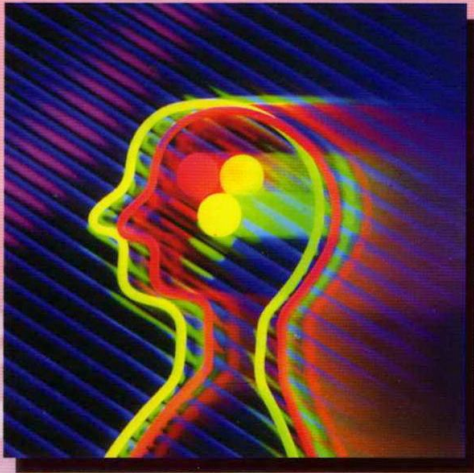


FOTEK

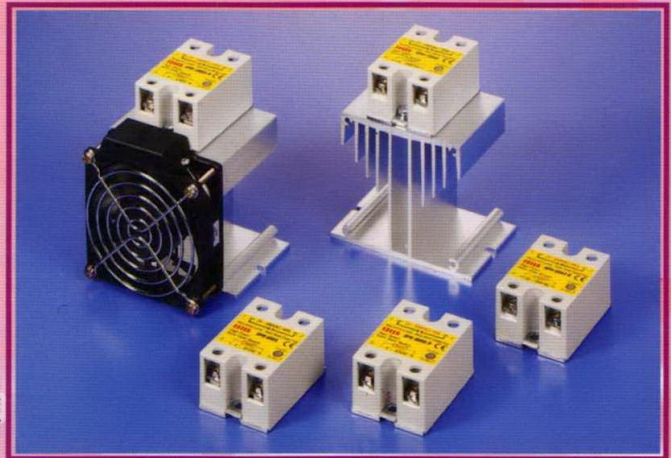


ESR series
High Power Tri Phase
Solid State Module
高功率三相固態模組

HPR series
High Power Single Phase
Solid State Module
高功率單相固態模組



- * High Dielectric strength over 4KV
- * High Isolation strength over 100M Ω /500VDC
- * With over heat protection Circuit (120 $^{\circ}$ C)
- * High surge current sustenance
- * High surge voltage sustenance
- * Conformity with EN60947-4-3 and EN60950
- * 高電介強度超過4KV
- * 高絕緣強度超過100M Ω /500VDC
- * 附過熱保護回路可防止過熱破壞
- * 耐瞬間電流超過額定電流10倍以上
- * 附雙重突波吸收回路有效防止突波破壞
- * 符合EN60947-4-3 AND EN60950標準



陽明電機股份有限公司
FOTEK CONTROL CO., LTD.

◆ **Specification [Rated current corresponding to Resistive load]**

| Type | 型式 | Standard type / 標準型 | | | | |
|---------------------------|-------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-25DA | ESR-40DA | ESR-60DA | ESR-80DA | ESR-100DA |
| Rated current | 額定電流 | 25A max | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 259A ² s | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 275A | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | | | |

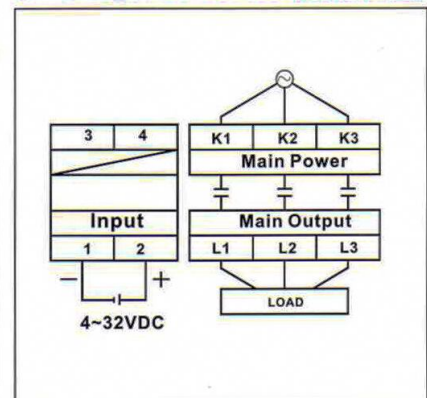
| Type | 型式 | High voltage type / 高壓型 | | | | |
|---------------------------|-------|-------------------------|---------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-25DA-H | ESR-40DA-H | ESR-60DA-H | ESR-80DA-H | ESR-100DA-H |
| Rated current | 額定電流 | 25A max | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 259A ² s | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 275A | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 90 ~ 480VAC | | | | |

| General specification / 共同規格 | | |
|------------------------------|-------|--|
| Input voltage | 輸入電壓 | 4 ~ 32 VDC |
| Turn off voltage | 關閉電壓 | <3.0 VDC |
| Input current | 輸入電流 | 30mA max. |
| Control method | 控制方式 | Zero cross switching |
| Leakage current | 洩漏電流 | 5 mA |
| Response time | 反應時間 | 8.3 ms (60Hz) |
| Over heat protection | 過熱保護 | Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 | 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 | 4 KVrms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 | 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 | -40°C ~ +80°C ; 35 ~ 85%RH |

