

## The Need for Environment Control

With wide spread use of micro-electronics in today's control systems, temperature management takes on a new priority in order to ensure steady and reliable performance. The maintenance of a correct operating temperature may combine both cooling and or heating inside an enclosure which can protect against costly down time and system failures.

### General Selection Considerations

Cooling			
Conditions	Solution	Advantages	Disadvantages
Maximum desired enclosure temperature is 10°F or 5°C above maximum outside ambient.	Oversize the Enclosure	Easy to implement, no maintenance. Maintains NEMA rating of the enclosure.	Dissipates small amount of heat. Larger enclosure size takes up more space.
	Install ventilation louvers	Economical solution, very little maintenance, easy to implement.	Dissipates limited amount of heat. Dirt, oil or fluids could enter the enclosure. NEMA rating is affected.
	Install filter fans	Less expensive than air/refrigeration systems. Relatively high amount of heat removed, some temperature control by using thermostats.	Must maintain filters. NEMA rating can be affected. Limited use in hostile environments such as chemical applications.
	Use an air/air heat exchanger	Easy to install, small power consumption, temperature control via thermostat. Maintains NEMA rating of the enclosure.	Must maintain filters.
Maximum desired enclosure temperature lower than maximum outside ambient.	Use an air conditioner	Easy to install. Temperature control via factory installed thermostat. Removes large amounts of heat. Maintains NEMA rating of enclosure, dehumidifies enclosure air.	Must maintain filter. Generally not to be used when outside temperature is below 59°F (15°) or above 130°F (52°C).
Circulation			
Conditions	Solution	Advantages	Disadvantages
Localized heat or "hot spots".	Install circulation fans in the enclosure.	Economical solution, no maintenance, easy to install. Maintains NEMA rating of the enclosure.	Dissipates small amount of heat.
Heating			
Conditions	Solution	Advantages	Disadvantages
Outside temperature is below minimum allowable equipment operation range.	Heat with radiant heater.	Economical power consumption. Reliable, can be temperature controlled.	Consumes energy, takes up internal panel space.
Condensation occurs.	Heat with radiant heater to maintain temperature above the dew point.	Economical power consumption. Reliable, humidity can be controlled.	Consumes energy, takes up internal panel space.