



24228413

VON DUPRIN®

Electrical Options Booklet

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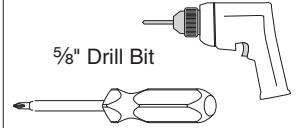
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QEL Wiring & Configuration (page 1 of 3)

⚠ DANGER:

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

Tools for Installation



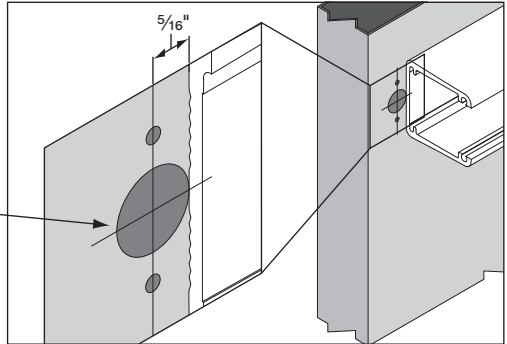
1 Confirm Equipment Compatibility

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

Drill 5/8" dia. access hole through device side of door.



3 Route Two Wires from QEL Exit Device to Power Supply

QEL Electrical Load

Voltage: 24 VDC
Current: 1.0 A inrush (0.5 sec)
0.14 A holding

PS900-Series power supply with 900-Series option board(s) installed

QEL device used with EPT, Door Loop, or Electric Hinge/Pivot

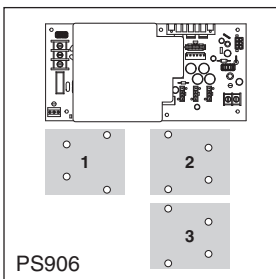
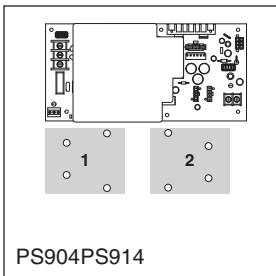
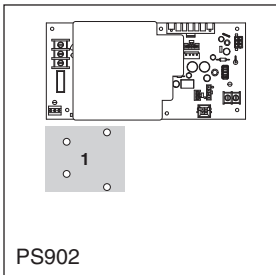
Distance (one way)	Wire Gauge
200'	18AWG
320'	16AWG
500'	14AWG
800'	12AWG

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

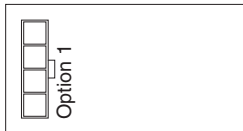
QEL Exit Device

4 Install 900-2RS, 4RL, or 4R option board(s) into power supply

a Review Available 900 series Option Board Mounting Locations (Gray)



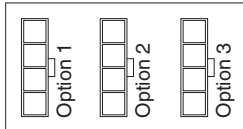
b Plug Option Board Cable into any Available Option Connector