◆ **Outline dimension / 外形尺寸**

| ESR-xxDA / ESR-xxDA-H | ESR-□□□+ Heat sink (HS-ESR-100) + Fan |
|-----------------------|---------------------------------------|
| | |

◆ **Connection/接線圖**



DC to AC 高功率三相固態模組

ESR
Series

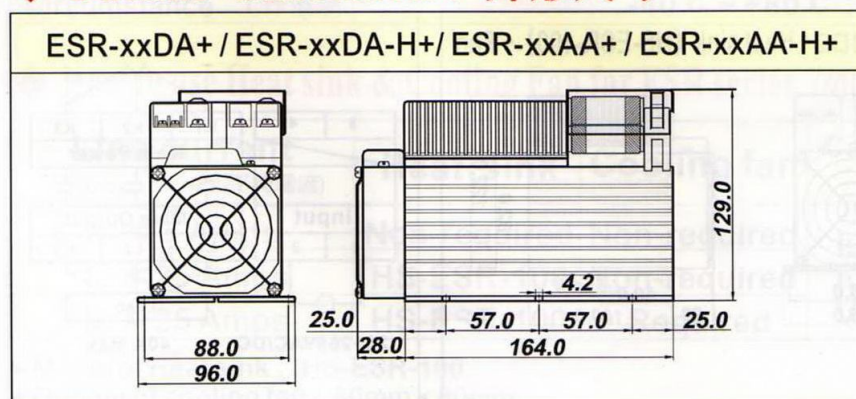
◆ Specification [Rated current corresponding to Resistive load]

| Type | 型式 | Standard type / 標準保險絲型 | | | |
|---------------------------|-------|------------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-40DA+ | ESR-60DA+ | ESR-80DA+ | ESR-100DA+ |
| Rated current | 額定電流 | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 40A/600VAC | 63A/600VAC | 80A/600VAC | 100A/600VAC |
| Surge current | 耐突波電流 | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | | |

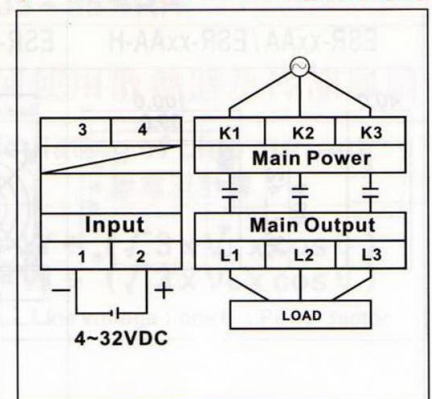
| Type | 型式 | High voltage fuse type / 高壓保險絲型 | | | |
|---------------------------|-------|---------------------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-40DA-H+ | ESR-60DA-H+ | ESR-80DA-H+ | ESR-100DA-H+ |
| Rated current | 額定電流 | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 40A/600VAC | 63A/600VAC | 80A/600VAC | 100A/600VAC |
| Surge current | 耐突波電流 | 650A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 90 ~ 480VAC | | | |

| General specification / 共同規格 | | |
|------------------------------|-------|--|
| Input voltage | 輸入電壓 | 4 ~ 32 VDC |
| Turn off voltage | 關閉電壓 | <3.0 VDC |
| Input current | 輸入電流 | 30mA max. |
| Control method | 控制方式 | Zero cross switching |
| Leakage current | 洩漏電流 | 5 mA |
| Response time | 反應時間 | 8.3 ms (60Hz) |
| Over heat protection | 過熱保護 | Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 | 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 | 4 KVRms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 | 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 | -40°C ~ +80°C ; 35 ~ 85%RH |

◆ Outline dimension / 外形尺寸



◆ Connection/接線圖



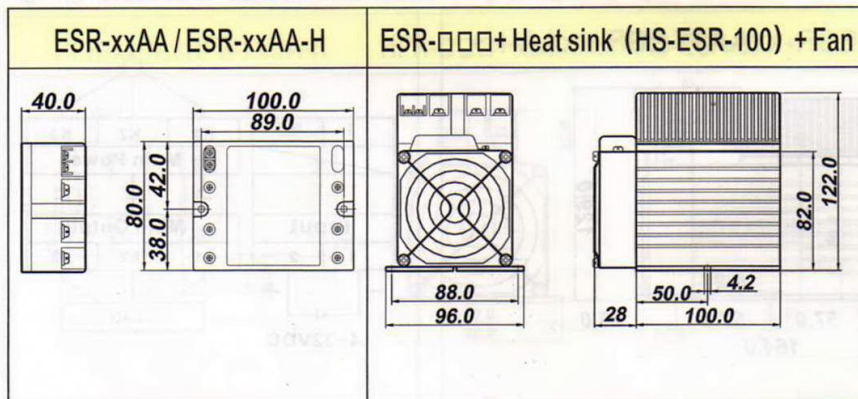
◆ **Specification [Rated current corresponding to Resistive load]**

| Type | 型式 | Standard type / 標準型 | | | | |
|---------------------------|-------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-25AA | ESR-40AA | ESR-60AA | ESR-80AA | ESR-100AA |
| Rated current | 額定電流 | 25A max | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 259A ² s | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 275A | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | | | |

