MODEL “K” Series

Single Channel
Inductive Loop Vehicle Detectors

FEATURES & BENEFITS:

- All switches are accessible on the Printed Circuit Board (PCB).
- Loop Diagnostics: “Fail” LED indicates “real-time” Open Loop and Shorted Loop conditions. A third distinct flash rate indicates a loop failure has occurred and was corrected.

FEATURES & BENEFITS (Cont.):

- “PWR” LED provides visual check of low line voltage or no power at all.
- Detect Memory helps prevent detection drops during short power interruptions.
- Sensitivity Boost, for gate operation where high profile vehicles might be encountered.
- 2-Second CALL Delay.
- Dual Programmable relays offer selectable modes of operation:
  - Output Relay A:
    - True Presence (Infinite)
    - Limited Presence
  - Output Relay B:
    - Presence (Duplicates “Output A”)
    - Pulse-on-Entry
    - Pulse-on-Exit
    - Fail Output
- 4 loop frequencies selectable from PCB mounted DIP switch.
- 8 sensitivity levels selectable from PCB mounted rotary switch.
- Super bright LEDs provide separate Power, Detect, & Loop Fail Indications.
- 10-pin Male Molex connector
- Fail-Safe and Fail-Secure versions available.
- Configurations available: 24 VAC & 120 VAC.

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Patent Pending

Specifications:

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

Loop Frequency: There are 4 frequencies (normally in the range of 20 to 100 kHz) that are DIP switch selectable.

Reset: Changing any DIP switch position (except Pos Sw 7 & Pos Sw 8, frequency selection) or the rotary sensitivity switch resets the detector. After changing the frequency selection switches, the detector will require a RESET. Reset clears the loop fault memory.

Sensitivity: Vehicle detection results when a negative change in loop inductance (-ΔL/L) exceeds the sensitivity setting. The 8 detection sensitivity levels are rotary switch selectable. (See Tables, "Sensitivity").

Sensitivity-Boost: A DIP switch setting may be turned ON to increase sensitivity ONLY during the DETECT period. When a vehicle enters the loop, the detector sensitivity is boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the DETECT period. When the vehicle leaves the loop, the sensitivity returns to the vacant loop setting. This feature helps prevent dropouts during the passage of high bed vehicles and is particularly useful in sliding gate situations.

Output Relay "A" Modes: Two presence hold times are DIP switch selectable for Output Relay A, "TruePresence™" and "Limited Presence". Both modes output a "Call" when a vehicle is present in the loop. TruePresence™ will hold the Call for as long as the vehicle is present and power is not removed or reset applied. Limited presence will typically hold the Call output for about one to three hours. The TruePresence™ time applies only for normal size automobiles and trucks and for normal size loops (approximately 12 sq ft to 120 sq ft).

Output Relay "B" Modes: Three modes of operation are DIP switch selectable for Output Relay B, Presence, Pulse, or Fail. When in the presence mode, the presence hold time is the same as Output A. When in the pulse mode, the 250 millisecond pulse can be selected as either *pulse-on-entry* (when a vehicle enters the loop) or *pulse-on-exit* (when a vehicle exits the loop). The Fail mode provides an output for as long as a loop failure exists. Output Relay B is a Fail-Secure output in the presence and pulse modes. In the fail mode, output relay B is Fail-Secure when power fails. A loop failure will generate an output.

Call Delay: A two second delay of Outputs A & B can be DIP switch activated. Output delay is the time the detector outputs are delayed after a vehicle first enters the loop detection area and is indicated by the front panel "DET" LED flashing at 4 Hz with a 50% duty cycle. If the 2 second output delay feature is activated, the output relays will only be turned on after 2 seconds has passed with a vehicle continuously present in the loop detection area. If a vehicle leaves the loop detection area during the 2 second delay interval, detection is aborted and the next vehicle entering the loop detection area will initiate a new full 2 second delay interval.

Output "Call" Memory: When power is removed for 2 seconds or less, the detector automatically "remembers" if a vehicle was present over the loop. When power is restored, the detector will continue to output a Call until the vehicle leaves the loop. (Power loss or dips of 2 seconds or less will not drop the Call).

