Our UL924 Emergency Lighting Automatic Load Control Relays are designed for applications that require an emergency load to be switched on during a loss of normal power. These economically priced relays are available prepackaged in their own NEMA 1 enclosure.
# Table of Contents

## UL924 Emergency Lighting Automatic Load Control Relays

<table>
<thead>
<tr>
<th>Relay</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESRB &amp; ESRN</td>
<td>3</td>
</tr>
<tr>
<td>ESRN-1</td>
<td>9</td>
</tr>
<tr>
<td>ESRLBC</td>
<td>11</td>
</tr>
<tr>
<td>ESRTB</td>
<td>12</td>
</tr>
<tr>
<td>ESRBE01C</td>
<td>13</td>
</tr>
<tr>
<td>ESRBE277C</td>
<td>14</td>
</tr>
</tbody>
</table>

## UL924 Emergency Lighting Bypass/Shunt Relays

<table>
<thead>
<tr>
<th>Relay</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR2401B</td>
<td>16</td>
</tr>
<tr>
<td>ESR2402B</td>
<td>17</td>
</tr>
<tr>
<td>ESR2401D</td>
<td>18</td>
</tr>
<tr>
<td>ESR2402D</td>
<td>19</td>
</tr>
<tr>
<td>ESR01P</td>
<td>20</td>
</tr>
<tr>
<td>ESR02P</td>
<td>21</td>
</tr>
</tbody>
</table>
UL924 Emergency Lighting Automatic Load Control Relays

Quick Reference Chart

<table>
<thead>
<tr>
<th>FD Number</th>
<th>Model #</th>
<th>Coil Voltage</th>
<th>AC</th>
<th>Contacts</th>
<th>Magnetic Ballast</th>
<th>Electronic Ballast</th>
<th>Local Test Button</th>
<th>Self Test</th>
<th>Remote Test</th>
<th>Dimmer Override</th>
<th>Fire Alarm Test</th>
<th>Ballast Channel Mount</th>
<th>Nipple Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESRN</td>
<td>•</td>
<td>120-277</td>
<td>16 A</td>
<td>SPST</td>
<td>20 A</td>
<td>16 A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>ESRN-1</td>
<td>•</td>
<td>120-277</td>
<td>16 A</td>
<td>SPST</td>
<td>20A</td>
<td>16 A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>ESRB</td>
<td>•</td>
<td>120-277</td>
<td>10 A</td>
<td>SPST</td>
<td>10 A</td>
<td>10 A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>ESRBE01C</td>
<td>•</td>
<td>120</td>
<td>10 A</td>
<td>SPST</td>
<td>10 A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>ESRBE277C</td>
<td>•</td>
<td>277</td>
<td>10 A</td>
<td>SPST</td>
<td>10 A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

* = UL924; Emergency Lighting  ** = also Dali Dimmable

Model ESRB & ESRN
Enclosed Relay 10 Amp & 20 Amp SPST Automatic Load Control Relay with 120-277 Vac Coil Input

Features

Perfect for emergency lighting automatic load control applications.

- Automatic load control override
- Normal control of emergency lighting
- Coil input range: 120 Vac through 277 Vac
- LED indicators for normal voltage, emergency voltage, and load status
- 10 Amp and 20 Amp SPST magnetic ballast and tungsten ratings
- LED rating - Up to 16 Amp electronic ballast rating
- 0-10 Vdc dimmer override
- Remote control/test capability (model ESRTB)
- Nipple mount, wall mount, or ballast channel mount
- Made in the U.S.A.
Applications

By using our Automatic Load Control Relays, you are able to complete your emergency lighting applications.

- High contact ratings allow for multiple loads on a single relay unit.
- Emergency lighting can be controlled under normal conditions using the switch input.
- Under normal operation, emergency light can be controlled by a controller using the dry contact input.
- The dry contact output can be used to override 0-10 V dimmers to full brightness (or for feedback to controllers, etc.)
- The on-board local test button and LEDs allow for installation to be tested immediately.
- A two second self-test of the unit is performed every time the wall switch input is turned off.
- Remote test capability allows for a button, switch, controller, fire alarm panel, etc. to be conveniently mounted anywhere desired. [Class 2 acceptable]
  See model ESRTB (remote test button).
- Different housings allow for wall or nipple mount (model ESRN), or ballast channel mount (model ESRB).