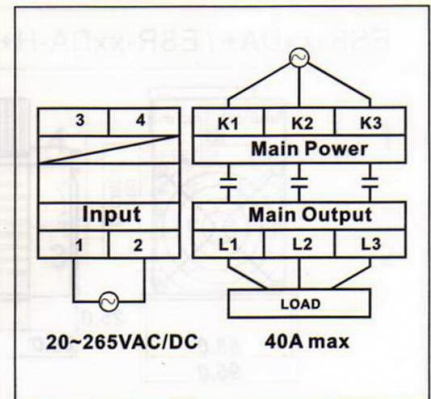
| Type | 型式 | High voltage type / 高壓型 | | | | |
|---------------------------|-------|-------------------------|---------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-25AA-H | ESR-40AA-H | ESR-60AA-H | ESR-80AA-H | ESR-100AA-H |
| Rated current | 額定電流 | 25A max | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 259A ² s | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 275A | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 90 ~ 480VAC | | | | |

| General specification / 共同規格 | | |
|------------------------------|-------|--|
| Input voltage | 輸入電壓 | 20 ~ 265 VAC/DC |
| Turn off voltage | 關閉電壓 | <10 VAC/DC |
| Input current | 輸入電流 | 3VA max. |
| Control method | 控制方式 | Zero cross switching |
| Leakage current | 洩漏電流 | 5 mA |
| Response time | 反應時間 | 49.8 ms (60Hz) |
| Over heat protection | 過熱保護 | Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 | 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 | 4 KVrms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 | 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 | -40°C ~ +80°C ; 35 ~ 85%RH |

◆ **Outline dimension / 外形尺寸**



◆ **Connection/接線圖**



◆ Specification 【Rated current corresponding to Resistive load】

| Type | 型式 | Standard type / 標準保險絲型 | | | |
|---------------------------|-------|------------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-40AA+ | ESR-60AA+ | ESR-80AA+ | ESR-100AA+ |
| Rated current | 額定電流 | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 40A/600VAC | 63A/600VAC | 80A/600VAC | 100A/600VAC |
| Surge current | 耐突波電流 | 410A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | | |

| Type | 型式 | High voltage fuse type / 高壓保險絲型 | | | |
|---------------------------|-------|---------------------------------|----------------------|----------------------|----------------------|
| Model | 型號 | ESR-40AA-H+ | ESR-60AA-H+ | ESR-80AA-H+ | ESR-100AA-H+ |
| Rated current | 額定電流 | 40A max. | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 664A ² s | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 40A/600VAC | 63A/600VAC | 80A/600VAC | 100A/600VAC |
| Surge current | 耐突波電流 | 650A | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 90 ~ 480VAC | | | |

| General specification / 共同規格 | | |
|------------------------------|-------|--|
| Input voltage | 輸入電壓 | 20 ~ 265 VAC/DC |
| Turn off voltage | 關閉電壓 | <10 VAC/DC |
| Input current | 輸入電流 | 3VA max. |
| Control method | 控制方式 | Zero cross switching |
| Leakage current | 洩漏電流 | 5 mA max. |
| Response time | 反應時間 | 8.3 ms (60Hz) |
| Over heat protection | 過熱保護 | Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 | 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 | 4 KVrms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 | 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 | -40°C ~ +80°C ; 35 ~ 85%RH |

◆ How to use Heat sink & Cooling Fan for ESR series / 如何使用散熱器及冷卻風扇

| Line current (Average current/平均電流) | Heat sink | Cooling fan | Calculating of Line current 線電流計算 |
|--|--------------|--------------|--|
| I _L < 5 Amps | Non-required | Non-required | $I_L = W \div (\sqrt{3} \times V_L \times \cos \theta)$ $I_L = W \div (\sqrt{3} \times V_L \times \cos \theta)$ V _L : Line voltage ; cos θ : Power factor |
| I _L < 25 Amps | HS-ESR-100 | Non-required | |
| I _L > 25 Amps | HS-ESR-100 | Required | |

