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SOLID STATE RELAY - SSR
150 / 200 / 300 A
INSTRUCTIONS MANUAL - V1.0x_B

FEATURES

The Solid State Relays (SSR) are electronic devices used for switching resistive or inductive AC loads with many advantages over the conventional relays.
Increased lifetime, due to the fact that there are no moving parts, and thus, no mechanical wear. Zero cross switching, which implies lower electrical noise. Silent operation. Control INPUT signal optically isolated from the OUTPUT. Internal snubber provided.
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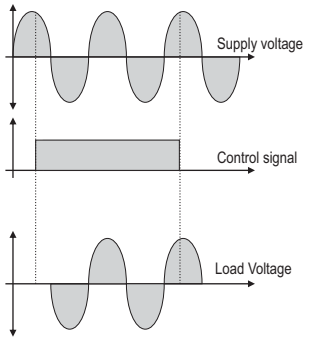
OPERATION

A control voltage applied to the device INPUT turns the SSR ON, energizing the load. The conduction effectively occurs at the next zero crossing of the mains voltage. When the INPUT signal is removed, the SSR turns OFF when the load reaches a current equal to zero. This means that the load switching may be delayed by ½ of mains period (or 8.3 ms for the 60 Hz mains).

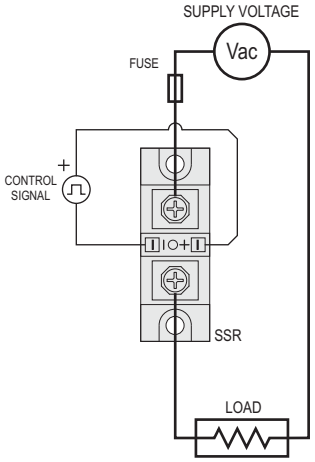


Turning the output ON and OFF only on the mains voltage zero crossing brings important performance advantages to the system: practically no EMI is generated during the load switching and the SSR is submitted to less severe switching conditions. On the other hand, the SSR is suitable to AC loads only (it cannot be used to switch DC loads).

The SSR control signal is indicated by a LED on the SSR body.

ELECTRICAL CONNECTIONS

The two connections needed for the installation of the SSR are the command signal and the load circuit. The load circuit must be protected by an ultra-fast fuse with a rate that matches the SSR nominal current specification. The SSR terminals must be firmly screwed and the wire gauge compatible with the output load.



Recommended cables are:
70, 95 and 310 mm²
for the currents of 150, 200 and 300 A, respectively. For the connections, use compatible cables and terminals to the compression.

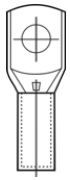


Fig. 1 - Electrical connections

SPECIFICATIONS

Parameter	Unit	Model		
		SSR 48150	SSR 48200	SSR 48300
Load current (I_L)	A rms	150	200	300
Load voltage	V rms	40 to 480		
Turn-on voltage (V_{ssr})	V rms	1.6 to 1.8		
Leakage current	mA rms	< 5.0		
Frequency	Hz	47 to 63		
dv/dt	V/µs	300		
Control voltage	Vcc	4 to 32		
Control current	mAcc	6 to 20		
Switching time	ms	< 10		
Control method		Zero cross trigger		
Isolation	V rms	2000		
Operating temperature	°C	-40 to 80		

HEAT DISSIPATION

The SSR generates heat during its conduction. This heat must be dissipated to avoid SSR fail due to over-heat. The nominal SSR load specification assumes the use of a suitable heat sink. Without a heat sink the allowed load current is substantially reduced. The user may calculate the needed heat sink or make use of a heat sink suggested by Novus.

$$R_{thha} = \frac{75°C - T_{amb}}{I_L \times V_{ssr}}$$

Where:
R thha = Thermal resistance heat sink to ambient
T amb = Maximum ambient temperature
I L = Load current
V ssr = Voltage drop when the SSR is ON.
75°C is the maximum temperature allowed for the

For better heat transfer, a thermal conducting paste must be used between the SSR and the heat sink. The SSR along with its heat sink must be mounted in a vertical position such as to allow for air flow and thus a good heat exchange.

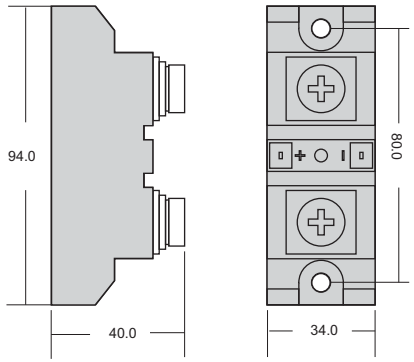


Fig. 2 - Dimensions

The graphs below show the current carrying capacity of the SSR as a function of ambient temperature when mounted on the indicated heatsink and whether or not the fan is used.

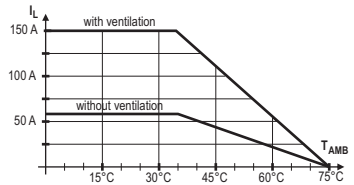


Fig. 3 - Sink NDP3-120 mm: R $_{thha}$ = 0.52 / 0.12 °C / W)

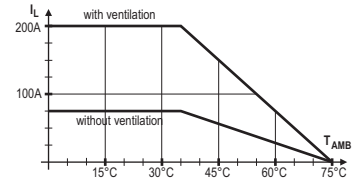


Fig. 4 - Sink NDP3-180 mm: R $_{thha}$ = 0.40 / 0.08 °C / W)

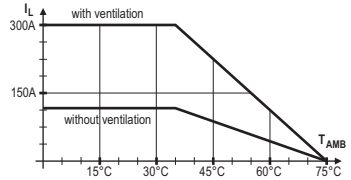


Fig. 5 - Sink NDP3-220 mm: R $_{thha}$ = 0.35 / 0.04 °C / W)

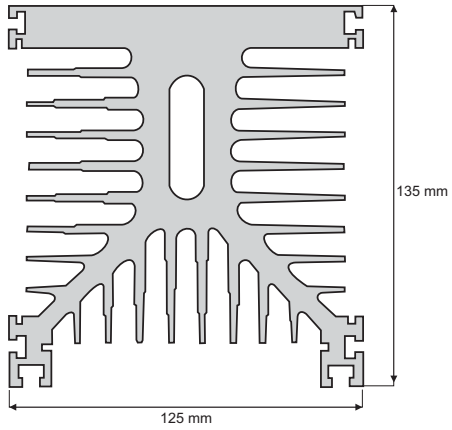


Fig. 6 - Sink NDP3-120 mm: R $_{thha}$ = 0.52 °C / W)

The length measurement of the NDP3 heatsink varies according to the nominal SSR current used:

SSR48150	SSR48200	SSR48300
120 mm	180 mm	220 mm

The proper fan is also offered to the user. It has 127 and 220 Vac power and dimensions of 120x120 x 40 mm. The minimum air flow is 3 m / s.