

# VON DUPRIN®

## Electrical Options Booklet

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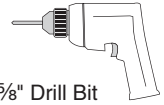


# EL Wiring (page 1 of 2)

## ⚠ DANGER:

To avoid risk of electric shock, turn off AC power to power supply before installing or wiring option board

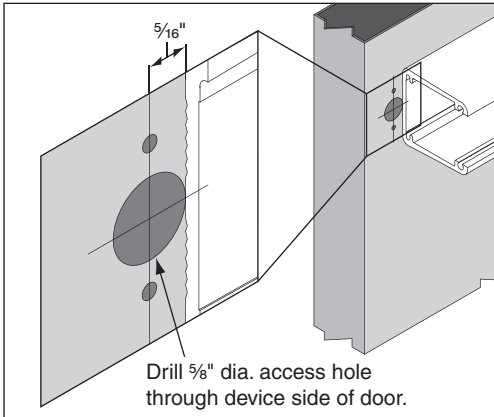
### Tools for Installation



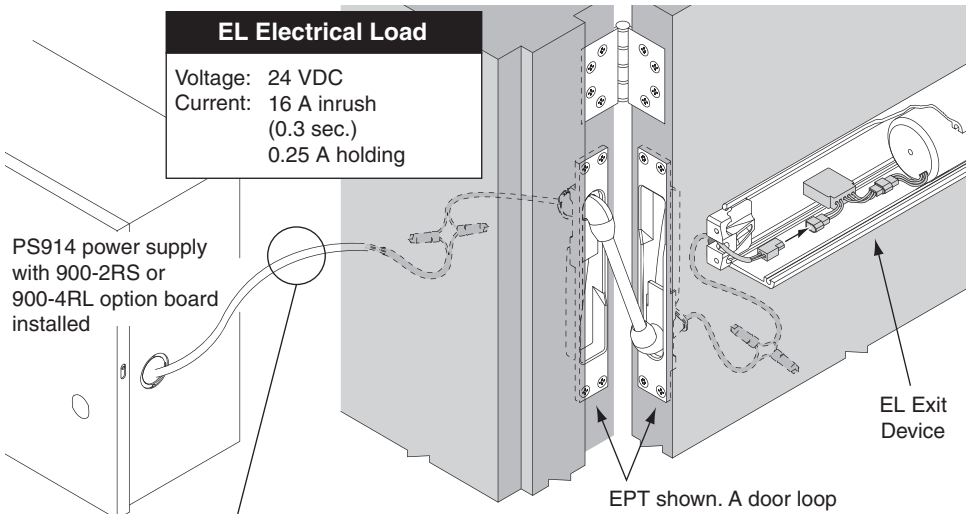
5/8" Drill Bit



## 1 Drill Wire Access Hole



## 2 Route Two Wires from EL Exit Device to Power Supply



### EL Electrical Load

Voltage: 24 VDC  
 Current: 16 A inrush  
 (0.3 sec.)  
 0.25 A holding

PS914 power supply with 900-2RS or 900-4RL option board installed

EL Exit Device

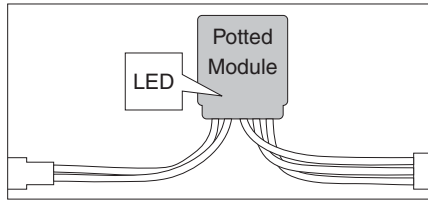
EPT shown. A door loop or electric hinge/pivot may also be used.

EL device used with	Distance (one way)	Wire Gauge
EPT or Door Loop	200' or less	12AWG required
	0-100'	14AWG permitted
Electric Hinge/Pivot	150' or less	12AWG required
	0-75'	14AWG permitted

# EL Wiring (page 2 of 2)

## 3 Review LED Functions (For devices purchased after 8/15/12)

Normal Operation	<p>LED will flash "ON" briefly when +24V DC is applied. This is when potted module is operational and power is being applied to the exit device.</p> <p>LED then goes into a steady "OFF" state and holds there, even with +24V continuing to be applied to the module.</p>
Fault Condition	<p>LED will turn "ON" and remain illuminated when over-voltage is detected. The potted module will remain in this state until power is removed from the module.</p> <p><b>NOTE:</b> Input voltage greater than 30V will cause an over-voltage condition.</p>



## 4 Check EL Device Operation

Activate input and verify that EL device operates properly. Solenoid should retract latch bolt(s). If device does not operate properly, see EL Troubleshooting section.

# EL Troubleshooting (page 1 of 3)

**A** If the motor fails to retract the latch bolt when power is applied, recheck wiring for proper connections.

If motor retracts latch bolt momentarily but will not remain in energized position:

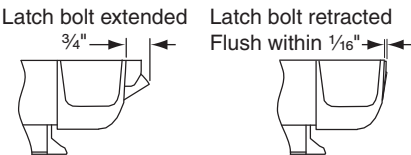
1. Check wiring for proper connections, gauge, and distances.
2. Make sure PS914-2RS or PS914-4RL power supply is installed.
3. Check for latch bolt binding caused by improper strike installation, warped door, etc.
4. If device still does not function properly, continue to Section B.

