

| Part Number | Description  |
|-------------|--------------|
| FS24R10-06  | 10A, 280 Vac |
| FS24D10-06  | 10A, 280 Vac |
| FS24D10     | 10A, 280 Vac |
| FS24D20-06  | 20A, 280 Vac |

**Part Number Explanation**

| FS     | 24                        | R                        | 10                    | -06                  |
|--------|---------------------------|--------------------------|-----------------------|----------------------|
| Series | Line Voltage <sup>1</sup> | Switch Type <sup>2</sup> | Output Current - Amps | Feature <sup>3</sup> |

**NOTES**

- 1) Line Voltage (nominal): 24 = 240 Vac
- 2) Switch Type: R = Random turn-on; D = Zero-cross turn-on;
- 3) Feature: -06 = Faston terminals

**MECHANICAL SPECIFICATION**

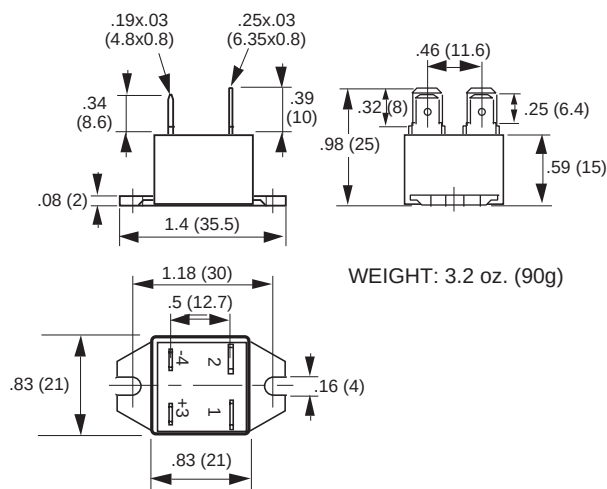


Figure 1a — FS relays except FS24D10

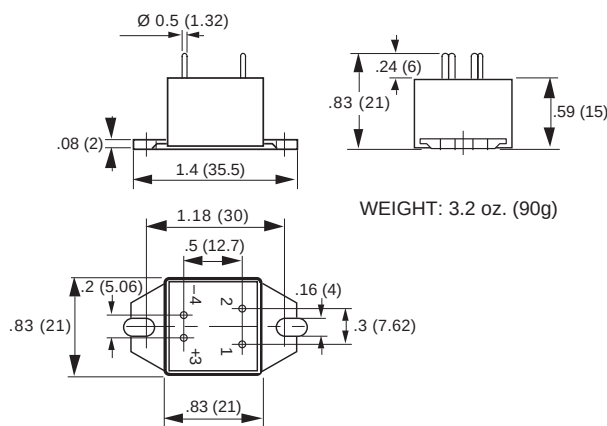


Figure 1b — FS24D10



**FEATURES/BENEFITS**

- Miniature size package
- Designed for medium-power applications
- Faston or PCB terminals available
- Tight zero-cross window for low EMI
- Excellent thermal performance
- High immunity to surges

**DESCRIPTION**

The Series FS relays are designed for medium-power loads. The design incorporates a triac output. The Series FS relays utilize optical isolation to protect the control from load transients. The FS compact package is available with faston or PCB terminals. Its compact size makes it ideal for designs where space is limited. The Series FS relays have excellent thermal performance.

**APPLICATIONS**

- Heating control
- Motor control
- Uninterruptible power supplies
- Light dimmers
- Industrial and process control
- On/Off controls of medium-power AC equipment
- Electromechanical line relay replacement

**APPROVALS**

All models are UL recognized.  
UL File Number E128555.

