

Chapter 20 Electrical Equipment Environmental Protection

20-1. General

Since the electrical equipment will stand idle for long periods of time, special attention must be given to corrosion protection. Guide Specifications CW 15170 and CW 15171 provide recommended corrosion-protection requirements for induction and synchronous motors, respectively. The standard manufacturer's treatments of the medium-voltage motor controller line-ups and motor control centers consist generally of one undercoat of a phosphatizing rust inhibitor followed by one finish coat applied to both internal and external surfaces. In many stations where humidity is especially high or other conditions merit special consideration, two undercoats of the rust-inhibiting primer should be specified. In addition, all major items of electrical equipment including motors, control centers, controller line-ups, control consoles, wall-mounted combination starters, gate operator controllers, trashrake controllers, etc., should be equipped with space heaters sized per the manufacturer's recommendations. Heaters in motors and controllers should be interlocked with the motor starters to ensure de-energization when the equipment is in operation. Heaters are generally fed from the lighting panels, and as such pose a shock hazard. Therefore, all items of equipment containing space heaters should be clearly marked indicating the source of the space heater power. These heaters will require 120 VAC, single-phase service year-round.

20-2. Formulas

Standard formulas used to estimate the output ratings of equipment heaters to give a temperature rise above ambient are as follows:

$$Ph = 0.6 \times A \times dT \quad (20-1)$$

where

Ph = panel heater output rating (watt)

A = panel external surface area (square feet)

dT = designed temperature rise above ambient
(degrees Fahrenheit)

For motor-winding heaters giving a 10-degree-Fahrenheit rise above ambient,

$$Ph = D \times L / 2.52 \quad (20-2)$$

where

Ph = motor winding heater output rating (watt)

D = end bell diameter (inches)
= "2D" (frame dimension from NEMA MG1)

L = motor length (inches)
= "2F + 2BA" (frame dimensions from NEMA
MG1)