

Loop Installation

The vehicle detection characteristics of the inductive loop detector are greatly influenced by the loop size and proximity to moving metal objects such as gates. Vehicles such as small motorcycles and high-bed trucks can be reliably detected if the proper size loop is selected. If the loop is placed too close to a moving metal gate, the detector may detect the gate. The diagram below is intended as a reference for the dimensions that will influence the detection characteristics.

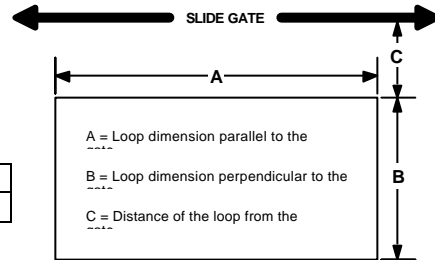
General Rules

1. The detection height for a loop is 2/3rds the shortest leg (A or B) of the loop. Example: Short leg = 6' then Height = 4' (2/3 x 6).

2. As leg A is made longer, distance C will need to increase.

| | | | | | | |
|-----|------|------|--------|-------|--------|-------|
| A = | 6 ft | 9 ft | 12 ft | 15 ft | 18 ft | 21 ft |
| C = | 3 ft | 4 ft | 4.5 ft | 5 ft | 5.5 ft | 6 ft |

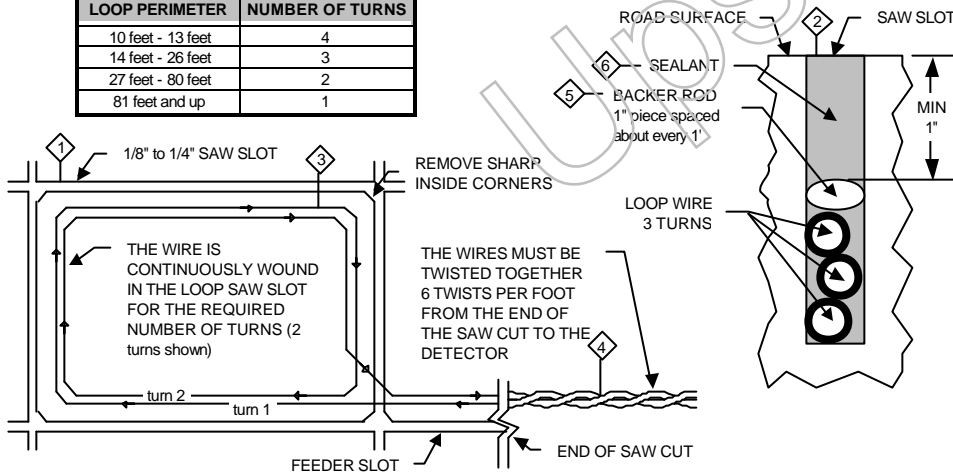
3. For reliable detection of small motorcycles, legs A and B should not exceed 6 feet.



Loop Installation - Saw Cut Type

1. Mark the loop layout on the pavement. Remove sharp inside corners that can damage the loop wire insulation.
2. Set the saw to cut to a depth (typically 2" to 2.5") that insures a minimum of 1" from the top of the wire to pavement surface. The saw cut width should be larger than the wire diameter to avoid damage to the wire insulation when placed in the saw slot. Cut the loop and feeder slots. Remove all debris from the saw slot with compressed air. Check that the bottom of the slot is smooth.
3. It is highly recommended that a continuous length of wire be used to form the loop and feeder to the detector. Loop wire is typically 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation. Use a wood stick or roller to insert the wire to the bottom of the saw slot (do not use sharp objects). Wrap the wire in the loop saw slot until the desired number of turns is reached. Each turn of wire must lay flat on top of the previous turn.
4. The wire must be twisted together a minimum of 6 twists per foot from the end of the saw slot to the detector.
5. The wire must be held firmly in the slot with 1" pieces of backer rod every 1 to 2 feet. This prevents the wire from floating when the loop sealant is applied.
6. Apply the sealant. The sealant selected should have good adhering properties with similar contraction and expansion characteristics to that of the pavement material.

| LOOP PERIMETER | NUMBER OF TURNS |
|-------------------|-----------------|
| 10 feet - 13 feet | 4 |
| 14 feet - 26 feet | 3 |
| 27 feet - 80 feet | 2 |
| 81 feet and up | 1 |



Recommended Loop Wire: Reno LW-120 for 1/8" slots
Model K Operating Instructions 12-19-03.d Reno LW-116-S for 1/4" slots

RENO A&E P/N 551-1100-00



Engineering

Reno A & E
4655 Aircenter Circle
Reno, NV 89502-5948 USA
Telephone: (775) 826-2020
Fax: (775) 826-9191
Website: www.renoae.com
E-mail: contact@renoae.com



OPERATING INSTRUCTIONS FOR

Model K Series

PC BOARD LOOP DETECTORS

I General

The Model K can be configured for 24 VAC or 120 VAC input power and Fail Safe or Fail Secure mode of operation.

The model number designates the configuration as follows:

Model K-XXX-X

Blank or S. Blank = Fail Safe, S = Fail Secure.

24 or 120. 24 = 24 VAC input, 120 = 120 VAC input.

