TELEDYNE RELAYS
Everywhereyoulook™

# Series S

**Single Output to 660 Vac AC/DC Control**

## Part Numbers

| Package & Chip Type | Line Voltage[1] | Switch Type[2] | Output Current | Feature[3] |
|---|---|---|---|---|
| S | 24 | R | 12 | -22 |
| | | D | 25 | |
| | | A | 40 | |
| S | 48 | R | 25 | -22 |
| | | D | 50 | |
| | | | 125 | |
| S | 60 | D | 50 | |
| | | | 125 | |

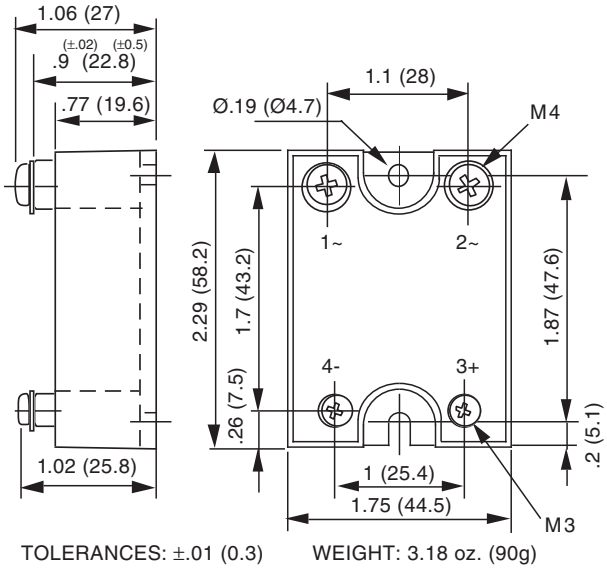
For RoHS Compliant Contact Factory

RoHS Option

Part Number Example: **S48A25-22**

NOTES
1) Line Voltage (nominal): 24 = 240 Vac; 48 = 480 Vac; 60 = 600 Vac
2) Switch Type: R = Random turn-on; D = Zero-cross turn-on;
A = AC control, Zero-cross turn-on
3) Feature: -22 = 24 Vac control. Available on A type 240 Vac, 25 and 40A models and A type 480 Vac, 25, 50, 125A models

## MECHANICAL SPECIFICATION




TOLERANCES: ±.01 (0.3) WEIGHT: 3.18 oz. (90g)

Figure 1 — S relays, 12–95 A;
dimensions in inches (mm)
125A model uses larger M5 output screw terminals

## TYPICAL APPLICATION

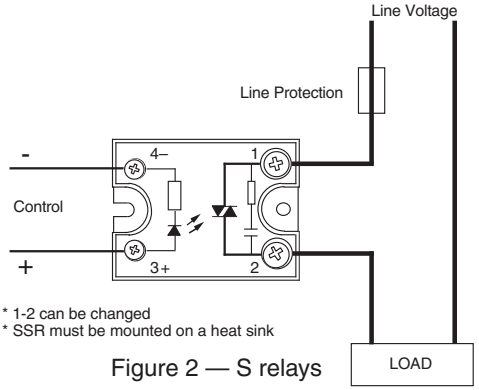



Figure 2 — S relays

## FEATURES/BENEFITS

- Industry standard package
- Internal snubber (except S60 models)
- Designed for all types of loads
- AC or DC control available
- Excellent thermal performance
- Tight zero-cross window for low EMI
- High immunity to surges

## DESCRIPTION

The Series S single-phase relays are designed for all types of loads. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. All contain an internal snubber for output protection. High-current models are excellent for motor and phase angle control.

## APPLICATIONS

- Heating control
- Motor control
- Uninterruptible power supplies
- Light dimmers
- Industrial and process control
- On/Off controls of AC equipment

## APPROVALS

S24 and S48 models are UL recognized.
UL File Number: E128555.

## INPUT (CONTROL) SPECIFICATION

| | | Min | Max | Units |
|---|---|---|---|---|
| **Control Range** | | | | |
| S24 | R | 3 | 30 | Vdc |
| | D | 4 | 30 | Vdc |
| S48 | R | 4 | 30 | Vdc |
| | D | 5 | 30 | Vdc |
| S60 | D | 5 | 30 | Vdc |
| SxxA | A | 90 | 240 | Vac/Vdc |
| Sxxxxx-22 | A | 17 | 80 | Vac/Vdc |
| **Input Current Range** | | | | |
| S | R/D | 3 | 30 | mA |
| S | A | 3 | 8 | mA |
| Sxxxxx-22 | A | 5.6 | 26 | mA |
| **Must Turn-Off Voltage** | | | | |
| S | R/D | | 1 | Vdc |
| S24 | A | | 15 | Vac |
| S48 | A | | 1 | Vac |
| Sxxxxx-22 | | | 3 | Vac |
| **Input Resistance (Typical)** | | | | |
| S | R/D | | 1000 | Ohms |
| S | A | | 30,000 | Ohms |
| Sxxxxx-22 | | | 3000 | Ohms |
| **Reverse Voltage Protection** | | | | |
| S | R/D | | 30 | V |
| S | A | | | NA |

