

| Part Number | Description        |
|-------------|--------------------|
| DRL48R35    | 35A 510 Vac Output |
| DRL48D35-21 | 35A 480 Vac Output |
| DRL48D35    | 35A 510 Vac Output |
| DRL48A35-22 | 35A 510 Vac Output |
| DRL48A35    | 35A 510 Vac Output |

### Part Number Explanation

|            |                           |                          |                       |                       |
|------------|---------------------------|--------------------------|-----------------------|-----------------------|
| <b>DRL</b> | <b>48</b>                 | <b>D</b>                 | <b>35</b>             | <b>-21</b>            |
| Series     | Line Voltage <sup>1</sup> | Switch Type <sup>2</sup> | Output Current - Amps | Features <sup>3</sup> |

#### NOTES

- 1) Line Voltage (nominal): 48 = 480 Vac
- 2) Switch Type: D = Zero-cross turn-on; A = Zero-cross, AC control; R = Random turn-on
- 3) Features: -21 = Self turn-on suppression; -22 = 24 Vac control

### MECHANICAL SPECIFICATION

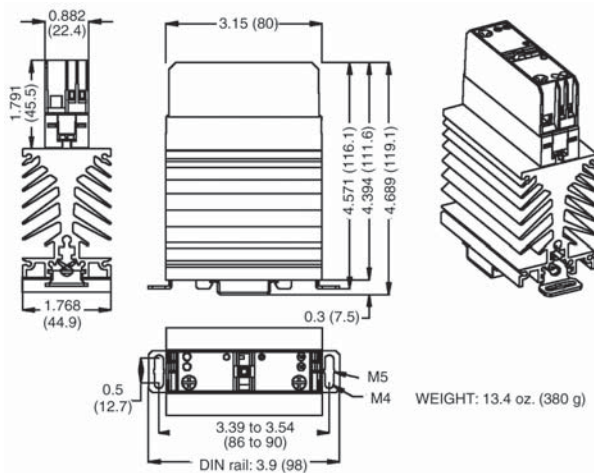


Figure 1 — DRL relay; dimensions in inches (mm)



### FEATURES/BENEFITS

- Mounting and dismounting on DIN rail without any tool or directly mountable on panel
- Zero-cross and random models; thyristors output
- Large control range
- Green control LED
- Very high immunity
- Low leakage current
- Internal transient suppression

### DESCRIPTION

The Series DRL single-phase DIN-rail relays are designed for all types of loads. The relays utilize optical isolation to protect the control from load transients. DRL relays have an integral heat sink, and can be mounted and dismounted onto a DIN rail without any tools. The relays may also be panel mounted. All relays offer a green control LED and transient suppression.

### APPLICATIONS

- Heating control
- Motor control
- Industrial and process control

### APPROVALS

Series DRL relays are pending UL recognition.

### CONTROL CHARACTERISTIC

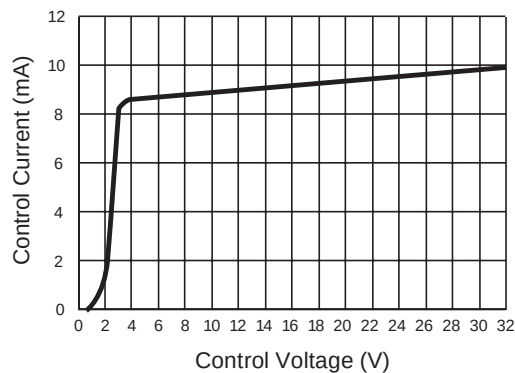


Figure 2a — DR38R and DR48D relays

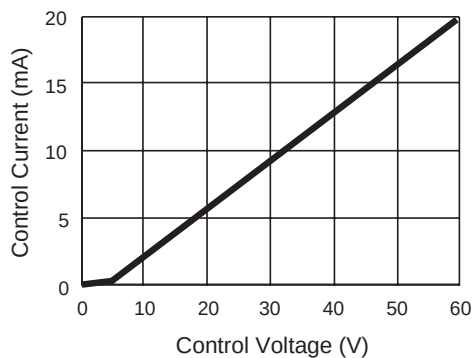


Figure 2b — DRL48A35-22 relay

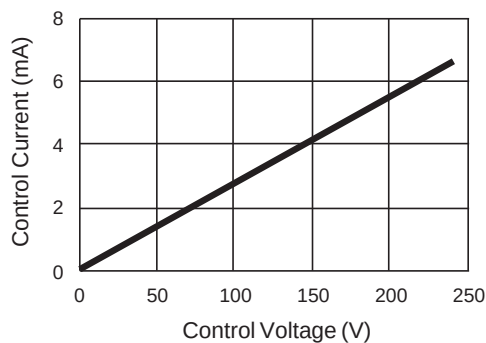


Figure 2c — DRL48A35 relay

### INPUT (CONTROL) SPECIFICATION

|                      | Min | Max | Units   |
|----------------------|-----|-----|---------|
| <b>Control Range</b> |     |     |         |
| DRL48R35             | 3.5 | 32  | Vdc     |
| DRL48D35-21          | 3   | 32  | Vdc     |
| DRL48D35             | 3.5 | 32  | Vdc     |
| DRL48A35-22          | 17  | 60  | Vac/Vdc |
| DRL48A35             | 150 | 240 | Vac/Vdc |