## B Check For Proper Function

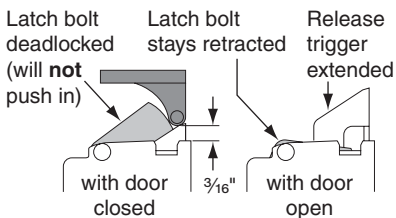
33A/35A Rim	98/99 Rim	98/9947WDC
33A/3527A	98/9927	98/9957
33A/3547A	98/9947	98/9975

1. Make sure device is not dogged for SD/HD-EL.
2. Depress pushbar and make sure latch bolt retracts and extends fully (see Figure 1). If latch bolt does not retract or extend fully, adjustment may be required per the device installation instructions.
3. Electrically energize solenoid and hold.
4. Check latch bolt(s) for full retraction (must clear strike, see Figure 1).
5. Release solenoid and check latch bolt extension (see Figure 1)
6. Continue to Section C if device does not function electrically.

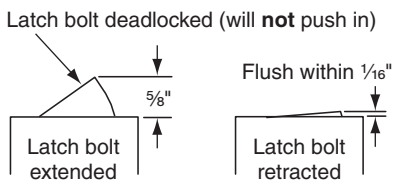
### 33A/35A Rim, 98/99 Rim, 98/9957



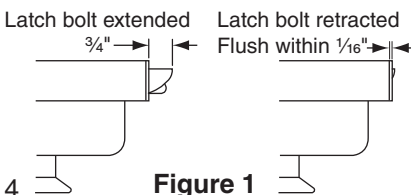
### 33A/3527A, 98/9927, 98/9957



### 33A/3547A, 98/9947, 98/9947WDC



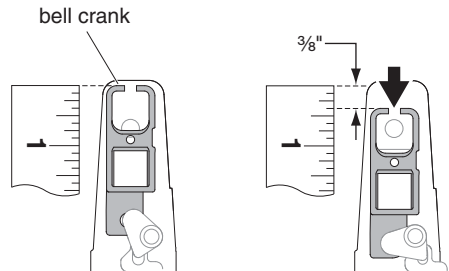
### 98/9975



33/3549A
98/9949
98/9949WDC

1. Make sure device is not dogged for SD/HD-EL.
2. Using a ruler, locate the extended position of the bell crank (see Figure 2).
3. Electrically energize solenoid and hold.
4. Check bell crank travel. Bell crank must be a minimum of  $\frac{3}{8}$ " from extended position and must not run out of travel (see Figure 2).
5. Continue to Section C if bell crank travel is too short or long.

### 33/3549A



### 98/9949, 98/9949WDC

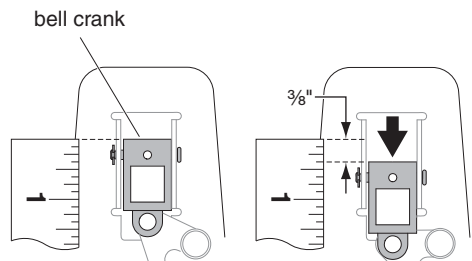


Figure 2

## C Determine if Dogging Rod Adjustment is Too Long or Short

Device	
33A/35A Rim 98/9927 33A/3527A 98/9947 33A/3547A 98/9947WDC 98/99 Rim 98/9975	<ol style="list-style-type: none"> <li>1. The dogging rod adjustment is too <b>long</b> if latch bolt does not retract and clear strike (see Section D for adjustment).</li> <li>2. The dogging rod adjustment is too <b>short</b> if latch bolt does not fully extend <b>or</b> latch bolt fully retracts but solenoid releases while energized (see Section D for adjustment).</li> </ol>
33/3549A	<ol style="list-style-type: none"> <li>1. The dogging rod adjustment is too <b>long</b> if bell crank moves less than <math>\frac{3}{8}</math>" (see Section D for adjustment).</li> <li>2. The dogging rod adjustment is too <b>short</b> if bell crank runs out of travel (see Section D for adjustment).</li> </ol>
98/9949 98/9949WDC	<ol style="list-style-type: none"> <li>1. The dogging rod adjustment is too <b>long</b> if bell crank pin moves less than <math>\frac{3}{8}</math>" (see Section D for adjustment).</li> <li>2. The dogging rod adjustment is too <b>short</b> if bell crank pin bottoms out on the end of the slot (see Section D for adjustment).</li> </ol>

## D Adjust Solenoid Plunger if Required (See Figure 4)

1. Remove end cap ① and dogging cover ②.
  2. Loosen cap screw ③ with  $\frac{3}{32}$ " hex key.
  3. Hold plunger ④ so it does not rotate.
  4. Turn threaded bushing ⑤ in or out to see 8 to 10 threads showing so plunger ④ just bottoms in solenoid housing ⑥ and latch bolt is fully retracted.
  5. Tighten cap screw ③.
- Note:** Cap screw ③ must be tightened against flat on threaded bushing ⑤. Apply a few drops of Loc-Tite 222 to threads of cap screw ③.
6. Replace dogging cover ② and end cap ①.
  7. Return to Section B to check for proper function.

