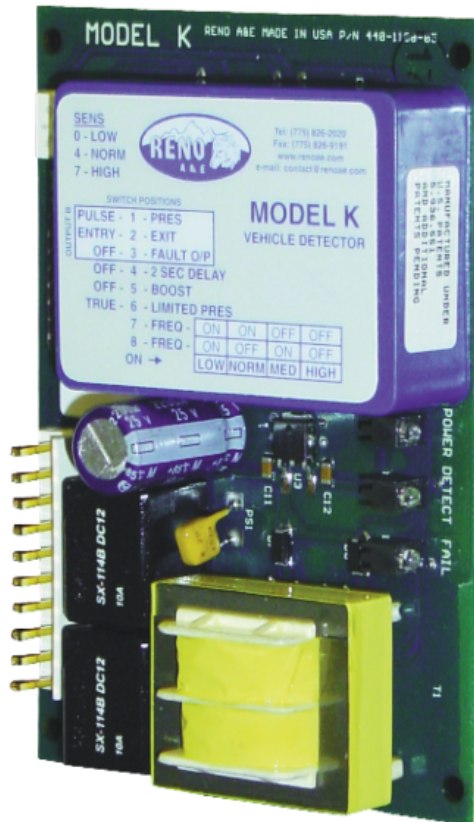


# K SERIES



## PC BOARD TYPE SINGLE CHANNEL DETECTOR



4.50" High x 3.20" Wide x 1.15" Deep

### Ordering Information:

Model K-XXX-X



Blank = Fail-Safe, S = Fail-Secure

24 or 120: 24 = 24 VAC input power, 120 = 120 VAC input power

- 24 VAC and 120 VAC versions available
- Fail-Safe and Fail-Secure versions available
- Dual Relay outputs:
- Output A:
  - ◆ Limited Presence
  - ◆ True Presence™
- Output B:
  - ◆ Presence (Duplicates Output A)
  - ◆ Pulse-on-Entry
  - ◆ Pulse-on-Exit
  - ◆ Fault Output
- Two second delay of Outputs A and B
- Sensitivity Boost, for gate operation where high-bed vehicles might be encountered
- Detect memory feature maintains detection during momentary power interruptions of up to two seconds
- Three super bright LEDs provide separate indications of Power, Detect, and Loop Fail conditions
- Fail LED provides an indication of current loop failures or loop failures that have occurred
- Rotary switch selects one of eight sensitivity levels
- DIP switches select one of four loop frequencies

### Overview:

The Model K is a single channel, dual output, PC Board type vehicle detector that incorporates the reliable vehicle detection technology found in all of Reno A & E's vehicle detectors. All detector functions and settings are easy to configure using a set of eight external DIP switches and a simple to use eight-position rotary switch. Available in 24 VAC and 120 VAC configurations, the Model K is a full featured detector in a compact package.

# K SERIES SPECIFICATION

This is a Performance Specification. It is not intended to be used as Operating Instructions.

**Loop Frequency:** Four (4) operating frequencies (normally in the range of 20 to 100 kilohertz) are selectable by means of two PC board mounted DIP switches.

**Sensitivity:** Eight (8) detection sensitivity levels are selectable by means of a PC board mounted rotary switch. Vehicle detection results from a sufficient negative change in loop inductance (-ΔL/L). (See **SENSITIVITY, -ΔL/L** table.)

**Sensitivity Boost:** A PC board mounted DIP switch may be turned on to increase sensitivity only during the Detect State. When a vehicle enters the loop detection zone, the detector sensitivity is automatically boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the Detect State. When the vehicle leaves the loop detection zone, the sensitivity immediately returns to the vacant loop setting. This feature is particularly useful in preventing dropouts during the passage of high bed vehicles.

**Output A Presence Modes:** Output A has two presence hold times that are selectable by means of a PC board mounted DIP switch; True Presence™ and Limited Presence. Both modes provide a Detect output when a vehicle is present in the loop detection zone. Limited Presence will typically hold Output A in the Detect state for one to three hours. True Presence™ will hold Output A in the Detect state as long as the vehicle is present in the loop detection zone and power is not removed or reset applied. True Presence™ time applies only for normal size automobiles and trucks and for normal size loops (approximately 12 to 120 sq. ft.).

**Output B Modes of Operation:** Output B has four modes of operation that are selected by three PC board mounted DIP switches; Presence, Pulse-on-Entry, Pulse-on-Exit, or Fault. When operating in Presence mode, the presence hold time is the same as Output A. When set to operate in Pulse mode, the 250 millisecond pulse can be set to occur when the vehicle enters the loop detection zone (Pulse-on-Entry) or when the vehicle leaves the loop detection zone (Pulse-on-Exit). When operating in Fault mode, Output B will provide a fault indication when a loop fault exists. Output B is a Fail-Secure output in either Presence or Pulse mode.

**Fail-Safe / Fail-Secure Operation:** The detector is factory configured for Fail-Safe or Fail-Secure operation. When the detector is configured to operate in Fail-Safe mode, Output A will assume the Detect output state (Relay A Normally Open contacts closed, Relay A Normally Closed contacts open) during a power loss or loop fault condition. When the detector is configured to operate in Fail-Secure mode, Output A will not respond to power losses or loop failures (Relay A Normally Open contacts open, Relay A Normally Closed contacts closed). Output B will always assume a No Detect state during a power loss or loop fault condition (Relay B Normally Open contacts open, Relay B Normally Closed contacts closed).