### CONTROL CHARACTERISTICS

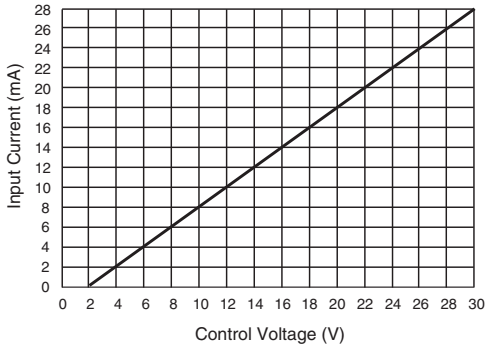



Figure 3a — S48R, S48D and S60D relays

### CONTROL CHARACTERISTICS

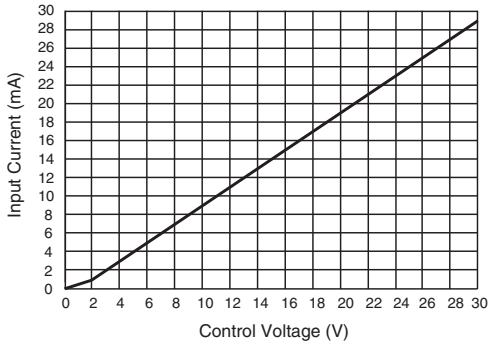



Figure 3b — S24D/R relays

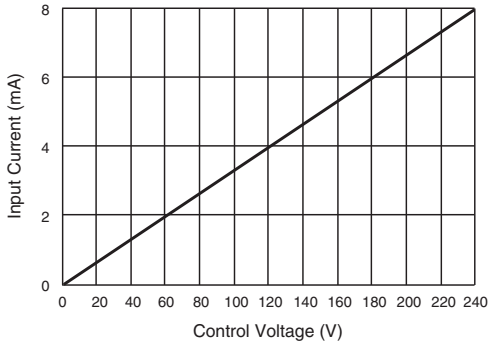



Figure 3c — S24A and S48A relays

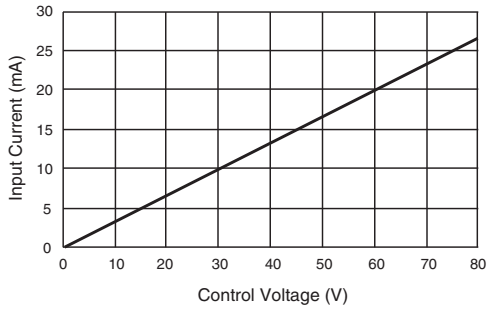



Figure 3d — Sxxxxx-22 relays

## OUTPUT (LOAD) SPECIFICATION

| | Min | Max | Units |
|---|---|---|---|
| Operating Range | | | |
| S24 | 12 | 280 | Vrms |
| S48 | 24 | 520 | Vrms |
| S60 | 24 | 660 | Vrms |
| Peak Voltage | | | |
| S24 | | 600 | Vpeak |
| S48 | | 1200 | Vpeak |
| S60 | | 1600 | Vpeak |
| Load Current Range (Resistive) | | | |
| 12A output current | .005 | 12 | Arms |
| 25A output current | .005 | 25 | Arms |
| 40A output current | .005 | 40 | Arms |
| 50A output current | .005 | 50 | Arms |
| 125A output current | .005 | 125 | Arms |
| Inductive Load Current | | | |
| 12A output current | | 2.5 | Arms |
| 25A output current | | 5 | Arms |
| 40A output current | | 9 | Arms |
| 50A output current | | 12 | Arms |
| 125A output current | | 30 | Arms |
| Capacitive Load Current | | | |
| S60D50 | | 13 | Arms |
| S60D125 | | 48 | Arms |
| Maximum Surge Current Rating (Non-Repetitive) | | | |
| 12A output current | | 120 | A |
| S24, 25A output current | | 240 | A |
| S48, 25A output current | | 230 | A |
| 40A output current | | 350 | A |
| 50A output current | | 550 | A |
| 125A output current | | 2000 | A |

