

## DESCRIPTION

The primary function of the flame safeguard system is to verify the presence of a burner flame. The Detector Electronics R9005P and R9105P Controllers monitor signals from a flame scanner and generate relay output switching in response to changes in flame status. The R9005P Controller is a panel mounted unit. The R9105P is a rack mounted unit, designed to fit into the Q9801C Rack Assembly.

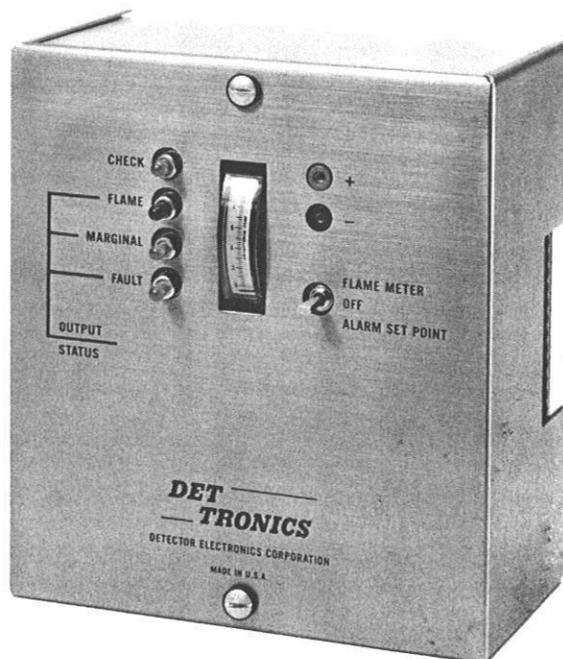
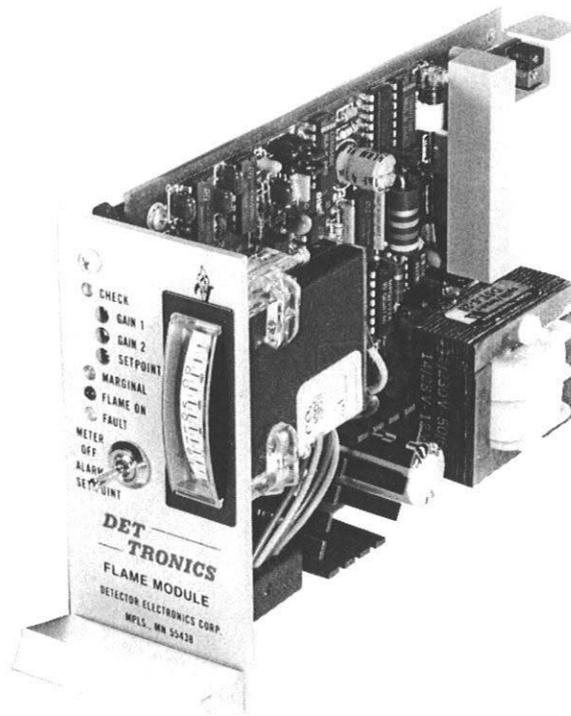
Circuit design and features of the two controllers are nearly identical. True burner discrimination is accomplished by incorporating an adjustable flame threshold to compensate for background radiation and adjacent burner interference. The controllers also include a self-checking feature that tests response to a loss of flame once every ten seconds. The test is accomplished by mechanically blocking light from the flame, then checking the controller for the appropriate response.

The faceplate indicators, consisting of four LED status outputs and one analog flame intensity meter, allow remote monitoring while the self-checking feature ensures constant system reliability. The flame safeguard system, together with external sensing devices, controls logic and load relays, ensures safe startup and initiates burner shut-down in response to loss of flame.

See Figure 1 for a block diagram of the flame controller operation.

## FEATURES

- Adjustable flame threshold.
- Selectable flame on delay time - 1 or 2 seconds.
- Selectable flame off and marginal flame delay time - 3.5 or 6 seconds (FM approved model has 3.5 second delay time only).
- External output for remote flame intensity voltmeter (0 to 10 volts dc) standard.
- Optional 4 to 20 milliampere module provides flame intensity output for connection to remote devices.



