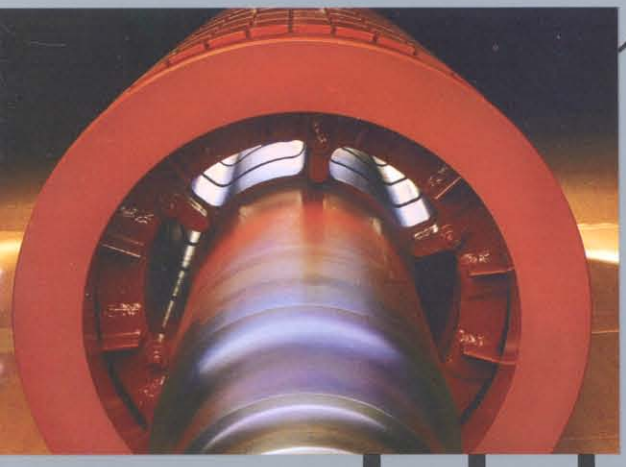
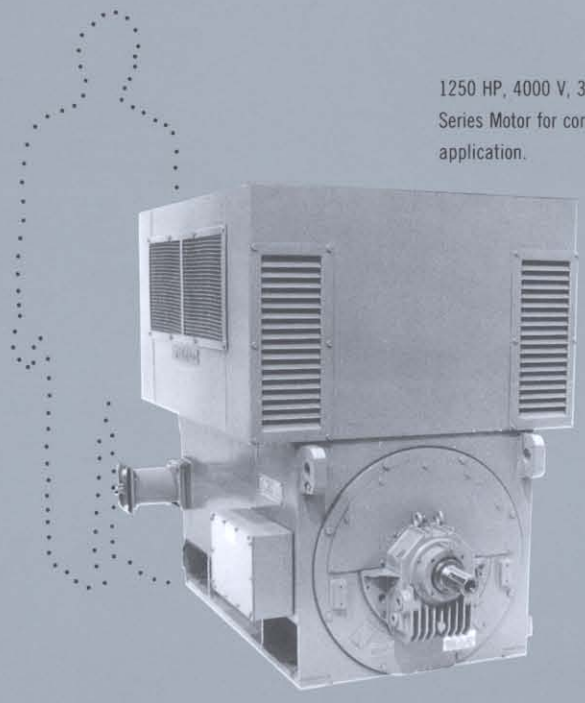
World Series Motors



TECO–Westinghouse

MOTOR COMPANY

World Series Motors



1250 HP, 4000 V, 3600 RPM World Series Motor for compressor application.

30 HP, 200 V, 25Hz sump pump motor. Manufactured in East Pittsburgh in 1900. Still operating in 1978.

A Tradition of Industry Leadership

The TECO–Westinghouse Motor Company is a world leader in the design, production and marketing of large induction motors.

No other motor manufacturer in the world can match the TECO–Westinghouse track record for excellence and innovation. Among our many pioneering developments are the Thermalastic® epoxy insulation system, refinements in copper bar rotor construction, and computer-aided design (CAD) of large motors.

When the world of heavy industry wanted a new generation of high quality, high performance motors, TECO–Westinghouse met the challenge. The best design features of the Life Line D Motors were combined with the very latest advancements in motor design and manufacturing technologies.

The result is truly a "world class" line of integrated, form wound machines—the World Series Motors. Designed to meet the needs of worldwide motor markets while satisfying all domestic requirements, World Series Motors are the culmination of over 100 years of experience from an acknowledged leader in electric motor technology . . . TECO–Westinghouse.

TECO–Westinghouse Induction Motors

A History of Innovation

TECO–Westinghouse has been a pacesetter in the design and production of large induction motors since 1894. It was then that Westinghouse introduced the first line of commercially practical polyphase motors—the Type B Induction Motors.

