



Low Voltage 3-Phase | **Range**
Induction Motors | **0.18kW to 670kW**

TOTALLY ENCLOSED FAN-COOLED CAST IRON FRAME SERIES



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Welcome To Teco!



TECO Australia – Electric Motor Division

Established in 1983 as a wholly owned subsidiary of TECO Electric & Machinery Co., TECO Australia has earned a reputation as a reliable supplier of superior quality Electric Motors, Variable Speed Drive systems and Motor Controls. These products are all designed, manufactured and tested to meet stringent Australian and International Standards.

TECO Electric Motors are regarded as one of the leading brands available on the market and are regularly specified and preferred amongst equipment manufacturers, constructors, engineering companies and major end-users alike.

TECO Electric & Machinery Co.

From modest beginnings in 1956, TECO Electric & Machinery Co. has grown to be one of the worlds largest manufacturers of an extensive range of electric motors. In addition to the core manufacturing facilities in Taiwan, the continual growth of TECO on a global front has seen the formation in 1995 of the TECO Westinghouse Motor Company in the USA, borne out of the 100% ownership of the Westinghouse Motor Company

along with the establishment of additional major manufacturing facilities around the world to service new markets and meet global demand.

TECO Westinghouse

Today TECO designs and manufactures a complete range of low, medium and high voltage motors, Variable Speed Drives and Control Gear with sales and support being offered on a global basis.

Quality Assurance

All TECO manufacturing plants and TECO Australia have been assessed to meet the requirements of ISO9001:2000 documented quality systems.



Environmental and RoHS

TECO major manufacturing plants in Taiwan have ISO14001 Environmental Management System accreditation.

Low Voltage motors manufactured by TECO do not contain (or contain within the maximum allowable limits) any restricted hazardous substances as per European Directive 2002/95/EC(RoHS).



Driving & Connecting Globally



General Information

The motors described in this catalogue are designed and manufactured by TECO Electric & Machinery Co. and are Squirrel Cage Induction Motors intended for general purpose industrial / arduous mining applications and meet all relevant sections of the Australian, New Zealand and International Standards detailed herein.

Electrical Design and Standards

Altitude

Designed for operation at an altitude up to 1000 metres above sea level, refer to page 26 for higher altitudes.

Ambient

Motors are designed to operate in ambient conditions of -20°C to $+40^{\circ}\text{C}$ with motors being capable for operation within an ambient of 50°C . Please refer to page 26 for operation in adverse ambient conditions.

Direction of Rotation

Standard rotation is clockwise when viewed from the drive end with the terminal marking corresponding to incoming line markings.

Duty Rating

All motors have a maximum continuous duty rating of S1 to AS1359.101. Other duty ratings are available on request.

Electric 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 27 for Connection diagram.

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)

All motors meet or exceed the requirements of Australian New Zealand Standard "AS/NZS1359.5-2004 3-Phase cage induction motors - High efficiency and minimum efficiency performance standards requirements" within the range of 0.75 kW to less than 185 kW, 2 - 4 - 6 & 8 pole single speed, rated S1 continuous duty.

Standards and TECO compliance is detailed below

TECO Type Designation	Frame Size	Output kW	Name plated	Efficiency Level
AEEB-NE	D63 ~ D90L	< 0.75	TECO	Not applicable
AEHB ~ AEHD	D80 ~ D315M	0.75 ~ 185	TECO MAX-E2™	MEPS table B2
AEMB	D80 ~ D315M	0.75 ~ 185	TECO MAX-E3™	MEPS table B3 High Efficiency
AEJE	D315A ~ D450*	110 ~ 670*	TECO MAX-E3™	MEPS table B3* High Efficiency

* MEPS covers motors less than 185kW.

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

Performance

Motors are designed to meet the performance requirements of Design N as per AS1359.41, normal torque for Direct On Line starting.

Motors are also suitable for other means of starting, depending on load characteristics, please refer to TECO.

Other performance characteristics can be manufactured to suit any special requirement.

Standards

Motors are designed, manufactured and tested in accordance with AS1359. Frame sizes comply with AS1359.30 Australian / British allocations.

Motors also meet the requirements of European Directives where applicable and are CE marked.

For EMC "C-tick" requirements to AS1044, squirrel cage induction motors fall into Compliance Level 1 "Voluntary" category.

TECO has a "Declaration of Conformity" and is a registered user of "C-tick" number N121, which covers TECO squirrel cage induction motors.

For other foreign standards i.e. UL, CSA etc., please refer to TECO.

Stator and Windings

The stator is made up of exceptional high grade, low loss insulated cold rolled electro magnetic silicon steel laminations for maximum efficiency and low core losses.

Windings are random wound with double enamelled Class H copper wire, impregnated with

a solventless resin and are tropic proof rated as standard. Other insulation materials used meet Class F as a minimum.

Windings are designed with a temperature rise of less than Class B (80°C), however, in most cases are less than Class E (75°C) for long motor life, providing superior thermal reserve in abnormal conditions.

Testing

In addition to a full program of tests during manufacture each motor is subjected to routine tests to AS1359 prior to despatch. Performance testing (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 the load characteristics and correct installation of motor and drive.

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. Force cooling units are also available when necessary (please refer to page 23 for force cooling details and page 34 for VSD rating).

Electro-discharge machining of motor bearings can be a concern in some applications with larger motors on VSD's (please refer page 35 for our preventative measures).

Winding Protection

Motors 11 kW and larger are fitted with PTC thermistor protection (P140) within the windings (one per phase) with the leads terminated in the main terminal box.

MAX-E™-Mining spec motors 185 kW and larger have an additional set of PTC thermistors (P130, alarm) within the windings (one per phase) with the thermistor leads terminated in an auxiliary terminal box thereby providing both alarm and trip set of thermistors.

Mechanical Design and Standards

Balance

All rotors are dynamically balanced with a half key to Class N or better, in accordance with AS1359.114.

Bearing and Lubrication System

Frame Size	Poles	DE Bearing	NDE bearing	Greasing
D63 ~ D90L	2	Ball	Ball	Greased for life
D100L ~ D160L	2	Ball	Ball	Greased for life (GR)
D180M ~ D250M	2	Ball	Ball	Grease relief
D280S ~ D450*	2	Ball	Ball	Grease relief with brass dust flinger
D63 ~ D90L	4 and Above	Ball	Ball	Greased for life
D100L ~ D132M	4 and Above	Ball	Ball	Greased for life (GR)
D160M ~ D180M/L	4 and Above	Ball (Roller)	Ball	Greased for life (GR)
D200L ~ D225M	4 and Above	Ball (Roller)	Ball	Grease relief
D250S ~ D315M	4 and Above	Roller (Ball)	Ball	Grease relief with brass dust flinger
D315A ~ D450*	4 and Above	Ball**(Roller)	Ball	Grease relief with 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.

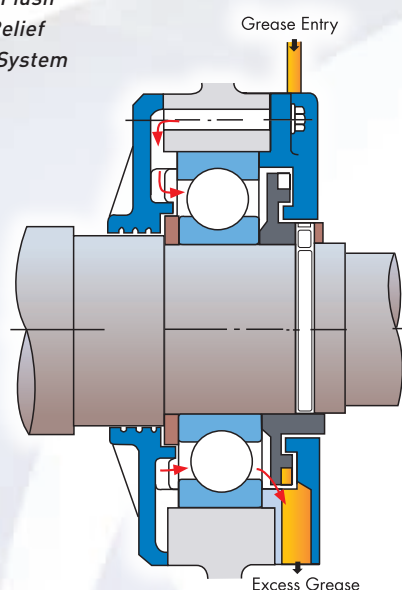
MaxE mining have a roller at drive end as standard.

- 2 Pole motors up to D180 are suitable for direct drive or belt drive.
- 2 Pole motors D200 and larger are suitable for direct drive, belt drive above D200 please refer to TECO.
- 4 Pole and larger; up to and including D315MC, motor are suitable for Belt or Direct Drive.
- Frames D315A ~ 450 (AEJE) are suitable for direct drive, for Belt Drive refer to TECO "MAX-E3™-Mining".

The TECO Through Flush Grease Relief Bearing System gives positive displacement of old grease and is designed for re-greasing during operation.

TECO

Through Flush Grease Relief Bearing System



The fitment of rotating inner & outer labyrinth seals achieves effective sealing from ingress of contamination.

This is a true pressure grease relief system where the grease enters the back of the bearing then is forced through to the front and is expelled through a large external discharge chute.

This system will not allow over greasing to affect the performance of the bearings. This type of grease replenishment system will not allow contaminants to be pushed back into the bearing itself, which can cause premature bearing failure.

Cooling System

Cooling is Totally Enclosed Fan Cooled (TEFC), with integrally cast cooling fins on frame and endshields, fitted with external fan (IC411) to AS1359.106.

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

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 in TECO Grey (Munsell 7.5BG4/2).

MAX-E3™ mining motors (AEJE D315A and larger) have a finish colour of Light Grey (Munsell 3.5GY6.9/04).

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

MAX-E3™ - Mining Spec Motors

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

- Grease Relief Purging Bearing System.
- Cast Iron cooling fans.
- IP66 with porous drain plugs.
- Frames D315MC to D355A, 185 kW to 375 kW have oversized drive end shaft and bearings for demanding belt drive applications which are suitable for arduous Mining and Crusher Duty applications.
- Motors 185 kW and larger have two sets of thermistors providing an alarm and trip set with auxiliary terminal box.
- Oversized Cast Iron / Fabricated Steel primary terminal box.

Mounting

Motors are available in the following mountings, refer to page 24 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.

Castings are machined to close tolerances in order to ensure accurate alignment with minimum vibration.

Standard Materials of Construction

Frame Size	External Fan	Fan Cover	Terminal Box
D63~D160	PP (CI)	HDPS (CI)	CI
D180 (2 pole)	PP (CI)	HDPS (CI)	CI
D180 (4 pole)	CI	HDPS (CI)	CI
D200~D315M	CI	HDPS (CI)	CI
D315A~D450*	FS	FS	FS* (CI)

Key: (material in parentheses is alternative)

PP - Polypropylene

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 up to and including D315MC are IP56 as standard with motors D315A (AEJE) and larger rated IP66, thereby providing excellent protection against the ingress of dust and water.

Rating Plate

A stainless steel rating plate containing all details as specified in AS1359.101 including bearing sizes are fitted to all motors. Rating plate also confirms compliance with MEPS Efficiency Standard and is marked "MAX-E2™" (MEPS table B2) or "MAX-E3™ High Efficiency" (MEPS table B3) where applicable. Refer to page 28 for example of rating plate.

Rotor Assembly

As per the stator, the rotor core is made up of exceptional high grade, low loss insulated cold rolled electro magnetic steel laminations 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 AEJE motors, the rotor is of 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 (ANSI1040) and is also keyed onto the shaft on motor frames D200 and larger.

Induction Brazing



Finished Rotor and Shaft Assemblies



Terminal Box

On 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 (AEJE) 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 90° increments. An internal earth is provided within the motor terminal box.

Options

Some available options in this range are as follows:

- Airstream rated IC418
- Anti-condensation heaters
- Auxiliary terminal boxes for Thermistor / Heater / RTD terminations
- Electromechanical "fail safe" Brake Motors
- Cooling Tower application
- Crane rated motors
- Double / non standard shaft extensions
- Encoder / Tacho
- Force ventilation IC416
- Induction Generators
- Insulated bearing
- IP66 enclosure
- Multi-speed motors
- Resistance temperature detectors (RTDs) winding and / or bearings
- Rotor Groundary brush
- Smoke spill to BS7436 to 185 kW
- Special paint systems / colours
- Stainless steel fasteners
- Thermistor protection (on motor frames <11 kW)
- Others on request

Typical Performance Data



TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

Standard Range 63 to 315 Frame (415V 50Hz)

Output kW	Full Load Speed RPM	Frame Size	Efficiency			Power Factor			Current		Torque				Inertia		Noise Level dB(A)	Weight Foot Mount Kgs
			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	Pull Up %FLT	Break-Down %FLT	Rotor J=GD ² /4 Kg-m ²	Max Load 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	330	330	330	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	240	230	260	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	260	240	280	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	360	350	370	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	320	270	310	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	325	270	305	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	230	215	240	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	195	190	265	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	300	260	280	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	260	230	280	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	230	210	230	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	170	145	205	0.0058	1.54	47	27
0.75	2860	80**	83.0	82.0	79.0	85.0	78.5	65.5	1.47	1,020	2.50	340	340	380	0.0015	0.081	57	18
	1420	80	82.5	82.5	80.5	71.0	61.0	47.0	1.77	678	5.04	330	320	330	0.0028	0.353	50	18
	940	90S	78.0	78.0	75.0	67.5	58.0	46.0	1.97	609	7.62	200	200	250	0.0048	0.913	54	25
	695	100L	76.5	76.5	73.0	60.0	51.0	39.0	2.26	442	10.3	230	215	230	0.0088	1.89	49	31
1.1	2840	80**	84.5	84.0	82.0	87.5	82.0	70.5	2.11	947	3.70	300	290	330	0.0018	0.110	53	21
	1415	90S	84.0	85.0	84.0	80.0	72.5	60.0	2.32	690	7.42	250	215	270	0.0043	0.523	46	27
	940	90L	82.0	80.0	77.0	69.0	60.0	48.0	2.75	582	11.2	240	230	290	0.0063	1.40	42	26
	695	100L	78.0	79.5	77.0	64.5	55.5	43.0	3.09	485	15.1	210	200	215	0.0113	2.74	49	37
1.5	2855	90S	85.0	85.5	83.0	85.5	80.5	68.0	2.86	804	5.02	330	300	330	0.0028	0.145	54	24
	1430	90L	85.0	85.0	83.0	75.0	66.5	53.0	3.26	706	10.0	300	240	310	0.0058	0.670	46	30
	930	100L	83.0	83.0	81.5	78.0	71.5	60.0	3.21	623	15.4	240	200	250	0.0138	1.83	44	36
	705	112M	79.5	79.0	77.0	59.0	49.0	39.0	4.43	451	20.3	200	170	230	0.0150	3.65	49	45
2.2	2855	90L	86.0	86.5	85.5	88.0	83.0	72.0	4.11	803	7.36	320	290	330	0.0038	0.213	59	29
	1440	100L	86.5	86.5	85.0	82.5	76.0	63.5	4.36	757	14.6	290	250	300	0.0103	1.04	46	37
	955	112M	84.5	85.0	83.0	74.5	67.0	54.5	4.95	606	22.0	210	190	260	0.0193	2.68	44	43
	710	132S	82.0	81.5	79.0	65.0	56.0	43.0	5.84	514	29.6	250	230	280	0.0385	5.29	49	65
3	2875	100L**	88.5	88.5	87.0	87.5	83.0	73.0	5.36	932	9.97	400	320	370	0.0063	0.280	57	38
	1430	100L	87.5	87.5	87.0	82.5	77.0	65.0	5.95	748	20.0	290	270	310	0.0125	1.34	46	43
	965	132S**	88.5	87.5	86.0	81.0	75.0	63.0	5.79	777	29.7	200	170	290	0.0385	3.50	51	71
	710	132M	83.5	83.5	81.0	65.0	55.0	42.0	7.65	523	40.4	250	235	290	0.0480	6.97	50	75
4	2880	112M**	89.5	90.0	89.0	91.0	88.5	81.0	7.01	856	13.3	280	240	350	0.0115	0.383	57	48
	1445	112M	89.0	89.0	88.0	84.0	80.0	68.5	7.64	785	26.4	240	180	300	0.0208	1.81	48	48
	970	132M**	89.5	89.0	87.0	79.0	72.5	60.0	8.07	743	39.4	210	180	310	0.0515	4.75	51	87
	720	160M	84.5	84.0	81.5	73.0	65.0	52.5	9.25	541	53.1	200	180	250	0.0878	9.51	51	118
5.5	2915	132S**	91.5	91.5	90.5	88.0	85.0	78.5	9.67	776	18.0	220	190	280	0.0190	0.505	64	71
	1460	132S	90.5	90.5	89.0	82.5	76.0	63.5	10.40	817	36.0	270	220	320	0.0333	2.37	53	72
	960	132M	89.0	88.5	88.0	82.0	77.0	66.0	10.70	654	54.7	190	170	270	0.0543	6.33	47	90
	715	160M	85.0	85.5	83.5	73.0	65.0	52.0	12.50	520	73.5	170	160	230	0.123	12.7	54	118
7.5	2895	132S**	91.0	91.0	90.0	80.0	74.0	63.0	14.30	629	24.7	210	180	260	0.0190	0.670	64	84
	1455	132M	91.0	91.0	90.0	85.0	80.0	68.5	13.40	821	49.2	270	220	320	0.0358	3.10	56	82
	970	160M**	91.0	91.0	90.0	81.0	75.0	64.0	14.10	674	73.8	240	200	260	0.121	8.34	55	138
	720	160L	87.0	87.0	85.0	72.0	64.0	51.0	16.60	572	99.5	195	185	270	0.147	16.6	55	155

