Industrial Solid-State Relays Selection Guide

Single Phase

Quad Output

Three Phase

Motor Controllers

TELEDYNE RELAYS
Everywhereyoulook™

RoHS or Non-RoHS:
Your Choice!

Series SH High Industrial Performance (HIPpak) AC Solid-State Relays with Covers

Series SH relays offer high performance in a flexible and innovative package. Designed for all types of loads, they provide output to 125A, 690Vac. They incorporate removable touch-proof terminal covers for versatile, easy, and quick connections. SH relays feature a metal baseplate and built-in LED. They are up to 30% lighter than standard relays.

- **Random and zero-cross models available**
- **Low zero-cross turn-on voltage**
- **Input and output protection and control LED**
- **IP20 touch-proof terminal covers**
- **Heat sinks available**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
SH24D25	25A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	600 A^2s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SH24A25	25A	12–275 Vac	600 Vpeak	Zero Cross	20–265 Vac/Vdc	600 A^2s	
SH24D50	50A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	2800 A^2s	
SH24R50	50A	12–275 Vac	600 Vpeak	Random	3–32 Vdc	2500 A^2s	
SH48D35	35A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	1250 A^2s	
SH48D50	50A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	2500 A^2s	
SH48A50	50A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	2500 A^2s	
SH48D95	95A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	14400 A^2s	
SH48A95	95A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	14400 A^2s	
SH48R125	125A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	24000 A^2s	
SH48D125	125A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	24000 A^2s	
SH48A125	125A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	24000 A^2s	
SH60D50	50A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	2500 A^2s	
SH60D125	125A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	24000 A^2s	

RoHS Compliant

See Appendix for heat-sink information and other options.
RoHS Compliant.
For SH48D75, contact factory for availability.

Series STH High Industrial Performance (HIPpak) AC Solid-State Relays

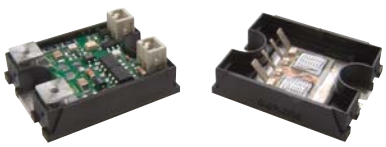
Series STH relays offer high performance in a flexible and innovative package. Designed for all types of loads, they deliver output to 75A, 600Vac for resistive loads. They have removable touch-proof terminal covers for versatile, easy, and quick connections. STH relays feature a metal baseplate and are up to 30% lighter than standard relays.

- **Regulated input current**
- **Low zero-cross turn-on voltage**
- **Input protection and control LED standard**
- **IP20 touch-proof terminal covers optional**
- **Heat sinks available**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
STH24D12	12A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	128 A^2s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
STH24D25	25A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	600 A^2s	
STH24D35	35A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	1250 A^2s	
STH48D50	50A	24–600 Vac	1200 Vpeak	Zero Cross	3–32 Vdc	2500 A^2s	
STH24D50	50A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	2800 A^2s	

RoHS Compliant

See Appendix for heat-sink information and other options.
IP20 touchproof covers option: -17
RoHS Compliant.
For STH48D35, contact factory for availability.



HIPpak interior

TELEDYNE'S INNOVATIVE CONSTRUCTION

New construction method offers low profile, less weight, touchproof terminal covers and higher reliability.

Teledyne's new HIPpak housing offers a new metallic base for screw terminals versus plastic to improve the ruggedness. The housing also offers hinged, removable terminal covers for opening and closing. Internal components are now surface mount, allowing for a lower profile. The power device continues to utilize a DBC (Direct Bond Copper) process between the copper and alumina substrate. The DBC process offers the most efficient means of transferring thermal energy out of the device. The construction also incorporates wirebonds versus clips and jumpers. This feature reduces the thermal stress improving the reliability of the relay (see chart, page 20).

Series S AC Hockey Puck Solid-State Relays

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 UPS control.

- **Low zero-cross turn-on voltage for low EMI**
- **AC or DC control available**
- **Excellent thermal performance**
- **High immunity to surges**
- **Internal snubber (except S60 models)**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
S24A12	12A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac	72 A^2s	2.29 x 1.75 x 1.06 in. 58.2 x 44.5 x 27 mm
S24D25	25A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A^2s	
S24R40	40A	12–280 Vrms	600 Vpeak	Random	3–30 Vdc	612 A^2s	
S24D40	40A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	612 A^2s	
S24A40	40A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac/Vdc	612 A^2s	
S48R25	25A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	265 A^2s	
S48D25	25A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	265 A^2s	
S48R50	50A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	1500 A^2s	
S48D50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	1500 A^2s	
S48A50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	1500 A^2s	
S48A50-22/R**	50A	24–520 Vrms	1200 Vpeak	Zero Cross	17–80 Vac/Vdc	1500 A^2s	
S48R125	125A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	20000 A^2s	
S48A125	125A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	20000 A^2s	
S60D50	50A	24-690 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	1500 A^2s	
S60D125	125A	24–660 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	20000 A^2s	