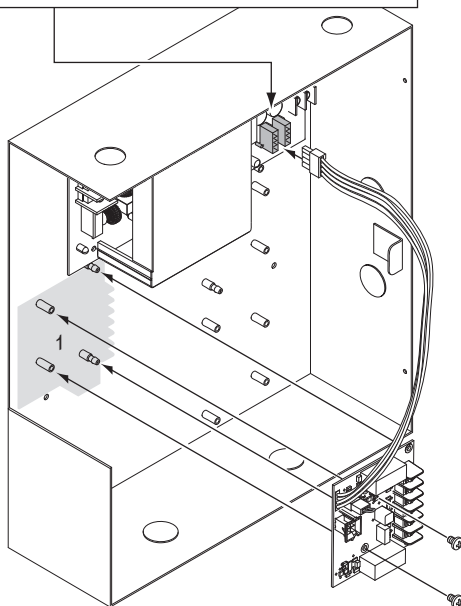
PS902
1 Board



PS904, 914
2 Boards



PS906
3 Boards

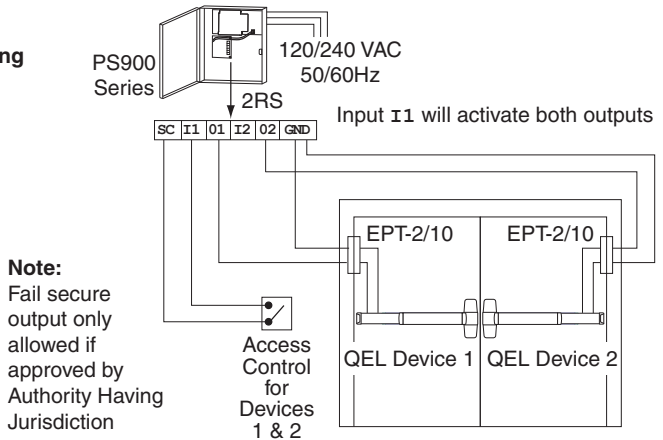


c Secure Board(s) with Screws

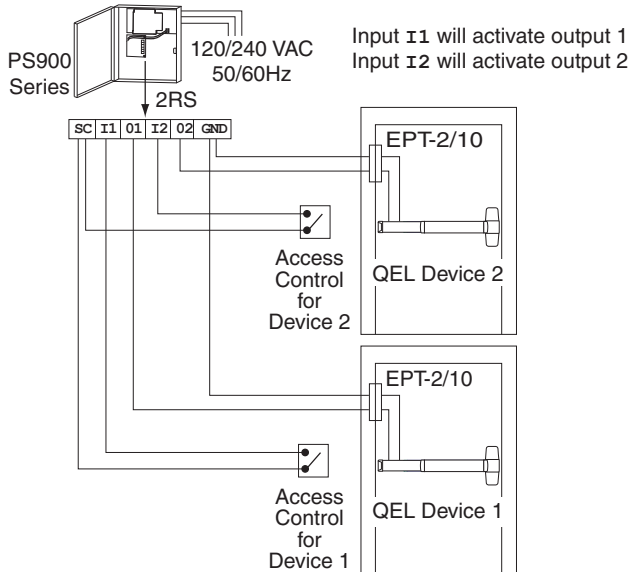
- Notes:**
1. 24VDC output setting required when QEL device connected.
 2. If installing board in location 2 or 3, rotate board 180°
 3. The QEL is compatible with an existing 900-2Q board if currently installed.
 4. Latchbolt retraction of (2) sequenced QEL's requires more than 1 second to complete.
 5. When powering multiple components, verify that the amperage requirements of all components combined does not exceed the power supply output rating.

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

Sequential Mode - Typical Wiring



Individual Mode - Typical Wiring



6 Check Operation

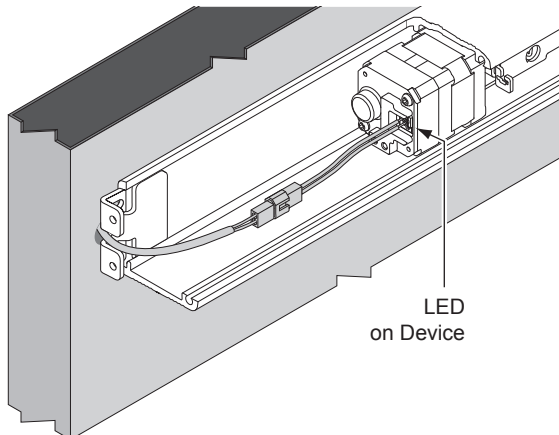
- Activate each input and verify all QEL devices operate properly.
- If any device does not operate properly, see step 7 for troubleshooting.

