



Heat Problems in Panels Due To Drive Losses

Q. I have been experiencing drive trips on one of my lines and when I checked into it I was surprised how hot it was inside the Nema 12 panel, where the drive was located. What's the best thing to do to fix the problem?

A. Because this is an existing line drive the best thing we can do is to install a fan in the panel. In order to maintain the Nema 12 rating of the enclosure, we will need to use a Nema 12 fan assembly. US manufacturers of fans have been slow to provide such items but fortunately the Europeans have come to the rescue.

I recommend going to Pfannenberg www.pfannenbergusa.com for their 'Click and Fit' designs which are available up to 500 cfm or www.hawacorp.com another good supplier.



The next thing to do is specify a size for the fan. We will be limited physically by the size of your existing enclosure. Pfannenberg's largest fan is approx 12" sq. You will need to follow the following guidelines for a successful fan installation:

1. Pressurize the enclosure ie pump fan filtered air into the panel
2. Keep inlet air (fan) and exhaust air far apart
3. Cooling air should enter enclosure from as low as possible and leave from above the highest hot component.
4. Make exhaust same size as inlet.

****Most drives are designed for a Max. operating temperature of 40 degrees C (104 deg. F) so let us choose a Max allowable internal temp. of 95 degrees F .If the Max ambient temp is 85degrees F then if we know how many watts of heat were being dissipated by the drive, we could solve for the cfm needed**

From the formula $\text{cfm needed, } V = \frac{\text{Power dissipated in Watts, } Q \times 3.17}{\text{Max allowed Int Temp F} - \text{Max Amb. Temp F}}$

If we assume 300W dissipated, then $\text{cfm needed} = 300 \times 3.17 / 95-85 = 951/10 = 95 \text{ cfm}$

Add an additional 25% to this figure as a safety factor and we have cfm needed as 119 cfm

AC Drives can have a heat loss of between 3 and 5% of their KW rating. You should check the specs for your drive to see how much the heat loss is.

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