* Model of Heat sink : HS-ESR-100

* Outline of cooling fan : 80mm x 80mm

◆ Specification 【Rated current corresponding to Resistive load】

| Type | 型式 | Standard type / 標準型 | | |
|---------------------------|-------|----------------------|----------------------|----------------------|
| Model | 型號 | HPR-60DA | HPR-80DA | HPR-100DA |
| Rated current | 額定電流 | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | |

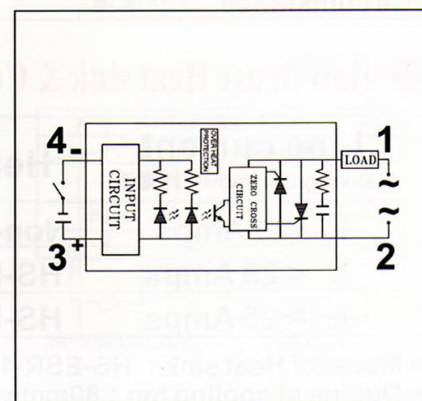
| Type | 型式 | High voltage type / 高壓型 | | |
|---------------------------|-------|-------------------------|----------------------|----------------------|
| Model | 型號 | HPR-60DA-H | HPR-80DA-H | HPR-100DA-H |
| Rated current | 額定電流 | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 1800A ² s | 3200A ² s | 7200A ² s |
| Surge current | 耐突波電流 | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 550VAC | | |

| General specification / 共同規格 | |
|------------------------------|---|
| Input voltage | 輸入電壓 4 ~ 32 VDC |
| Turn off voltage | 關閉電壓 <3.0 VDC |
| Input current | 輸入電流 30mA max. |
| Control method | 控制方式 Zero cross switching |
| Leakage current | 洩漏電流 5 mA |
| Response time | 反應時間 8.3 ms (60Hz) |
| Over heat protection | 過熱保護 Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 4 KVrms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 -40°C ~ +80°C ; 35 ~ 85%RH |

◆ Outline dimension / 外形尺寸

| HPR-xxDA / HPR-xxDA-H | HPR-□□□+Heat Sink (HS-ESR-60) + Fan |
|-----------------------|-------------------------------------|
| | |

◆ Connection/接線圖



◆ Specification 【Rated current corresponding to Resistive load】

| Type | 型式 | Standard type / 標準型 | | |
|---------------------------|-------|----------------------|----------------------|----------------------|
| Model | 型號 | HPR-60AA | HPR-80AA | HPR-100AA |
| Rated current | 額定電流 | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 63A /600VAC | 80A /600VAC | 100A /600VAC |
| Surge current | 耐突波電流 | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 380VAC | | |

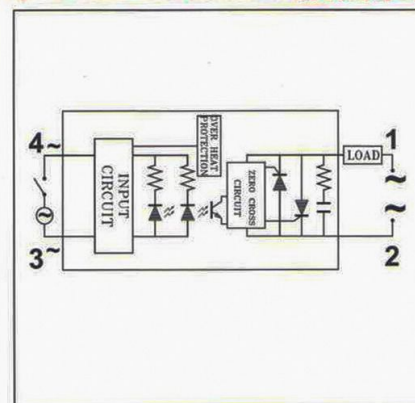
| Type | 型式 | High voltage type / 高壓型 | | |
|---------------------------|-------|-------------------------|----------------------|----------------------|
| Model | 型號 | HPR-60AA-H | HPR-80AA-H | HPR-100AA-H |
| Rated current | 額定電流 | 60A max. | 80A max. | 100A max. |
| I ² t for fuse | 熔斷電流 | 1800A ² s | 3200A ² s | 7200A ² s |
| Protection fuse | 保險絲 | 63A /600VAC | 80A /600VAC | 100A /600VAC |
| Surge current | 耐突波電流 | 850A | 1200A | 1750A |
| Peak voltage | 耐突波電壓 | 1200VAC | 1200VAC | 1200VAC |
| Output voltage | 輸出電壓 | 24 ~ 550VAC | | |

| General specification / 共同規格 | |
|------------------------------|---|
| Input voltage | 輸入電壓 20 ~ 265 VAC/DC |
| Turn off voltage | 關閉電壓 <10 VAC/DC |
| Input current | 輸入電流 3VA max. |
| Control method | 控制方式 Zero cross switching |
| Leakage current | 洩漏電流 5 mA max. |
| Response time | 反應時間 8.3 ms (60Hz) |
| Over heat protection | 過熱保護 Turn off output over 120°C ; Reset below 110°C |
| Input immunity | 輸入耐突波 2 KV (EN61000-4-4) |
| Isolation strength | 電介強度 4 KVrms (EN60950/VDE0805) |
| Insulation strength | 絕緣強度 100MΩ / 500VDC (EN60950/VDE0805) |
| Circumstance | 工作環境 -40°C ~ +80°C ; 35 ~ 85%RH |