QEL Troubleshooting (page 1 of 2)

7 If Necessary, Troubleshoot Operation (LED is only visible with the mechanism cover removed)

Power at the QEL	QEL Response	Condition/Solution
24VDC	LED - Solid green Latchbolt - retracted	Operation normal, latch retracted immediately
	LED - Solid red after latchbolt attempts to retract multiple times	Latchbolt cannot fully retract mechanically Verify mechanical adjustment (on vertical rod or mortise lock devices if used). Remove and reapply input voltage to reset this condition.* See <i>Check Mechanical Operation</i> on page 6 as needed.**
	LED - Flashing green/red Latchbolt - not retracted	Excessive tamper (while power applied, the push-pad was pulled out at least 3 time) Wait 15 seconds and latchbolt will retract again OR remove and reapply power to clear condition
24VDC low	LED - Flashing green Latchbolt - retracted	Voltage low during latchbolt retraction (latchbolt retracts at reduced force) Wire length is too long, wire gauge is too small or power supply has poor regulation
29VDC or greater	LED- Flashing red Latchbolt - will not retract	Input voltage is too high for proper operation Wrong power supply, power supply defective.
13VDC or lower		Input voltage is too low for proper operation Wrong power supply, power supply defective or not set to the proper output voltage. To set, remove AC power from power supply, change power supply setting from 12 to 24VDC, then reapply AC power and verify proper operation.
0VDC	LED - off Latchbolt - not retracted	No input voltage Problem with the power supply, control switch or wiring
0VDC	LED - off Latchbolt - retracted	No input voltage Mechanical dogging is engaged

*For information about adjusting exit devices, you can find their installation instructions in the support area at www.allegion.com/us or call Technical Services at 1-877-671-7011



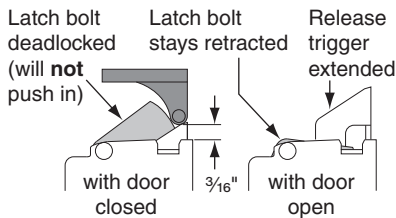
QEL Troubleshooting (page 2 of 2)

Check Mechanical Operation

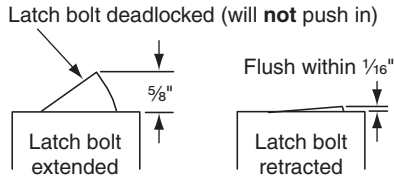
33A/3527A 98/9927 98/9947WDC
33A/3547A 98/9947 98/9957
98/9975

1. Make sure device is not dogged for SD-QEL/HD-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.

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



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



98/9975

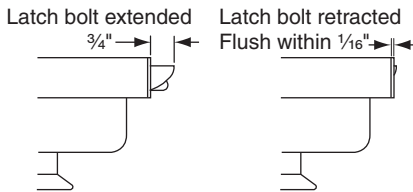


Figure 1

33/3549A 98/9949
33/3550A-WDC 98/9949WDC
98/9950WDC

1. Make sure device is not dogged for SD-QEL/HD-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.

Any HD Device

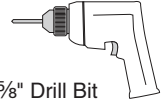
1. Fully depress pushbar.
2. Insert hex dogging key and turn clockwise.
3. Release pushbar and verify latchbolt remains retracted.
4. Fully depress pushbar.
5. Insert hex dogging key and turn counter clockwise.
6. Release pushbar and verify latchbolt extends fully.

