

SB522

# Large Induction Motors

125 through 6,000 HP



 **marathon**<sup>®</sup>  
electric

Motors for the long run



# Marathon introduces large, robust motors for

## A History of Reliability

Since 1913, the name Marathon Electric has been associated with highly reliable electric motors. Today Marathon Electric raises the bar with medium voltage motors to 6,000 HP.

- ODP (Open Dripproof)
- WPI (Weather Protected Type I)
- WP2 (Weather Protected Type II)
- TEAAC (Totally Enclosed Air to Air Cooled)
- TEWAC (Totally Enclosed Water to Air Cooled)

Enclosures have fabricated steel modular-type construction consisting of a basic reinforced fabricated plate steel lower frame and cast-iron bearing brackets. The WP2, TEAAC and TEWAC enclosures utilize a "top hat" construction to complete the enclosure.

Marathon Electric also offers cast iron fin cooled TEFC (Totally Enclosed Fan Cooled) motors through 2,500 HP.

- Available stator voltages: 460V – 13,800V

- Available rotor constructions: cast aluminum, cast aluminum vented and copper bar with brazed end rings

All motors 2,300 volts and above have form wound stator coils that are vacuum pressure impregnated in 100 percent epoxy solids resin.



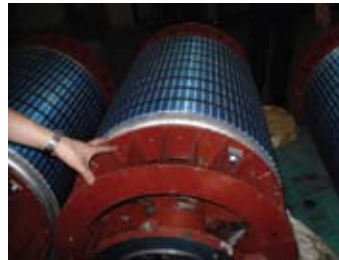
Marathon Electric motors are the right choice for applications demanding ruggedness and high reliability. Users recognize the value of Marathon Electric motors and their ability to outlast competitors' motors. Every motor is backed by more than 95 years of experience, plus state-of-the-art engineering and manufacturing, along with comprehensive service, starting in the earliest planning stages of your motor.

## Rotor Construction

Cast aluminum rotor



Cast aluminum vented rotor



Copper bar rotor



## Standard Features

**Conduit Box** is made of generously sized cast iron or fabricated steel. IEC frame medium voltage motors feature termination connections on standoff insulators (optional on NEMA frame motors).

**End Turn** bracing yields long life and is designed to minimize the effects of coil fatigue from frequent starts, yet it allows for thermal expansion under full load temperatures.

**Corrosion Protection** against the effects of hostile atmospheres eases hardware removal for regular maintenance inspections. All large motor rotors are epoxy-coated for added protection against chemical attack. The motor nameplate is stainless steel.

**Anti-Friction Bearings** are normally used in applications where high radial or axial thrust loading is common. The bearing chamber and lubrication system are designed with an ample grease supply, safely extending maintenance intervals.

## Robust Construction for Demanding Applications

Conduit box with standoff insulators



End turn bracing



Split sleeve bearings



# heavy duty and extreme applications.

## Design Features

### Spherically Seated Split Sleeve Bearings

Available on horizontal motors and standard on two pole motors, IEC frame 500 and higher. The bearing system uses oil ring action with the rings dipping into large built-in reservoirs to assure adequate lubrication and heat dissipation for cooler running bearings. An inboard seal, close running fits and a unique pressure equalization system eliminate potential leaks. This bearing system features split oiling rings, split seals and the bearing itself is split. All of the bearing system components can be changed without disconnecting the coupling.

### Dripproof / Weather Protected I (ODP/WPI)

Dripproof motors are best suited for indoor, industrial operating conditions. The WPI enclosure has louvers over the openings allowing the motor to be used in sheltered outdoor areas or indoors where more protection is desirable.

### Weather Protected II (WP2)

Weather Protected II motors are similar to the WPI motor construction with the exception of the cooling air path. Usage of a specially fabricated "top hat" on top of the modular constructed lower frame, routes the air through three 90 degree turns as prescribed by NEMA.

A Weather Protected II machine is commonly applied in unprotected outdoor areas. This enclosure is also used indoors or in areas having significant amounts of airborne dirt of dust or areas where lower sound levels are necessary. The WP2 enclosure has a lower noise level than WPI or ODP. In addition, sound reducing foam liners are available that result in even lower noise levels. Air filters are an available option with this enclosure.