Input and Output Characteristics

<table>
<thead>
<tr>
<th>Quick Reference Chart</th>
<th>Mechanical Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical Specifications (ESRB, ESRN)</strong></td>
<td>Housing:</td>
</tr>
<tr>
<td>Normal Power Supply Voltage</td>
<td>UL Accepted</td>
</tr>
<tr>
<td>120-277Vac</td>
<td>for use in Plenum, NEMA 1</td>
</tr>
<tr>
<td>Normal Power Current Draw</td>
<td>16” 600V Rated</td>
</tr>
<tr>
<td>24mA max</td>
<td>-30° to 140° F (-35° to 60° C)</td>
</tr>
<tr>
<td>Normal Power Operating Frequency</td>
<td>5 to 95% (noncondensing)</td>
</tr>
<tr>
<td>50/60Hz</td>
<td>Rated for dry and damp</td>
</tr>
<tr>
<td></td>
<td>locations only</td>
</tr>
<tr>
<td>Emergency Power Supply Voltage</td>
<td>UL Listed, UL924, C-UL</td>
</tr>
<tr>
<td>120-277Vac</td>
<td></td>
</tr>
<tr>
<td>Emergency Power Current Draw</td>
<td></td>
</tr>
<tr>
<td>18mAm max</td>
<td></td>
</tr>
<tr>
<td>Emergency Power Operating Frequency</td>
<td></td>
</tr>
<tr>
<td>50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Remote Test Input (Class 2, Dry Contact)</td>
<td>ESRTB or other switching</td>
</tr>
<tr>
<td>Feedback/Dimmer Contact Switching Capability (Dry Contact Output)</td>
<td>method ¹ ²</td>
</tr>
<tr>
<td>130mA @ 250V max</td>
<td></td>
</tr>
<tr>
<td>Relay Contact (ESRN) SPST</td>
<td></td>
</tr>
<tr>
<td>20A Magnetic Ballast @ 277V</td>
<td></td>
</tr>
<tr>
<td>16A Electronic Ballast @ 277V</td>
<td></td>
</tr>
<tr>
<td>10A Tungsten @ 120V</td>
<td></td>
</tr>
<tr>
<td>Relay Contact (ESRB) SPST</td>
<td></td>
</tr>
<tr>
<td>10A Magnetic Ballast @ 277V</td>
<td></td>
</tr>
<tr>
<td>10A Electronic Ballast @ 277V</td>
<td></td>
</tr>
<tr>
<td>10A Tungsten @ 120V</td>
<td></td>
</tr>
</tbody>
</table>

1: If not using the ESRTB Remote Test Button (sold separately), switching methods should be rated for at least 24Vdc. External voltage should not be supplied to this input. No specific current rating is required.
2: To maintain Class 2, a maximum of 45 total test inputs (ESRB and/or ESRN) can be wired in parallel per ESRTB.
### Wiring Descriptions

<table>
<thead>
<tr>
<th>Wire Color</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLACK</td>
<td>Normal Hot</td>
<td>Can be different voltage than Emergency.</td>
</tr>
<tr>
<td>WHITE/BLACK</td>
<td>Switch Input (Self-Test Input)</td>
<td>WHITE/BLACK wires must be from same branch circuit as BLACK and RED. When switched off, a two second delay keeps the load on to test emergency power. This does not test feedback/dimmer output.</td>
</tr>
<tr>
<td>RED</td>
<td>Normal Neutral or other Phase</td>
<td>Can be different voltage than Emergency.</td>
</tr>
<tr>
<td>BROWN</td>
<td>Emergency Hot</td>
<td>--</td>
</tr>
<tr>
<td>BLUE</td>
<td>Emergency Hot Switched to Load</td>
<td>Switches out the voltage from BROWN</td>
</tr>
<tr>
<td>YELLOW</td>
<td>Emergency Neutral or other Phase</td>
<td>--</td>
</tr>
<tr>
<td>WHITE/BLUE (ESRB)</td>
<td>Terminal Screw 4 (ESRN)</td>
<td>When wiring multiple units together, WHITE/BLUE or Terminal Screw 4 must be a shared common. Test is performed when Input is CLOSED.</td>
</tr>
<tr>
<td>WHITE/RED (ESRB)</td>
<td>Terminal Screw 3 (ESRN)</td>
<td>--</td>
</tr>
<tr>
<td>VIOLETS (ESRB)</td>
<td>Feedback/Dimmer Contact (Dry Contact Output)</td>
<td>Output is OPEN when normal power is absent or Remote Test Input is CLOSED. Output is CLOSED when normal power is present and Remote Test Input is OPEN.</td>
</tr>
<tr>
<td></td>
<td>Terminal Screws 1, 2 (ESRN)</td>
<td>--</td>
</tr>
</tbody>
</table>

### Wiring Information

#### ESRN

![Wiring Diagram](image)

- **Local Test Button**
- **Normal Power LED**
- **Feedback/Dimmer Contact (Dry Contact Output)**
- **Remote Test Input (Dry Contact Input)**
- **Load Power LED**
- **Emergency Power LED**

*Can be used to override 0-10V dimmer to full brightness by breaking the positive (+) leg or monitor status of Normal Power. 130mA @ 250V max.*

^ Class 2 input that can be tied to a remote button/switch (N/O) or to a controller. Remote Test Button (Model ESRTB) sold separately

# Optional switch or controller to control Emergency Load under normal conditions and perform self-test. Cap off White/Black if not used
ESRB

# Optional switch or controller to control Emergency Load under normal conditions and perform self-test. Cap off White/Black if not used

Remote Test Input (Dry Contact Input)^

^ Class 2 input that can be tied to remote button SWITCH (N/O) or to a controller

Remote Test Button (Model ESRTB) Sold Separately

Feedback/Dimmer Contact (Dry Contact Output)*

* Can be used to override 0-10V dimmer to full brightness by breaking the positive (+) leg or monitor status of Normal Power 130mA @ 250V max.

