

HPA Series Solid State Relay

HPA系列面板型固态继电器

Solid State Relay | P/Z Trigger
Thyristor Output | LED Indicator



7 Key Features | 七大核心特性

- 1. 25 / 40 / 60 / 80 / 100 多电流规格**
25 / 40 / 60 / 80 / 100 rated current options
- 2. 负载电压范围 48-440VAC**
48-440VAC load voltage range
- 3. 控制电压 4-32VDC**
4-32VDC control input
- 4. P 随机 / Z 过零触发可选**
P random turn-on / Z zero-cross trigger options
- 5. 面板/散热器安装结构**
Panel or heat-sink mounting structure
- 6. 输入输出耐压 4000VACrms**
Input-output isolation: 4000VACrms
- 7. 符合 CE / EMC / RoHS 应用要求**
Supports CE / EMC / RoHS application requirements

Product Overview | 产品概述

HPA 系列为面板型交流固态继电器，覆盖 P 随机触发与 Z 过零触发两种触发代码，两种触发方式均提供 25A / 40A / 60A / 80A / 100A 五个电流等级，负载电压范围为 48-440VAC，控制输入为 4-32VDC。产品采用可控硅交流输出，具备 LED 状态指示和面板/散热器安装结构，适用于工业加热、自动化设备以及一般交流负载的无触点开关控制。

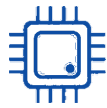
The HPA series is a panel-mount AC solid state relay family covering both P random turn-on and Z zero-cross trigger codes. Each trigger mode is available in 25A / 40A / 60A / 80A / 100A current ratings with a 48-440VAC load voltage range and 4-32VDC control input. The thyristor AC output, LED status indication and panel or heat-sink mounting structure support contactless switching of industrial heating, automation equipment and general AC loads.

Ordering Code | 型号说明

HPA	38	P	25
产品系列 Product Series	电压代码 Voltage Code	触发代码 Trigger Code	额定电流 Rated Current
HPA: 面板型交流 固态继电器系列 HPA: panel-mount AC solid state relay series	38: 48-440VAC 负 载电压范围 38: 48-440VAC load voltage range	P: 随机触发 P: random turn-on	25: 25A 额定负载 电流 25: 25A rated load current

Typical Applications | 典型应用

 工业加热控制 Industrial Heating Control	 自动化设备 Automation Equipment	 塑料成型设备 Plastic Molding Equipment
 包装机械 Packaging Machinery	 暖通空调 HVAC Systems	 测试设备 Testing Equipment