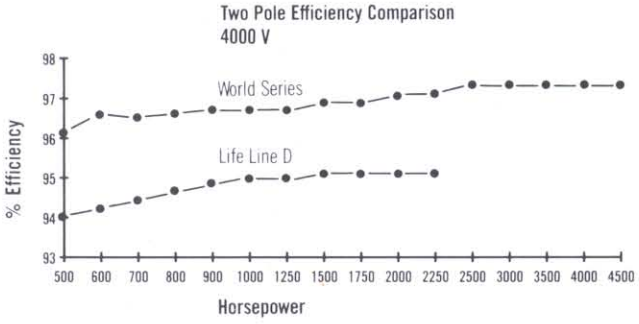
Since then TECO–Westinghouse has been the driving force behind the evolution of induction motor technology. Each new generation of motors was built on the strengths of preceding designs. After the early success of the Type B Motors, Westinghouse developed five successive product lines culminating with the highly reliable, widely used Life Line D motors.

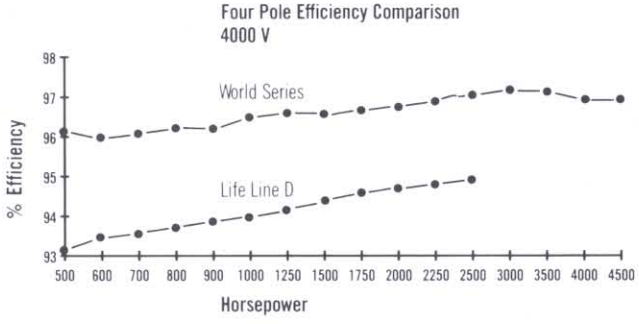
The high-performance Life Line D motors were a tough act to follow, but Westinghouse had already set the stage for even greater advancements in large induction motor design.

World-Class Performance

Whether your application requires a 250-horsepower motor, an 8000-horsepower motor or anything in between, look to World Series Motors for the utmost in value and performance.

World Series Motors are the latest evolutionary step in TECO–Westinghouse motor technology. This top-quality line of induction motors is distinguished by higher efficiencies, advanced software design capabilities, metric frame sizes and TECO–Westinghouse's reputation for quality and reliability.





These graphs demonstrate World Series Motor efficiency improvements in comparison with the previous generation, the Life-Line D.

Enhanced Efficiencies for Greater Savings

Operating efficiencies are vitally important to the bottom-line needs of industry. You may save hundreds of thousands of dollars over the life of a motor by careful evaluation of the operating efficiency. That's why World Series Motors are designed to deliver operating efficiencies that are among the highest in the world.

The following key features have enabled World Series Motors to reduce operating losses up to 30 percent from previous designs:

Powerful computer design programs

Using sophisticated computer programs, TECO–Westinghouse engineers study your electrical and mechanical specifications, scan hundreds of design possibilities in minutes and select the best design for your specific requirements. The result: each motor design is optimized for the highest operating efficiency. State-of-the-art software capabilities also allow us to respond more quickly to your needs with improved outline drawings, complete quotations and accurate performance data.

Metric frame sizes

World Series Motors are built on a metric family of frame sizes that conform to IEC standards. As a result, more frame sizes are available than ever before, and our engineers can select optimized designs for any horsepower, RPM or voltage rating with no gaps in the entire product line. Our wider range of frame sizes also enables more efficient ventilation, which helps reduce heating and windage losses.

Improved materials

World Series Motors incorporate the latest advances in insulation materials. Superior insulating materials allow increased use of copper in the electrical circuit, which enhances operating efficiency.

FASTRACK Program

Large Motors, Short Lead Times

An exciting addition to the World Series line is our FASTRACK Motor Program. This innovative plan provides you with top quality large induction motors with very short lead times. Ratings from 250 HP up to 1250 HP are available.

These machines deliver all the advanced features found on our World Series line including Thermalastic® Epoxy Insulation, Copper Rotor Construction and High Efficiency Performance. Other standard features include ODP/WPI enclosures, 100 ohm stator RTD's, space heaters and dual voltage ratings.

Many customized options can be added to these motors in our FASTRACK PLUS program. FASTRACK PLUS Motors are also on a significantly accelerated production schedule.

