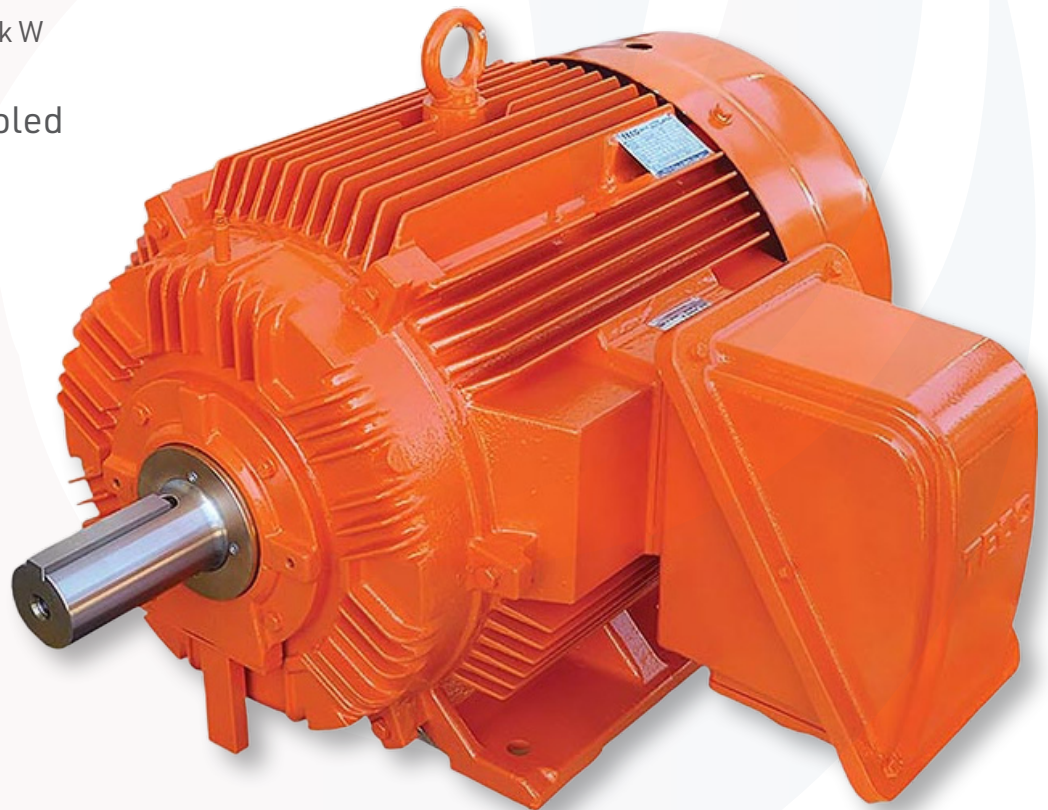




MAXe3 Low Voltage 3-Phase Induction Motors

RANGE 0.55kW TO 500kW

Totally enclosed fan-cooled
cast iron frame series



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Rotating the World Sustainably and Reliably with TECO's Industrial Solutions.



GLOBAL EXPERTISE WITH LOCAL SUPPORT

Operating in over 40 countries across all five continents.



VAST STOCK AVAILABILITY

Large stock range across Australia & New Zealand.



LOCAL IN-HOUSE WORKSHOP

Full range of mechanical and electrical modifications ensuring adherence to TECO's stringent QA standards.

TECO is a global leader specialising in manufacturing and distribution of industrial Electric Motors and Variable Speed Drives.

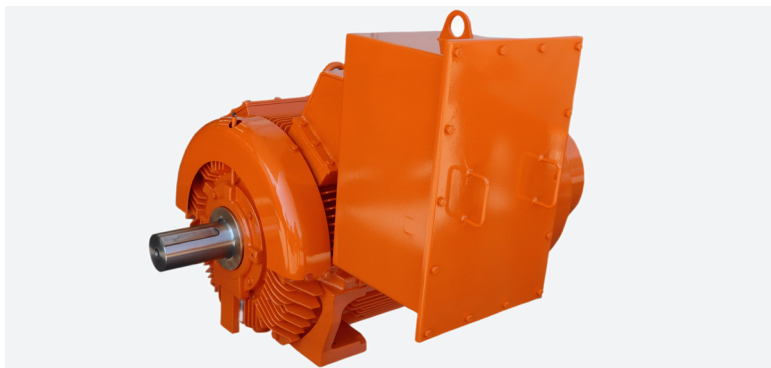
Our extensive product range includes high-quality Low & - Medium Voltage Motors from fractional kW to 22,000 kW for supplies up to 14,200 Volts, energy-efficient Variable Speed Drives and reliable automation equipment.

Our commitment to excellence is evident in our longstanding ISO 9001 and ISO 14001 certifications. Furthermore, our recent acquisition of the EPACT Energy Efficiency Certificate solidifies our position as an exemplary player in the global marketplace.

TECO's commitment to technological advancement and sustainable practice has earned a reputation for delivering superior products and exceptional customer service.

With TECO, you can trust in industry-leading performance, reliability, and a commitment to sustainable practices.

MAXe3 Range High Efficiency Electric Motor



The new MAXe3 range of High Efficiency motors have been specifically designed, manufactured and tested by TECO to excel in the most arduous conditions encountered by the Australian mining sector, heavy industries and in other demanding environments.

Motors are protected to IP66 and rated to 55°C (Severe Duty) or 60°C (Mining) ambient to outlast in the harshest Australian conditions.



They are designed and manufactured by TECO Electric & Machinery Co. and are Squirrel Cage Induction Motors intended for industrial and arduous mining applications and they also meet all relevant sections of the Australian, New Zealand and International Standards detailed herein.

Electrical Design and Standard

Altitude

Designed for operation at an altitude up to 1000 metres above sea level, refer to page 28 for higher altitudes.

Ambient

Motors are designed to operate at full rated nameplated kW in ambient conditions of -20°C to maximum ambients as detailed below.

- MAXe3 MINING - 60°C
- MAXe3 PREMIUM SEVERE DUTY - 55°C

Direction of Rotation

Standard rotation is clockwise when viewed from the drive end with the terminal marking corresponding to incoming line markings all are manufactured as bi-directional.

Duty Rating

All motors have a maximum continuous duty rating of S1 to IEC60034-1. TECO MAXe3 motors have a generous Service Factor, enabling overload, as detailed below, in a 40°C ambient.

- MAXe3 MINING - 1.2 Service Factor
- MAXe3 PREMIUM SEVERE DUTY - 1.15 Service Factor

Electrical Supply

Stock motors are designed for operation on a 380~415 Volt 3-Phase 50 Hz supply and are also suitable for a 440~480 Volt 3-Phase 60 Hz supply.

Motors 4 kW and below are 380~415 Volt 50 Hz STAR connected and may also be reconnected to 240 Volt 3-Phase 50 Hz DELTA configuration for use with single-phase input inverters.

Motors 5.5 kW and larger are 380 ~ 415 Volt 50 Hz DELTA connected.

Please refer to page 29 for Connection diagrams.

Motors can be manufactured for supply systems of up to 1100 Volts, 50 or 60 Hz on a factory made to order basis or by local rewind / wind.

Motor Types / MEPS (Minimum Efficiency Performance Standard)

TECO MAXe3 motors (AEMB and AFJE/AFJN) exceed the High Efficiency requirements from Greenhouse and Energy Minimum Standards (GEMS) acts and regulations. Within the range of 0.75 kW to less than 185 kW, 2 to 8 poles, these motors also comply with IE3 efficiency level of IEC60034-30-1 standard, when operating at 50 Hz, single speed, and direct on-line.

Performance

Maxe3 Electric Motors are designed to meet the performance requirements of Design N, as per IEC60034-12, which includes normal torque for Direct-On-Line starting. These motors are also suitable for other means of starting, depending on the load characteristics. For further details, please refer to TECO. Additionally, other performance characteristics can be customized to meet any special requirement.

Standards

The motors are designed, manufactured and tested in accordance with AS60034-12. Frame sizes comply with IEC60072-1.

Furthermore, the motors meet the requirements of European Directives, where applicable, and are CE marked. TECO holds a "Declaration of Conformity" and is a registered user of the "C-tick" number N121, which covers TECO squirrel cage induction motors. For compliance with other foreign standards, such as UL, CSA, etc., please refer to TECO.

Stator and Windings

The stator comprises of exceptionally high-grade, low-loss insulated, cold-rolled electromagnetic silicon-steel laminations for maximum efficiency and minimal core losses. Windings are randomly wound with spike-resistant Class H copper wire, impregnated with a solventless resin, and are rated as tropic-proof standard. Motor types are insulated as detailed below:

Motor Type - Insulation System

MAXe3 MINING - Class H 180°C

MAXe3 PREMIUM SEVERE DUTY - Class F 155°C

Windings are designed with a temperature rise of less than Class B (80°C), and in most cases, are below Class E (75°C) for extended motor life, providing a significant thermal reserve. Please refer to page 32 for more details on Thermal Reserve.

Testing

In addition to a comprehensive program of tests during manufacture, each motor undergoes routine testing to IEC60034-1 prior to dispatch. Performance testing, whether witnessed or unwitnessed, can be arranged for factory made-to-order motors.



Variable Speed Drive (VSD) Suitability

Motors are suitable for VSD operation, subject to torque and speed limitations, depending on load characteristics and correct installation of both motor and drive. For variable torque loads (e.g., centrifugal pumps and fans) at speeds between 5~50 Hz, derating is not normally required. Force cooling units are also available when necessary (please refer to page 25 for forced cooling details and pages 37-38 for VSD speed range and insulation ratings). Electro-discharge machining of motor bearings can be a concern in some applications with larger motors on VSDs (please refer to page 38 for our recommended preventative measures).

Winding Protection

Motors frame size D160 and larger are equipped with PTC thermistor protection within the windings (one per phase), with the leads terminated in the main terminal box as detailed below:

Motor Type - Thermistors Fitted

- MAXe3 MINING - P180 (Trip) + P150 (Alarm)
- MAXe3 PREMIUM SEVERE DUTY - P150 Trip

Motors 185 kW and larger have thermistor leads terminated in an auxiliary terminal box (available for smaller motors upon request). Additional sets or different temperature rating thermistors can be fitted upon request.

Mechanical Design and Standards

Balancing and Vibration

All rotors are dynamically balanced with a half key to grade G2.5 according to the ISO 21940 standard, so the motor vibration complies with grade A of the IEC60034-14 standard. Alarm and trip vibration values for motors mounted in situ depend on the application conditions, please refer to the ISO 20816 standard.

Bearing and Lubrication System

Frame Size	Poles	DE Bearing	NDE bearing	Greasing/Shaft Seal
D63 ~ D90L	2	Ball	Ball	Greased for life/Gamma***
D100L ~ D160L	2	Ball	Ball	Greased for life (GR)/Gamma***
D180M ~ D250M	2	Ball	Ball	Grease relief
D280S ~ D355*	2	Ball	Ball	Grease relief brass dust flinger
D63 ~ D90L	4 and Above	Ball	Ball	Greased for life/Gamma***
D100L ~ D132M	4 and Above	Ball	Ball	Greased for life (GR)/Gamma***
D160M ~ D180M/L	4 and Above	Ball (Roller)	Ball	Greased for life (GR) /Gamma***
D200L ~ D225M	4 and Above	Ball (Roller)	Ball	Grease relief/Gamma
D250S ~ D250M	4 and Above	Roller (Ball)	Ball	Greased relief/Gamma
D280S ~ D315M	4 and Above	Roller (Ball)	Ball	Grease relief/brass dust flinger
D315A ~ D355*	4 and Above		Ball	Grease relief/brass dust flinger

Key: (options in the parentheses are alternatives) GR – Grease Relief

* Larger sizes also available, refer to TECO for details.

** Ball bearing fitted for direct drive applications, Roller can be fitted for Belt Drive applications, please refer to TECO. MAXe3 Mining have a roller at drive end as standard.

*** Oil Seal fitted to flange/Cface.

C3 diametrical clearance bearings are fitted to all MAXe3 motors for long life and optimum reliability in service.

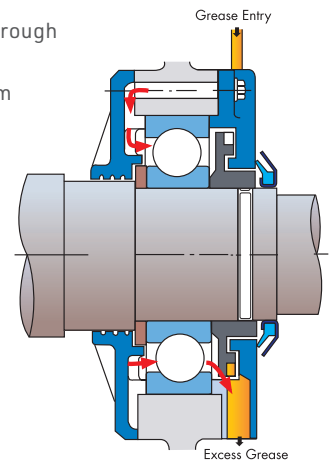
- 2 Pole motors up to and including D180 are suitable for direct drive or belt drive.
- 2 Pole motors D200 and larger are typically suitable for direct drive only, for belt drive above D200 please refer to TECO.
- 4 Pole and larger; up to and including D315MC, (AEMB) motors are suitable for Belt Drive or Direct Drive.

Frames D315A ~ 560 (AFJE/AFJN) are, suitable for direct drive, for Belt Drive refer to TECO.

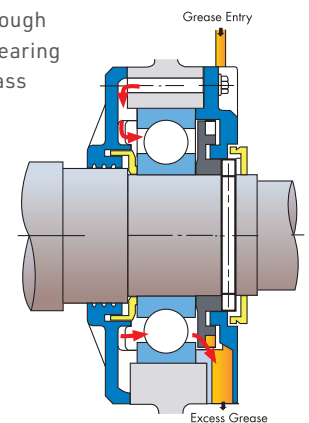
The TECO Flush Through Grease Relief Bearing System ensures positive displacement of old grease when new grease is entered, the TECO system is designed for re-greasing during operation. The fitment of rotating inner and outer labyrinth seals achieves effective sealing from the ingress of external or internal contaminants.

This is a true pressure grease relief system where the grease enters the back of the bearing, is forced through to the front, and is expelled through a large external discharge chute. This system prevents over-greasing from affecting the performance of the bearings. This type of grease replenishment system prevents contaminants from being pushed back into the bearing itself, which can cause premature bearing failure.

TECO Flush Through Grease Relief Bearing System with Gamma Seal to D250



TECO Flush Through Grease Relief Bearing System with Brass Dust Flinger D280-355



Bearing Lubrication Instructions

Bearing Number	8 Pole	6 Pole	4 Pole	2 Pole	
62XX	10	17500	15500	12500	6000
63XX	11	17000	15000	11500	5500
72XX	12	16500	14500	11000	4500
73XX	13	16000	14000	10000	4000
	14	15000	12500	9000	3500
	15	15000	12500	9000	3000
	16	14500	12000	8500	2500
	17	14000	11500	8000	2500
	18	13500	11000	7500	2500
	20	12500	10000	6000	
	22	11500	9000	5500	
	24	11000	8000	4500	

Table 1: Bearing Grease Schedule - 50Hz Operation (bearing temperature 70°C)-Hours

Bearing Number	8 Pole	6 Pole	4 Pole	
NU2XX	14	12000	9500	6000
NU3XX	15	11500	9000	5500
	16	11000	8500	5000
	17	10500	8000	4500
	18	10000	7500	4000
	20	9000	6000	3000
	22	8000	5500	2500
	24	7000	4500	2000
	26	6500	4000	1500

Table 2: Bearing Grease Fill

Bearing Number	Amount (Grams)	Bearing Number	Amount (Grams)		
62XX	6210	30	63XX	6310	40
	11	35		11	50
72XX	12	40	73XX	12	60
NU2XX	13	50	NU3XX	13	80
	14	50		14	80
	15	60		15	100
	16	60		16	100
	17	80		17	120
	18	80		18	120
	20	100		20	160
	22	120		22	220
	24	120		24	270
				26	300



Extensive shaft locking clamp on large AFJE / AFJN motor

Notes:

- Please ensure bearings are fully purged during commissioning, thereafter, adhere to the above re-greasing schedule.
- Replenishment of grease recommended when motor is running.
- Do not mix dissimilar greases.
- TECO uses and recommends use of Mobil Polyrex EM grease on regreasable MAXe3 motors.

Grease

Super-premium Mobil Polyrex™ EM Series grease is specially formulated for electric-motor bearings. The advanced thickener formulation and proprietary manufacturing techniques provide improved bearing performance and protection for long electric motor life.

Features and Benefits

- Outstanding grease life, outstanding long-life, high temperature lubrication of ball and roller bearings
- Advanced polyurea thickener
- Increased durability versus conventional polyurea greases when subjected to mechanical shear forces
- Excellent corrosion resistance providing protection against rust and corrosion
- Protection under mild salt-water wash conditions
- Low-noise properties

When do motors require greasing?

- At initial start during commissioning
- If the motor has been out of service for three (3) months or longer
- At predetermined intervals, please refer to "Table 1"

What to do prior to greasing?

- Check the motor nameplate for the type of grease and check that the grease you plan to use is fully compatible
- Clean the grease nipples on the motor and the grease gun discharge connection
- Ensure that the grease discharge chute on the motor is clean and not blocked with old hard grease
- The electric motor must be running with preferably the bearings up to normal operating temperature before greasing.
- Pump-in half of the required quantity of grease as show in "Table 2" to each bearing and allow to settle
- After 10 - 15 minutes pump-in remainder of the required grease quantity
- Please note, it is normal to see an increase in the bearing temperature during the greasing procedure
- Expelled grease should be evident at the rotating labyrinth seal and within the discharge chute when new grease exits greasing can cease.
- 30 minutes after the greasing procedure the bearing temperatures should return to normal, if not, please check that there are no other reasons for an increase in bearing temperature, i.e. misalignment, high vibration etc.

Bearing False Brinelling Protection : A bearing, will experience false brinelling when it is not turning and subjected to external vibrations. This is generally in the cylindrical roller type and brought about by transportation of the motor without an effective shaft lock to prevent movement or from vibration of the motor when de-energized. Because the bearing is not turning, the grease or oil will be gradually removed from the ball or roller contacts resulting in metal to metal contact. Wear can then take place and the damage will cause the bearing to fail prematurely after start up. TECO fit shaft locks on ≥180 frame 2 pole ≥200 frame 4 pole to prevent false brinelling. Please ensure that motors are transported and stored with their shaft clamps attached.

Cooling System

Motors are Totally Enclosed Fan Cooled (TEFC), with integrally cast cooling fins on the motor frame and endshields, fitted with an external fan (IC411) to AS1359.106.

TECO cooling fans fitted are bi-directional and low noise as standard (2 pole 220 kW and larger have uni-directional fans).

Finish

All external components are shot blast to a near white finish. A durable coat of Alkyd Resin primer giving excellent corrosion protection follows this preparation. The complete motor is then finish coated with Alkyd Resin Gloss Enamel, finish Colour as per table below.

MAXe3 MINING -Orange (X15 AS2700)

MAXe3 PREMIUM SEVERE DUTY - TECO Westinghouse Blue (Munsell 5PB3/8).

Other paint systems and colours are available upon request, including chemical duty two-pack polyurethane and epoxy paint systems.

Hardware

All hardware is electro zinc plated for better corrosion resistance.

Stainless steel hardware can be offered as an alternative, please contact TECO for the surcharge to provide this feature.