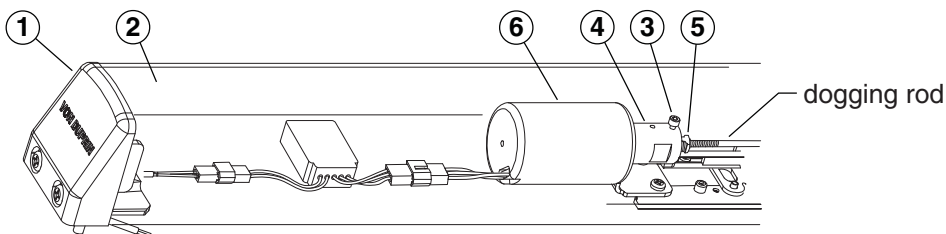


Figure 4

# SD/EL 98/99 Cylinder Dogging

1. Obtain a 1¼" mortise cylinder.
2. Make sure cylinder cam is in position shown **with key removed** (Figure A). If not, remove key, remove cam, and reinstall in position shown (Figure B).

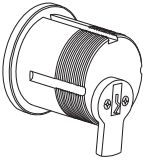


Figure A

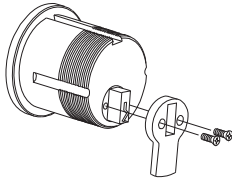
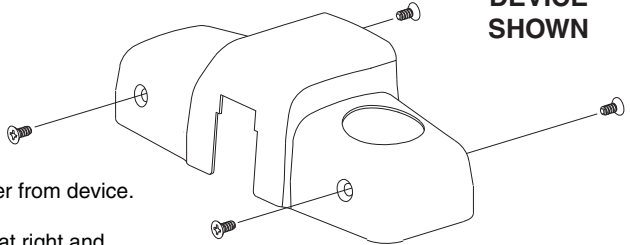


Figure B



RHR  
DEVICE  
SHOWN



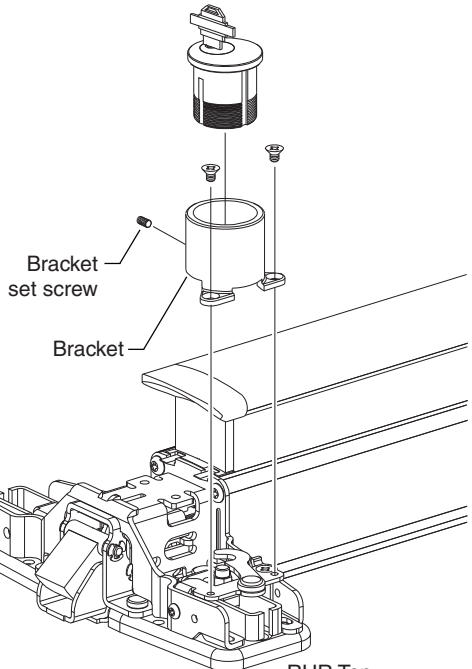
3. Remove center case cover from device.
4. Orient cylinder as shown at right and insert cylinder into bracket.
5. Tighten bracket set screw with a 1/16" hex wrench.

If you cannot reach bracket set screw with wrench, remove bracket from center case, install cylinder in bracket, tighten bracket set screw, and reinstall bracket in center case.

6. Install center case cover.

**To dog RHR device**, depress pushbar, insert key, and turn key 180 degrees counterclockwise. **To dog LHR device**, turn key clockwise.

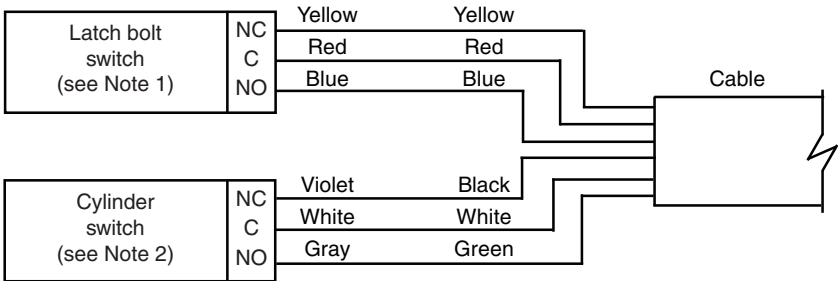
**To undog RHR device**, insert key and turn key 180 degrees clockwise. **To undog LHR device**, turn key counterclockwise.



