminal .250 X .032**  
**Ø .114" Wire**

22-100001-334



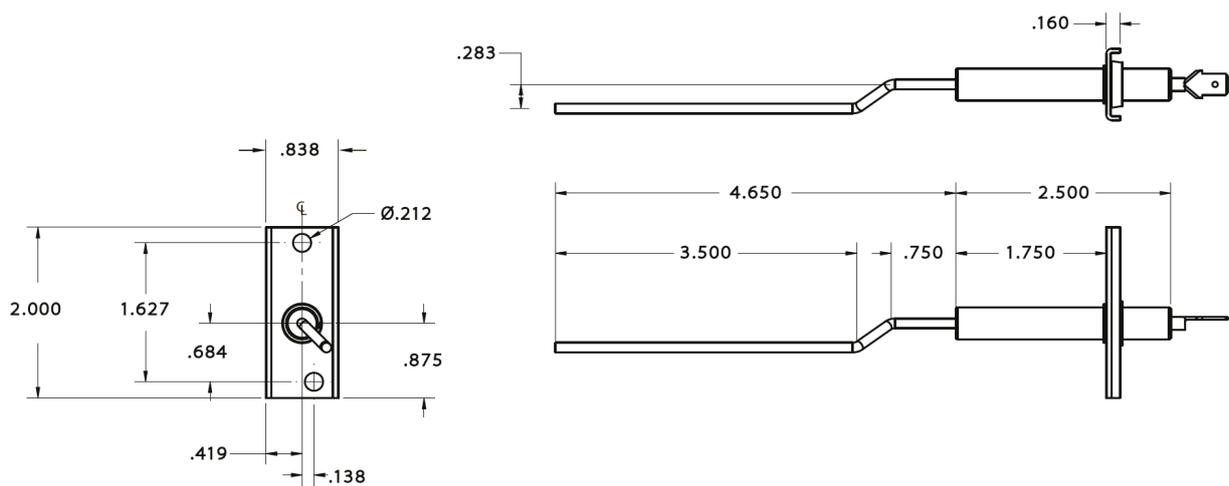
**QC Male Terminal .250 X .032**  
**Ø .085" Wire**

## 22-100001-352



QC Male Terminal .250 X .032  
 $\varnothing$  .114" Wire

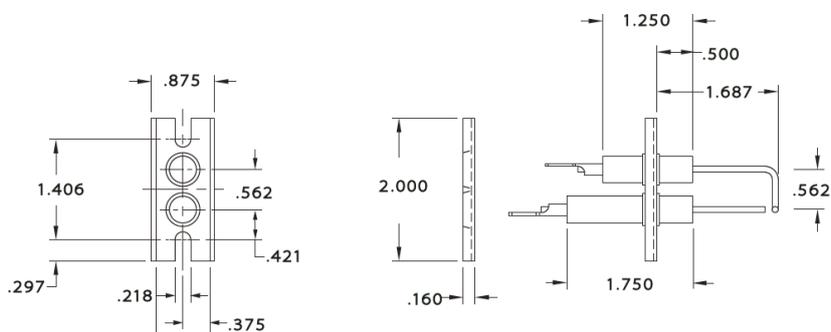
## 22-100001-390



QC Male Terminal .250 X .032  
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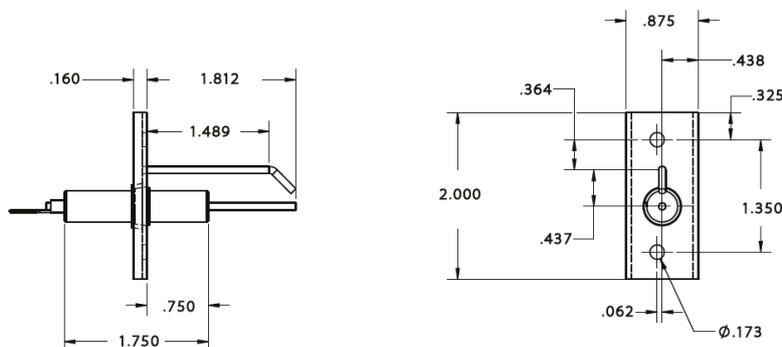
# Two rod electrodes/spark and sense electrodes