- Notes:**
1. All figures are based on tests carried out on 415 Volt 3-Phase Motors.
 2. Test Method: AS1359.5, Method B.
 3. Tolerance: AS1359.101.
 4. ** motors comply to MEPS 2006 High Efficiency requirements, **MAX-E3**.
 5. dB(A): Mean Sound Pressure Level on no load at 1 metre.
 6. Motor data 8 pole and slower speeds not listed available on request.
 7. Data subject to change without notice.

Typical Performance Data



TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

Standard Range 63 to 315 Frame (415V 50Hz)

Output kW	Full Load Speed RPM	Frame Size	Efficiency			Power Factor			Current		Torque				Inertia		Noise Level dB(A)	Weight Foot Mount Kgs
			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	Pull Up %FLT	Break-Down %FLT	Rotor J=GD ² /4 Kg-m ²	Max Load J=GD ² /4 Kg-m ²		
11	2935	160M**	92.5	92.5	92.0	91.5	89.0	84.5	18.40	761	35.8	230	200	280	0.0458	0.973	70	128
	1460	160M**	92.5	92.5	92.0	85.0	82.0	74.0	19.80	707	72.0	230	180	270	0.0918	4.57	56	133
	975	160L	91.0	90.5	89.0	79.0	72.5	60.0	21.7	737	108	280	230	280	0.158	12.2	52	159
	720	180L	87.5	88.0	87.5	78.5	74.0	72.5	22.7	529	146	180	160	215	0.314	24.3	56	210
15	2935	160M**	92.5	92.0	91.5	91.0	88.0	81.0	24.70	789	48.8	240	210	290	0.0458	1.28	70	130
	1460	160L**	93.0	93.0	92.5	88.0	84.5	76.5	25.40	728	98.1	230	180	270	0.116	6.02	56	153
	970	180LC**	92.0	92.0	92.0	84.0	79.5	71.5	26.90	613	148	230	190	250	0.336	15.9	58	215
	720	200LC	89.0	89.5	89.5	81.5	78.5	70.5	28.6	454	199	150	130	180	0.445	31.8	57	282
18.5	2925	160L**	93.0	93.0	93.0	91.5	89.5	84.0	30.50	803	60.4	260	210	300	0.0593	1.55	72	148
	1470	180MC**	94.0	94.0	93.5	85.0	81.0	72.5	32.50	754	120	240	180	270	0.177	7.42	63	194
	975	200LC**	93.0	93.5	93.0	78.0	74.0	64.0	35.80	615	181	230	200	250	0.459	19.7	55	285
	725	225S	90.0	90.5	90.0	77.0	72.0	61.0	37.4	508	244	190	180	160	0.591	39.2	58	334
22	2935	180MA**	93.5	93.5	92.5	87.5	84.5	76.0	38.1	787	71.6	250	210	300	0.0708	1.89	72	194
	1465	180LC**	94.0	94.0	93.5	86.0	82.5	74.0	38.5	701	143	230	180	270	0.198	8.76	64	215
	975	200LC**	93.5	93.5	93.5	79.0	75.0	67.0	42.2	592	216	220	190	220	0.521	23.4	54	300
	735	225MC**	92.5	92.5	92.0	78.0	73.5	63.0	43.2	509	286	190	170	195	0.709	46.8	58	375
30	2955	200LA**	94.0	94.0	93.0	89.0	87.5	83.5	49.6	685	97.0	175	150	260	0.151	2.43	76	286
	1470	200LC**	94.5	94.5	94.5	87.0	85.5	78.0	50.5	773	195	230	190	270	0.364	11.5	64	300
	980	225MC**	94.0	94.0	93.5	85.5	82.0	75.0	51.7	590	292	210	190	230	0.756	30.5	61	390
	735	250SC	92.5	92.5	92.0	76.5	71.0	61.0	58.7	545	390	205	180	225	1.025	61.2	65	480
37	2950	200LA**	94.5	94.5	93.5	90.0	88.0	84.5	61.0	656	120	155	135	260	0.189	2.98	76	312
	1475	225SC**	95.0	95.0	94.5	85.0	81.0	73.0	64.3	669	240	200	180	240	0.474	14.1	69	359
	985	250SC**	94.0	94.5	94.0	86.5	83.5	76.0	63.8	634	359	210	200	250	1.049	37.8	64	480
	735	250MC	93.0	93.0	92.0	78.0	74.0	63.0	71.5	559	481	210	180	235	1.225	75.5	68	554
45	2955	225MA	94.5	94.5	93.5	92.0	91.0	88.0	72.0	667	145	140	130	230	0.311	3.53	78	373
	1475	225MC**	95.0	95.0	94.5	85.0	81.0	72.5	77.1	642	291	200	175	250	0.495	16.7	69	387
	985	250MC**	94.5	95.0	94.5	87.5	85.0	77.5	75.3	704	436	230	200	250	1.277	44.8	66	554
55	2960	250SA**	95.0	94.5	94.0	89.5	88.0	87.0	91.5	705	177	150	130	250	0.387	4.32	78	470
	1480	250SC**	95.5	95.0	94.5	87.0	84.0	77.0	93.7	700	355	230	200	260	0.978	20.3	71	528
	984	280SC**	95.0	94.5	94.0	85.0	82.5	75.0	94.8	680	534	165	140	230	2.125	55.0	77	650
75	2960	250MA**	95.5	95.5	95.0	91.0	88.0	85.0	119.0	693	242	140	130	250	0.454	5.60	78	548
	1480	250MC**	95.5	95.5	95.0	87.0	84.0	77.0	125.0	648	484	220	180	240	1.123	26.8	72	574
	984	280MC**	95.3	94.9	94.8	86.0	83.3	76.0	127	689	728	160	136	230	2.775	46.8	77	730
90	2960	280SA	95.4	94.8	94.0	89.0	87.5	82.0	147	717	290	130	110	230	0.725	6.88	83	650
	1480	280SC	95.6	95.0	94.2	87.0	84.2	78.0	150	703	581	160	136	230	2.025	33.0	80	700
	985	315SC	95.3	94.8	94.3	86.0	83.3	76.0	153	690	873	155	131	230	4.275	88.2	77	920
110	2960	280MA	95.4	94.8	94.0	89.7	88.0	82.0	179	721	355	120	102	230	0.850	8.08	83	700
	1482	280MC	95.8	95.2	94.4	88.0	84.5	78.5	182	709	709	155	131	230	2.375	39.0	80	850
	985	315MC**	95.8	95.3	94.8	86.2	84.0	76.5	185	697	1067	150	127	220	4.975	105	77	1010
132	2976	315SA	95.8	95.2	94.3	90.0	88.0	83.0	213	723	424	115	98	220	1.625	9.13	83	840
	1482	315SC**	96.2	95.6	94.8	88.5	85.0	79.5	216	713	851	150	127	220	2.800	44.0	80	940
	986	315MC	95.8	95.3	94.8	86.2	84.5	77.5	222	694	1279	150	127	220	5.050	120	77	1050
150	2976	315MA	96.0	95.4	94.5	90.3	89.0	83.5	241	726	481	110	94	220	1.625	10.5	83	920
	1485	315MC	96.2	95.6	94.8	88.5	85.0	80.0	245	714	965	150	127	220	3.650	50.5	80	930
185	2982	315MA	96.0	95.4	94.5	90.3	89.2	83.5	297	724	593	105	91	220	1.975	12.8	83	1000
	1486	315MB	96.2	95.6	94.8	89.0	85.6	80.5	301	714	1189	140	119	220	3.825	61.8	80	1100

- Notes:**
1. All figures are based on tests carried out on 415 Volt 3-Phase Motors.
 2. Test Method: AS1359.5, Method B.
 3. Tolerance: AS1359.101
 4. ** motors comply to MEPS 2006 High Efficiency requirements, **MAX-E3**.

5. dB(A): Mean Sound Pressure Level on no load at 1 metre.
6. Motor data 8 pole and slower speeds not listed available on request.
7. Data subject to change without notice.

Typical Performance Data



TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

High Efficiency Range MAX-E3™ 63 to 315M Frame (415V 50Hz)

Output kW	Full Load Speed RPM	Frame Size	Efficiency			Power Factor			Current		Torque				Inertia		Noise Level dB(A)	Weight Foot Mount Kgs
			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	Pull Up %FLT	Break-Down %FLT	Rotor J=GD ² /4 Kg-m ²	Max Load J=GD ² /4 Kg-m ²		
0.75	2860	80	83.0	82.0	79.0	85.0	78.5	65.5	1.47	1,020	2.50	340	340	380	0.0015	0.081	57	18
	1420	80	84.5	83.0	80.5	75.5	66.5	52.5	1.63	920	5.04	365	330	355	0.0033	0.353	44	18
	935	90S	80.5	81.0	79.5	74.0	66.0	53.0	1.74	574	7.66	200	180	235	0.0055	0.913	46	25
	700	100L	76.5	76.5	73.0	60.0	50.5	38.5	2.26	442	10.2	235	220	230	0.0105	1.89	49	31
1.1	2840	80	84.5	84.0	82.0	87.5	82.0	70.5	2.11	947	3.70	300	290	330	0.0018	0.110	53	21
	1435	90S	86.0	86.5	86.0	82.0	75.5	63.5	2.21	905	7.32	255	205	290	0.0048	0.523	46	27
	940	90L	82.5	81.5	79.5	69.5	60.0	46.0	2.72	551	11.2	215	195	255	0.0068	1.40	46	26
	695	100L	79.5	80.0	77.5	64.0	55.0	42.5	3.06	490	15.1	210	200	215	0.0148	2.74	49	37
1.5	2850	90S	86.5	87.0	86.5	89.5	85.5	76.0	2.68	933	5.03	330	270	335	0.0030	0.145	56	24
	1440	90L	87.0	86.0	85.0	77.0	69.0	56.0	3.10	968	9.95	310	250	335	0.0063	0.670	47	30
	945	100L	84.0	85.0	84.0	70.0	62.0	48.5	3.53	708	15.2	280	265	290	0.0148	1.83	45	36
	705	112M	81.0	80.0	78.0	60.0	51.0	39.5	4.27	468	20.3	200	170	235	0.0178	3.65	49	45
2.2	2860	90L	87.5	87.5	87.0	85.5	80.0	69.5	4.16	961	7.35	340	275	355	0.0038	0.213	55	29
	1435	100L	88.5	88.0	87.5	83.0	77.5	66.0	4.24	973	14.6	325	285	340	0.0115	1.04	49	37
	965	112M	85.5	85.5	85.0	66.0	58.0	45.5	5.52	634	21.8	200	195	285	0.0210	2.68	51	43
	705	132S	83.5	83.5	82.0	69.0	59.5	46.0	5.40	556	29.8	230	210	265	0.0345	5.29	49	65
3	2875	100L	88.5	88.5	87.0	87.5	83.0	73.0	5.36	932	9.97	400	320	370	0.0063	0.280	57	38
	1440	100L	89.5	88.5	87.5	78.0	70.5	58.0	5.95	924	19.9	345	310	360	0.0125	1.34	49	43
	965	132S	88.5	87.5	86.0	81.0	75.0	63.0	5.79	777	29.7	200	170	290	0.0385	3.50	51	71
	715	132M	85.0	85.0	83.0	64.0	54.0	41.0	7.63	590	40.1	280	260	330	0.0450	6.97	50	75
4	2880	112M	89.5	90.0	89.0	91.0	88.5	81.0	7.01	856	13.3	280	240	350	0.0115	0.383	57	48
	1450	112M	90.0	89.5	89.0	82.5	77.0	65.5	7.69	845	26.3	235	205	330	0.0208	1.81	50	48
	970	132M	89.5	89.0	87.0	79.0	72.5	60.0	8.07	743	39.4	210	180	310	0.0515	4.75	51	87
	720	160M	86.5	86.0	84.5	70.5	62.0	48.5	9.36	588	53.1	190	170	250	0.0860	9.51	51	118
5.5	2915	132S	91.5	91.5	90.5	88.0	85.0	78.5	9.67	776	18.0	220	190	280	0.0190	0.505	64	71
	1455	132S	91.0	90.5	90.5	85.0	81.0	71.0	10.10	891	36.1	265	215	320	0.0333	2.37	55	72
	970	132M	89.5	89.5	88.5	73.0	65.0	51.0	11.90	798	54.1	245	225	360	0.0543	6.33	53	90
	720	160M	88.0	87.0	85.0	71.5	63.0	50.0	12.40	605	73.0	200	190	275	0.126	12.7	54	118
7.5	2895	132S	91.0	91.0	90.0	80.0	74.0	63.0	14.30	629	24.7	210	180	260	0.0190	0.670	64	84
	1460	132M	91.5	92.0	91.5	83.5	78.5	67.5	13.60	882	49.1	290	235	345	0.0433	3.10	55	82
	970	160M	91.0	91.0	90.0	81.0	75.0	64.0	14.10	674	73.8	240	200	260	0.121	8.34	55	138
	720	160L	89.0	88.0	86.0	71.0	62.5	49.5	16.40	610	99.5	205	195	285	0.168	16.6	55	155
11	2935	160M	92.5	92.5	92.0	91.5	89.0	84.5	18.40	761	35.8	230	200	280	0.0458	0.973	70	128
	1460	160M	92.5	92.5	92.0	85.0	82.0	74.0	19.80	707	72.0	230	180	270	0.0918	4.57	56	133
	970	160L	91.5	91.5	91.0	77.0	71.0	59.0	22.10	724	108	285	240	295	0.158	12.2	59	159
	720	180LC	90.5	90.5	90.0	82.0	79.0	70.0	21.00	595	146	170	155	210	0.320	24.3	56	210
15	2935	160M	92.5	92.0	91.5	91.0	88.0	81.0	24.70	789	48.8	240	210	290	0.0458	1.28	70	130
	1460	160L	93.0	93.0	92.5	88.0	84.5	76.5	25.40	728	98.1	230	180	270	0.116	6.02	56	153
	970	180LC	92.0	92.0	92.0	84.0	79.5	71.5	26.90	613	148	230	190	250	0.336	15.9	58	215
	730	200L	91.5	90.0	89.0	78.0	72.0	60.5	29.10	619	196	195	170	230	0.521	31.8	57	282
18.5	2925	160L	93.0	93.0	93.0	91.5	89.5	84.0	30.50	803	60.4	260	210	300	0.0593	1.55	72	148
	1470	180MC	94.0	94.0	93.5	85.0	81.0	72.5	32.50	754	120	240	180	270	0.177	7.42	63	194
	975	200LC	93.0	93.5	93.0	78.0	74.0	64.0	35.80	615	181	230	200	250	0.459	19.7	55	285
	735	225SC	92.0	92.0	91.5	76.5	71.5	61.0	36.90	515	240	180	160	195	0.611	39.2	58	334