RoHS Compliant

See Appendix for heat-sink information and other options.
RoHS Compliant **.S48A50-22 available with /R option

Series ST AC Hockey Puck Solid-State Relays

Series ST relays are designed for high-power applications. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. A control LED is available on certain models. All Series ST relays are zero crossing. Internal MOV is also available on ST24D 25A and 50A models.

- **Tight zero-cross window for low EMI**
- **AC or DC control available**
- **Excellent thermal performance**
- **Internal MOV (certain models)**
- **Control LED (certain models)**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
ST24D12	12A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A^2s	2.29 x 1.75 x 1.06 in. 58.2 x 44.5 x 27 mm
ST24D12-02	12A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A^2s	
ST24D25	25A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A^2s	
ST24D50-16	50A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	1500 A^2s	
ST48D50	50A	24-600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	1500 A^2s	
ST48D50-02	50A	24-520Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	1500 A^2s	

RoHS Compliant

-02 = Control LED; -16 = Internal MOV; -22 = 24 Vac control
See Appendix for heat-sink information and other options.
RoHS Compliant

SINGLE-PHASE AC SOLID-STATE RELAYS

Series SHPXXNXXR

Series SHP Phase-Control AC Solid-State Relays

The Series SHP phase-angle controller provides analog switching. It features an internal microcontroller and overvoltage protection. Choose relays with either removeable input spring connectors or IP20 touch-proof flaps. The relays are designed in conformity with EN60947-4-3 (IEC947-4-3)and EN60950/VDE0805 (Reinforced Insulation).

- **Microcontroller inside**
- **Analog switcing**
- **Overvoltage protection by varistor**
- **Green LED for input visualization**
- **Short-circuit protection**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Range	I^2t	Dimensions LxWxH
SHP24N50R	50A	90–280 Vac	600 Vpeak	Phase Angle	4–20 mA	2500 A^2s	1.77 x 2.30 x 1.18 in. 45 x 58.5 x 30 mm
SHP24N50A	50A	100–280 Vac	600 Vpeak	Phase Angle	8-30Vdc	2500 A^2s	1.77 x 2.30 x 1.18 in. 45 x 58.5 x 30 mm

RoHS Compliant

RoHS Compliant

DUAL-OUTPUT AC SOLID-STATE RELAYS

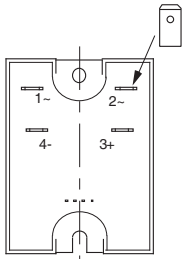
Series SD Dual-Output AC Solid-State Relays

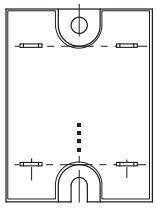
Series SD dual-phase relays are designed for all types of loads. The design incorporates two relays in a single package. The relays utilize optical isolation to protect the control from load transients. High-current models are excellent for motor and phase angle control. SD Series are available with faston or screw terminals.

- **Designed for all types of loads**
- **Dual output (two relays in one package)**
- **Faston or screw terminals**
- **Tight zero-cross window for low EMI**
- **High immunity to surges**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
SD24D40-06	40 Arms	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	612 A^2s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD24R50	50 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	1500 A^2s	2.28 x 1.75 x 1.06 in. 58 x 44.5 x 27 mm
SD24D50-06	50 Arms	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	1500 A^2s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD24R50-06	50 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	1500 A^2s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD48D50A	50 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	10–30 Vdc	1500 A^2s	2.28 x 1.75 x 1.06 in. 58 x 44.5 x 27 mm
SD48D50A2	50 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	10–30 Vdc	1500 A^2s	2.28 x 1.75 x 1.40 in. 58 x 44.5 x 35.6 mm
SD48D40-06	40 Arms	24-510 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	612 A^2s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm

-06 = Faston terminals See Appendix for heat-sink information and other options.
RoHS Compliant





RoHS Compliant

View data sheet for package detail.