Power Status Indicator: A green super high intensity light emitting diode (LED) indicates power status during normal detector operation. When the green "PWR" LED is ON the power to the detector is normal. When power drops approximately. 20% from nominal, the green LED turns OFF and the detector remains operational. When power drops approximately. 25% from nominal, the green LED is OFF and the "line" voltage is not sufficient to operate the detector.

Detect Status Indicator: The red "DET" LED is steady ON while a vehicle is being detected. The "DET" LED will flash at a 4 Hz rate with a 50% duty cycle while timing out the 2 Second Call Delay.

Loop Fail Monitor Indicator: If the total inductance of the detector input network goes out of the range specified for the detector or suddenly changes more than ±25% the detector will enter fail mode. The red "FAIL" LED will either begin flashing with a 50% duty cycle once per second for a shorted loop condition or will be ON continuously for an open loop condition. These indicator conditions will continue until the inductance returns to its previous value at which time the detector output will automatically resume normal operation and the red "FAIL" LED will flash at a distinctive rate (a burst of three flashes once per second) to indicate an intermittent loop fault has occurred and corrected. [The detector input network, consists of the loop or loops plus the feeder cable (lead-in or home run) up to the connector on the detector].

Fail-Safe Operation: When the loop fails or power is removed, continuity exists between Common & N.O. for Relay A. Continuity exists between Common & N.C. for Relay B.

Fail-Secure Operation: When the loop fails or power is removed, continuity exists between Common & N.C. for both relays A & B.

Self Tuning: Automatically tunes to loop within 2 seconds after application of power or reset. 30 seconds of operation is required before full sensitivity and presence time is reached following application of power or a reset.

Environmental Tracking: 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 1000 microhenries with Q factor of 5 or greater.

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

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

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 2,000 volts being charged between either loop terminal and earth ground.

Internal Circuitry Isolation: All internal electronic circuitry is isolated from all external circuitry. Power is isolated by means of the power transformer. The loop is isolated by means of the loop isolation transformer. The outputs are isolated by means of the output relays.

Automatic Reset Fuse: When 120 VAC is applied to 24 VAC models, the automatic internal fuse will open. The fuse will automatically reset when power is removed for 3 seconds. Source voltage should be verified before reinstalling.

Relay Rating(s): The relay contacts are rated for 10-amp max, 150-VDC max, 300-VAC max and 500-VA max switched power.

Construction: Printed circuit boards are 0.062 in FR4 material with 2 oz copper each side. Circuit boards are conformally coated for environmental protection.

Operating Temperature: -40°F to + 180°F.

Power(s):

18 to 32 VAC, 50/60 Hz, 4.0 watts max.

89 to 135 VAC, 50/60 Hz, 4.0 watts max.

Size: 4.50 in (11.43 cm) high x 3.20 in (8.13 cm) wide. The circuit board is 0.065 in (0.165 cm) thick, and the maximum height of components on the board is 1.10 in (2.80 cm).

Weight: Approximately 6.1 oz (173 gm).

Connector: 10-pin male "Molex", #26-61-4100.

Tables:

SENSITIVITY

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

PIN ASSIGNMENTS

PIN	FUNCTION
1	Output B Relay Common (COM)
2	Output B Relay Normally Open (N.O.)
3	Relay B, Normally Closed (N.C.)
4	Output A Relay Common (COM)
5	Output A Relay Normally Closed (N.C)
6	Output A Relay Normally Open (N.O.)
7	D.C. Power Common
8	D.C.Power (+)
9	Loop
10	Loop

Notes:

➤ Relay contacts are shown with power applied, loop(s) connected, and no vehicles present.

MODELS & CONFIGURATIONS:

Model	Connector	Voltage	Operation
K-24	10 Pin "Molex" Male	24 VAC	Fail Safe
K-24-S	10 Pin "Molex" Male	24 VAC	Fail Secure
K-120	10 Pin "Molex" Male	120 VAC	Fail Safe
K-120-S	10 Pin "Molex" Male	120 VAC	Fail Secure

FACTORY DEFAULT SETTINGS:

Sensitivity Level:	Level 3
Output Configurations:	Relay A = TruePres. (Infinite)
	Relay B = Pulse on Entry
Sensitivity Boost:	OFF
2-Second Call Delay:	OFF

Notes: 1. "Detect" Memory is ALWAYS ON. There is no switch setting for this feature.

2. Please specify correct model number for **Fail-Safe** or **Fail-Secure** when ordering.

Engineering Excellence!