特性与安装 / Characteristics & Integration

通用数据表 | General Data

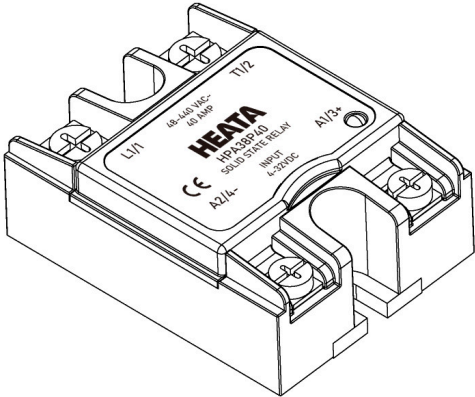
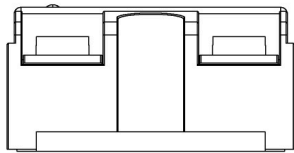
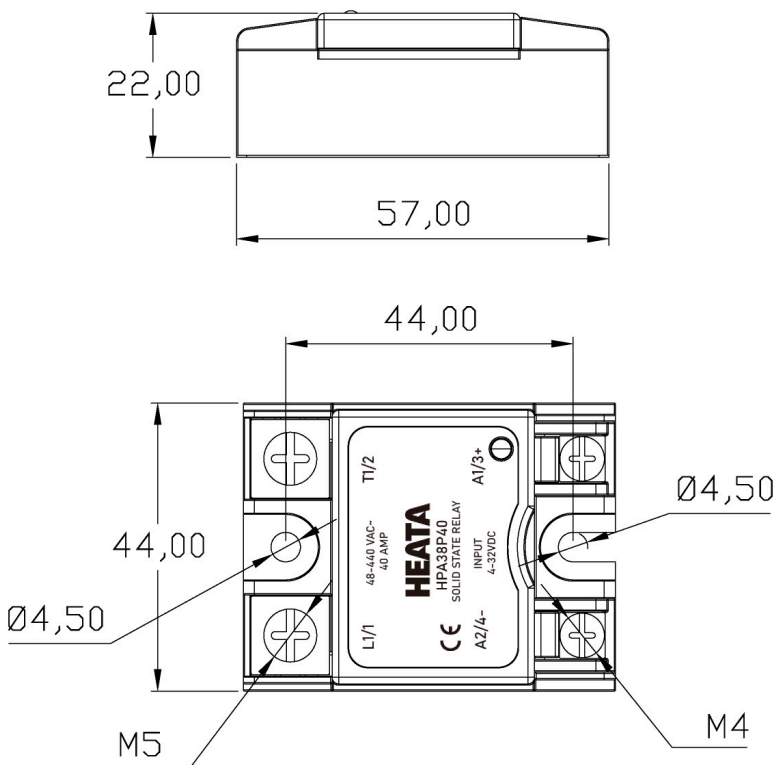
材料 / Material	Noryl GFN 1, black
安装方式 / Mounting	Panel / heat sink mounting
触摸保护 / Touch protection	IP20 cover recommended
基板 / Baseplate	Aluminum
输入-输出绝缘 / Input-output isolation	>=4000VACrms
输出-外壳绝缘 / Output-case isolation	>=2500VACrms (25/40A); >=4000VACrms (60A and above)
工作温度 / Operating temperature	-20 to +70 °C
储存温度 / Storage temperature	-40 to +100 °C
相对湿度 / Relative humidity	<95%, non-condensing

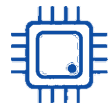
系列型号表 | Series Model Matrix

型号 Model	额定电流 Rated Current	负载电压范围 Load Voltage Range	控制电压范围 Control Voltage Range	输出 / 触发 Output / Trigger
HPA38P25	25A	48-440VAC	4-32VDC	随机触发 Random turn-on
HPA38P40	40A	48-440VAC	4-32VDC	随机触发 Random turn-on
HPA38P60	60A	48-440VAC	4-32VDC	随机触发 Random turn-on
HPA38P80	80A	48-440VAC	4-32VDC	随机触发 Random turn-on
HPA38P100	100A	48-440VAC	4-32VDC	随机触发 Random turn-on
HPA38Z25	25A	48-440VAC	4-32VDC	过零触发 Zero-cross
HPA38Z40	40A	48-440VAC	4-32VDC	过零触发 Zero-cross
HPA38Z60	60A	48-440VAC	4-32VDC	过零触发 Zero-cross
HPA38Z80	80A	48-440VAC	4-32VDC	过零触发 Zero-cross
HPA38Z100	100A	48-440VAC	4-32VDC	过零触发 Zero-cross

