

## ENVIRONMENTAL MODIFICATIONS

### ALTITUDE

The rating of standard motors assumes operation at sea level in a 40°C ambient. For purposes of standardization it is considered that there is no difference in motor operating temperature between sea level and 3300 feet altitude.

The cooling effect of ventilating air is a function of its density. The atmospheric pressure and density at higher altitudes is reduced and the air cannot remove as much motor heat, causing the motor to run hotter. As a general guide, motor temperature rise increases 1% for every 330 feet above 3300 feet. To keep motor heating within safe limits at altitudes above 3300 feet, there are the following alternatives:

- A. Supply a motor designed for standard sea level operation which can either be:
- (1) Operated at less load (a motor with service factor rating of 1.15 or higher can be operated at altitudes up to 9000 feet with a 1.0 service factor), or
  - (2) Operated in a lower ambient temperature per the following table:

Table 26.

If Ambient Temperature is:	Max. Altitude with Same Service Factor is:
30° C	6600 ft.
20° C	9900 ft.

It should be remembered that, although the outdoor ambient temperature at higher altitudes is low, motors probably will be installed indoors in higher ambient temperatures.

Motors applied per A(1) or A(2) above, will have no special altitude or temperature data on the nameplate.

- B. Supply a special motor designed for the required high altitude operation, with appropriate data stamped on the nameplate.

### HIGH AMBIENT, POLYPHASE

Standard motors are designed so that the temperature rise produced within the motor, added to the standard 40°C ambient temperature, will not exceed the winding-insulation temperature limit. If the ambient temperature exceeds 40°C:

- A. The temperature rise produced in the motor must be offset by:
- (1) Reducing the load and consequent motor losses. A motor rated for a 40°C ambient temperature and operating in a 50°C ambient, will, if rated 1.15 service factor, carry rated hp with no overload (1.0 SF) and, if rated 1.0 service factor, carry 90% of rated hp, or by...
  - (2) Applying a special motor design.
- B. The temperature limit may be raised by the substitution of a higher-temperature insulation system, special grease and bearings.

Motors applied per A(1) above will not have special ambient temperature or service factor data on the nameplate.

The choice between A(2) and B rests with the motor designer who also may have to use a frame size larger than is standard for the rating. Explosion-proof motors may require frame sizes different from the corresponding totally-enclosed motors.

**WARNING:** THE MAXIMUM ALLOWABLE AMBIENT TEMPERATURE FOR EXPLOSION-PROOF MACHINES IS 60°C.

### HIGH AMBIENT, SINGLE-PHASE

For operation in ambient temperatures higher than 40°C, refer to Company giving full details of the application.

### LOW AMBIENT

For operation in ambient temperatures of less than minus 40°C, give full details of the application. Special low-temperature grease and special steel shafts may be required.

### DRIP COVERS (WALL OR VERTICAL MOUNTING)

Drip covers can be furnished on standard horizontal motors for added protection from dripping liquids and falling objects when the motor is mounted in other than the normal horizontal position.

If dripping liquids are present in the application, protective covers are recommended for dripproof construction motors mounted shaft up or shaft down.

### EXPORT BOXING AND PACKING

Export boxing and packing should be specified when a motor, and/or spare parts, are to be furnished for export shipment.

### GREASE, SPECIAL

Motors designed for unusual environmental conditions or special duty should have bearing grease selected for such service. The most commonly encountered conditions requiring special lubricants are extremely high or low operating ambients. The majority of motor greases used by GE Motors are suitable for operation at ambient temperatures from minus 40°C to plus 40°C.

### HARDWARE

Standard motor hardware has a plated protective coating suitable for the corrosive atmospheres generally encountered. For extremely corrosive atmospheres, stainless hardware may be required, and should be specified.

### PAINT

#### Standard Finishes

Motors are protected by a two coat paint system. The first coat is a rust-inhibitive primer applied to protect the castings during storage and manufacture. The second coat is a medium light gray or buff semigloss paint.

Most commercially available paints are compatible with the paint system described above. It is recommended that the customer apply any finish coat over the motor paint in his plant when the driven equipment is painted.

### SCREENS

#### Intake and Discharge Screens – Dripproof Guarded

Corrosion resistant screens can be furnished over the air- intake and discharge openings of dripproof motors. Dripproof motors equipped with these screens conform to the “dripproof guarded” definition appearing in NEMA MG1, Part 1.

**Rodent Screens** – Rodent screens will be provided where required as part of the dripproof guarded system and on specific request of the purchaser.