If you need a large induction motor quickly, contact your local TECO–Westinghouse Motor Company sales office or distributor about our FASTRACK Motor Program.

Traditional Features

Thermalastic Insulation System. For Unequalled Dielectric Strength and Voltage Endurance

Thermalastic® is a proprietary, integrated insulation system that impregnates the wound and connected stator with a solventless epoxy resin. Developed by TECO–Westinghouse over 40 years ago, Thermalastic® is acknowledged as the industry's premier insulation system and is under continuous development to maintain its position as the world's finest.

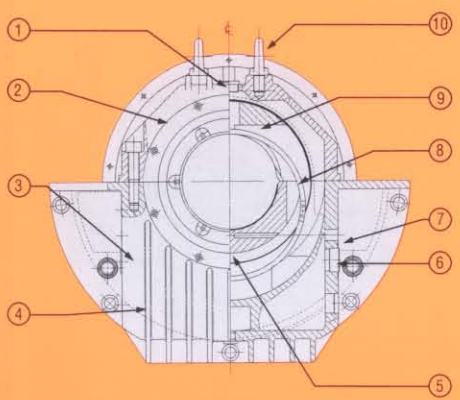
Mica is the heart of the Thermalastic® insulation system and is applied to all of the stator coils. The form-wound stator is post-impregnated with epoxy resin in a vacuum pressure tank and then transferred to an oven for polymerization. The cycle is repeated to ensure elimination of corona-generating voids. The result is a stator insulation system that withstands prolonged voltage stresses, moisture, dirt, thermal cycling and chemical contaminants.

Rugged Box Frame Construction for Strength and Reliability

World Series Motors use box frame construction to provide frames that have the mechanical strength and stability to assure years of dependable, economical performance.

The fabricated steel frames are braced by heavy steel plate bulkheads and end plates to make the frames both laterally and torsionally stable. End brackets are reinforced to give the bearings rigid support and to minimize vibration. Located in line with the end of the frame, the bearing housing provides maximum bearing stiffness. Overall frame strength also minimizes vibration and virtually eliminates the need for realignment.

A wide range of frame sizes is available for the utmost in design flexibility at any motor rating.



Bearing Sleeve Outboard End View

1 Oil Ring View Glass
2 Housing Cap
3 Housing
4 Cooling Fin
5 Bearing (Shell) Lower Half
6 Oil Level Sight Gauge
7 Temperature Detector Port
8 Oil Ring
9 Bearing (Shell) Upper Half
10 Lifting Eye Bolt

Additional Standard Features

Oil Sealing System
Drain Plug
Fill Plug
Flood Lube Inlet
Flood Lube Return
Oil Sump Heater Port

Available Optional Features

Axial Thrust Capability
Provisions for Vibration Transducers
Shaft Current Isolation
Pivoted Pad Bearing
Buffered Seals

Advanced Bearing System for Reliable Performance

The bearing system used in World Series Motors has been designed and engineered for continuous, reliable performance and easy maintenance. Both anti-friction and split-sleeve bearings are offered. When required, bearing insulation can be added to either unit.

Our split-sleeve bearings are spherically seated and self aligning, thus easy to service in all field conditions. They also feature a high-lead content babbitt material and a heavy-duty, two-piece bronze oil ring. The oil ring lubrication process is easily modified for flood lubrication.

This bearing unit employs a sophisticated sealing system that is designed to prevent oil leakage along the shaft. An optional buffered seal can be provided when pressurization is required to keep hostile environments from entering the bearing.

The bearings can be inspected visually through an oil ring sight gauge and an oil level sight gauge on the housing. Bearing caps can be removed easily for bearing inspection without uncoupling the motor from the driven machine. No special tools are required for the inspection procedure.

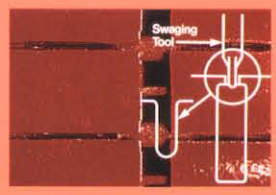
Heavy-Duty Rotor Construction for Dependable Service

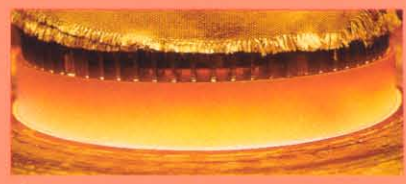
TECO–Westinghouse induction motor rotors are recognized as the most reliable in the industry, and their high performance standards are a hallmark of the World Series Motors.