RHR Top

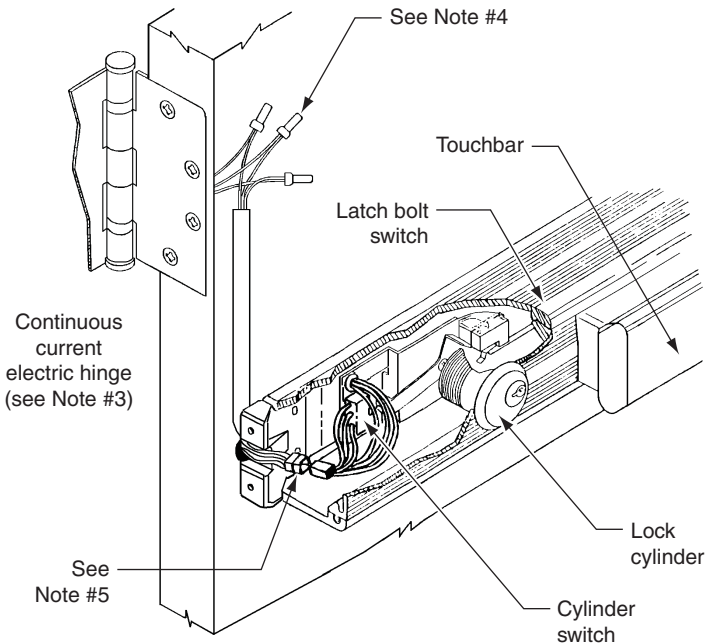
# SS Wiring

Applies to all SS33/35, SS33A/35A, & SS98/99 series exit devices



## Notes:

1. The latch bolt switch is actuated whenever the touchbar is depressed or the device latch bolt is retracted. This switch may be used for initiating an alarm.
2. The cylinder switch is actuated when the key is inserted into the lock cylinder and turned clockwise. This switch may be used for shunting or resetting an alarm.
3. A continuous current electric hinge or equivalent is required to transfer the wiring from the door to the frame.
4. Splice electric hinge wires and cable wires together with wire nuts. Unused wires should be cut off or insulated separately.
5. Cut device to proper length before connecting cable and switch wires.

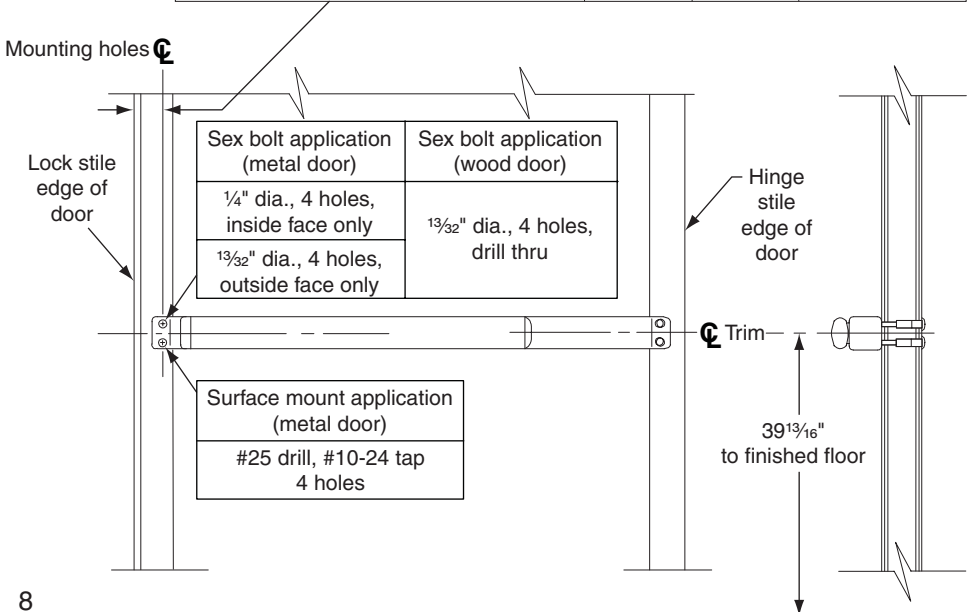


# 330, 350, RX-330 and RX-350 Push Bar Trim

## Mechanical Installation (page 1 of 2)

1. Follow directions for fitting and cutting trim (see next page). See trim installation schedule below to determine proper formula to use.
2. Use lock stile mounting bracket to mark lock stile mounting holes, then prepare lock stile mounting holes; be sure bracket is flush against mechanism case on both ends before marking holes; be sure trim is level.
3. Temporarily install trim using lock stile mounting bracket.
4. Insert hinge stile mounting bracket in hinge stile end of trim and mark hinge stile mounting holes.
5. Remove trim from door and prepare hinge stile mounting holes.
6. For RX-330/350 wiring, see page 10.
7. Install trim on door and attach end caps.

Trim Installation Schedule			
Installation	Stile Size	Backset	Cutoff Formula (see next page)
Single door 1/2" stop and back to back with 386DT, 337DT or 696/697DT trim on single door 1/2" stop	1 3/4" - 3"	1 5/16"	Fig. 1A
Single door 5/8" stop and back to back with 386DT, 337DT or 696/697DT trim on single door 5/8" stop	1 7/8" - 3"	1 7/16"	Fig. 1A
Pair of doors without mullion and back to back with 386DT, 337DT or 696/697DT trim on pair of doors without mullion	1 3/4" - 3"	1 5/16"	Fig. 1B
Single door, pair of doors without mullion, and back to back with 990DT, 991DT, 992DT, or 230DT trim	3" flush	1/2 of stile	Fig. 1C





