TELEDYNE RELAYS
Everywhereyoulook™

Series SHP

Output to 50A, 280 Vac
Phase-Angle Controller Solid-State Relays

Part Number	Description
SHP24N50R	50A, 9-280 Vac
SHP24N50A	50A, 9-280 Vac

RoHS Option

For RoHS Compliant Contact Factory

FEATURES/BENEFITS

- Phase angle controller — microcontroller inside
- Analog switching
- Overvoltage protection by varistor
- Green LED for input visualization
- IP20 touch-proof flaps
- Designed in conformity with EN60947-4-3 (IEC947-4-3)and EN60950/VDE0805 (Reinforced Insulation)

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

SHPXXNXXA RELAYS

	Min	Max	Units
Control Voltage	8	30	V
Supply Current		12	mA
Reverse Supply		30	V
Analog Voltage Range	0	10	V
Analog Input Current		100	µA
Reverse Analog Voltage		30	V
Analog Input Impedance (Typ.)		120	kΩ

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

SHPXXNXXR RELAYS

	Min	Max	Units
Control Current Range	4	20	mA
Voltage Range	-0.6	7.5	V
Dynamic Impedance			
SHP24N50X		>100	mΩ
Reverse Polarity Protection		Yes	
Input Current		50	mA

TYPICAL APPLICATION

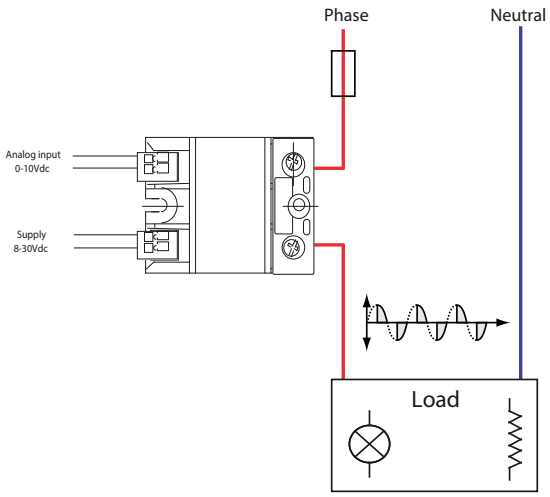


Figure 1a — SHPXXNXXA relays

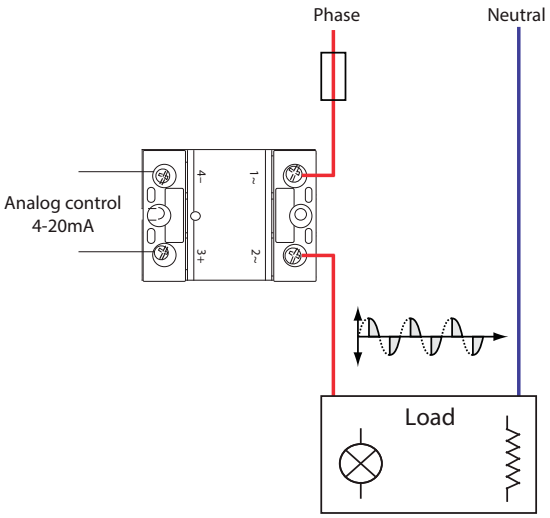


Figure 1b — SHPXXNXXR relays

MECHANICAL SPECIFICATION

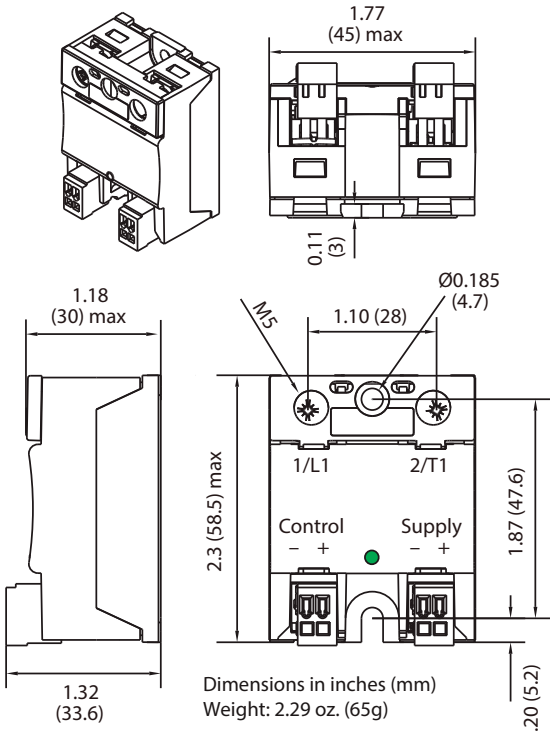


Figure 2a — SHPXXNXXA relays

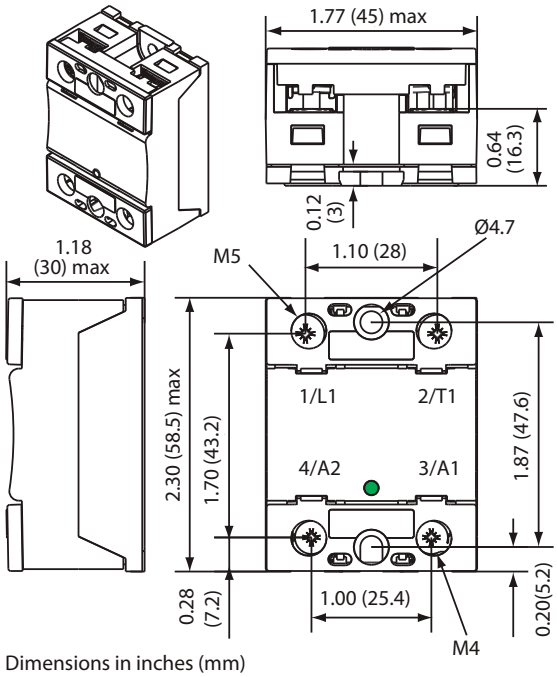


Figure 2b — SHPXXNXXR relays

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Operating Range			
SHP24N50A	90	280	Vrms
SHP24N50R	90	280	Vrms
Peak Voltage (VDR Clamping)			