MAXe3 MINING "HX" Motors

Arduous Mining Crusher Duty - Frames D315MC to D355

These are a special range of motors, which meet the High Efficiency levels and also have the following extra features as standard:

- Oversized drive end shaft and bearings for demanding vee belt drive applications.
- Two sets of thermistors providing an alarm and trip set with auxiliary terminal box.
- Oversized Fabricated Steel primary terminal box with non-ferrous blank gland plate.

Mounting

Motors are available in the following mountings, refer to page 26 for IM codes of mountings.

- Foot-mounted
- Foot and Flange mounted
- Flange-mounted
- Foot and C Face-mounted
- C Face-mounted

Motor Construction

Motor frames are high grade Cast Iron with integrally cast feet and cast iron end shields, suiting arduous mining applications. Castings are machined to close tolerances in order to ensure accurate alignment with minimum vibration.

Standard Materials of Construction

Frame Size	MAXe3 MINING	MAXe3 PREMIUM SEVERE DUTY	Fan Cover	Terminal box
	External Fan	External Fan		
D80-D132	CPP (CI)	CPP (CI)	HDPS (CI)	CI
D160-D315M	CI	CPP (CI)	HDPS (CI)	CI
D315A-D355*	FS	CPP (FS)	FS	FS*(CI)

Key: (material in parentheses is alternative)

CPP - Conductive Polypropylene (Non Sparking)

CI - Cast Iron

HDPS - Heavy Duty Pressed Steel

FS - Fabricated Steel

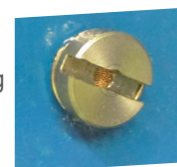
FS* - Fabricated Steel with blank cable entry gland plate.

* Larger sizes are also available, please refer to TECO for details.

Protection

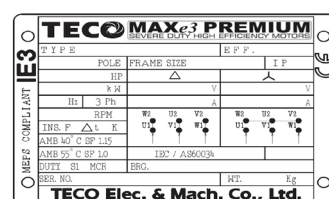
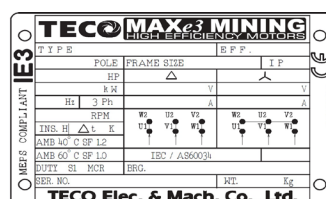
(IP rating – stock motors)

All motors are rated IP66, thereby providing excellent protection against the ingress of dust and water. Sintered Bronze (screwed in stainless holder) porous drain plugs are fitted to all Foot and Foot / Flange mounted motors, intended for Horizontal mounting and can be included on Flange mount motors upon request.



Rating Plate

A stainless steel rating plate containing all details as specified in AS60034-1 [including bearing sizes] is fitted to all motors. The rating plate also confirms compliance with the MEPS Efficiency Standard.



Rotor Assembly

As per the stator, the rotor core is made up of exceptional high grade laminations, made from low-loss insulated cold-rolled electro-magnetic steel for maximum efficiency and low core losses.

The rotor cage is pressure die-cast high conductivity aluminium with waffer blades and balance supports integrally cast onto the rotor endrings.

On some larger AFJE/AFJN motors, the rotor is of a copper / copper alloy rotor bar construction. This rotor construction offers superior performance and reliability.

TECO utilizes high-frequency induction brazing as a means to enhance the structural integrity of the rotor bar to endring joint. Induction brazing provides an "all at once" uniform braze that reduces stresses and hot spots in the joint, which can cause premature fatigue and rotor bar failure.

The rotor is a press fit onto the high tensile steel shaft (ANSI10405) and is also keyed onto the shaft on motor frames D200 and larger.

Motor Terminal Stud Tightening Torques in Nm

Frame Size	Stud Size	Tightening Torque (Nm)
D63-D71	M4	0.97
D80-D112	M5	1.9
D132-D180	M6	3.2
D200-D250	M8	7.8
D250-D315M	M10	15.1
D250-D315M	M12	26.5
D250-D355	M16	64.7

Note: Recommended Terminal Tightening Torques

Terminal Box

On foot and foot / flange mounted motors up-to and including D315M, the terminal box is mounted on the right-hand side viewed from drive-end and can be transferred to the left-hand side upon request.

For frames D315A (AFJE/AFJN) and larger the terminal box is at the 2 o'clock position on the right hand side (alternative terminal box locations are available on request, please refer to TECO).

All terminal boxes have one-piece neoprene gaskets between frame, box and gland plate and can be rotated through 360° in 4x90° increments.

An internal earth is provided within the motor terminal box.

TECO motors are shipped with a rubber gasket in the cable entry of the terminal box to prevent contamination during transport and storage. For installation, please pierce the gasket and install the cable gland. Please refer to the dimensional tables within this catalogue for the correct gland size (KK) for your corresponding motor.

Maximum Cable Sizes

Frame Size	Maximum Cable Size
D80 ~ D112	10 mm ²
D132 ~ D180	50 mm ²
D200 ~ D225	95 mm ²
D250 ~ D315M*	185 mm ²

Notes: Sizes based on -
3 core + Earth Copper PVC Insulated / PVC Sheathed or
3 core + Earth Copper PVC Insulated / Steel Wire Armoured.
Standard Cast Iron terminal box *
Larger terminal boxes are available, please refer to TECO.

Frame sizes D315A-355, Type AFJE.

These units have an oversized fabricated steel terminal box and include an undrilled brass gland plate in order to prevent eddy currents produced by the use of single core supply cables which can present this problem when terminated via a ferrous gland plate. These gland plates are designed to be drilled (and tapped where applicable) by the customer to suit the incoming supply cables and glands being used. All terminal boxes are internally prime painted to prevent corrosion and include an internal earth terminal with lug for connection of the incoming earth conductor.

TECO are renowned for providing one of the largest terminal boxes on the market. This ensures that there is more than enough space for terminating incoming cables, even in extra long cable runs or aluminium cables.

TERMINAL BOXES Motor frame sizes D315A-355, type AFJE

MAXe3 Premium Severe Duty

Terminal arrangement fitted to these motors is the TECO Heavy Duty Isolator type (x 6 studs) and is complete with the necessary links for Star or Delta connection. Terminals are offset, top to bottom, to allow for 2 (or more) incoming supply cables per phase.

MAXe3 MINING

Terminal arrangement fitted to these motors can also be the Weidmuller WFF300AH (x 6) rated for a voltage and current of up to 1100 Volts.

These Weidmuller terminals are rated for Ex e Increased Safety use as standard and are IECEx certified, ensuring cool operating temperatures whilst in service.

They incorporate phase barriers, non-twist locking terminals and have an insulation cover over each terminal as standard for added safety. Terminals are marked according to AS60034-8 and they are provided with Star and Delta links, for winding configuration and cable connection as required.

MAXe3 Premium Severe Duty Terminal Box



Some available options in this range are as follows:

- 1000V motors
- Airstream rated IC418
- Anti-condensation heaters
- Auxiliary terminal boxes for Thermistor/Heater / RTD terminations
- Electromechanical "fail safe" Brake Motors
- Ex e, Increased Safety, IECEx certified
- Ex nA, Non-sparking, IECEx certified
- Ex tD, Dust Ignition Proof, IECEx certified
- Cooling Tower application
- Crane rated motors
- Double / non standard shaft extensions
- Encoder / Tacho
- Forced Cooling IC416
- Induction Generators
- Insulated bearing
- Multi-speed motors
- Rain covers for vertical shaft down motors
- Resistance temperature detectors (RTD's) winding and / or bearings
- Rotor Groundary brush / Earthing ring
- Dust covers to clear foreign debris
- Extended/Flying leads
- Special paint systems / colours
- SPM vibration studs
- Vibration sensors
- Stainless steel fasteners
- Thermistor protection (on motor frames <D160)
- Others on request.

MAXe3 Mining Terminal Box



TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

AEMB High Efficiency Range 63 to 315M Frame (415V 50Hz) - Electric Motor Performance

Output kW	Full Load Rpm	Frame No.	Efficiency			Power Factor			Current		Torque					Inertia		dB(A)	Weight Foot Mount Kgs (approx)
			Full Load (%)	3/4 Load (%)	1/2 Load (%)	Full Load (%)	3/4 Load (%)	1/2 Load (%)	Full Load (A)	Locked Rotor (%)	Full Load N-m	Locked Rotor %FLT	Locked Rotor t (secs) (hot)	Pull Up %FLT	Break-Down %FLT	ROTOR J = GD ² /4 Kg-m ²	MAX J = GD ² /4 Kg-m ²		
0.18	2740	63	61.0	59.5	55.0	77.5	69.0	57.0	0.55	455	0.63	363	7	363	363	0.0005	0.022	52	9
	1350	63	63.5	63.0	58.0	70.0	61.0	49.0	0.58	431	1.27	264	8.5	253	286	0.0008	0.103	48	11
	910	71	61.0	57.0	50.0	64.0	55.0	44.0	0.66	379	1.89	286	17.6	264	308	0.0018	0.175	45	12
	705	80	52.0	48.0	39.0	47.0	41.0	34.0	1.06	302	2.44	396	22	385	407	0.0025	0.543	44	16
0.37	2800	71	75.0	74.0	70.0	85.0	78.0	64.0	0.81	593	1.26	352	6.2	297	341	0.0008	0.043	54	12
	1405	71	74.5	73.0	68.5	69.5	60.5	48.0	1.00	530	2.51	358	7.1	297	336	0.0013	0.198	50	13
	920	80	72.5	72.0	68.5	72.0	62.5	49.0	0.99	535	3.84	253	11	236.5	264	0.0025	0.338	49	18
	710	90S	70.5	68.0	62.5	60.0	51.0	39.5	1.23	388	4.98	215	15.2	209	292	0.0045	1.04	49	22
0.55	2780	71	73.0	72.0	68.0	83.0	75.0	62.0	1.28	563	1.89	330	7	286	308	0.0008	0.062	53	16
	1405	80	71.5	70.5	65.0	74.0	65.0	52.0	1.47	524	3.74	286	9.6	253	308	0.0018	0.291	48	18
	910	80	68.0	68.0	63.0	72.0	62.0	49.0	1.59	365	5.77	253	11.5	231	253	0.0030	0.498	48	18
	690	90L	70.0	70.0	66.0	70.0	61.0	49.0	1.59	365	7.61	187	14.4	160	226	0.0058	1.54	47	27
0.75	2825	80	83.0	82.0	79.0	85.0	79.0	65.0	1.48	878	2.53	308	13	275	385	0.0015	0.081	56	16
	1440	80	84.5	82.0	79.0	74.5	65.0	50.5	1.66	783	4.97	325	21	286	413	0.0033	0.353	47	19
	935	90S	80.5	80.0	78.5	73.0	64.5	51.5	1.78	562	7.64	220	50	171	259	0.0055	0.913	45	24
	700	100L	76.6	76.5	73.0	60.0	50.5	38.5	2.27	441	10.2	259	55	242	253	0.0105	1.89	49	33
1.1	2815	80	84.5	84.0	82.0	85.0	79.0	66.0	2.13	845	3.72	330	11	286	363	0.0018	0.110	55	18
	1435	90S	86.0	86.5	85.5	80.5	73.5	60.5	2.21	814	7.31	281	34	198	319	0.0048	0.523	46	23
	935	90L	82.5	81.5	79.5	73.0	65.0	52.0	2.54	591	11.2	220	38	193	264	0.0068	1.40	45	27
	695	100L	79.5	80.0	77.5	64.0	55.0	42.5	3.01	498	15.1	231	48	220	237	0.0148	2.74	49	40
1.5	2895	90S	86.5	87.0	85.0	85.0	79.0	66.5	2.84	880	4.94	330	9	292	413	0.0030	0.145	56	24
	1440	90L	87.0	86.0	84.0	76.0	67.0	53.0	3.16	791	9.94	314	22	237	374	0.0063	0.670	47	24
	950	100L	84.0	84.0	81.5	73.0	67.0	54.0	3.40	735	15.1	259	38	248	308	0.0148	1.83	47	40
	705	112M	82.1	81.0	78.5	66.5	58.0	45.0	3.82	523	20.3	187	46	171	259	0.0225	3.65	49	48
2.2	2900	90L	87.5	87.0	85.0	80.0	72.0	58.0	4.37	892	7.23	374	8	325	446	0.0035	0.213	55	26
	1455	100L	88.5	88.0	86.0	81.0	73.0	59.0	4.27	913	14.4	303	20	215	391	0.0115	1.04	48	36
	965	112M	87.2	85.5	85.0	67.0	54.0	47.5	5.24	668	21.7	220	39	198	314	0.0210	2.68	48	47
	705	132S	84.6	83.5	82.0	69.0	60.0	46.5	5.24	572	29.8	253	32	226	292	0.0345	5.29	49	59
3	2870	100L	88.5	88.5	87.0	88.0	85.0	76.0	5.36	932	9.97	391	8	363	413	0.0063	0.280	59	37
	1450	100L	89.5	87.5	85.5	78.0	69.0	54.5	5.98	903	19.7	314	27	220	396	0.0130	1.34	48	39
	970	132S	88.8	87.5	86.0	78.0	71.0	59.0	6.03	746	29.5	220	40	198	325	0.0385	3.50	48	67
	715	132M	85.3	85.0	83.0	64.0	54.5	41.0	7.65	588	40.0	308	48	286	363	0.0450	6.97	50	73
4	2885	112M	90.3	90.5	90.0	90.0	87.0	80.0	6.85	949	13.2	347	9	330	385	0.0115	0.383	59	45
	1450	112M	90.0	89.5	89.0	82.0	76.0	63.5	7.54	862	26.3	303	16	171	363	0.0208	1.81	50	47
	970	132M	89.6	89.0	87.0	78.0	71.5	59.0	7.96	754	39.3	231	38	215	341	0.0515	4.75	52	83
	720	160M	87.1	86.0	84.5	70.5	62.0	48.5	9.06	607	53.0	209	39	187	275	0.0860	9.51	51	116
5.5	2930	132S	91.7	91.5	90.5	85.0	82.0	73.0	9.82	866	17.9	242	13	209	330	0.0190	0.505	65	67
	1460	132S	91.0	90.5	90.5	85.5	81.0	72.0	9.83	916	35.9	275	19	226	352	0.0333	2.37	54	68
	970	132M	89.5	89.5	88.5	74.5	66.5	54.0	11.5	826	54.1	270	20	237	369	0.0543	6.33	52	84
	720	160M	88.0	87.0	85.0	71.5	63.0	50.0	12.2	615	72.8	220	24	204	303	0.1260	12.7	54	133
7.5	2920	132S	91.7	91.0	91.5	85.0	79.0	70.0	13.4	821	24.5	231	10	193	303	0.0205	0.670	65	69
	1465	132M	91.7	92.0	91.5	85.0	80.5	71.0	13.4	896	48.8	281	14	215	380	0.0433	3.10	54	86
	970	160M	91.0	90.5	89.5	79.0	73.0	61.5	14.5	690	73.7	297	21	259	297	0.1210	8.34	52	133
	720	160L	89.0	88.0	86.0	71.0	64.5	51.0	16.5	606	99.4	248	24	237	325	0.1680	16.6	55	158
11	2945	160M	93.2	92.5	92.0	91.0	89.0	83.5	18.0	777	35.6	253	16	204	314	0.0458	0.973	67	126
	1465	160M	92.9	92.5	92.0	86.0	82.5	73.5	19.2	729	71.6	259	17	209	303	0.0918	4.57	57	129
	965	160L	91.5	91.0	90.5	80.0	74.5	63.0	20.9	766	109	314	14	281	325	0.1575	12.2	56	153
	720	180L	90.5	90.5	90.0	72.0	61.0	52.5	20.6	606	146	187	27	165	231	0.3195	24.3	56	208

Notes:

- All figures are based on tests carried out on 415 Volt 3 Phase Motors
- Test Method : IEC60034-2-1 Method
- Tolerance : Page 38
- dB(A): Mean Sound Pressure Level on no load and 1 metre on mains 50Hz sinusoidal supply, subject to 3dB(A) tolerance
- Motor data 8 pole and slower speeds not listed available on request
- Data subject to change without notice.

Other 50Hz Mains Voltage	380V	400V	440V	525V	550V	690V	1000V
Full Load Current multiplication factor (x)	1.092	1.038	0.943	0.790	0.755	0.601	0.415

Note: Figures for 525, 550, and 1000V are for comparative purposes only. 415V plated motors are not suitable for connection to these voltages.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

AEMB High Efficiency Range 63 to 315M Frame (415V 50Hz) - Electric Motor Performance