- Notes:**
1. All figures are based on tests carried out on 415 Volt 3-Phase Motors.
 2. Test Method: AS1359.5, Method B.
 3. Tolerance: AS1359.101
 4. dB(A): Mean Sound Pressure Level on no load at 1 metre.
 5. Motor data 8 pole and slower speeds not listed available on request.
 6. Data subject to change without notice.

Typical Performance Data



TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

High Efficiency Range MAX-E3™ 63 to 315 Frame (415V 50Hz)

Output kW	Full Load Speed RPM	Frame Size	Efficiency			Power Factor			Current		Torque				Inertia		Noise Level dB(A)	Weight Foot Mount Kgs
			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	Pull Up %FLT	Break-Down %FLT	Rotor J=GD ² /4 Kg-m ²	Max Load J=GD ² /4 Kg-m ²		
22	2935	180MA	93.5	93.5	92.5	87.5	84.5	76.0	38.1	787	71.6	250	210	300	0.0708	1.89	72	194
	1465	180LC	94.0	94.0	93.5	86.0	82.5	74.0	38.5	701	143	230	180	270	0.198	8.76	64	215
	975	200LC	93.5	93.5	93.5	79.0	75.0	67.0	42.2	592	216	220	190	220	0.521	23.4	54	300
	735	225MC	92.5	92.5	92.0	77.0	72.0	61.5	43.7	526	286	185	170	195	0.756	46.8	58	375
30	2955	200LA	94.0	94.0	93.0	89.0	87.5	83.5	49.6	685	97.0	175	150	260	0.151	2.43	76	286
	1470	200LC	94.5	94.5	94.5	87.0	85.5	78.0	50.5	773	195	230	190	270	0.364	11.5	64	300
	980	225MC	94.0	94.0	93.5	85.5	82.0	75.0	51.7	590	292	210	190	230	0.756	30.5	61	390
	735	250SC	93.5	93.0	92.0	74.5	68.0	56.0	59.6	705	390	260	230	295	1.235	61.2	65	480
37	2950	200LA	94.5	94.5	93.5	90.0	88.0	84.5	61.0	656	120	155	135	260	0.189	2.98	76	312
	1475	225SC	95.0	95.0	94.5	85.0	81.0	73.0	64.3	669	240	200	180	240	0.474	14.1	69	359
	985	250SC	94.0	94.5	94.0	86.5	83.5	76.0	63.8	634	359	210	200	250	1.049	37.8	64	480
	735	250MC	94.0	93.5	93.0	76.0	70.0	59.0	72.6	668	481	245	215	270	1.417	75.5	68	554
45	2960	225MA	95.0	94.5	94.0	91.0	90.0	86.0	72.0	736	145	150	125	255	0.297	3.53	80	373
	1475	225MC	95.0	95.0	94.5	85.0	81.0	72.5	77.1	642	291	200	175	250	0.495	16.7	69	387
	985	250MC	94.5	95.0	94.5	86.5	83.0	75.0	76.2	767	436	240	215	270	1.277	44.8	66	554
55	2960	250SA	95.0	94.5	94.0	89.5	88.0	87.0	91.5	705	177	150	130	250	0.387	4.32	78	470
	1480	250SC	95.5	95.0	94.5	87.0	84.0	77.0	93.7	700	355	230	200	260	0.978	20.3	71	528
	984	280SC	95.0	94.5	94.0	84.0	81.5	74.0	96	677	534	165	140	230	2.125	55.0	78	650
75	2960	250MA	95.5	95.5	95.0	91.0	88.0	85.0	119.0	693	242	140	130	250	0.454	5.60	78	548
	1480	250MC	95.5	95.5	95.0	87.0	84.0	77.0	125.0	648	484	220	180	240	1.123	26.8	72	574
	985	280MC	95.3	94.9	94.8	85.0	82.0	75.0	128.9	875	727	160	136	230	2.775	46.8	78	730
90	2960	280SA	95.5	95.0	94.0	88.5	87.0	81.0	148.1	739	290	130	110	230	0.725	6.88	85	650
	1480	280SC	95.7	95.2	94.2	86.5	83.6	77.0	151.3	734	581	160	136	230	2.025	33.0	82	700
	985	315SC	95.5	95.0	94.3	85.5	82.5	76.0	153.3	714	873	155	131	230	4.275	88.2	78	920
110	2960	280MA	95.8	95.3	94.0	89.2	87.5	81.0	179.1	731	355	120	102	230	0.850	8.08	85	700
	1482	280MC	96.0	95.5	94.4	87.5	84.0	77.5	182.2	719	709	155	131	230	2.350	39.0	82	850
	985	315MC	95.8	95	94.8	86.0	83.0	76.5	185.7	705	1067	150	127	220	4.975	105	78	1010
132	2976	315SA	96.1	95.6	94.3	89.5	87.8	82.0	213.5	721	424	115	98	220	1.325	9.13	85	840
	1482	315SC	96.2	95.6	94.8	88.0	84.5	78.5	217.1	709	851	150	127	220	3.050	44.0	82	940
	986	315MC	96.1	95.6	94.8	86.0	83.0	76.5	222.2	693	1279	150	127	220	5.675	120	78	1050
150	2976	315MA	96.1	95.6	94.5	90.0	89.0	83.0	241.3	725	481	110	94	220	1.500	10.5	85	920
	1485	315MC	96.3	95.8	94.8	88.0	84.5	79.0	246.2	711	965	150	127	220	3.550	50.5	82	930
185	2982	315MA	96.1	95.6	94.5	90.0	89.0	83.0	297.6	736	593	105	91	220	1.500	12.8	85	1000
	1486	315MB	96.3	95.8	94.8	88.5	85.0	79.5	302.0	725	1189	140	119	220	3.700	61.8	82	1100

- Notes:**
1. All figures are based on tests carried out on 415 Volt 3-Phase Motors.
 2. Test Method: AS1359.5, Method B.
 3. Tolerance: AS1359.101
 4. dB(A): Mean Sound Pressure Level on no load at 1 metre.
 5. Motor data 8 pole and slower speeds not listed available on request.
 6. Data subject to change without notice.

Typical Performance Data



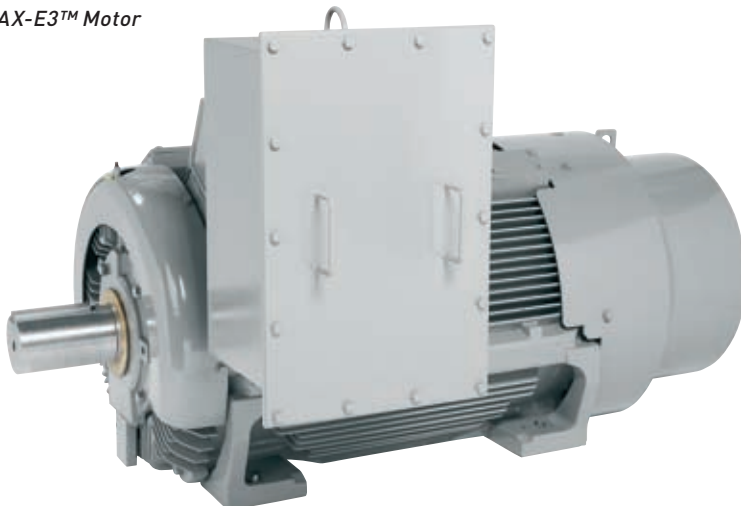
TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

AEJE High Efficiency Range MAX-E3™ 315 to 450 Frame (415V 50Hz)

Output kW	Full Load Speed RPM	Frame Size	Efficiency			Power Factor			Current		Torque				Rotor Inertia J=GD ² /4 Kg-m ²	Weight Foot Mount Kgs
			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	Pull Up %FLT	Break-Down %FLT		
150	985	315AB	96.2	95.3	94.8	87.0	85.0	78.0	249	697	1454	110	99	220	7.28	1400
185	985	315AB	95.5	95.0	93.5	87.0	85.0	79.0	312	673	1794	120	108	220	8.88	1660
	737	315CB	95.5	94.8	93.5	82.0	79.0	69.0	331	634	2397	110	99	220	11.73	1700
220	2970	315AA	96.0	95.5	94.0	90.5	90.0	86.0	358	726	707	90	90	240	2.23	1480
	1475	315AB	95.8	95.2	94.0	88.6	87.0	83.0	367	708	1424	100	95	240	5.85	1450
	985	315CB	95.6	95.2	94.2	87.4	85.0	78.0	373	697	2133	100	95	220	11.50	1800
260	2970	315CA	96.0	95.5	94.0	90.5	89.5	86.0	418	718	836	85	85	240	2.85	1580
	1480	315CB	96.0	95.5	94.0	88.6	87.0	83.0	427	703	1678	100	95	240	6.88	1660
	985	315DB	96.0	95.6	94.5	87.5	85.9	79.0	432	694	2521	90	90	220	12.93	1950
300	2975	315DA	96.3	95.8	94.5	91.2	90.0	87.0	473	740	963	85	85	240	3.35	1750
	1480	315CB	96.3	95.8	94.5	88.5	87.0	83.3	487	719	1936	110	99	240	7.60	1800
	985	355AB	96.0	95.6	94.5	87.5	86.0	80.0	494	709	2909	90	90	220	19.15	2200
335	2975	315DA	96.4	96.0	94.5	91.2	90.0	87.0	531	744	1075	85	85	240	3.90	1850
	1480	315DB	96.3	95.8	94.5	88.5	87.0	83.8	548	712	2162	100	95	240	8.63	1900
	987	355CB	96.0	95.6	94.5	88.0	86.0	80.0	553	736	3241	90	90	210	21.00	2600
370	2975	355AA	96.4	96.0	94.8	91.5	90.0	89.0	588	731	1188	85	85	240	4.73	2000
	1480	355AB	96.5	96.0	94.8	88.5	87.0	83.5	608	707	2388	100	95	230	12.13	2150
	987	400AB	96.3	95.8	94.8	87.5	86.0	80.0	616	698	3580	85	85	200	22.65	2800
450	2978	400CA	96.5	96.1	94.8	91.5	90.0	88.0	705	737	1443	80	80	240	7.70	3000
	1485	355CB	96.6	96.0	94.8	88.5	87.0	83.5	728	714	2894	95	95	230	13.45	2500
	987	400AB	96.3	95.8	94.8	87.5	86.0	80.0	739	704	4354	80	80	210	24.95	3000
520	2978	400CA	96.5	96.1	94.8	91.5	90.0	88.0	822	745	1668	80	80	240	8.73	3200
	1485	400AB	96.6	96.0	94.8	89.0	88.0	84.0	845	724	3344	80	80	230	22.01	2900
	987	400CB	96.3	95.8	94.8	88.0	86.0	80.0	857	664	5031	80	80	210	28.50	3400
600	2980	450AA	96.5	96.1	94.8	91.5	90.0	88.0	940	745	1923	80	80	240	15.75	4000
	1485	400CB	96.6	96.0	94.8	89.0	87.5	84.0	965	725	3859	80	80	230	25.00	3400
	987	450AB	96.5	95.0	94.8	89.0	86.0	80.0	978	716	5806	80	80	210	45.50	4000
670	1486	450AB	96.6	96.0	95.0	89.5	87.5	84.0	1080	731	4306	80	80	230	34.25	4100

- Notes:**
1. All figures are based on tests carried out on 415 Volt3-Phase Motors.
 2. Test Method: AS1359.5, Method B.
 3. Tolerance: AS1359.101
 4. dB(A): Mean Sound Pressure Level on no load at 1 metre.
 5. Motor data 8 pole and slower speeds not listed available on request.
 6. Data subject to change without notice.

