Eliminating Moisture in Electrical Cabinets

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Moisture in electrical cabinets, control panels and motor compartments can affect plant efficiency and product quality, leading to significant downtime and expensive repairs.

This is especially critical in food-processing industries, since moisture can lead to mold and/or bacterial growth and create regulatory concerns. Purging the compartment with air dried by a system using a filter and membrane provides a reliable solution with considerably lower initial and operating costs. The system can be used on a 24/7 basis — even during washdown procedures (when drying is most needed).

Removing Water Vapor from Air via a Filter & Membrane

Water, compressor oils and particulate matter can be removed from compressed air (input temperature range between 40° to120°F and input pressure range of 60 to 150 PSIG) using a coalescing filter and a hollow membrane module. The coalescing filter removes water droplets, oil and particulate materials with an efficiency of 99.99 percent at 0.01 µm, and the hollow membrane fibers remove water vapor to provide dry air with a dew point of -7°F from saturated inlet air of 100°F and 100 PSIG.

Using a Cabinet Dryer Avoids Downtime

Cabinet dryers have no moving parts and require minimum maintenance; periodic

replacement of a filter can be performed during routine system shutdowns. As an example, a meat-processing plant in the Midwest that used a heater to keep a control panel dry found that it was replacing the keypad every three weeks. After it replaced the heater with a cabinet dryer, it was possible to operate for six months or more at a time without failures, replacing the filter on a routine maintenance basis.

A similar cabinet drying system was installed on a metal detection system at Dan's Prize, a division of Hormel Foods Corp. Before the dryer was employed, it was necessary to stop production three times a week to remove moisture from the detector. According to Tom Breslin, plant engineering manager, "Once we installed our dryer system, the problem went away. The dryer has been in place for about a year, without maintenance issues."

Dried Compressed Air Reduces Operating Costs

The operating cost of a filter/membrane based system is considerably lower than that of alternative systems. As an example, Lee Clarkson, a production engineer at Ross Industries, a manufacturer of meat tenderizers, food-packaging equipment and food-processing systems, in Midland VA, reports, "There are essentially no operating costs for the membrane dryer once the system is installed, except for annual cartridge replacement. In the case of the meat-processing plant [discussed above], a saving of about $25,000/year was obtained from eliminating the need to replace the control panel and from downtime during the replacement time."

The filter membrane system provides an effective, reliable and inexpensive approach to the problem of mold or premature component failure due to moisture. The system does not require electricity, has no moving parts and can be used on a 24/7 basis, even during washdown procedures. The combination of a coalescing filter and a membrane filter provides air with a dew point of -7°F and a relative humidity of 10 percent or less, ensuring that cabinets will be kept bone dry.

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[1] http://www.parker.com/