**Call Delay:** A two second delay of Outputs A and B can be activated by setting a PC board mounted DIP switch. Output delay is the time the detector outputs are delayed after a vehicle first enters the loop detection zone. If the Delay feature is activated, the outputs will only be turned on after the two second delay time has passed with a vehicle continuously present in the loop detection zone. If a vehicle leaves the loop detection zone during the delay interval, detection is aborted and the next vehicle to enter the loop detection zone will initiate a new full two second delay interval. By flashing the Detect LED at a four Hz rate with a 50% duty cycle, the detector indicates that a vehicle is being detected but that the outputs are being delayed.

**Power Indicator:** The green Power LED is Off when the detector has no power supplied or when the power level is below 75% of its nominal value. The Power LED is On when the detector is being supplied with a suitable level of power.

**Detect Indicator:** The red Detect LED is Off when the loop detection zone is vacant. The Detect LED is On when a vehicle is being detected. The Detect LED flashing at a four Hz rate with a 50% duty cycle indicates that the delay interval is currently timing.

**Fail Indicator:** The red Fail LED indicates whether or not the loop is currently within tolerance. If the loop is within tolerance, the Fail LED will be Off. If out of tolerance, the LED indicates a current loop failure by turning On (Open Loop) or flashing at a one Hz rate (Shorted Loop). If and when the loop returns to an in tolerance state, the FAIL LED will flash at a three Hz rate to indicate an intermittent loop fault has occurred and has been corrected. This flash rate will continue until another loop fault occurs, the detector is reset, or the detector loses power.

**Detector Reset:** Changing the position of any DIP Switch (except the Frequency DIP switches) or the Sensitivity Level setting will reset the detector. After changing the Frequency selection switches (DIP switches 1 & 2), the detector must be reset.

**Detect Memory:** The Detect State of the detector is maintained during momentary power interruptions of up to two seconds.

**Self Tuning:** The detector automatically tunes and is operational within two seconds after application of power or after being reset. Full sensitivity and hold time requires 30 seconds of operation.

**Environmental & Tracking:** The detector is fully self-compensating for environmental changes and loop drift over the full temperature range and the entire loop inductance range.

**Loop Inductance Range:** 20 to 2000 microhenries with a Q factor of 5 or greater.

**Loop Feeder Length:** Up to 2500 feet (762 m) maximum with proper feeder cable and appropriate loops.

**Loop Input:** Transformer isolated. The minimum capacitance added by the detector is 0.068 microfarad.

**Grounded Loop Operation:** The loop isolation transformer allows operation with poor quality loops (which may include one short to ground at a single point).

**Lightning Protection:** The detector can tolerate, without damage, a 10 microfarad capacitor charged to 1,000 volts being discharged directly into the loop input terminals, or a 10 microfarad capacitor charged to 1,000 volts being discharged between either loop terminal and earth (chassis) ground.

**Electrical Isolation:** The loop is isolated by means of the loop isolation transformer. The outputs are isolated by means of the output relays. The power inputs are isolated by means of the power transformer.

**Automatic Fuse Protection:** If 120 VAC power is applied to a Model K-24, an integral automatic fuse will open to protect the detector from damage due to excess voltage. The fuse will automatically reset when power is removed for a period of three seconds or longer.

**Relay Outputs:** Rated for maximum continuous current of 6.0 amps, 300 VAC maximum, 150 VDC maximum, and 180 Watts maximum switched power.

**Power:** 24 VAC version (K-24): 18 to 32 VAC, 4 Watts maximum.

120 VAC version (K-120): 89 to 135 VAC, 4 Watts maximum.

**Ruggedized Construction:** PC board mounted components are protected by a cover made from a high temperature rated plastic. Printed circuit boards are 0.062 inch thick FR4 material with 2 oz. copper on both sides and plated through holes. Circuit board and components are conformal coated with polyurethane.

**Operating Temperature:** -30°F to +180°F (-34°C to +82°C).

**Connector:** 10 pin, in-line male. Molex P/N 26-61-4100. (See **PIN ASSIGNMENTS** table.)

**Size:** 4.50 inches (11.43 cm) high x 3.20 inches (8.13 cm) wide x 1.15 inches (2.92 cm) deep.

**Weight:** 6.1 oz (172.9 gm).

## TABLES

### SENSITIVITY, -ΔL/L

Switch Position	0	1	2	3 *	4	5	6	7
-ΔL/L	1.28%	0.64%	0.32%	0.16% *	0.08%	0.04%	0.02%	0.01%

\* Denotes factory default.

**Note:** Changing the sensitivity setting will reset the detector.

### PIN ASSIGNMENTS

Pin	Function
1	Relay B, Common
2	Relay B, Normally Open (N.O.)
3	Relay B, Normally Closed (N.C.)
4	Relay A, Common
5	Relay A, Normally Closed (N.C.)
6	Relay A, Normally Open (N.O.)
7	AC Neutral
8	AC Line
9	Loop
10	Loop

**Note:** All pin connections listed above are with power applied, loop(s) connected, and no vehicle detected.

### FACTORY DEFAULT SETTINGS

Switch	ON	OFF	Factory Default
1	Output B Presence	Output B Pulse	OFF
2	Output B Pulse-on-Exit	Output B Pulse-on-Entry	OFF
3	Output B Fault	Output B Presence / Pulse	OFF
4	Two Second Call Delay	No Delay	OFF
5	Sensitivity Boost	No Boost	OFF
6	Limited Presence	True Presence™	OFF
7	Four (4) Frequency Selections		ON
8			OFF