Series E3P Three-Phase AC Solid-State Relays

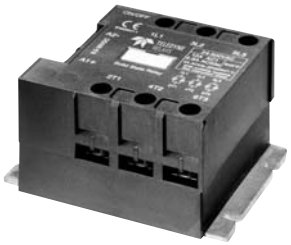
Series E3P three-phase relays are designed for all types of loads. The design incorporates an oversized thyristor output. Control status LED is standard on all models. Output protection is provided internally on certain models. The E3P is available in random and zero-cross turn-on. High-current models are ideal for motor control.

- **Three-phase output**
- **AC or DC control**
- **Internal output protection**
- **Tight zero-cross window for low EMI**
- **High immunity to surges**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
E3P48A50	50A	24–600 Vrms	1200 Vpeak	Zero Cross	90-240 Vac	1500 A^2s	3.94 x 2.89 x 1.56 in. 100 x 73.5 x 39.5 mm
E3P48A75	75A	24-600 Vrms	1200 Vpeak	Zero Cross	90-240 Vac	5000 A^2s	
E3P48A75-22	75A	24-600 Vrms	1200 Vpeak	Zero Cross	10-30 Vac	5000 A^2s	
E3P48D25	25A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	265 A^2s	
E3P48D50	50A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	1500 A^2s	
E3P48D75	75A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	5000 A^2s	
E3P48D75-16	75A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	5000 A^2s	

RoHS Compliant

-16 = Internal protection
RoHS Compliant.
For E3P48R50-16, contact factory for availability.



Series E3PT Three-Phase Touch-Proof AC Solid-State Relays

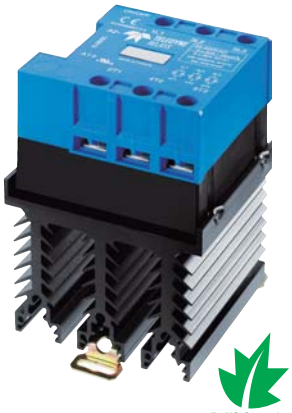
Series E3PT three-phase solid-state relays are designed for all types of loads. The E3PT relays include as a standard a control LED for visual status. The E3PT is touch-proof for user safety. An internal MOV and snubber circuit protect the output thyristor. The E3PT relays are highly immune to large current surges.

- **Designed for all types of loads**
- **Tight zero-cross window for low EMI**
- **Control LED on all models**
- **Internal output transient protection**
- **IP20 touch-proof**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
E3PT48D50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	7200 A^2s	3.94 x 2.99 x 2.22 in. 100 x 76 x 56.5 mm

RoHS Compliant

H = High surge capability
RoHS Compliant.
For E3PT48D50H and E3PT48A50H, contact factory for availability.



Series DR3P Three-Phase AC Solid-State Relays with Heat Sink and DIN Rail

Series DR3P solid-state relays provide three-phase output, offering both AC and DC control with a zero-cross turn-ON thyristor output. The DR3P provides an integrated heat sink, output transient suppression (MOV and snubber circuit) and LEDs that serve as status indicators for diagnostics. The relays are designed for DIN-rail or panel mounting.

- **Three-phase solid-state relay with heat sink**
- **DIN rail or panel mounting**
- **AC/DC control voltage with input status LED**
- **Internal protection by integrated snubber MOV**
- **IP20 touch-proof**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
DR3P48A50	22A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vdc (DC) 90–240 Vac (AC)	2500 A^2s	3.54 x 3.86 x 4.81 in. 89.8 x 98 x 122.2 mm
DR3P48D50	22A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc (DC) 10–30 Vac (AC)	2500 A^2s	

RoHS Compliant

RoHS Compliant

THREE-PHASE AC SOLID-STATE RELAYS

Series C3P Three-Phase AC Solid-State Relays

Series C3P relays control medium amounts of power in three-phase applications. Optical isolation ensures complete protection of the C3P's control circuit from load transients. The compact plastic housing provides a low-cost alternative to large metallic three-phase contactors. The ceramic baseplate provides excellent thermal performance.

- **Three-phase relay in a compact single-inline package**
- **High-temperature plastic housing**
- **Tight zero-cross window for low EMI**
- **Exposed ceramic baseplate for reduced thermal resistance**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
C3P24D25	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	10–30 Vdc	260 A^2s	3.2 x 1.09 x 0.32 in 81.9 x 27.7 x 8.3 mm
C3P24D25C	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	3.5–10 Vdc	260 A^2s	

Lead forming available upon request.

