

Eclipse Combustion Information Guide

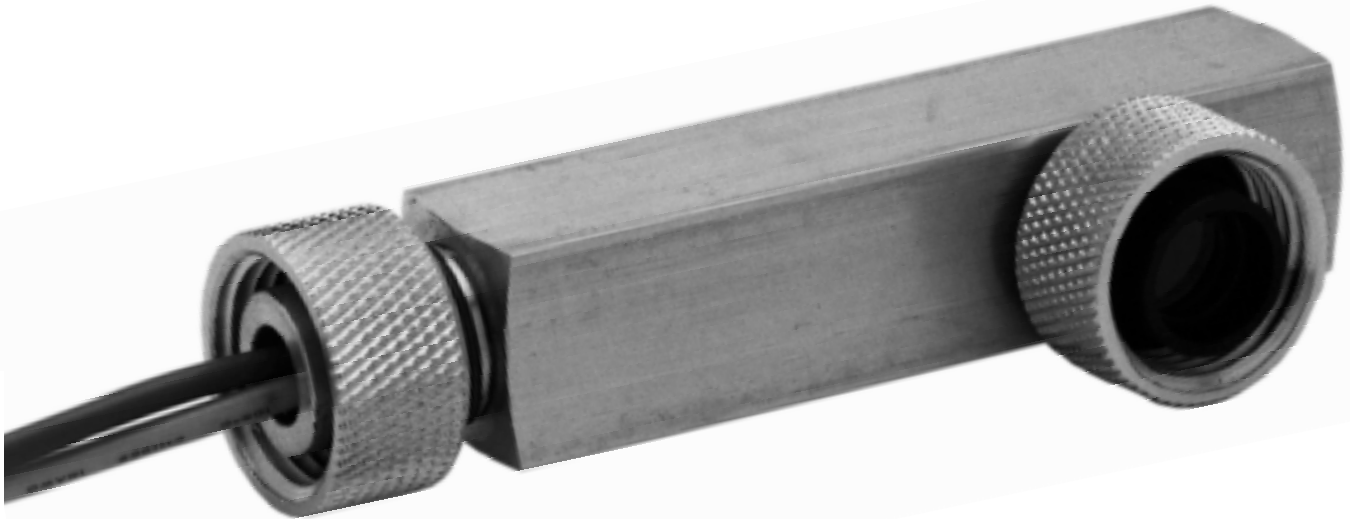
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Info

6/95

90° U.V. Scanner

Model 5600-90A



About This Scanner

This sensor features high sensitivity ultraviolet (U.V.) for monitoring gas or oil flames which cycle on and off frequently. It is safeguarded against reverse connection. The Eclipse flame safeguard checks for a short-circuited, or “runaway” scanner at the beginning and end of each flame cycle. The scanner is UL listed, CSA certified and FM approved. It comes with a 183 cm (6 ft.) cable lead. The 90° U.V. Scanner operates with the 6000 Series Multi-Flame and 6500 Series Bi-Flame controllers.

1.0 Specifications

Supply Voltage	425 VDC \pm 25 VDC
Discharge Current	0.1 mA
Supply Wiring	183 cm (6 ft.) cable lead of two #18 AWG conductors
Temperature Range	-20° to +60°C (0° to 140°F)
Shipping Weight	1.4 kilograms (3 lbs.)
Options	Magnifying lens (Part #15076), 1/2" F.N.P.T. insulated coupling (Part #15099) or radiation shield (Part #15100)



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2.0 Sensor Installation

Caution

Incorrect sensor installation may cause the sensor to generate a false flame signal. This can cause unburned fuel to collect in the combustion chamber, resulting in explosions, injuries, and property damage. Be certain that the flame sensor detects only the pilot and main flames, not glowing refractory or burner parts.

Sensor Wiring

Route sensor wiring a sufficient distance from ignition and other high voltage wiring to avoid electrical interference. Figure 1 illustrates where the sensor is wired to an Eclipse Multi-Flame.

If sensor wiring is to extend beyond the supplied 183 cm (6 ft.) length, use #14 to #18 AWG wire suitable for 75°C (167°F) and 600 volt insulation, and run each pair of leads in its own conduit or shielded cable. Multiple shielded cables can be run in a common conduit, but only on short distances.

Sensor Installation

Consult the burner manufacturer's instructions for mounting location.