## OUTPUT (LOAD) SPECIFICATION (continued)

| | | Min | Max | Units |
|---|---|---|---|---|
| On-State Voltage Drop | | | | |
| 12A output current | | | 1.3 | V |
| 25A output current | | | 1.2 | V |
| 40A output current | | | 1.4 | V |
| 50A output current | | | 1.4 | V |
| 125A output current | | | 1.3 | V |
| S60D125 | | | 1.1 | V |
| Zero-Cross Window (Typical) | | | | |
| S | R | | NA | V |
| S | D/A | | ±12 | Vac |
| Off-State Leakage Current (60Hz) | | | | |
| S24 | | | 3 | mA |
| S48 | D/A | | 3 | mA |
| S48 | R | | 2.5 | mA |
| S60 | A | | 1 | mA |
| Turn-On Time (60Hz) | | | | |
| S | R | | 0.1 | ms |
| S | D | | 8.3 | ms |
| S | A | | 24.9 | ms |
| Turn-Off Time (60Hz) | | | | |
| S | R/D | | 8.3 | ms |
| S | A | | 24.9 | ms |
| Off-State dv/dt | | | 500 | V/µs |
| Maximum di/dt (Non-repetitive) | | | 50 | A/µs |

## OUTPUT (LOAD) SPECIFICATION (continued)

| | Min | Max | Units |
|---|---|---|---|
| Operating Frequency | 0.1 | 440 | Hz |
| I²T for match fusing (<8.3ms) | | | |
| 12A output current | | 72 | A²S |
| S24R25 | | 312 | A²S |
| S24D/S24A 25A output current | | 288 | A²S |
| S48 25A output current | | 265 | A²S |
| 40A output current | | 612 | A²S |
| 50A output current | | 1500 | A²S |
| 125A output current | | 20000 | A²S |

## ENVIRONMENTAL SPECIFICATION

| | Min | Max | Units |
|---|---|---|---|
| Operating Temperature | -40 | 100 | °C |
| S48D50 | -55 | 100 | °C |
| Storage Temperature | -40 | +100 | °C |
| Input-Output Isolation | | 4000 | Vrms |
| Output-Case Isolation | | | |
| 12A output current | 2500 | | Vrms |
| 25A output current | 2500 | | Vrms |
| 40A output current,R | 2500 | | Vrms |
| 40A output current,D | 3300 | | Vrms |
| 40A output current,A | 3300 | | Vrms |
| 50A output current | 3300 | | Vrms |
| 125A output current | 3300 | | Vrms |