Series S3P Three-Phase AC Solid-State Relays

Series S3P relays are made up of three separate relays controlled by a common DC voltage control. They are designed to control 10A AC loads such as resistors and small motors on a mains from 12 to 440 Vac, either single- or three-phase. They are well suited for applications requiring compact size and low cost.

- **Industry-standard hockey-puck package**
- **Spring connectors**
- **Three relays in a single package**
- **Zero-cross and random turn-on options**
- **RoHS Compliant available with option -/R**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
S3P44D10	10 Arms	12–440 Vrms	850 Vpeak	Zero Cross	4–30 Vdc	72 A^2s	2.3 x 1.75 x 1.14 in. 44.5 x 58.5 x 29 mm

RoHS Compliant

See Appendix for heat-sink information and other options.
RoHS Compliant

QUAD-OUTPUT AC SOLID-STATE RELAYS

Series SQ Quad-Output AC Solid-State Relays

Series SQ relay provides four independent 25A relays in a standard hockey-puck package. The SQ package conserves space while providing high-power switching. The tight zero-cross window reduces the EMI level. Optical isolation ensures complete protection of the control circuit from load transients.

- **Four solid-state relays in a hockey puck package**
- **Tight zero-cross window for low EMI**
- **Constant current input for low current draw**
- **High Immunity to surges**
- **RoHS Compliant available with option -/R**

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
SQ24D25	25 Arms	12–280 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	288 A^2s	2.28 x 1.75 x 1.29 in. 58 x 44.5 x 33 mm
SQ24R25	25 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	288 A^2s	
SQ24D25-02	25 Arms	12–280 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	288 A^2s	

RoHS Compliant

See Appendix for heat-sink information and other options.
RoHS Compliant

Series S20, S60 and S75 DC Solid-State Relays

Series S20 and S60 relays switch medium- to high-power DC loads. These devices feature the latest-generation MOSFET technology as well as an innovative isolated driver to ensure fast power turn on and off. The relays feature triggered control input to avoid linear control risks and fast switching times. The relays also offer an LED for status.

- **Low on-state resistance**
- **Low output leakage current**
- **Low control current consumption**
- **Triggered control input to avoid linear control risks**
- **Low conducted and radiated disturbances**

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
S20DC100	100A	0–130 Vdc	200 Vpeak	10 µs	4.5–32 Vdc	22 mΩ	2.29 x 1.75 x 1.1 in. 58.2 x 44.5 x 28 mm
S60DC40	40A	0–350 Vdc*	600 Vpeak	10 µs	4.5–32 Vdc	70 mΩ	
S20DC30	30A	0–130 Vdc	200 Vpeak	10 µs	4.5–32 Vdc	164 mΩ	
S75DC150	150A	0-42 Vdc	75 Vpeak	10 µs	4.5–32 Vdc	2.25 mΩ	

*275 Vrms size 20 varistor as protection across the output
See Appendix for heat-sink information and other options.
RoHS Compliant

RoHS Compliant

Series SI DC Solid-State Relays

Series SI relays are designed to switch high voltage (high power) DC loads. These devices feature the latest generation of High Voltage IGBT Technology as well as an innovative isolated driver to ensure fast power turn on and OFF. The relays feature triggered control input to avoid linear control risks and fast switching times. The relays also offer an LED for status.

- **Latest generation of High Voltage IGBT Technology**
- **Ultra low output leakage current**
- **Low control current consumption**
- **Triggered control input to avoid linear control risks**
- **Low conducted and radiated disturbances**

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON-State Voltage Drop	Dimensions LxWxH
SI60DC100	100A	0-500 Vdc	600 Vpeak	10 µs	4.5-32 Vdc	1.35 V	2.29 x 1.75 x 1.1 in. 58.2 x 44.5 x 28 mm
SI120DC50	50A	0-1000 Vdc	1200 Vpeak	10 µs	4.5-32 Vdc	1.5 V	
SI170DC25	25A	0-1400 Vdc	1700 Vpeak	10 µs	4.5-32 Vdc	3.3 V	

See Appendix for heat-sink information and other options.
RoHS Compliant

RoHS Compliant

Series SH DC Solid-State Relays

Series SH relays offer high performance in a flexible, innovative package. They feature the latest-generation MOSFET technology as well as triggered control input to avoid linear control risks. The relays offer diagnostics, removable touch-proof terminal covers and a metal baseplate. They are up to 30% lighter than standard relays.

