



## Motor Terminology

**AC**—Alternating Currents

**Amb. (Ambient)**—The temp. of the space around the motor.

**Auto**—Automatic

**Bearings**—Basic types:

- **Sleeve**—Preferred where low noise level is important, as on fan and blower motors. Unless otherwise stated, sleeve bearing motors listed herein can be mounted in any position, including shaft-up or shaft-down (all-position mounting).
- **Ball**—Used where higher load capacity is required or periodic lubrication is impractical. The 2 methods used to keep out dirt are: shields and seals.

**CSA**—Canadian Standards Association

**DC**—Direct Current

**Enclosure**—The motor's housing. Types:

- **Open Dripproof (ODP)**—Ventilation openings in endshields and shell placed so drops of liquid falling within 15° from vertical will not affect performance. Usually used indoors, in fairly clean locations.
- **Open Air-Over (OAP)**—Motors intended for fan and blower service. Must be located in the driven fan blade's air stream to provide motor cooling.
- **Totally Enclosed Air-Over (TEAO)**—Air flow from driven or external device provides cooling air flow over the motor, but not airtight or waterproof.
- **Totally Enclosed Fan-Cooled (TEFC)**—Includes an external fan in a protective shroud, to blow cooling air over the motor, but not airtight or waterproof.
- **Totally Enclosed Nonventilated (TENV)**—Not equipped with an external cooling fan, but not airtight or waterproof. Depends on convection air for cooling.

**Energy Efficient**—Any motor that has improved efficiency performance above a standard design as determined by the manufacturer, i.e., Epact levels in compliance with NEMA Table 12-11, but does not qualify for a NEMA Premium designation and or a small motor energy legislation model because the motor cannot meet the Federal and/or NEMA nominal efficiency guidelines, will be categorized as "Energy Efficient."

**FLA (Full Load Amps)**—Line current (amperage shown on motor nameplate) drawn by a motor when operating at rated HP and voltage.

**Hz (Hertz)**—Frequency, in cycles per sec., of AC power; usually 60 Hz in USA, 50 Hz overseas.

**HP (Horsepower)**—The amount of work a motor can do. 1 HP equals 746 watts.

**Imp.**—Impedance

**Ins. (Insulation)**—In motors, usually classified by max. allowable operating temp.: Class A-105°C (221°F), Class B-130°C (266°F), Class F-155°C (311°F), Class H-180°C (356°F).

**Man.**—Manual

**Max.**—Maximum

**µF**—Microfarad

**Min.**—Minimum

**Mtg. (Mounting)**—Basic types

- **Bolted**—Frame is attached to motor with removable bolts.
- **C-Face or Flange**—Shaft end has a flat mounting surface, machined to standard dimensions, with holes to allow easy, secure mounting to driven equipment. Commonly used on jet pumps, oil burners, and gear reducers.
- **Cradle/Resilient**—Motor shell is isolated from base by vibration-absorbing material, such as rubber rings on the endshields, to reduce transmission of vibration to the driven equipment.
- **Rigid**—Motor solidly fastened to equipment through metal base that is welded to, or cast into, motor shell.
- **Stud**—Motor has bolts extending from front or rear, by which it is mounted. Often used on small, direct drive fans and blowers.
- **Yoke**—Tabs or ears are welded to motor shell to allow bolting of motor to a fan column/pedestal or bracket.

**Nameplate RPM**—The nominal speed at which an induction motor operates under rated load (HP) conditions.

**NEMA**—National Electrical Manufacturer's Association

**NEMA Premium Efficient**—Any 3-phase motor that meets NEMA MG1 Table 12-12 Nominal Premium Efficiency Levels for a particular HP, rpm, and enclosure type rating and is required to display a CC Number on the nameplate, as registered with the Department of Energy, or single-phase motor that meet EISA standards, i.e. small motor rule, that are not required to display a CC Number, but do have the NEMA logo on the nameplate will be categorized as "NEMA Premium Efficient".

**Nom.**—Nominal

**OC**—On Center

**PE**—Pump end

**Premium Efficient**—For 2-digit open enclosure, single and 3-phase motors that meet EISA standards, i.e. small motor rule, that are not required to display a CC Number on the nameplate, will be categorized as "Premium Efficient".

**Prot.**—Protection

**PSC**—Permanent Split Capacitor

**Resil.**—Resilient

**Rev.**—Reversible

**Rotation**—Basic types:

- **CCW**—Counterclockwise
- **CW**—Clockwise
- **CW/CCW**—Reversible
- **CWSE**—Clockwise Facing Shaft End
- **CWLE**—Clockwise Facing Lead End
- **CCWSE**—Counterclockwise Facing Shaft End
- **CCWLE**—Counterclockwise Facing Lead End

**RPM**—Revolutions per Minute

**SF (Service Factor)**—A measure of the reserve margin built into a motor. Motors rated over 1.0 SF have more than normal margin, and are used where unusual conditions such as occasional high or low voltage, momentary overloads, etc. are likely to occur.

**Severe Duty**—A totally enclosed motor with extra protection (shaft slinger, gasketed terminal box) to resist entry of contaminants. Used in extra dirty, damp or other nonhazardous contaminated environments.

**Syn.**—Synchronous

**Standard Efficient**—Any motor not required to meet any specific called out nominal efficiency specifications including federal guidelines will be categorized as "Standard Efficient".

**Temperature Rise**—The amount by which a motor, operating under rated conditions, is hotter than its surroundings.

**Thermal Protection**—A temp. sensing device built into the motor that shuts off the motor if the temp. becomes excessive due to failure-to-start or overloading. Basic types:

- **Auto (Automatic-Reset)**—After motor cools, thermal protector automatically connects motor to power.
- **WARNING: Should not be used where unexpected restarting would be hazardous.**
- **Imp (Impedance Protected)**—Motor is designed so that it will not burn out in less than 15 days under locked rotor (stalled) conditions, in accordance with UL standard No. 519.
- **Man. (Manual-Reset)**—An external button must be pushed to reconnect power to motor. Preferred where unexpected restarting would be hazardous, as on saws, conveyors, compressors, etc.
- **T-Stat (Thermostat)**—A temperature-sensing device installed inside the motor with separate leads brought out for connection into motor starter coil (control) circuit. Under failure-to-start or overload conditions, thermostat contacts will open. Thermostat contacts will reclose automatically when motor cools.
- **Torque**—Twist, or turning ability, as applied to a shaft. Measured in foot-pounds (ft.-lb.), inch-pounds (in.-lb.), ounce-feet (oz.-ft.) or ounce-inches (oz.-in.).
- **Breakdown**—The maximum torque a motor will produce while running, without an abrupt drop in speed and power.
- **Locked Rotor or Starting**—The maximum torque produced at initial start.

## Insulation Classes and Temperature Rise

Heat is a byproduct of the operation of a motor. A motor's internal operating temp. depends on its design. Insulation classes are designated to meet the requirements of the motor design. The insulation class is determined by the ability of each insulation system to handle a specified amount of heat:

Class A: 105°C (221°F)

Class B: 130°C (266°F)

Class F: 155°C (311°F)

Class H: 180°C (356°F)

A newer design of general purpose 3-phase motors has been introduced to promote longer service life. These motors feature a higher insulation class (primarily Class F) with a lower temp. rise (primarily Class B rise). This allows for about 25°C reserve thermal capacity in the motor. The reserve thermal capacity is what helps maintain the integrity of the insulation and lengthen motor life.