AEJE MAX-E3™ Motor



TECO Cast Iron TEFC 3-Phase Squirrel Cage Induction Motors

Frame 63 - 132 Foot Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

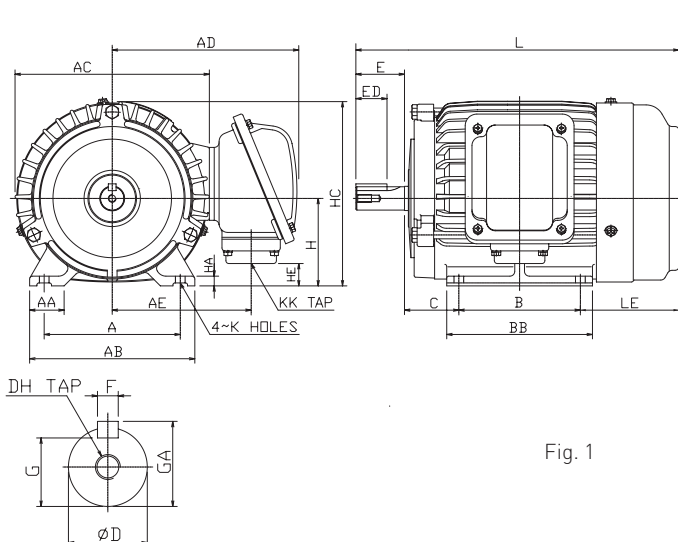


Fig. 1

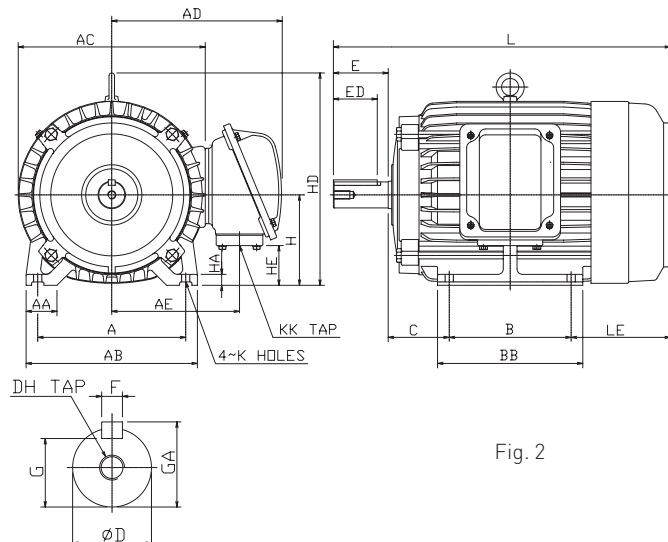


Fig. 2

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	2	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		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	M20 × P1.5	219	76	11	23	18	4	8.5	12.5	M4 × 8	6201ZZ	6201ZZ
71	35	7	M20 × P1.5	250.5	85.5	14	30	24	5	11	16	M5 × 10	6202ZZ	6202ZZ
80	13	10	M25 × P1.5	282.5	92.5	19	40	25	6	15.5	21.5	M6 × 12	6204ZZ	6204ZZ
90S	23	10	M25 × P1.5	307.5	101.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
90L	23	10	M25 × P1.5	332.5	101.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
100L	33	12	M25 × P1.5	374.5	111.5	28	60	40	8	24	31	M10 × 20	6206ZZ	6305ZZ
112M	45	12	M25 × P1.5	391.5	121.5	28	60	40	8	24	31	M10 × 20	6306ZZ	6306ZZ
132S	58	12	M40 × P1.5	454	145	38	80	64	10	33	41	M12 × 24	6308ZZ	6306ZZ
132M	58	12	M40 × P1.5	492	145	38	80	64	10	33	41	M12 × 24	6308ZZ	6306ZZ

- Notes: 1. Tolerance: Refer to page 33.
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 160 - 250 Foot Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

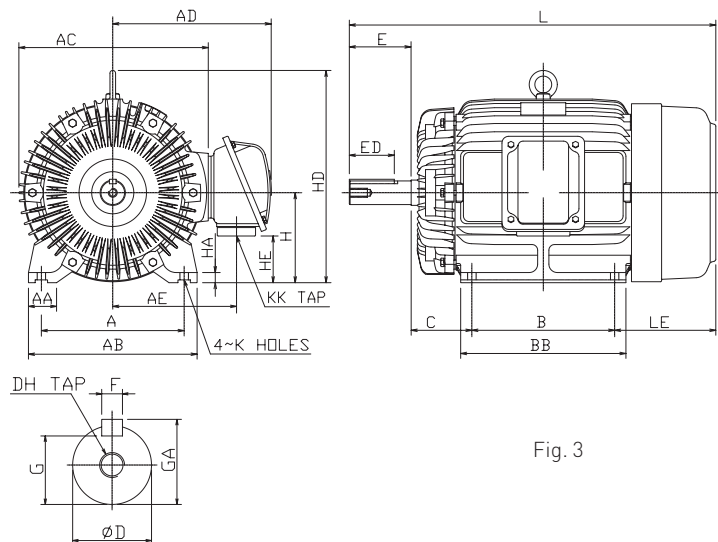


Fig. 3

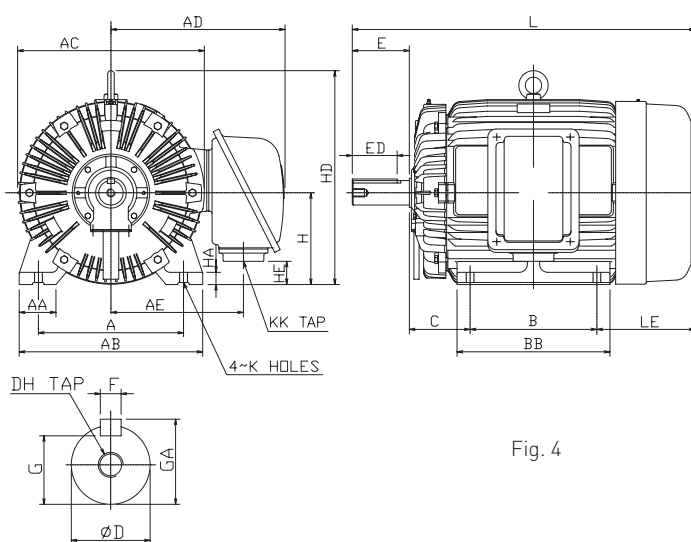


Fig. 4

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 / 15	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	421
-	18.5	-	-	180MC	3	279	75	355	382	312	250	241	297	121	180	20	421
-	22	15	11	180LC		279	75	355	382	312	250	279	335	121	180	20	421
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	575
-	55	37	30	250SC		406	100	500	510	493	375	311	385	168	250	36	575
75	-	-	-	250MA		406	100	500	510	493	375	349	425	168	250	36	575
-	75	45	37	250MC		406	100	500	510	493	375	349	425	168	250	36	575

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	6309ZZ	6307ZZ
160L	83	14.5	M40 × P1.5	652	180	42	110	80	12	37	45	M16 × 32	6309ZZ	6307ZZ
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	6311ZZ	6310ZZ
180LC	103	14.5	M40 × P1.5	710	200	48	110	80	14	42.5	51.5	M16 × 32	6311ZZ	6310ZZ
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	6312	6212
225SC	57	18.5	M50 × P1.5	816	241	60	140	110	18	53	64	M20 × 40	6313	6213
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	6313	6213
250SA	42	24	M63 × P1.5	882.5	263.5	60	140	110	18	53	64	M20 × 40	[6313C3]	[6213C3]
250SC	42	24	M63 × P1.5	882.5	263.5	70	140	110	20	62.5	74.5	M20 × 40	NU316	6313
250MA	42	24	M63 × P1.5	920.5	263.5	60	140	110	18	53	64	M20 × 40	[6313C3]	[6213C3]
250MC	42	24	M63 × P1.5	920.5	263.5	70	140	110	20	62.5	74.5	M20 × 40	NU316	6313

- Notes:
1. Tolerance: Refer to page 33.
 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 280 - 315 Foot Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

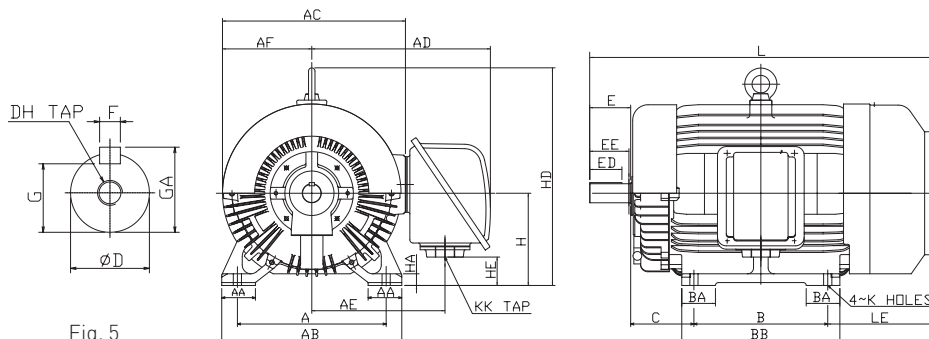


Fig. 5

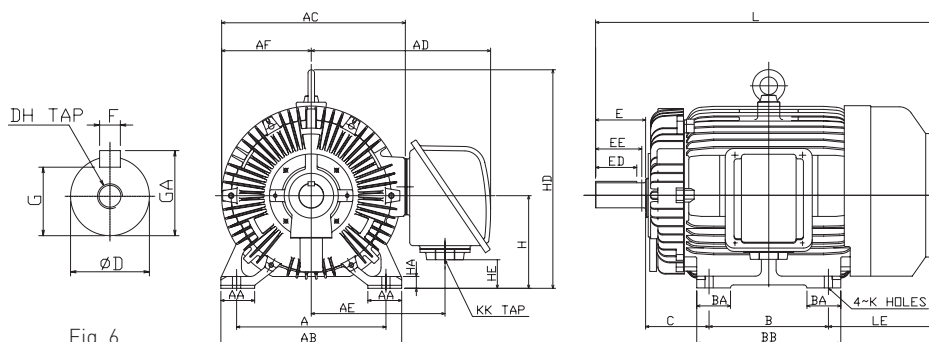


Fig. 6

Output (kW)				Frame Size	Fig. No.	Dimensions (mm)												
2P	4P	6P	8P			A	AA	AB	AC	AD	AE	AF	B	BA	BB	C	H	HA
90	-	-	-	280SA	5	457	110	560	625	610	455	305	368	110	445	190	280	36
-	90	55	45	280SC	6	457	110	560	625	610	455	305	368	110	445	190	280	36
110	-	-	-	280MA	5	457	110	560	625	610	455	305	419	130	495	190	280	36
-	110	75	55	280MC	6	457	110	560	625	610	455	305	419	130	495	190	280	36
132	-	-	-	315SA	5	508	115	615	625	610	455	305	406	115	490	216	315	40
-	132	90	75	315SC	6	508	115	615	625	610	455	305	406	115	490	216	315	40
150 / 185	-	-	-	315MA	5	508	115	615	625	610	455	305	457	115	540	216	315	40
-	150	110 / 132	90	315MC	6	508	115	615	625	610	455	305	457	115	540	216	315	40
-	185	-	-	315MB*	6	508	115	615	625	610	455	305	457	115	540	216	315	40

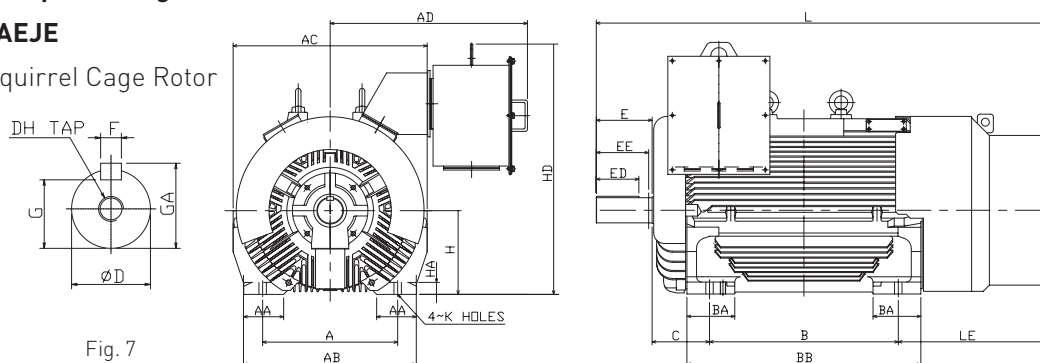
Frame Size							Shaft Extension								Bearings	
	HD	HE	K	KK	L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
280SA	710	91	24	M63 × P1.5	1042	344	65	140	110	134	18	58	69	M20 × 30	6314C3	6314C3
280SC	710	91	24	M63 × P1.5	1072	344	80	170	140	157	22	71	85	M20 × 30	NU318C3	6316
280MA	710	91	24	M63 × P1.5	1092	343	65	140	110	134	18	58	69	M20 × 30	6314C3	6314C3
280MC	710	91	24	M63 × P1.5	1122	343	80	170	140	157	22	71	85	M20 × 30	NU318C3	6316
315SA	743	126	28	M63 × P1.5	1131	369	65	140	110	134	18	58	69	M20 × 30	6314C3	6314C3
315SC	743	126	28	M63 × P1.5	1161	369	85	170	140	157	22	76	90	M20 × 30	NU320C3	6316
315MA	743	126	28	M63 × P1.5	1182	369	65	140	110	134	18	58	69	M20 × 30	6314C3	6314C3
315MC	743	126	28	M63 × P1.5	1212	369	85	170	140	157	22	76	90	M20 × 30	NU320C3	6316
315MB	743	126	28	M63 × P1.5	1212	369	85*	170	140	157	22	76	90	M20 × 30	NU320C3	6316

- Notes:
- * Also available with 95mm DIA shaft as MAX-E Mining spec, refer to TECO for detail.
 - Tolerance: Refer to page 33.
 - Usable Shaft Length: EE
 - 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 315 - 450 Foot Mount AEJE

Totally Enclosed Fan Cooled Squirrel Cage Rotor



Output (kW)				Frame Size	Fig. No.	Dimensions (mm)										
2P	4P	6P	8P			A	AA	AB	AC	AD	B	BA	BB	C	H	HA
220	-	-	-	315AA	7	508	150	650	730	846	560	180	730	216	315	45
-	220	150 / 185	110/132/150	315AB		508	150	650	730	846	560	180	730	216	315	45
260	-	-	-	315CA		508	150	650	730	846	710	180	880	216	315	45
-	260 / 300	220	185	315CB		508	150	650	730	846	710	180	880	216	315	45
300 / 335	-	-	-	315DA		508	150	650	730	846	910	180	1080	216	315	45
-	335	260	220	315DB		508	150	650	730	846	910	180	1080	216	315	45
370	-	-	-	355AA		610	150	750	810	959	710	210	930	254	355	45
-	370	300	260	355AB		610	150	750	810	959	710	210	930	254	355	45
-	450	335	300	355CB		610	150	750	810	959	900	210	1120	254	355	45
-	520	370 / 450	335	400AB		686	150	810	860	976	800	245	1060	280	400	40
450 / 520	-	-	-	400CA		686	150	810	860	976	1000	245	1260	280	400	40
-	600	520	370	400CB		686	150	810	860	976	1000	245	1260	280	400	40
600	-	-	-	450AA		750	180	890	986	1004	900	270	1230	315	450	50
-	670	600	450 / 520	450AB		750	180	890	986	1004	900	270	1230	315	450	50

