

#### FEATURES/BENEFITS

- Random and zero-cross models available for all applications
- Low zero-cross turn-on voltage
- Input protection and control LED standard
- Connectors for power wiring and heat sinks available
- Designed in conformity with EN60947-4-3 (IEC947-4-3)



Part No.	Load Voltage	Load Current	Control Voltage	Switch Type
SF24D25	12-280 Vac	25A	3-32 Vdc	Zero Cross
SF24R50HE	12-275 Vac	50A	3-32 Vdc	Random
SF60D50HE	24-600 Vac	50A	3.5-32 Vdc	Zero Cross

#### NOTES

- 1) Line Voltage (nominal): 24 = 240 Vac; 60 = 600 Vac
- 2) Switch Type: R= Random turn-on; D = Zero-cross turn-on
- 3) Feature: HE = High Efficiency Thyristors

$$I_{\max} = 64A @ T_{\text{case}} = 85^{\circ}\text{C}$$

$$I_{\max} = 44A @ T_{\text{case}} = 100^{\circ}\text{C}$$

#### ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

##### INPUT (CONTROL) SPECIFICATIONS

	Min	Max	Units
Input Current Range			
All Relays	10	13	mA
Must Turn-Off Voltage	2.0		Vdc
Reverse Voltage Protection (D)		32	V
Clamping Voltage (D)		36	V
Input Immunity (EN61000-4-4)		2	kV
Input Immunity (EN61000-4-5)		2	kV

#### CONTROL CHARACTERISTICS

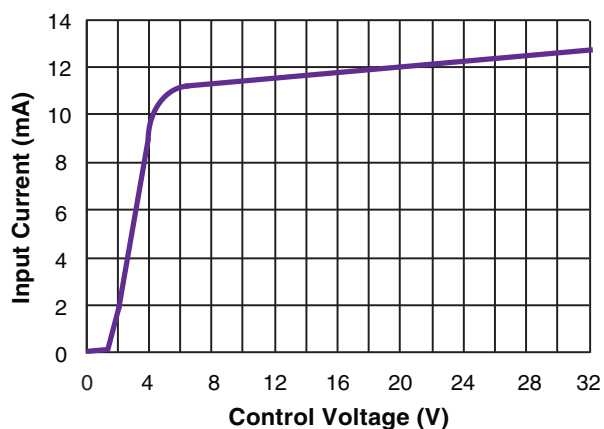
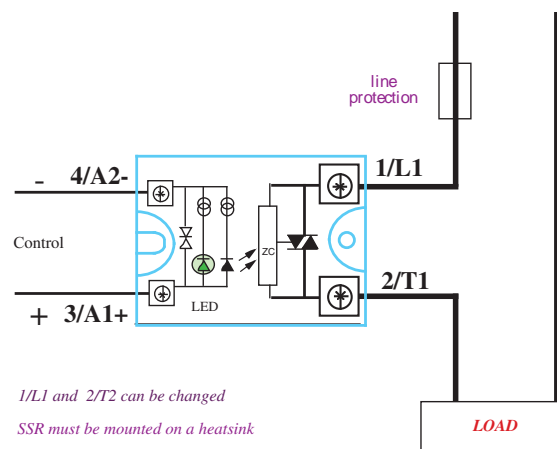


Figure 1

#### TYPICAL APPLICATION



**Typical application:**  
5 kW resistor  
(AC-51 load)  
on 230 VAC

Figure 2a — SF24D25

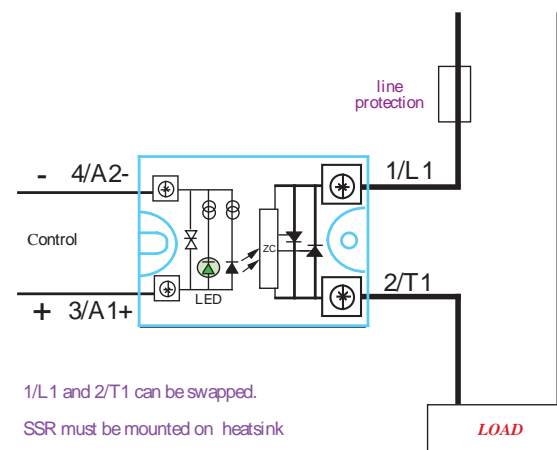


Figure 2a — SF60D50HE & SF24R50HE

ELECTRICAL SPECIFICATIONS  
(+25°C ambient temperature unless otherwise specified)

## OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Operating Range			
SF24D25	12	280	Vac
SF24R50HE	12	275	Vac
SF60D50HE	24	600	Vac