# 330, 350, RX-330 and RX-350 Push Bar Trim

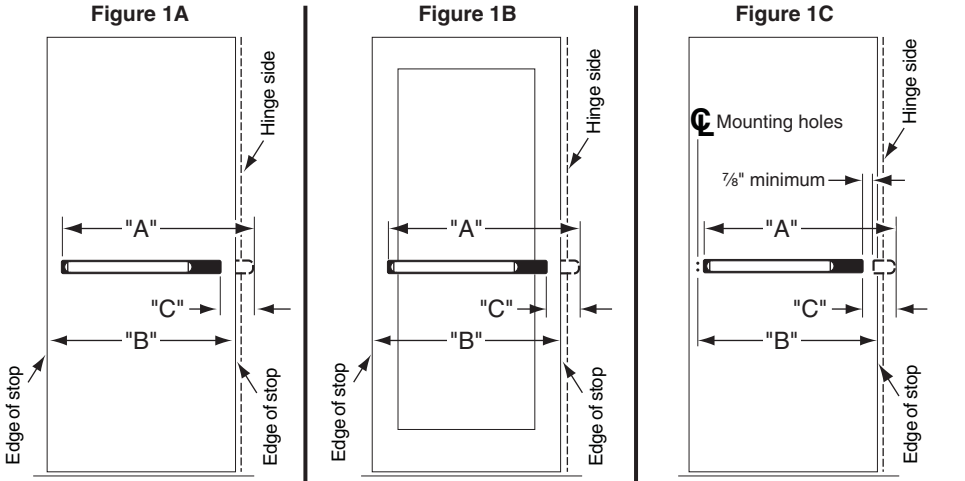
## Mechanical Installation (page 2 of 2)

### Cutoff Instructions

- To determine required trim length, fill in appropriate chart below Figure 1A, 1B, or 1C. See trim installation schedule on previous page to determine proper formula to use.
- Cut trim as shown in Figure 2.

**NOTE**

Measure trim with both end caps and mounting brackets removed.



Trim Cutoff Formula for Single Doors 1¼ - 3" Stile		Trim Cutoff Formula for Double Doors without Mullion		Trim Cutoff Formula for 3" Stile - Flush	
44 <sup>15</sup> / <sub>16</sub> " (4' door)	"A"	44 <sup>15</sup> / <sub>16</sub> " (4' door)	"A"	44 <sup>15</sup> / <sub>16</sub> " (4' door)	"A"
32 <sup>15</sup> / <sub>16</sub> " (3' door)	Trim length *	32 <sup>15</sup> / <sub>16</sub> " (3' door)	Trim length *	32 <sup>15</sup> / <sub>16</sub> " (3' door)	Trim length *
+ 2 <sup>1</sup> / <sub>16</sub> "		+ 2 <sup>1</sup> / <sub>16</sub> "		+ 2 <sup>1</sup> / <sub>16</sub> "	
=		=		=	
-	"B" (stop to stop)	-	"B" (edge of door at lock stile to hinge stop)	-	"B" (⌀ mounting holes to hinge stile stop)
=	"C" (cutoff dim.)	=	"C" (cutoff dim.)	=	"C" (cutoff dim.)

\* "A" trim length is measured with both end caps and mounting brackets removed.

- Mark dimension "C" on mechanism case and cover plate. (Measure trim with both end caps and mounting brackets removed.)
- Cut mechanism case and cover plate. Cover plate ① must be flush against end of mechanism case ② when cutting.

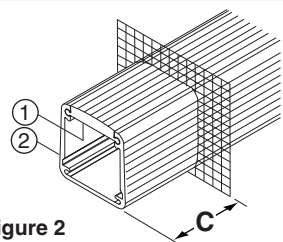


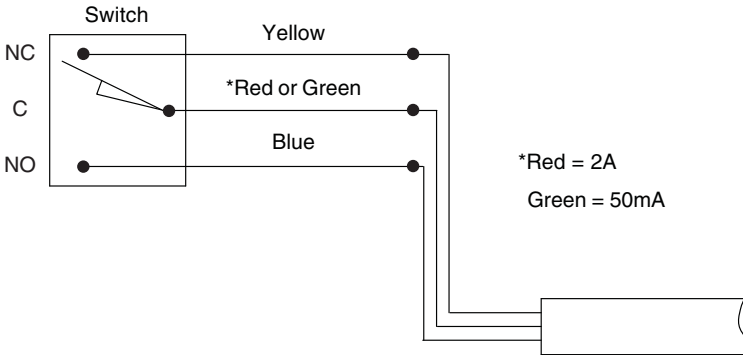
Figure 2

# RX or RX-LC/S1 Switch Wiring

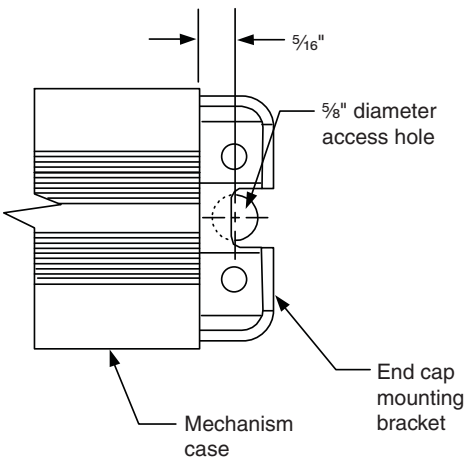
**RX** - Switch is intended for signaling purposes only and is rated for a maximum 2 ampere resistance load at 24VDC/AC. Use with inductive or capacitive loads (magnetic locks or solenoid devices) derates the capacity of the switch. Consult the factory for assistance.