22-100000-555



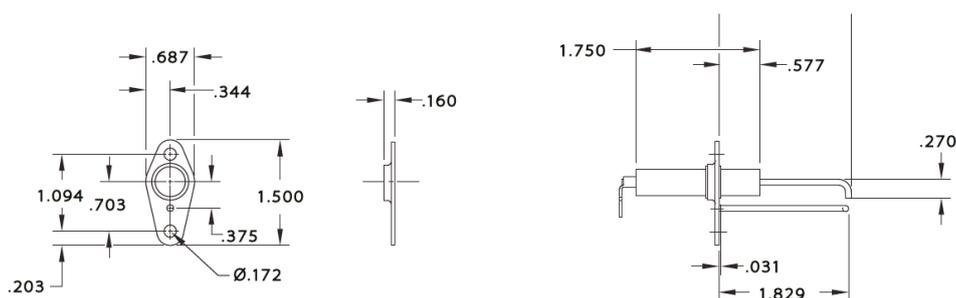
2 QC Male Terminals .250 X .032  
Ø .085" Wire

22-100000-663



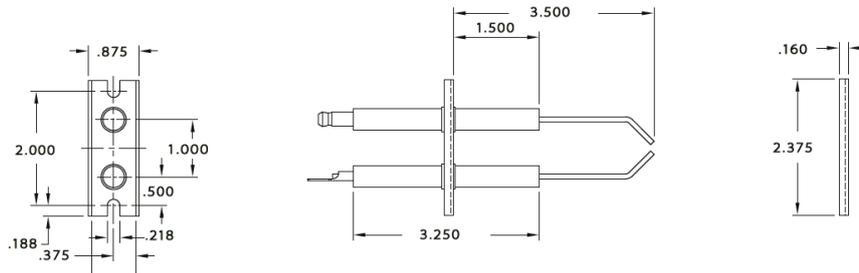
QC Male Terminal .250 X .032  
Ø .085" Wire

22-100000-664



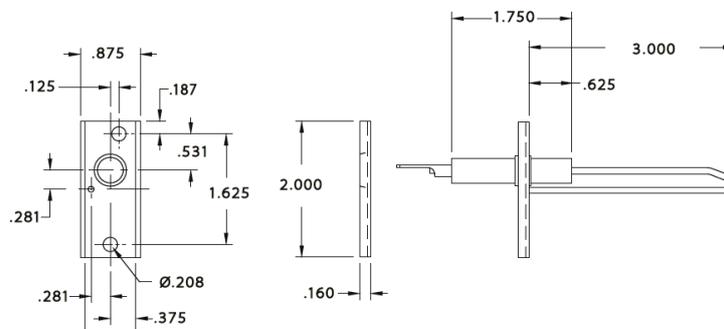
QC Male Terminal .250 X .032  
Ø .085" Wire

22-100000-673



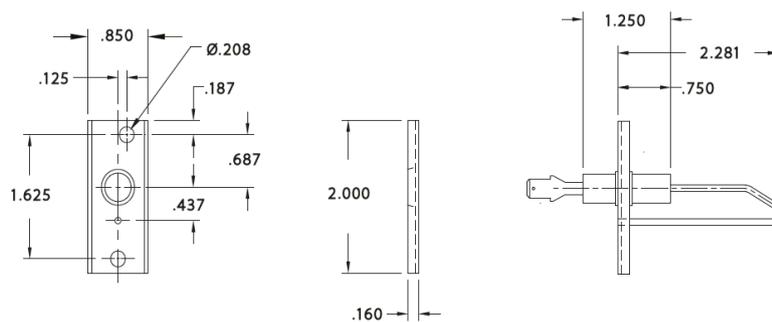
**QC Male Terminal .250 X .032**  
**1 Rajah Terminal**  
**Ø .085 Wire**

22-100001-012



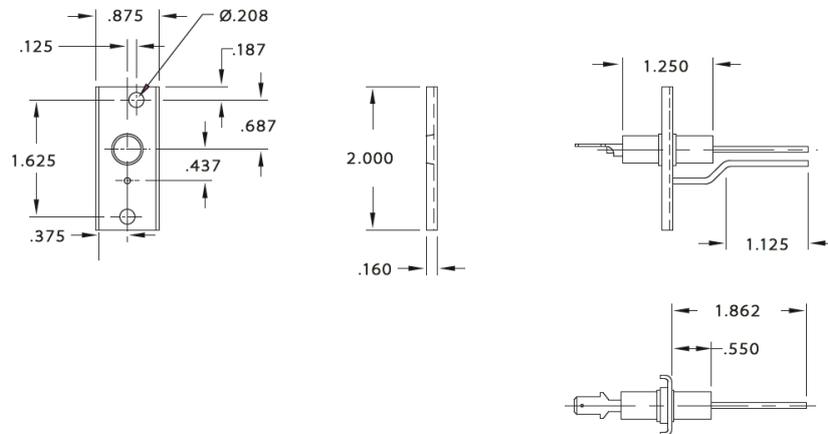
**QC Male Terminal .250 X .032**  
**Ø .114" Wire**

