HPR Series (Hockey Puck Relay)

Industrial, 1-Phase ZS (IO) w. LED and Built-in Varistor

- Zero switching
- Direct copper bonding (DCB) technology
- LED indication
- Built-in varistor 480 V
- Clip-on IP20 protection cover
- Self-lifting terminals
- Housing free of moulding mass
- Opto-isolation: > 4000 VAC rms
- Blocking voltage: 1200V_p
- Control Volatage: 4-32 VDC or 20-280 VAC/22-48 VDC
- Line & Load accepts: 8-18 AWG
- Operational ratings: Up to 75 AMPS rms
- Rated voltage: 480 VAC rms

CE

cULus
E 354129

Product Description

The industrial, 1-phase relay with anti parallel thyristor output is the most widely used industrial SSR due to its multiple application possibilities. The relay can be used for resistive, inductive and capacitive loads. The zero switching relay switches ON when the sinusoidal curve crosses zero and switches OFF when the current crosses zero.

The instant-on relay with DC control input can be used for phase control. The built in varistor secures transient protection for the heavy industrial applications, and the LED indicates the status of the control input. The clip on cover is securing touch protection to IP20. Protected output terminals can handle cables up to 16mm² (6 AWG).

Ordering Key

HPR48 A 25

- HPR48 — Solid State Relay
- A — Control voltage
- 25 — Rated operational current

Type Selection

Control voltage	Rated operation current
A: 20-280 VAC/22-48 VDC	25: 25 AACrms
D: 4-32VDC	50: 50 AACrms
	75: 75 AACrms
	100: 100 AACrms

General Specifications

	HPR48...
Operational voltage range	42 to 530 VAC rms
Blocking voltage	≥ 1200 V_p
Zero voltage turn-on	≤ 10V
Operational frequency range	45 to 65Hz
Power factor	> 0.5 @ 480 VAC rms
Markings	cULus CE

Input Specifications

	HPR..D..	HPR..A..
Control voltage range	4 - 32 VDC	20 - 280 VAC
Pick-up voltage @ Ta = 25°C	3.5 VDC	18 VAC/DC
Reverse voltage	32 VDC	-
Drop out voltage	1.2 VDC	6 VAC/DC
Input current @ max voltage	≤ 12 mA	≤ 20 mA
Response time pick-up	≤ 1/2 cycle	≤ 12 ms
Response time drop-out	≤ 1/2 cycle	≤ 40 ms

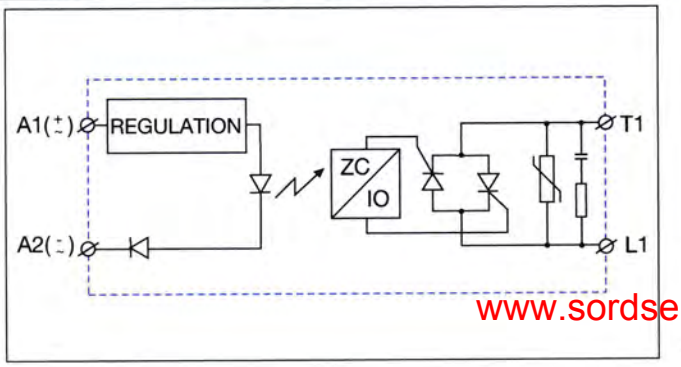
Fusing

See Web: https://www.mdius.com/solid-state/hpr/
Call: (269) 663-8574 or (800) 634-4077

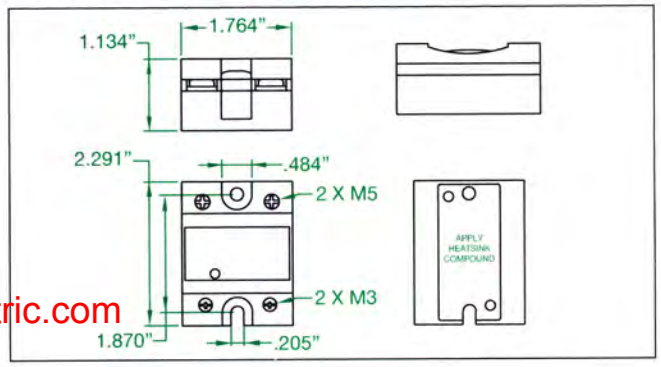
Thermal Specifications

	HPR...25	HPR...50	HPR...75	HPR...100
Operating temperature range		-20° to 70°C (36° to 126°F)		
Storage temperature range		-40° to 100°C (72° to 180°F)		
Junction temperature		≤ 125°C (225°F)		
R_{th} junction to case	≤ 0.80K/W	≤ 0.50K/W	≤ 0.35K/W	≤ 0.30K/W
R_{th} junction to ambient		≤ 20.0K/W		