Output kW	Full Load Rpm	Frame No.	Efficiency			Power Factor			Current		Torque					Inertia		dB(A)	Weight Foot Mount Kgs (approx)
			Full Load (%)	3/4 Load (%)	1/2 Load (%)	Full Load (%)	3/4 Load (%)	1/2 Load (%)	Full Load (A)	Locked Rotor (%)	Full Load N-m	Locked Rotor %FLT	Locked Rotor t (secs) (hot)	Pull Up %FLT	Break-Down %FLT	ROTOR J=GD ² /4 Kg-m ²	MAX J=GD ² /4 Kg-m ²		
15	2935	160M	93.5	92.0	91.5	90.0	87.0	80.0	24.8	786	48.7	264	12	237	341	0.0513	1.28	67	129
	1465	160L	93.0	93.0	92.5	86.0	83.0	74.5	26.1	747	97.6	270	12	215	314	0.1155	6.02	57	148
	970	180LC	92.0	92.0	92.0	84.0	81.0	72.5	27.0	630	147	253	19	182	275	0.3355	15.9	56	206
	730	200LC	91.7	90.5	89.0	78.0	72.0	60.0	29.2	616	196	215	20	187	253	0.5213	31.8	57	313
18.5	2940	160L	93.8	93.5	93.0	90.5	87.0	79.5	30.3	809	60.0	286	10	248	330	0.0593	1.55	67	142
	1480	180M	94.0	94.0	93.0	83.0	76.0	64.5	33.0	742	119	220	13	154	275	0.1768	7.42	62	191
	975	200LC	93.0	93.0	92.5	82.0	78.5	69.5	33.7	653	181	253	22	182	270	0.4588	19.7	56	292
	735	225SC	93.6	93.0	92.5	77.0	71.5	60.0	35.7	532	240	215	32	138	215	0.7268	39.3	58	380
22	2950	180MA	94.1	94.0	93.0	87.0	85.0	77.0	37.4	882	71.1	248	12	198	303	0.0708	1.89	67	183
	1480	180LC	94.5	94.0	93.5	83.0	76.5	65.0	39.0	692	142	220	14	154	264	0.1980	8.76	62	205
	975	200LC	93.5	93.5	93.5	82.5	79.5	71.0	39.7	655	215	242	24	198	264	0.5213	23.4	56	311
	740	225MC	93.7	93.0	92.0	73.0	66.0	54.0	44.7	515	284	248	32	160	253	0.8140	46.8	58	405
30	2945	200LA	94.5	94.0	93.0	90.5	91.0	88.5	48.8	717	97.1	187	17	132	275	0.1505	2.43	74	289
	1475	200LC	94.5	94.5	94.5	86.0	84.5	77.0	51.4	798	194	292	11	237	313	0.3628	11.5	62	301
	985	225MC	94.6	94.0	93.5	83.0	79.5	70.0	53.1	574	290	231	29	187	253	0.7558	30.5	60	397
	735	250SC	93.5	93.0	92.0	74.5	68.0	56.0	59.9	701	389	286	20	248	325	1.2345	61.3	65	521
37	2960	200LA	94.9	94.5	93.5	91.0	90.5	87.0	59.6	780	119	215	15	154	303	0.1883	2.98	74	323
	1480	225SC	95.4	95.0	94.5	85.0	82.0	74.0	63.5	724	239	226	17	204	319	0.4740	14.1	66	376
	985	250SC	95.1	94.5	94.5	86.0	82.5	74.0	62.9	715	358	270	24	231	292	1.1400	37.8	63	513
	740	250MC	94.0	93.0	92.0	76.0	70.0	58.5	72.1	680	477	270	20	237	297	1.4173	75.5	68	567
45	2960	225MA	95.6	95.0	94.0	93.0	92.0	87.0	70.4	736	145	165	18	132	352	0.2968	3.53	79	388
	1480	225MC	95.4	95.0	95.0	85.5	82.0	74.0	76.7	665	290	220	14	187	303	0.4948	16.7	66	387
	985	250MC	94.5	94.5	94.0	86.5	84.0	76.0	76.6	764	436	264	20	226	297	1.2765	44.8	63	545
55	2970	250SA	95.8	94.5	94.0	91.5	90.5	87.0	87.3	739	177	165	18	143	346	0.3868	4.32	74	498
	1485	250SC	95.8	95.0	95.0	86.0	83.5	76.5	92.8	744	353	242	16	270	303	0.9778	20.3	70	531
	984	280SC	95.7	95.0	94.3	84.0	81.5	74.0	95.0	684	533	182	22	154	253	2.1250	55.0	73*	670
75	2960	250MA	95.5	95.0	95.0	92.0	91.0	88.0	119.0	693	242	154	14	143	325	0.4540	5.60	79*	531
	1480	250MC	95.7	95.0	95.0	86.0	84.5	79.0	127.0	740	484	242	14	253	275	1.1225	26.8	70*	576
	984	280MC	95.8	95.7	95.3	85.0	82.0	75.0	128.0	684	727	176	27	150	253	2.7750	46.8	73*	772
90	2960	280SA	96.1	95.7	94.8	90.0	88.0	82.0	145.0	755	290	143	11	121	253	0.6750	6.88	80*	635
	1480	280SC	96.2	95.5	94.9	86.5	83.6	77.0	148.0	740	580	176	13	150	253	1.8250	33.0	75*	673
	985	315SC	96.4	95.8	95.2	85.5	82.5	76.0	152.0	720	872	171	31	144	253	4.2750	88.3	73*	944
110	2960	280MA	96.3	95.7	94.7	90.0	88.0	82.0	177.0	763	355	132	11	112	253	0.8000	8.08	80*	678
	1482	280MC	96.4	96.3	95.9	87.5	84.0	77.5	181.0	746	709	154	13	121	253	2.1500	39.0	75*	730
	985	315MC	96.5	96.0	95.3	86.0	83.0	76.5	184.0	734	1068	110	26	99	242	4.9750	105	73*	1042
132	2976	315SA	96.6	95.7	94.9	90.0	88.0	82.0	211.0	754	423	127	28	108	242	1.2750	9.13	82*	833
	1482	315SC	96.7	95.9	95.3	88.0	84.5	78.5	216.0	736	850	154	27	121	242	3.0500	44.0	75*	926
	986	315MC	96.5	96.0	95.4	86.0	83.0	76.5	221.0	719	1274	110	18	99	242	5.1750	120	73*	1080
150	2976	315MA	96.7	96.1	95.3	90.0	89.0	83.0	240.0	750	481	116	27	100	242	1.4500	10.5	82*	927
	1485	315MC	96.9	96.0	95.7	88.0	84.5	79.0	245.0	735	964	110	26	99	242	3.5500	50.5	75*	1062
185	2982	315MA	97.0	96.3	95.6	90.0	89.0	83.0	295.0	780	592	116	25	100	242	1.5000	12.8	82*	1050
	1486	315MC	97.0	96.0	95.7	88.5	85.0	79.5	300.0	767	1186	110	19	99	242	3.6000	61.8	75*	1150

Notes:

- All figures are based on tests carried out on 415 Volt 3 Phase Motors
- Test Method : IEC60034-2-1 Method
- Tolerance : Page 36
- Mean Sound Pressure Level on no load and 1 metre on mains 50Hz sinusoidal supply, subject to 3dB(A) tolerance
- Motor data 8 pole and slower speeds not listed, available on request
- 185kW motor in D315MC frame with fabricated steel terminal box
- Data subject to change without notice
- *Low noise option available D280-315M
- Larger sizes, please refer to TECO.

Other 50Hz Mains Voltage	380V	400V	440V	525V	550V	690V	1000V
Full Load Current multiplication factor (x)	1.092	1.038	0.943	0.790	0.755	0.601	0.415

Note: Figures for 525, 550, and 1000V are for comparative purposes only. 415V plated motors are not suitable for connection to these voltages.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 63 to 132 Foot Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

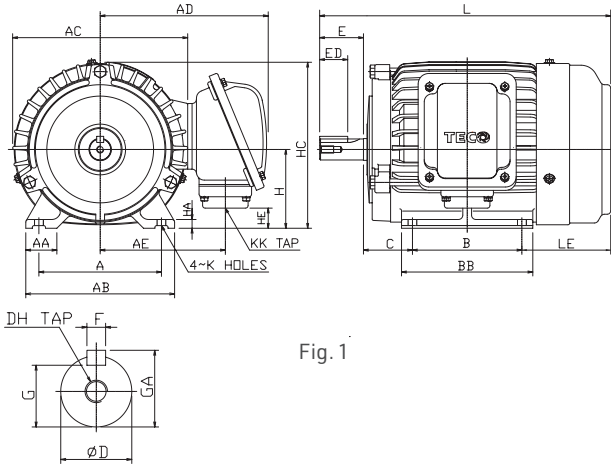


Fig. 1

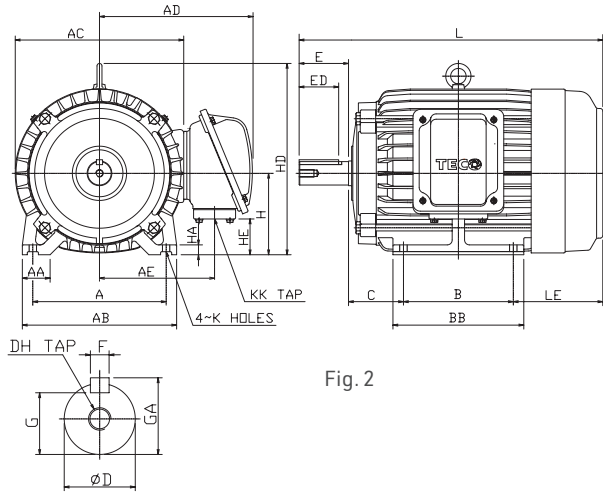


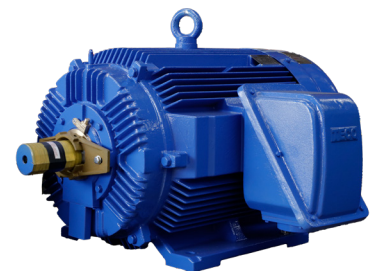
Fig. 2

Output (kW)				Frame Size	Fig. No.	Dimensions (mm)												
2P	4P	6P	8P			A	AA	AB	AC	AD	AE	B	BB	C	H	HA	HC	HD
0.18	0.18	-	-	63	1	100	28	120	144	138	100	80	100	40	63	8	135	-
0.37 / 0.55	0.37	0.18	-	71		112	35.5	140	162	148	110	90	115	45	71	8	152	-
0.75 / 1.1	0.55 / 0.75	0.37 / 0.55	0.18	80		125	35.5	155	177	179	130	100	130	50	80	9	168	-
1.5	1.1	0.75	0.37	90S		140	35.5	170	200	192	143	100	130	56	90	10	190	-
2.2	1.5	1.1	0.55	90L		140	35.5	170	200	192	143	125	150	56	90	10	190	-
3	2.2 / 3	1.5	0.75 / 1.1	100L		160	45	195	219	202	153	140	175	63	100	12.5	-	243
4	4	2.2	1.5	112M	2	190	45	224	238	211	162	140	175	70	112	14	-	265
5.5 / 7.5	5.5	3	2.2	132S		216	45	250	273	249	187	140	175	89	132	16	-	310
-	7.5	4 / 5.5	3	132M		216	45	250	273	249	187	178	212	89	132	16	-	310

Frame Size	Shaft Extension					Bearings								
	HE	K	KK	L	LE	D	E	ED	F	G	GA	DH	DE	NDE
63	10	7	M20xP1.5	219	76	11	23	18	4	8.5	12.5	M4x8	6201ZCC3	6201ZCC3
71	35	7	M20xP1.5	250.5	85.5	14	30	24	5	11	16	M5x10	6202ZCC3	6202ZCC3
80	13	10	M25xP1.5	282.5	92.5	19	40	25	6	15.5	21.5	M6x12	6204ZCC3	6204ZCC3
90S	23	10	M25xP1.5	307.5	101.5	24	50	32	8	20	27	M8x16	6205ZCC3	6205ZCC3
90L	23	10	M25xP1.5	332.5	101.5	24	50	32	8	20	27	M8x16	6205ZCC3	6205ZCC3
100L	33	12	M25xP1.5	374.5	111.5	28	60	40	8	24	31	M10x20	6206ZCC3	6205ZCC3*
112M	45	12	M25xP1.5	391.5	121.5	28	60	40	8	24	31	M10x20	6306ZCC3	6205ZCC3*
132S	58	12	M40XP1.5	454	145	38	80	64	10	33	41	M12x24	6308ZCC3	6306ZCC3
132M	58	12	M40xP1.5	492	145	38	80	64	10	33	41	M12x24	6308ZCC3	6306ZCC3

Notes:

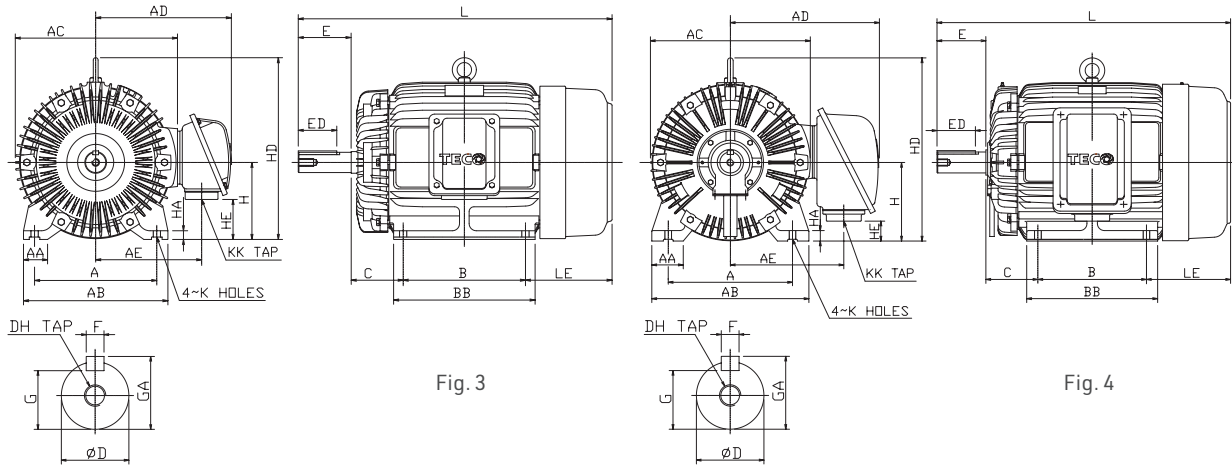
1. Tolerance: Refer to page 36
2. Eyebolt provided on frames D100 and larger
3. *Before June 2022, NDE bearing was 6305
4. **Before June 2022, NDE bearing was 6306.



MAXe3 Premium Severe Duty

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 160 to 250 Foot Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet



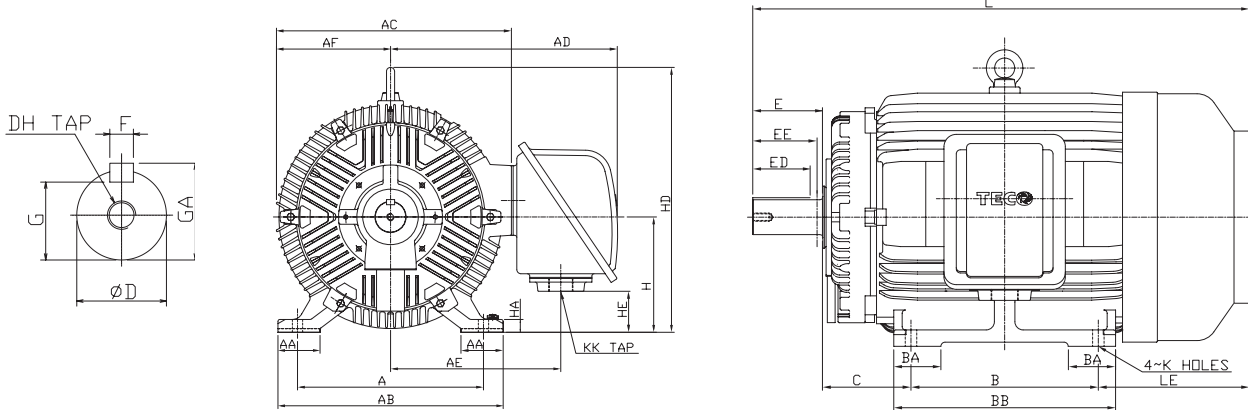
Output (kW)				Frame Size	Fig. No.	Dimensions (mm)											
2P	4P	6P	8P			A	AA	AB	AC	AD	AE	B	BB	C	H	HA	HD
-	11	7.5	4 / 5.5	160M	3	254	50	300	334	287	225	210	250	108	160	18	377
18.5	15	11	7.5	160L		254	50	300	334	287	225	254	300	108	160	18	377
22	-	-	-	180MA	4	279	75	355	382	312	250	241	297	121	180	20	431
-	18.5	-	-	180MC	3	279	75	355	382	312	250	241	297	121	180	20	431
-	22	15	11	180LC		279	75	355	382	312	250	279	335	121	180	20	431
30 / 37	-	-	-	200LA	4	318	80	400	420	374	287	305	365	133	200	25	469
-	30	18.5 / 22	15	200LC		318	80	400	420	374	287	305	365	133	200	25	469
-	37	-	18.5	225SC		356	90	450	458	427	330	286	350	149	225	30	524
45	-	-	-	225MA		356	90	450	458	427	330	311	375	149	225	30	524
-	45	30	22	225MC		356	90	450	458	427	330	311	375	149	225	30	524
55	-	-	-	250SA		406	100	500	510	493	375	311	385	168	250	36	595
-	55	37	30	250SC	406	100	500	510	493	375	311	385	168	250	36	595	
75	-	-	-	250MA	406	100	500	510	493	375	349	425	168	250	36	595	
-	75	45	37	250MC	406	100	500	510	493	375	349	425	168	250	36	595	

Frame Size						Shaft Extension							Bearings	
	HE	K	KK	L	LE	D	E	ED	F	G	GA	DH	DE	NDE
160M	83	14.5	M40×P1.5	608	180	42	110	80	12	37	45	M16×32	6309ZZC3	6307ZZC3
160L	83	14.5	M40×P1.5	652	180	42	110	80	12	37	45	M16×32	6309ZZC3	6307ZZC3
180MA	103	14.5	M40×P1.5	672	200	48	110	80	14	42.5	51.5	M16×32	(6211C3)	(6211C3)
180MC	103	14.5	M40×P1.5	672	200	48	110	80	14	42.5	51.5	M16×32	6311ZZC3	6310ZZC3
180LC	103	14.5	M40×P1.5	710	200	48	110	80	14	42.5	51.5	M16×32	6311ZZC3	6310ZZC3
200LA	88	18.5	M50×P1.5	770	222	55	110	80	16	49	59	M20×40	(6312C3)	(6212C3)
200LC	88	18.5	M50×P1.5	770	222	55	110	80	16	49	59	M20×40	6312C3	6212C3
225SC	57	18.5	M50×P1.5	816	241	60	140	110	18	53	64	M20×40	6313C3	6213C3
225MA	57	18.5	M50×P1.5	811	241	55	110	80	16	49	59	M20×40	(6312C3)	(6212C3)
225MC	57	18.5	M50×P1.5	841	241	60	140	110	18	53	64	M20×40	6313C3	6213C3
250SA	42	24	M63×P1.5	882.5	263.5	60	140	110	18	53	64	M20×40	(6313C3)	(6213C3) (6313C3*)
250SC	42	24	M63×P1.5	882.5	263.5	70	140	110	20	62.5	74.5	M20×40	NU316C3	6313C3
250MA	42	24	M63×P1.5	920.5	263.5	60	140	110	18	53	64	M20×40	(6313C3)	(6213C3) (6313C3*)
250MC	42	24	M63×P1.5	920.5	263.5	70	140	110	20	62.5	74.5	M20×40	NU316C3	6313C3

- Notes:
1. Tolerance: Refer to page 36
 2. * 6313C3 from July 2016 manufacture
 3. Data subject to change without notice and should not be used for installation purposes.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 280 to 315M Foot Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheets

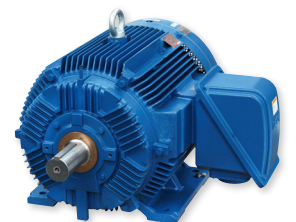


Output (kW)				Frame Size	Dimensions (mm)												
2P	4P	6P	8P		A	AA	AB	AC	AD	AE	AF	B	BA	BB	C	H	HA
90	-	-	-	280SA	457	110	560	603	600	445	293	368	110	445	190	280	30
-	90	55	45	280SC	457	110	560	603	600	445	293	368	110	445	190	280	30
110	-	-	-	280MA	457	110	560	603	600	445	293	419	130	495	190	280	30
-	110	75	55	280MC	457	110	560	603	600	445	293	419	130	495	190	280	30
132	-	-	-	315SA	508	115	615	642	620	465	312	406	115	490	216	315	35
-	132	90	75	315SC	508	115	615	642	620	465	312	406	115	490	216	315	35
150 / 185	-	-	-	315MA	508	115	615	642	620	465	312	457	115	540	216	315	35
-	150	110 / 132	90	315MC	508	115	615	642	620	465	312	457	115	540	216	315	35
-	185	-	-	315MB	508	115	615	642	620	465	312	457	115	540	216	315	35
-	185	-	-	315MC**	508	115	615	642	703	482	312	457	115	540	216	315	35