22-100001-045



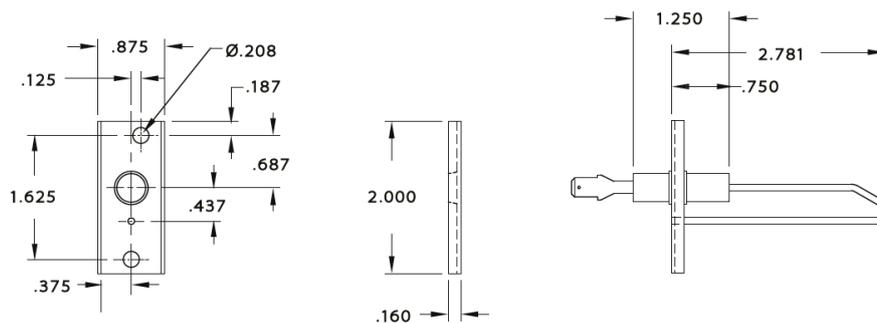
**QC Male Terminal .250 X .032**  
**Ø .085" Wire**

## 22-100001-100



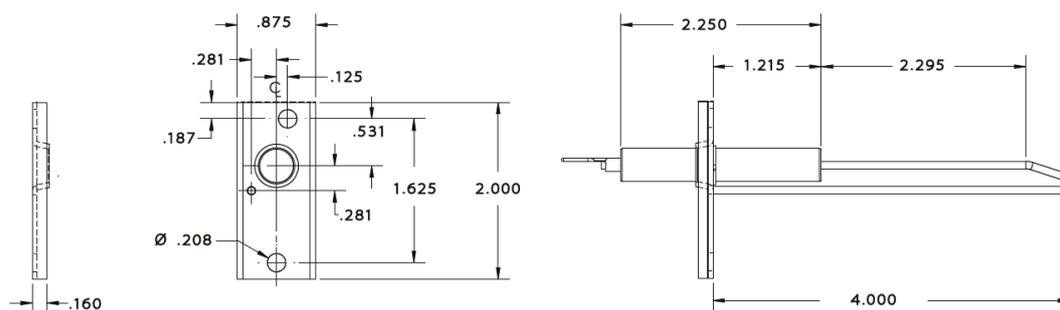
QC Male Terminal .250 X .032  
Ø.085" Wire

## 22-100001-108



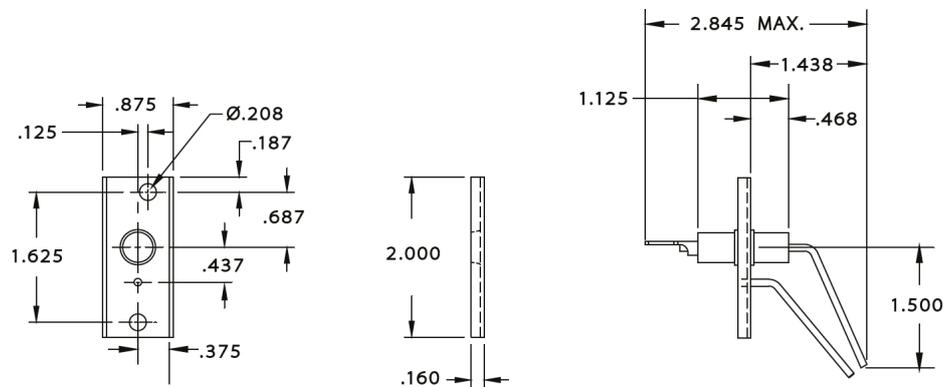
QC Male Terminal .250 X .032  
Ø.085" Wire