ESRN & ESRB Dimensions

UL924 Emergency Lighting Automatic Load Control Relays
Using Emergency Lighting as Normal Lighting (ESRN & ESRB)

Overriding a 0-10Vdc Dimmer (ESRN & ESRB)
Test Procedure: Four Options to Test the ESRB and ESRN After Installation:

**Initial Test for Correct Wiring**
Apply Emergency Power to the Emergency Power Input and Normal Power to the Normal Power Input. (If using the Wall Switch Input, apply Normal Power to the switch also, but keep the switch OFF/OPEN.)

- (a) The Red LED (Emergency Power available) should be ON.
- (b) The Green LED (Normal Power available) should be ON.
- (c) The Yellow LED (Load Status) should be OFF.
- (d) The Load should be OFF.
- (e) The Feedback/Dimmer Contact should be CLOSED.

**Local Test Button**
1. Turn switched circuit OFF. Emergency light should be OFF.
2. Press and hold “Local Test Button”
3. Emergency light should turn ON.
4. Release “Local Test Button” and emergency light should turn OFF.

**Remote Test Button (Model ESRTB - sold separately)**
1. Turn switched circuit OFF. Emergency light should be OFF.
2. Press and hold “Remote Test Button”
3. Emergency light should turn ON.
4. Release “Remote Test Button” and emergency light should turn OFF.

**Wall Switch or Controller Contact**
1. Turn ON switch if not already on.
2. Emergency light should turn ON.
3. Turn wall switch OFF.
4. Emergency light will remain on for two seconds before turning OFF.

To test the ESRB and ESRN periodically, repeat the appropriate Test Procedure above in accordance with national and local codes.

**Troubleshooting**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red LED is OFF</td>
<td>Check Emergency Power Input wiring (BROWN and YELLOW wires) and voltage.</td>
</tr>
<tr>
<td>Green LED is OFF</td>
<td>Check Normal Power Input wiring (BLACK and RED wires) and voltage.</td>
</tr>
</tbody>
</table>
| Yellow LED is ON but Load is OFF | • Check Load wiring (BLUE wire and Load’s neutral).  
• Verify Load’s operating voltage is the same as the Emergency Power Input Voltage.  
• Check bulbs and ballast.  
• Replace unit. |
| Load is ON but Yellow LED is OFF | Replace unit. |
| Yellow LED and Load do not turn on when being tested | • Check bulbs and ballast.  
• Check wiring connections if using a remote test option.  
• Press local test button on the unit.  
• Replace unit. |
| Yellow LED and Load will not turn OFF | • Verify status of Normal Power Input.  
• Open Wall Switch Input.  
• Verify that no test inputs are stuck closed. (i.e. Remote Test Input is not closed). |
UL924 Emergency Lighting Automatic Load Control Relays

Model ESRN-1
Enclosed Relay 20 Amp SPST Automatic Load Control Relay

Specifications

- **Relays & Contact Type:** One (1) SPST Continuous Duty Coil
- **Expected Relay Life:** 10 million cycles minimum mechanical
- **Operating Temperature:** -30 to 140° F
- **Operate Time:** 18ms
- **LED:**
  - Green = Normal Power
  - Red = Emergency Power
  - Yellow = Load Power
- **Dimensions:** 4.0” x 4.57” x 1.80” with .50” NPT Nipple
- **Wires:** 16’, 600V Rated
- **Approvals:** UL Listed, UL924, C-UL, CE, RoHS
- **Housing Rating:** UL Accepted for Use in Plenum, NEMA
- **Gold Flash:** No
- **Override (Test Switch):** No
- **Humidity Range:** 5-95%(noncondensing)

Test and Troubleshooting

**Initial Test**
Apply Emergency Power to the Emergency Power Input and Normal Power to the Normal Power Input. (If using the Wall Switch Input, apply Normal Power to the switch also, but keep the switch OFF/OPEN.)

- a. The Red LED (Emergency Power available) should be ON.
- b. The Green LED (Normal Power available) should be ON.
- c. The Yellow LED (Load Status) should be OFF.
- d. The Load should be OFF.

**Test Button**
1. Turn switched circuit OFF. Emergency light should be OFF.
2. Press and hold “Local Test Button” or “Remote Test Button”
3. Emergency light should turn ON.
4. Release “Local Test Button” and emergency light should turn OFF.

**Wall Switch or Controller Contact**
1. Turn ON switch if not already on.
2. Emergency light should turn ON.
3. Turn wall switch OFF.
4. Emergency light will remain on for two seconds before

Bypass/Shunt Relays & Dimming Override Application

Our Bypass/Shunt Relays are UL924 Listed and suitable for shunting around wall switches and/or lighting control panel circuits, in order to turn on emergency lighting when normal utility power is lost.

