

ZENER

VARIDRIVE SOLUTIONS

Technical Notes

What are IP Ratings?

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WHAT ARE IP RATINGS?

IP is an abbreviation for Ingress Protection and is generally denoted by a two digit number as specified in Australian Standard AS60529-2004. The object of AS60529-2004 is to give:

- a) Definitions for degrees of protection provided by enclosures of electrical equipment as regards:
 - 1) Protection of persons against access to hazardous parts inside the enclosure;
 - 2) Protection of the equipment inside the enclosure against ingress of solid foreign objects;
 - 3) Protection of the equipment inside the enclosure against harmful effects due to ingress of water.
- b) Designation for these degrees of protection.
- c) Requirements for each designation.
- d) Tests to be performed to verify that the enclosure meets the requirements of this standard.

The ratings are expressed as IP followed by the two-digit rating. The first digit represents the degree of protection against ingress of solid objects, with a zero representing no protection and 6 representing the highest level of protection against ingress of dust.

The second digit represents the degree of protection against ingress of water, with a zero representing no protection and 8 representing total immersion.

If you are designing a system or are unsure as to the nature and degree of protection required for your electrical apparatus then referral to the above standard is highly recommended.

Bear in mind that this is a very brief overview and your perusal of AS60529-2004 will reveal the exact nature of the test requirements and that there are on occasions when third and fourth optional letters may be used EG IP66CS. See section 9 of the standard for a full explanation of these options.

Generally when it comes to variable speed drives, industry practice is to use a low level of IP rating for equipment which will be mounted within another enclosure such as a clean and dry switchboard.

When it comes to standalone wall mounted equipment consideration should be given to the mounting environment.

- Is it clean?
- Will it be subject to water spray such as from fire sprinklers?
- Will it be mounted in a corrosive environment such as could be found close to cooling towers?
- Will it be subject to airborne salt contaminations such as beachside or harbour side locations?
- Will it be mounted in proximity to pressurised pipework or pumps, where there is the possibility of pipe or seal failures which may spray water over the VSD?
- And most importantly, is the VSD being used as part of a mission critical application or as part of fire safety or life saving system?

Give these aspects careful consideration, some would be worthy of a Zener Stainless Steel enclosure solution.

As well as looking after our own Zener designed and manufactured equipment, our service department is frequently asked to service other brands of equipment. From this work, our records clearly show that whether it is Zener equipment or another brand, the longevity and reliability of electronic equipment is very highly correlated to the level of protection against ingress of dust and water and that IP66 protected equipment delivers far superior results for equipment life and reliability when compared to lower levels of protection.

Be aware that VSDs pack a lot of circuitry into tiny spaces and the voltages are high so the last thing you want is dust entering the electronics enclosure with the potential to cause damaging short circuits. Think high levels of atmospheric humidity and overnight condensation, far better to keep moisture out.

Our view, based on many years of experience, is that drives mounted within other cubicles, such as clean and dry non-condensing switchboard environs, is that IP30 is adequate in these circumstances as it provides the necessary personal protection against access to hazardous parts inside the respective VSD enclosure.

However thermal considerations need to be taken into account such as:

- how many drives will go inside the proposed switchboard or electrical enclosure
- what are the VSD power ratings
- what other heat sources are present
- what will the resultant heat load be
- will the proposed enclosure overheat, or will it need auxiliary fan forced ventilation and air filtering to maintain the necessary IP protection rating for the equipment.

This is where experience counts to ensure an adequate outcome.

Once more based on our many years of experience we believe that plant room wall mounted drives are best selected as IP66 enclosure protection which offers the highest level of dust and water protection available other than for immersion purposes. Also be aware that reliability can be seriously compromised if the ventilation fans located outside the electronics compartment are not also rated to the same level of protection.

Think about it – no forced ventilation no VSD in service! All IP66 Zener drives have IP66 rated external heat sink ventilation fans. Pay us a visit at our factory and see them run underwater!

Another benefit of being conversant with AS60529-2004 is that you will avoid the mistake of describing equipment as waterproof or weatherproof, neither of which adequately address the protection requirements.

For example if the intention is to mount the variable speed drive outdoors then descriptions such as weatherproof or waterproof are deficient and do not address the most important issues which are the effects of solar heat gain and the ability to render service and maintenance in inclement weather. If the proposed outdoor mounting is sufficiently severe, such as being adjacent to cooling towers or beachside or harbour side locations, then give consideration to Zener's Stainless Steel enclosures.

We have seen many of our VSDs successfully mounted on exposed rooftops and other severe or challenging outdoor locations and again from our experience we can advise the best ways to go about this but in all cases care must be taken to mount the

drive out of direct sun (solar gain may cause over temperature tripping) and it will need suitable protection against direct rain to allow servicing and maintenance in inclement weather.

Zener offer a range of durable drive enclosures manufactured in sturdy powder coated steel through to integrated stainless steel which requires no additional enclosure and maintains the original drive dimensions.

Email us for guidance or phone one of our engineers to discuss.

CONTACT ZENER

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