Frame Size							Shaft Extension								Bearings	
	HD	HE	K	KK	L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
280SA	651	82	24	M63x1.5	1042	344	65	140	110	134	18	58	69	M20x30	6314C3	6314C3
280SC	651	82	24	M63x1.5	1072	344	80	170	140	157	22	71	85	M20x30	NU318C3	6316C3
280MA	651	82	24	M63x1.5	1092	343	65	140	110	134	18	58	69	M20x30	6314C3	6314C3
280MC	651	82	24	M63x1.5	1122	343	80	170	140	157	22	71	85	M20x30	NU318C3	6316C3
315SA	723	112	28	M63x1.5	1131	369	65	140	110	134	18	58	69	M20x30	6314C3	6314C3
315SC	723	112	28	M63x1.5	1161	369	85	170	140	157	22	76	90	M20x30	NU320C3	6316C3
315MA	723	112	28	M63x1.5	1182	369	65	140	110	134	18	58	69	M20x30	6314C3	6314C3
315MC	723	112	28	M63x1.5	1212	369	85	170	140	157	22	76	90	M20x30	NU320C3	6316C3
315MB	723	112	28	M63x1.5	1212	369	85	170	140	157	22	76	90	M20x30	NU320C3	6316C3
315MC**	723	112	28	BLANK	1212	369	95	170	140	157	25	86	100	M24x48	NU320C3	6316C3

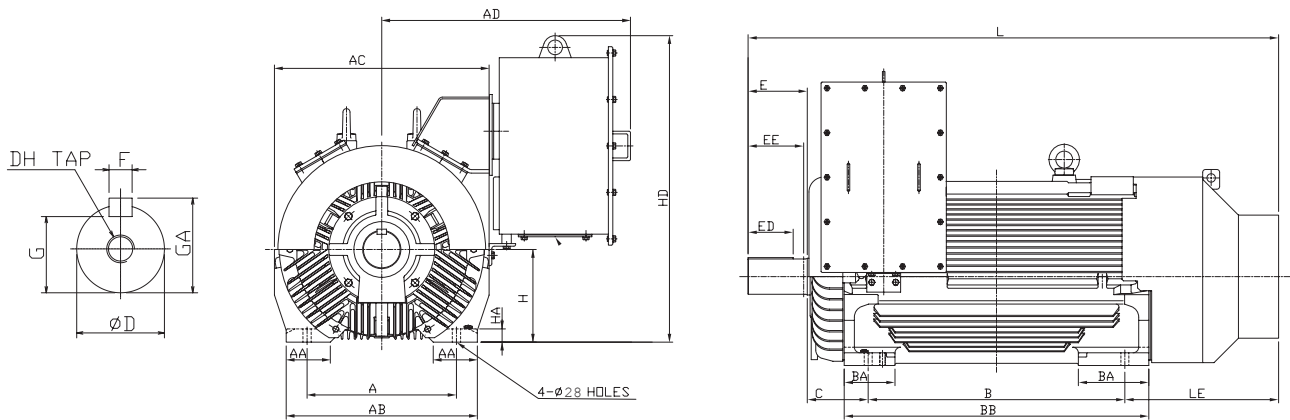
Notes:

1. Tolerance: Refer to page 36
2. Usable Shaft Length : EE
3. ** 185kW motor in D315MC frame with fabricated steel terminal box and oversize DE shaft
4. Data subject to change without notice and should not be used for installation purposes.



TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 315A to 355 Foot Mount **AFJE** Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

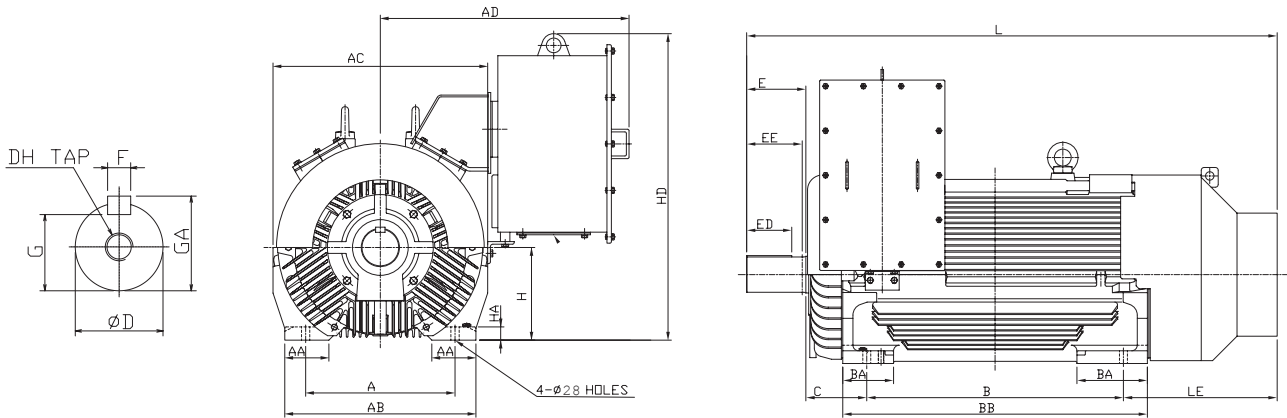


Output (kW)		Frame Size	Dimensions (mm)											
4P	6P		A	AA	AB	AC	AD*	B	BA	BB	C	H	HA	HD*
-	150 / 185	315A	508	150	650	730	846	560	180	730	216	315	45	992
220 / 250 / 300	220	315C	508	150	650	730	846	710	180	880	216	315	45	992
375	260 / 315	315D	508	150	650	730	846	910	180	1080	216	315	45	1042
450	-	355C	610	150	750	810	959	900	210	1120	254	355	45	1227



TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

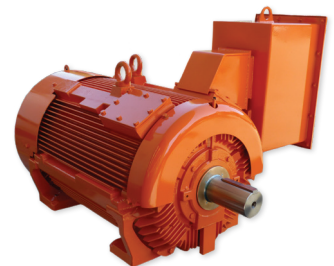
Frame 315A to 355 Foot Mount **AFJE** Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet



Output (kW)		Frame Size	Shaft Extension - Direct / Belt Drive [#]										Bearings	
4P	6P		L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
-	150 / 185	315A	1491/1531	545	95/110	170/210	140/160	157/197	25/28	86/100	100/116	M24X48	6220C3 / NU324C3	6320C3
220 / 250	220	315C	1641/1681	545	95/110	170/210	140/160	157/197	25/28	86/100	100/116	M24X48	6220C3 / NU324C3	6320C3
300	-	315C	1641/1681	545	95/125	170/210	140/160	157/197	25/32	86/114	100/132	M24X48	6220C3 / NU326C3	6320C3
375	260 / 315	315D	1841/1881	545	95/125	170/210	140/160	157/197	25/32	86/114	100/132	M24X48	6220C3 / NU326C3	6320C3
450	-	355C	1894/1934	570	95/125	170/210	140/160	157/197	25/32	86/114	100/132	M24X48	6220C3 / NU326C3	6322C3

Notes:

1. Tolerance: Refer to page 36
2. Usable Shaft Length: EE
3. Fitted with undrilled blank gland plate
4. Data subject to change without notice and should not be used for installation purposes
5. AFJE/AFJN performance data, please refer to TECO
6. *AD & *HD as per MAXe3 Premium Severe Duty
7. # Belt Drive as standard.



**AFJE MAXe3 Mining Motor
FRAME SIZES D315A-355**

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 63 to 132 Flange Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

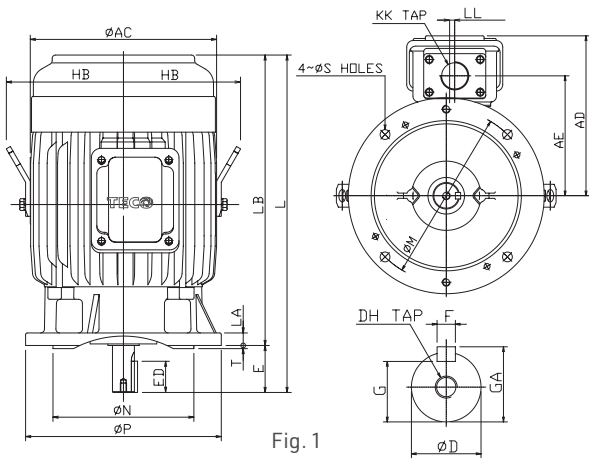


Fig. 1

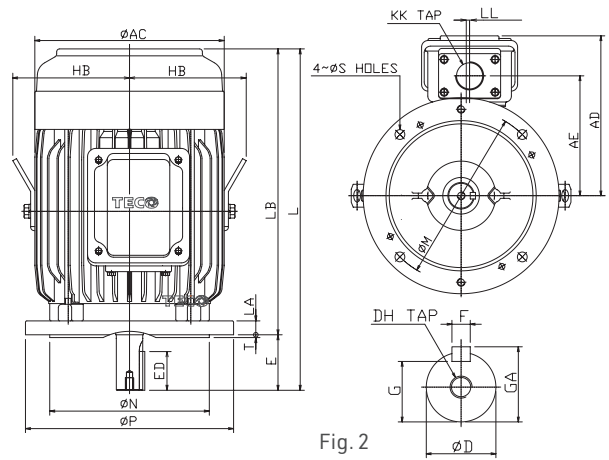


Fig. 2

Output (kW)				Frame Size	Fig No.	Dimensions (mm)										Flange		
2P	4P	6P	8P			AC	AD	AE	HB	KK	L	LA	LB	LL	M	N	P	
0.18	0.18	-	-	63	1	144	123	93	-	M20XP1.5	248	12	225	0	115	95	140	
0.37 / 0.55	0.37	0.18	-	71		162	133	103	-	M20XP1.5	278	12	248	17	130	110	160	
0.75 / 1.1	0.55 / 0.75	0.37 / 0.55	0.18	80	2	177	179	130	-	M25XP1.5	282	12	242	15	165	130	200	
1.5	1.1	0.75	0.37	90S	1	200	192	143	-	M25XP1.5	347	12	297	15	165	130	200	
2.2	1.5	1.1	0.55	90L		200	192	143	-	M25XP1.5	372	12	322	15	165	130	200	
3	2.2 / 3	1.5	0.75 / 1.1	100L	2	219	202	153	140	M25XP1.5	375	16	315	15	215	180	250	
4	4	2.2	1.5	112M	1	235	211	162	150	M25XP1.5	431	16	371	15	215	180	250	
5.5 / 7.5	5.5	3	2.2	132S	2	273	249	187	169	M40XP1.5	454	20	374	13	265	230	300	
-	7.5	4 / 5.5	3	132M		273	249	187	169	M40XP1.5	492	20	412	13	265	230	300	

Frame Size	Flange		Shaft Extension							Bearings	
	S	T	D	E	ED	F	G	GA	DH	DE	NDE
63	10	3	11	23	18	4	8.5	12.5	M4×8	6201ZZC3	6201ZZC3
71	10	3.5	14	30	24	5	11	16	M5×10	6202ZZC3	6202ZZC3
80	12	3.5	19	40	25	6	15.5	21.5	M6×12	6204ZZC3	6204ZZC3
90S	12	3.5	24	50	32	8	20	27	M8×16	6205ZZC3	6205ZZC3
90L	12	3.5	24	50	32	8	20	27	M8×16	6205ZZC3	6205ZZC3
100L	14.5	4	28	60	40	8	24	31	M10×20	6206ZZC3	6305ZZC3
112M	14.5	4	28	60	40	8	24	31	M10×20	6306ZZC3	6306ZZC3
132S	14.5	4	38	80	64	10	33	41	M12×24	6308ZZC3	6306ZZC3
132M	14.5	4	38	80	64	10	33	41	M12×24	6308ZZC3	6306ZZC3

Notes:

1. Tolerance: Refer to page 36
2. Lifting lugs provided on frames D100 and larger
3. Data subject to change without notice and should not be used for installation purposes.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 160 to 250 Flange Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

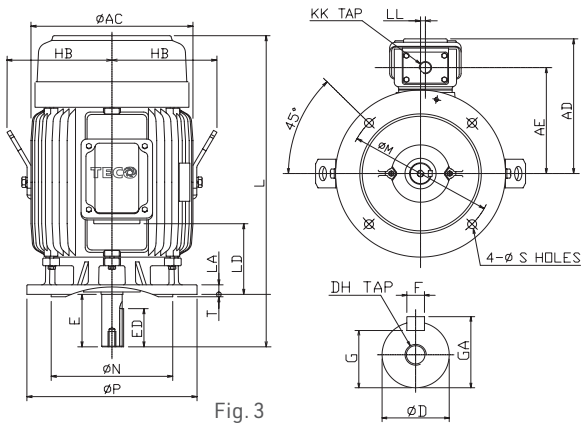


Fig. 3

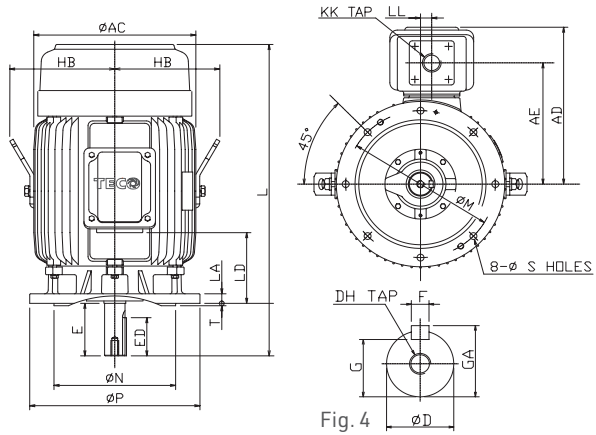


Fig. 4

Output (kW)				Frame Size	Fig. No.	Dimensions (mm)								Flange			
2P	4P	6P	8P			AC	AD	AE	HB	KK	L	LA	LD	LL	M	N	P
11 / 15	11	7.5	4 / 5.5	160M	3	334	287	225	217	M40 × P1.5	608	20	126	10	300	250	350
18.5	15	11	7.5	160L		334	287	225	217	M40 × P1.5	652	20	148	10	300	250	350
22				180MA		382	312	250	241	M40 × P1.5	672	20	155	10	300	250	350
	18.5			180MC		382	312	250	241	M40 × P1.5	672	20	155	10	300	250	350
	22	15	11	180LC		382	312	250	241	M40 × P1.5	710	20	174	10	300	250	350
30 / 37				200LA		420	374	287	260	M50 × P1.5	770	20	154	20	350	300	400
	30	18.5 / 22	15	200LC		420	374	287	260	M50 × P1.5	770	20	154	20	350	300	400
	37		18.5	225SC	4	458	427	330	286	M50 × P1.5	816	22	94	30	400	350	450
45				225MA		458	427	330	286	M50 × P1.5	811	22	107	30	400	350	450
	45	30	22	225MC		458	427	330	286	M50 × P1.5	841	22	107	30	400	350	450
55				250SA		510	493	375	312	M63 × P1.5	882.5	22	86	30	500	450	550
	55	37	30	250SC		510	493	375	312	M63 × P1.5	882.5	22	86	30	500	450	550
	75			250MA		510	493	375	312	M63 × P1.5	920.5	22	105	30	500	450	550
	75	45	37	250MC		510	493	375	312	M63 × P1.5	920.5	22	105	30	500	450	550

Frame Size	Flange		Shaft Extension							Bearings	
	S	T	D	E	ED	F	G	GA	DH	DE	NDE
160M	18.5	5	42	110	80	12	37	45	M16 × 32	6309ZZ	6307ZZ
160L	18.5	5	42	110	80	12	37	45	M16 × 32	6309ZZ	6307ZZ
180MA	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	6211C3	6211C3
180MC	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	6311ZZ	6310ZZ
180LC	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	6311ZZ	6310ZZ
200LA	18.5	5	55	110	80	16	49	59	M20 × 40	6312C3	6212C3
200LC	18.5	5	55	110	80	16	49	59	M20 × 40	6312	6212
225SC	18.5	5	60	140	110	18	53	64	M20 × 40	6313	6213
225MA	18.5	5	55	110	80	16	49	59	M20 × 40	6312C3	6212C3
225MC	18.5	5	60	140	110	18	53	64	M20 × 40	6313	6213
250SA	18.5	5	60	140	110	18	53	64	M20 × 40	6313C3	6213C3
250SC	18.5	5	70	140	110	20	62.5	74.5	M20 × 40	NU316	6313
250MA	18.5	5	60	140	110	18	53	64	M20 × 40	6313C3	6213C3
250MC	18.5	5	70	140	110	20	62.5	74.5	M20 × 40	NU316	6313

Notes:

1. Tolerance: Refer to page 36
2. Data subject to change without notice and should not be used for installation purposes.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 63 to 200 Foot and Flange Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

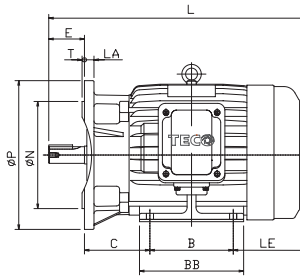
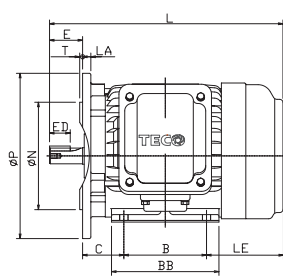
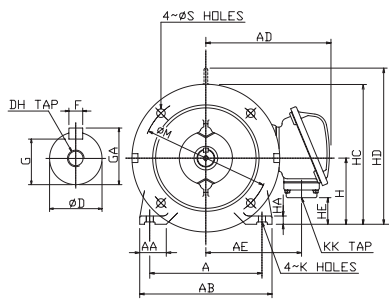


Fig. 1

Fig. 2

Fig. 3

Output (kW)				Frame Size	Fig. No.	Dimensions (mm)														
2P	4P	6P	8P			A	AA	AB	AD	AE	B	BB	C	H	HA	HC	HD	HE	K	KK
0.18	0.18	-	-	63	2	100	28	120	123	97	80	100	69	63	8	135	-	10	7	M20 X P1.5
0.37 / 0.55	0.37	0.18	-	71		112	35.5	140	133	107	90	115	72	71	8	152	-	35	7	M20 X P1.5
0.75 / 1.1	0.55 / 0.75	0.37 / 0.55	0.18	80	1	125	35.5	155	159	129	100	130	50	80	9	180	-	13	10	M25 X P1.5
1.5	1.1	0.75	0.37	90S	2	140	35.5	170	170	140	100	130	95	90	10	190	-	23	10	M25 X P1.5
2.2	1.5	1.1	0.55	90L		140	35.5	170	170	140	125	150	95	90	10	190	-	23	10	M25 X P1.5
3	2.2 / 3	1.5	0.75 / 1.1	100L	2	160	45	195	180	150	140	175	103	100	12.5	-	243	33	12	M25 X P1.5
4	4	2.2	1.5	112M		190	45	224	189	159	140	175	110	112	14	-	265	45	12	M25 X P1.5
5.5 / 7.5	5.5	3	2.2	132S	2	216	45	250	225	184	140	175	139	132	16	-	310	58	12	M40 X P1.5
-	7.5	4 / 5.5	3	132M		216	45	250	225	184	178	212	139	132	16	-	310	58	12	M40 X P1.5
11 / 15	11	7.5	4 / 5.5	160M	3	254	50	300	263	222	210	250	108	160	18	-	377	83	14.5	M40 X P1.5
18.5	15	11	7.5	160L		254	50	300	263	222	254	300	108	160	18	-	377	83	14.5	M40 X P1.5
22	18.5	-	-	180MA	3	279	75	355	305	247	241	297	121	180	20	-	421	103	14.5	M40 X P1.5
-	22	15	11	180LC		279	75	355	305	247	279	335	121	180	20	-	421	103	14.5	M40 X P1.5
30 / 37	30	18.5 / 22	15	200LA	3	318	80	400	342	285	305	365	133	200	25	-	469	88	18.5	M50 X P1.5
30 / 37	30	18.5 / 22	15	200LC		318	80	400	342	285	305	365	133	200	25	-	469	88	18.5	M50 X P1.5