外形尺寸 | Mechanical Dimensions

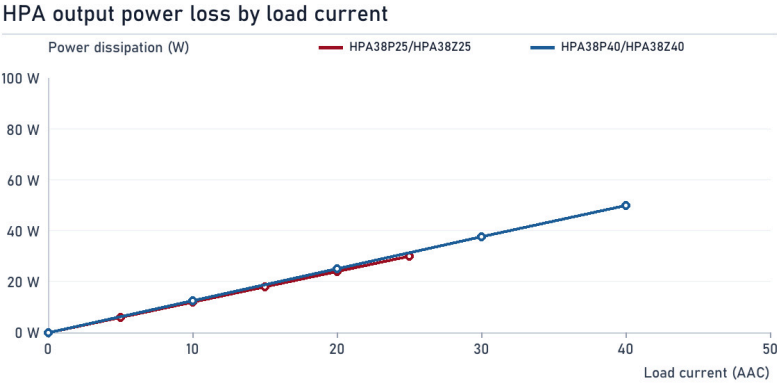
单位 / Unit: mm



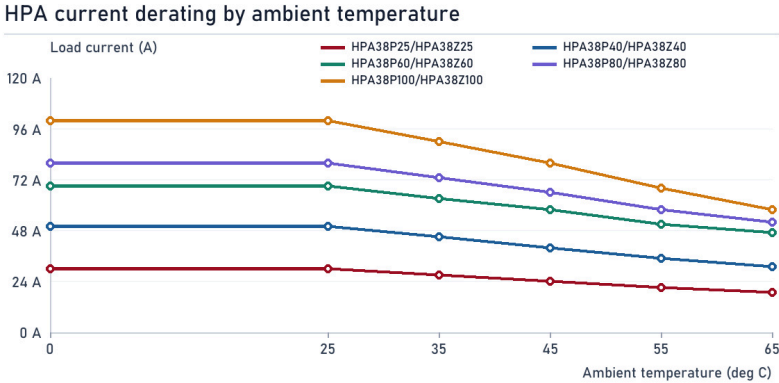


输出功率损耗与电流降额曲线 | Power Loss & Current Derating

● 输出功率损耗曲线 25/40A / Output power loss curve 25/40A



● 环境温度电流降额曲线 / Current derating by ambient temperature



兼容性和符合性 | Compatibility & Compliance

项目 Item	参数 Rating
认证 Certification	CE / cURus application reference
低压指令 LVD	EN 60947-4-3
电磁兼容 EMC	EN 60947-4-3 / EN 61000-4 series
抗扰度 Immunity	ESD, RF field, burst, surge, voltage dip
发射 Emission	EN 55011 Class A
RoHS RoHS	EU RoHS compliant / China RoHS 25
短路保护 Short circuit protection	Fuse coordination reference, UL508

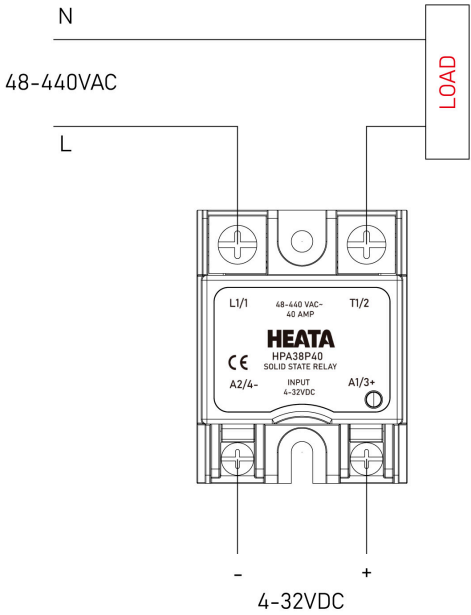
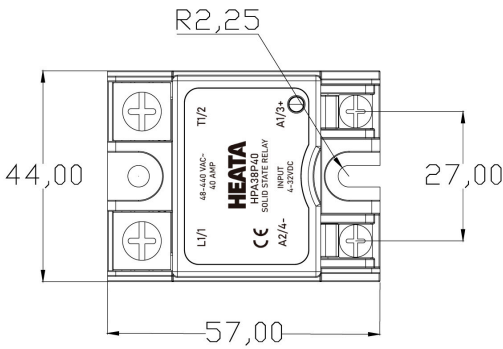
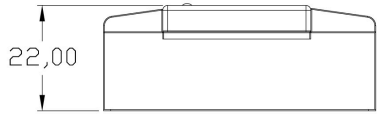


