Solid State Relays

block type (zero crossing)

Solid state switching devices are used in most modern automation systems to switch electrical loads.

They offer high durability where a high number of switching operations or a fast switching speed is required. Further benefits are resistance to mechanical shock or vibration, moisture and dust as well as silent operation, maintenance free service and reduction of electromagnetic noise.

Switching is initiated by applying a low DC signal (typically 4-32VDC, 4mA) to the trigger input, placing less demand on control outputs and enhancing safety.

SSRs are normally “zero crossover switching”, only closing or opening when the AC power sine wave crosses zero. This eliminates electromagnetic interference and harmonics on the power supply.

Precautions

1. Fuse protection:
Circuit breakers and similar overload protection devices are too slow to prevent damage to SSRs when short circuits occur. For this purpose ultra-rapid fuses are needed. It is common practice to install DIN-rail mounted fuse holders, making replacement of fuses easy.

2. Heat sinks:
SSRs dissipate power proportional to the load current. When the load current exceeds 4A, heat sinking becomes essential. SSRs should not be mounted directly onto the backing plate of instrument panels as this often leads to overheating. It is also advisable to study the current-versus-temperature derating curves when selecting heatsinks. We recommend to put thermal strips onto heatsinks, changing colour when the rated temperature is exceeded. This makes it possible to detect overheating.

3. Ventilation:
Because Solid State Relays dissipate heat, adequate ventilation needs to be provided in panels and enclosures containing SSRs. If a number of SSRs and other heat generating components are mounted in a panel, it may be necessary to provide forced ventilation. Care should be taken to ensure good airflow over the heatsinks. Therefore the positioning of air vents is important. Obstructions and blind corners should be avoided. When using fans we recommend that the fans blow out rather than suck in. Inlet vents should be spread over a big area, preferably on the underside of the panel. This prevents plastic foil or paper from blocking the suction inlet. Air vents on top of panels should be avoided because somebody may innocently place an obstruction there.

4. Overvoltage:
On three-phase loads it is advisable to use SSRs with a rating of 400-480V, even if a neutral is connected. When the neutral conductor fails or is absent, the voltage per phase may exceed 250V and reach 400V or more. SSRs with a voltage rating of 250V (normal

Single phase solid state relay

Three phase solid state relay

Fuse

Fuse holder

1Ph heatsink and mounting clip

3Ph heatsink and mounting clip

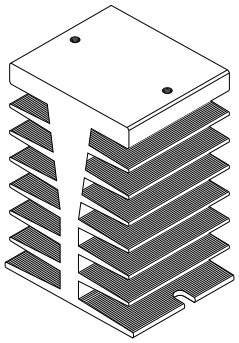
Solid State Relays			
	stock code	trigger voltage	load rating
25A			
Solid State Relay	UMA-S1-250D025L	3--32VDC	25A, 250Vac (5KWatt max.), single phase
Heatsink	UMA-S1-DIS-20		heatsink, complete with DIN-Rail mounting clip
Fuse	UMA-E025-10-038		25A ultra-rapid fuse, 10x38mm
Fuse holder	UMA-GDP0-10-038		DIN-mounting fuse holder for 10x38mm fuse
40A			
Solid State Relay	UMA-S1-250D040L	3--32VDC	40A, 250Vac (9KWatt max.), single phase
Heatsink	UMA-S1-DIS-50		heatsink, complete with DIN-Rail mounting clip
Fuse	UMA-E040-14-051		40 A ultra-rapid fuse, 14x51mm
Fuse holder	UMA-GDP0-14-051		DIN-mounting fuse holder for 14x51mm fuse
50A			
Solid State Relay	UMA-S1-400D050	3--32VDC	50A, 400Vac (11KWatt max.) single phase
Heatsink	UMA-S1-DIS-50		heatsink, complete with DIN-Rail mounting clip
Fuse	UMA-E050-14-051		50A ultra-rapid fuse, 14x51mm
Fuse holder	UMA-GDP0-14-051		DIN-mounting fuse holder for 14x51mm fuse
3x25A			
Solid State Relay	UMA-S3-425D025G	10--40VDC	25A, 400Vac (16 kWatt max.), three phase
Heatsink	UMA-S1-DIS-910		3ph. heatsink, complete with DIN-Rail mounting clip
Mounting clip	UMA-S1-DIN-5		DIN-rail mounting bracket for 3ph. SSR heatsink
Fuse (x3)	UMA-E025-10-038		25A ultra-rapid fuse, 10x38mm (three required)
Fuse holder (x3)	UMA-GDP0-10-038		DIN-mounting fuse holder for 10x38mm fuse (three required)
3x50A			
Solid State Relay	UMA-S3-425D060L	10--40VDC	60A, 400Vac (34 KWatt max.), three phase
Heatsink	UMA-S1-DIS-910		3ph. heatsink, complete with DIN-Rail mounting clip
Mounting clip	UMA-S1-DIN-5		DIN-rail mounting bracket for 3ph. SSR heatsink
Fan	UMA-VEN-90		Fan kit for heatsink (required if I > 30A)
Fuse (x3)	UMA-E050-14-051		50A ultra-rapid fuse, 14x51mm (three required)
Fuse holder (x3)	UMA-GDP0		DIN-mounting fuse holder for 14x51mm fuse (three required)