### Peak Voltage (VDR Clamping)

SF24D25 & SF24R50HE	600	Vpeak
SF60D50HE	1200	Vpeak

Load Current Range (Resistive)

25 output current	.005	25	Arms
50 output current	.005	60	Arms

Maximum Surge Current Rating (Non-Repetitive)

25 output current	350	A
50 output current	580	A

### On-State Voltage Drop

On-State Voltage Drop	0.85	V
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## Output Power Dissipation (Max)

25 output current	$0.9 \times 0.85 \times I + 0.016 \times I^2$	W
50 output current	$0.9 \times 0.85 \times I + 0.0075 \times I^2$	W

### Zero-Cross Window (Typical)

SFXXD	±17.5	Vac
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### Off-State Leakage Current

All Relays	1	mA
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Turn-On Time (60 Hz)

SFXXD	10	ms
SFXXR	0.05	ms

Turn-Off Time (60 Hz)

SFXXD	10	ms
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Off-State  $dv/dt$ 

Maximum di/dt (Non-Repetitive)	50	A/ $\mu$ s
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## Maximum di/dt (Non-Repetitive)

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### Operating Frequency

All Relays	0.1	800	Hz
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$I^2t$  for fuse matching ( $<10\text{ms}$ )

25 output current	600	A <sup>2</sup> s
50 output current	1680	A <sup>2</sup> s

### Junction-Case Thermal Resistance

25 output current	0.17	°C/W
50 output current	0.55	°C/W

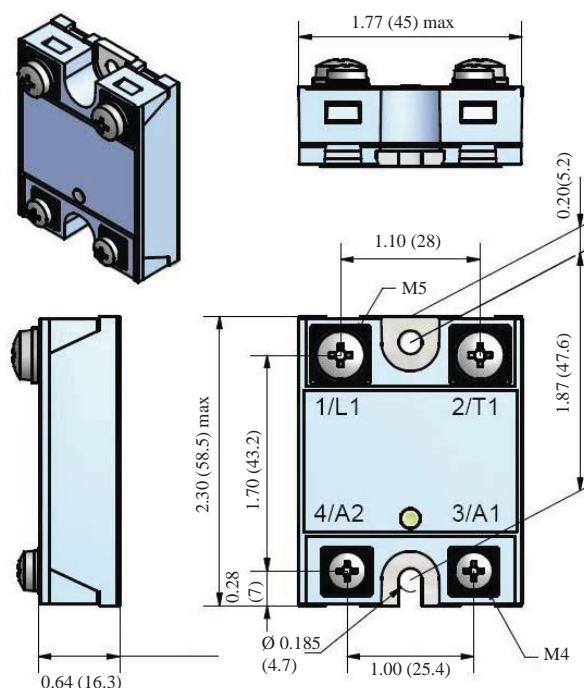
## Conducted Immunity Level

IEC/EN61000-4-4 (bursts)	
SF48	2kV criterion A

## IEC/EN61000-4-5 (surge)

SF48	2kV criterion A with external VDR
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## MECHANICAL SPECIFICATION



Dimensions in inches (mm)  
Weight: 2.29 (65 g)

Figure 3

**GENERAL SPECIFICATIONS**  
(+25°C ambient temperature unless otherwise specified)

**ENVIRONMENTAL SPECIFICATIONS**

	Min	Max	Units
Operating Temperature			
25A output current	-55	+100	°C
50A output current	-40	+100	°C
Storage Temperature			
25A output current	-55	+125	°C
50A output current	-40	+125	°C
Ambient Humidity	40 to 85	%	