Please verify source voltage before applying power.

| Relay | Fail Safe | | Fail Secure | |
|-------|---------------|--------------|---------------|--------------|
| | Power Failure | Loop Failure | Power Failure | Loop Failure |
| A | Call | Call | No Call | No Call |
| B | No Call | No Call | No Call | No Call |

II Indicators and Controls

| Status | Power LED | Detect LED | Fail LED |
|--------|-----------------------|------------------------------|--|
| Off | No power or low power | Output Off | Loop OK |
| On | Normal power | Output On | Open Loop |
| Flash | N/A | 4 Hz - 2 second timing delay | 1Hz - Shorted Loop 3/sec - Prior Loop Failure |

Note: If the supply voltage drops below 75% of the nominal supply voltage, the power LED will turn off, providing a visual check of low supply voltage. Model K detectors operate with supply voltage as low as 70% of nominal supply voltage.

Sensitivity Level Rotary Switch

The 8-position rotary switch selects one of eight sensitivity levels as shown below. Zero (0) is the lowest and seven (7) is the highest, with the normal (factory default) being three (3). Use the lowest sensitivity setting that detects the desired vehicles.

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

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DIP Switches

| Switch | On | Off | Factory Default |
|--------|-----------------------------------|-----------------|-----------------|
| 1 | Presence Mode | Pulse Mode | Off |
| 2 | Exit Pulse | Entry Pulse | Off |
| 3 | FAULT Output | No FAULT Output | Off |
| 4 | 2 Second Delay | No Delay | Off |
| 5 | Sensitivity Boost | No Boost | Off |
| 6 | Limited Presence | True Presence | Off |
| 7 | See table under Frequency section | | On |
| 8 | | | Off |

Presence/Pulse (DIP Switch 1)

Relay B has 2 modes of operation: Presence and Pulse. When in Pulse mode (DIP switch 1 set to OFF), the 250 ms pulse can be set for entry pulse or exit pulse via DIP switch 2. When in Presence mode, the presence hold time is the same as Output A.

Entry Pulse/Exit Pulse (DIP switch 2)

In Pulse Mode (with DIP switch 1 set to OFF), the detector can be programmed to output a 250 millisecond pulse only upon vehicle entry over the loop or only upon vehicle exit from the loop. DIP switch 2 has no effect on output A (the presence output).

FAULT Output (DIP switch 3)

Setting DIP Switch 3 to OFF enables the settings programmed via DIP switches 1 and 2 for Relay B. Setting the DIP switch to ON disables DIP switches 1 and 2 and forces an output on Relay B on a loop failure. Factory default for DIP switch 3 is OFF.

Output Delay (DIP Switch 4)

A 2 second delay of outputs A and B can be activated by setting DIP switch 4 to the ON position. Output delay is the time the detector output is delayed after a vehicle first enters the loop detection area. 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 to enter the loop detection area will initiate a new full 2 second delay interval. By flashing the front panel DET LED at 4 Hz with a 50% duty cycle, the detector indicates that a vehicle is being detected but that the output is being delayed.

Sensitivity Boost (DIP Switch 5)

DIP switch 5 can be turned ON to increase sensitivity only during the detect period without changing the sensitivity of a vacant loop. When a vehicle enters the loop, the detector will automatically boost the loop sensitivity during the detect condition. As soon as no vehicle is detected, the detector immediately returns to the original sensitivity level. This feature helps prevent dropouts during the passage of high-bed vehicles and is particularly useful in sliding gate situations.

Limited Presence/True Presence (DIP switch 6)

Output A always a presence output. The detector has two presence hold time modes: Limited Presence and True Presence. When set for True Presence (DIP switch 6 OFF), the detector will hold the output call for as long as a vehicle is present in the loop detection area and power is not removed or reset applied. True Presence time applies only for normal size automobiles and trucks and for normal size loops (loop area approx. 12 ft² to 120 ft²). When set for Limited Presence (DIP switch 6 ON), the detector will typically hold the Call for about one to three hours when a vehicle is in the detection zone.

Frequency (DIP switches 7 and 8)

| Switch | Low | Normal | Medium | High |
|--------|-----|--------|--------|------|
| 7 | On | On | Off | Off |
| 8 | On | Off | On | Off |

Loop frequency is controlled by DIP switches 7 and 8. Sometimes where loops are in close proximity, it is necessary to select a different frequency for each loop to avoid loop interference – commonly known as crosstalk. Four frequencies are available as shown in the above table. Normal is the default frequency.

III Reset

Changing any DIP switch position (except 7 or 8) will reset the detector. After changing the frequency selection switches, the detector will require a reset (a reset will clear the loop fault memory).

IV CALL Memory

When power is removed for 2 seconds or less, the detector automatically “remembers” if a vehicle was present and a CALL was in effect. 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 bring a gate arm down onto cars as they wait at the gate.

V Fuse (Automatic Recovery)

If 120VAC power is applied to the Model K-24, the automatic fuse will open. The fuse will automatically reset when power is removed for three seconds. Check source voltage before reinstalling.

VI Pin Connections

| 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 | Power (Neutral) |
| 8 | Power (Hot) |

| | |
|----|------|
| 9 | Loop |
| 10 | Loop |

Note: All relay contacts shown above are with power applied, loops connected, and no vehicle present. Output B always operates in Fail Secure mode when loop or power fails.

VII Warnings

Separately for each loop, the lead-in should be a twisted pair created by twisting two (2) loop wires all the way from the loop to the detector (including through all wiring harnesses) at approximately six (6) full twists per foot. For trouble free operation, it is highly recommended that all connections (including crimped connectors) be soldered.

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