

# Medium Voltage Motors



 **MARATHON<sup>®</sup>**  
**ELECTRIC**

*Motors for the Long Run!*

# Medium Voltage Motors

## Designed and Eng

### A Word About Quality...

Marathon Electric's uncompromising quality standards encompass ISO 9001:2000 procedures from design and engineering through manufacturing. Our motors have earned a well deserved reputation for their outstanding performance and reliability in the toughest of industrial applications from mining to the process industries. Marathon's reputation for producing highly reliable motors is a direct result of state-of-the-art techniques and computer aided design that allow our engineers to simulate designs prior to manufacturing.

Marathon Electric combines a long history of craftsmanship with our culture of continuous improvement to ensure that each motor is engineered and built for lasting dependability. So, when it comes to specifying or using quality medium voltage motors, turn to the industry leader, Marathon Electric!

### A History of Reliability...

Since 1913, the name Marathon Electric has been associated with highly reliable, low voltage electric motors from 1/12 through 1000 horsepower. Today, that history of conservative motor designs, coupled with the best technology, materials, and manufacturing techniques, ensures premium operation and long service life in our above NEMA motor offering.

The power of quality and innovation are combined in our Blue Chip XRI® Medium Voltage motor family. The Blue Chip XRI® Medium Voltage incorporates advanced design techniques that contribute to such benefits as size and weight reduction, and air flow improvements that keep motor operating temperatures low and efficiencies high.

All motors over 600 volts have form wound stator coils that are vacuum pressure impregnated in 100% solid epoxy resin, and are final coated with an epoxy ester for additional resistance to abrasion and build-up of contaminants.

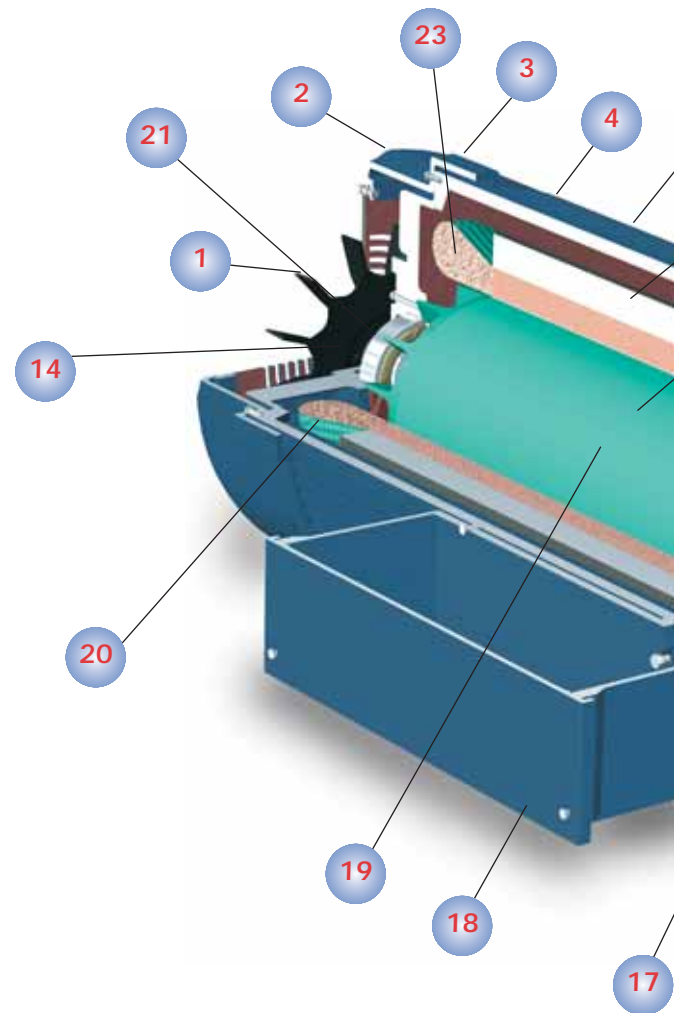
Computer controlled machine tools maintain the tight tolerance needed for precise fits, runouts, and air gaps.

Marathon's Blue Chip XRI® Medium Voltage motors are the right choice for applications demanding ruggedness and high dependability such as metal processing, paper making and mining.

### TEFC Construction for Strength and Reliability

The Blue Chip XRI® Medium Voltage motors incorporate a totally enclosed fan cooled (TEFC) design for severe indoor and outdoor environments. The motor's unique profile, deep fin design, and the circulating action of the internal air passages, allow for superior heat dissipation. This revolutionary recirculating design, coupled with the motor's 100% cast iron construction, provides a cooler running motor resulting in longer bearing and insulation life.