## 22-100001-117



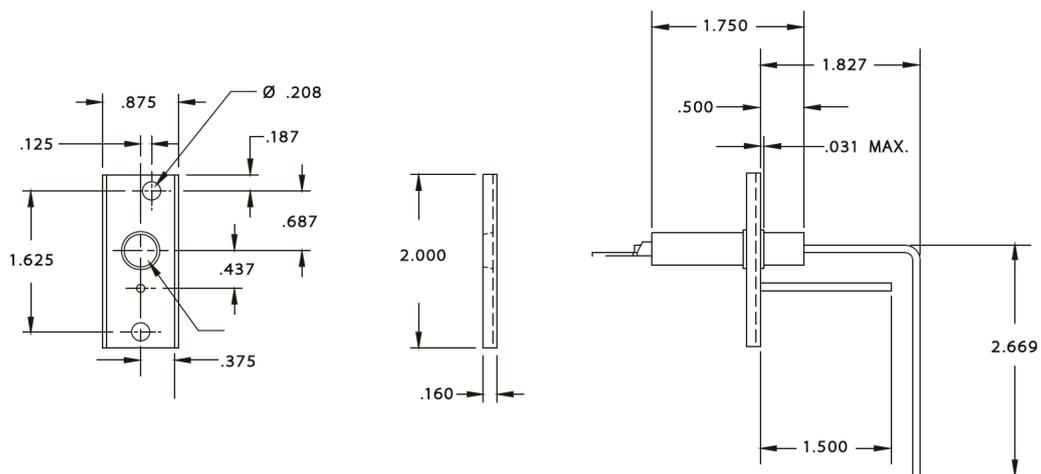
QC Male Terminal .250 X .032  
Ø.085" Wire

22-100001-120



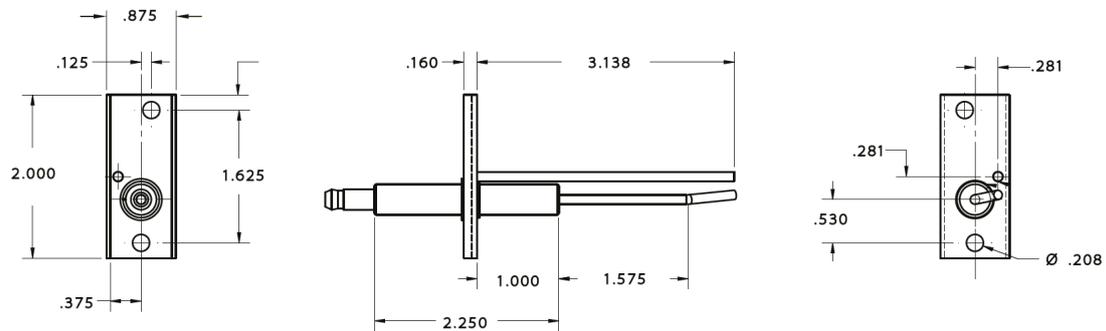
QC Male Terminal .250 X .032  
Ø .085" Wire

22-100001-182



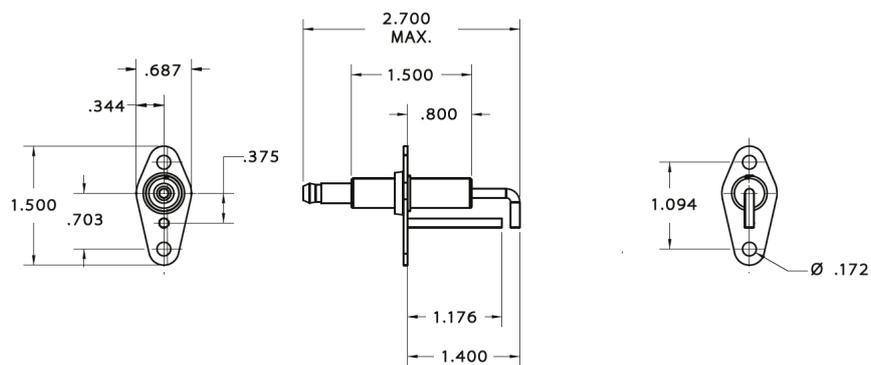
QC Male Terminal .250 X .032  
Ø .085" Wire