Frame Size	Flange								Shaft Extension							Bearings	
	LA	LE	L	M	N	P	S	T	D	E	ED	F	G	GA	DH	DE	NDE
63	12	23	248	115	95	140	10	3	11	23	18	4	8.5	12.5	M4×6	6201ZCC3	6201ZCC3
71	12	40	277	130	110	160	10	3.5	14	30	24	5	11	16	M5×7.5	6202ZCC3	6202ZCC3
80	12	50	282	165	130	200	12	3.5	19	40	25	6	15.5	21.5	M6×9	6204ZCC3	6204ZCC3
90S	16	50	346	165	130	200	12	3.5	24	50	32	8	20	27	M8×12	6205ZCC3	6205ZCC3
90L	16	50	371	165	130	200	12	3.5	24	50	32	8	20	27	M8×12	6205ZCC3	6205ZCC3
100L	20	60	374	215	180	250	15	4	28	60	40	8	24	31	M10×15	6206ZCC3	6305ZCC3
112M	20	60	431	215	180	250	15	4	28	60	40	8	24	31	M10×15	6306ZCC3	6306ZCC3
132S	20	80	454	265	230	300	15	4	38	80	64	10	33	41	M12×18	6308ZCC3	6306ZCC3
132M	20	80	492	265	230	300	15	4	38	80	64	10	33	41	M12×18	6308ZCC3	6306ZCC3
160M	20	110	608	300	250	350	19	5	42	110	80	12	37	45	M16×24	6309ZCC3	6307ZCC3
160L	20	110	652	300	250	350	19	5	42	110	80	12	37	45	M16×24	6309ZCC3	6307ZCC3
180MA	20	110	672	300	250	350	19	5	48	110	80	14	42.5	51.5	M16×24	(6211C3)	(6211C3)
180LC	20	110	710	300	250	350	19	5	48	110	80	14	42.5	51.5	M16×24	6311ZCC3	6310ZCC3
200LA	20	110	770	350	300	400	19	5	55	110	80	16	49	59	M20×30	(6312C3)	(6212C3)

- Notes: 1. Tolerance: Refer to page 36
 2. Eyebolt provided on frames D100 and larger
 3. Data subject to change without notice and should not be used for installation purposes.

TECO CAST-IRON TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 225 to 315M Foot and Flange Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet

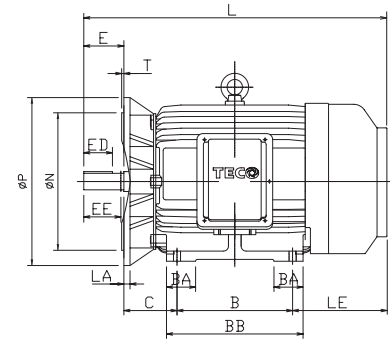
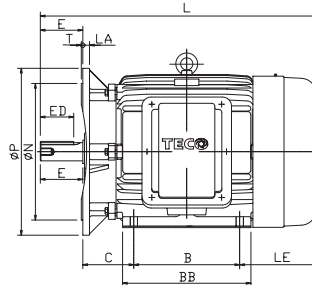
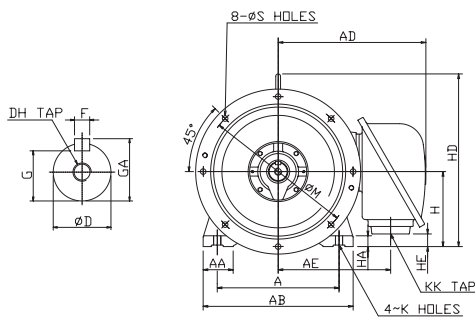


Fig. 4

Fig. 5

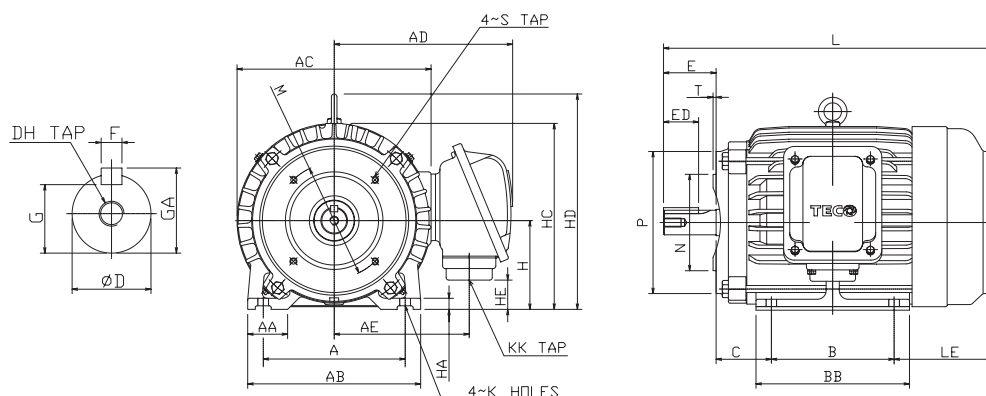
Output (kW)				Frame Size	Fig. No.	Dimensions (mm)													
2P	4P	6P	8P			A	AA	AB	AD	AE	B	BB	C	H	HA	HD	HE	K	KK
-	37	-	18.5	225SC	4	356	90	450	386	330	286	350	149	225	30	524	57	19	M50 X 1.5
45	-	-	-	225MA	4	356	90	450	386	330	311	375	149	225	30	524	57	19	M50 X 1.5
-	45	30	22	225MC	4	356	90	450	386	330	311	375	149	225	30	524	57	19	M50 X 1.5
55	-	-	-	250SA	4	406	100	500	479	375	311	385	168	250	36	576	42	24	M63 X 1.5
-	55	37	30	250SC	4	406	100	500	479	375	311	385	168	250	36	576	42	24	M63 X 1.5
75	-	-	-	250MA	4	406	100	500	479	375	349	425	168	250	36	576	42	24	M63 X 1.5
-	75	45	37	250MC	4	406	100	500	479	375	349	425	168	250	36	576	42	24	M63 X 1.5
90	-	-	-	280SA	5	457	110	560	610	405	368	445	190	280	36	660	106	24	M63 X 1.5
-	90	55	45	280SC	5	457	110	560	610	405	368	445	190	280	36	660	106	24	M63 X 1.5
110	-	-	-	280MA	5	457	110	560	610	405	419	495	190	280	36	660	106	24	M63 X 1.5
-	110	75	55	280MC	5	457	110	560	610	405	419	495	190	280	36	660	106	24	M63 X 1.5
132	-	-	-	315SA	5	508	115	615	610	430	406	490	216	315	45	743	136	28	M63 X 1.5
-	132	90	75	315SC	5	508	115	615	610	430	406	490	216	315	45	743	136	28	M63 X 1.5
150 / 185	-	-	-	315MA	5	508	115	615	610	430	457	540	216	315	45	743	136	28	M63 X 1.5
-	150	110 / 132	90	315MC	5	508	115	615	610	430	457	540	216	315	45	743	136	28	M63 X 1.5
-	185	-	-	315MB	5	508	115	615	610	430	457	540	216	315	45	743	136	28	M63 X 1.5

Frame Size	Shaft Extension								Bearings									
	LA	LE	L	M	N	P	S	T	D	E	ED	EE	F	G	GA	DH	DE	NDE
225SC	22	241	816	400	350	450	19	5	60	140	110	-	18	53	64	M20 X 30	6313C3	6213C3
225MA	22	241	811	400	350	450	19	5	55	110	80	-	16	49	59	M20 X 30	6312C3	6212C3
225MC	22	241	841	400	350	450	19	5	60	140	110	-	18	53	64	M20 X 30	6313C3	6213C3
250SA	22	241	882	500	450	550	19	5	60	140	110	-	18	53	64	M20 X 30	6313C3	6313C3
250SC	22	263	882	500	450	550	19	5	70	140	110	-	20	62.5	74.5	M20 X 30	NU316C3	6313C3
250MA	22	263	920	500	450	550	19	5	60	140	110	-	18	53	64	M20 X 30	6313C3	6313C3
250MC	22	263	920	500	450	550	19	5	70	140	110	-	20	62.5	74.5	M20 X 30	NU316C3	6313C3
280SA	22	263	1042	500	450	550	19	5	65	140	110	134	18	58	69	M20 X 30	6314C3	6314C3
280SC	22	263	1042	500	450	550	19	5	80	170	140	157	22	71	85	M20 X 30	NU318C3	6316C3
280MA	22	344	1092	500	450	550	19	5	65	140	110	134	18	58	69	M20 X 30	6314C3	6314C3
280MC	22	344	1122	500	450	550	19	5	80	170	140	157	22	71	85	M20 X 30	NU318C3	6316C3
315SA	25	369	1131	600	550	660	24	6	65	140	110	134	18	58	69	M20 X 30	6314C3	6314C3
315SC	25	369	1161	600	550	660	24	6	85	170	140	157	22	76	90	M20 X 30	NU320C3	6316C3
315MA	25	369	1182	600	550	660	24	6	65	140	110	134	18	58	69	M20 X 30	6314C3	6314C3
315MC	25	369	1212	600	550	660	24	6	85	170	140	157	22	76	90	M20 X 30	NU320C3	6316C3
315MB	25	369	1042	600	550	660	24	6	85	140	140	157	22	76	90	M20 X 30	NU320C3	6316C3

- Notes:
1. Tolerance: Refer to page 36
 2. Usable Shaft length: EE
 3. Data subject to change without notice and should not be used for installation purposes
 4. * 6313C3 from July 2016 manufacture.

TECO Cast-Iron TEFC 3-Phase Squirrel-Cage Induction Motors

Frame 63 to 132 Foot and C Face Mount Totally Enclosed Fan Cooled Squirrel Cage Rotor - Outline Dimensions Sheet



Output (kW)				Frame Size	Dimensions (mm)															
2P	4P	6P	8P		A	AA	AB	AC	AD	AE	B	BB	C	H	HA	HC	HD	HE	K	KK
0.18	0.18	-	-	63	100	28	120	144	123	97	80	100	40	63	8	135	-	10	7	M20x1.5
0.37 / 0.55	0.37	0.185	-	71	112	35.5	140	162	133	107	90	115	45	71	8	152	-	35	7	M20x1.5
0.75 / 1.1	0.55 / 0.75	0.37 / 0.55	0.18	80	125	35.5	155	177	179	130	100	130	50	80	9	168	-	13	10	M25x1.5
1.5	1.1	0.75	0.37	90S	140	35.5	170	200	192	143	100	130	56	90	10	190	-	23	10	M25x1.5
2.2	1.5	1.1	0.55	90L	140	35.5	170	200	192	143	125	150	56	90	10	190	-	23	10	M25x1.5
3	2.2 / 3	1.5	0.75 / 1.1	100L	160	45	195	219	202	153	140	175	63	100	12.5	-	243	33	12	M25x1.5
4	4	2.2	1.5	112M	190	45	224	238	211	162	140	175	70	112	14	-	265	45	12	M25x1.5
5.5 / 7.5	5.5	3	2.2	132S	216	45	250	273	249	187	140	175	89	132	16	-	310	58	12	M25x1.5
-	7.5	4 / 5.5	3	132M	216	45	250	273	249	187	178	212	89	132	16	-	310	58	12	M25x1.5

Frame Size	Flange			Shaft Extension											Bearings		
	LA	LE	L	M	N	P	S	T	D	E	ED	F	G	GA	DH	DE	NDE
63	12	23	248	75	60	90	M5	3	11	23	18	4	8.5	12.5	M4x8	6201ZZC3	6201ZZC3
71	12	40	277	85	70	105	M6	3.5	14	30	24	5	11	16	M5x10	6202ZZC3	6202ZZC3
80	12	50	282	100	80	120	M6	3.5	19	40	25	6	15.5	21.5	M6x12	6204ZZC3	6204ZZC3
90S	12	50	346	115	95	140	M8	3.5	24	50	32	8	20	27	M8x16	6205ZZC3	6205ZZC3
90L	12	50	371	115	95	140	M8	3.5	24	50	32	8	20	27	M8x16	6205ZZC3	6205ZZC3
100L	16	60	374	130	110	160	M8	4	28	60	40	8	24	31	M10x20	6206ZZC3	6305ZZC3
112M	16	60	431	130	110	160	M8	4	28	60	40	8	24	31	M10x20	6306ZZC3	6306ZZC3
132S	20	80	454	165	130	200	M10	4	38	80	64	10	33	41	M12x24	6308ZZC3	6306ZZC3
132M	20	80	492	165	130	200	M10	4	38	80	64	10	33	41	M12x24	6308ZZC3	6306ZZC3

- Notes:
1. Tolerance: Refer to page 36
 2. Eyebolt provided on frames D100 and larger
 3. Data subject to change without notice and should not be used for installation purposes.

Mechanical design

Axial and Radial Loadings

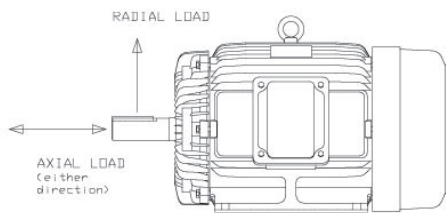
The table below gives the permissible axial and radial loads. The values are based on normal conditions at 50 Hz and a calculated L10 bearing life of 40,000 hours.

Frame Size	Radial Load Horizontal Shaft	Axial Load Horizontal Shaft	Axial Load Shaft Down (down thrust)	Axial Load Shaft Down (up thrust)
80	47 kg	69 kg	65 kg	73 kg
90	49 kg	73 kg	66.5 kg	79.5 kg
100	72 kg	105 kg	95 kg	115 kg
112	95 kg	138 kg	124 kg	152 kg
132	147 kg	143 kg	123 kg	163 kg
160	179 kg	174 kg	134 kg	214 kg
180	248 kg	238 kg	182 kg	292 kg
200	297 kg	290 kg	210 kg	370 kg
225	305 kg	310 kg	230 kg	390 kg
250	1400 kg	325 kg	320 kg	510 kg
280	1500 kg	-	-	-
315M	1650 kg	-	-	-

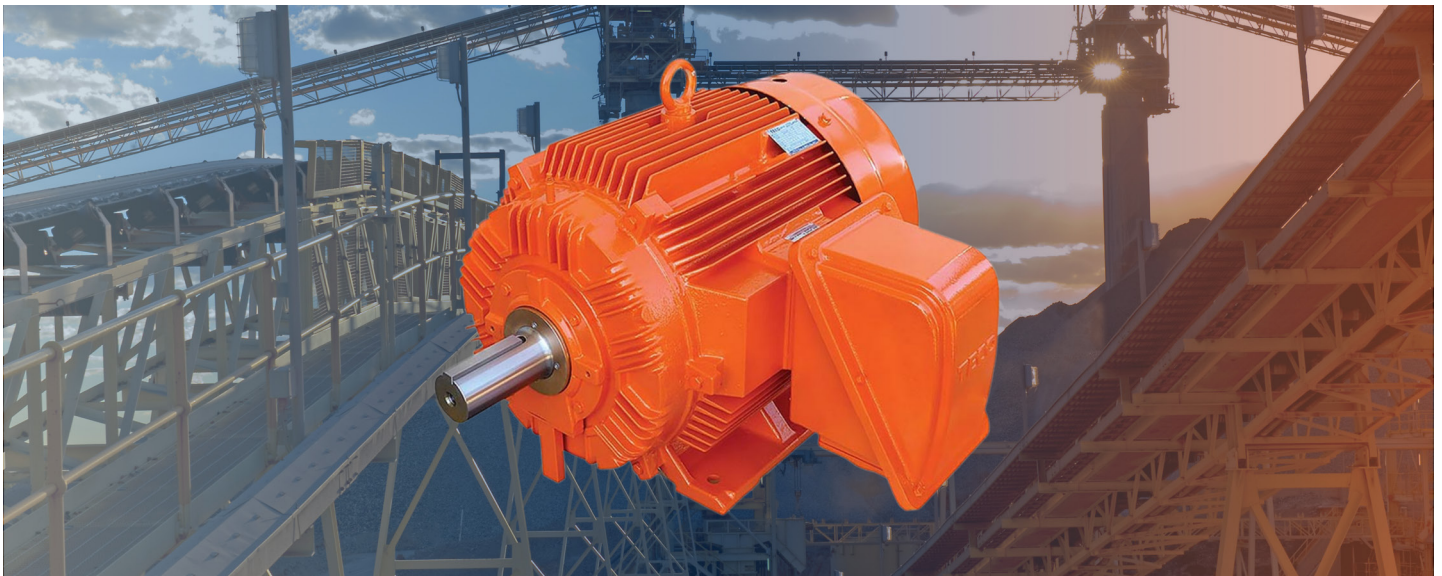
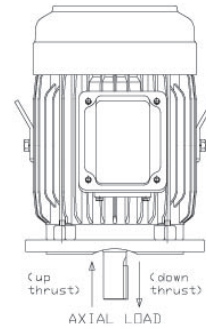
Notes:

- Based on 4 Pole motors, bearing life L-10 40,000 hours.
- For radial load overhung point at centre of shaft extension.
- For other loadings, please contact TECO.

Axial Radial Loadings - Foot

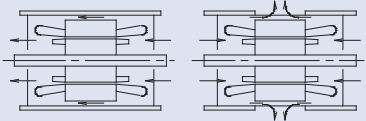
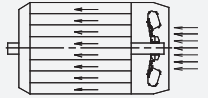



Axial Radial Loadings



Cooling

Designation System Concerning Methods of Cooling Refers to Standard IEC 60034-6. Standard Code Example:

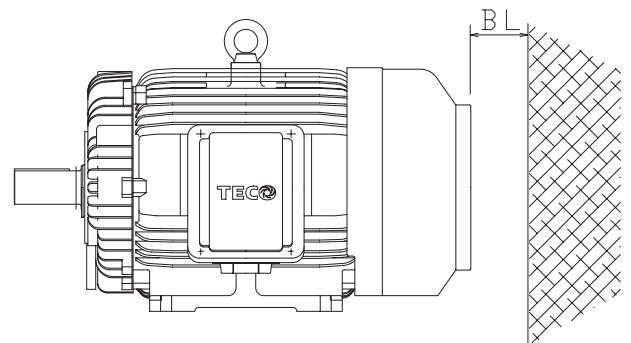
Code	Description	Type
IC 01	Self-cooling open machine.	
IC411	Enclosed machine. Smooth or finned ventilated casing. External shaft-mounted fan.	
IC416	Enclosed machine. Smooth or finned ventilated casing. External motorized axial fan supplied with machine.	