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

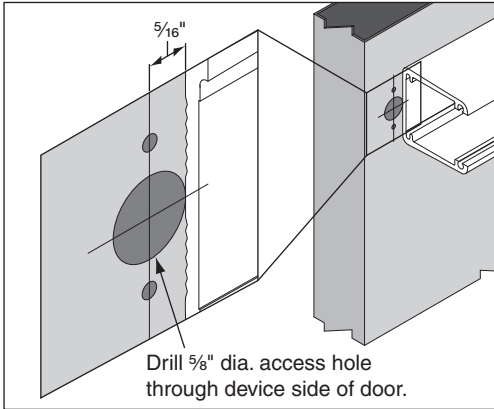
Tools for Installation



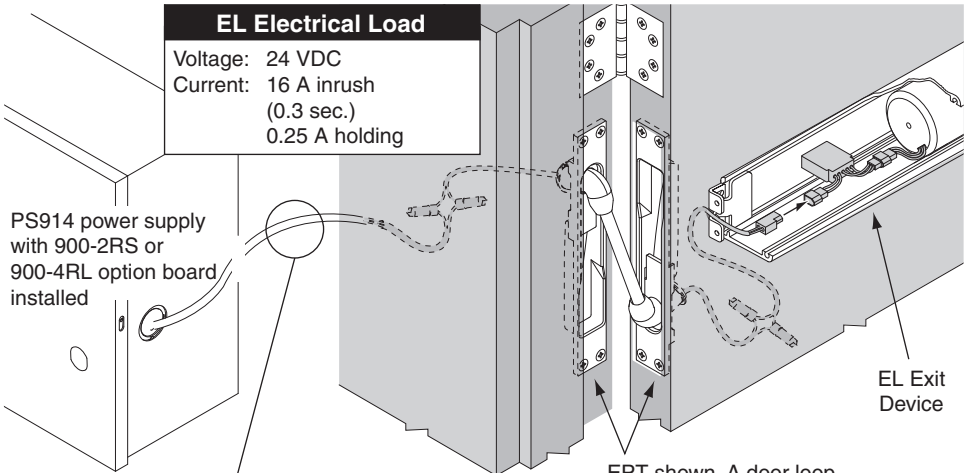
5/8" Drill Bit



1 Drill Wire Access Hole



2 Route Two Wires from EL Exit Device to Power Supply



	Wire length (feet) ¹	Wire gauge
EL 98/99	0-500	12
EL 33A/35A	0-300	14
	0-200	16
All other EL 98/99 and EL 33A/35A device types	0-250	12
	0-150	14
	0-100	16

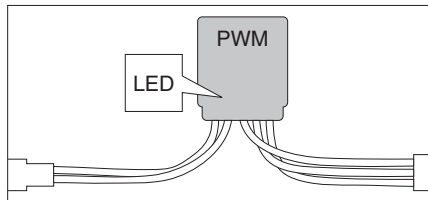
EPT shown. A door loop or electric hinge/pivot may also be used.

¹ Wire lengths include an EPT, door loop, electric hinge or pivot and are measured one way between the PS914/option board and the device.

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 PWM 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 PWM will remain in this state until power is removed from the module.</p> <p>NOTE: 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 solenoid fails to retract the latch bolt when power is applied, recheck wiring for proper connections.

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

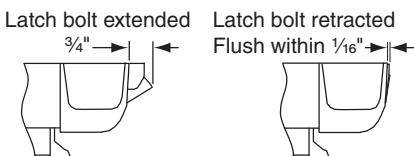
1. Check wiring for proper connections, gauge, and distances.
2. Make sure PS914-2RS or PS914-4RL power supply is installed.
3. Check for latch bolt binding caused by improper strike installation, warped door, etc.
4. If device still does not function properly, continue to Section B.

B Check For Proper Function

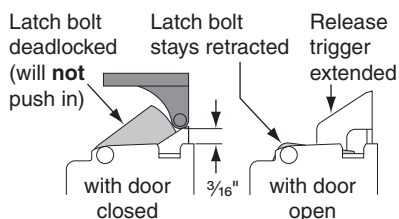
33A/35A Rim	98/99 Rim	98/9947WDC
33A/3527A	98/9927	98/9957
33A/3547A	98/9947	98/9975

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.

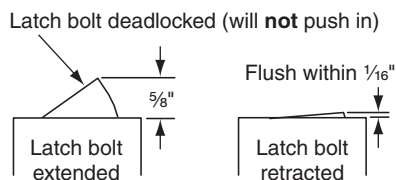
33A/35A Rim, 98/99 Rim, 98/9957



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



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



98/9975

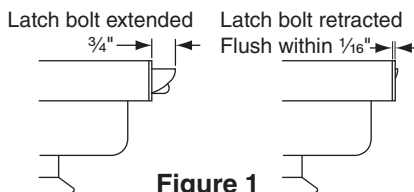
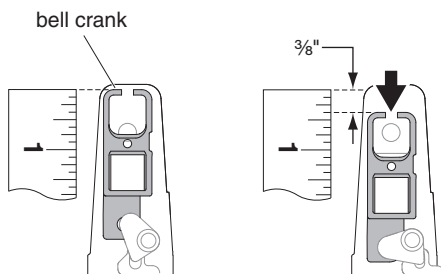


