Power-IO™

H Family of Solid State Relays
Up to 75 Amps
Up to 330 Vac or 660 Vac switched

- **Maximum Surge Survival**™ technology for triple-layer surge protection
- Internal, oversized components + advanced direct copper bonding capability = increased reliability, less thermal rise, and longer life
- Optically isolated for 4000 volt isolation
- Green LED indicating input status
- International terminal markings (L1, T1, A1, A2)
- 800 volt transient blocking voltage (in the 3V models)
- 1200 volt transient blocking voltage (in the 6V models)
- Precise zero voltage turn-on for low EMI (noise) without the need for CE filters or other external components
- Internal, rugged, snubber circuit for robust performance on all models
- Clear safety cover included
- All parameters are at 40°C, as required by the latest CE EN60947-4-3, which is the industrial SSR specification (toughest specification).

Model Numbers	DC Control input	HDA-3V25	HDA-3V50	HDA-3V75	HDA-6V50	HDA-6V75
	AC Control input	HAA-3V25	HAA-3V50	HAA-3V75	HAA-6V50	HAA-6V75

Items marked in green are engineering enhancements that typically lead the industry resulting in better, long term performance.

Output Specifications (All shown at 40°C, per CE EN60947-4-3, and tested by UL or CSA, on appropriate heat sinks)

Operating Voltage (47-63 Hz) [Vrms}	24-330	24-330	24-330	24-660	24-660
Max Load Current [Arms] with heat sink	25	50	75	50	75
Min Load Current [Arms]	0.10	0.10	0.15	0.10	0.15
Transient Overvoltage [Vpk]	800	800	800	1200	1200
Max Surge Current for 16.7ms [Apk]	250	625	1300	625	1300
Max On-State Voltage Drop @ Rated Current [Vpk]	1.6	1.5	1.4	1.5	1.4
Thermal Resistance Junction to Case [°C/W]	0.97	0.34	0.18	0.34	0.18
Max I^2T for fusing (8.3 msec) [A^2sec]	260	1620	7010	1620	7010
Max. Off-State Leakage @ Rated Voltage [mArms]	5	10	10	10	10
Min Off-State dv/dt @ Max Rated Voltage [V/µsec]	>750	>1000	>1500	>1000	>1500
Max Turn-On Time	1/2 sinewave (HDA), 1 sinewave (HAA) max imbalance = 1/2 sinewave				
Max Turn-Off Time	1/2 sinewave (HDA), 1 sinewave (HAA) max imbalance = 1/2 sinewave				

Input Specifications (All shown at -40°C to +85°C)

Control Voltage Range	DC Control: 4-32 Vdc. AC Control: 100-280 Vac, 60 Hz				
Min Turn-Off Voltage (HDA DC control models)	1 VDC/0.02mA.				
Min Turn-Off Voltage (HAA AC control models)	20 Vrms/2mA (> than most PLC's triac leakage = eliminates false activation)				
HAA models can be activated by triac output PLCs, PID controllers, etc. typically WITHOUT the extra burden resistor.					
Control inputs are **current limited** (consistent mA) and include the green "input status" LED requirements					
HDA -Nominal Input Current Regulation @ 4-32 Vdc	8 mA	5 mA	5 mA	5 mA	5 mA
HAA -Nominal Input Impedance of 10K @ 120 Vac	12 mA	12 mA	12 mA	12 mA	12 mA
HAA -Nominal Input Impedance of 10K @ 240 Vac	20 mA	20 mA	20 mA	20 mA	20 mA

