

TABLE 2. TYPICAL SPECIFICATIONS FOR d-c MOTORS

..... Hp,	RPM, {Constant Adjustable Varying}	Speed, {Shunt Compound Series}	Wound, {115 230 600}	Volts
d-c Motors For Driving	Motor Shall Be Arranged For (Application)			
{Horizontal Vertical}	Mounting And Shall Be Provided With A (Open, Splashproof, etc.)			
Type Of Enclosure, NEMA {Class A Class B}	Insulation, And {Ball Sleeve} Bearings.			

TABLE 3. TYPICAL SPECIFICATIONS FOR d-c MOTOR CONTROL

Control For {Constant Adjustable Adjustable Varying}	Speed d-c Motors Shall Be {Manual Magnetic}	And Shall
Consist of a {Safety Switch Circuit Breaker}	And an Enclosed Controller Providing Overload Protection [And Low Voltage {Protection Release}]	

TABLE 4. TYPICAL SPECIFICATIONS FOR SQUIRREL-CAGE MOTORS

..... Hp,	RPM, {25 60}	Cycles, {208 220 440 550}	Volts, {2 3}	Phase,
Squirrel-Cage Induction Motors of the NEMA				
{Design A—Normal Starting Torque, Starting Current above NEMA value Design B—Normal Starting Torque, NEMA Starting Current Design C—High Starting Torque, NEMA Starting Current Design D—High Slip High Starting Torque}	Type**			
Driving	Motor Shall Be Arranged For {Horizontal Vertical} Mounting (Application)			
And Shall Be Provided With A	Type of Enclosure, NEMA (Open, Splashproof, etc.)			
{Class A Class B}	Insulation, And {Sleeve Ball} Bearings.			

** Refer to following section on Alternating Current Motors for explanation of types.

TABLE 5. TYPICAL SPECIFICATIONS FOR WOUND ROTOR MOTORS

..... Hp,	RPM, {25 60}	Cycles, {208 220 440 550}	Volts, {2 3}	Phase, Wound Rotor
Induction Motors For Driving	Motor Shall Be Arranged for (Application)			
{Horizontal Vertical}	Mounting And Shall Be Provided With A (Open, Splashproof, etc.)			
Type of Enclosure, NEMA {Class A Class B}	Insulation and {Ball Sleeve} Bearings.			

the use of a fused safety switch or circuit breaker and a face-plate type starter. For automatic push button starting a safety switch or circuit breaker and an automatic starter are recommended

Adjustable Speed Motors are normally shunt wound and are operated at various speeds by varying a resistance connected in series with the motor field. A maximum range of speed of about 5 to 1 can be obtained by this means. Rated speed regulation is 22 per cent for motors of this type from 2 to 5 hp; 15 per cent is standard in larger sizes. The NEMA practice on rating adjustable speed d-c motors is defined in the Glossary at the end of the chapter.

The control for the adjustable speed motor consists of the addition of

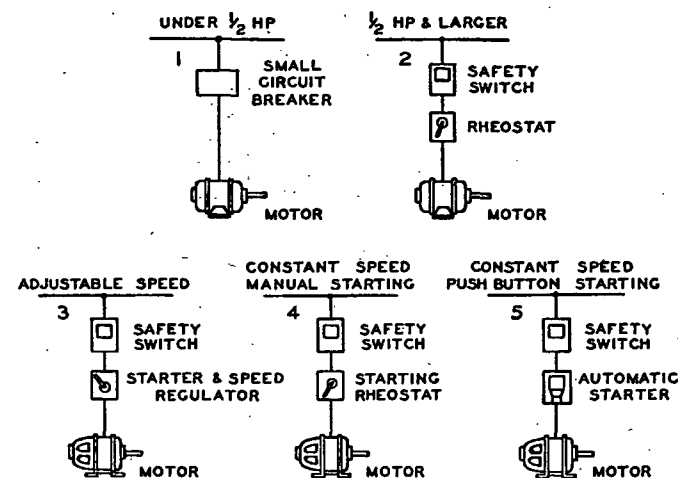


FIG. 2. RECOMMENDED CONTROLS FOR d-c MOTORS

a field rheostat for speed control to the equipment specified for the constant speed motor.

*Adjustable Varying Speed** motors are d-c motors in which the speed is varied by the addition of resistance in series with the armature. The speed of the motor by this means is always less than the rated full field speed and varies widely with a change in load, especially with high series resistance. Fig. 3 illustrates typical speed characteristics of this type of motor for different values of armature resistance.

The addition of series resistance in the armature circuit reduces the motor speed by lowering the voltage on the armature. At one-half speed the voltage is approximately one-half of line voltage. Consequently, with rated full load current the power delivered by the motor will be only one-half of the maximum, e.g., it will be 5 hp from a 10 hp motor, because the other 5 hp will be lost in the resistance. It is, therefore, evident that the efficiency of the motor is reduced at reduced speeds due to the loss in the resistor.

Control for the adjustable varying speed motor is similar to that for

* Refer to Glossary at end of chapter.