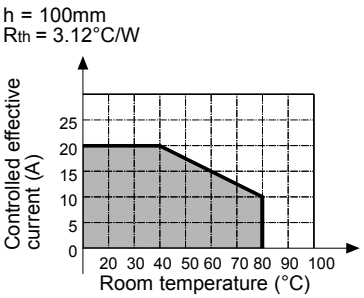
Solidstate Relay Accessories

Heatsinks

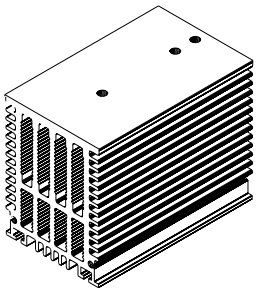
stock code	Nominal Rating (A)	Suitable for:	Size (mm) LxWxH	Derating curve
UMA-S1-DIS-20	20	UMA-S1-250D025L	80x50x70	DIS 20
UMA-S1-DIS-50G	50	UMA-S1-250D025L UMA-S1-250D040L UMA-S1-400D050A	100x60x78	DIS 50G
UMA-S1-DIS-910	3x30 3x55 (with fan)	UMA-S3-425D025G UMA-S3-425D040G	80x127x102	DIS 910

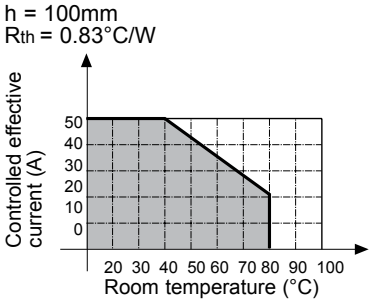
UMA-S1-DIS-20



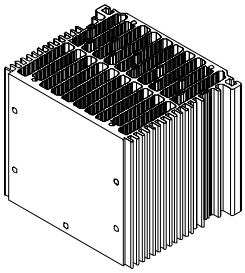


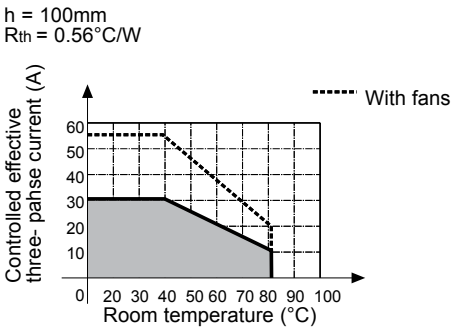
UMA-S1-DIS-50G





UMA-S1-DIS-910





Should the stated point [Tmaxa Imax] be outside the working area, it is necessary to equip the heatsink with a fan and a safety thermostat.
N.B. The operating point has not to be outside the delimited area.
- DIS908/910 heatsinks are suitable for three-phase solid state relays of RZ series.
- Controlled three-phase effective current refers to the used line current of threephase load.
- Heatsinks used with a cooling fan should be equipped with safety thermostat, so that the solid state relay can be switched off in case of fan failure.

Data surveyed with 40°C ambient temperature and heatsink in vertical position surrounded by 15cm free space; natural convection; contact surface with the heating element = ~ 8cm2 [38mmx 20mm]

Ultrarapid fuses

stock code	current rating	suitable for	Size (mm)
UMA-E010-10-038	10A	GTS/GTT-15	10x38
UMA-E016-10-038	16A	GTS/GTT-15	10x38
UMA-E025-10-038	25A	GTS/GTT-25	10x38
UMA-E040-14-051	40A	GTS/GTT-40	14x51
UMA-E060-22-058	63A	GTS/GTT-60	22x58
UMA-E100-22-058	100A	GTS/GTT-90	22x58
UMA-E125-30-050	125A	GTS/GTT-120	100x51x30

Fuse holders (DIN rail mounting)

stock code	For fuse size
UMA-GDP0-10-038	10x38
UMA-GDP0-14-051	14x51
UMA-GDP0-22-058	22x58
UMA-GDP0-40-145 *	100x51x30

Silicone heat transfer paste (for coupling the Solidstate relay to the heatsink)

stock code	Tube
UMB-YSILPASTE	10g
UMB-YSILPAST150	150g

Fan kit (230Vac, attachable to heatsink):

stock code	Suitable for:	Size (mm) LxWxH
RMA-FYFAN80X80	UMA-S1-DIS-910	80x80x40
	UCG-GTS120A-480	
	UCG-GTT120A-4800	

*** see reverse of page for details**