- **Built-in diagnostics with status LED**
- **Ultra low on-state resistance**
- **Low output leakage current**
- **IP20 protection by terminal covers on load terminals**
- **No radiated or conducted disturbances**

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
SH10DC40	40A	5–100 Vdc	100 Vpeak	20 µs	3.5–32 Vdc	30 mΩ	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SH10DC40-16	40A	5–60 Vdc	100 Vpeak	20 µs	3.5–32 Vdc	30 mΩ	
SH20DC20-16	20A	5–110 Vdc	200 Vpeak	20 µs	3.5–32 Vdc	90 mΩ	

-16 = Internal protection
See Appendix for heat-sink information and other options.
RoHS Compliant

RoHS Compliant

MOTOR CONTROLLERS

Series EMCRT Three-Phase Motor Reverser up to 7.5kW Motors

The Series EMCRT three-phase induction motor reverser can be used to turn on an industrial motor in either direction safely. It is designed to control and invert the direction of a three-phase motor. The reverser incorporates very-high-immunity components and can be mounted on a DIN rail or attached with screws.

- **Controls and reverses three-phase motors without direct third leg (two legs)**
- **IP20 touch-proof housing**
- **Built-in snubber and MOV**
- **Forward/Reverse display LED**

Part No.	Motor Current	Mains Voltage	Peak Voltage	Switch Type	Control Voltage	I^2t	Dimensions LxWxH
EMCRT48D50	8.5A	24–520 Vac	1600 Vpeak	Zero Cross	12–30 Vdc	1500 A^2s	3.94 x 2.99 x 2.22 in. 100 x 76 56.5 mm
EMCRT48D75	16A	24–550 Vac	1600 Vpeak	Zero Cross	12–30 Vdc	5000 A^2s	

RoHS Compliant

RoHS Compliant

EMC48S50-04

Series EMC Soft-Start Motor Controller up to 26kW Motors

The Series EMC motor controllers provide an alternative to costly and large variable speed controllers in pumps, fans, compressors and conveyors. Its six-thyristor structure, working like a full-wave phase angle controller, reduces the induction motor starting current as well as the motor starting torque to improves the efficiency of the power used.

- **Controls both positive and negative cycles**
- **Avoids voltage fluctuations that lead to flicker**
- **Fits existing applications without modification of the wiring field configuration**
- **Features diagnostic and self-test functions**

MAIN CHARACTERISTICS										
Part No.	Max. Motor Power @40°C				IAC53a @40°C		Phase to Phase Voltage	Mains Frequency	Input	Operating Temperature
	Star (Y)		Delta (D)		Max.	EN60947-4-2				
	400Vac	230Vac	400Vac	230Vac						
EMC48S50-04	15kW	8.6kW	26kW	15kW	30A	22.5A	200 to 480Vac	40 to 65Hz	10 to 24Vdc	–40°C to +100°C

RoHS Compliant

RoHS Compliant

PROTECTION MODULES FOR DC SOLID-STATE RELAYS

Series PR Protection Module

SSeries PR is a protection module that helps protect DC solid-state relays against voltage transients due to inductive effects of lines and loads. The PR Series offer 2 types, one with additional output protection for DC relays that already have built-in MOV and one with a full protection scheme for relays that have no built-in protection. The PR Series also features IP20 touch-proof covers.

- **External protection for DC Solid-State Relays**
- **Fly wheel diode**
- **Decoupling capacitor and discharge resistor**
- **Clamping voltage function**
- **IP20 touch-proof flaps**

Part No.	Load Current	Load Voltage	Peak Voltage	Recover Time	Vdrop During Fly Wheel	Discharge Time Constant	Dimensions LxWxH
PR20DC80	0-80A	0-130 Vdc	200 Vpeak	190 ns	1.2 V	2 s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
PR75DC80	0-80A	0-40 Vdc	75 Vpeak	190 ns	1.2 V	1 s	

See Appendix for heat-sink information and other options.

RoHS Compliant

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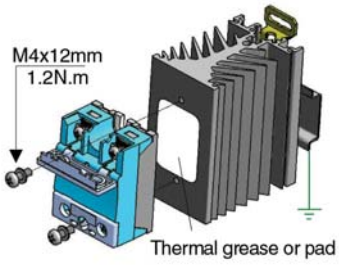
APPENDIX

Hockey Puck Relay Options

2–2.5°C/W
Teledyne P/N FW151

1.1°C/W
Teledyne P/N FW108

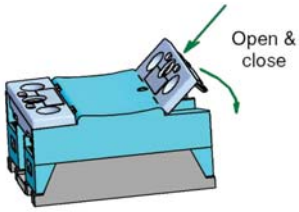
0.3°C/W
Teledyne P/N FW031



DIN Rail Adapter
Teledyne P/N DL12

Mounting
Most SSRs must be mounted on heat sinks. A large range of heat sinks are available. For heat-sink mounting, use thermal grease or a thermal pad with high conductibility specified by Teledyne. See our website for additional heat sinks.