Using Emergency Lighting as Normal Lighting

- **Normal Lighting**
- **Automatic Transfer Switch**
- **Emergency Lighting**
- **Emergency Panel**
- **Emergency Breaker**
- **Normal Panel**
- **Normal Breaker**
- **Wall Switch**
- **Control Circuitry**
- **Remote Test Input (N/O)**
- **Remote Test Button (Model ESRTB) sold separately**

* The White/Black wire must be on the same branch circuit as the Black wire.
To use Remote Test Input, the White/Black wire must be de-energized. Input can also be sent by a controller.
UL924 Emergency Lighting Automatic Load Control Relays

Model ESRLBC
Enclosed Relay 5 Amp SPST Automatic Load Control Relay with 120-277 Vac Coil Input

Specifications
- # Relays & Contact Type: One (1) SPST Continuous Duty Coil
- # Expected Relay Life: 10 million cycles minimum mechanical
- Operating Temperature: -30 to 140° F
- Operate Time: 18ms
- LED: Green = Normal Power
  Red = Emergency Power
  Yellow = Load Power
- Dimensions: 5.63” x 1.40” x 1.00”
- Wires: 16”, 600V Rated
- Approvals: UL Listed, UL924, C-UL, CE, RoHS
- Housing Rating: UL Accepted for Use in Plenum, NEMA
- Gold Flash: No
- Override (Test Switch): No
- Humidity Range: 5-95% (noncondensing)

Coil Current:
- Normal Power = 24 mA max
- Emergency Power = 88 mA max

Coil Voltage Input:
- Emergency Input: 120-277 Vac (50/60 Hz)
- Normal Input: 120-277 Vac (50/60 Hz)

Relay Contact Ratings:
- 5 Amp Electronic/LED Ballast @ 277 Vac
- 5 Amp Ballast @ 120-277 Vac
- 5A @ 30 Vdc

Testing
Initial Test for Correct Wiring
Apply Emergency Power to the Emergency Power Input and Normal Power to the Normal Power Input. (If using the Wall Switch Input [Wh/Bk wire], apply Normal Power to the switch also, but keep the switch OFF/OPEN.)

- a. The Red LED (Emergency Power available) should be ON.
- b. The Green LED (Normal Power available) should be ON.
- c. The Yellow LED (Load Status) should be OFF.
- d. The Load should be OFF.
- e. The N/O Feedback/Dimmer Contact should be CLOSED.

Local Test Button
1. Turn wall switch OFF. Emergency light should be OFF.
2. Press and hold “Local Test Button”
3. Emergency light should turn ON.
4. Release “Local Test Button” and emergency light should turn OFF.

Remote Test Button (Model ESRTB - sold separately)
1. Turn wall switch OFF. Emergency light should be OFF.
2. Press and hold “Remote Test Button”
3. Emergency light should turn ON.
4. Release “Remote Test Button” and emergency light should turn OFF.

Wall Switch or Controller Contact
1. Turn ON switch if not already on.
2. Emergency light should turn ON.
3. Turn wall switch OFF.
4. Emergency light will remain on for two seconds before turning OFF.

Bypass/Shunt Relays & Dimming Override Application
Our Bypass/Shunt Relays are UL924 Listed and suitable for shunting around wall switches and/or lighting control panel circuits, in order to turn on emergency lighting when normal utility power is lost.

Troubleshooting

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red LED is OFF</td>
<td>Check Emergency Power Input wiring (BROWN and YELLOW wires) and voltage.</td>
</tr>
<tr>
<td>Green LED is OFF</td>
<td>Check Normal Power Input wiring (BLACK and RED wires) and voltage.</td>
</tr>
</tbody>
</table>
| Yellow LED is ON but Load is OFF | • Check Load wiring (BLUE wire and Load’s neutral).  
  • Verify Load’s operating voltage is the same as the Emergency Power Input Voltage.  
  • Check bulbs and ballast.  
  • Replace unit. |
| Load is ON but Yellow LED is OFF | Replace unit. |
| Yellow LED and Load do not turn on when being tested | • Check bulbs and ballast.  
  • Check wiring connections if using a remote test option.  
  • Press local test button on the unit.  
  • Replace unit. |
| Yellow LED and Load will not turn OFF | • Verify status of Normal Power Input.  
  • Open Wall Switch Input.  
  • Verify that no test inputs are stuck closed. (i.e. Remote Test Input is not closed). |
Using Emergency Lighting as Normal Lighting (ESRLBC)

- Automatic Transfer Switch
- Emergency Panel
- Normal Panel
- Normal Lighting
- Emergency Panel
- Emergency Breaker
- Control Circuitry

* The White/Black wire must be on the same branch circuit as the Black wire.

To use Remote Test Input, the White/Black wire must be de-energized. Input can also be sent by a controller.

Overriding a 0-10Vdc Dimmer (ESRLBC)

- Automatic Transfer Switch
- Emergency Panel
- Normal Panel
- Normal Lighting
- Emergency Panel
- Emergency Breaker
- Control Circuitry

* The White/Black wire must be on the same branch circuit as the Black wire.

To use Remote Test Input, the White/Black wire must be de-energized. Input can also be sent by a controller.

^ Class 2 Remote Test Input (N/O) for button, controller, or fire alarm panel

Remote Test Button (Model ESRTB) sold separately

When not using the Remote Test Input, cap off the White/Red and White/Blue wires individually.
Specifications
- **# Relays & Contact Type:** One (1) SPST-NC Continuous Duty Coil
- **Expected Relay Life:** 10 million cycles minimum mechanical
- **Operating Temperature:** -30 to 140°F
- **Operate Time:** 50 ms
- **Relay Status:** Red LED On = Activated
- **Emergency Power Present:** Yellow LED On = Transfer Power Present
- **Dimensions:** 4.60” x 1.20” x 1.70”
- **Wires:** 16.00’, 600V Rated
- **Approvals:** UL Listed, UL924, C-UL, CE, RoHS
- **Gold Flash:** No

**Contact Ratings:**
- 10 Amp Magnetic Ballast @ 277 Vac (N/C)
- 2 Amp Electronic Ballast @ 120 Vac (N/C)

**Coil Current:**
- 100 mA @ 120 Vac

**Coil Voltage Input:**
- 120 Vac ; 50-60 Hz

**Notes:**
- Control input on purple wire detects wall switch, allowing emergency light to be used as normal lighting.
- Smaller design to fit inside ballast housing of fluorescent light fixture.

