Control of a 1234 Oxygen Sensor

The temperature of the 1234 oxygen sensor must be maintained between 650°C and 750°C (1200°F and 1380°F). The recommended running temperature is 720°C (1330°F).

The temperature should be stable to within 10°C per minute.

Control of the temperature can be achieved with proportional and integral action, with a time proportioning cycle of 2.5 seconds.

The proportional band should be set to 15% (150°C proportional range).

The integral action should be set to 200 seconds.

NOTE:

- If running the 1234 oxygen sensor from 240VAC allow only a **25% duty cycle**.
- If running the 1234 oxygen sensor from 110VAC a 100% duty cycle is allowed.
- The heater will get to 720°C within 10 minutes if the voltage and the duty cycle are correct.

The heater inside the 1234 oxygen sensor is rated at 240VAC, but DO NOT apply 240VAC to the heater for more than a few seconds.

Output: EMF = $2.154 \times 10^{-2} \times T \times \log_e (0.2095/\text{oxygen level of the sample})$

T = Temperature in degrees Kelvin