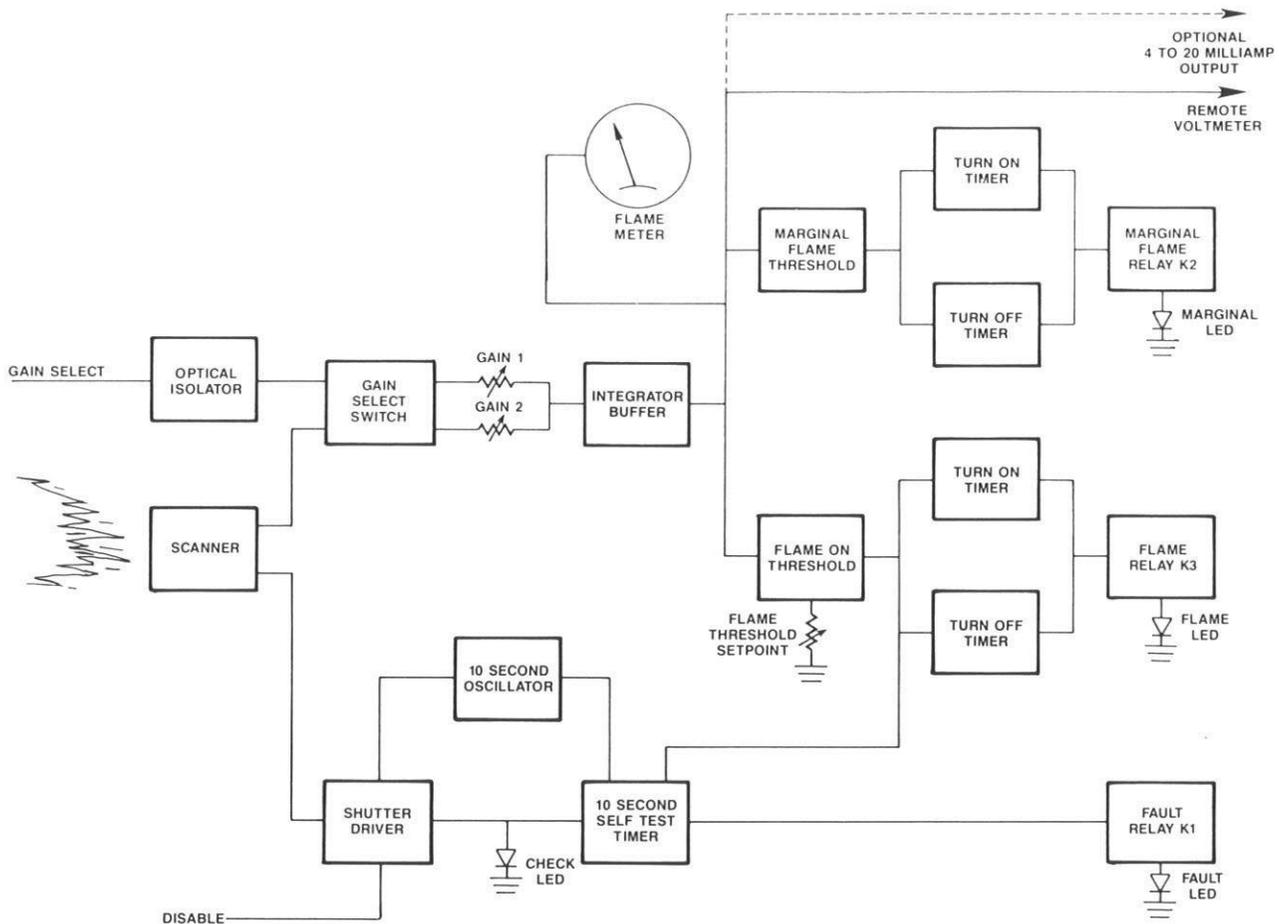


Figure 1—Flame Response Circuitry Diagram

- Accommodates ultraviolet, infrared, All Fuel and fiber optic flame scanners to provide a choice of application solutions. (Different scanner types do not require modification.)
- Self-checking light chopper simulates flame loss every 10 seconds to thoroughly test scanner for proper operation.
- Check Fault relay energizes if response to simulated flame loss is improper.
- Two separate adjustable gain settings provide enhanced discrimination in multi-burner applications. Gain channels are switchable by application of external voltage.
- Front panel analog voltmeter and select switch allow indication of the flame threshold of the controller or the flame intensity monitored by the scanner.
- When the flame signal falls to marginal level (2 volts greater than flame threshold setpoint), a marginal relay is energized.
- Controller to scanner power fused for system protection.

## SPECIFICATIONS

### GAIN SELECT (from external contact)—

No voltage applied selects Channel 1. Line voltage applied selects Channel 2.

### OUTPUTS—

Relay contact ratings - Fault relay K1, Marginal relay K2 and Flame relay K3: (Form C) 4 amperes at 125 vac or 240 vac; 3 amperes at 30 vdc; 1/20 hp at 125 or 250 vac.

### REMOTE METER OUTPUT—

0 to 10 volts dc  
4 to 20 milliamperes (optional).

### NOTE

*The R9005P Controller can have both the 0 to 10 vdc and the 4 to 20 milliamper output. The R9105P Controller can have either the 0 to 10 vdc or the 4 to 20 milliamper output, but not both.*

### OPERATING VOLTAGE—

120 vac, 50/60 Hz (+15 vac, -18 vac) standard.  
240 vac, 50/60 Hz (+30 vac, -36 vac) selectable.

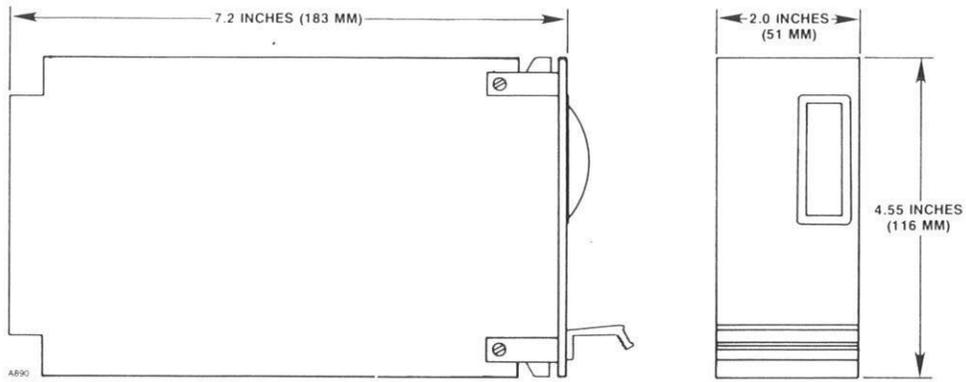


Figure 3—R9105P Dimensions

**Detector Electronics Corporation**  
6901 West 110th Street • Minneapolis, Minnesota 55438 USA • Telephone (612) 941-5665  
Facsimile (612) 829-8750 • Telex 6879043 DETEL UW • Cable DETRONICS  
Printed in USA