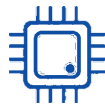
接线规格表 | Wiring Specification Table

项目 Item	1/L1, 2/T1	A1+, A2-
导体 Conductor	75 °C copper wire	60/75 °C copper wire
连接类型 Connection type	M5 screw terminal	M4 screw terminal
剥线长度 Stripping length	12 mm	8 mm
硬线 Solid / stranded wire	1x 2.5-6.0 mm ² / 14-10 AWG	1x 0.5-2.5 mm ² / 18-12 AWG
扭矩 Terminal torque	2.4 Nm (21.2 lb-in)	0.5 Nm (4.4 lb-in)
安装螺栓 Mounting screw	M5, 1.5-2.0 Nm	M5, 1.5-2.0 Nm



接线示意图 | Wiring Diagram





性能 / Performance

输出参数表 | Output Parameters

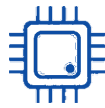
项目 Item	HPA38P25 HPA38Z25	HPA38P40 HPA38Z40	HPA38P60 HPA38Z60	HPA38P80 HPA38Z80	HPA38P100 HPA38Z100
最高运行电流 AC-51 [AAC] Max. operating current AC-51 [AAC]	25	40	60	80	100
工作频率范围 [Hz] Operating frequency [Hz]	45-65	45-65	45-65	45-65	45-65
负载电压范围 [VAC] Load voltage range [VAC]	48-440	48-440	48-440	48-440	48-440
关断/阻断电压 [Vp] Blocking voltage [Vp]	600	600	600	600	600
额定电压下泄漏电流 [mAAC] Leakage current at rated voltage [mAAC]	<3	<3	<3	<3	<3
最小工作电流 [mAAC] Minimum operational current [mAAC]	250	400	250	400	500
瞬态浪涌电流 [Ap] Non-repetitive surge current [Ap]	175	280	550	800	1096
熔化热能值 I2t (10 ms) [A2s] I2t for fusing (10 ms) [A2s]	215	560	1500	3200	6000
功率因数 Power factor	>0.95	>0.95	>0.95	>0.95	>0.95
临界 dV/dt [V/us] Critical dV/dt [V/us]	>=1000	>=1000	>=1000	>=1000	>=1000

输入参数表 | Input Parameters

项目 Item	参数 Rating
控制电压范围 [VDC] Control voltage range [VDC]	4-32
确保导通电压 [VDC] Guaranteed ON Voltage [VDC]	3.5
确保关断电压 [VDC] Guaranteed OFF Voltage [VDC]	1
最大控制电流 [mA] Maximum control current [mA]	<=15
最大反向电压 [VDC] Maximum reverse voltage [VDC]	32
接通/关断时间 [cycle] Turn-on / turn-off time [cycle]	1/2 max.
状态指示 Status indication	LED

热数据 | Thermal Data

项目 Item	HPA38P25 HPA38Z25	HPA38P40 HPA38Z40	HPA38P60 HPA38Z60	HPA38P80 HPA38Z80	HPA38P100 HPA38Z100
最高结温 Max. junction temperature	125 °C	125 °C	125 °C	125 °C	125 °C
结到外壳热阻 Rthjc Junction-case thermal resistance Rthjc	<2.31 °C/W	<1.68 °C/W	<0.90 °C/W	<0.63 °C/W	<0.35 °C/W
外壳到散热器热阻 Rthcs Case-heatsink thermal resistance Rthcs	<0.054 °C/W	<0.054 °C/W	<0.20 °C/W	<0.15 °C/W	<0.10 °C/W
散热界面 Thermal interface	Thermal grease or pad	Thermal grease or pad	Thermal grease or pad	Thermal grease or pad	Thermal grease or pad



散热器选择 | Heat Sink Selection

型号 Model	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
HPA38P25 HPA38Z25	1.02	0.70	0.37	0.05	-	-
HPA38P40 HPA38Z40	0.36	0.16	-	-	-	-
HPA38P60 HPA38Z60	0.71	0.51	0.32	0.13	-	-
HPA38P80 HPA38Z80	0.61	0.46	0.32	0.18	0.04	-
HPA38P100 HPA38Z100	0.51	0.41	0.32	0.22	0.13	0.03

说明 / Note: Values are thermal resistance Rthsa (°C/W). Lower values indicate better cooling.