**RX-LC** - Switch is intended for systems using low current signals and is rated for a maximum 50mA. Consult the factory for assistance.

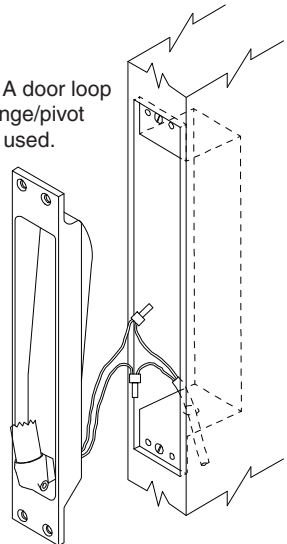
1. The RX touchbar monitor switch is activated whenever the touchbar is depressed.
2. The switch function is shown with the latchbolt extended and the touchbar not depressed.



3. Mark and drill wiring access hole on inside face of door (only after device is cut to length).
4. The Von Duprin EPT-10 power transfer (for three wires) or EPT-2 power transfer (for two wires) is required to transfer the wiring from the door to the frame.
5. Connect the power transfer wires and switch assembly wires with crimp connectors. Unused wires should be insulated separately.



EPT shown. A door loop or electric hinge/pivot may also be used.

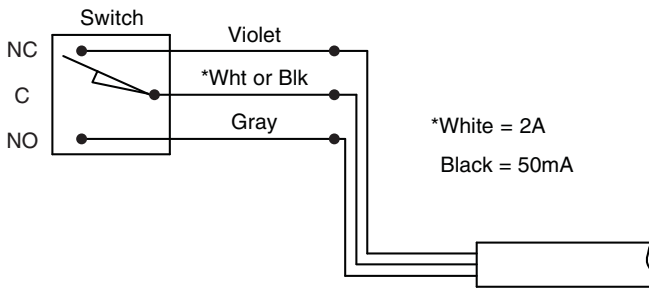


# LX or LX-LC Switch Wiring

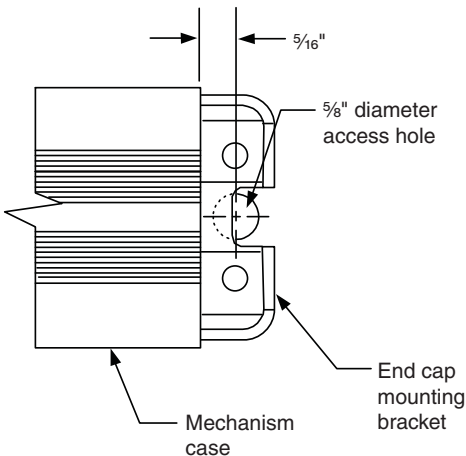
**LX** - Switch is intended for signaling purposes only and is rated for a maximum 2 ampere resistance load at 24VDC/AC. Use with inductive or capacitive loads (magnetic locks or solenoid devices) derates the capacity of the switch. Consult the factory for assistance.

**LX-LC** - Switch is intended for systems using low current signals and is rated for a maximum 50mA. Consult the factory for assistance.

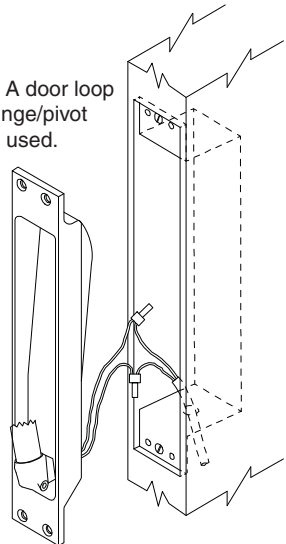
1. The latchbolt monitor switch is activated whenever the latch bolt is retracted.
2. The switch function is shown with the latchbolt extended and the touchbar not depressed.



3. Mark and drill wiring access hole on inside face of door (only after device is cut to length).
4. The Von Duprin EPT-10 power transfer (for three wires) or EPT-2 power transfer (for two wires) is required to transfer the wiring from the door to the frame.
5. Connect the power transfer wires and switch assembly wires with crimp connectors. Unused wires should be insulated separately.



EPT shown. A door loop or electric hinge/pivot may also be used.