Figure 1

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 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

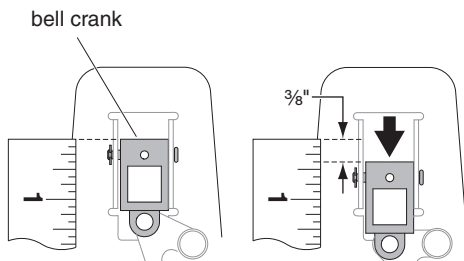


Figure 2

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

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.

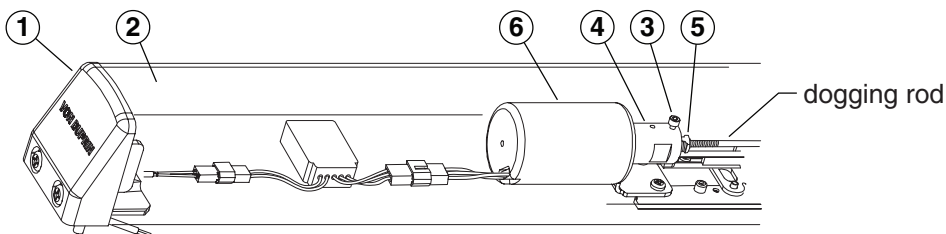


Figure 4

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).

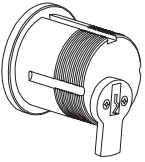


Figure A

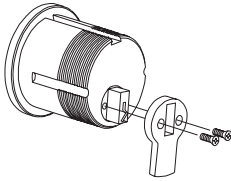
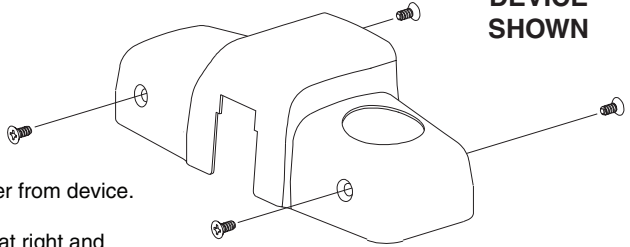


Figure B



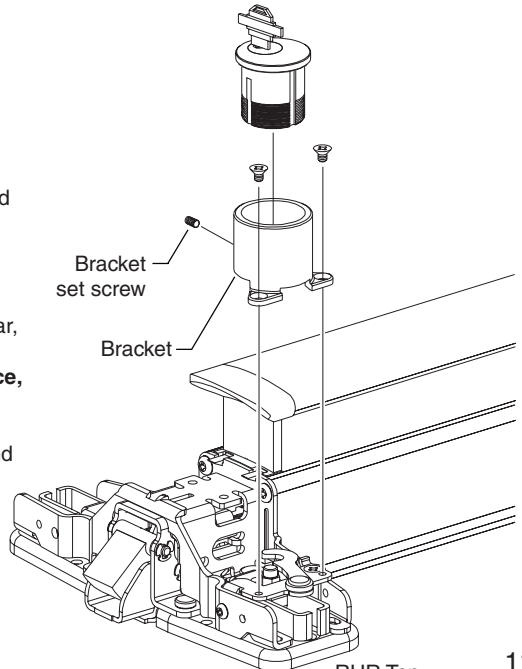
3. Remove center case cover from device.
4. Orient cylinder as shown at right and insert cylinder into bracket.
5. Tighten bracket set screw with a 1/16" hex wrench.

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.