Thermal Pad
Teledyne P/N –12



Removable IP20 touch-proof terminal covers on HIPpak

Typical Loads (Random)
HIPpak relays with random turn-on are designed for high inductive loads or phase angle control applications.
Our data sheet lists nominal current of power thyristors corresponding to a resistive load (AC-51).
Depending on the loads, check the inrush current at turn ON and possible overvoltages at turn OFF.
Main applications:
- AC-55b — Incandescent or infrared lamps. Inrush current is generally 10 times In during few 10ms. Random relays often use in-phase angle controllers or soft-starters with the right control.
- AC-53 — Three-phase motors. 2 or 3 random turn-on relays can drive such motors.
- AC-56a — Transformer loads. Very high inrush current up to 100 times In. Use a random turn-on SSR like the SH.

The table below lists recommended current values for proper lifetime expectancy.

Typical Loads (Zero-Cross)
HIPpak relays with zero-cross turn-on are designed for most types of loads.
Our data sheet lists the AC-51 current value corresponding to resistive loads.
For other loads, check the inrush current at turn ON and possible overvoltages at turn OFF:
- AC-55b — Incandescent lamps. Inrush current is generally 10 times In during few 10ms.
- AC-55a — Electric discharge lamp. These loads often have overcurrent at turn ON and overvoltage at turn OFF , so use 400VAC SSR on 230VAC mains.
- AC-58 — One-pole motors. These loads often have overcurrent at turn ON and overvoltage at turn OFF, so use 400VAC SSR on 230VAC mains and adapt the SSR current to the starting current of the motor.
- AC-53 — Three-phase motors. 2 or 3 SH zero-cross relays can drive these motors, but generally use E3P/E3PT or other three-phase relays or SH random range.
- AC-56a — Transformer loads. Very high inrush current up to 100 times In. Use SH random relay or peak control SSR.
- AC-56b — Capacitor loads with very high current at turn ON and overvoltage at turn OFF. Our high-voltage relays are well adapted for high inrush current.

SSR Model	AC-53 Current (motor)	AC-55b Current (lamp)	AC-55b Current (transformer)	AC-55b Current (capacitor)
12A	2.5A	2.5A	0.4A	XXX
25A	5A	5A	1A	XXX
35A	9A	9A	2A	XXX
50A	12A	12A	3A	13A
75A	16A	16A	6A	24A
95A	24A	24A	9A	36A
125A	32A	32A	12A	48A

TELEDYNE RELAYS
Everywhereyoulook™

Did you know...

Teledyne Relays offers Commercial/Industrial Solid State Relays?

SINGLE PHASE AC SOLID STATE RELAYS

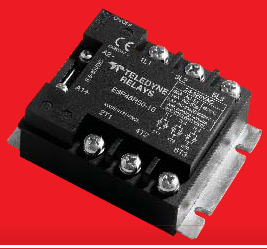
- *Up to 690Vac, 125A*
- *Input & Output Protection*
- *Chassis, DIN Rail and PCB Mount*
- *Zero-Cross & Random Switching*
- *Touch-Proof Covers*

DUAL-PHASE AC SOLID STATE RELAYS

- *Up to 600Vac, 50A*
- *Output Protection*
- *Chassis and DIN Rail*
- *Zero-Cross & Random Switching*
- *Touch-Proof Covers*

3 & 4 PHASE SOLID STATE RELAYS

- *Up to 600Vac, 75A*
- *Output Protection*
- *Chassis and DIN Rail*
- *Zero-Cross & Random Switching*
- *DC & AC Control*



DC SOLID STATE RELAYS

- *Up to 1400Vdc, 100A*
- *Output Protection*
- *Chassis, DIN Rail and PCB Mount*
- *IGBT and MOSFET*
- *Touch-Proof Covers*

SOFT START MOTOR CONTROLLERS AND MOTOR REVERSERS

- *Up to 26kW, 480Vac*
- *Star & Delta Configurations*
- *DIN Rail*
- *Output Protection*
- *Built-in Diagnostics and Self Test*