Frame Size					Shaft Extension - Direct Drive								Bearings	
	HD	K	L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
315AA	1042	28	1601	685	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
315AB	1042	28	1496	550	95	170	140	157	25	86	100	M24 × 48	6320	6320
315CA	1042	28	1751	685	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
315CB	1042	28	1646	550	95	170	140	157	25	86	100	M24 × 48	6320	6320
315DA	1042	28	1951	685	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
315DB	1042	28	1846	550	95	170	140	157	25	86	100	M24 × 48	6320	6320
355AA	1227	28	1854	750	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
355AB	1227	28	1699	565	95	170	140	157	25	86	100	M24 × 48	6322	6320
355CB	1227	28	1889	565	95	170	140	157	25	86	100	M24 × 48	6322	6320
400AB	1278	35	1910	620	110	210	160	197	28	100	116	M24 × 48	6324	6320
400CA	1278	35	2200	780	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
400CB	1278	35	2110	620	110	210	160	197	28	100	116	M24 × 48	6324	6320
450AA	1348	35	2240	885	70	140	110	134	20	62.5	74.5	M20 × 40	6315C3	6315C3
450AB*	1348	35	2220	795	110	210	160	197	28	100	116	M24 × 48	6324	6322
450AB**	1348	35	2125	700	110	210	160	197	28	100	116	M24 × 48	6324	6322

Frame Size	Output (kW)						Shaft Extension Belt Drive - Max-E Mining						Bearings	
	4P	6P	L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
315AC	220	150 / 185	1536	550	110	210	160	197	28	100	116	M24 × 48	NU324C3	6320
315CC	250	-	1686	550	110	210	160	197	28	100	116	M24 × 48	NU324C3	6320
315CC	300	220	1686	550	125	210	160	197	32	114	132	M24 × 48	NU326C3	6320
315DC	-	260	1886	550	125	210	160	197	32	114	132	M24 × 48	NU326C3	6320
355AC	375	315	1789	615	125	210	160	197	32	114	132	M24 × 48	NU326C3	6322

Notes: 1. Tolerance: Refer to page 33
 2. Usable Shaft Length: EE
 3. L and LE dimensions differ on 450AB frame for (4 pole*) (6 and 8 pole**).

4. Fitted with undrilled blank gland plate.
 5. Data subject to change without notice and should not be used for installation purposes.

TECO Cast Iron TEFC 3-Phase Squirrel Induction Motors

Frame 63 - 132 Flange Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

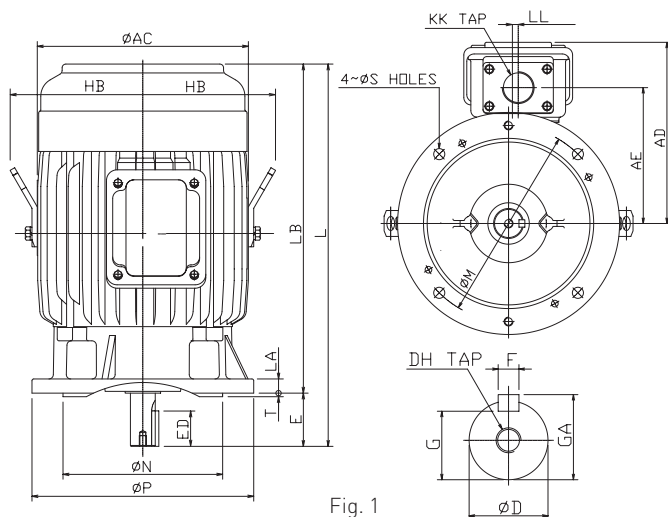


Fig. 1

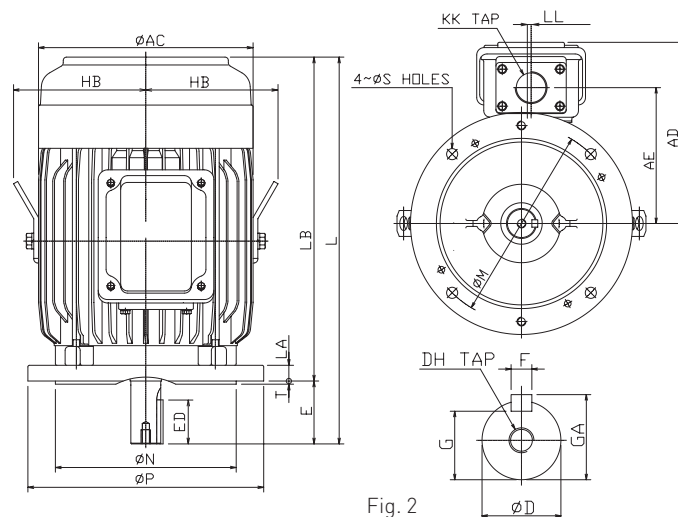


Fig. 2

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	138	100	-	M20 × P1.5	225	12	235	0	115	95	140	
0.37 / 0.55	0.37	0.18	-	71		162	148	110	-	M20 × P1.5	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	-	M25 × P1.5	280	12	240	15	165	130	200	
1.5	1.1	0.75	0.37	90S	1	200	192	143	-	M25 × P1.5	347	12	297	15	165	130	200	
2.2	1.5	1.1	0.55	90L		200	192	143	-	M25 × P1.5	372	12	322	15	165	130	200	
3	2.2 / 3	1.5	0.75 / 1.1	100L	2	219	202	153	140	M25 × P1.5	375	16	315	15	215	180	250	
4	4	2.2	1.5	112M	1	238	211	162	150	M25 × P1.5	431	16	371	15	215	180	250	
5.5 / 7.5	5.5	3	2.2	132S	2	273	249	187	169	M40 × P1.5	454	20	374	13	265	230	300	
-	7.5	4 / 5.5	3	132M		273	249	187	169	M40 × P1.5	484	20	404	13	265	230	300	

Frame Size	Flange		Shaft Extension								Bearings	
	S	T	Q	D	E	ED	F	G	GA	DH	DE	NDE
63	10	3	45	11	23	18	4	8.5	12.5	M4 × 8	6201ZZ	6201ZZ
71	10	3.5	45	14	30	24	5	11	16	M5 × 10	6202ZZ	6202ZZ
80	12	3.5	45	19	40	25	6	15.5	21.5	M6 × 12	6204ZZ	6204ZZ
90S	12	3.5	45	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
90L	12	3.5	45	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
100L	14.5	4	45	28	60	40	8	24	31	M10 × 20	6206ZZ	6305ZZ
112M	14.5	4	45	28	60	40	8	24	31	M10 × 20	6306ZZ	6306ZZ
132S	14.5	4	40	38	80	56	10	33	41	M12 × 24	6308ZZ	6306ZZ
132M	14.5	4	40	38	80	56	10	33	41	M12 × 24	6308ZZ	6306ZZ

- Notes:
1. Tolerance: Refer to page 33.
 2. Lifting lugs not provided on frames D90 and smaller.
 3. Data subject to change without notice and should not be used for installation purposes.

TECO Cast Iron TEFC 3-Phase Squirrel Induction Motors

Frame 160 - 250 Flange Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

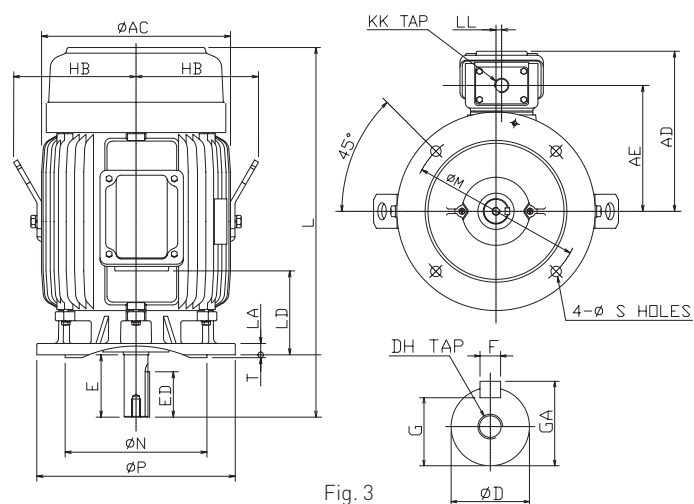


Fig. 3

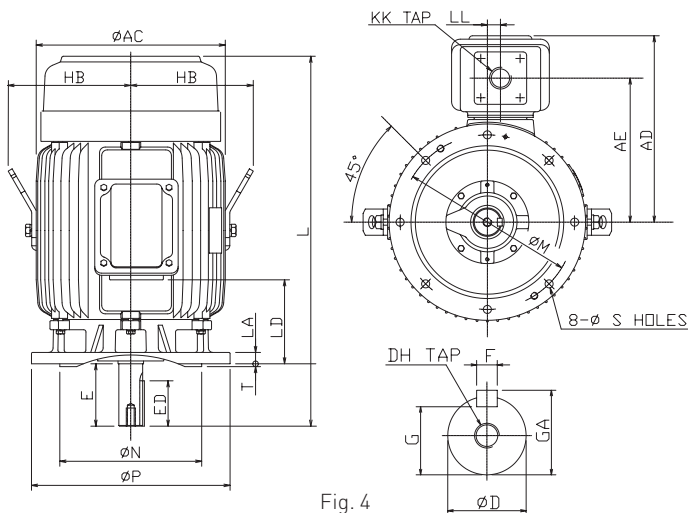


Fig. 4

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 33.
 2. Data subject to change without notice and should not be used for installation purposes.

TECO Cast Iron TEFC 3-Phase Squirrel Induction Motors

Frame 63 - 200 Foot and Flange Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

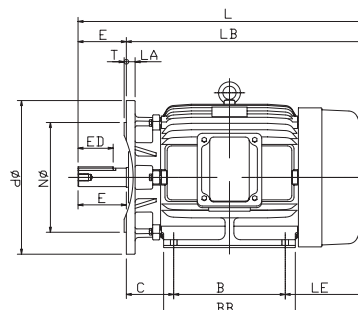
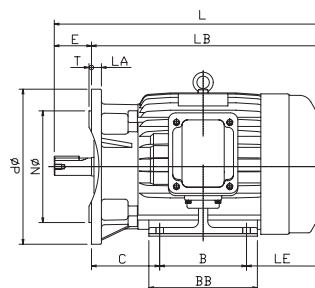
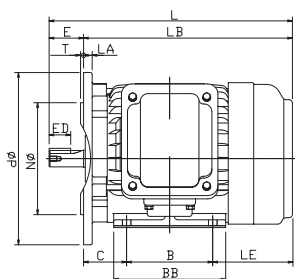
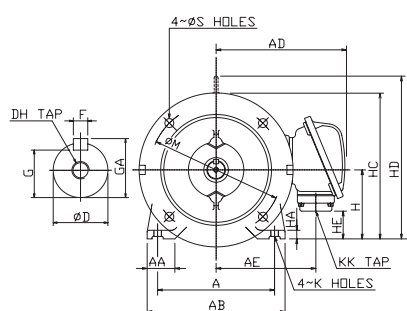


Fig. 1

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 × P1.5
0.37 / 0.55	0.37	0.18	-	71		112	35.5	140	148	110	90	115	72	71	8	152	-	35	7	M20 × P1.5
0.75 / 1.1	0.55 / 0.75	0.37 / 0.55	0.18	80	1	125	35.5	155	179	130	100	130	50	80	9	180	-	13	10	M25 × P1.5
1.5	1.1	0.75	0.37	90S	2	140	35.5	170	192	143	100	130	95	90	10	190	-	23	10	M25 × P1.5
2.2	1.5	1.1	0.55	90L		140	35.5	170	192	143	125	150	95	90	10	190	-	23	10	M25 × P1.5
3	2.2 / 3	1.5	0.75 / 1.1	100L	2	160	45	195	202	153	140	175	103	100	12.5	-	243	33	12	M25 × P1.5
4	4	2.2	1.5	112M		190	45	224	211	162	140	175	110	112	14	-	265	45	12	M25 × P1.5
5.5 / 7.5	5.5	3	2.2	132S	2	216	45	250	249	187	140	175	139	132	16	-	310	58	12	M40 × P1.5
-	7.5	4 / 5.5	3	132M		216	45	250	249	187	178	212	139	132	16	-	310	58	12	M40 × P1.5
11 / 15	11	7.5	4 / 5.5	160M	3	254	50	300	287	225	210	250	108	160	18	-	377	83	14.5	M40 × P1.5
18.5	15	11	7.5	160L		254	50	300	287	225	254	300	108	160	18	-	377	83	14.5	M40 × P1.5
22	-	-	-	180MA	3	279	75	355	312	250	241	297	121	180	20	-	421	103	14.5	M40 × P1.5
-	18.5	-	-	180MC		279	75	355	312	250	241	297	121	180	20	-	421	103	14.5	M40 x P1.5
-	22	15	11	180LC	3	279	75	355	312	250	279	335	121	180	20	-	421	103	14.5	M40 × P1.5
30/37	-	-	-	200LA		318	80	400	374	287	305	365	133	200	25	-	469	88	18.5	M50 × P1.5
-	30	18.5 / 22	15	200LC		318	80	400	374	287	305	365	133	200	25	-	469	88	18.5	M50 × 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	76	248	115	95	140	10	3	11	23	10	4	8.5	12.5	M4 × 8	6201ZZ	6201ZZ
71	12	86	278	130	110	160	10	3.5	14	30	14	5	11	16	M5 × 10	6202ZZ	6202ZZ
80	12	92.5	282.5	165	130	200	12	3.5	19	40	25	6	15.5	21.5	M6 × 12	6204ZZ	6204ZZ
90S	12	101.5	346.5	165	130	200	12	3.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
90L	12	101.5	371.5	165	130	200	12	3.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
100L	16	112	414.5	215	180	250	14.5	4	28	60	40	8	24	31	M10 × 20	6206ZZ	6305ZZ
112M	16	121.5	431.5	215	180	250	14.5	4	28	60	40	8	24	31	M10 × 20	6306ZZ	6306ZZ
132S	20	145	504	265	230	300	14.5	4	38	80	56	10	33	41	M12 × 24	6308ZZ	6306ZZ
132M	20	145	542	265	230	300	14.5	4	38	80	56	10	33	41	M12 × 24	6308ZZ	6306ZZ
160M	20	180	608	300	250	350	18.5	5	42	110	80	12	37	45	M16 × 32	6309ZZ	6307ZZ
160L	20	180	652	300	250	350	18.5	5	42	110	80	12	37	45	M16 × 32	6309ZZ	6307ZZ
180MA	20	200	672	300	250	350	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	[6211C3]	[6211C3]
180MC	20	200	672	300	250	350	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	6311ZZ	6310ZZ
180LC	20	200	710	300	250	350	18.5	5	48	110	80	14	42.5	51.5	M16 × 32	6311ZZ	6310ZZ
200LA	20	222	770	350	300	400	18.5	5	55	110	80	16	49	59	M20 × 40	[6312C3]	[6212C3]
200LC	20	222	770	350	300	400	18.5	5	55	160	80	16	49	59	M20 × 40	6312C3	6313C3

- Notes:
1. Tolerance: Refer to page 33.
 2. Lifting lugs not provided on frames D90 and smaller.
 3. Data subject to change without notice and should not be used for installation purposes.