### Totally Enclosed Air to Air Cooled (TEAAC)

This enclosure is used in severe indoor or outdoor environments. Being a totally enclosed motor, it has no free exchange of internal and external air. The circulating internal air passes over a heat exchanger which is integral in the motor "top hat". The heat exchanger consists of a bank of aluminum tubes

through which the external cooling air is passed. Internal fans move the warm air inside the motor over the outside tube surfaces, thus exchanging heat to the ambient air. Other metals are available for the tube material if the environment is corrosive to aluminum.

### Totally Enclosed Air to Water Cooled (TEWAC)

This design uses water as the heat transfer medium in the heat exchanger similar to an automotive radiator. The water travels inside the heat exchanger, while the internal air passes through the finned tubing of the heat exchanger. Being a totally enclosed motor it has no free exchange of internal and external air. This construction provides a design that is the quietest available for large motors. It does require an ample supply of cooling water. This enclosure should be considered in high air ambient conditions as the ambient to the motor is the temperature of the incoming water, not the external air.

### Totally Enclosed Fan Cooled - Finned Housing (TEFC)

This enclosure consists of a cast-iron finned housing that cools by conduction of the internal heat to the housing's fins. It uses an external shaft mounted fan blowing ambient air through the channels created by the fins. With no free exchange of internal and external air, this enclosure is used in severe indoor or outdoor environments.

Available accessories include but are not limited to:

- Stator RTDs
- Bearing RTDs
- Space Heaters
- Vibration Detectors
- Split Sleeve Bearings
- Noise Reduction Packages
- Surge Capacitors
- Lightning Arrestors

800 HP on hydraulic pumps for forging presses



Disc refiner drivers in a pulp and paper mill



Pump application, sewage treatment plant



# Medium Voltage Motors

Marathon Electric's Medium Voltage motors are available through 6,000 horsepower, and through 13.8 kV (13,800 volts). Enclosures include Dripproof (ODP), WP1, WP11, Totally Enclosed Fan Cooled (TEFC), Totally Enclosed Air-to-Air Cooled (TEAAC) and Totally Enclosed Water-to-Air Cooled (TEWAC). Contact Marathon Electric for a quotation on any ratings or configurations not listed below.



MV ODP NEMA	MV WPI IEC	MV WP11 IEC	MV TEFC NEMA	MV TEFC IEC	MV TEAAC IEC
Range: 125-700HP Voltage: 2,300/4,000v Pole: 2-, 4-, 6-, 8-pole Frequency: 60Hz, 50Hz avail. Frame: 449T-510U NEMA Protection: IP23 Ambient: 40° C Insulation: Class H VPI Construction: CI Performance: MG1 Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/18 mo.	Range: 250-6,000HP Voltage: 2,300/4,000V Pole: 2-, 4-, 6-pole Frequency: 60Hz, 50Hz avail. Frame: 355-630 IEC Protection: IP23 Ambient: 40° C Insulation: Class F VPI Construction: Fab Performance: IEC Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/24 mo.	Range: 250-6,000HP Voltage: 2,300/4,000V Pole: 2-, 4-, 6-pole Frequency: 60Hz, 50Hz avail. Frame: 355-630 IEC Protection: IPW23 Ambient: 40° C Insulation: Class F VPI Construction: Fab Performance: IEC Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/24 mo.	Range: 200-750HP Voltage: 2,300/4,000v Pole: 2-, 4-, 6-pole Frequency: 60Hz, 50Hz avail. Frame: 5011-5013 NEMA Protection: IP55 Ambient: 40° C Insulation: Class H VPI Construction: CI Performance: MG1 Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/18 mo.	Range: 250-2,500HP Voltage: 2,300/4,000V Pole: 2-, 4-, 6-pole Frequency: 60Hz, 50Hz avail. Frame: 355-560 IEC Protection: IP55 Ambient: 40° C Insulation: Class F VPI Construction: CI Performance: IEC Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/24 mo.	Range: 300-6,000 HP Voltage: 2,300/4,000V Pole: 2-, 4-, 6-pole Frequency: 60Hz, 50Hz avail. Frame: 355-630 IEC Protection: IP44 Ambient: 40° C Insulation: Class F VPI Construction: Fab Performance: IEC Bearings: Anti-Friction Service Factor: 1.15 Inverter: Yes Warranty: 12/24 mo.



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