## 22-100001-211



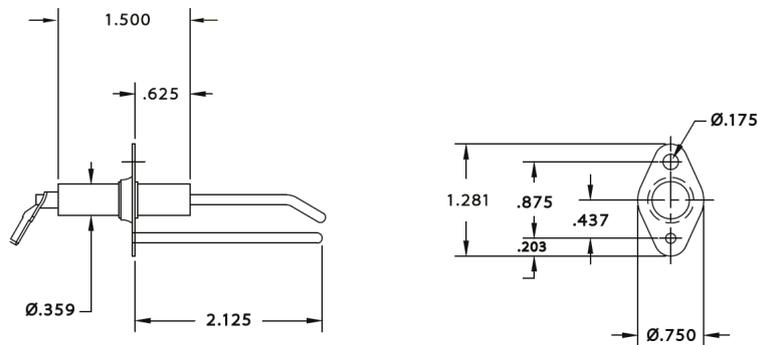
**Rajah Terminal**  
**Ø .114" Wire**

## 22-100001-261



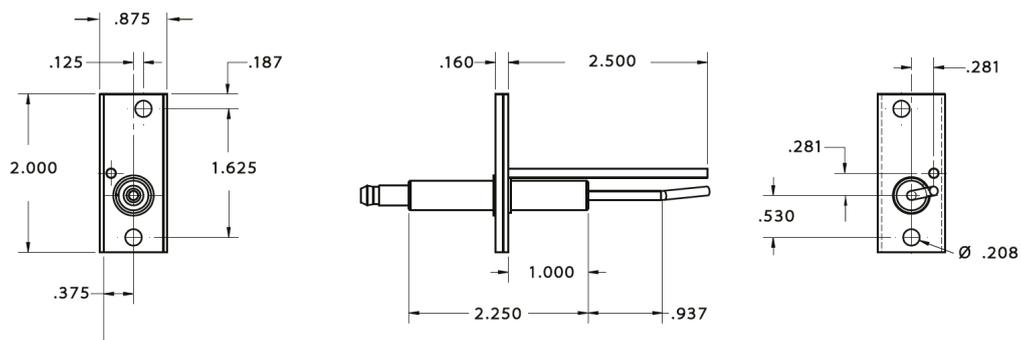
**Rajah Terminal**  
**Ø .114" Wire**

## 22-100001-333



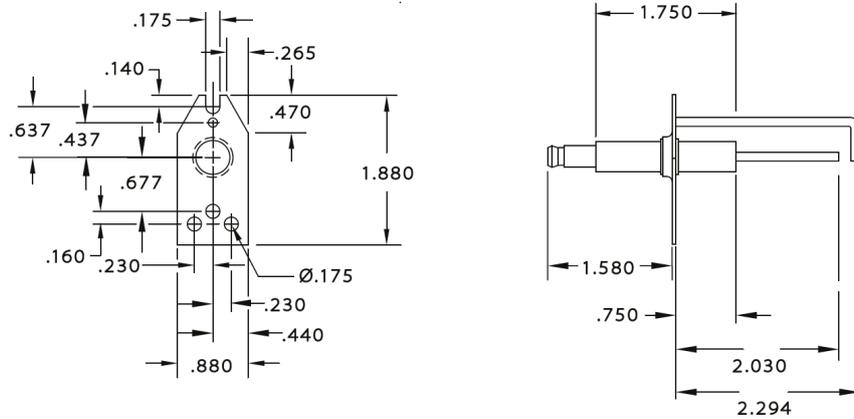
QC Male Terminal .250 X .032  
Ø .114" Wire

