

TABLE 10. TYPICAL SPECIFICATIONS FOR WOUND ROTOR MOTOR CONTROL

Control for Wound Rotor Motor Control for . . . Applications Shall Consist of a Safety (Fan, Pump, etc.) Disconnect Switch, a {Separately Mounted Across the Line Starter Providing Overload Protection, Low Voltage {Protection Release}, and a Secondary {Starting Speed Regulating} Controller for {Separate Mounting Mounting in Same Enclosure}. Primary and Secondary Control Shall Be Interlocked so as to Provide Complete Control from the Rheostat Handle.

TABLE 11. TYPICAL SPECIFICATIONS FOR SYNCHRONOUS MOTOR CONTROL

Synchronous Motor Control for . . . Motors Shall Provide for (Application) {Full Voltage Starting and Shall Be {Full Magnetic}. (Reduced Voltage {Reduced Voltage} Starting Shall Be Obtained by Means of {Autotransformers Resistors Reactors} And Shall Limit The KVA Inrush to a Maximum of . . . per cent of Full Load KVA.) The Control Panel Shall Be For {Isolated Switchboard} Assembly And Shall Be of {Open Switchboard Enclosed Cubicle} Construction. It Shall Provide Overload, Under Voltage Protection And After Pulling Out of Step Will {Automatically Resynchronize} The Motor. {Automatically Stop}

TABLE 12. TYPICAL SPECIFICATIONS FOR SINGLE PHASE MOTOR CONTROL

Control For Single Phase . . . Motors Shall Consist of a (Fan, Pump, etc.) {Manual Magnetic} Type {Across The Line Reduced Voltage} Starter Providing Overload Protection (And Low Voltage); And A Separate Safety Disconnecting Switch.

high motor power factor and efficiency. The gearing efficiency is also high, usually about 98 per cent for a single reduction of the helical or spur type, that is, a 2 per cent loss for one reduction or 4 per cent loss for a double reduction. Consequently, the over-all performance of the gear motors is much higher than a combination of open gearing, belting, countershaft, or other arrangement, which would otherwise be required. Gear motors are used extensively to drive numerous types of slow speed drives. Besides being more effective than other combination drives in saving space, they are important in reducing maintenance and operating hazards.

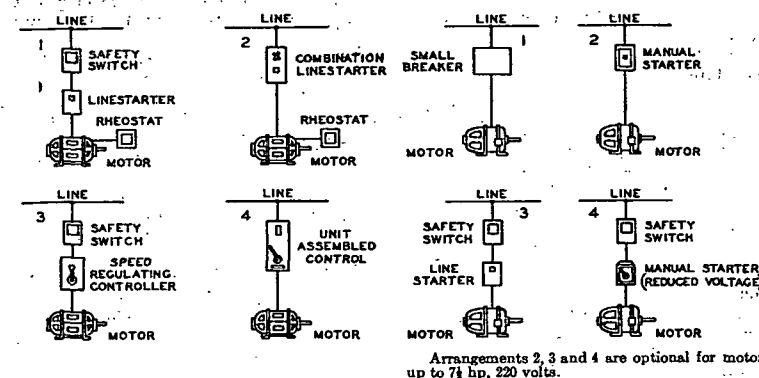


FIG. 12. RECOMMENDED CONTROLS FOR WOUND ROTOR MOTORS

FIG. 13. RECOMMENDED CONTROLS FOR SINGLE PHASE MOTORS

GLOSSARY

General Definitions

NEMA is the abbreviation for the *National Electrical Manufacturers Association*.

Speed Regulation (d-c motors) is the change in speed between no-load and full-load, expressed in per cent of full-load speed; for example, a motor having a no-load speed of 1200 rpm and a full-load speed of 1140 rpm would have a speed regulation of 5.6 per cent.

Slip (a-c induction motors) is the difference between the motor speed and synchronous speed expressed in per cent of synchronous speed, e.g., a 1200 rpm motor operating at 1140 rpm would have a slip of 5 per cent.

Torque is an expression of the turning effort developed by the motor at the shaft and is usually expressed in ounce-feet for fractional horsepower motors and in pound-feet for motors of larger ratings.

Primary is the term usually applied to the high voltage or line side of a transformer or motor. In the case of the wound rotor motor the primary is the stator winding.

Secondary is the term usually applied to the low voltage or load side of a transformer or motor. In the case of the wound rotor motor the secondary is the rotor winding.

NEMA Classification of Motor Enclosures

Open motors (40C rise, rated load, 50C rise, service factor load) are self-ventilated machines having no restriction to ventilation other than that necessitated by mechanical construction.

Protected motors (50C rise) have all ventilating openings in the frame protected by perforated covers.

Semi-Protected motors (50C rise) have the ventilating openings in the top half of the frame only protected by perforated covers.

Drip Proof motors (50C rise) are so constructed that drops of liquid or solid particles falling on the machine at any angle not greater than 15 deg from the vertical cannot enter the machine either directly or by striking and running along a horizontal or inclined surface.

Splash Proof motors (50C rise) are so constructed that drops of liquid or solid particles falling on the machine or coming towards it in a straight line at any angle not greater than 100 deg from the vertical cannot enter the machine either directly or by striking and running along the surface.