Initial Wiring Verification
1. Turn OFF Normal Power, Transfer Power, and Wall Switch.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Wall Switch. Emergency Light should illuminate.

Field Inspection
1. Ensure Normal Power and Transfer Power are energized.
2. Turn OFF Wall Switch. Light will turn OFF.
3. Red LED and Yellow LED will be illuminated.
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.

Use of Normal Light as Emergency Light
Our Emergency Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When the Emergency Light is needed as a Normal Light as well, this application can be applied using this specific relay.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using the existing wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact falls closed. The Automatic Transfer Switch changes over to backup (generator) power, and the Emergency Light remains illuminated, regardless of the position of the existing wall switch, while the Normal Lighting is off.
Specifications

- **Relays & Contact Type:** One (1) SPST-NC Continuous Duty Coil
- **Expected Relay Life:** 10 million cycles minimum mechanical
- **Operating Temperature:** -30 to 140°F
- **Operating Time:** 50 ms
- **Relay Status:** Red LED On = Activated
- **Emergency Power Present:** Yellow LED On = Transfer Power Present
- **Dimensions:** 4.60” x 1.20” x 1.70”
- **Wires:** 16.00”, 600V Rated
- **Approvals:** UL Listed, UL924, C-UL, CE, RoHS
- **Gold Flash:** No

Initial Wiring Verification

1. Turn OFF Normal Power, Transfer Power, and Wall Switch.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Wall Switch. Emergency Light should illuminate.

Field Inspection

1. Ensure Normal Power and Transfer Power are energized.
2. Turn OFF Wall Switch. Light will turn OFF.
3. Red LED and Yellow LED will be illuminated.
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.

Use of Normal Light as Emergency Light

Our Emergency Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When the Emergency Light is needed as a Normal Light as well, this application can be applied using this specific relay.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using the existing wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact falls closed. The Automatic Transfer Switch changes over to backup (generator) power, and the Emergency Light remains illuminated, regardless of the position of the existing wall switch, while the Normal Lighting is off.
UL924 Emergency Lighting Automatic Load Control Relays

Model ESRTB
Momentary Test Button

The ESRTB is a momentary pushbutton to be used to remotely test the ESRB and ESRN Emergency Lighting Automatic Load Control Relays. It can either be installed directly to the ceiling or to a standard 4" x 4" round or octagonal Junction Box.

The two wire terminations connect directly to the ESRB’s and ESRN’s Class 2, dry contact “Remote Test Input.”

Wiring Specifications:

Acceptable Wiring: 18-24 AWG, Solid or Stranded with at least ¼” stripped

Wiring Terminations: There are no screws to tighten or tabs to press in order to install the wiring. Wiring is done by inserting the wire through the hole on the circuit board.

Wiring Contact Degradation: After 5 cycles

Mounting Specifications:

Direct-mount to Ceiling (fig. 1): Mount directly to surface by cutting appropriate sized wiring hole (1 ½” square or round hole minimum; 2 ½” square or round hole maximum.) Screw ESRTB to the surface using the provided screws or other screws of installer’s choice.

Junction Box (fig. 2): 4” round or 4” x 4” octagonal with #8 cover plate screw holes. Cover plate screw holes must be 3 ½” apart.

Included Hardware: Two (2) #8 self-drilling screws. Screws have white oval Phillips heads and ¼” grip.

Faceplate Specifications:

Actuator: Red momentary pushbutton
Color: White
Overall Diameter: 4 3/8”
Operating Actuator Force: 160 gf (1.57N)
Expected Life: 200,000 cycles minimum
Approvals: UL924
• Mounts easily through ½” knockout or remotely on flat surfaces
• Multi-coil voltage input
• 10 Amp and 20 Amp contact ratings: Up to 16 Amp Electronic Ballast rating
• Prepackaged and prewired for convenience
• LED indicator of utility power
• NEMA 1 enclosure
• Override capabilities for wiring verification and field inspection
• UL924 Listed

Quick Reference Chart

<table>
<thead>
<tr>
<th>FDI Model #</th>
<th>Coil Voltage</th>
<th>Contacts</th>
<th>Resistive</th>
<th>Local Test Button</th>
<th>Self Test</th>
<th>Remote Test</th>
<th>Dimmer Override</th>
<th>Line Voltage/0-10 V Signal</th>
<th>Bypass Ballast Channel Mount</th>
<th>Nipple Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR2401B</td>
<td>24 AC/DC</td>
<td>120</td>
<td>SPST</td>
<td>20 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESR2402B</td>
<td>24 AC/DC</td>
<td>208-277</td>
<td>SPST</td>
<td>20 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESR2401D</td>
<td>24 AC/DC</td>
<td>120</td>
<td>DPDT</td>
<td>10 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESR2402D</td>
<td>24 AC/DC</td>
<td>208-277</td>
<td>DPDT</td>
<td>10 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESR01P</td>
<td>120 AC/DC</td>
<td></td>
<td>DPDT</td>
<td>20 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESR02P</td>
<td>208-277 AC/DC</td>
<td></td>
<td>DPDT</td>
<td>20 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= UL924; Emergency Lighting
UL924 Emergency Lighting Bypass/Shunt Relays