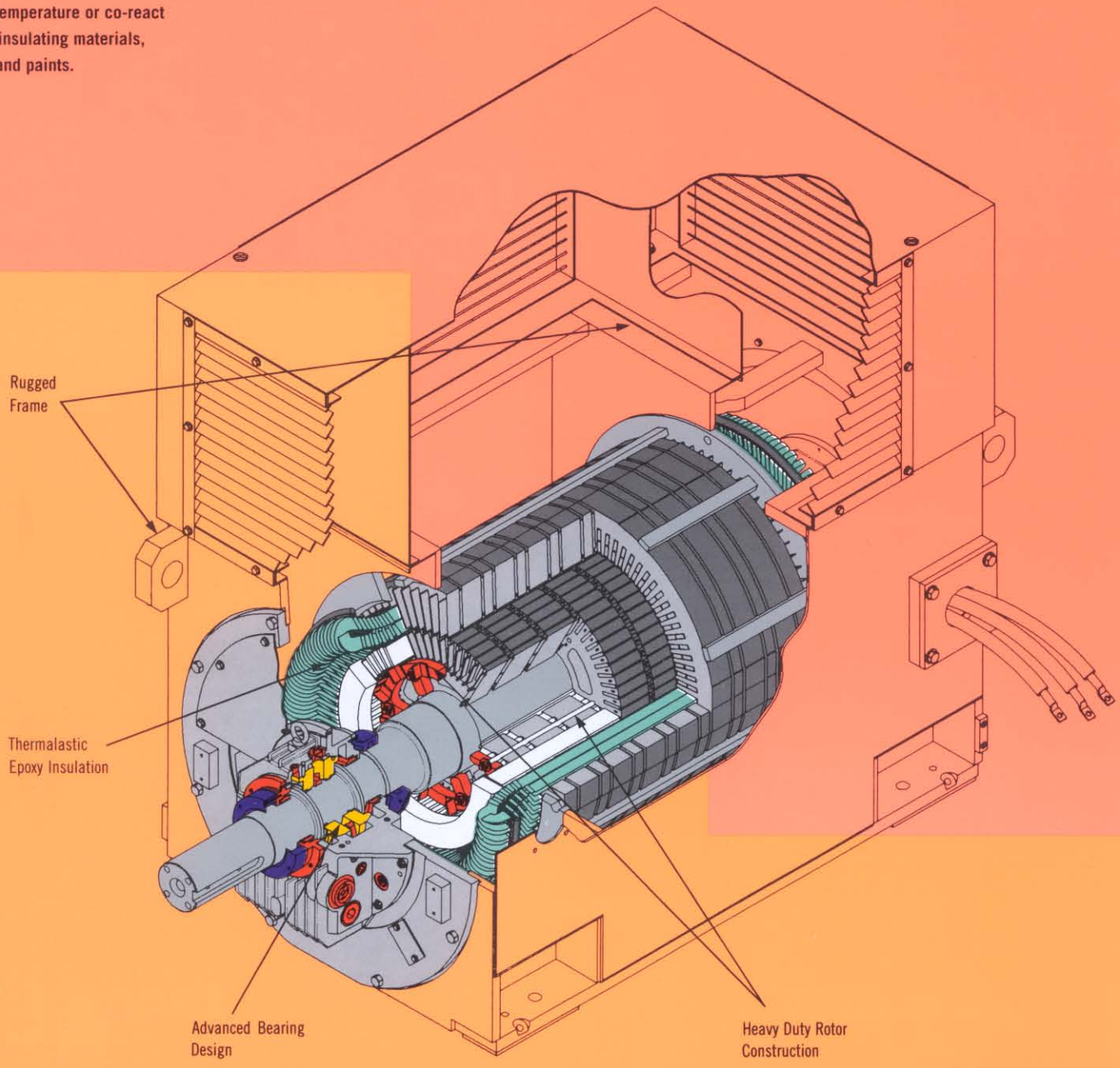
The rotors advanced design features and rugged construction begin with single-piece laminations that help prevent motor shifting and vibration. Each lamination is coated with C5 or C6 insulation, which provides interlaminar resistance. Core losses will be kept to a minimum because the C5 or C6 coating will not flow at any operating temperature or co-react with other insulating materials, varnishes and paints.

