

BX-LP SERIES



SINGLE CHANNEL DETECTOR



- Extremely Low Power Consumption - 1.1 to 5.5 milliamps in No Detect state.
- Models available that operate on 12 VDC or 24 VDC input power.
- Selectable Fail-Safe or Fail-Secure operation during a loop fail condition.
- Relay or Solid State versions available.
- Dual 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.
- Fail LED indicates current loop failures or loop failures that have occurred.
- Four loop frequencies.

3.00" High x 1.75" Wide x 4.30" Deep

Ordering Information:
Model BX-LP-XX

Blank = 12 VDC Input Power, Relay Outputs
24 = 24 VDC Input Power, Relay Outputs
SS = 12 VDC or 24 VDC Input Power, Solid State Outputs

Overview:

The Model BX-LP 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. Designed to minimize power consumption, the BX-LP is the perfect choice for all solar and battery sourced installations.

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BX-LP 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 front panel mounted DIP switches.

Sensitivity: Eight (8) detection sensitivity levels are selectable by means of a front panel mounted rotary switch. Vehicle detection results from a selectable negative change in loop inductance (- $\Delta L/L$). (See *SENSITIVITY, $\Delta L/L$, & CURRENT DRAW* table.)

Sensitivity Boost: A front panel mounted 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 a front panel 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 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 front panel mounted 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.

Fail-Safe / Fail-Secure Operation: The detector can be configured for Fail-Safe or Fail-Secure operation during a loop failure condition by means of a front panel mounted DIP switch. When 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 or Solid State Output A sourced to ground) during a loop fault condition. When the detector is configured to operate in Fail-Secure mode, Output A will not respond to loop failures (Relay A Normally Open contacts open, Relay A Normally Closed contacts closed or Solid State Output A not sourced to ground). Output B will always assume a No Detect state during a loop fault condition (Relay B Normally Open contacts open, Relay B Normally Closed contacts closed or Solid State Output B not sourced to ground).

Call Delay: A two second delay of Outputs A and B can be activated by setting a front panel 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. This flash rate will occur only during the three minutes immediately following initial power-up or reset of the detector.

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. The Detect LED will only activate during the three minutes immediately following initial power-up or reset of the detector.

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 (Open Loop or Shorted Loop) by flashing at a one Hz rate. If and when the loop returns to an in tolerance state, the FAIL LED will flash at a rate of one flash every five seconds 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.

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

Solid State Outputs: 30 VDC maximum collector (drain) to emitter (source). 100 mA maximum saturation current. 2 VDC maximum transistor saturation voltage. The output is protected with a 33-volt Zener diode connected between the collector (drain) and emitter (source).

Power: 12 VDC version with Relay Outputs (BX-LP): 10 to 14 VDC.

- 1.1 to 5.5 milliamps with no vehicle in the loop detection zone. *
- 35.0 milliamps maximum with a vehicle in the loop detection zone during the three minutes immediately following initial power-up or reset of the detector (Detect LED activated). Add 25.0 milliamps for dual presence operation.
- 30.0 milliamps maximum with a vehicle in the loop detection zone after the three minutes immediately following initial power-up or reset of the detector (Detect LED deactivated). Add 25.0 milliamps for dual presence operation.

24 VDC version with Relay Outputs (BX-LP-24): 20 to 28 VDC.

- 1.1 to 5.5 milliamps with no vehicle in the loop detection zone. *
- 25.0 milliamps maximum with a vehicle in the loop detection zone during the three minutes immediately following initial power-up or reset of the detector (Detect LED activated). Add 15.0 milliamps for dual presence operation.
- 20.0 milliamps maximum with a vehicle in the loop detection zone after the three minutes immediately following initial power-up or reset of the detector (Detect LED deactivated). Add 15.0 milliamps for dual presence operation.

12 / 24 VDC version with Solid State Outputs (BX-LP-SS): 10 to 14 VDC / 20 to 28 VDC.

- 1.1 to 5.5 milliamps with no vehicle in the loop detection zone. *
- 12.0 milliamps maximum with a vehicle in the loop detection zone during the three minutes immediately following initial power-up or reset of the detector (Detect LED activated).
- 5.5 milliamps maximum with a vehicle in the loop detection zone after the three minutes immediately following initial power-up or reset of the detector (Detect LED deactivated).

* Relay and Solid State versions of the BX-LP consume 1.1 to 5.5 mA of current when the outputs are Off (No Detect state). See the *SENSITIVITY, $\Delta L/L$, & CURRENT DRAW* table for the actual current draw at each of the sensitivity settings.

Ruggedized Construction: The detector enclosure is 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 connector. (See *PIN ASSIGNMENTS* table.)

Size: 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: 4.9 oz (138.9 gm).

TABLES

SENSITIVITY, $\Delta L/L$, & CURRENT DRAW:

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%
Current Draw	1.1 mA	1.3 mA	1.6 mA	2.4 mA *	3.2 mA	3.4 mA	3.5 mA	5.5 mA

* Denotes factory default.

Note: Changing the sensitivity setting will reset the detector.

PIN ASSIGNMENTS:

Pin	Function (Relay Outputs)	Function (Solid State Outputs)
1	DC +	DC +
2	DC Common	DC Common
3	Relay B, Normally Open (N.O.)	Output B, Collector (Drain)
4	No Connection	No Connection
5	Relay A, Common	DC Common
6	Relay A, Normally Open (N.O.)	Output A, Collector (Drain)
7	Loop	Loop
8	Loop	Loop
9	Relay B, Common	DC Common
10	Relay A, Normally Closed (N.C.)	No Connection
11	Relay B, Normally Closed (N.C.)	No Connection

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

FACTORY DEFAULT SETTINGS:

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