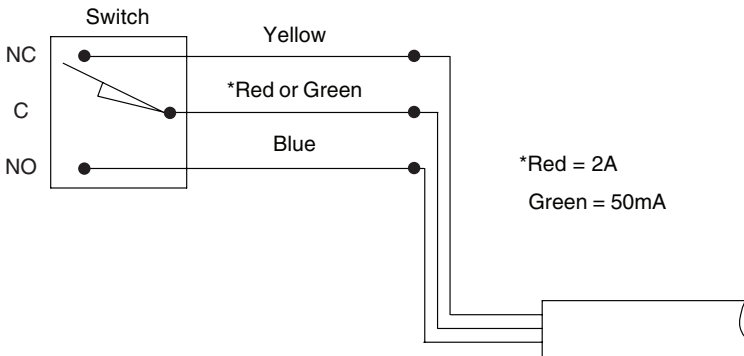


RX or RX-LC/S1 Switch Wiring

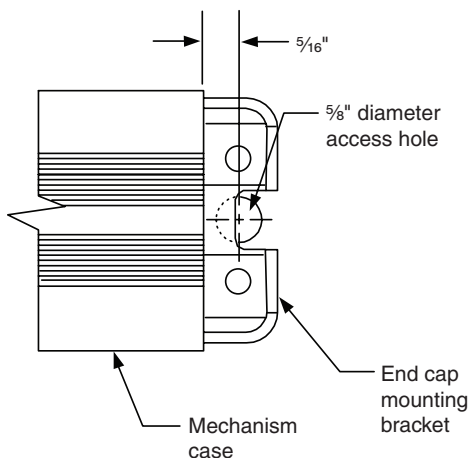
RX - Switch is intended for signaling purposes only and is rated for a maximum 2 ampere resistance load at 24VDC/AC. Use with inductive or capacitive loads (magnetic locks or solenoid devices) derates the capacity of the switch. Consult the factory for assistance.

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

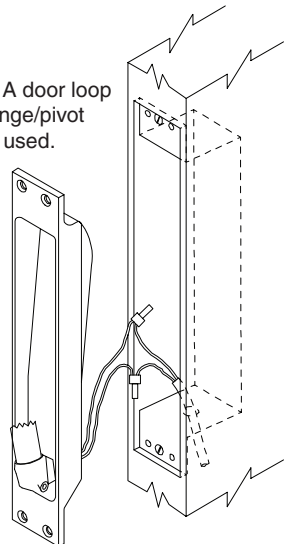
1. The RX touchbar monitor switch is activated whenever the touchbar is depressed.
2. The switch function is shown with the latchbolt extended and the touchbar not depressed.



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.