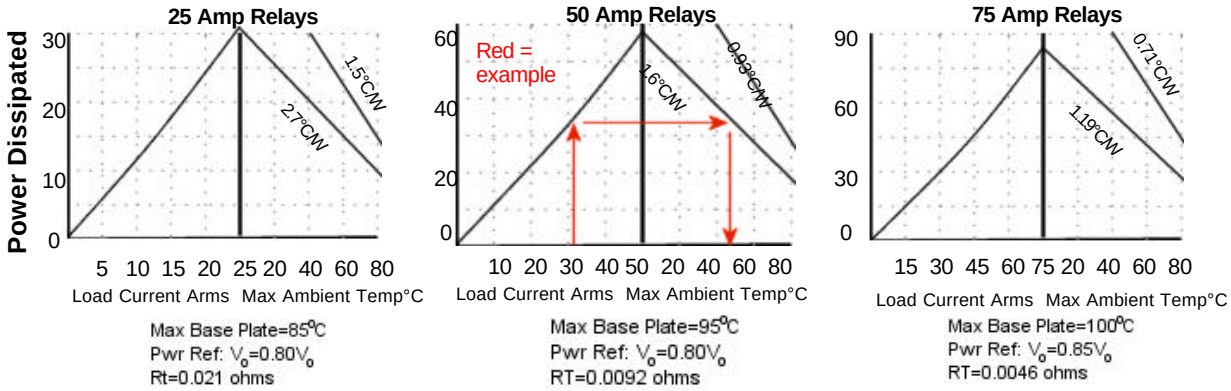
General Specifications

Dielectric Strength: Input / Output / Base	4000 Vrms
Ambient Operating Temperature Range	-40°C to 85°C, when used with an appropriate heat sink and air flow
Ambient Storage Temperature Range	-40°C to 125°C
Terminals	Four screws and saddle clamps provided, unmounted
Screw torque:	6-32 Screws 10 inch lbs.; 8-32 screws 20 inch lbs.
Safety Cover	Clear, snap on, with 4 holes for multi-meter test probes
Shipping	4.2 oz (130.6 g) weight typical. Box = 3.5x2x1.5 inches (87.5x50x37.5 mm)

Power-IO™

H Family of Solid State Relays
Up to 75 Amps
Up to 330 Vac or 660 Vac switched

Heat sink calculations. The left side of the graph shows the total power dissipated as watts of heat, when the relay is in the "on" state. The right side of the graph shows how different heat sinks will "typically" dissipate this heat when in different ambient temperature applications, where unrestricted air is permitted to flow up and through the heat sink. Between the relay and the heat sink, you should install: a Power-IO thermal transfer pad, OR a 0.002 thick layer of Dow Corning™ 340 thermal transfer compound, OR an equivalent thermal transfer gel.



Math calculations, in place of the chart information:
1) Power dissipation (heat generated) for a Power-IO solid state relay:

$(0.9 \times Irms \times V_o)$ + (Irms² x Rt) = Watts of Heat

For example: Use a HDA-6V50 (50 amp relay) for a 31 amp application:
(0.9 x 31Amps x 0.80) + (31Amps² x 0.0092 ohms) = 31.16 watts of heat

2) What size heat sink do I need?:

(Max Base Plate Temp - Max Ambient Temp) / Watts Dissipated = ___°C/W

For example: For the solid state relay in example 1 above,
(95°C max base plate - 45°C at your industrial installation) / 31.16 watts = 1.6°C/W
You need a heat sink that is rated 1.6 °C/W or **LOWER**. The Power-IO 1.6°C/W heat sink would be a good choice or the 1.0°C/W heat sink would offer even better performance. Our calculations include the thermal junctions between the relay, the thermal compound, and the heat sink. We also use a conservative 115°C max for the heat sink which is 10°C below the theoretical 125°C limit.

Precautions:
The products that are designed, manufactured, or sold by POWER-IO are intended to be installed or serviced by electrically trained personnel. In addition, there are local, national, factory, and other regulations (sometimes referred to as the NEC, National Electrical Code, OSHA, or equivalent) that must be strictly followed during the installation and use of any POWER-IO product. Failure to follow all of these regulations can result in downtime, damage, injury, or death. It is important that the customer anticipate the temperature requirements of the product. To ensure the longest possible life, it is customary that the electrical design not exceed 80% of the max amperage for relays, circuit breakers, fuses, wiring and other electronic components in an installation, when at full operating temperature. Power-IO warrants its products for a period of 2 years from the date of manufacture to be free from defects in both workmanship and materials. See www.power-io.com for further information.

Power-IO, Inc. 537 Braemar Avenue Naperville, IL 60563 USA Tel: 630-717-7335 www.power-io.com
Specifications subject to change without notice. ©2003-2008 Power-IO. PN:HDA08/01/2008