Model ESR2401B
Enclosed Relay 20 Amp SPDT with 24 Vac/dc/120 Vac Coil

Specifications
- # Relays & Contact Type: One (1) SPDT Continuous Duty Coil
- Expected Relay Life: 10 million cycles minimum mechanical
- Operating Temperature: -30 to 140°F
- Operate Time: 18ms
- Relay Status: LED On = Normal power present
- Dimensions: 2.30" x 3.20" x 1.80" with .50" NPT Nipple
- Wires: 16", 600V Rated
- Approvals: UL Listed, UL924, C-UL, CE, RoHS
- Housing Rating: UL Accepted for Use in Plenum, NEMA 1
- Gold Flash: No
- Override (Test Switch): No

Coil Voltage Input:
- 24 Vac/dc: 120 Vac, 50-60 Hz
- Drop Out = 2.1 Vac / 3.8 Vdc
- Pull In = 18 Vac / 22 Vdc

Contact Ratings:
- 20 Amp Resistive @ 277 Vac
- 20 Amp Ballast @ 277 Vac
- 16 Amp Electronic Ballast @ 277 Vac (N/O)
- 10 Amp Tungsten @ 120 Vac (N/O)
- 770 VA Pilot Duty @ 120 Vac
- 1,110 VA Pilot Duty @ 277 Vac
- 2 HP @ 277 Vac
- 1 HP @ 120 Vac

Bypass/Shunt Relays & Dimming Override Application

Our Bypass/Shunt Relays are UL924 Listed and suitable for shunting around wall switches and/or lighting control panel circuits, in order to turn on emergency lighting when normal utility power is lost. In certain applications where a designated emergency light is desired for dimmed normal lighting, our UL924 relays will open the dimming control and override the switch position or 0-10 Vdc controller output to provide full illumination when normal utility power is lost.

Dimming Override Low Voltage Application
- When Normal Power is present, the ESR coil is activated and the N/O contacts are closed, allowing for the 0-10 Vdc to control the dimming of the load. When Normal Power is lost, the N/O contacts open, breaking the 0-10 Vdc dimming control, bringing the light load to full brightness.

Initial Wiring Verification
1. Turn OFF Normal Power and Transfer Power.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Wall Switch. Emergency Light should illuminate.

Field Inspection
1. Ensure Normal Power and Transfer Power are energized.
2. Turn OFF Wall Switch. Light will turn OFF.
3. Red LED will be illuminated.
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.

Bypass/Shunt Application
- When Normal Power is present, the ESR Bypass/Shunt relay coil is activated (contacts N/O), and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch. When normal power drops out, the ESR coil is deactivated and N/C contact falls closed.

Functiona Devices, Inc. • Lighting Control Products
Bypass/Shunt Relays & Dimming Override Application

Our Bypass/Shunt Relays are UL924 Listed and suitable for shunting around wall switches and/or lighting control panel circuits, in order to turn on emergency lighting when normal utility power is lost. In certain applications where a designated emergency light is desired for dimmed normal lighting, our UL924 relays will open the dimming control and override the switch position or 0-10 Vdc controller output to provide full illumination when normal utility power is lost.

Dimming Override Low Voltage Application

1. When Normal Power is present, the ESR coil is activated and the N/O contacts are closed, allowing for the 0-10 Vdc to control the dimming of the load. When Normal Power is lost, the N/O contacts open, breaking the 0-10 Vdc dimming control, bringing the light load to full brightness.

Bypass/Shunt Application

1. When Normal Power is present, the ESR Bypass/Shunt relay coil is activated (contacts N/O), and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch. When normal power drops out, the ESR coil is deactivated and N/C contact fails closed.

Specifications

- # Relays & Contact Type: One (1) SPDT Continuous Duty Coil
- Expected Relay Life: 10 million cycles minimum mechanical
- Operating Temperature: -30 to 140°F
- Operate Time: 18ms
- Relay Status: LED On = Normal power present
- Dimensions: 2.30” x 3.20” x 1.80” with .50” NPT Nipple
- Approvals: UL Listed, UL924, C-UL, CE, RoHS
- Housing Rating: UL Accepted for Use in Plenum, NEMA 1
- Gold Flash: No
- Override (Test Switch): No
- Coil Voltage Input: 24 Vac/dc ; 208-277 Vac ; 50-60 Hz
  - Drop Out = 2.1 Vac / 3.8 Vdc
  - Pull In = 18 Vac / 22 Vdc
- Contact Ratings:
  - 20 Amp Resistive @ 277 Vac
  - 20 Amp Ballast @ 277 Vac
  - 16 Amp Electronic Ballast @ 277 Vac (N/O)
  - 10 Amp Tungsten @ 120 Vac (N/O)
  - 770 VA Pilot Duty @ 120 Vac
  - 1,110 VA Pilot Duty @ 277 Vac
  - 2 HP @ 277 Vac
  - 1 HP @ 120 Vac
- Coil Current:
  - 50 mA @ 18 Vac
  - 83 mA @ 24 Vac
  - 69 mA @ 208-277 Vac
  - 33 mA @ 22 Vdc
  - 35 mA @ 24 Vdc
  - 47 mA @ 30 Vdc

Initial Wiring Verification

1. Turn OFF Normal Power and Transfer Power.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Wall Switch. Emergency Light should illuminate.