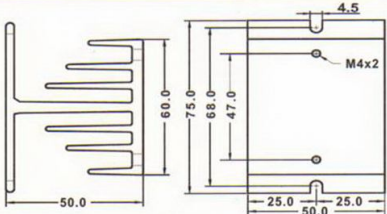
◆ Outline dimension / 外形尺寸

| HPR-xxAA / HPR-xxAA-H | HPR-xxAA+Heat Sink (HS-ESR-60) + Fan |
|-----------------------|--------------------------------------|
| | |

◆ Connection/接線圖




◆ How to use Heat sink & Cooling Fan for HPR series / 如何使用散熱器及冷卻風扇

| Line current (Average current / 平均電流) | Heat sink | Cooling fan | Heat sink (HS-50H)  |
|--|--------------|--------------|---|
| IL < 5 Amps | Non-required | Non-required | |
| IL < 12 Amps | HS-50H | Non-required | |
| IL < 25 Amps | HS-ESR-60 | Non-required | |
| IL > 25 Amps | HS-ESR-60 | Required | |

◆ Notice of use / 使用注意事項

- 1> To protect the solid state module against a short-circuit of the load, please use a fuse with a I^2t value < 1/2 I^2t value specified.
請加裝快速保險絲(I^2t value 小於額定值的一半), 以防止因負載短路而造成固態模組燒毀。
- 2> The thermal conductive silicone rubber or thermal grease is required
When the solid state module is mounted on a heat sink
本固態模組加裝散熱器時務必墊高導熱系數的矽膠片或散熱膏【導熱系數(K)>4.5】。
- 3> The rated current is corresponding to a resistive load, if the solid state module is applied in other loads, Please consider the inrush current at turn on and the surge voltage at turn off.
本固態模組所標示的額定電流是以電阻性負載為準, 如果使用在其他負載上須考慮起動電流及關機突波。
 - * **Electric discharge lamps** : Those loads have the 「inrush current」 at turn on and the 「surge voltage」 at turn off, please use 「high voltage type」 on 220VAC mains.
電子起動式燈具(如日光燈) : 須考慮起動電流及關機突波, 220VAC電源系統請選用「高壓型」。
 - * **Incandescent lamp** : The rated current of the module must be over 4 times of the incandescent lamp current.
炙熱燈泡(如IR燈管) : 須考慮起動電流, 固態模組的額定電流須大於炙熱燈泡電流的「四倍」。
 - * **Three phase motors** : The rated current of the module must be over 4 times of the three phase motor average current.
三相馬達 : 須考慮起動電流, 固態模組的額定電流須大於三相馬達平均電流的「四倍」。
 - * **Transformer loads** : The rated current of the module must be over 10 times of the transformer current.
變壓器負載 : 須考慮反電動電流, 固態模組的額定電流須大於變壓負載電流的「十倍」。
 - * **Capacitor loads** : the rated current of the module must be over 3 times of the capacitor current.
電容性負載 : 須考慮充電瞬間電流, 固態模組的額定電流須大於電容性負載電流的「三倍」。

◆ Notice of safety / 安全注意事項

| | |
|--|---|
|  | Warning Potentially hazardous situation, if mishandling, may result in death or serious injury. 潛在危險, 如果操作失當可能導致死亡或嚴重傷害。 |
| <ol style="list-style-type: none"> 1> Please do not touch any terminal of this module while power supply is supplied, if do, it may result in electronic shock. 送電中, 請勿碰觸本固態模組任何接線端子以避免觸電。 2> 「Power supply system」 must to be shutdown before renew the fuse, if not, it may result in electronic shock. 更換保險絲前, 請務必關閉電源系統以避免觸電。 3> Please rated the load current within the specified value, if not, it may result to burn up this module or fuse. 負載電流請勿超過額定電流, 以避免保險絲或本固態模組燒毀。 4> Please tighten the screw terminal over 80kg-cm, if not, it may result to burn up this module or fuse. 請務必鎖緊端子螺絲, 扭力須超過80kg-cm, 否則可能導致本固態模組或保險絲燒毀。 5> If this module is burned up, it may be in short circuit condition or malfunction, Please settle an independent alarm system to ensure safety protection, if not, it may result in a serious accident. 本固態模組燒毀後可能是短路或失控狀態, 請加裝獨立警報系統以確保安全, 否則可能造成嚴重意外事故。 | |

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Specification may be modified without notice in advance.
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