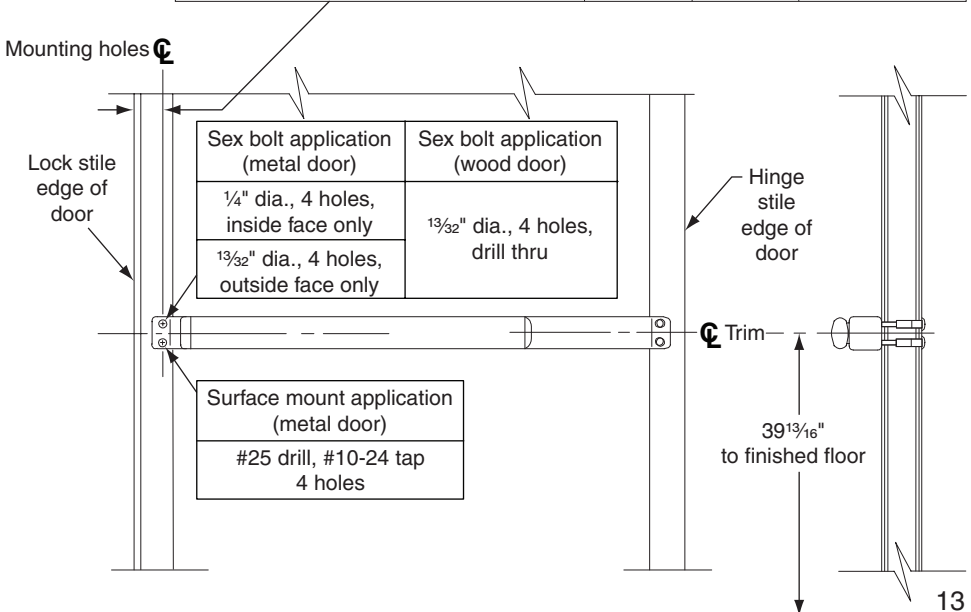


330, 350, RX-330 and RX-350 Push Bar Trim

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

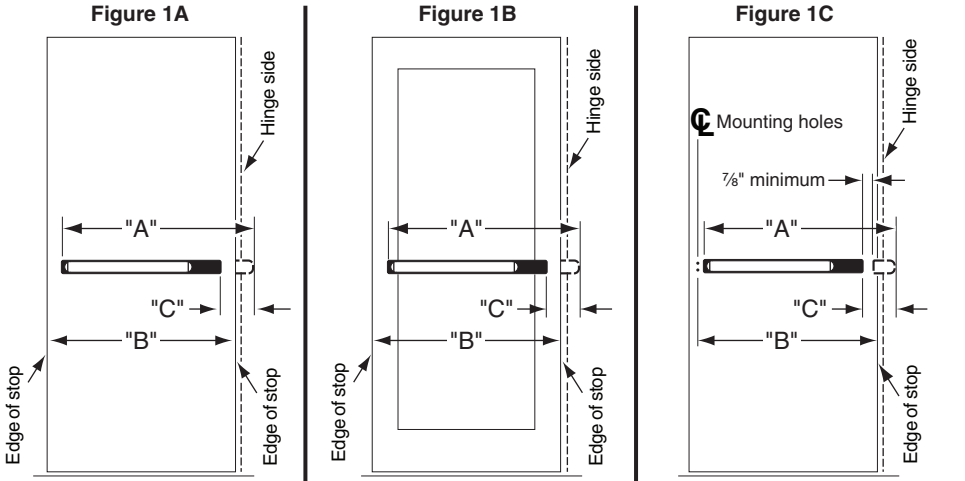
Mechanical Installation (page 2 of 2)

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 1 3/4 - 3" Stile		Trim Cutoff Formula for Double Doors without Mullion		Trim Cutoff Formula for 3" Stile - Flush	
44 ¹⁵ / ₁₆ " (4' door)	"A"	44 ¹⁵ / ₁₆ " (4' door)	"A"	44 ¹⁵ / ₁₆ " (4' door)	"A"
32 ¹⁵ / ₁₆ " (3' door)	Trim length *	32 ¹⁵ / ₁₆ " (3' door)	Trim length *	32 ¹⁵ / ₁₆ " (3' door)	Trim length *
+ 2 ¹ / ₁₆ "		+ 2 ¹ / ₁₆ "		+ 2 ¹ / ₁₆ "	
=		=		=	
-	"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.