**EQUIVALENT CIRCUIT**

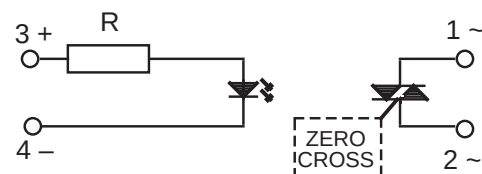


Figure 2 — FS relays

#### INPUT (CONTROL) SPECIFICATION

|                                   | Min | Max  | Units |
|-----------------------------------|-----|------|-------|
| <b>Control Range</b>              |     |      |       |
| FS24R                             | 3   | 30   | Vdc   |
| FS24D                             | 4   | 30   | Vdc   |
| <b>Input Current Range</b>        |     |      |       |
| FS24R                             | 2   | 30   | mAdc  |
| FS24D                             | 3   | 30   | mAdc  |
| <b>Must Turn-Off Voltage</b>      |     |      |       |
| All relays                        |     | 1    | Vdc   |
| <b>Input Resistance (Typical)</b> |     |      |       |
| All relays                        |     | 1000 | Ohms  |
| <b>Reverse Voltage Protection</b> |     |      |       |
| All relays                        |     | 30   | V     |

#### OUTPUT (LOAD) SPECIFICATION

| Input Type                                           | Min  | Max | Units |
|------------------------------------------------------|------|-----|-------|
| <b>Operating Range</b>                               |      |     |       |
| All relays                                           | 12   | 280 | Vrms  |
| <b>Peak Voltage</b>                                  |      |     |       |
| All relays                                           |      | 600 | Vpeak |
| <b>Load Current Range (Resistive)</b>                |      |     |       |
| 10A output current                                   | .005 | 10  | Arms  |
| 20A output current                                   | .005 | 20  | Arms  |
| <b>Inductive Load Current</b>                        |      |     |       |
| 10A output current                                   |      | 2.5 | Arms  |
| 20A output current                                   |      | 4   | Arms  |
| <b>Maximum Surge Current Rating (Non-Repetitive)</b> |      |     |       |
| 10A output current                                   |      | 120 | A     |
| 20A output current                                   |      | 200 | A     |
| <b>On-State Voltage Drop</b>                         |      |     |       |
| All relays output current                            |      | 1.3 | V     |

#### CONTROL CHARACTERISTIC

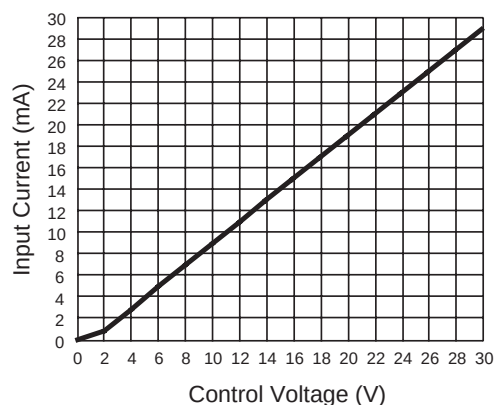


Figure 3 — FS relays

#### OUTPUT (LOAD) SPECIFICATION (Continued)

|                                                    | Min  | Max | Units            |
|----------------------------------------------------|------|-----|------------------|
| <b>Zero Cross Window (Typical)</b>                 |      |     |                  |
| FS24 R                                             |      | NA  |                  |
| FS24 D                                             |      | 12  | Vac              |
| <b>Off-State Leakage Current (60Hz)</b>            |      |     |                  |
| All relays                                         |      | 3   | mA               |
| <b>Turn-On Time (60 Hz)</b>                        |      |     |                  |
| FS24R                                              |      | 0.1 | ms               |
| FS24D                                              |      | 8.3 | ms               |
| <b>Turn-Off Time (60 Hz)</b>                       |      |     |                  |
| All relays                                         |      | 8.3 | ms               |
| <b>Off-State dv/dt</b>                             |      |     |                  |
| All relays                                         |      | 500 | V/μs             |
| <b>Maximum di/dt (Non-Repetitive)</b>              |      |     |                  |
| All relays                                         |      | 50  | A/μs             |
| <b>Operating Frequency Range</b>                   |      |     |                  |
| All relays                                         | 0.1  | 440 | Hz               |
| <b>I<sup>2</sup>t for Match Fusing (&lt;8.3ms)</b> |      |     |                  |
| 10A output current                                 | .005 | 72  | A <sup>2</sup> S |
| 20A output current                                 | .005 | 200 | A <sup>2</sup> S |

### ENVIRONMENTAL SPECIFICATION

|                        | Min  | Max | Units |
|------------------------|------|-----|-------|
| Operating Temperature  | -40  | 100 | °C    |
| Storage Temperature    | -40  | 100 | °C    |
| Input-Output Isolation | 4000 |     | Vrms  |
| Output-Case Isolation  | 2500 |     | Vrms  |

#### NOTES:

1. External snubber is recommended when switching inductive loads.
2. Electrical specifications at 25°C unless otherwise specified.
3. For 800Hz applications, contact factory.
4. For additional/custom options, contact factory.