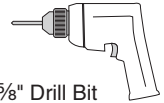


# QEL Wiring & Configuration (page 1 of 3)

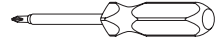
## **⚠ DANGER:**

To avoid risk of electric shock, turn off AC power to power supply before installing or wiring option board

## Tools for Installation



5/8" Drill Bit

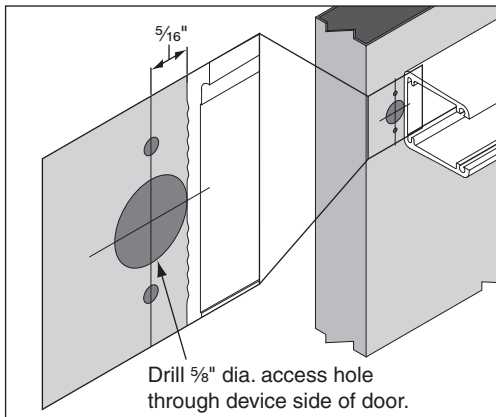


## **1** Confirm Equipment Compatibility

The QEL is compatible with the following equipment (refer to individual instructions as needed):

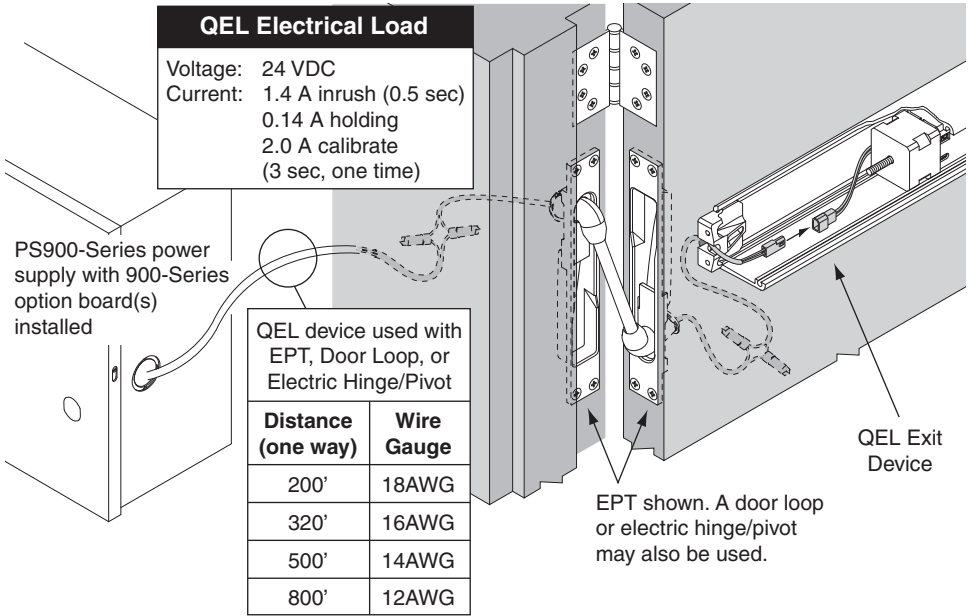
- PS900-Series power supplies - PS902, PS904, PS906, PS914
- 900-Series option boards - 900-2RS, 900-4R, 900-4RL, 900-2Q
- PS873 power supply plus 871-2, 871-2Q, 873-4TD/AO option boards

## **2** Drill Wire Access Hole



# QEL Wiring & Configuration (page 2 of 3)

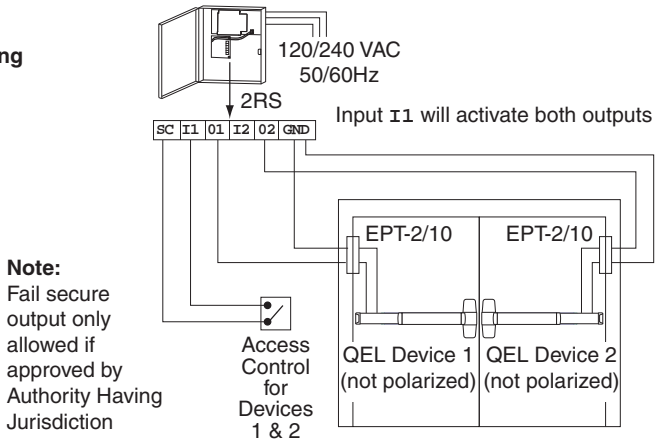
## 3 Route Two Wires from QEL Exit Device to Power Supply



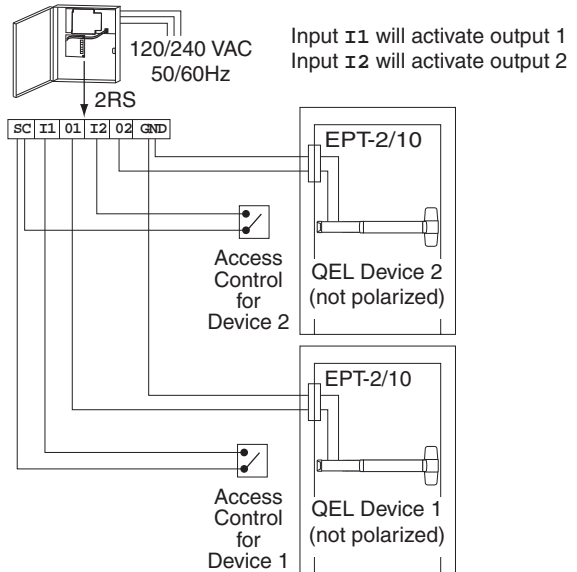
# QEL Wiring & Configuration (page 3 of 3)

## 4 Connect Input and Output Wires to Option Board (2RS Shown)

### Sequential Mode - Typical Wiring



### Individual Mode - Typical Wiring



## 5 Check Operation

NOTE: When using a PS902 power supply with two QEL exit devices, power must be applied to one device at a time.