Field Inspection

1. Ensure Normal Power and Transfer Power are energized.
2. Turn OFF Wall Switch. Light will turn OFF.
3. Red LED will be illuminated.
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.
UL924 Emergency Lighting Bypass/Shunt Relays

Model ESR2401D
Enclosed Relay 10 Amp DPDT with 24 Vac/dc/120 Vac

Specifications

# Relays & Contact Type: One (1) DPDT Continuous Duty Coil  
Expected Relay Life: 10 million cycles minimum mechanical  
Operating Temperature: -30 to 140°F  
Operate Time: 8ms  
Relay Status: LED On = Normal power present  
Dimensions: 1.70” x 2.80” x 1.50” with .50” NPT nipple  
Wires: 16’, 600V Rated  
Approvals: UL Listed, UL924, C-UL, CE, RoHS  
Housing Rating: UL Accepted for Use in Plenum, NEMA 1  
Gold Flash: No  
Override (Test Switch): No  

Contact Ratings:  
10 Amp Resistive @ 30 Vdc  
10 Amp General Use @ 277 Vac  
1/2 HP @ 120/240 Vac (N/O)  
1/3 HP @ 120/240 Vac (N/C)  
B300 Pilot Duty  
120 Vac 30A Make 3A Break (360 VA)  
240 Vac 15 A Make 1.5A Break (360 VA)  
208 Vac 17.3A Make 1.73A Break (360 VA)  
277 Vac 13A Make 1.3A Break (360 VA)  
24 Vac 30A Make 5A Break (120 VA) 5A Max  

Coil Current:  
24 mA @ 18 Vac  
32 mA @ 24 Vac  
40 mA @ 30 Vac  
31 mA @ 120 Vac  

Coil Voltage Input:  
24 Vac/dc ; 120 Vac ; 50-60 Hz  
Drop Out = 3 Vac / 3.8 Vdc  
Pull In = 18 Vac / 20 Vdc  

Notes:  
• Not rated for use as a UL1008 Transfer Device.

Initial Wiring Verification

1. Turn OFF Normal Power and Transfer Power.  
2. Wire relay according to wiring diagram.  
4. Energize Normal Power. Emergency Lights will turn OFF.  
   Red LED will turn ON.  
5. Turn ON Wall Switches. Emergency Lights should illuminate.

Field Inspection

1. Ensure Normal Power and Transfer Power are energized.  
2. Turn OFF Wall Switches. Lights will turn OFF.  
3. Red LED will be illuminated.  
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Lights will illuminate.

Shunt Relay Application

Our Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact falls closed. The Automatic Transfer Switch changes over to backup (generator) power, and the lighting load is illuminated regardless of the position of the wall switch or controller scheme.
UL924 Emergency Lighting Bypass/Shunt Relays

Model ESR2402D
Enclosed Relay 10 Amp DPDT with 24 Vac/dc/208-277 Vac

Specifications

- # Relays & Contact Type: One (1) DPDT Continuous Duty Coil
- Expected Relay Life: 10 million cycles minimum mechanical
- Operating Temperature: -30 to 140° F
- Operate Time: 8ms
- Relay Status: LED On = Normal power present
- Dimensions: 1.70” x 2.80” x 1.50” with .50” NPT nipple
- Wires: 16”, 600V Rated
- Approvals: UL Listed, UL924, C-UL, CE, RoHS
- Housing Rating: UL Accepted for Use in Plenum, NEMA 1
- Gold Flash: No
- Override (Test Switch): No

Contact Ratings:
- 10 Amp Resistive @ 30 Vdc
- 10 Amp General Use @ 277 Vac
- 1/2 HP @ 120/240 Vac (N/O)
- 1/3 HP @ 120/240 Vac (N/C)
- 8300 Pilot Duty
- 120 Vac 30A Make 3A Break (360 VA)
- 240 Vac 15 A Make 1.5A Break (360 VA)
- 208 Vac 17.3A Make 1.73A Break (360 VA)
- 277 Vac 13A Make 1.3A Break (360 VA)
- 24 Vac 30A Make 5A Break (120 VA) 5A Max

Coil Current:
- 24 mA @ 18 Vac
- 32 mA @ 24 Vac
- 40 mA @ 30 Vac
- 36 mA @ 208-277 Vac

Coil Voltage Input:
- 24 Vac/dc ; 208-277 Vac ; 50-60 Hz
- Drop Out = 3 Vac / 3.8 Vdc
- Pull In = 18 Vac / 20 Vdc

Notes:
- Not rated for use as a UL1008 Transfer Device.

Initial Wiring Verification

1. Turn OFF Normal Power and Transfer Power.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Lights will turn OFF.
   Red LED will turn ON.
5. Turn ON Wall Switches. Emergency Lights should illuminate.

