

of Developing a Starting Torque of Per Cent Full Load Torque, a Pull-In Torque of Per Cent Full Load Torque, and a Pull-Out Torque of Per Cent Full Load Torque. The Motor Field Shall Be Excited from a

{Direct Connected Exciter
Belted Exciter
M-G Set Exciter
d-c Bus } Which {Shall
Shall Not} Be Included with the Motor.

SPECIFICATION F. TYPICAL SPECIFICATIONS FOR SINGLE PHASE MOTORS

..... Hp, RPM, {25
60} Cycles, {115
230} Volts, Single Phase Motor of

the Type for Driving Motor Shall
(Capacitor, Split Phase, etc.) (Application)

Be Arranged for {Horizontal
Vertical} Mounting and Shall Be Provided with

a Type of Enclosure, NEMA {Class A
Class B} Insulation, and
(Open, Splashproof, etc.)

{Ball
Sleeve} Bearings.

SPECIFICATION G. TYPICAL SPECIFICATIONS FOR SQUIRREL-CAGE MOTOR CONTROL

Control for Squirrel-Cage Motors Shall Consist of an Enclosed
(Fan, Pump, etc.)

{Manual } Type {Across The Line
Magnetic } {Reduced Voltage} Starter Providing Overload Protection and

Low Voltage {Protection
Release} Control Shall Include a Safety Disconnect Switch

{Separately Mounted
In a Common Enclosure} with the Starting Controller.

SPECIFICATION H. 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
Common} Mounted Across the Line Starter Providing Over-

load 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.

SPECIFICATION I. TYPICAL SPECIFICATIONS FOR SYNCHRONOUS MOTOR CONTROL

Synchronous Motor Control for Motors Shall Provide for
(Application)

{Full Voltage
Reduced Voltage} Starting and Shall Be {Full Magnetic
Semi-Magnetic}. (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 Pull-

ing Out of Step Will {Automatically Resynchronize
Automatically Stop} the Motor.

SPECIFICATION J. TYPICAL SPECIFICATIONS FOR SINGLE PHASE MOTOR CONTROL

Control for Single Phase Motors Shall Consist of a
(Fan, Pump, etc.)

{Manual } Type {Across The Line
Magnetic } {Reduced Voltage} Starter Providing Overload Protection (and

Low Voltage); and a Separate Safety Disconnecting Switch.

GLOSSARY

General Definitions

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

AEIC is the abbreviation for the *Association of Edison Illuminating Companies*.

EI is the abbreviation for the *Edison Electric Institute*.

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

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

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

Drip Proof motors (50 C 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 (50 C 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