Rotor cores are held together by a unique system of heavy-duty through-bolts and end plates. Core mechanical integrity does not rely on any electrically active component. Rotor bars and end rings are copper or copper alloy. Copper is the time-proven choice for rotor construction because it provides maximum performance and reliability.

Swaged rotor bars ensure long motor life by minimizing the movement and vibration that can cause bar fatigue and failure. End rings are centrifugally cast for a void-free cross section and purity, and they are joined to the bars by high-frequency induction brazing to reduce stresses and hot spots in the joint, which can cause fatigue and failure.





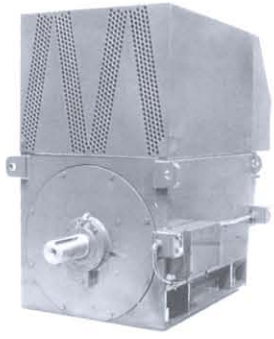


Available NEMA Enclosures

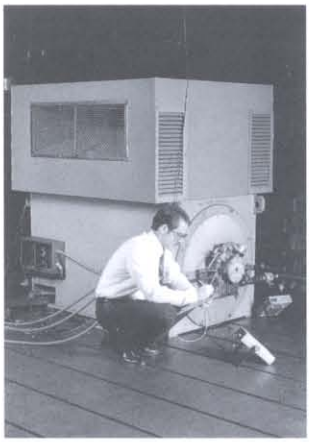
World Series Motors are offered in a complete range of NEMA enclosures to meet the toughest demands of industry. IEC enclosures can also be supplied. Available NEMA enclosures include the following configurations:

- Open Dripproof Guarded
- Weather-Protected Type I
- Weather-Protected Type II
- Totally-Enclosed Water-to-Air-Cooled
- Totally-Enclosed Fan-Cooled
- Totally-Enclosed Air-to-Air-Cooled
- Pipe-Ventilated

Open Dripproof enclosure.



Totally-Enclosed Air-to-Air Cooled enclosure.



Motor on Test with Weather-Protected Type II enclosure.

Terminal Boxes

World Series Motors feature main lead terminal and auxiliary boxes constructed of 12-gauge steel. Each terminal box is gasketed for air-tight, dust-free and weather-proof protection of terminal leads. Available for F1 or F2 locations, terminal boxes can be modified to include any customer terminations and accessory devices.

The main lead terminal box provides termination of the motor's main power leads. Available terminal box options include lightning arresters, surge capacitors, current transformers, special grounding devices, cable or bus bar terminations, and top or bottom lead entry. Standard main lead terminal boxes are available in five sizes, ranging from 14 by 13 by 18 inches up to 36 by 36 by 36 inches, to meet any customer requirements.

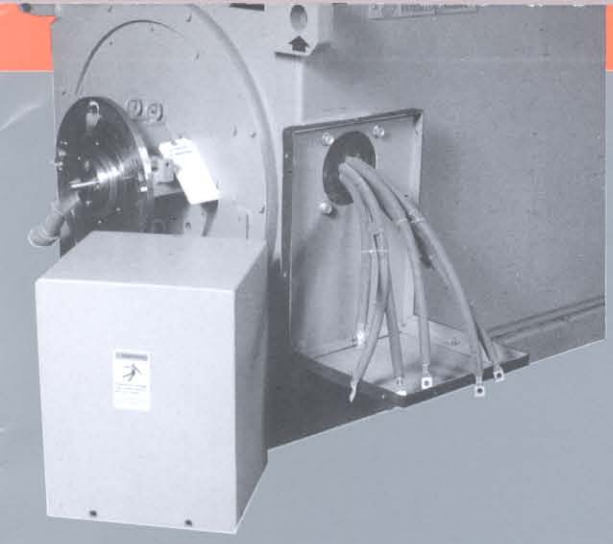
A key feature of the auxiliary box is the "box within a box" system. Designed to meet National Electric Code (NEC) specifications, the auxiliary box provides safe, protected termination for all auxiliary motor devices regardless of voltage.

