

AVR TECHNICAL NOTES

In most applications, purchasing a stabiliser is simply a process of deciding the power requirement and the voltage and choosing a suitably rated unit. However, ambient temperature, altitude, load duty cycle, type of load are also all important factors in deciding which AVR to buy. Furthermore, in certain situations it can be necessary to consider in greater detail the characteristics of the electricity supply and connected load when selecting an AVR. Please see the notes below for further details:

Ambient Temperature. Ambient temperatures in excess of 40°C should be mentioned at the time of ordering as AVR size or rating may be affected. As a rule of thumb, output power should be de-rated by 10% - 15% per 10°C above 40°C ambient.

Supply Frequency. The Sollatek standard ranges of AVRs are suitable for both 50Hz and 60Hz supplies. However, frequencies below 50Hz result in larger transformer and therefore AVR size, while frequencies above 50Hz may enable AVR size to be reduced. Any frequency other than 50Hz should be notified at the order/enquiry stage.

Duty Cycle. If the AVR is to be used continually for considerably less than 100% of the time, allowance can be made for this, leading to a reduction in transformer size. The effective power in VA may be estimated from the following formula:

$$\text{Effective VA} = \sqrt{\frac{\text{Time on (mins)}}{\text{Total Time (mins)}}} (I^2) \times \text{Volts} \times 3$$

Time on = time in minutes that AVR supplies current (say 15 minutes)

Total time = total length in minutes of period in question (say 60 minutes)

I = Output current (say 20A)

In the above example, the AVR supplies 20 Amps for 15 minutes out of every 60 minutes. Duty cycle information may result in cost reduction and should be notified at the time of enquiry/order.

Operation at Altitude. The operation of electrical equipment at high altitude causes cooling by the circulation of air to be reduced. The greater the altitude the greater this effect. It is therefore important to indicate that the AVR is destined for a high altitude environment at the time of ordering. In this case, a high altitude is regarded as above 1500m.

Motor Starting. Motor loads draw a very high initial starting current from the AVR. Whilst the AVR is designed to be able to supply this initial high current without damage, repeated motor starts within a short period may cause excessive heating in the AVR. If motor based, air conditioner or refrigeration equipment are likely to constitute a large proportion of the AVR load, this should be indicated at the point of enquiry. Since this could result in an increase in AVR size, it may be beneficial in some instances to fit a soft start device to the motor to reduce starting surges. Please contact customer support at Sollatek UK or your nearest Sollatek agent for further advice.

Neutral. The Sollatek 3 phase AVRs MUST have a fully rated neutral connection to the supply.

Harmonics. It is important to state whether harmonics will be present on the supply, or will be generated by the load. Harmonics can be created by devices such as thyristors, silicon controlled rectifiers, switch mode power supplies, computer, UPS, television loads, fluorescent lamps with electronic ballasts, variable speed drives and welding equipment. Alternatively harmonics can be generated from the supply side by neighboring installations. If you think harmonics are present on the supply please contact customer support at Sollatek UK or your nearest Sollatek agent for further advice.

Circuit Breakers. As a minimum, the mains input to the AVR should be protected by a circuit breaker. For full protection an output circuit breaker should also be fitted. The input circuit breaker should be rated at 1.4 x output current. The output breaker should be rated at output current. The Sollatek AVR – single phase models – are all protected by either a fuse or circuit breaker. Circuit Breaker is an option on the three phase models.

Spike Protection. The AVR is protected against high voltage surges and spikes on input and output by metal oxide varistor based surge suppressors. Spikes can be caused by lightning, switching heavy reactive equipment such as industrial motors and transformers, arc welding and electrical grid switching. In areas of extremely high spike activity, additional protection may be necessary. Please contact customer support at Sollatek UK or your nearest Sollatek agent for further advice.

Cable selection. When selecting cable for the AVR input / out connections, one should bear in mind the input current may be up to 40% higher than the output current of the unit. The input neutral (4-Wire system) must be fitted and be fully rated. Voltage-drop should be kept as low as practicable.

