

# B SERIES



## SINGLE CHANNEL DETECTOR



11-Pin Amphenol Style Connector

3.00" High x 1.75" Wide x 4.30" Deep (11-Pin)

### Ordering Information:

Model B-XX-XX



Blank = Internal DIP Switches set to Relay B Pulse-on-Entry

DP = Internal DIP Switches set to Relay B Presence Mode

3 = 120 VAC Input Power

4 = 10 to 35 VAC or VDC Input Power

### Overview:

The Model B is a full featured, single channel, dual output 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 configured by using a set of eight internal DIP switches and a front panel mounted pushbutton switch.

- Models available that operate on 10 to 35 VAC or VDC, 120 VAC input power.
- Fail-Safe
- Dual Relay outputs:
  - Output A:
    - Limited Presence.
    - True Presence™.
  - Output B:
    - Presence (Duplicates Output A).
    - Pulse-on-Entry.
    - Pulse-on-Exit.
- Delay Outputs A and B for two seconds.
- Eight levels of sensitivity.
- Sensitivity Boost for applications where high-bed vehicles might be encountered.
- Detect Memory feature maintains detection during momentary power interruptions of up to two seconds.
- Fail LED indicates current loop failures or loop failures that have occurred.
- Four loop frequencies.
- Loop Fail Memory stores a record of the last loop failure.

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## B 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 a front panel mounted pushbutton switch.

**Sensitivity:** Eight (8) detection sensitivity levels are selectable by means of three internal DIP switches. Vehicle detection results from a sufficient negative change in loop inductance (- $\Delta$ L/L). (See **SENSITIVITY,  $\Delta$ L/L** table.)

**Sensitivity Boost:** An internal DIP switch may be turned on to increase sensitivity 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 level is maintained 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 an internal 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 three modes of operation that are selected by two internal DIP switches; Presence, Pulse-on-Entry, or Pulse-on-Exit. 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). Output B is a Fail-Secure output in either Presence or Pulse mode.

Note: A special version of the detector is available that has an extended pulse output. When set to operate in Pulse mode, Output B will generate a one second pulse when the vehicle enters or leaves the loop detection zone. To order this option, add the **-SP2** designator to the end of the model number when ordering (example: **B-4-S-SP2**).

**Fail-Safe / Fail-Secure Operation:** The detector is factory configured for Fail-Safe 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. To operate in Fail-Secure mode swap pin 5 and 10, and 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 an internal 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 with a 50% duty cycle (Shorted Loop). If and when the loop returns to an in tolerance state, the FAIL LED will turn Off or stop flashing and the detector will resume normal operation.

**Non-Volatile Loop Fail Memory:** If a loop failure occurs and the loop returns to an in tolerance state, the detector will store information pertaining to the type of loop failure in non-volatile memory. To review the type of loop failure (if any) that has last occurred, press and hold the Frequency pushbutton for at least three seconds. When the Fail LED begins to flash at a one Hz rate with a 5% duty cycle, release the Frequency pushbutton. The Fail LED will remain Off (no previous loop failure), turn On (previous loop failure = Open Loop), or flash at a one Hz rate with a 50% duty cycle (previous loop failure = Shorted Loop) The previous loop fail indication will be displayed one time for about 15 seconds unless terminated by pressing the Reset or Frequency pushbutton. The non-volatile memory used to store the last loop failure type is automatically cleared each time it is interrogated. A power loss or detector reset will not clear the information stored in non-volatile memory.

**Detector Reset:** The front panel mounted Reset pushbutton is used to reset the detector. Changing the position of any internal DIP Switch will also reset the detector. After changing the Frequency setting, 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 0.01 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.

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

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

**Power:** 120 VAC versions B1: 135 VAC, 4 Watts maximum.  
10 to 30 VAC or VDC B-4: 10 to 30 VAC or VDC ,  
10 to 30 VDC, 50 milliamps maximum / 10 to 30 VAC, 4 Watts maximum.

**Ruggedized Construction:** 11-pin (Amphenol style connector) detector enclosures are 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:** Rear mounted 11 Pin Amphenol style connector on rear mounted (See **PIN ASSIGNMENTS** table.)

**Size:** 11-Pin Models - 3.00 inches (7.62 cm) high x 1.75 inches (4.45 cm) wide x 4.30 inches (10.92 cm) deep (excluding connector).

**Weight:** 11-Pin Models - 8.8 oz (249.5 gm).

## TABLES

### SENSITIVITY, - $\Delta$ L/L:

Sensitivity Setting	0	1	2	3*	4	5	6	7
- $\Delta$ L/L	1.28%	0.64%	0.32%	0.16%*	0.08%	0.04%	0.02%	0.01%

\* Denotes factory default.

Note: Changing a sensitivity switch will reset the detector.

### PIN ASSIGNMENTS:

#### Pin Function (11-Pin Models)

Pin	Function (11-Pin Models)
1	AC Line / DC +
2	AC Neutral / DC Common
3	Relay B, Normally Open (N.O.)
4	No Connection
5	Relay A, Common
6	Relay A, Normally Open (N.O.)
7	Loop
8	Loop
9	Relay B, Common
10	Relay A, Normally Closed (N.C.)
11	Relay B, Normally Closed (N.C.)

Note: Relay contacts shown are with power applied, loop(s) connected, and no vehicle present.

### FACTORY DEFAULT SETTINGS:

Switch	ON	OFF	Factory Default
1	Eight (8) Sensitivity Selections (See Sensitivity, - $\Delta$ L/L Table)		OFF
2			ON
3			ON
4	Two Second Call Delay	No Delay	OFF
5	Sensitivity Boost	No Boost	OFF
6	Output B Pulse-on-Exit	Output B Pulse-on-Entry	OFF
7	Limited Presence	True Presence™	OFF
8	Output B Pulse	Output B Presence	ON*

\* Dual Presence (DP) models have DIP switch 8 set to the OFF position.