### SURGE CURRENT

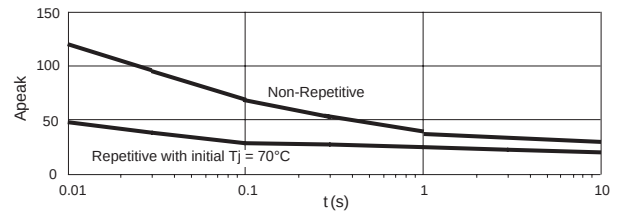


Figure 4a — All 10A FS relays output current

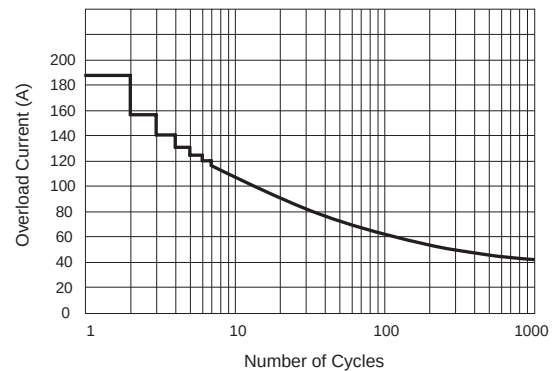


Figure 4b — FS24D20-06 output current

### THERMAL CHARACTERISTICS

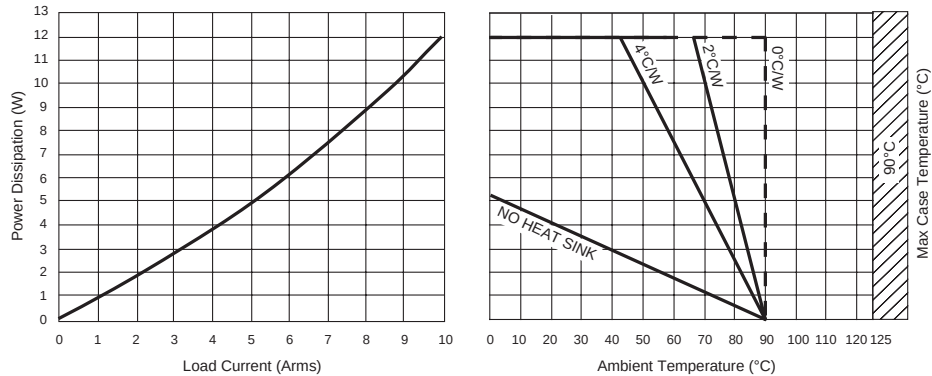


Figure 5a — All 10A FS relays output current

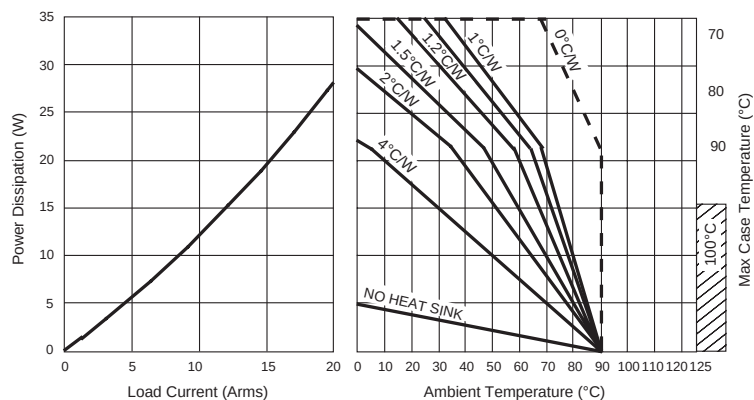


Figure 5b — FS24D20-06 output current