## 22-100001-365



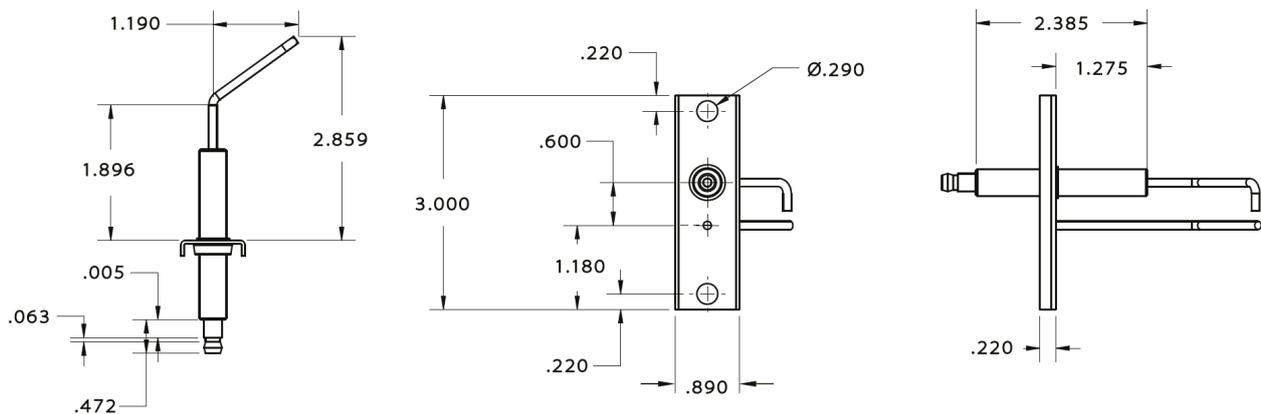
Rajah Terminal  
Ø .114" Wire

22-100001-372



Rajah Terminal  
 $\varnothing.114''$  Wire

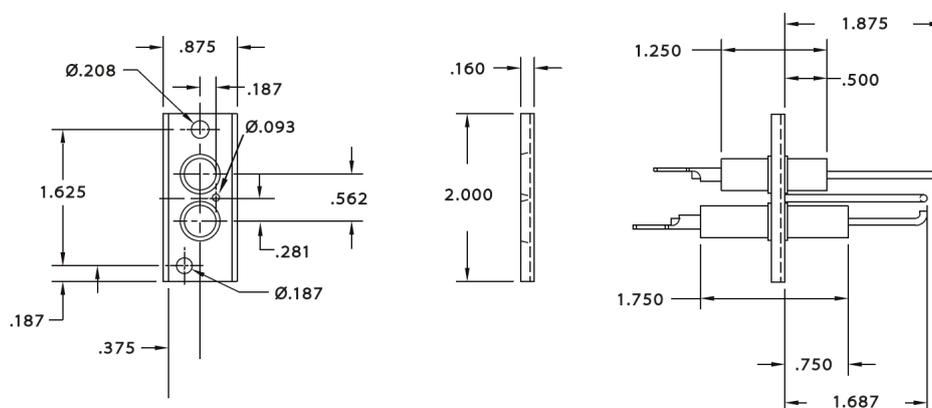
22-100001-389



Rajah Terminal  
 $\varnothing.114''$  Wire

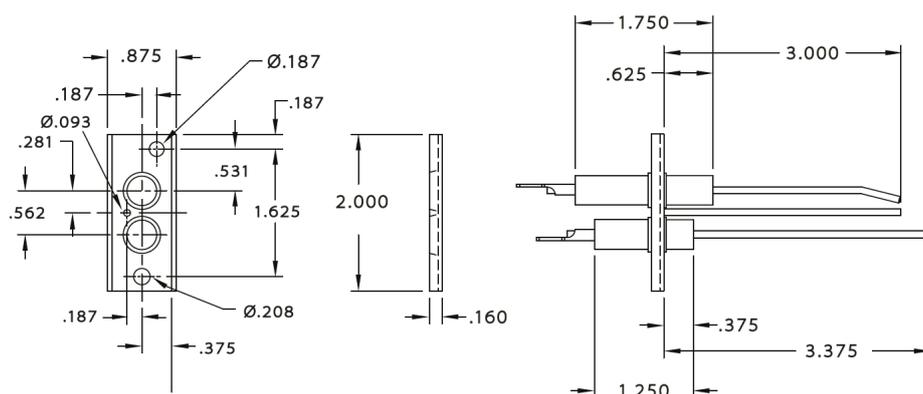
# Three rod electrodes/spark electrodes with integral remote flame Sense rod

05-10000-411



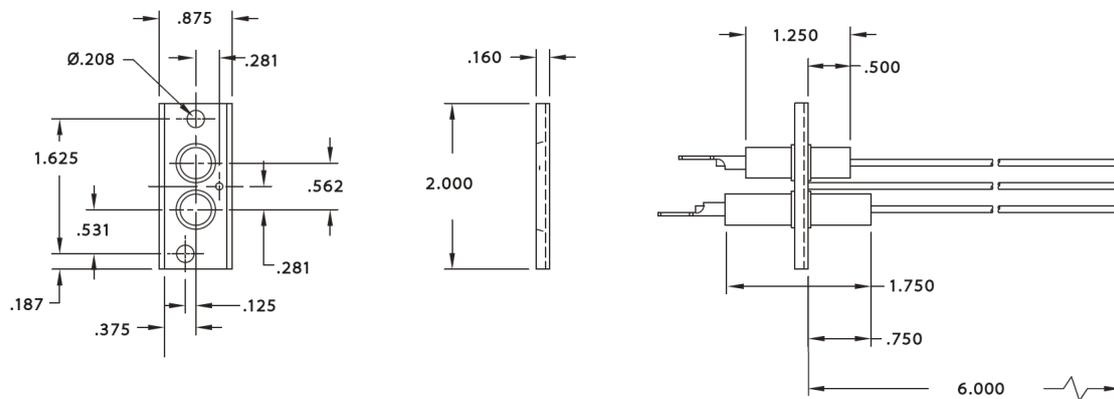
1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 Ø .085" Wire