- Position the scanner within 457 mm (18 inches) of the flame.
- Scanner bushing threads are 1/2" F.N.P.T.
- Ambient temperature limits are -20° to +60°C (0° to 140°F). For higher temperatures, use the 1/2" F.N.P.T. insulated coupling (#15099). If necessary, also use a purge tee.

Pilot & Main Sensors Installation

Aim the scanners at the third of the flame closest to the burner nozzle, especially with oil flames which typically have less U.V. radiation in the outer flame. The scanner should view the intersection of the pilot and main flames, as shown in Figure 1. Note especially:

- Sight the scanner away from the ignition spark. Sighting the spark or its reflections from burner internals can cause nuisance shutdowns during burner ignition. If necessary, use a scanner orifice to reduce spark pickup.
- Perform a minimum pilot test when installing or adjusting any pilot or main burner system, as detailed in "Minimum Pilot Test" in Section 3.0.

Figure 1
Scanner Wiring to Multi-Flame

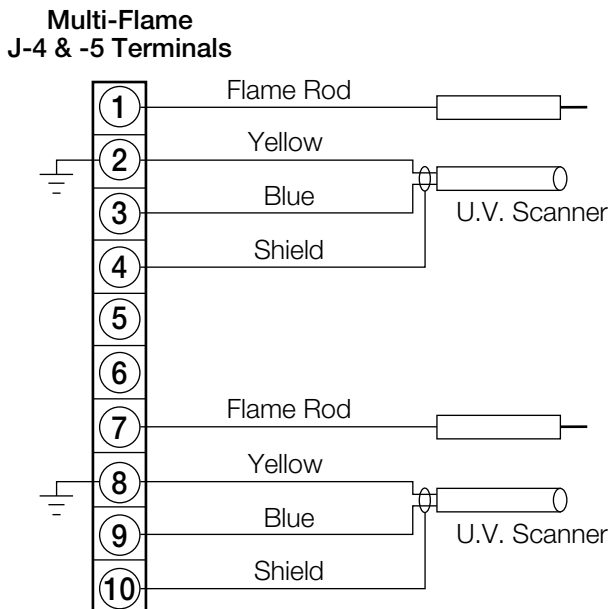
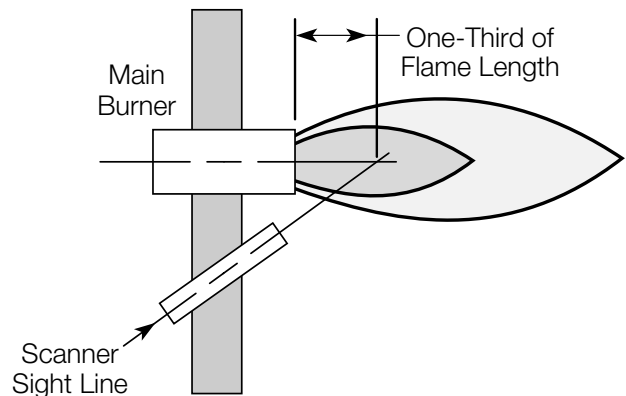


Figure 2
UV Scanner Sighting



3.0 Test Procedures

Perform the following test for every new installation:

Signal Strength	U.V. Scanner
Good	6-11 VDC
Marginal	4-6 VDC
Inadequate	0-4 VDC

Flame Signal Strength Insert the positive probe of a 0-15 VDC, 10k ohmmeter into the test point on the control cover. Connect the negative probe to ground. The chart at right shows the desired flame signal strength.

Minimum Pilot Test Run this test to ensure that the sensor will not detect a pilot flame too small to reliably light the main flame.

- 1) Manually shut off the fuel supply to the burner, but not to the pilot.
- 2) Start the system normally. The control will hold the operating sequence at the pilot flame step.
- 3) Push in the Test/Reset button on the control cover to the "Test" position.
- 4) Measure signal strength as described in "Sensor Wiring" in Section 4.0.
- 5) Reduce pilot fuel until the flame relay drops out. Increase pilot fuel until the flame signal is slightly greater than 4 VDC, and flame relay just manages to pull in. This is the minimum pilot. If you don't think this flame will be able to safely light the main burner, sight the sensor further out on the pilot flame and repeat steps 2 through 5.
- 6) Push the Test/Reset Button again so that it pops out to the "run" position and begin the start-up sequence again.
- 7) When the sequence reaches the main flame trial for ignition, smoothly restore the fuel supply to the burner. If the main burner does not light within five seconds, immediately shut off the burner supply to shut down the system. Realign the sensor so that it requires a large pilot flame. Repeat steps 1 through 6 until the main burner lights off smoothly and reliably.