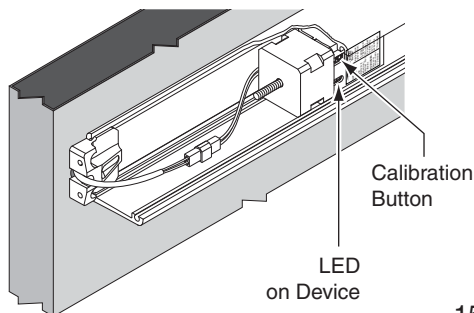
- Activate each input and verify all QEL devices operate properly. **NOTE:** During the first activation, each device will perform a one time self calibration, which is normal. For best results, power each device separately so that the calibration cycles do not overlap.
- If any device does not operate properly, see step 6 for troubleshooting.

# QEL Troubleshooting (page 1 of 2)

## 6 If Necessary, Troubleshoot Operation

Power at the QEL	QEL Response	Condition / Solution
0VDC	LED - Off Latchbolt extended	QEL is not receiving power to operate 1. Problem with power supply or wiring
24VDC	LED - Solid green Latchbolt retracted	Operation normal
	LED - Solid red after latchbolt attempts to retract multiple times	Improper mechanical adjustment or QEL calibration  First check mechanical adjustment (on vertical rods or mortise lock devices, if used) and correct adjustments*. See <i>Check Mechanical Operation</i> on page 16, as needed.  Calibrate the QEL 1. Apply power and wait until the LED is solid red 2. Momentarily press the calibrate pushbutton (LED will flash green) 3. QEL will go through a retraction sequence to complete calibration, LED will be solid green and latchbolt retracted 4. Remove and reapply power to verify correct operation  If the power to the QEL is being controlled by an access control system with momentary unlock, calibrate as follows: 1. Open door completely if using auto operator 2. Press and hold the QEL pushbutton 3. Activate the access control input to unlock the QEL 4. Immediately after the QEL LED turns on green, release the QEL pushbutton 5. The QEL will calibrate (this will look like a fast then a slow pull) 6. Reapply power to verify correct operation
	LED - Flashing green/red Latchbolt is not retracted	Excessive tamper (while power was applied, the pushpad was pulled out at least 3 times) 1. Wait 2 minutes, latchbolt will retract again; OR 2. Remove and reapply power to clear the condition
12 VDC	LED - Solid red after latchbolt attempts to retract multiple times	Power supply is not set for proper voltage output 1. Remove AC from power supply, change it from 12 to 24VDC 2. Apply AC power to power supply and verify proper operation

\*For information about adjusting exit devices, go to [w3.securitytechnologies.com](http://w3.securitytechnologies.com) or call Technical Services at 1-877-671-7011



# QEL Troubleshooting (page 2 of 2)

## Check Mechanical Operation

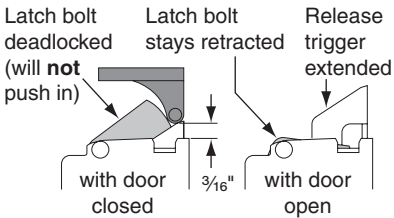
33A/3527A 98/9927 98/9947WDC  
33A/3547A 98/9947 98/9957  
98/9975

1. Make sure device is not dogged for SD-QEL.
2. Depress pushbar and make sure latch bolt retracts and extends fully (see Figure 1).
3. If latch bolt does not retract or extend fully, adjustments may be required per the device installation instructions.

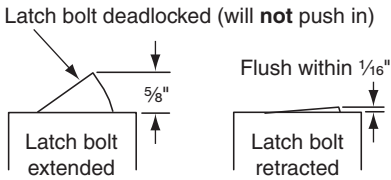
33/3549A  
98/9949  
98/9949WDC

1. Make sure device is not dogged for SD-QEL.
2. Depress pushbar. Door should begin to open with pushbar depressed halfway.
3. Close door. Top latch should be secure. If two point latch, bottom latch should be secure as well.
4. If device does not function as described in steps 2 and 3, adjustments may be required per the device installation instructions.

### 33A/3527A, 98/9927, 98/9957



### 33A/3547A, 98/9947, 98/9947WDC



### 98/9975

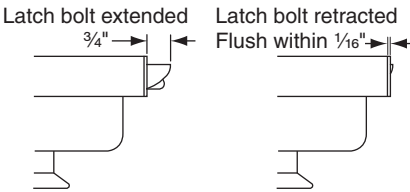


Figure 1