### Control Current Range

|             |   |    |      |
|-------------|---|----|------|
| DRL48R35    |   | 10 | mAdc |
| DRL48D      |   | 10 | mAdc |
| DRL48A35-22 | 3 | 20 | mA   |
| DRL48A35    | 3 | 7  | mA   |

### Must Turn-off Voltage

|             |    |   |
|-------------|----|---|
| DRL48R35    | 2  | V |
| DRL48D35-21 | 1  | V |
| DRL48D35    | 2  | V |
| DRL48A35-22 | 4  | V |
| DRL48A35    | 15 | V |

|                               |       |   |
|-------------------------------|-------|---|
| Reverse Voltage (DC Control)  | 32    | V |
| Clamping Voltage (DC Control) | 42    | V |
| Input LED                     | Green |   |

### TYPICAL APPLICATION

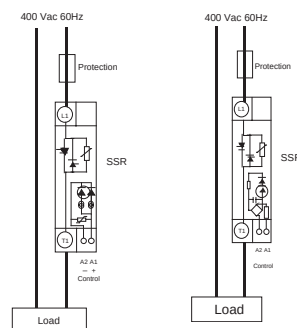


Figure 3 — DRL relay DC control (left) and DRL relay AC control (right)

## OUTPUT (LOAD) SPECIFICATION

|                                                | Min | Max                                   | Unit  |
|------------------------------------------------|-----|---------------------------------------|-------|
| Operating Range                                | 24  | 510                                   | Vrms  |
| Peak Voltage                                   |     | 1200                                  | Vpeak |
| Clamping Voltage                               |     |                                       |       |
| -21 feature (On voltage, typical)              |     | 950                                   | V     |
| All others (@1mA)                              |     | 820                                   | V     |
| Zero-Cross Window (Typical)                    |     |                                       |       |
| DRL48R35                                       |     | Random                                |       |
| DRL48D35-21                                    |     | ±10                                   | V     |
| DRL48D35                                       |     | ±20                                   | V     |
| DRL48A                                         |     | ±20                                   | V     |
| Non-Repetitive Surge Current<br>(See Figure 5) |     | 550                                   | A     |
| On-State Voltage Drop (Typical)                |     | 0.9                                   | V     |
| Output Power Dissipation<br>(Typical)          |     | $0.81 \times I_e + 0.08 \times I_e^2$ |       |
| Thermal Resistance<br>(Junction to Air)        |     | 2.6                                   | °C/W  |
| Off-State Leakage Current (60Hz)               |     | 1                                     | mA    |
| Turn-On Time (60Hz)                            |     |                                       |       |
| DRL48R35                                       |     | 0.1                                   | ms    |
| DRL48D                                         |     | 8.3                                   | ms    |
| DRL48A                                         |     | 24.9                                  | ms    |
| Turn-Off Time (60Hz)                           |     |                                       |       |
| DRL48R35                                       |     | 8.3                                   | ms    |
| DRL48D                                         |     | 8.3                                   | ms    |
| DRL48A                                         |     | 24.9                                  | ms    |
| Operating Frequency Range                      | 0.1 | 440                                   | Hz    |
| Off-State dv/dt                                |     | 500                                   | V/μs  |
| I²t for match fusing (<8.3ms)                  |     | 1500                                  | A²S   |

## ENVIRONMENTAL SPECIFICATION

|                        | Min  | Max | Unit |
|------------------------|------|-----|------|
| Storage Temperature    | -30  | 100 | °C   |
| Operating Temperature  | -30  | 80  | °C   |
| Input-Output Isolation | 4000 |     | Vrms |
| Output-Case Isolation  | 4000 |     | Vrms |
| Insulation Resistance  | 100  |     | MΩ   |
| Rated Impulse Voltage  | 4000 |     | V    |