Example

Code	IC	4	(A)	1	(A)	6
International Cooling						
Circuit Arrangement	0: Free circulation (open circuit) 4: Frame surface cooled					
Primary Coolant	A: Air (omitted for simplified designation)					
Method of Movement of Primary Coolant	0: Free convection 1: Self-circulation 6: Machine-mounted independent component					
Secondary Coolant	A: Air (omitted for simplified designation) W: Water					
Method of Movement of Secondary Coolant	0: Free convection 1: Self-circulation 6: Machine-mounted independent component					

Cooling air flows from the non-drive-end to the drive end. When the motor is installed care should be taken not to impede the airflow into the motor fan cover. As a guide the following minimum dimension shown at BL should be adopted.

Motor Frame	Dimensions BL (mm)
80 - 100	60
112 - 132	85
160 - 180	85
200 - 250	110
280	140
315 - 355	180



Forced Cooling IC416

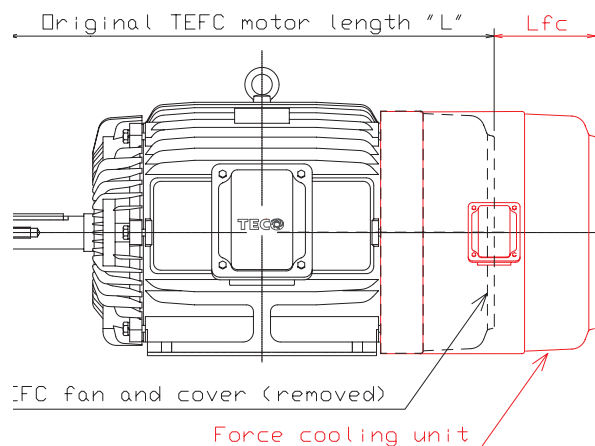
TECO can offer forced cooling on most TEFC motors, listed below are common sizes with details. All forced cooling motors are 230 ~ 240 Volts Single-Phase 50Hz and are IP55 as standard. Fan motor leads are terminated in an auxiliary terminal box mounted on the fan cover, three phase and larger size are available please refer to TECO.

Frame Size	Motor Watts	Amps	Force Cooling Unit length "Lfc" in mm
D80	17	0.1	95
D90	29	0.12	95
D100	29	0.12	90
D112	46	0.22	105
D132	46	0.22	85
D160	75	0.42	140
D180	75	0.42	135
D200	135	0.59	95

Notes: Dimensions subject to change.



Typical Force Cooling Unit.
View from the inside.



Force Cooling Lfc

Mounting Arrangement (IM Code)

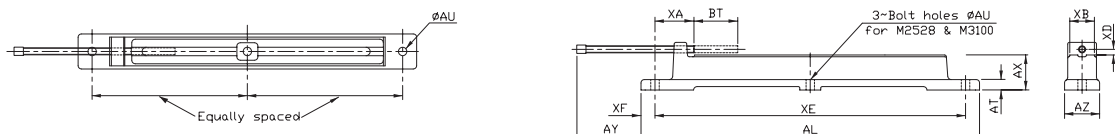
Foot Mounted		Flange Mounted		Foot / Flange Mounted	
IM 1001 (IM B3) Horizontal Shaft. Foot mounted.		IM 3001 (IM B5) Horizontal Shaft. 'D' type flange at D.E. No feet.		IM 2001 (IM B35) Horizontal Shaft. 'D' type flange at D.E. Foot mounted.	
IM 1051 (IM B6) Horizontal Shaft. Foot wall mounted with feet on left-side when viewed from D.E.		IM 3011 (IM V1) Vertical Shaft. 'D' type flange at D.E. Shaft down. No feet.		IM 2011 (IM V15) Vertical Shaft. 'D' type flange at D.E. Wall mounted. Shaft down.	
IM 1061 (IM B7) Horizontal Shaft. Foot wall mounted with feet on right-side when viewed from D.E.		IM 3031 (IM V3) Vertical Shaft. 'D' type flange at D.E. Shaft up. No feet.		IM 2031 (IM V36) Vertical Shaft. 'D' type flange at D.E. Wall mounted. Shaft up.	
IM 1071 (IM B8) Horizontal Shaft. Ceiling mounted with feet above motor.		IM 3601 (IM B14) Horizontal Shaft. 'C' type flange at D.E. No feet.		IM 2101 (IM B34) Horizontal Shaft. 'C' type flange at D.E. Foot mounted.	
IM 1011 (IM V5) Vertical Shaft. Wall mounted. Shaft down.		IM 3611 (IM V18) Vertical Shaft. 'C' type flange at D.E. Shaft down. No feet.		IM 2111 Vertical Shaft. 'C' type flange at D.E. Wall mounted. Shaft down.	
IM 1031 (IM V6) Vertical Shaft. Wall mounted. Shaft up.		IM 3631 (IM V19) Vertical Shaft. 'C' type flange at D.E. Shaft up. No feet.		IM 2131 Vertical Shaft. 'C' type flange at D.E. Wall mounted. Shaft up.	

It is important to nominate the "IM" code at the enquiry and order stage to ensure that the drain holes are in the correct position and the bearing arrangement is checked for suitability if the "IM" code differs from the standard configuration.

Standard Mounting Arrangement

TECO Stock Motors - Standard Mounting Arrangement and Terminal Box Position				
Mounting	IM Code	(IM Code)	Terminal box position (viewed from drive end)	Cable entry direction
Foot	IM1001	IMB3	Right	From below
Flange	IM3011	IMV1	As needed (motor can be rotated)	From flange end
Foot & Flange	IM2001	IMB35	Right	From below

Mounting Cast - Iron - Slide Rails - Dimensions






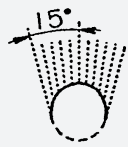

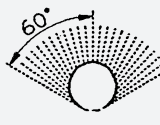
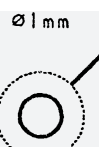

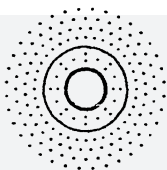
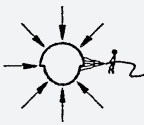
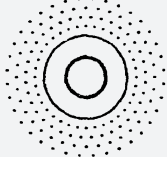
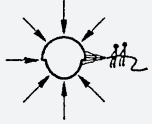
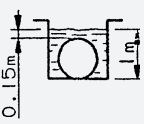
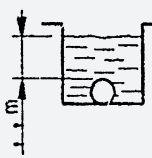
SLIDE RAIL	FRAME SIZE	AL	AT	AU	AX	AY	AZ	BT min.	XA max.	XB	XD	XE	XF
M0809	80	355	12	10	30	105	35	95	45	30	6	325	15
	90	355	12	10	30	105	35	80	45	30	6	325	15
M1013	100	470	16	12	44	170	52	160	50	43	6	430	18
	112	470	16	12	44	170	52	125	50	43	6	430	18
M1618	132	470	16	12	44	170	52	100	50	43	6	430	18
	160	615	19	15	64	170	76	155	67	57	11	565	25
M2022	180	615	19	15	64	170	76	125	67	57	11	565	25
	200	780	25	19	82	210	100	190	80	82	12	725	27
M2528	225	780	25	19	82	210	100	140	80	82	12	725	27
	250	965	30	24	100	275	100	250	86	82	16	885	40
M2528	280	965	30	24	100	275	100	190	86	82	16	885	40

Larger sizes please refer to TECO.

Protection IP Code

First number: Protection against solid objects

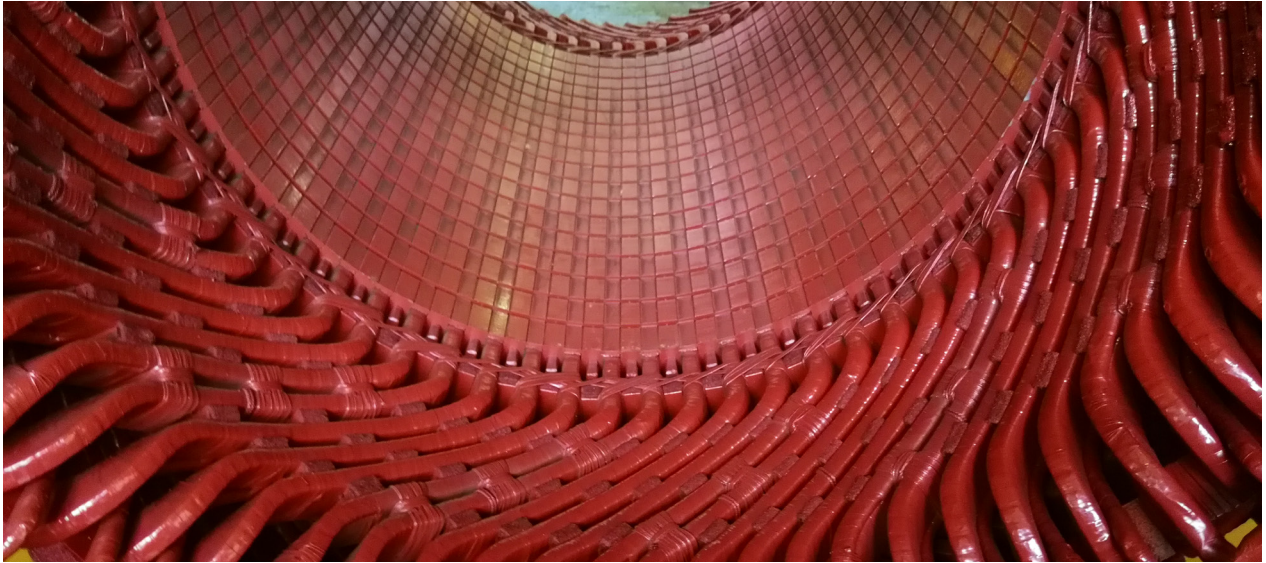
Second number: Protection against liquids

IP	TEST	DEFINITION	IP	TEST	DEFINITION
0		No protection.	0		No protection.
1	 <p>∅50mm</p>	Protected against solid objects of over 50mm (e.g. accidental hand contact).	1		Protected against vertically dripping water (condensation).
2	 <p>∅12mm</p>	Protected against solid objects of over 12mm (e.g. finger).	2	 <p>15°</p>	Protected against water dripping up to 15° from the vertical.
3	 <p>∅2.5mm</p>	Protected against solid objects of over 2.5mm (e.g. tools, wire).	3	 <p>60°</p>	Protected against rain falling at up to 60° from the vertical.
4	 <p>∅1mm</p>	Protected against solid objects of over 1mm (e.g. thin wire).	4		Protected against water splashes from all directions.
5		Protected against dust (e.g. no deposits of harmful material).	5		Protected against jets of water from all directions.
6		Totally protected against dust.	6		Protected against jets of water comparable to heavy seas.
			7	 <p>0.15m</p>	Protected against effects of immersion to depths of between 0.15 and 1m.
			8	 <p>1m</p>	Protected against the effects of prolonged immersion at depth.

All TECO MAXe3 motors are IP66 protection a standard.

Electrical design

Altitude and Ambient Temperature



Ambient Temperature	Temperature Factor	Altitude above sea level	Altitude Factor
30°C	1.06	1000 m	1
35°C	1.03	1500 m	0.97
40°C	1	2000 m	0.945
45°C	1	2500 m	0.92
50°C	1	3000 m	0.89
55°C	1	3500 m	0.865
60°C	0.97 / 1.0*	4000 m	0.835
65°C	0.97 / 1.0*	4500 m	0.740

Notes:

1. Effective Power = (Rated Power) x (Temperature Factor) x (Altitude Factor)
2. The low temperature rise of TECO motors in many instances preclude the need for derating, Larger sizes please refer to TECO
3. Refer page 4 for permissible ambients for MAXe3 motors
4. * 60°C, PSD / Mining.



Anti - Condensation Heaters (Optional)

Anti-condensation heaters are used to prevent the water accumulation caused by moisture condensation inside the motor.

These are flexible type elements and tied on the ends of the winding to maintain the average temperature of the motor above dew point.

The heaters must be switched on when the machine stops and switched off whilst the machine is in operation.

A prominent warning label is fitted with the appropriate rating of the heaters nominated.

The anti-condensation heater leads are normally terminated to an auxiliary terminal box for safety reasons.

The normal supply of anti-condensation heaters is single phase 240V 50Hz, other voltages can be supplied upon request.

Connection Diagrams

TECO motors are connected as shown on the motor nameplate, the typical Star or Delta connection diagrams are shown below.

TECO stock motors 4 kW and below are 380 ~ 415 Volt 50 Hz STAR connected and may also be reconnected to 240 Volt 3-Phase 50 Hz DELTA configuration for use with single phase input inverters.

Motors 5.5 kW and larger are 380 ~ 415 Volt 50 Hz DELTA connected.

Duty

TECO motors are supplied suitable for S1 operation (continuous operation under rated load). When the motor is to operate under any other type of duty the following information should be supplied to determine the correct motor size. Type and frequency of switching (short time, intermittent, periodic, high inertia, braking etc).

Power Rating of Anti-Condensation Heaters

Heater length varies to suit diameter of end-winding.

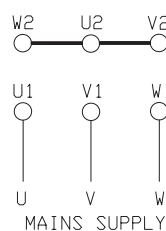
Frame Size	Power in Watts
80 ~ 100	25
112	21
132 ~ 160	40
180 ~ 200	26
225 ~ 250	42
280	54
315M	99
315A	200
355	250

Heater Nameplate

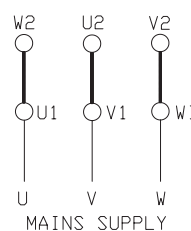
ANTI- CONDENSATION HEATERS		
Type FACH	V	W
WARNING Heaters must be switched OFF when the motor is energised <small>TM 95121</small>		

MAXe3 AEMB D63 - 315M

Star Connection

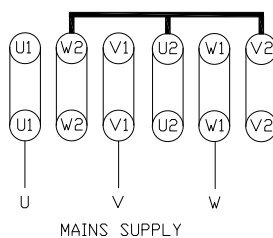


Delta Connection

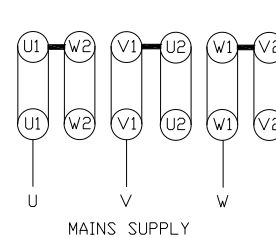


MAXe3 Mining AFJE D315A - 355

Star Connection



Delta Connection



Load torque variation during motor acceleration and braking (in graphical form).

Moment of inertia of the load on the motor shaft.

Type of braking (e.g. mechanical, electrical through phase reversal or DC injection.)

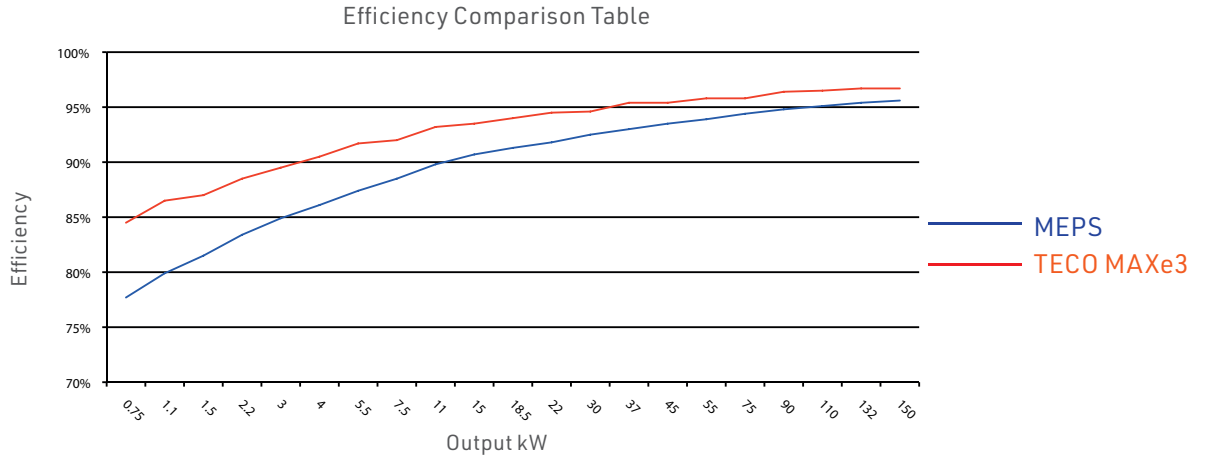
For duty cycles other than S1 please refer to TECO.

Efficiency

Energy use is the dominant source of green-house gas emissions in Australia & New Zealand. TECO is committed to producing high efficiency motors in order to reduce the energy consumed and in turn reduce greenhouse gas emissions. TECO **MAXe3** motors meet the High Efficiency requirements (IE3) of IEC60034-30 under

the scope of GEMS Determination.

This series provides the best payback periods and the lowest cost of ownership. The graph below shows the comparison of **TECO MAXe3 High Efficiency Motors** against the current MEPs levels (IEC60034-30).



Operating Cost Saving

How much money can be saved in the first year of operation?

Typical cost saving on a 75 kW 4 Pole motor can be calculated as follows:

$$S = kW \times N \times C (100/E1 - 100/E2)$$

S = Savings in \$ per year

kW = Rated motor output (kW) = 75

C = Energy cost per kW/hr = \$ 0.25

N = Running time in hrs/year = 8760 hrs

E1 = Efficiency of a standard motor (MEPS2000) = 93.6%

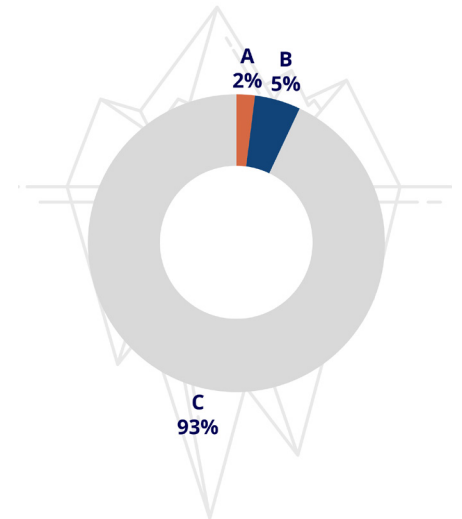
E2 = Efficiency of TECO **MAXe3**™ motor = 95.7%

Calculation Example - Operational cost saving per year

- $S = 75 \times 8760 \times 0.25 \times (100/93.6 - 100/95.7) = \$ 3,851$
- Saving over a 20 year period = \$ 77,020

Typical Total cost of ownership of an electric motor:

The purchase price is only the tip of the iceberg (based on 2000 hr PA, 20 year life).



