

Compact Cabinet Coolers
Press Release 2006

Modern day electronics continue to be placed in denser packaging and smaller enclosures. Consequently, electronics are being designed to handle higher temperatures.

Moisture and airborne dust, oil, dirt and other contaminants can damage sensitive electronic equipment. Sealed enclosures protect the electronics but cause another problem - overheating, which can result in reliability problems and unnecessary downtime.

The NOREN **Compact Cabinet Cooler**, which is an air-to-air heat exchanger, is **energy efficient** and solves many of the problems associated with the denser packaged electronics. The Noren Compact Cabinet Coolers remove only the heat inside the enclosure while recirculating the air inside at the same time and maintain the enclosures' protective seal against contaminants.

Air conditioners and other below ambient type coolers, such as compressed air coolers, are not necessary for most enclosure cooling applications. They are usually very expensive and have high maintenance issues associated with them. The **Compact Cabinet Coolers**, built with our Noren **heat pipe** technology, **are virtually maintenance free and are 1/10 the cost** to use.

A **heat pipe** consists of a sealed aluminum or copper container or a tube with inner surfaces that have a capillary wicking material. Inside the container is a liquid under its own pressure that enters the pores of the capillary material, wetting all internal surfaces. Applying heat to any point along the surface of the **heat pipe** causes the liquid at that point to boil and enter a vapor state. The gas, which then has a high pressure, moves inside the sealed container to a colder location where it then condenses. Thus, the gas gives up the latent heat of vaporization and moves the heat from the input to the output end of the **heat pipe**.

The heat pipe is a thousand times more conductive than a copper tube of the same weight, and **heat pipes** conduct large volumes of

thermal energy away from the heat source. The heat pipe design is so simple and efficient and has no mechanical parts that can fail.

The Noren Products Compact Cabinet Coolers have many benefits over using conventional air conditioners, such as:

- ***Energy efficient** and cost effective *no condensation inside the enclosure
- *Compact and lightweight ***easy to install** or retrofit on top, side, door or back or enclosure *virtually maintenance free, only moving parts are the small fans to***reduce hot spots inside the cabinet** because air is circulating inside
- *Features available, such as, corrosive resistant coating, NEMA 4, 4X, UL/cUL so that they can be located in wet, hazardous locations or corrosive environments ***air-to-water units available for below ambient cooling.**

The Noren **Compact Cabinet Coolers** have been in the field for over thirty years without any field failures, **saving time, energy and money** for all those who have used them.