SHP24N50A		600	Vpeak
SHP24N50R		600	Vpeak
Latching Voltage			
SHP24N50A	10		V
SHP24N50R	10		V
Load Current Range (See Fig. 5)			
SHP24N50A	0.1	50	Arms
SHP24N50R	0.1	50	Arms
Non-Repetitive Overload Current			
SHP24N50A	550	720	A
SHP24N50R	550	720	A

OUTPUT (LOAD) SPECIFICATIONS (continued)

	Min	Max	Units
On-State Voltage Drop		0.9	V
On-State Dynamic Resistance			
SHP24N50A	12		mΩ
SHP24N50R	12		mΩ
Output Power Dissipation (Max)	0.9x0.9 + 0.012xI²		W
Off-State Leakage Current			
SHP24N50A		2	mA
SHP24N50R		1	mA
Input Time (60 Hz)			83.3ms
Delay Time (60 Hz)		16.6	ma
Rise, Fall Time (60 Hz)		52.3	ma
Operating Frequency	40	70	Hz
Off-State dv/dt	500		V/µs
Maximum di/dt (Non-Repetitive)		50	A/µs
I²T for fuse matching (<10ms)			
SHP24N50A		2500	A²s
SHP24N50R		2500	A²s
Conducted Immunity Level			
IEC/EN6100-4-4 (bursts)	4kV criterion A		
IEC/EN6100-4-5 (surge)	4kV criterion A		
Internal Overvoltage Protection	820(@1mA)		V

GENERAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

ENVIRONMENTAL SPECIFICATIONS

	Min	Max	Units
Operating Temperature	-40	100	°C
Storage Temperature	-40	125	°C
Ambient Humidity	40	85	%
Input-Output Isolation	4000		Vrms
Output-Case Isolation	4000		Vrms
Insulation Resistance @500Vdc	1000		MΩ
Rated Impulse Voltage		4000	V
Protection Level (CEI529)		IP20	
Vibration (10-55 Hz according to CE168)		1.5	mm
Shock (according to CE168)		30/50	g
Thermal Resistance (Junction to Case)			
SHP48NXXR		0.5	C°/W
Housing Material		PA6 UL94VO	
Baseplate	Aluminum, nickel-plated		