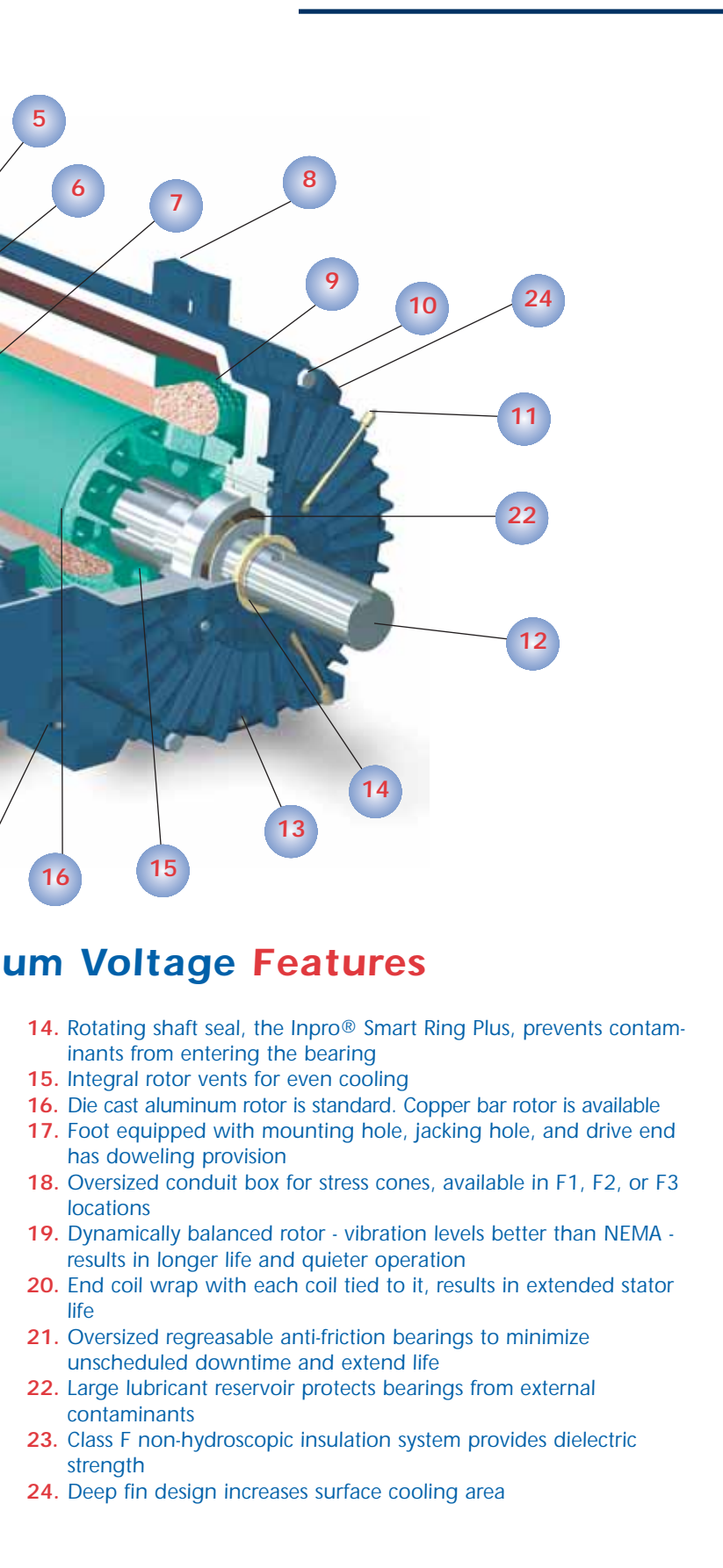
The heavy duty construction of the Blue Chip XRI® Medium Voltage motor provides a strong, sturdy support for bearings. This ensures accurate alignment of the rotor shaft assembly, bearings and stator. The motor's all cast iron design minimizes total vibration and 'noise' levels.



### Blue Chip XRI® Medi

1. Polypropylene non sparking fan runs quieter and uses less power due to motor's superior air flow design
2. Cast iron fan cover meets NEMA "guarded" definition
3. All cast iron construction - provides rigidity and corrosion resistance
4. Class 20 cast iron same as our explosion proof motors
5. Epoxy finish paint over red alkyd oxide primer for corrosive environments
6. Internal air channels circulate cool air to bearings, resulting in longer bearing life
7. Epoxy ester rotor coating
8. Lifting lugs (2), integrally cast into frame for added safety and easier mounting
9. Epoxy VPI stator with epoxy ester overcoat
10. Grade 5 zinc dichromate hardware - resists rust and provides easy removal
11. Extended external grease fittings for ease of regreasing
12. Shaft diameters as large as 4.5 inches, standard is 1045 hot rolled, available as 4140 steel for severe belting
13. Corrosion resistant automatic breather drain guards against internal condensation, one each end

