

## ELECTRIC HEATERS

BUILT TO SPECIFICATION FOR ANY APPLICATION QUALIFIED TO: IEEE 323 & IEEE 344

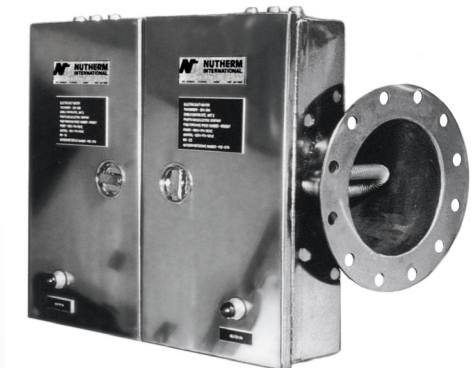
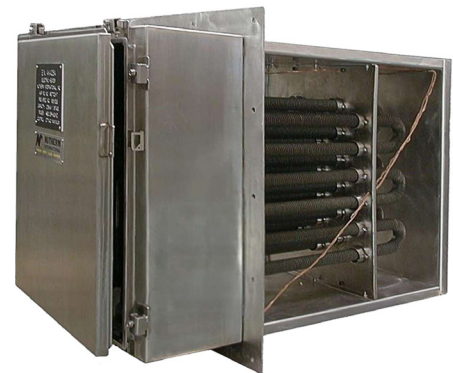
### SAFETY-RELATED ELECTRIC HEATERS

Nutherm manufactures safety-related electric heaters for applications ranging from humidity control in filter trains to space heating areas occupied by critical operating personnel. In 1979, Nutherm started manufacturing safety-related electric heaters for commercial nuclear power plants for a variety of needs.

### DESIGN

Nutherm offers heavy gauge galvanized steel to stainless steel frame and panel materials. Control panels are available in NEMA 1, 4 and 12 construction either in integral or remote designs. Nutherm heaters utilize low watt density finned tubular elements designed to withstand high seismic forces. Heater controls range from thermostat to electronic pulse width modulation temperature controls.

Nutherm heaters are manufactured under a 10 CFR 50 Appendix B/NQA-1 quality program where special processes such as welding, surface preparation, painting and wiring are specified, reviewed, controlled and inspected.



*Class 1E Systems & Components Since 1979*



## ELECTRIC HEATERS FOR FILTER TRAINS

Most filter trains utilize a charcoal filter for the removal of contaminated airborne particles. To maintain efficient operation, the relative humidity of the air entering the charcoal filter has to be at or below seventy percent. Electric heaters offer a practical way to reduce relative humidity for such applications.

Typical filter train heaters are qualified for harsh environments. Standard capillary over-temperature controls and standard airflow switches used for fan interlocks are not suitable for environments that contain contaminated air particles. Components used in filter trains must be radiation hardened or impervious to gamma radiation. Additionally, equipment which may be subjected to HELB, DBE, or LOCA conditions may require high temperature designs. All factors have to be considered in the design of safety-related filter train heaters.

Most electric heaters installed in commercial nuclear power plants were either designed or manufactured by Nutherm personnel.

## COMFORT OR SPACE HEATING

For a variety of reasons, safety-related electric heating equipment is required in nuclear power plants. Space heating is needed for personnel areas such as control rooms or technical support centers. Additionally, remote shutdown areas may require heating when primary areas become uninhabitable. Temperature control may also be required for vital control systems or battery rooms. Nutherm designs special heaters for hazardous areas where hydrogen is created during battery charging.