## SURGE CURRENT

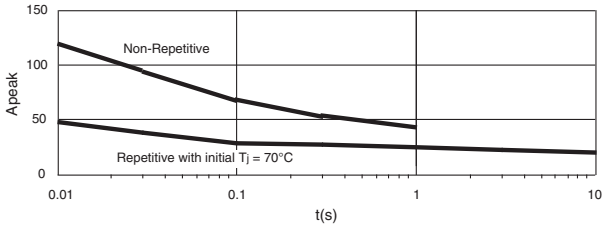



Figure 4a — 12A output current

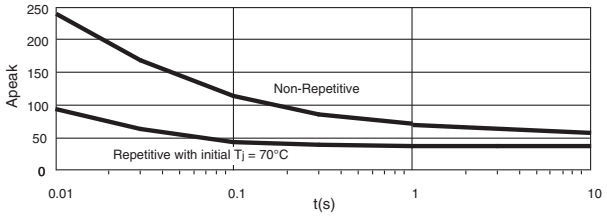



Figure 4b — 25A output current

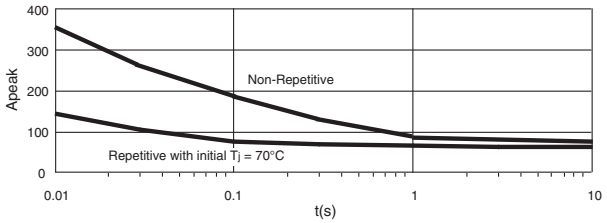



Figure 4c — 40A output current

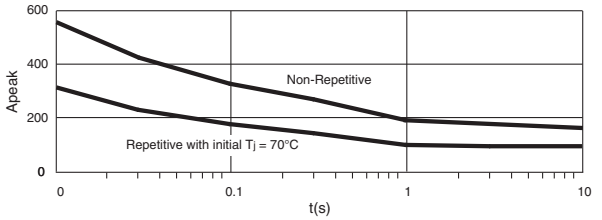



Figure 4d — 50A output current

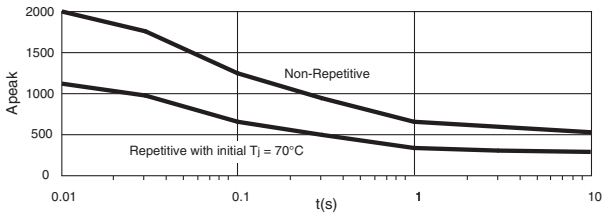



Figure 4g — 125A output current

## THERMAL CHARACTERISTICS

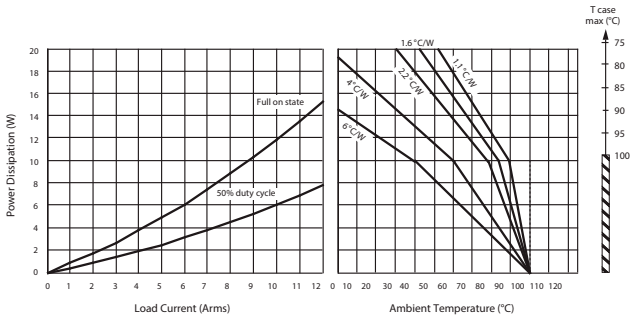



Figure 5a — 12A output current

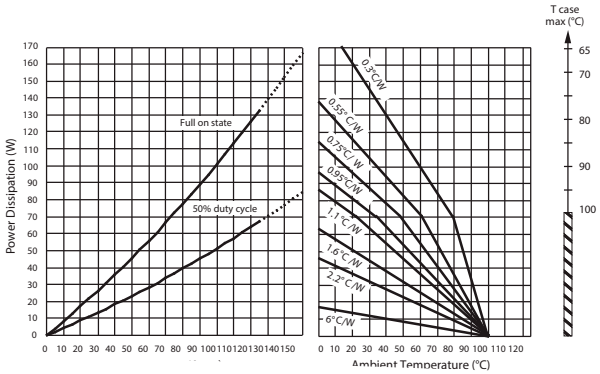



Figure 5e — 125A output current

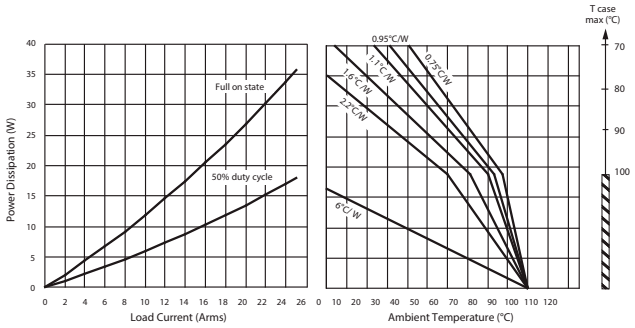



Figure 5b — 25A output current

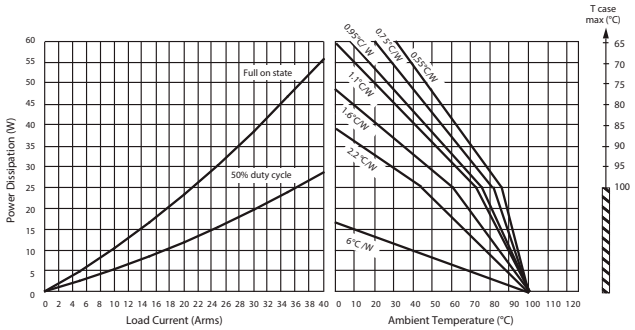



Figure 5c — 40A output current

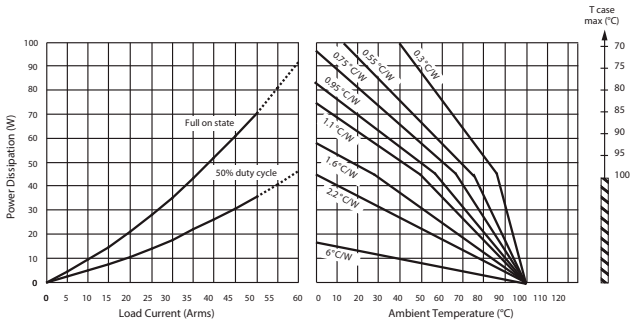



Figure 5d — 50A output current

NOTES:
1. Electrical specifications measured at 25°C unless otherwise specified.
2. For 800Hz applications, contact factory.
3. For additional/custom options, contact factory.

## OPTIONAL ADD-ONS

Please order add-ons separately:
- -12 — Thermal pad installed.
- -14 — Plastic touch-proof cover.