

# Keeping your cool in control panel enclosures

Amir Sami | Charter Controls

**C**ontrol panel designers are always juggling technical requirements for electrical control panels within financial constraints. On the one hand, there's the desire to select large control panels that maximise the arrangement of electrical equipment, and on the other, there's the necessity to adhere to strict cost constraints, which invariably necessitates compromises.

There's also the issue of potential space limitations within the facility, as well as the current environmental conditions. Having selected the most appropriate enclosure, one of the most challenging tasks to prolong the life and optimise performance of each item of electrical and electronic equipment within the control panel is to control the temperature within the enclosure, and guarantee that the heat dispersion inside the control panel keeps equipment temperatures within acceptable limits.

As internal and external heat are two variables that contribute to the issue of control panels overheating, the temperature inside control panels is proportional to the total heat produced and the efficiency of the enclosure cooling system.

Total internal heat generation can be calculated by determining all thermal losses of each piece of electrical/electronic equipment to be installed. The amount of heat dissipation by variable frequency drives (VFDs), and other items of electrical and electronic equipment, is proportional to their power consumption and efficiency. One of the most cost-effective solutions to



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this problem is to use filter fans of various sizes and airflow volumes to maintain the required temperature inside the panel.

Many fan manufacturers are capable of resolving the above issue. However, as we are all becoming more conscious about our carbon footprint and the need to reduce CO<sub>2</sub> emissions, it is greatly

beneficial both to panel manufacturers and to the environment to select the most value-added supplier of filter fans as a strategic partner. This not only reduces carbon footprint, but also overcomes financial constraints, and ensures that the most suitable and technically advanced fans are utilised.

## Strategic partnerships

Trading in the UK and Ireland as Charter Controls, Unipower UK Ltd. partners with Linkwell Electric, an established OEM of fan, filter, heater and related solutions that enable customers to become more environmentally-friendly and keep components inside the panel cool enough to maximise life expectancy and optimise efficiency.

Many Charter Controls customers across the UK and Ireland are using Linkwell's LK32 series fan filters, for example. One company in particular, Safronics, specifies and supplies control panels, power distribution and process control systems across a wide range of industries, and has highlighted how it has managed to overcome frequent issues by using some of the technical and value-added features offered by these fans. Notably, Safronics' customers in the water industry are aiming to be leaders in net carbon zero emissions.

Stuart Jones and Paul Stead from the Safronics engineering team have commented on how the unimpeded airflow volumes of up to 1,350m<sup>3</sup>/hr have enabled them to reduce the number of fans required, in turn reducing compartment size and freeing up extra space to install more equipment on the control panel door.

It has to be said that the other benefits of being able to use fewer fans include preventing multiple holes from being punched into the panel, thereby reducing wastage, saving design and manufacturing time, and hence reducing costs on multiple fronts, while also reducing control panel power consumption. All of these benefits lead the way in helping panel manufacturers and their customers to reduce carbon footprint, while aiming for the ultimate goal of sustainability and net zero carbon emissions.

### Reversed airflow

Winston Friskin and his team of electrical engineers at Galliford Try, another water industry control panel manufacturer, have also been making use of the reversed airflow capability of the Linkwell LK3243 model. Due to the large VFDs required to be installed in its panels, the reversed airflow feature of this particular model has enabled the air to be pulled out of the panel rather than in. Complementing the smaller fan integrated into the VFD that

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is pulling air out of the drive and into the panel, it makes sense also to install a fan to draw air out of the panel; this eliminates the possibility of any overheating that could result from impeding the airflow of the VFD's fan.

Galliford Try works within key industry standards, specifically IEC 60890 which defines the method of temperature rise calculation, and IEC 61439:1, for low voltage switchgear and control assemblies. The calculation also defines the requirement for an anti-condensation heater to be fitted within the control panel using the internal/external temperature data.

Another notable value-added feature offered by the LK32 series fans and filters is the illuminated-quick release latch for

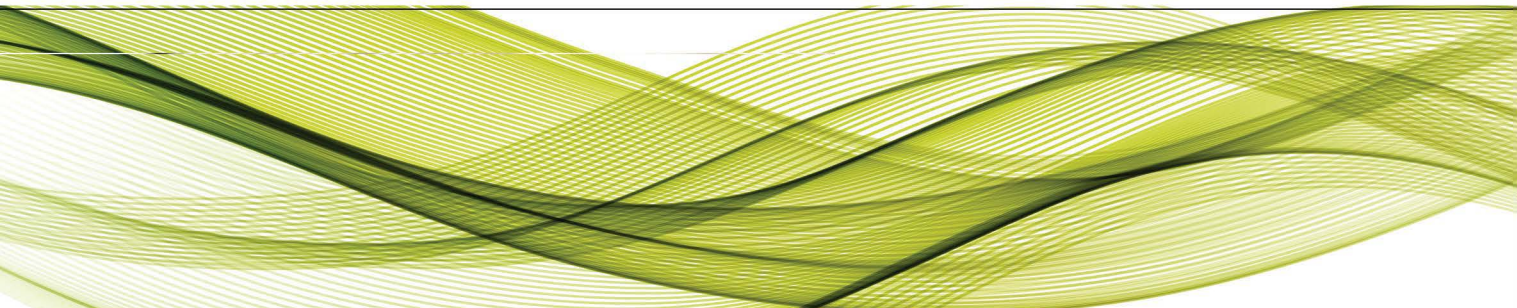
changing filters. The LED indicator integrated into the latch enables maintenance engineers to identify from a distance that the fan is powered and in operation, avoiding the need to get up close to the panel. Changing filters also saves maintenance engineers time, as it takes seconds with no tools required, and avoids possible damage to the fan.

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