- A - Motor purchase price
- B - Installation and maintenance
- C - Running cost (energy consumption)

Electric motors are responsible for the majority of electricity consumption in the industrial and commercial sectors. Typical applications include crushing, grinding, mixing, fans, pumps, materials conveying, air compressors, ventilation and refrigeration. In total, experts estimate that electric motors account for nearly 45% of total electricity consumption in Australia and New Zealand for all sectors or around 11% of total greenhouse gas emissions. By utilising TECO **MAXe3** High Efficiency Motors you will not only save money but also reduce your carbon foot print.



Formulae and Conversions - Electric Motor characteristics

Output Power

$$P \text{ (kW)} = \frac{M \times n}{9550}$$

Output Power

$$P_{\text{mec}} = \frac{\sqrt{3} \times U \times I \times \cos \varphi \times \eta}{1000}$$

Output Torque

$$M = \frac{9550 \times P}{n}$$

Star Delta Starting

$$\text{Torque (Star)} = \frac{\text{Full Load Torque (Delta)}}{0.333}$$

$$\text{Current (Star)} = \frac{\text{Full Load Current (Delta)}}{0.577}$$

3-Phase Input Power

$$P_{\text{el}} = \frac{\sqrt{3} \times U \times I \times \cos \varphi}{1000}$$

Efficiency

$$\eta = \frac{\text{Output kW}}{\text{Input kW}}$$

$$\eta = \frac{P_{\text{mec}} \times 1000}{\sqrt{3} \times U \times I \times \cos \varphi}$$

Motor Current

$$I = \frac{P_{\text{mec}} \times 1000}{\sqrt{3} \times U \times \cos \varphi \times \eta}$$

$$I = \frac{P_{\text{elec}} \times 1000}{\sqrt{3} \times U \times \cos \varphi}$$

I = Motor current can be calculated for full or partial loadings.

Use Efficiency and Power Factor relative to motor loadings see page 11 and 12.

Motor Synchronous Speed

$$n = \frac{120 \times f}{\text{Poles}}$$

Moment of Inertia

	kgm ² (J)	kgfm ² (GD ²)
1 kgm ² (J) =	1	4
1 kgfm ² (GD ²) =	0.25	1

Conversions

Length

	m	cm	mm
1 m =	1	100	1000
1 mm =	0.001	0.1	1
1 ft =	0.3048	30.48	304.8
1 in =	0.254	2.54	25.4

m = metre, cm - centimeter, mm = millimeter

Force and weight

	N	kp	p
1 N =	1	0.102	102
1 kp =	9.807	1	1000
1 lbf =	4.448	0.4536	453.6
1 in =	0.254	2.54	25.4

Velocity

	km/h	m/min	m/s
1 km/h =	1	16.667	0.2778
1 m/min =	0.06	1	16.7 x 10 ⁻³
1 m/s =	3.6	60	1
1 in =	0.254	2.54	25.4

Torque

	Nm	kgfm
1 Nm =	1	0.10197
1 kgfm =	9.8067	1
1 lbf.ft =	1.356	0.1383
1 lbf.in =	0.1129	11.5 x 10 ⁻³

Power

	kW	hp
1 kW =	1	1.341
1 hp =	0.7457	1

Key:

P = Power in kW

Subscript

P_{elec} = electrical

P_{mec} = mechanical

m = Torque in Nm

n = Rotational speed in r/min

U = Line voltage in V

I = Line current in A

cos = Power factor (per unit)

η = Motor efficiency (per unit)

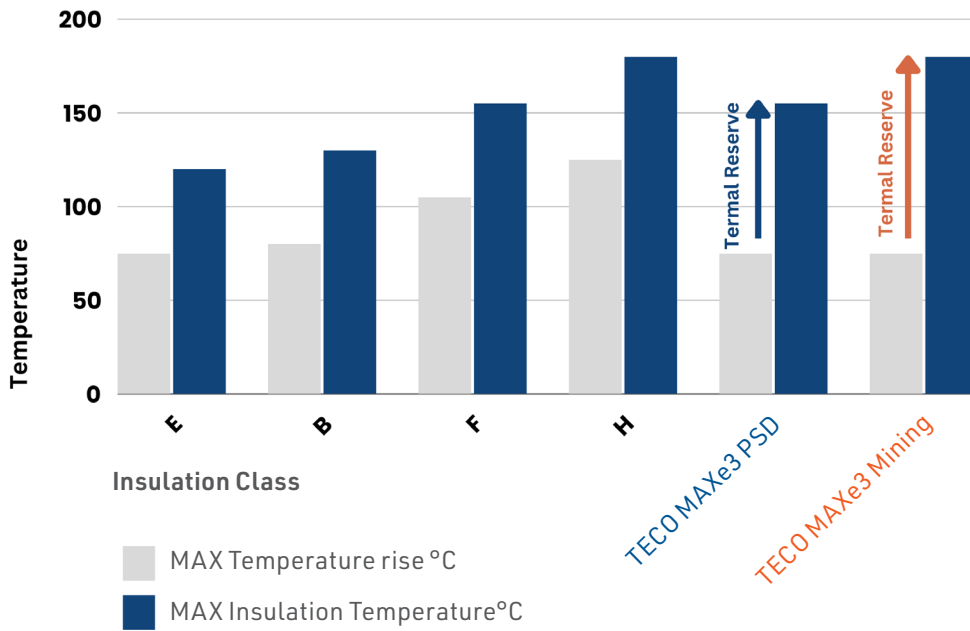
f = Frequency in Hz

J = WR² = WK²

Insulation Classes

The graph below indicates the limits of winding temperature and temperature rise for the various insulation classes in accordance with IEC60034-1 Items 1b) & 1d) AC motors. The difference between the temperature rise and the insulation class rating equates to the safety margin available.

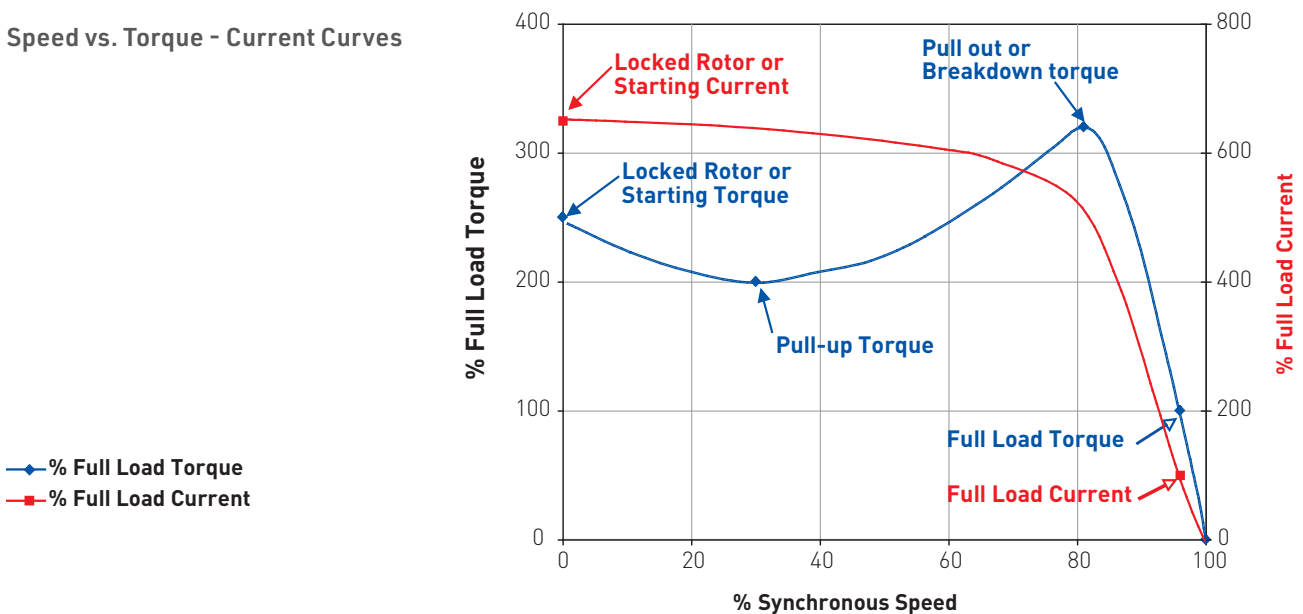
The majority of TECO motors comply with a limitation of Class E temperature rise (75°C) or less, thereby providing a massive thermal reserve, which provides the client with a motor that will perform extremely well in arduous temperature applications (whether load or ambient induced).



Speed vs. Torque - Current

The graph below indicates the typical speed vs. torque current characteristics of a D132 frame motor to "Design N" Normal Torque. The motor is started DOL and the major points on these curves are defined below.

Speed vs. Torque - Current Curves



Starts per Hour

Starts Per Hour and Maximum Load Inertia

Maximum starts per hour DOL based on maximum load inertia listed, these are quoted as equally spaced and includes one cold start.

For larger inertias and / or greater frequency of starting please refer to TECO.

Starts Per Hour (Based on Maximum Load Inertia)

Pole	Frame Size					
	80 - 112	132 - 160	180 - 200	225 - 250	280	315M
2	12	10	8	5	3	3
4	22	20	16	10	6	4
6	28	25	20	12	8	6

Maximum Allowable Load Inertia

kW	Load Inertia							
	GD ² kg-m ²	WR ² kg-m ²	GD ² kg-m ²	WR ² kg-m ²	GD ² kg-m ²	WR ² kg-m ²	GD ² kg-m ²	WR ² kg-m ²
	2 Pole		4 Pole		6 Pole		8 Pole	
0.75	0.325	0.081	1.41	0.353	3.65	0.913	7.54	1.89
1.1	0.440	0.110	2.09	0.523	5.60	1.40	11.0	2.74
1.5	0.580	0.145	2.68	0.670	7.30	1.83	14.6	3.65
2.2	0.850	0.213	4.14	1.04	10.7	2.68	21.2	5.29
3	1.12	0.280	5.35	1.34	14.0	3.50	27.9	6.97
4	1.53	0.383	7.23	1.81	19.0	4.75	38.0	9.51
5.5	2.02	0.505	9.49	2.37	25.3	6.33	50.6	12.7
7.5	2.68	0.670	12.4	3.10	33.3	8.34	66.4	16.6
11	3.89	0.973	18.3	4.57	48.7	12.2	97.3	24.3
15	5.11	1.28	24.1	6.02	63.8	15.9	127	31.8
18.5	6.20	1.55	29.7	7.42	78.8	19.7	157	39.2
22	7.54	1.89	35.1	8.76	93.5	23.4	187	46.8
30	9.73	2.43	46.0	11.5	122	30.5	245	61.2
37	11.9	2.98	56.5	14.1	151	37.8	302	75.5
45	14.1	3.53	66.9	16.7	179	44.8	358	89.5
55	17.3	4.32	82.2	20.6	220	55.0	441	110
75	22.4	5.60	107	26.8	187	46.8	577	144
90	27.5	6.88	132	33.0	353	88.2	710	178
110	32.3	8.08	156	39.0	418	105	*	*
132	36.5	9.13	176	44.0	481	120	*	*
150	41.8	10.5	202	50.5	*	*	*	*
185	51.1	12.8	247	61.8	*	*	*	*

Notes: * For larger sizes please refer to TECO.

Thermal Protection

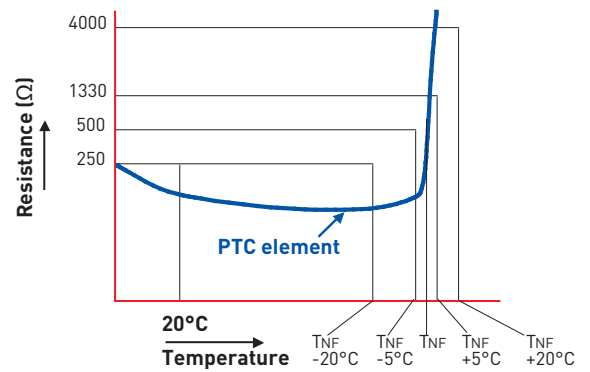
The various types of thermal protection devices are described below. Whilst these devices provide excellent thermal protection they may not fully protect against some transient conditions.

Additional set(s) of these protection devices can be provided with a lower temperature rating which can be utilized as an alarm function. Higher temperature ratings can be supplied for higher trip temperatures, however, care should be taken to ensure the temperature rating of the insulation class is not compromised.

Thermistors

Thermistors are thermo-variable resistors and have a positive temperature co-efficient (PTC). Three thermistors are fitted to the end-windings (one per phase), which are connected in series. The standard TECO thermistors at trip temperature have a resistance of 1000 ohms per thermistor (3000 ohms total, 3 thermistors, one per phase). Thermistors are sensors that require connection to a control relay (this relay is not supplied by TECO). The leads normally are terminated in the main terminal box (with an auxiliary terminal box available if specified).

Temperature vs. Resistance Diagram



Connection Lead Colour Coding

Trip Temperature (°C)	Lead Wire Colours	
90	GREEN	GREEN
100	RED	RED
110	BROWN	BROWN
120	GREY	GREY
130	BLUE	BLUE
140	WHITE	BLUE
150	BLACK	BLACK
160	BLUE	RED
170	WHITE	BLACK
180	WHITE	RED

Thermistors and / or RTD's should not be Meggered or tested at a voltage above 2.5 volts.

Typical Thermistor Nameplates



Resistance Temperature Detectors (RTD's)

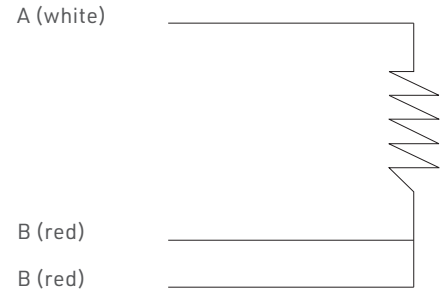
An RTD, (Resistance Temperature Detector), is a device that provides a change in resistance value in relationship to temperature.

This change is of a linear nature thereby providing the ability to accurately monitor the motor operating temperatures when connected to an appropriate relay.

The most commonly used RTD is the platinum type which has a nominal resistance of 100ohms @ 0°C (PT100) and is of the 3 wire type (other RTD types available on application).

When fitted the RTD leads are terminated to an auxiliary terminal box (it is recommended that external wiring to this box be of the screened copper conductor type to prevent any electromagnetic interference).

"3 wire" RTD circuit



- Winding RTDs can be provided within the windings, one per phase or more as required.
- Bearing RTDs can be provided if required. The RTD element is located in a stainless-steel metal probe sheath and is mounted within a bearing thermowell.

Table for Platinum Resistance Elements (Resistance in Ohms vs. Temperature) e.g. 19°C = 107.40 Ohms

°C	0	1	2	3	4	5	6	7	8	9
0	100.00	100.39	100.78	101.17	101.56	101.95	102.34	102.73	103.12	103.51
10	103.90	104.29	104.68	105.07	105.46	105.85	106.24	106.63	107.02	107.40
20	107.79	108.18	108.57	108.96	109.35	109.73	110.12	110.51	110.90	111.28
30	111.67	112.06	112.45	112.83	113.22	113.61	113.99	114.38	114.77	115.15
40	115.54	115.93	116.31	116.70	117.08	117.47	117.85	118.24	118.62	119.01
50	119.40	119.78	120.16	120.55	120.93	121.32	121.70	122.09	122.47	122.86
60	123.24	123.62	124.01	124.39	124.77	125.16	125.54	125.92	126.31	126.69
70	127.07	127.45	127.84	128.22	128.60	128.98	129.37	129.75	130.13	130.51
80	130.89	131.27	131.66	132.04	132.42	132.80	133.18	133.56	133.94	134.32
90	134.70	135.08	135.46	135.84	136.22	136.60	136.98	137.36	137.74	138.12
100	138.50	138.88	139.26	139.64	140.02	140.39	140.77	141.15	141.53	141.91
110	142.29	142.66	143.04	143.42	143.80	144.17	144.55	144.93	145.31	145.68
120	146.06	146.44	146.81	147.19	147.57	147.94	148.32	148.70	149.07	149.45
130	149.82	150.20	150.57	150.95	151.33	151.70	152.08	152.45	152.83	153.20
140	153.58	153.95	154.32	154.70	155.07	155.45	155.82	156.19	156.57	156.94
150	157.31	157.69	158.06	158.43	158.81	159.18	159.55	159.93	160.30	160.67
160	161.04	161.42	161.79	162.16	162.53	162.90	163.27	163.65	164.02	164.39
170	164.76	165.13	165.50	165.87	166.24	166.61	166.98	167.35	167.72	168.09
180	168.46	168.83	169.20	169.57	169.94	170.31	170.68	171.05	171.42	171.79
190	172.16	172.53	172.90	173.26	173.63	174.00	174.37	174.74	175.10	175.47
200	175.84	176.21	176.57	176.94	177.31	177.68	178.04	178.41	178.78	179.14

Suggested / Recommend Temperature Settings for RTD's

Device	Type	Location	Alarm	Trip
RTD	Platinum 100 Ohms @ 0°C	Winding, Class F	140°C	150°C
RTD	Platinum 100 Ohms @ 0°C	Winding, Class H	160°C	170°C
RTD	Platinum 100 Ohms @ 0°C	DE & NDE Bearing	95°C	100°C

Tolerance for Electromechanical Characteristic

IEC60034-1 Specifies Standard Tolerances for Electromechanical Characteristics (Squirrel Cage Induction Motors)

Quantity	Tolerance
Efficiency	-15% (1- η)
Power factor (Cos φ)	-1/6 (1-cos φ) min. 0.02, max. 0.07
Slip P < 1 kW	\pm 30% of the slip
Slip P \geq 1 kW	\pm 20% of the slip
Starting torque	-15%, +25% of the torque
Starting current	+20% of the current
Pull-up torque	-15% of the torque
Break down torque	-10% of the torque >1.5 full load torque

IEC60072 Dimensional Tolerances

Shaft Height - Dimension "H"

Frame Size	Tolerance	Tolerance (mm)
63 to 250		+ 0
		- 0.5
280 to 450		+ 0
		- 1

Shaft - Dimension "D".