05-10000-422



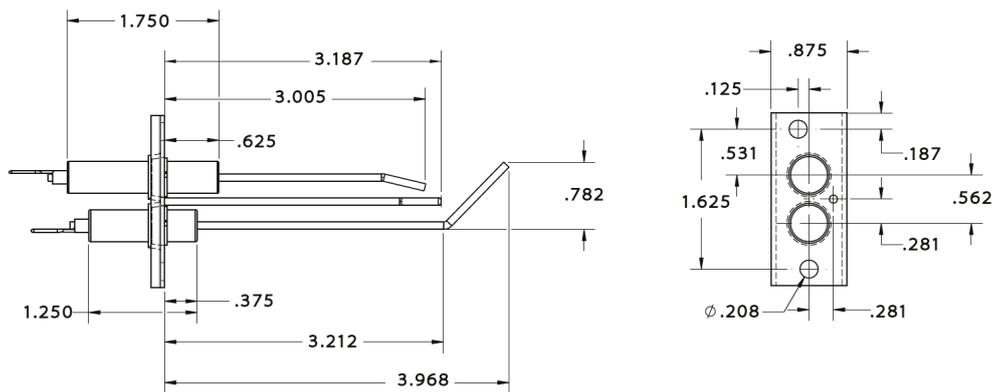
1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 Ø .085" Wire

## 22-100000-593



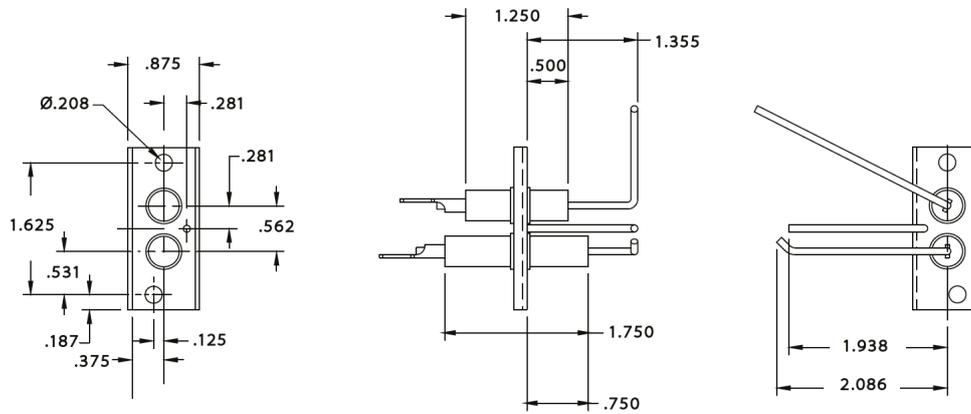
2 QC Male Terminals .187 X .032  
Ø .085" Wire

## 22-100000-630



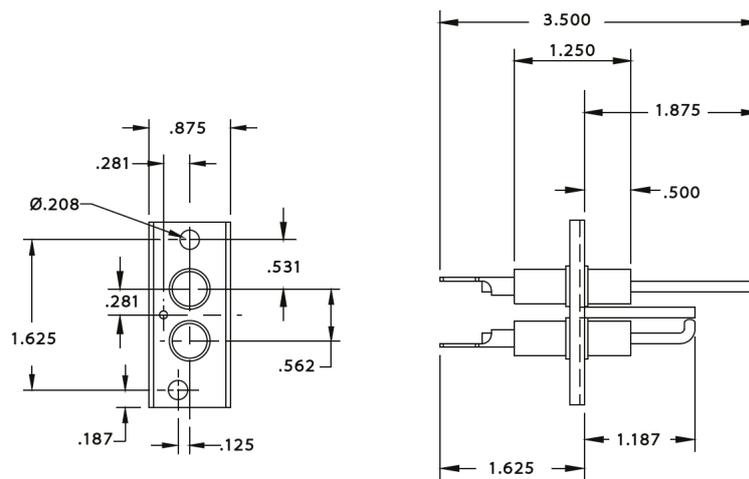
1 QC Male Terminal .250 X .032  
1 QC Male Terminal .187 X .032  
Ø .085" Wire

## 22-100001-113



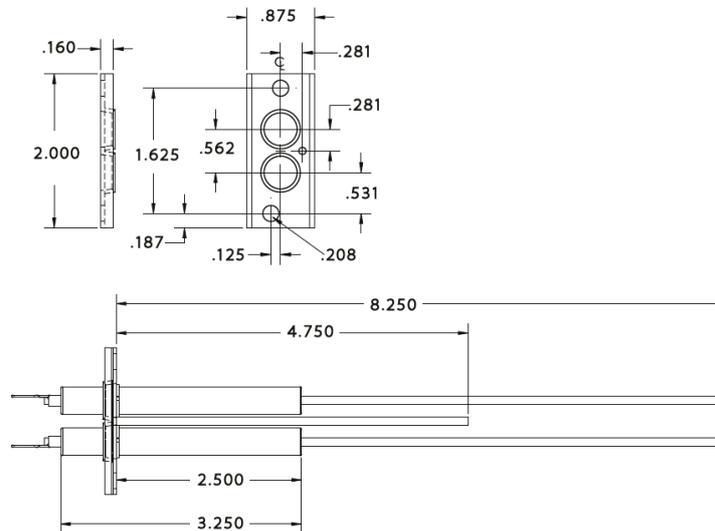
1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 $\varnothing.085''$  Wire