## THERMAL CHARACTERISTICS

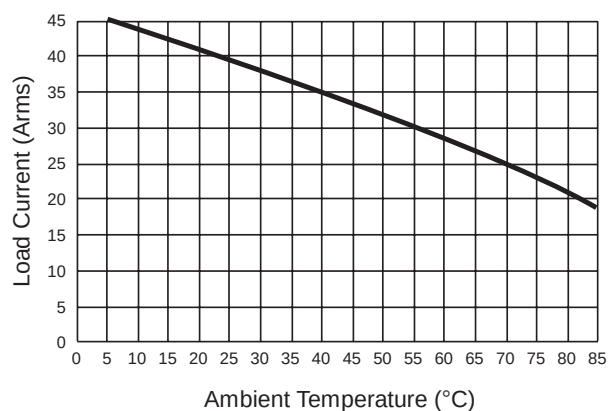


Figure 4 — DRL relays

## SURGE CURRENTS

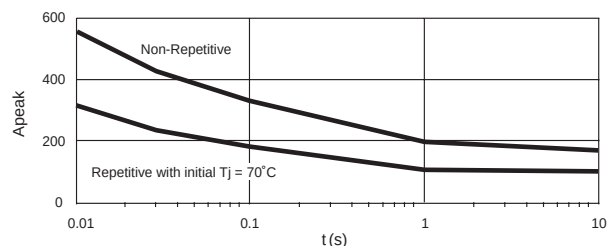


Figure 5 — DRL relays

### DIN-RAIL MOUNTING

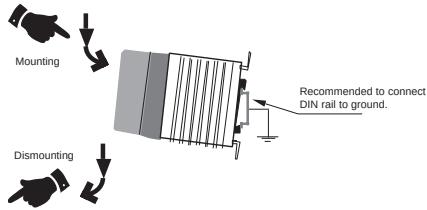


Figure 6 — DRL relays

### PANEL MOUNTING

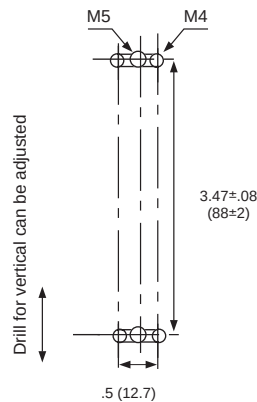


Figure 7 — DRL relays

### CONNECTIONS



| wires<br>(mm <sup>2</sup> )                        | torques                | screwdriver                     |
|----------------------------------------------------|------------------------|---------------------------------|
| control<br>1 x (0.75-->2.5)<br>L = 6mm             | 0.4N.m<br>(0.6N.m max) | 3.5 x 0.5mm                     |
| Power<br>1 x (1.5-->16) 1 x (1.5-->10)<br>L = 10mm | 1.2N.m<br>(1.8N.m max) | Pozidriv2/<br>0.8 x 5.5 (1 x 6) |

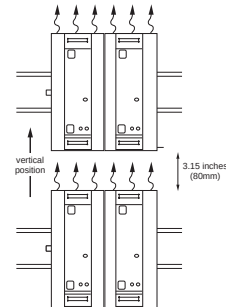
Figure 8 — DRL relays

### NOTES:

- Connections: For output terminals, the wire cross-sections must be adapted to the load current and to the overcurrent protection device characteristics. The relay rated voltage must be adapted to the mains rated voltage. These relays use screw clamp connections.

- Mounting: Only in vertical position.

Protect heat-sensitive materials as well as people from contact with the heat sink. For non-vertical mounting, the load current must be derated by 50%. The SSR requires air convection. Lack of air convection produces an abnormal heating. Keep a distance between the upper SSR and the lower SSR (see figure on the right). In case of zero space between two SSRs, reduce the load current. It's suggested to maintain the heat sink temperature under 90°C. Forced cooling significantly improves the thermal performances.



- Typical application loads: The DRL relay may handle motor and resistive loads. For different loads, check the inrush current at turn-ON and possible overvoltages at turn-OFF or contact the factory.

- Incandescent lamps — Inrush current is generally 10 times the nominal current for 10ms.
- Electric discharge lamp — These loads often have overcurrent at turn-ON and overvoltage at turn-OFF. Use 480Vac SSR on 240Vac mains.
- Transformer loads — Very high inrush current, up to 100 times the nominal current.
- Capacitive loads — Very high current at turn-ON and overvoltage at turn-OFF. Use only zero-cross models.

- Protection: To protect the SSR against a short-circuit of the load, use a fuse with a I<sup>2</sup>t value = 1/2 I<sup>2</sup>t value.

- EMC:

**Immunity:** Immunity levels of the DRL comply with EN61000-4-4 &5.

**Emission:** The system integrator must ensure that systems containing SSRs comply with the requirements of any rules and regulations applicable at the system level. The very low zero-cross voltage (<20V) improves the conducted emission level in comparison with most SSRs with zero-cross voltage higher than 50V.

- All electrical parameters specified at 25°C unless otherwise noted.