Field Inspection

1. Ensure Normal Power and Transfer Power are energized.
2. Turn OFF Wall Switches. Lights will turn OFF.
3. Red LED will be illuminated.
4. Turn OFF Normal Power. Red LED will turn OFF. Emergency Lights will illuminate.

Shunt Relay Application

Our Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact fails closed. The Automatic Transfer Switch changes over to backup (generator) power, and the lighting load is illuminated regardless of the position of the wall switch or controller scheme.
UL924 Emergency Lighting Bypass/Shunt Relays

Model ESR01P
Enclosed Relay 20 Amp DPDT with 120 Vac Coil

Specifications

- **# Relays & Contact Type:** One (1) DPDT Continuous Duty Coil
- **Expected Relay Life:** 10 million cycles minimum mechanical
- **Operating Temperature:** -30 to 140° F
- **Operate Time:** 18ms
- **Relay Status:** LED On = Normal power present
- **Dimensions:** 4.00” x 4.00” x 1.80” with .50” NPT Nipple
- **Wires:** 16”, 600V Rated
- **Approvals:** UL Listed, UL924, C-UL, CE, RoHS
- **Housing Rating:** UL Accepted for Use in Plenum, NEMA 1
- **Gold Flash:** Yes
- **Override (Test Switch):** No

Initial Wiring Verification

1. Turn OFF Normal Power and Transfer Power.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Emergency Zone Controller. Emergency Light should illuminate.

Field Inspection

1. Ensure Normal Power and Transfer Power are energized.
2. Red LED will be illuminated.
3. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.

Shunt Relay Application

Our Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact falls closed. The Automatic Transfer Switch changes over to backup (generator) power, and the lighting load is illuminated regardless of the position of the wall switch or controller scheme.

Notes:
- Not rated for use as a UL1008 Transfer Device.

Contact Ratings:
- 20 Amp Resistive @ 300 Vac
- 20 Amp Resistive @ 28 Vdc
- 20 Amp Ballast @ 277-480 Vac
- Not rated for Electronic Ballast
- 15 Amp Resistive @ 600 Vac
- 770 VA Pilot Duty @ 120 Vac
- 1158 VA Pilot Duty @ 240 Vac
- 1109 VA Pilot Duty @ 277 Vac
- 1640 VA Pilot Duty @ 480 Vac
- 3 HP @ 480-600 Vac
- 2 HP @ 240-277 Vac
- 1 HP @ 120 Vac

Coil Current:
- 105 mA @ 120 Vac

Coil Voltage Input:
- 120 Vac; 50-60 Hz
- Drop Out = 35 Vac
- Pull In = 85 Vac

Approvals:
- UL Listed for Use in Plenum, NEMA 1
- UL Accepted for Use in NEMA 1
- Not rated for use as a UL1008 Transfer Device.
### Specifications

- **# Relays & Contact Type:** One (1) DPDT Continuous Duty Coil
- **Expected Relay Life:** 10 million cycles minimum mechanical
- **Operating Temperature:** -30 to 140° F
- **Operate Time:** 18ms
- **Relay Status:** LED On = Normal power present
- **Dimensions:** 4.00” x 4.00” x 1.80” with .50” NPT Nipple
- **Wires:** 16”, 600V Rated
- **Approvals:** UL Listed, UL924, C-UL, CE, RoHS
- **Housing Rating:** UL Accepted for Use in Plenum, NEMA 1
- **Gold Flash:** Yes
- **Override (Test Switch):** No

### Contact Ratings:
- 20 Amp Resistive @ 300 Vac
- 20 Amp Resistive @ 28 Vdc
- 20 Amp Ballast @ 277-480 Vac
- Not rated for Electronic Ballast
- 15 Amp Resistive @ 600 Vac
- 770 VA Pilot Duty @ 120 Vac
- 1158 VA Pilot Duty @ 240 Vac
- 3 HP @ 480-600 Vac
- 2 HP @ 240-277 Vac
- 1 HP @ 120 Vac

### Coil Ratings:
-** Coil Current:** 105 mA @ 208-277 Vac
-** Coil Voltage Input:** 208-277 Vac; 50-60 Hz
- **Drop Out = 60 Vac**
- **Pull In = 160 Vac**

### Notes:
- Not rated for use as a UL1008 Transfer Device

### Initial Wiring Verification

1. Turn OFF Normal Power and Transfer Power.
2. Wire relay according to wiring diagram.
4. Energize Normal Power. Emergency Light will turn OFF.
5. Turn ON Emergency Zone Controller. Emergency Light should illuminate.

### Field Inspection

1. Ensure Normal Power and Transfer Power are energized.
2. Red LED will be illuminated.
3. Turn OFF Normal Power. Red LED will turn OFF. Emergency Light will illuminate.

### Shunt Relay Application

Our Bypass / Shunt Relays are UL924 Listed and suitable for shunting around wall switches in order to turn on emergency lighting in the event of loss of normal utility power.

When Normal Power is present, the ESR relay coil is activated and the emergency panel is fed from Normal Power. The lighting load can be switched on/off using an individual wall switch.

When Normal Power drops out, the ESR coil is deactivated and N/C contact falls closed. The Automatic Transfer Switch changes over to backup (generator) power, and the lighting load is illuminated regardless of the position of the wall switch or controller scheme.