TECO Cast Iron TEFC 3-Phase Squirrel Induction Motors

Frame 225 - 315 Foot and Flange Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

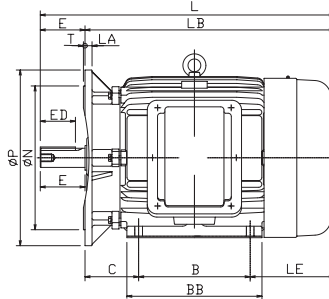
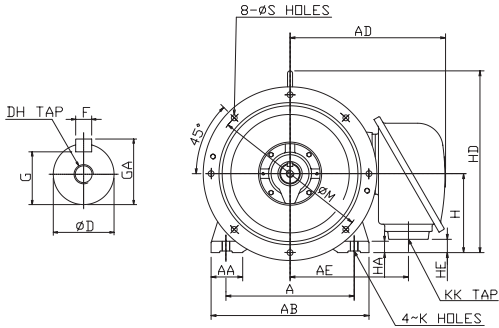


Fig. 4

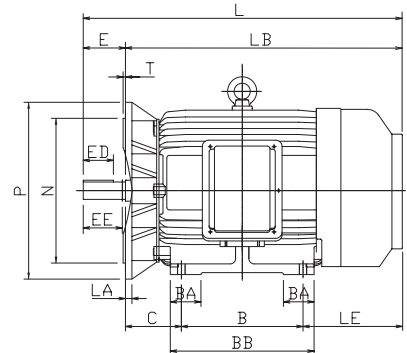


Fig. 5

Output (kW)				Frame Size	Fig. No.	Dimensions (mm)														
2P	4P	6P	8P			A	AA	AB	AD	AE	B	BA	BB	C	H	HA	HD	HE	K	KK
-	37	-	18.5	225SC	4	356	90	450	427	330	286	-	350	149	225	30	524	57	18.5	M50 × P1.5
45	-	-	-	225MA		356	90	450	427	330	311	-	375	149	225	30	524	57	18.5	M50 × P1.5
-	45	30	22	225MC		356	90	450	427	330	311	-	375	149	225	30	524	57	18.5	M50 × P1.5
55	-	-	-	250SA		406	100	500	493	375	311	-	385	168	250	36	575	42	24	M63 × P1.5
-	55	37	30	250SC		406	100	500	493	375	311	-	385	168	250	36	575	42	24	M63 × P1.5
75	-	-	-	250MA		406	100	500	493	375	349	-	425	168	250	36	575	42	24	M63 × P1.5
-	75	45	37	250MC		406	100	500	493	375	349	-	425	168	250	36	575	42	24	M63 × P1.5
90	-	-	-	280SA		5	457	110	560	610	405	368	110	445	190	280	36	710	106	24
-	90	55	45	280SC	457		110	560	610	405	368	110	445	190	280	36	710	106	24	M63 × P1.5
110	-	-	-	280MA	457		110	560	610	405	419	110	495	190	280	36	710	106	24	M63 × P1.5
-	110	75	55	280MC	457		110	560	610	405	419	110	495	190	280	36	710	106	24	M63 × P1.5
132	-	-	-	315SA	508		115	615	610	430	406	115	490	216	315	40	743	136	28	M63 × P1.5
-	132	90	75	315SC	508		115	615	610	430	406	115	490	216	315	40	743	136	28	M63 × P1.5
150 / 185	-	-	-	315MA	508		115	615	610	430	457	115	540	216	315	40	743	136	28	M63 × P1.5
-	150	110 / 132	90	315MC	508		115	615	610	430	457	115	540	216	315	40	743	136	28	M63 × P1.5
-	185	-	-	315MB	508	115	615	610	430	457	115	540	216	315	40	743	136	28	M63 × P1.5	

Frame Size				Flange					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	18.5	5	60	140	110	-	18	53	64	M20 × 40	6313	6213
225MA	22	241	811	400	350	450	18.5	5	55	110	80	-	16	49	59	M20 × 40	6312C3	6212C3
225MC	22	241	841	400	350	450	18.5	5	60	140	110	-	18	53	64	M20 × 40	6313	6213
250SA	22	263.5	882.5	500	450	550	18.5	5	60	140	110	-	18	53	64	M20 × 40	6313C3	6213C3
250SC	22	263.5	882.5	500	450	550	18.5	5	70	140	110	-	20	62.5	74.5	M20 × 40	NU316	6313
250MA	22	263.5	920.5	500	450	550	18.5	5	60	140	110	-	18	53	64	M20 × 40	6313C3	6213C3
250MC	22	263.5	920.5	500	450	550	18.5	5	70	140	110	-	20	62.5	74.5	M20 × 40	NU316	6313
280SA	22	344	1042	500	450	550	18.5	5	65	140	110	134	18	58	69	M20 × 40	6314C3	6314C3
280SC	22	344	1072	500	450	550	18.5	5	80	170	140	157	22	71	85	M20 × 40	NU318	6316
280MA	22	344	1092	500	450	550	18.5	5	65	140	110	134	18	58	69	M20 × 40	6314C3	6314C3
280MC	22	344	1122	500	450	550	18.5	5	80	170	140	157	22	71	85	M20 × 40	NU318	6316
315SA	25	369	1131	600	550	660	24	6	65	140	110	134	18	58	69	M20 × 40	6314C3	6314C3
315SC	25	369	1161	600	550	660	24	6	85	170	140	157	22	76	90	M20 × 40	NU320	6316
315MA	25	369	1182	600	550	660	24	6	65	140	110	134	18	58	69	M20 × 40	6314C3	6314C3
315MC	25	369	1212	600	550	660	24	6	85	170	140	157	22	76	90	M20 × 40	NU320	6316
315MB	25	369	1212	600	550	660	24	6	85	140	140	157	22	76	90	M20 × 40	NU320	6316

Notes: 1. Tolerance: Refer to page 33.
2. Usable Shaft length: EE
3. Data subject to change without notice and should not be used for installation purposes.

TECO Cast Iron TEFC 3-Phase Squirrel Induction Motors

Frame 63 - 132 Foot and C Face Mount

Totally Enclosed Fan Cooled Squirrel Cage Rotor

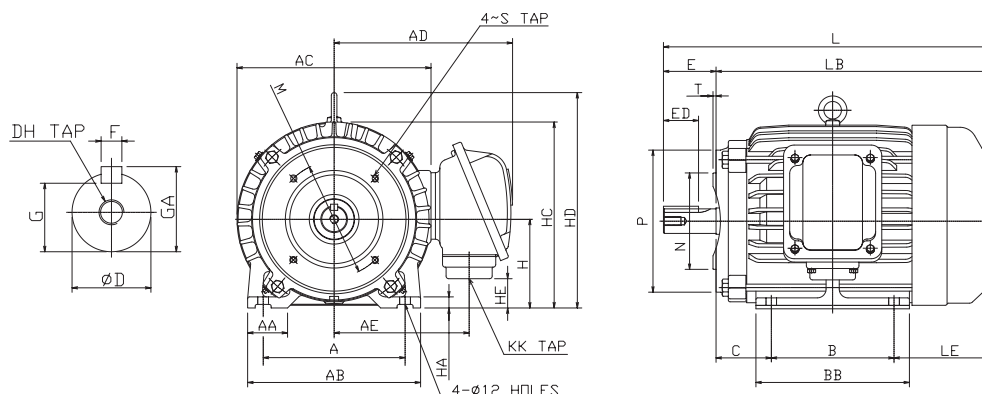


Fig. 1

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	HE	K	KK
0.18	0.18	-	-	63	1	100	28	120	144	123	97	80	100	40	63	8	135	-	10	7	M20 × P1.5
0.37 / 0.55	0.37	0.18	-	71		112	35.5	140	162	133	107	90	115	45	71	8	152	-	35	7	M20 × P1.5
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	M25 × P1.5
1.5	1.1	0.75	0.37	90S		140	35.5	170	200	192	143	100	130	56	90	10	190	-	23	10	M25 × P1.5
2.2	1.5	1.1	0.55	90L		140	35.5	170	200	192	143	125	150	56	90	10	190	-	23	10	M25 × P1.5
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	M25 × P1.5
4	4	2.2	1.5	112M		190	45	224	238	211	162	140	175	70	112	14	-	265	45	12	M25 × P1.5
5.5 / 7.5	5.5	3	2.2	132S		216	45	250	273	249	187	140	175	89	132	16	-	310	58	12	M40 × P1.5
-	7.5	4 / 5.5	3	132M		216	45	250	273	249	187	178	212	89	132	16	-	310	58	12	M40 × 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	105	248	75	60	90	M5	3	11	23	18	4	8.5	12.5	M4 × 8	6201ZZ	6201ZZ
71	12	112	277	85	70	105	M6	3.5	14	30	24	5	11	16	M5 × 10	6202ZZ	6202ZZ
80	12	92	282	100	80	120	M6	3.5	19	40	25	6	15.5	21.5	M6 × 12	6204ZZ	6204ZZ
90S	12	140	346	115	95	140	M8	3.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
90L	12	140	371	115	95	140	M8	3.5	24	50	32	8	20	27	M8 × 16	6205ZZ	6205ZZ
100L	16	111	374	130	110	160	M8	4	28	60	40	8	24	31	M10 × 20	6206ZZ	6305ZZ
112M	16	161	431	130	110	160	M8	4	28	60	40	8	24	31	M10 × 20	6306ZZ	6306ZZ
132S	20	145	454	165	130	200	M10	4	38	80	64	10	33	41	M12 × 24	6308ZZ	6306ZZ
132M	20	145	492	165	130	200	M10	4	38	80	64	10	33	41	M12 × 24	6308ZZ	6306ZZ

- Notes:
1. Tolerance: Refer to page 33.
 2. Lifting lugs not provided on frames D90 and smaller.
 3. Data subject to change without notice and should not be used for installation purposes.

Mechanical Design



Axial / Radial Loadings

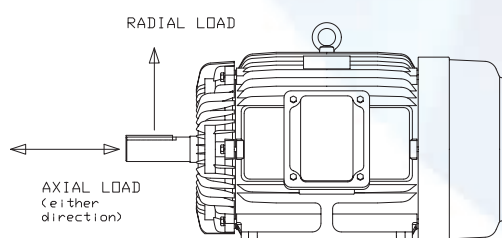
The table below gives the permissible axial and radial loads. The values are based on normal conditions at 50 Hz and a calculated L10 bearing life of 40,000 hours.

Frame Size	Radial Load Horizontal Shaft	Axial Load Horizontal Shaft	Axial Load Shaft Down (down thrust)	Axial Load Shaft Down (up thrust)
71	28 kg	40 kg	37 kg	43 kg
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	600 kg	310 kg	190 kg	430 kg
280	660 kg	420 kg	260 kg	690 kg
315M	730 kg	400 kg	180 kg	760 kg

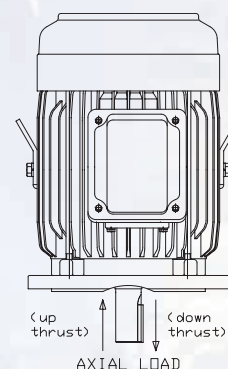
Notes:

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

Axial Radial Loadings - Foot



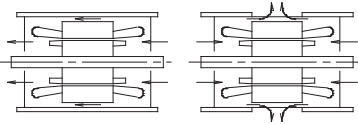
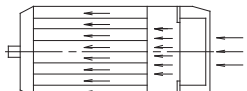
Axial Radial Loadings - Flange



Cooling

Designation System Concerning Methods of Cooling Refers to Standard AS1359.106.

Standard Code Example

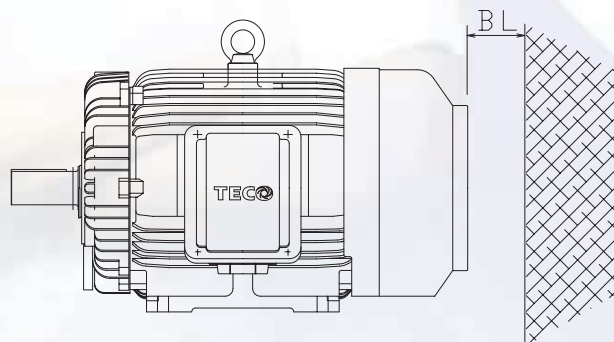
Code	Description	Type
IC 01	Self-cooling open machine.	
IC411	Enclosed machine. Smooth or finned ventilated casing. External shaft-mounted fan.	
IC416	Enclosed machine. Smooth or finned ventilated casing. External motorized axial fan supplied with machine.	