Functional Diagram



Dimensions



Heatsink Data
(load current versus ambient temperature)

HPR...25

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
25.0	2.70	2.34	1.98	1.61	1.25	0.89	28
22.5	3.10	2.69	2.28	1.86	1.45	1.04	24
20.0	3.61	3.13	2.65	2.18	1.70	1.23	21
17.5	4.26	3.70	3.14	2.59	2.03	1.47	18
15.0	5.14	4.47	3.80	3.14	2.47	1.80	15
12.5	6.38	5.56	4.73	3.91	3.09	2.27	12
10.0	8.25	7.19	6.14	5.08	4.02	2.97	9
7.5	11.4	9.94	8.49	7.04	5.59	4.14	7
5.0	17.7	15.4	13.2	11.0	8.74	6.51	4
2.5	-	-	-	-	18.2	13.6	2
	20	30	40	50	60	70°C	
	68	86	104	122	140	158°F	T_A

Ambient temp.

HPR...50

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
50.0	1.03	0.86	0.70	0.53	0.37	0.20	61
45.0	1.27	1.09	0.90	0.71	0.52	0.33	53
40.0	1.54	1.32	1.10	0.89	0.67	0.45	46
35.0	1.85	1.59	1.34	1.08	0.82	0.57	39
30.0	2.26	1.95	1.65	1.34	1.03	0.72	33
25.0	2.85	2.47	2.08	1.70	1.32	0.94	26
20.0	3.73	3.24	2.75	2.26	1.77	1.27	20
15.0	5.22	4.54	3.86	3.19	2.51	1.83	15
10.0	8.21	7.16	6.11	5.05	4.00	2.95	10
5.0	17.2	15.0	12.9	10.7	8.51	6.33	5
	20	30	40	50	60	70°C	
	68	86	104	122	140	158°F	T_A

Ambient temp.

HPR...75

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
75.0	0.91	0.78	0.65	0.52	0.39	0.26	77
67.5	1.10	0.96	0.81	0.66	0.51	0.36	68
60.0	1.34	1.17	1.00	0.83	0.66	0.49	59
52.5	1.60	1.40	1.20	1.00	0.80	0.60	50
45.0	1.93	1.68	1.44	1.20	0.96	0.72	42
37.5	2.38	2.08	1.78	1.49	1.19	0.89	34
30.0	3.06	2.68	2.30	1.91	1.53	1.15	26
22.5	4.21	3.68	3.16	2.63	2.10	1.58	19
15.0	6.51	5.70	4.88	4.07	3.26	2.44	12
7.5	13.5	11.77	10.09	8.41	6.73	5.04	6
	20	30	40	50	60	70°C	
	68	86	104	122	140	158°F	T_A

Ambient temp.

HPR...100

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
100.0	0.54	0.45	0.36	0.27	0.18	0.09	111
90.0	0.68	0.58	0.47	0.37	0.27	0.17	97
80.0	0.86	0.74	0.62	0.50	0.38	0.26	84
70.0	1.08	0.94	0.80	0.66	0.52	0.38	71
60.0	1.37	1.20	1.03	0.85	0.68	0.51	59
50.0	1.70	1.49	1.28	1.06	0.85	0.64	47
40.0	2.21	1.93	1.66	1.38	1.10	0.83	36
30.0	3.06	2.68	2.30	1.91	1.53	1.15	26
20.0	4.78	4.18	3.59	2.99	2.39	1.79	17
10.0	9.98	8.73	7.49	6.24	4.99	3.74	8
	20	30	40	50	60	70°C	
	68	86	104	122	140	158°F	T_A

Ambient temp.

Junction to ambient thermal resistance, $R_{th\ j\text{-}a}$	< 20.0	K/W
Junction to case thermal resistance, $R_{th\ j\text{-}c}$	< 0.35	K/W
Case to heatsink thermal resistance, $R_{th\ c\text{-}s}$	< 0.10	K/W
Maximum allowable case temperature	100 (212)	C (F)
Maximum allowable junction temperature	125 (257)	C (F)

Isolation

Rated isolation voltage Input to output	≥ 4000 VAC rms
Rated isolation voltage Output to case	≥ 4000 VAC rms

Heatsink Selection

Heatsink	Thermal resistance	for power dissipation
HS 45CD	2.70K/W	> 60W
HS 45BD	2.00K/W	> 60W
Consult MDI	> 0.25K/W	N/A