Applications

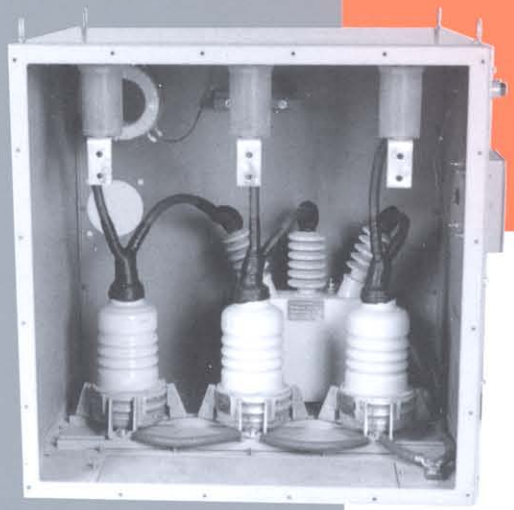
World Series Motors are custom-designed to each customer's specific application. Because of their design versatility and high operating efficiencies, the World Series Motors are the logical choice for a multitude of industries, including pulp and paper, electric utility, marine, water and waste water treatment, chemical and petrochemical, steel, mining, air conditioning and air separation applications.

World Series Motors are used on fans, pumps, compressors, crushers, extruders, conveyors, and most types of variable and constant torque process equipment. They also can be used as induction generators for energy recovery.

World Series Motors can be designed to do almost any big job imaginable—in almost any environmental condition. They also



Standard Main Lead Termination Box.



Oversized Main Lead Termination Box with one-three phase surge capacitor and three-single phase lightning arresters and room for stress cones.

Standard Auxiliary Box with cover.

Auxiliary Box with cover removed but the different voltages separated by "Box within a Box" on the right side.

"Box within a Box" with cover removed.

World Series Motors. Setting the Standard of Excellence

World Series Motors integrate the best of new motor technologies, such as computer design and advanced materials, with the best of proven technologies, including rugged copper rotor construction, Thermalastic® epoxy insulation and strong box frames. This unique blend of new and traditional features makes World Series Motors the optimal choice for heavy industry applications anywhere in the world.

Each World Series Motor is backed by over 100 years of TECO–Westinghouse design experience and industry leadership, as well as the expertise of TECO–Westinghouse's worldwide field service and engineering organization.

Discover how the efficiencies and economies of World Series Motors can work for you. Contact your local TECO–Westinghouse representative or call toll free:

1-800-451-8798

are available in the following special design configurations:

PAM Motors

World Series Motors can be designed to operate as two-speed, one-winding Pole Amplitude Modulation (PAM) Motors. PAM Motors offer the flexibility and energy savings of two speeds while requiring only one winding. TECO–Westinghouse is the world leader in PAM motors, offering more experience than all other motor manufacturers combined.

Adjustable Frequency

Our motors can be engineered to operate with many of today's most advanced adjustable frequency drives. These drives adjust the motor's speed by changing the frequency of the power feeding the motor. By utilizing these drives, users can save energy, better handle high inertia loads, and improve overall reliability. If you are considering an AFAC application then team your drive with a quality World Series Motor.