Example

Code	IC	4	(A)	1	(A)	6
International Cooling						
Circuit Arrangement						
Primary Coolant						
Method of Movement of Primary Coolant						
Secondary Coolant						
Method of Movement of Secondary Coolant						

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 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



Force Cooling IC416

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

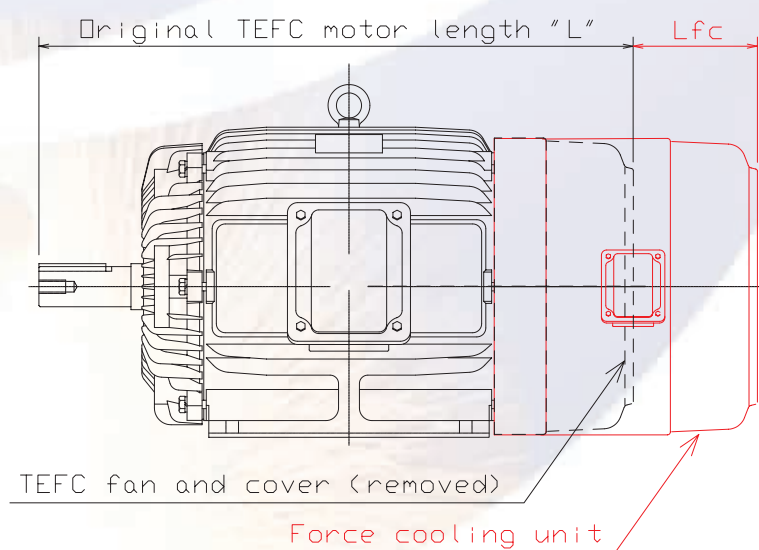
Frame Size	Motor Watts	Amps	Force Cooling Unit length "Lfc" in mm
D80	17	0.1	95
D90	29	0.12	95
D100	29	0.12	90
D112	46	0.22	105
D132	46	0.22	85
D160	75	0.42	140
D180	75	0.42	135
D200	135	0.59	95

Notes: 1. Dimensions subject to change.

*Typical Force Cooling Unit.
View from the inside.*

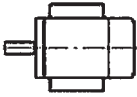
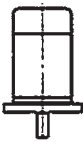
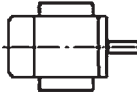
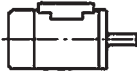
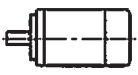
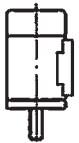
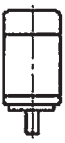
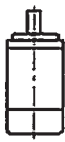


Force Cooling Lfc



Mounting (IM code)

Mounting Arrangement (IM)

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

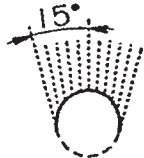
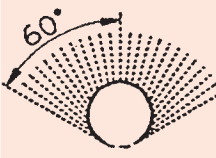
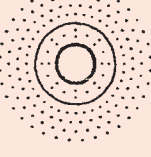
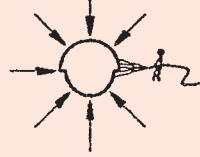
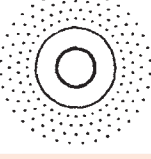
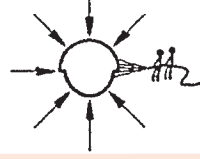
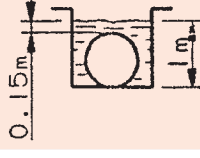
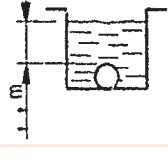
It is important to nominate the "IM" code at enquiry and order stage to ensure that drain holes are in the correct position and bearing arrangement is checked for suitability if the "IM" code differs from standard.

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

Protection (IP code)

Protection (IP)

First number: Protection against solid objects			Second number: Protection against liquids		
IP	Tests	Definition	IP	Tests	Definition
0		No protection.	0		No protection.
1		Protected against solid objects of over 50mm (e.g. accidental hand contact).	1		Protected against vertically dripping water (condensation).
2		Protected against solid objects of over 12mm (e.g. finger).	2		Protected against water dripping up to 15° from the vertical.
3		Protected against solid objects of over 2.5mm (e.g. tools, wire).	3		Protected against rain falling at up to 60° from the vertical.
4		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		Protected against effects of immersion to depths of between 0.15 and 1m.
			8		Protected against the effects of prolonged immersion at depth.

Electrical Design



Altitude and Ambient Temperature

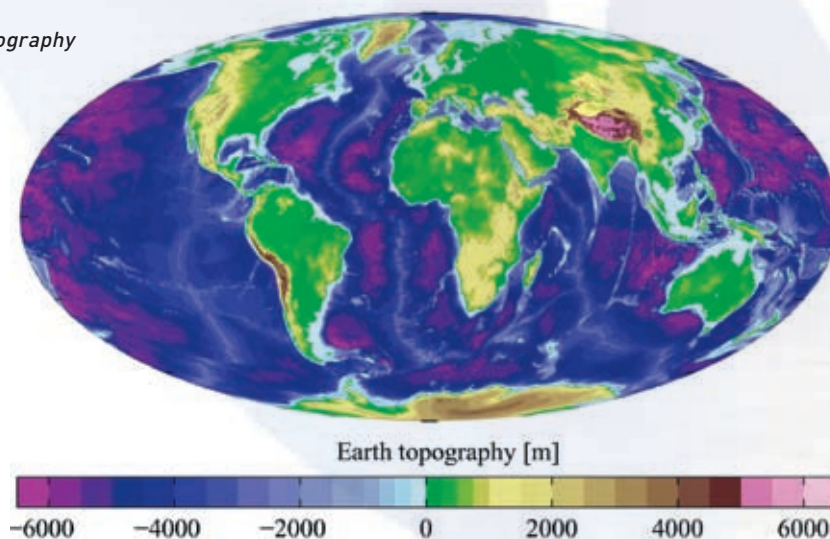
Rated output power specified in the performance data tables apply for standard ambient conditions of 40°C up to 1000 m above sea level. Where temperature or altitude differ from the standard, multiplication factors in the table below should be used if motor temperature rise is to be maintained.

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	0.97	2500 m	0.92
50°C	0.93	3000 m	0.89
55°C	0.9	3500 m	0.865
60°C	0.865	4000 m	0.835

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, please refer to TECO.

Earth Topography



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 space heater leads are normally terminated to an auxiliary terminal box for safety reasons.

The normal supply of space heaters is single phase 240V, other voltages can be supplied on request.

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 ~ 400	250
450	300

Connection Diagrams

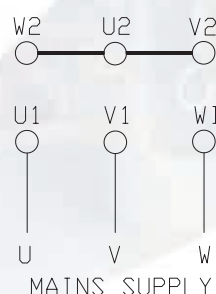
TECO motors are connected as shown on the motor nameplate, typical Star or Delta connection diagram is shown below.

TECO stock motors 4 kW and below are 380~415 Volt 50 Hz STAR connected and may

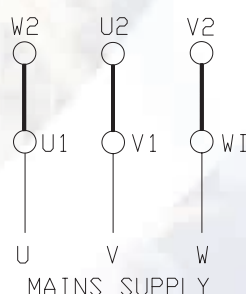
also be reconnected to 240 Volt 3-Phase 50 Hz DELTA configuration for use with single phase input inverters.

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

STAR CONNECTION



DELTA CONNECTION



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).

- 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 greenhouse gas emissions in Australia, contributing approximately 70% of the nation's total emissions. Electric motors account for around 30 per cent of Australian electricity use.

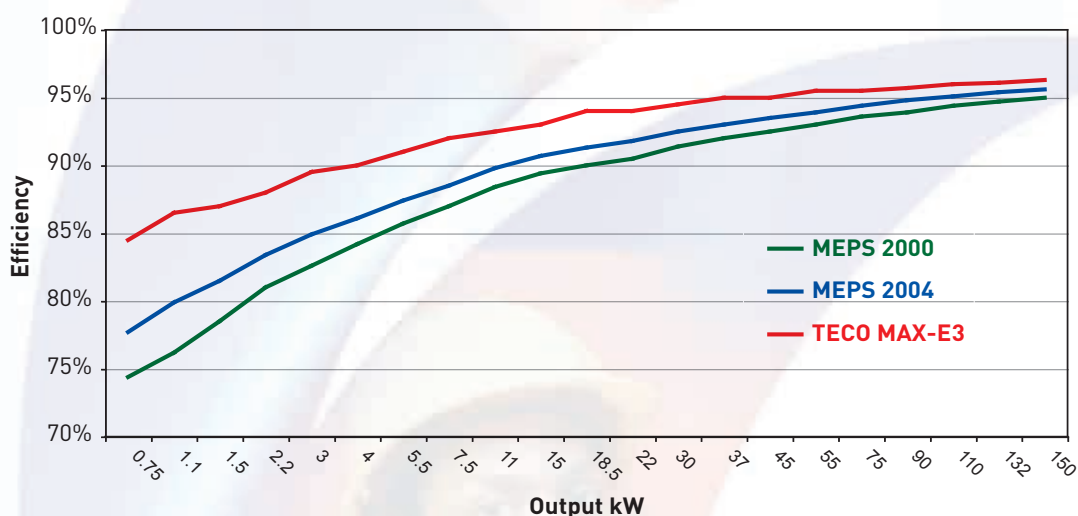
TECO is committed to produce high efficiency motors in order to reduce the energy consumed and in turn reduce greenhouse gas emissions.

Many standard TECO motors meet the High

Efficiency level of MEPS 2004 as standard and TECO can provide the full range of **MAX-E3™ High Efficiency** motors when required.

Minimum Efficiency Performance Standard AS1359.5 (MEPS) was first introduced in 2000, then revised to meet world's best practice in 2004 and became mandatory in 2006. The graph below shows the improvement in efficiencies and the level of **TECO MAX-E3™ High Efficiency** motors.

Efficiency Comparison Table



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)

C = Energy cost per kW/hr = \$ 0.10

N = Running time in hrs/year = 8760 hrs

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

E2 = Efficiency of TECO MAX-E3™ motor = 95.5%

Calculation Example:

$$S = 75 \times 8760 \times 0.10 \times (100/93.6 - 100/95.5) = \$ 1397 \text{ Operational cost saving per year}$$

Cost saving on the environment?

Based on current electric motor pricing at the time of printing this publication the cost difference between a standard efficiency motor and a high efficiency motor is \$480, therefore, within 4 months the savings received has paid for the cost difference between the standard and high efficiency, every hour thereafter the motor will continue to save you money.

Name Plate MAX-E3™

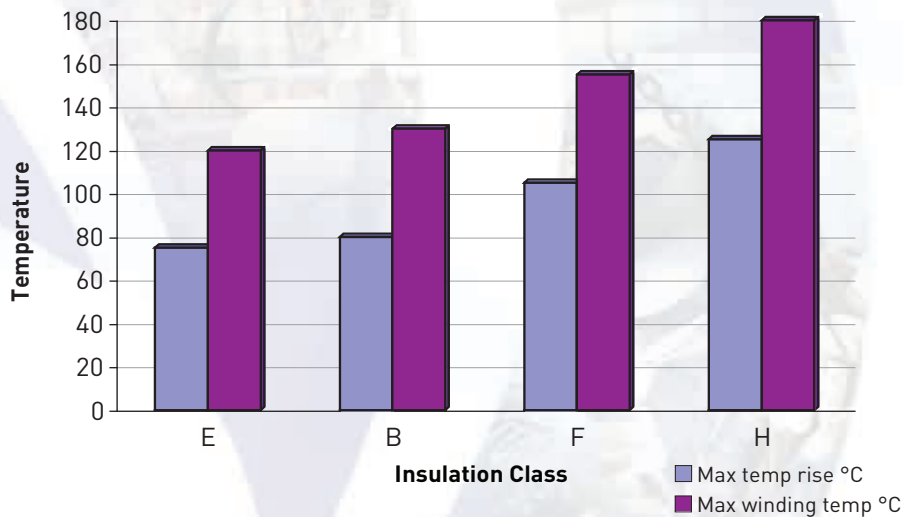
TECO		MAX-E3™ HIGH EFFICIENCY	
		3-PHASE INDUCTION MOTOR	
CODE	POLE	FRAME SIZE	EFF.
HP	Δ	Δ	Δ
kW	V	V	V
Hz	A	A	A
RPM	W2	U2	V2
INS.	U1	V1	W1
AMB °C	W2	U2	V2
CONT. RATING	U1	V1	W1
BRG.	AS1359/BS4999		IP
SER.NO.	WT.		KG
TECO Elec. & Mach. Co., Ltd.			

Insulation Classes

The graph below indicates the limits of winding temperature and temperature rise for the various insulation classes in accordance with AS1359.101 Items 1b) & 1d) AC motors.

The difference between the temperature rise and the insulation class rating equates to the safety margin available.

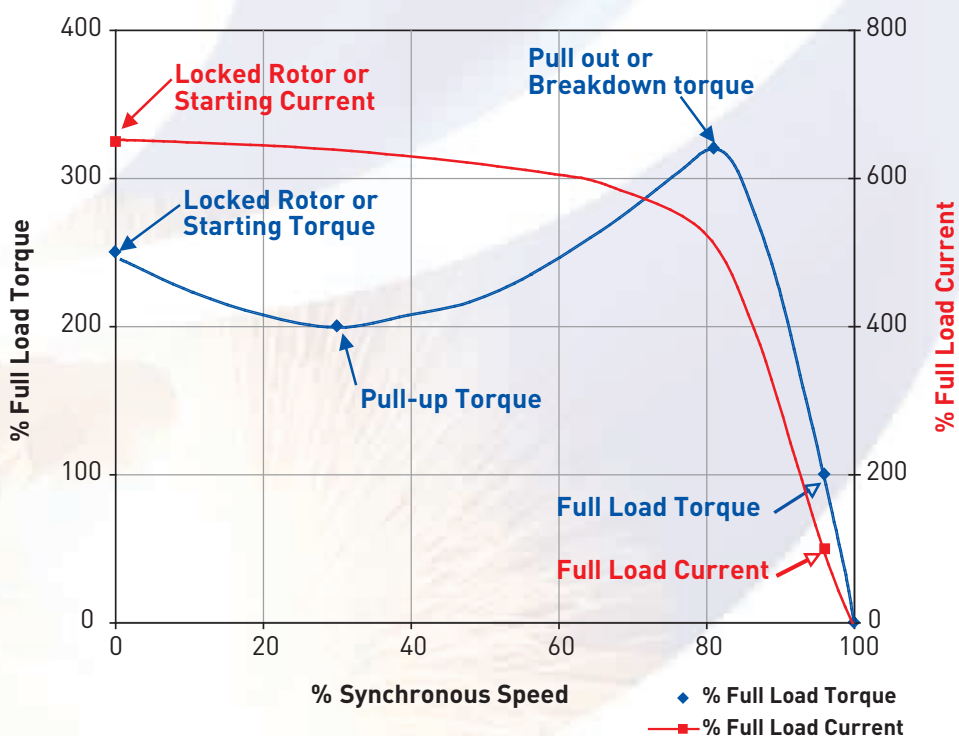
The majority of TECO motors comply with a limitation of Class E temperature rise (75°C) or less thereby providing a minimum of an additional 5°C that can be added to the safety margin, which provides the client with a motor that will perform extremely well in arduous temperature applications whether this be 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					
	63 - 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	
0.18	0.087	0.022	0.410	0.103	0.700	0.175	2.17	0.543
0.37	0.169	0.042	0.791	0.198	1.350	0.338	4.18	1.04
0.55	0.248	0.062	1.16	0.291	1.99	0.498	6.14	1.54
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.

