

Managing Heat in LCD Projectors

Heat is a necessary evil in any electronic circuit. It's also the mortal enemy of projectors! Many of the components in an LCD projector depend on thermal management to operate properly. These include the individual LCD panels and dichroic filters, as well as any signal processing boards.

It's easy to add cooling fans to boost airflow through a projector. The problem is, simply adding more fans also boosts noise levels. The trick is to design an efficient cooling system that maximizes airflow across all sensitive components while minimizing noise. The choice of metal alloys used for the projector's housing also determines its thermal coefficient, or its ability to "sink" heat from the lamp and radiate it away from the housing.

Even though projector manufacturers can design a good cooling system, all of that hard work can easily be undone by improper installation and maintenance of a projector, particularly high-brightness large venue and conference room models. The hot air has to go someplace!

If a projector must be installed in a confined space, it is important for that space to have slightly negative air pressure. This ensures a constant outward flow of air from the projector, which in turn helps maintain the designed operating temperature. Exhaust fans or air-conditioning systems provide this negative air pressure. Even a small (4" – 8") muffin fan or two can move a considerable volume of air over and away from a projector.

Dust goes hand in hand with heat, which means that the air filters in a projector must be cleaned and replaced at regular intervals. In a confined space installation, filters must be cleaned and replaced more frequently, as dust accumulates very quickly. The best and most cost-effective way to protect your LCD projector investment is to keep those filters clean, and make sure the projector is well ventilated.

To get the most performance out of your LCD projector, follow these "golden rules":

1. Air flow through a projector is its lifeblood. Impaired airflow will result in lamp failure and/or burnt LCD panels and optical glass. Keep that air moving!
2. Projector air filters must be cleaned on a regular basis, depending on the venue. An LCD projector used in a church won't need cleaning as often as one used in a nightclub or sports bar.
3. Vacuuming the projector's air filters is the most efficient way to clean them.
4. When cleaning filters, vacuum all openings on the projector as well.
5. Portable and installation projectors require adequate space around them for airflow, usually 19 inches or more. Check your owner's manual and follow the recommendations.

6. Do not mount or tilt an LCD projector beyond the angles shown in the owner's manual. If you do, you will eventually have problems with your projector.

7. If an LCD projector is used near smoke, cooking oils or fog machines, wash the air filter with a mild detergent and water. Vacuum the filter again after washing.