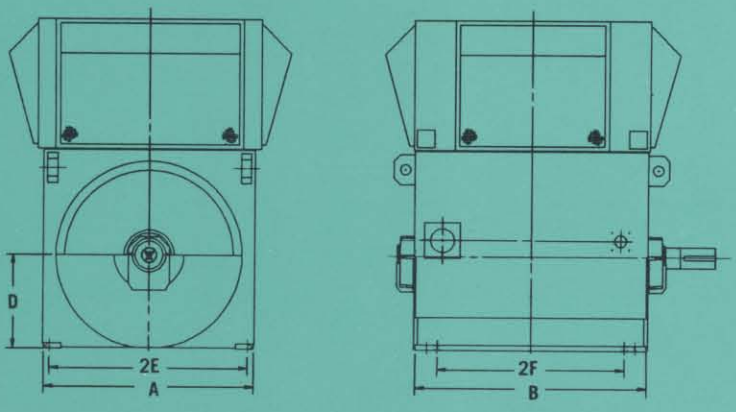
TECO–Westinghouse
MOTOR COMPANY

PO Box 277
Round Rock, TX 78680-0277
1-800-451-8798
Fax: 512-244-5500

TECO–Westinghouse
MOTORS (CANADA) INC.

18060-109 Avenue
Edmonton, Alberta, Canada T5S 2K2
403-444-8933
Fax: 403-486-4575

World Series Motor Dimensions



FRAME	# POLES	EST. WT.	D	2E	A	2F	B	D	2E	A	2F	B
		Lbs.	Inches					Millimeters				
3505	4P UP	3200	13.98	28.0	31.3	22.0	32.9	355	710	795	560	836
3506	2P	3500	13.98	28.0	31.3	24.8	35.6	355	710	795	630	904
3507	4P UP	3800	13.98	28.0	31.3	28.0	38.8	355	710	795	710	986
3508	2P	4000	13.98	28.0	31.3	31.5	42.3	355	710	795	800	1074
3509	4P UP	4300	13.98	28.0	31.3	35.4	46.3	355	710	795	900	1176
3510	2P	4700	13.98	28.0	31.3	39.4	50.2	355	710	795	1000	1275
4008	4P UP	4800	15.75	31.5	35.2	31.5	42.3	400	800	900	800	1074
4009	2P	5100	15.75	31.5	35.2	35.4	46.5	400	800	900	900	1181
4010	4P UP	5500	15.75	31.5	35.2	39.4	50.2	400	800	900	1000	1275
4011	2P	5900	15.75	31.5	35.2	44.1	54.9	400	800	900	1120	1394
4509	4P UP	7500	17.72	35.4	39.1	35.4	50.2	450	900	995	900	1275
4510	2P	7800	17.72	35.4	39.1	39.4	53.9	450	900	995	1000	1369
4511	4P UP	8000	17.72	35.4	39.1	44.1	58.9	450	900	995	1120	1496
4512	2P	8700	17.72	35.4	39.1	49.2	63.7	450	900	995	1250	1618
5010	4P UP	9600	19.68	39.4	43.9	39.4	53.9	500	1000	1115	1000	1369
5011	2P	10500	19.68	39.4	43.9	44.1	58.4	500	1000	1115	1120	1483
5012	4P UP	10500	19.68	39.4	43.9	49.2	63.7	500	1000	1115	1250	1618
5014	2P	11000	19.68	39.4	43.9	55.1	69.4	500	1000	1115	1400	1763
5611	4P UP	14000	22.05	46.5	49.0	44.1	58.6	560	1180	1245	1120	1488
5612	2P	14500	22.05	46.5	49.0	49.2	63.2	560	1180	1245	1250	1605
5614	4P UP	15000	22.05	46.5	49.0	55.1	69.6	560	1180	1245	1400	1768
5616	2P	17000	22.05	46.5	49.0	63.0	77.0	560	1180	1245	1600	1956
6312	4P UP	18000	24.8	49.2	55.9	49.2	67.9	630	1250	1420	1250	1725
6314	2P	18500	24.8	49.2	55.9	55.1	74.8	630	1250	1420	1400	1900
6316	4P UP	19000	24.8	49.2	55.9	63.0	81.7	630	1250	1420	1600	2075
6318	2P	20000	24.8	49.2	55.9	70.9	89.1	630	1250	1420	1800	2264