# Engineered For the Toughest Applications!



## Medium Voltage Features

14. Rotating shaft seal, the Inpro® Smart Ring Plus, prevents contaminants from entering the bearing
15. Integral rotor vents for even cooling
16. Die cast aluminum rotor is standard. Copper bar rotor is available
17. Foot equipped with mounting hole, jacking hole, and drive end has doweling provision
18. Oversized conduit box for stress cones, available in F1, F2, or F3 locations
19. Dynamically balanced rotor - vibration levels better than NEMA - results in longer life and quieter operation
20. End coil wrap with each coil tied to it, results in extended stator life
21. Oversized regreasable anti-friction bearings to minimize unscheduled downtime and extend life
22. Large lubricant reservoir protects bearings from external contaminants
23. Class F non-hydroscopic insulation system provides dielectric strength
24. Deep fin design increases surface cooling area

## Our Insulation System Guarantees Unequalled Dielectric Strength

Marathon Electric incorporates a class F, non-hygroscopic insulation system that provides an extra margin of thermal safety during normal operation. The coils are form wound with multiple layers of mica tape; vacuum pressure impregnated with a 100% epoxy resin and then overcoated with an epoxy ester for added protection against moisture, dirt, and chemical contaminants.

This insulation system provides unequalled mechanical and dielectric strength, plus voltage endurance during temporary overloads.

## Heavy Duty Rotor Construction For Dependable Service

The standard rotor assembly consists of die cast aluminum or optional copper bar construction. The rotor is dynamically balanced resulting in vibration levels below NEMA requirements. Low vibration results in longer operating life as well as quiet operation. Each motor is individually tested with the actual test and vibration data included with the motor.

Premium efficient features abound with the Blue Chip XRI® Medium Voltage motor. They include a longer core length to reduce losses by lowering flux density and increasing cooling capacity along with thinner laminations and high grade electrical steel.

## An Advanced Bearing System

The standard bearings for the 5000 frame are greased lubricated, single row, open, anti-friction ball bearings. These oversized bearings minimize unscheduled downtime, and provide extended life. Roller bearings are available depending on the application, and grease is added through external grease fittings. A large lubricant reservoir protects the bearings from external contaminants and keeps the bearings running cooler.

## Smart Ring Plus For Bearing Protection

The Inpro® Smart Ring Plus, a rotating shaft seal, provides better bearing protection than non-rotational seals with field retrofit capacity to convert to an Inpro/Seal when desired. This feature is provided on both ends of the motor.

## Adaptability and Flexibility Built Into Every Motor

Marathon's 5011 and 5013 frame motors have multiple mounting holes on the fan end foot. (5011 frame = holes for 5010, 5011 and 5012; 5013 frame = holes for 5012 and 5013.) This built in feature makes retrofit a breeze! Our 5000 frame also has an available 5800 frame mounting option. Adaptability and flexibility means cost savings to you.



# Quality Motors That Run the Toughest Applications:

*Motors for the Long Run!*

## Medium Voltage Dripproof Motor Features...

- Cast iron construction for rigidity and reduced vibration
- NEMA design B torques
- Bearing caps
- Oversized, fabricated steel conduit box
- 200 through 500 horsepower
- Class F insulation, vacuum pressure impregnated with 100% epoxy resin
- Regreaseable double shielded radial ball bearings
- 1.15 service factor
- Dripproof force ventilated designs are also available



449 Frame Dripproof

## Blue Chip XRI® Medium Voltage TEFC - 449 Frame Motor Features...

- Totally enclosed, cast iron construction for rigidity and reduced vibration
- Regreaseable double shielded oversized ball bearings
- NEMA design B torques
- Bearing caps
- Oversized, cast iron conduit box
- 150 through 350 horsepower
- Class F insulation, vacuum pressure impregnated with 100% epoxy resin
- 1.15 service factor (*Class B rise at 1.0 service factor*)
- Actual test and vibration data included with each motor



Blue Chip XRI®, 449 Frame TEFC

## Blue Chip XRI® Medium Voltage TEFC - 5000 Frame Motor Features...

- Cast iron construction for rigidity and reduced vibration
- Regreaseable open style Conrad bearings for easy relubrication
- NEMA design B torques
- Bearing caps
- Oversized cast iron conduit box, twice NEMA minimum volume
- 125 through 800 horsepower
- Class F insulation, vacuum pressure impregnated with 100% epoxy resin
- 1.15 service factor (*Class B rise at 1.0 service factor*)
- Epoxy ester stator overcoat
- Inpro® Smart Ring Plus, rotating shaft seal
- Provisions for jacking bolts
- Corrosion resistant automatic breather/drains are located in each end bracket



Blue Chip XRI®, 5000 Frame TEFC

## Setting The Standards Worldwide...

Each Marathon Electric motor design is proven reliable in the company's state-of-the-art test facility. Experienced test personnel are aided by modern computerized equipment to accurately test and evaluate the actual motor performance characteristics. Dynamometers are used for full load and service factor testing through 1,000 horsepower.

Additional tests available from Marathon Electric include, but are not limited to, calibration tests, sound level tests, vibration measurements, and sealed winding conformance.



Wausau, Wisconsin Test Lab

For additional information about our complete line of above NEMA requirement motors, or other Marathon Electric products, contact:



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