Input-Output Isolation 4000 Vrms

**Output-Case Isolation**

25A output current	4000	Vrms
50A output current	4000	Vrms

Insulation Resistance @500Vdc 1000 MΩ

Rated Impulse Voltage 4000 V

Vibration (10–55 Hz according to CE168) 1.5 mm

Shock (according to CD168) 30/50 g

Housing Material PA6 UL94VO

Baseplate Aluminum, nickel-plated

**SURGE CURRENT**

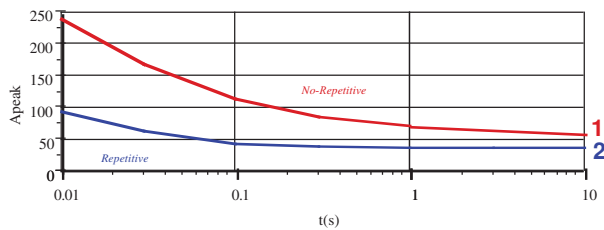


Figure 4a — 25A output current

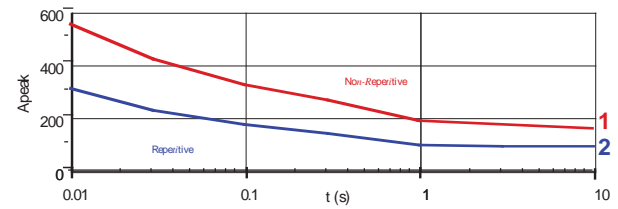


Figure 4b — 50A output current

**THERMAL CURVES**

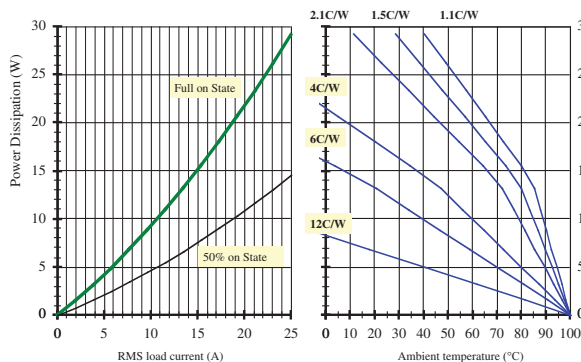


Figure 5a — 25A output power

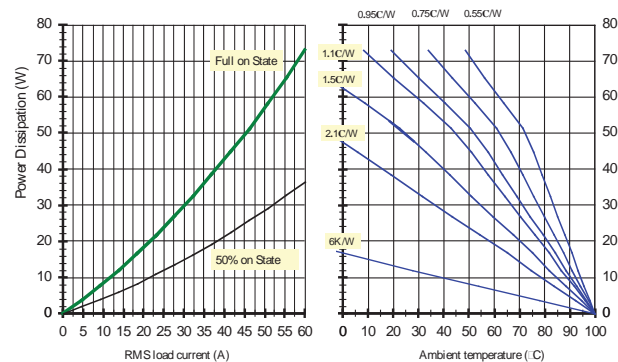


Figure 5b — 50A output power

12°C/W corresponds to a relay without heat sink

6°C/W corresponds to a relay mounted on a DIN-rail adaptor (Teledyne P/N DL12)



2-2.5°C/W  
Teledyne P/N - FW151



1.1°C/W  
Teledyne P/N - FW108

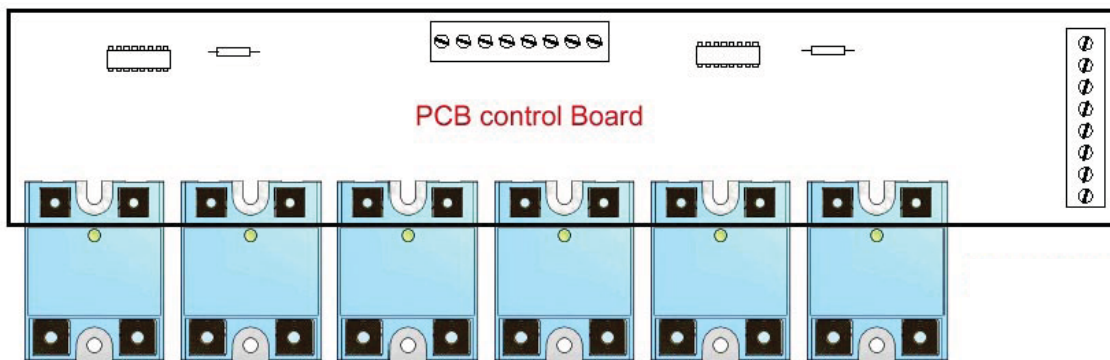


Thermal Pad  
Teledyne P/N - 12

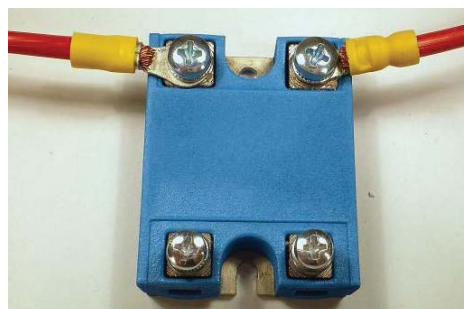


DIN Rail Adapter  
Teledyne P/N - DL12

## Applications



Teledyne's new Flatpac is designed to be used in applications where height is limited. Below is an example of 6 solid state relays in-line where controls are directly connected to a PCB.



Teledyne's new Flatpac can be used where power terminals must be in a 90° angle.