SURGE CURRENT

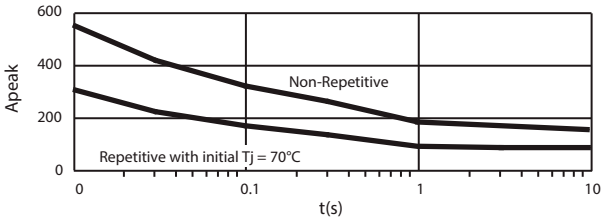


Figure 3a — 50A output current

TRANSFER CHARACTERISTIC

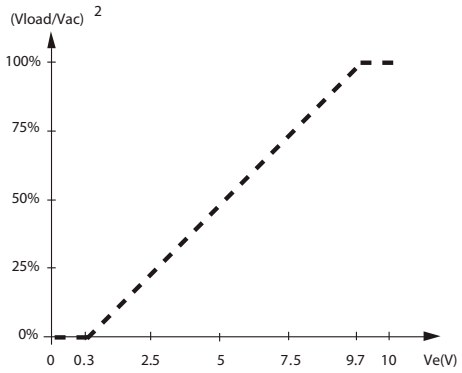


Figure 4a — SHPXXNXXA

THERMAL CHARACTERISTICS

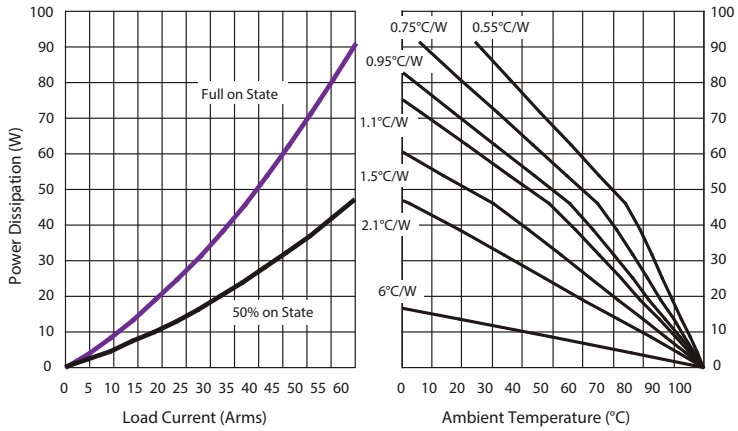
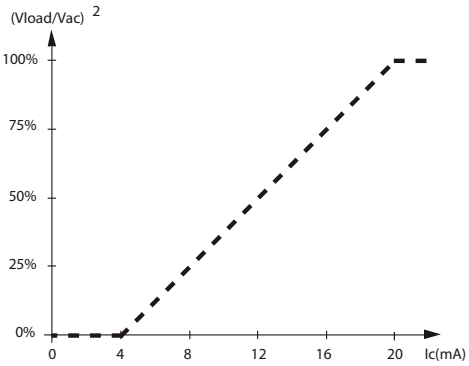


Figure 5a — 50A output power

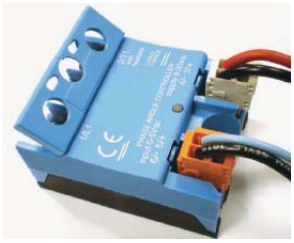


OPTIONAL CONNECTIONS

Directly with wires,
with or without ferrules

With tips
(ring terminals)

CONTROL WIRING - SHPCCNXXA

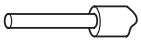
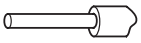


Pluggable removable input
spring connectors
Minimum: AWG28
Maximum: AWG14

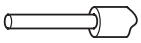
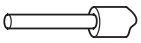
Connector
WAGO 734

With clip

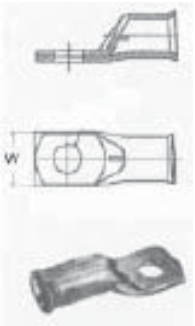
CONTROL WIRING - SHPXXNXXR

Number of Wires				Screwdriver Type	Recommended Torque
1		2			
Solid (no ferrule)	Fine Stranded (with ferrule)	Solid (no ferrule)	Fine Stranded (with ferrule)		M4 N.m
					
AWG18…AWG14	AWG18…AWG14	AWG18…AWG14	AWG18…AWG14	Pozidriv 2	1.2

POWER WIRING

Number of Wires				Screwdriver Type	Recommended Torque
1		2			
Solid (no ferrule)	Fine Stranded (with ferrule)	Solid (no ferrule)	Fine Stranded (with ferrule)		M5 N.m
					
AWG16…AWG8	AWG16…AWG10	AWG16…AWG8	AWG16…AWG10	Pozidriv 2	2

Power with tips



W max = 12.6 mm

AWG6 (16mm²)

AWG4 (25mm²)

AWG2/AWG3
(35mm²)

AWG0/AWG1
(50mm²)

Options

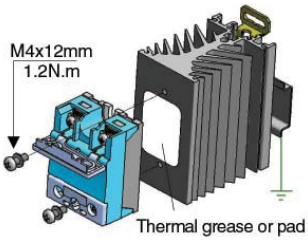
Fastons: Call us

Special kit for high current

AWG2 (35mm²)

AWG0 (50mm²)

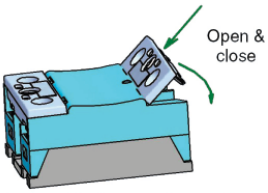
Mounting
HIPpak SSRs must be mounted on heat sinks. A large range of heat sinks is available. For heat-sink mounting, use thermal grease or a thermal pad with high conductibility specified by Teledyne.



2–2.5°C/W
Teledyne P/N FW151

1.1°C/W
Teledyne P/N FW108

Thermal Pad
Teledyne P/N –12



Removable IP20 touch-proof flaps