The various types of thermal protection devices are described as 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.

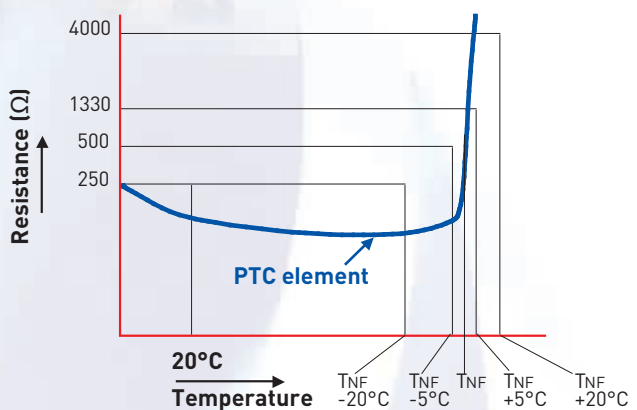
Thermistors

Thermistors, 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 have a trip temperature of 140°C @ 1000 ohms (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

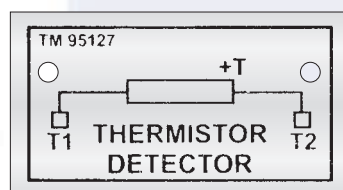


Connection Lead Colour Coding

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

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

Typical Thermistor Nameplates



Resistance Temperature Detectors (RTDs)

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).

- 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 and is mounted within a bearing thermowell.

"3 wire" RTD circuit

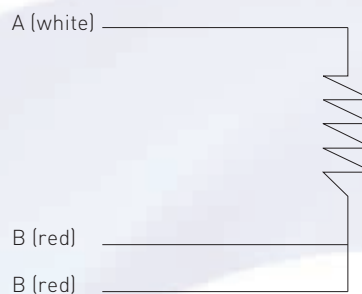


Table for Platinum Resistance Elements (Resistance in Ohms vs. Temperature) e.g. 19°C = 107.40 Ohms

°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

Recommend Temperature Settings for RTDs

Device	Type	Location	Alarm	Trip
RTD	Platinum 100 Ohms @ 0°C	Winding	140°C	150°C
RTD	Platinum 100 Ohms @ 0°C	DE & NDE Bearing	90°C	95°C

Tolerances for Electromechanical Characteristics



AS1359.101 Specifies Standard Tolerances for Electromechanical Characteristics (Squirrel Cage Induction Motors)

Quantity	Tolerance
Efficiency $P \leq 50$ kW	-15% (1- η)
Efficiency $P > 50$ kW	-10% (1- η)
Power factor (Cos ϕ)	-1/6 (1-cos ϕ) min. 0.02, max. 0.07
Slip $P < 1$ kW	$\pm 30\%$
Slip $P \geq 1$ kW	$\pm 20\%$
Starting torque	-15%, +25% of guaranteed torque
Starting current	-15%, +25% of guaranteed current
Pull-up torque	-15% of rated torque
Break down torque	-10% of rated torque >1.5 full load torque

AS1359.10 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	h8	+ 0
		- 0.054
130 & 180	h8	+ 0
		- 0.063
230 & 250	h8	+ 0
		- 0.072
300	h8	+ 0
		- 0.081
350	h8	+ 0
		- 0.089
450	h8	+ 0
		- 0.097
550	h8	+ 0
		- 0.110

C Face

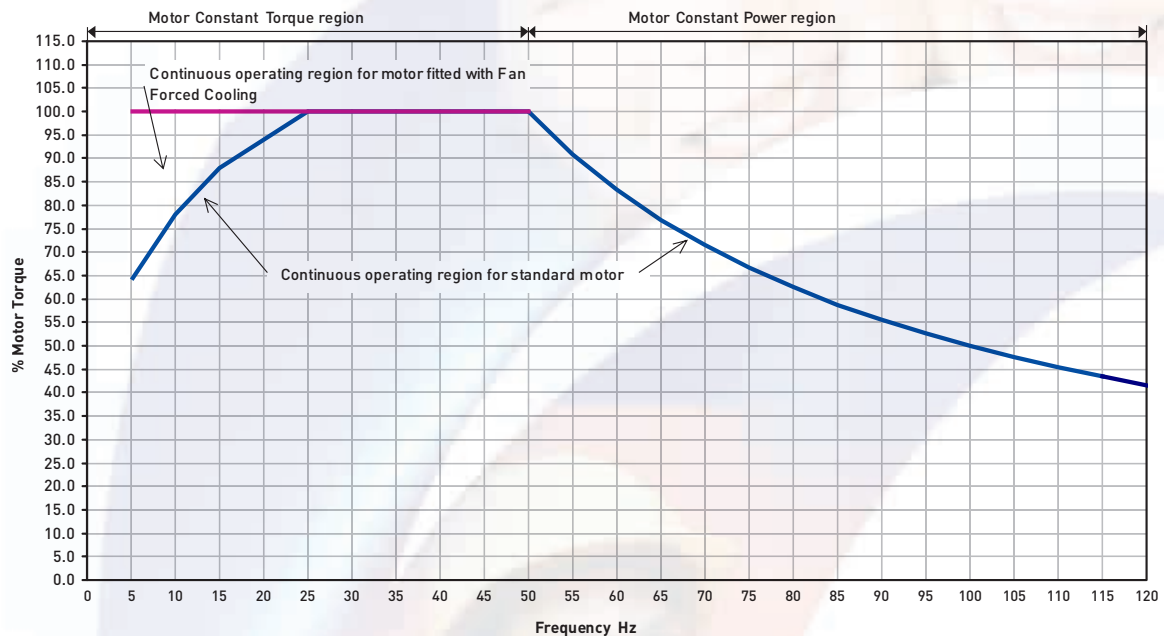
Dimension "N"

N	Tolerance	Tolerance (mm)
60 to 80	h8	+ 0
		- 0.046
95 & 110	h8	+ 0
		- 0.054
130	h8	+ 0
		- 0.063

Variable Speed Drives (VVVF)

The 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.

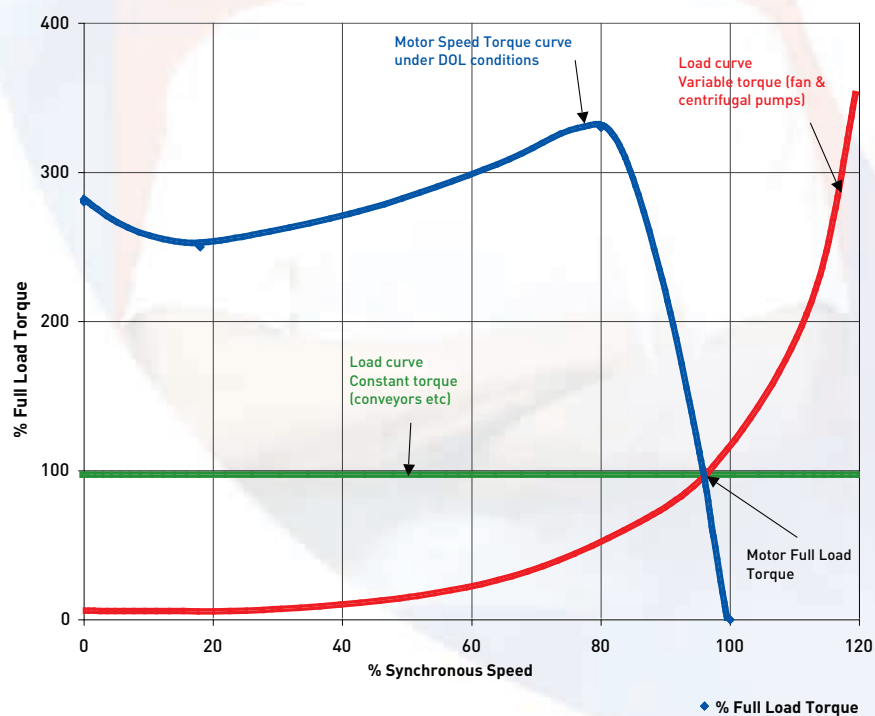
Typical Motor Loadability Curve for TECO Motor and Inverter



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)



Maximum Safe Operating Speeds

kW	Maximum Safe Operating Speed (RPM)		
	2 Pole	4 Pole	6 Pole
0.18 to 4	7200	3600	2400
5.5 to 15	5400	3600	2400
18.5 to 22	5400	2700	2400
30 to 37	4500	2700	2400
45 to 55	3600	2700	2400
75 to 110	3600	2700	1800
132	3600	2250	1800
150	3600	2250	1800
185 to 220	3600	2250	1800
250 to 315	3600	1800	1800

Note: Motors are balanced to 60 Hz speed. If motor operation is above 60 Hz special balance may be required (please refer to TECO).

Motor Synchronous Speed vs. Frequency

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

Cage Induction Motors when Fed from Variable Speed Drives

TECO motors follow the guidelines laid down in IEC60034-17:2006 "Cage Induction motors when fed from converters - Application guide".

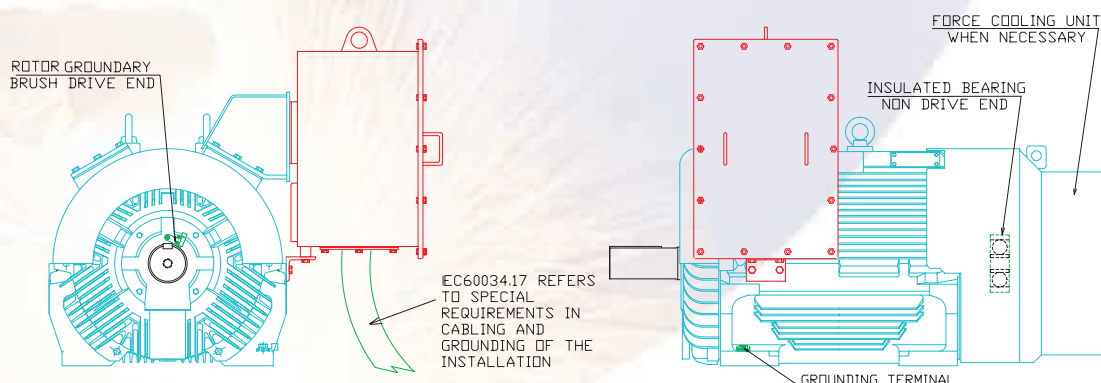
Certain applications, installations and site condition may cause some damage to motors if they are not correctly installed. IEC60034-17 has details on installation of Cage Motors and Variable Speed Drives.

On motor frame sizes D280 and larger TECO

are able to offer a rotor groundary brush at the drive end in order to reduce the effects of Electro Discharge Machining (EDM) on motor bearings, which can be prevalent in some cases. On larger motors, frame size 355 and above the option for an insulated bearing at the non drive end is available to further assist in the likelihood of EDM damage.

These options are also available on smaller motors if specified.

Typical "VSD Ready" Large Frame Size Motor



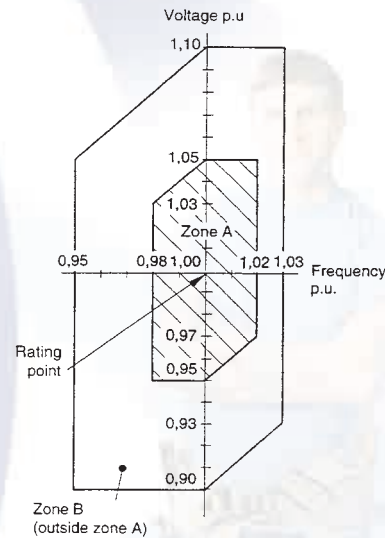
Voltage and Frequency Variations during Operation

For a.c. motors rated for use on a power supply of fixed frequency supplied from an a.c. 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 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 and Frequency Limits for Motors



Voltage Variation, 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
Q (reactive V A) no-load	0.81	0.9	1	1.1	1.21

Other Mains Supply

The TECO Australia 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 checked to confirm.

World 3-Phase Voltage-Frequency

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	346	50	Canada	460 or 565	60	South Africa	380	50
						Saudi Arabia	380	50

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

The TECO Group of Companies comprises a diverse range of six major sectors, including:

Industrial Product and System (IPS)



Low & high voltage motors, Mechatronic Components, Power Electric & System Control, Infrastructure Projects.

Some other TECO IPS products:

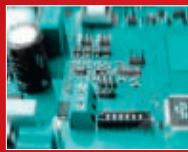
- 3-Phase Induction Motors
- 3-Phase Open Drip Proof Motors
- Brake Motors
- Crane Motors
- Cooling Tower Motors
- Eddy Current Motors
- Generators
- Hazardous Areas Motors
- High Efficiency Motors
- High Voltage Motors
- Induction Generators
- Mill use Induction Motors
- Multi-speed Motors
- Single Phase Motors
- Slip Ring Motors
- Smoke Spill Motors
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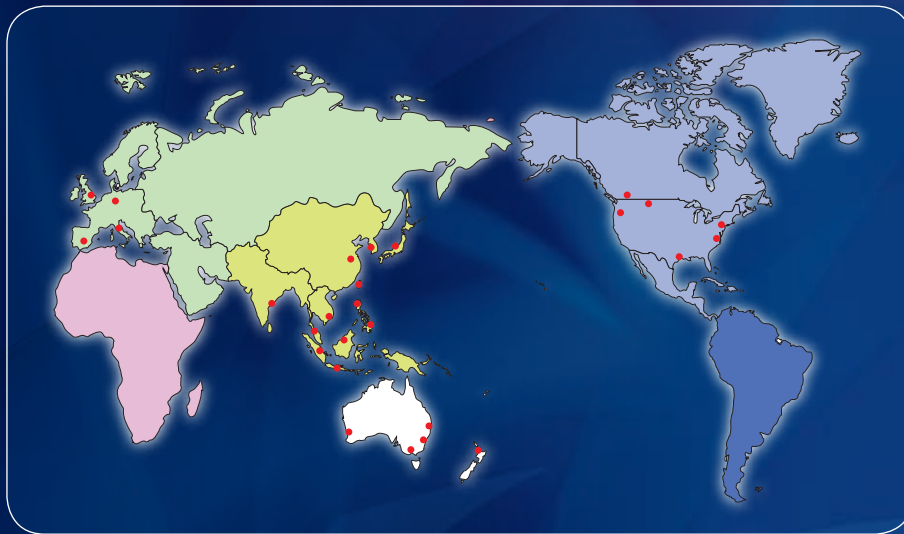


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