D	Tolerance	Tolerance (mm)
14	j6	+ 0.008
		- 0.003
19 to 28	j6	+ 0.009
		- 0.004
32 to 48	k6	+ 0.018
		+ 0.002
55 to 80	m6	+ 0.030
		+ 0.011
85 to 120	m6	+ 0.035
		+ 0.013
125	m6	+ 0.040
		+ 0.015

Flange - Dimension "N"

N	Tolerance	Tolerance (mm)
110	h7	+ 0
		- 0.035
130 & 180	h7	+ 0
		- 0.040
230 & 250	h7	+ 0
		- 0.046
300	h7	+ 0
		- 0.052
350	h7	+ 0
		- 0.057
450	h7	+ 0
		- 0.063
550	h7	+ 0
		- 0.070

C Face - Dimension "N"

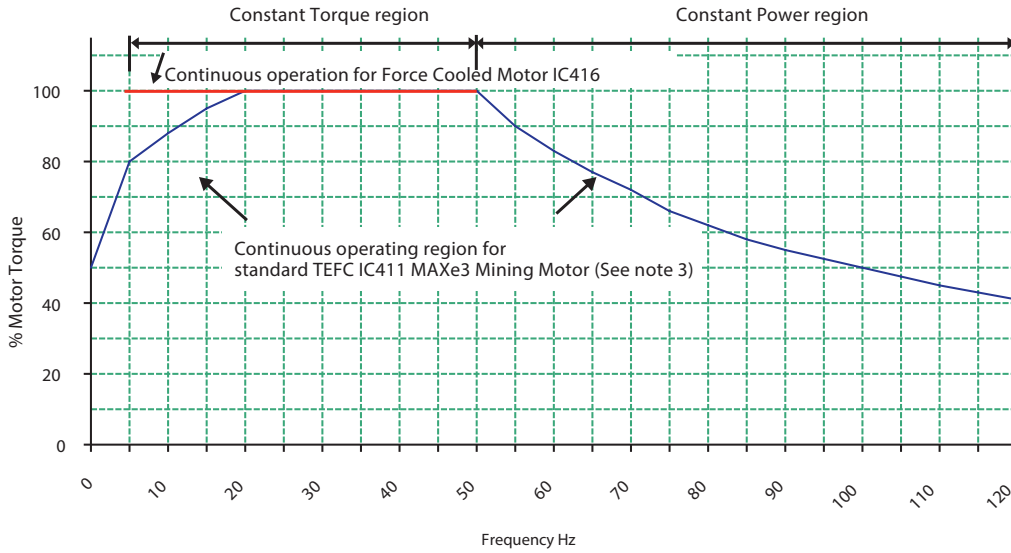
N	Tolerance	Tolerance (mm)
60 to 80	h7	+ 0
		- 0.030
95 & 110	h7	+ 0
		- 0.035

Variable Speed Drives (VVVF)

The voltage output of Variable Voltage Variable Frequency (VVVF) Drives is not purely sinusoidal. This causes higher voltage stresses within the windings and increases the losses, vibration, and noise of the motor. The Loadability Curve and Maximum Safe Speed are as below, (this graph should be used as a guide only).

Further consultation with TECO may be required for arduous critical speed and load duties, or for Ex rated areas.

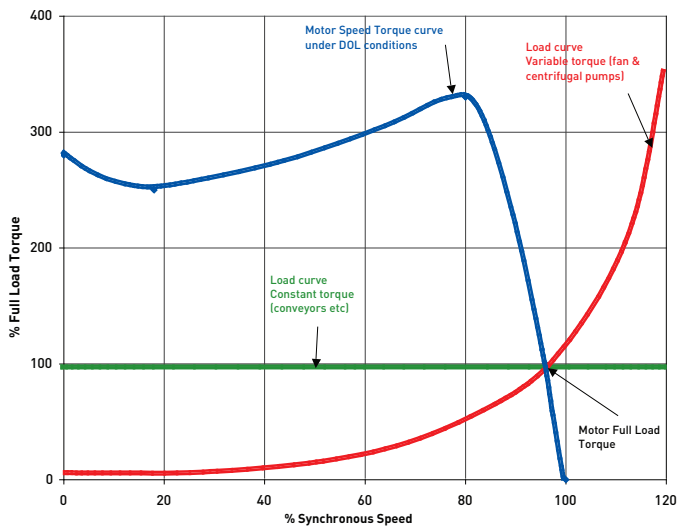
Typical Motor Loadability Curve



Notes:

- Installation: to follow the guidelines detailed in "AS60034-17:2006 Cage induction motors when fed from converters - Application guide"
- Maximum safe operating speed to follow AS60034-1, Table 17
- MAXe3 Premium Severe Duty constant torque to 25 Hz

For variable torque loads (centrifugal pumps and fans) for speeds between 5-50 Hz derating is not normally required. Outside of this range please check with TECO for motor suitability. Typical variable and constant torque load curves are shown below.



Speed vs. Torque Curves (assuming load torque @ 100% speed = motor full load torque)

◆ % Full Load Torque

Maximum Safe Operating Speed (RPM), According to IEC60034-1 (Table 18)

Frame Number	2 Pole	4 Pole	6 Pole
< 112	5200	3600	2400
132 ~ 180	4500	2700	2400
200	4500	2300	1800
225 ~ 315	3600	2300	1800

Note: Rotors are balanced up to 60 Hz speed. If the motor is going to operate above 3600 RPM (2 pole motor at 60 Hz), special balancing/rebalancing the rotor maybe required. Please refer to TECO.

Variable Speed Drives (VVVF)

TECO Squirrel-Cage Induction Motors on Variable Speed Drives

Motor Synchronous Speed vs. Frequency																									
Frequency (Hz)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
2 Pole RPM	0	300	600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400	5700	6000	6300	6600	6900	7200
4 Pole RPM	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	3150	3300	3450	3600
6 Pole RPM	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
8 Pole RPM	0	75	150	225	300	375	450	525	600	675	750	825	900	975	1050	1125	1200	1275	1350	1425	1500	1575	1650	1725	1800

Drawing on both TECO and Westinghouse expertise, TECO motors are designed with an advanced insulation system to meet the severe demands of modern inverters. TECO motors meet or exceed the recommendations of IEC 60034-17 and IEC 60034-25. All TECO motors are designed with an enhanced insulation system, including spike-resistant wire capable of withstanding the high-voltage stresses generated by modern PWM inverters.

Low Voltage Motors: TECO Low Voltage insulation system are rated as follows:					
Motor Low Voltage	Insulation Class	Winding Insulation (phase - phase)		Rise Time	Time between pulses
		Peak Voltage on Motors terminal	dV/dt on Motors terminal		
TECO AUS & NZ L.V. stock motor	F	≤1,600 V	≤ 6,500 V/μS	≥ 0.1 μS	≥ 6 μS
	H	≤ 2,200 V	≤ 8,500 V/μS		

Please refer to IEC 60034-25 and IEC 60034-18-41 for further information on the responsibility of specification and compliance with stress levels for the Power Drive System (PDS).

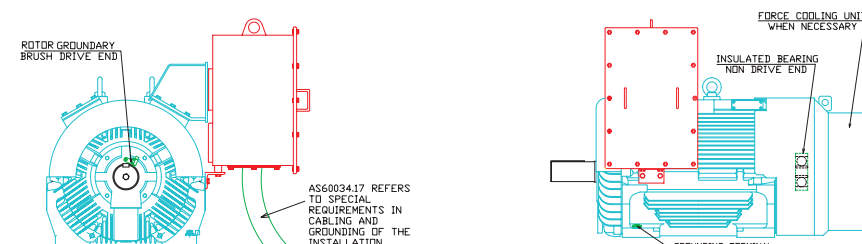
Providing the recommendations above are adhered to, all TECO Australia and New Zealand 3-Phase stock motors 380~415 Volt Delta connected are suitable for 690 Volt Star connection for both VSD or DOL starting (subject to load torque and speed limitations - please refer to TECO).

In addition to the inverter-rated insulation (standard across TECO motors), TECO recommends the fitment of a shaft earthing brush and an insulated bearing to mitigate the effects of VSD-induced shaft currents (which can damage the motor bearings). Although quoted as additional costs, protection against VSD-induced shaft currents can only be ensured if an insulated bearing and a shaft earthing brush are installed. Whilst there are different recommendations provided by the IEC, NEMA, CSA and other standards or industry bodies, TECO refers to IEC60034-17 and IEC60034-25 and recommends the following:

1. All installations must be done in accordance with IEC60034-17 and IEC60034-25.
2. Rotor Grounding brush on the drive-end and insulated bearing (or insulated housing). On the non-drive-end for frames 280 and above.
3. Setting the VSD carrier frequency (switching frequency) to 5kHz or below (as higher switching frequencies could increase shaft currents).

Alternatively, the user may wish to specify a common mode voltage filter, to be installed at the VSD output and effectively eliminate common mode voltages which are the root cause of VSD-induced shaft currents.

Typical "VSD Ready" Large Frame Size Motor



Rotor Grounding Brush fitted to a 280 Frame Motor.

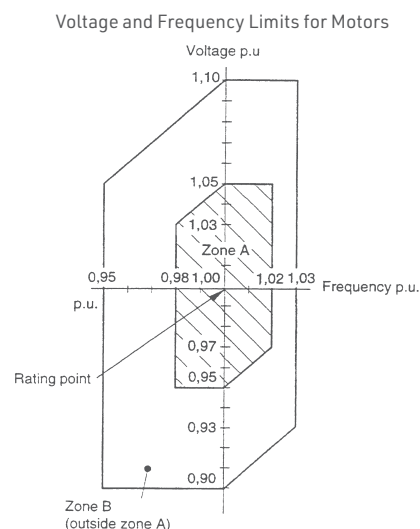


Voltage and Frequency Variations during Operation - IEC60034-1

For AC motors rated for use on a power supply of fixed frequency supplied from an AC generator (whether local or via a supply network), combinations of voltage variation and frequency variation are classified as being either Zone A or Zone B, (in accordance with the figure on the right).

A machine shall be capable of performing its primary function continuously within Zone A, but need not comply fully with its performance at rated voltage and frequency and may exhibit some deviations. Temperature rises may be higher than at rated voltage and frequency.

A machine shall be capable of performing its primary function within Zone B, but may exhibit greater deviations from its performance at rated voltage and frequency than in Zone A. Temperature rises may be higher than at rated voltage and frequency and most likely will be higher than those in Zone A.



Voltage Variation and its' Effect on Performance

The characteristics of motors will of course vary with a corresponding variation in voltage of $\pm 10\%$ around the nominal value. An approximation of these variations is given in the table below.

	Voltage Variation in %				
	$U_N - 10\%$	$U_N - 5\%$	U_N	$U_N + 5\%$	$U_N + 10\%$
Torque curve	0.81	0.9	1	1.1	1.21
Slip	1.23	1.11	1	0.91	0.83
Rated current	1.1	1.05	1	0.98	0.98
Rated efficiency	0.97	0.98	1	1	0.98
Rated power factor ($\cos \phi$)	1.03	1.02	1	0.97	0.94
Starting current	0.9	0.95	1	1.05	1.1
Nominal temperature rise	1.18	1.05	1	1.00	1.1
P (Watt) no-load	0.85	0.92	1	1.12	1.25

Other Mains Supply

The TECO Australia and New Zealand 380~415 Volt 3-Phase 50 Hz stock motors up to frame size D315M are also suitable for re-nameplating to 440 Volt 50 Hz or 400~480 Volt 60 Hz without the need for derating. Performance details are available on request.

Some world supply systems are given below. Site supply details should be further checked to confirm suitability.

World 3-Phase Voltage (V)-Frequency (Hz)

Country	Voltage	Frequency	Country	Voltage	Frequency	Country	Voltage	Frequency
Taiwan	380	60	Japan	200	50/60	* England	415*	50
Singapore	400	50	Philippines	460	60	* Germany	380*	50
Malaysia	415	50	India	400	50	Italy	380*	50
Indonesia	380	50	Korea	380	60	Spain	380*	50
Thailand	380	50	Vietnam	380	50	Netherlands	380*	50
China	380	50	USA	460	60	Australia	415	50
Hong Kong	380	50	Canada	460 or 565	60	South Africa	380	50
						Saudi Arabia	380	50

Note: * EU are harmonising voltage to 400 Volt 50 Hz

TECO Variable Speed Drives

TECO Manufactures and stocks locally Variable Speed Drives Providing a wide range of LV and MV drives and soft starters.

TECO products are renowned for their advanced technology and energy - saving features. Our variable speed drives and soft starters empower businesses to optimise motor control , achieve higher energy efficiency through reduced overall power consumption, reducing equipment wear and enhancing operational performance

TECO Australia and New Zealand offers a comprehensive range of control equipment through our Automation equipment business unit. this includes DOL starters, Star Delta Starters, Contactors, overload protection devices and associated accessories.



A510s - Advanced Current Vector Control Drive

- Seven control modes integrated into one drive
- 200% 0.5Hz starting torque
- Four quadrant control, speed, torque and position control modes
- Built in modbus RTU via RJ45 port
- PTC Thermistor Input
- Dual rating for normal and heavy duty loads
- Fire override mode
- PLC and PID functions as standard.



E510s - General Vector Control Drive

- V/F Control, Vector Control
- 11kW High IP rating with built-in isolator without the need for an enclosure solution
- Starting Torque 150% /3Hz (V/F), 150% /1Hz (Vector)
- Fire Override Mode / Safety Stop
- IP20 Enclosure
- Built-In Modbus RTU via RJ45 port
- PLC & PID functions as standard
- Parameter Lock Function prevents unauthorised access
- LCD keypad
- 0.75-2.2kW 1-Ph Input and 3-Ph Output
- Built-in potentiometer for varying motor speed
- Multi-pump feature as required by Pump OEMs.



F510 - Fan and Pump Drive

- Advanced Network functions for Building Automation
- Automatic Energy Saving Function
- Ultra Low Motor Noise using Soft PWM Technology
- Fire Override Mode
- Pump Cascade Control Card for up to 8 Pumps
- Built-In Multi Pump Control Mode
- Blockage Detection, Sleep Mode Dry Pump Protection
- Alphanumeric LCD Keypad Standard
- LCD Keypad Standard
- RTC Function / Simple PLC / PTC Motor
- Temperature detector input
- Built-In Filter up to and including 45kW thereafter
- Available with optional external filter
- 0.75kW to 600kW output range.

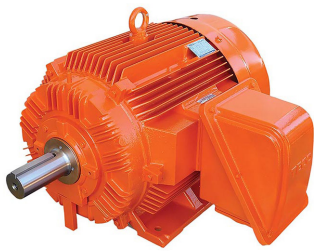


L510s - Compact V/F & SLV Control Drive

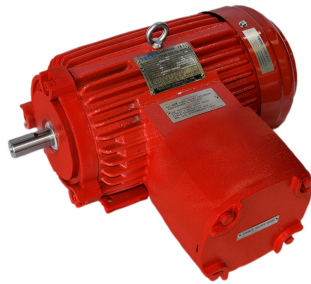
- V/F Control and torque compensation function
- Built in MODBUS RS485 communication
- RJ45 Interface for PC and Copy Module
- PID Functionality
- Full Protective Functions
- Built In EMI Filter for Interference Suppression
- External Cooling Heatsink
- Built In Digital Display and Keypad including
- Speed Adjust Potentiometer
- 0.75-2.2kW 1-Ph Input and 3-Ph Output.

Why choose TECO Australia and New Zealand

TECO Australia and New Zealand takes pride in offering a comprehensive range of industry-leading products across three business units. Our selection of Industrial Electric Motors includes Low Voltage (LV), Medium Voltage (MV), and High Voltage (HV) motors, Squirrel Cage and Wound Rotor motors, Direct Current (DC) motors, and single-phase motors. We also offer Invicta industrial vibrators, known for their exceptional performance and reliability. The following solutions are part of our Low Voltage Electric Motors lineup, renowned for their advanced technology and energy-saving features.



LV Premium High Efficiency Motor



Hazardous Area Motor



Te3 Cast Iron Series Motor



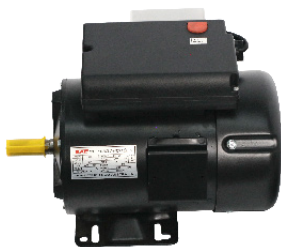
MaxAlloy Motor



Hollow Shaft



Open Drip Proof Motor



Special Purpose Motor



Single Phase Industrial Motor



Invicta Vibrator Motor

EXTENSIVE PRODUCT RANGE

Our diverse and extensive product portfolio caters to various applications and industries, ensuring that customers can find the right solution to meet their specific requirements.

VAST STOCK AVAILABILITY

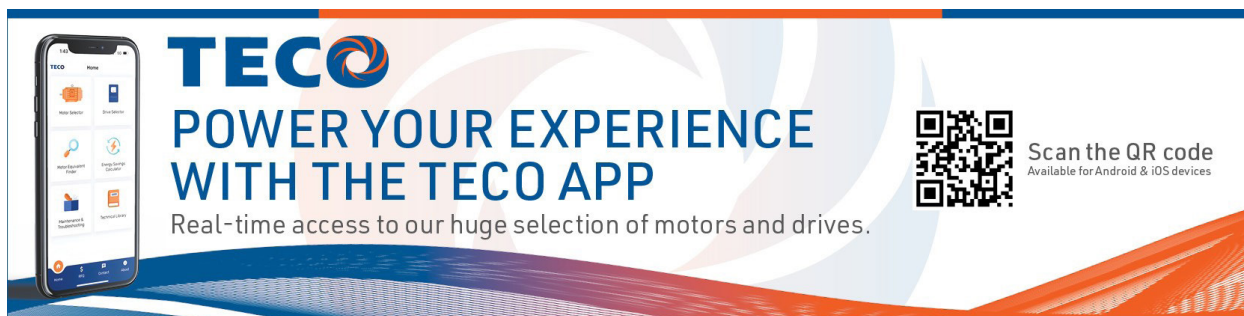
At TECO Australia and New Zealand, we maintain a vast stock of both motors and drives, ready to go. Our extensive inventory ensures quick delivery, minimising downtime and ensuring that our customers have access to the products that they need when they need them.

IN-HOUSE MODIFICATION SERVICE

TECO goes beyond offering off-the-shelf solutions. Our In-House modification services allow us to customise products according to unique customer specifications.

TECO APP

Available for smartphones and tablets and designed and produced in Australia by our local support engineers, the TECO App enables you to have a real-time access to our huge selection of motors and drives anytime, anywhere.



The banner features a smartphone on the left displaying the TECO app interface with icons for Motor Selector, Drive Selector, Motor Equipment Finder, and High-Speed Drives. The central text reads 'TECO POWER YOUR EXPERIENCE WITH THE TECO APP' in large blue letters, followed by 'Real-time access to our huge selection of motors and drives.' To the right is a QR code with the text 'Scan the QR code Available for Android & iOS devices'. The background has a stylized gear pattern and a blue-to-orange gradient at the bottom.



MAXe3 Low Voltage 3-Phase Induction Motors

PRODUCT CATALOGUE JULY 2024

HEAD OFFICE AUSTRALIA

TECO Australia Pty Limited

335-337 Woodpark Road,
Smithfield NSW 2164

P: +61 2 9765 8118

F: +61 2 9765 8185

E: sales.nsw@teco.com.au

W: www.teco.com.au

VIC/SA/TAS

TECO Australia Pty Limited
16 Longstaff Road,
Bayswater VIC 3153

P: +61 3 9720 4411

E: vicsales@teco.com.au

WA

TECO Australia Pty Limited
18 Hazelhurst Street,
Kewdale WA 6105

P: +61 8 9479 4879

E: sales.wa@teco.com.au

QLD

TECO Australia Pty Limited
50 Murdoch Circuit,
Acacia Ridge QLD 4110

P: +61 7 3373 9600

E: sales.qld@teco.com.au

NEW ZEALAND

TECO New Zealand Ltd
4 Autumn Place,
Penrose Auckland 1061

P: +64 9 526 8480

E: sales@teco.co.nz