Pilot Flame Failure Test

- 1) Manually shut off the fuel supply to the pilot and main burner.
- 2) Push in the Test/Reset button on the control cover to the "Test" position.
- 3) Start the system normally. The controller should lock out; if it doesn't, then the controller is detecting a false flame signal. Find the problem and correct it before resuming normal operation.


Main Flame Failure Test

- 1) Manually shut off the fuel supply to the main burner, but not to the pilot.
- 2) Start the system normally.
- 3) Push the Test/Reset Button so that it pops out to the "run" position. This should ignite the pilot and lock out. If the system does not lock out, the controller is detecting a false flame signal. Find the problem and correct it before resuming normal operation.

Spark Sighting Test

- 1) Manually shut off the fuel supply to the pilot and main burner.
- 2) Start the system normally.
- 3) Measure the flame signal as described in "Flame Signal Strength" in this section.
- 4) If a flame signal greater than 4 VDC is measured for more than three seconds during the trial for ignition, then the sensor is picking up a signal from the spark plug; see "Sensor Wiring" in Section 2.0.

Limit & Interlock Tests Periodically check all interlock and limit switches by manually tripping them during burner operation to make sure they cause a system to lock out.

 Warning	Never operate a system that is improperly adjusted or has faulty interlocks or limit switches. Always replace faulty equipment with new equipment before resuming operation. Operating a system with defective safety equipment can cause explosions, injuries, and property damage.
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4.0 Maintenance

Caution

Turn off power before disconnecting or installing sensors or controls.

Systems Checks

Periodically test the sensors as described in Section 3.0.

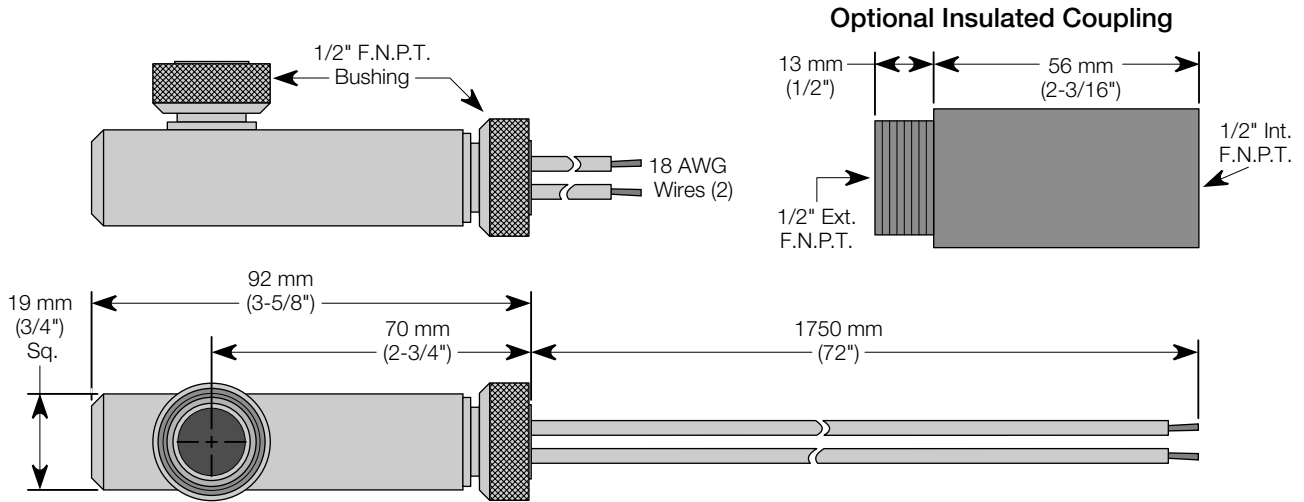
Sensor Lens

Clean the glass lens regularly with a soft, damp cloth. Small amounts of dust will measurably reduce the flame signal strength.

Rotation

Periodically swap spare sensors and control units with active ones.

5.0 Dimensions



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