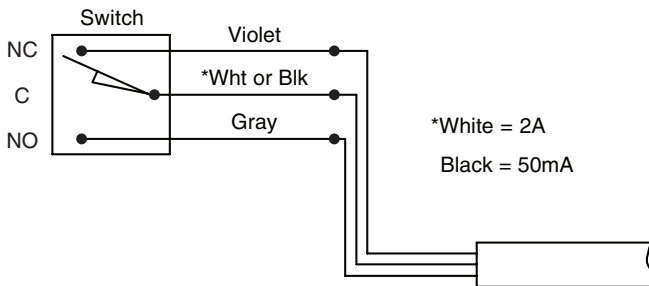
Figure 2

LX or LX-LC Switch Wiring

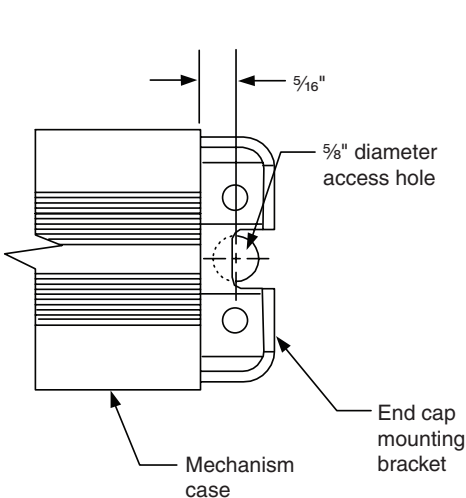
LX - Switch is intended for signaling purposes only and is rated for a maximum 2 ampere resistance load at 24VDC/AC. Use with inductive or capacitive loads (magnetic locks or solenoid devices) derates the capacity of the switch. Consult the factory for assistance.

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

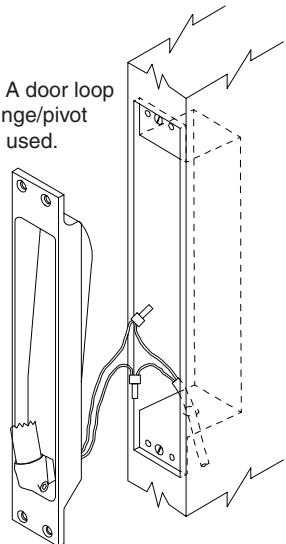
1. The latchbolt monitor switch is activated whenever the latch bolt is retracted.
2. The switch function is shown with the latchbolt extended and the touchbar not depressed.



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.

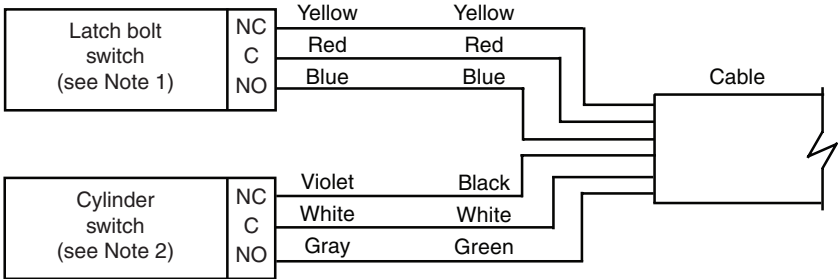


EPT shown. A door loop or electric hinge/pivot may also be used.



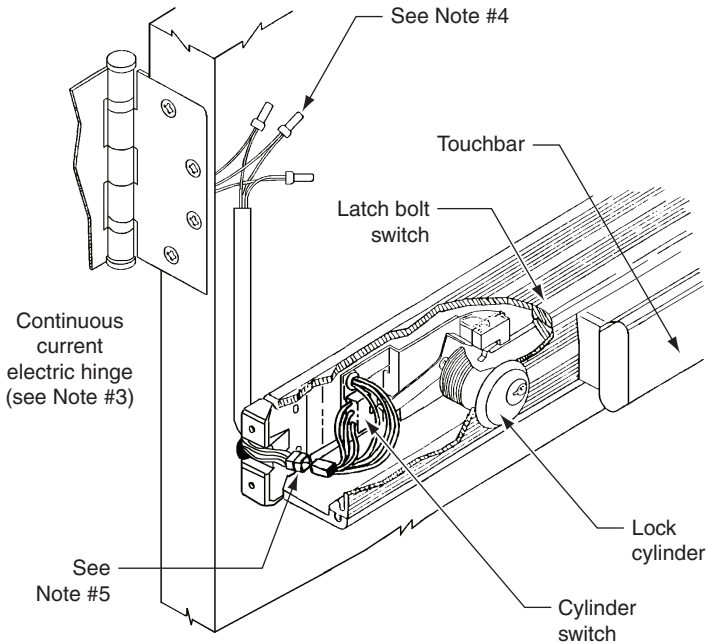
SS Wiring

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.



Customer Service

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Printed in U.S.A.
24228413 Rev. 11/16-e