## 22-100001-237



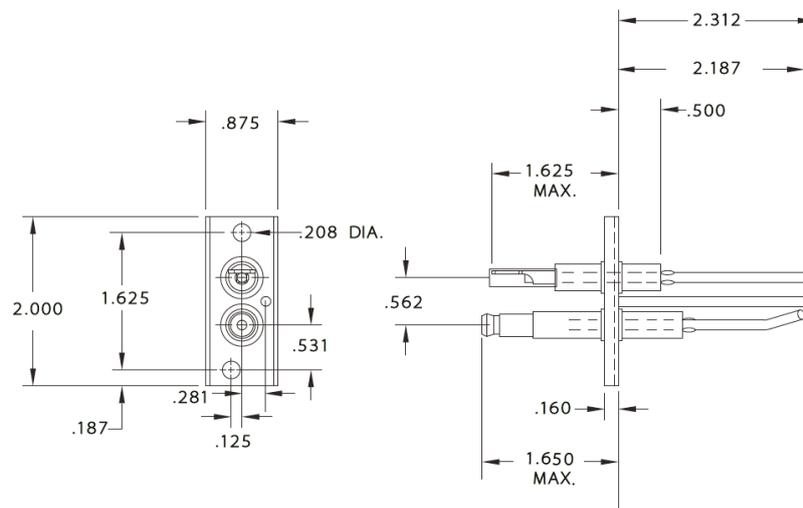
1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 $\varnothing.114''$  Wire

## 22-100001-292



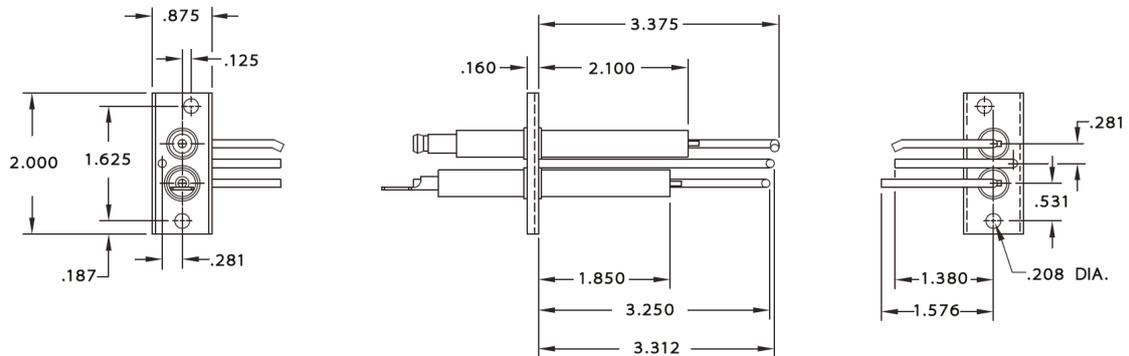
1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 Ø .114" Wire

## 22-100001-350



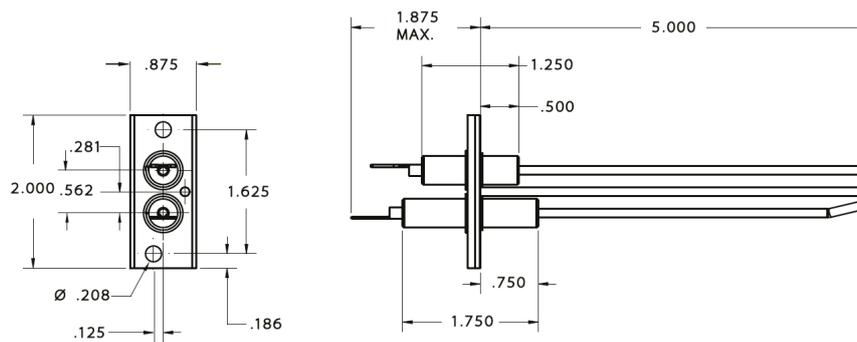
1 QC Male Terminal .187 X .032  
 1 Rajah Terminal  
 Ø .114" Wire

## 22-100001-366



1 QC Male Terminal .187 X .032  
 1 Rajah Terminal  
 Ø .114" Wire

## 22-100002-076



1 QC Male Terminal .187 X .032  
 1 QC Male Terminal .250 X .032  
 Ø .114" Wire

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