

Keeping your equipment cool - important considerations

With summer approaching protecting electrical equipment in both indoor and outdoor environments is vital.

However protecting your equipment from overheating in high ambient temperature extremes can sometimes be difficult depending on the installation environment and the installed equipment to be cooled.

To maintain optimum operating temperature there are a number of cooling methods available for various applications. Below are the key considerations when selecting climate control equipment for cooling of electrical / electronic enclosures.

What is recommended operating temperature of equipment?

Maintaining internal temperature limits within an enclosure is critical to the performance and life of the equipment it houses. All electrical or electronic equipment, depending on its thermal sensitivity has temperature operating limits eg 0°C to +50°C, which determines the final internal temperature limit to be maintained within the enclosure.

What heat sources need to be considered when determining a cooling method?

The internal temperature of an enclosure is affected by ambient (outside temperature) transferring through the enclosure walls, solar radiation (direct sunlight onto outdoor enclosure surfaces) and equipment heat dissipation.

All of these elements must be calculated when determining the combined heat within the enclosure which needs to be removed.

What is equipment heat dissipation?

All operating electrical equipment generates waste heat (watts losses), the level of which is determined by the operating efficiency of the equipment. Such waste heat adds to the ambient air temperature within the enclosure.

What access is there to power supply?

Many of the methods of Climate Control rely on a constant power supply, e.g. AC mains or DC battery. The absence of power supply may preclude some of the cooling options available.

What protection rating is enclosure?

The required protection level (IP Code) of an enclosure is determined by the sensitivity of the installed equipment to temperature, humidity, dust and moisture.

Subject to the environment and equipment sensitivity, enclosures installed indoors may not normally require a higher degree of protection than IP41.

However for both indoor or outdoor installations, fully sealed air-conditioned enclosures rated to IP66 would normally be used where a level of temperature is to be maintained and to protect against condensation.

Enclosures mounted outdoors demand a higher level of protection. A level of IP55 and above would normally maintain an adequate degree of protection from weather conditions. Subject to the equipment operating parameters, vented IP55 enclosures fitted with filtered fans and /or filtered ventilation openings to allow air convection through the enclosure would normally provide adequate protection from dust and water while maintaining the internal temperature to a fixed level above an outside ambient air temperature.

Airflow?

It is important to ensure adequate airflow through or within the enclosure. Most cooling applications require airflow to remove heat, either by circulating within a sealed enclosure e.g air conditioners and heat exchangers or by air exchange by natural convection via ventilation openings or by forced fan ventilation.

The most commonly used cooling methods for enclosures, in order of increasing cost, are natural convection, forced convection (such as fans and blowers) and air conditioning.

For information on B&R's range of climate control equipment contact local B&R sales representative or visit www.brenclosures.com.au

