

TOSHIBA

Leading Innovation >>>



“FLEXI MOUNT”

EXPLOSION PROTECTED Ex d
FLAMEPROOF ELECTRIC MOTORS

CLASS 1 • ZONE 1 • GROUP 1

0.18kW to 700kW – 200volt to 1100volt

S O L U T I O N S • S E R V I C E • S U P P O R T

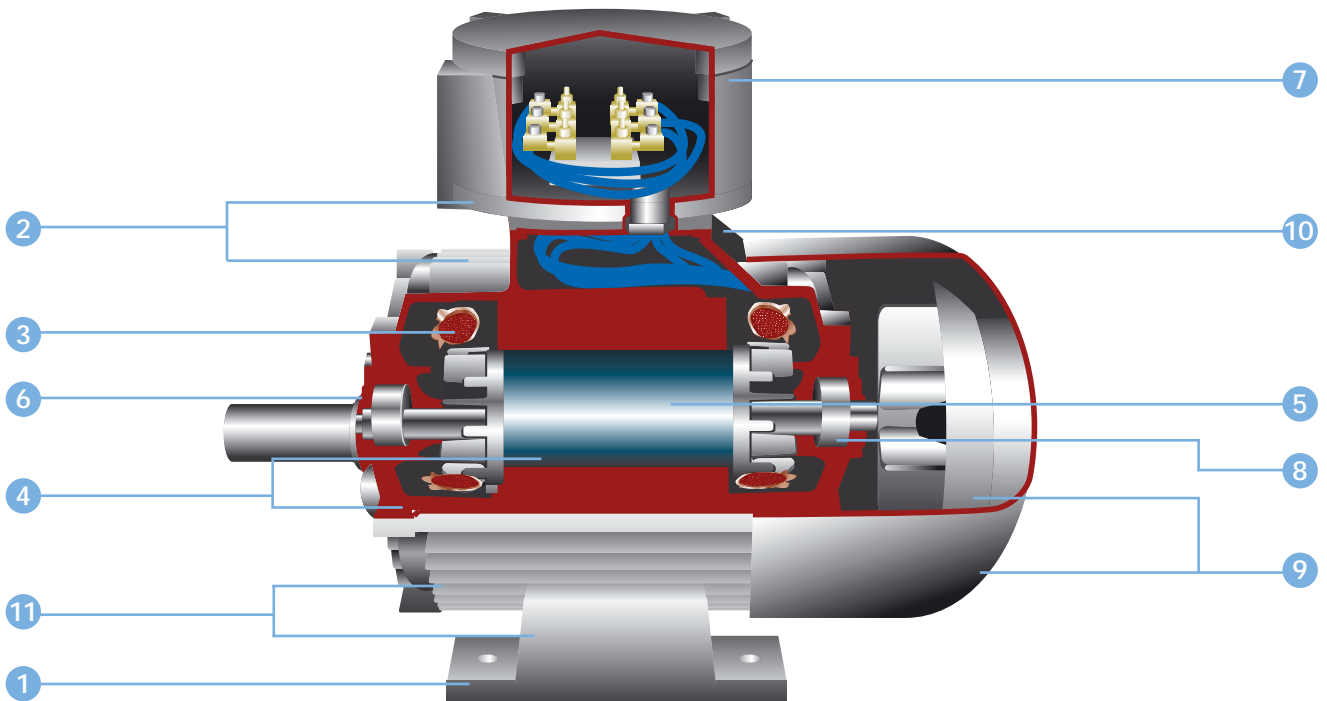


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TOSHIBA INTERNATIONAL CORPORATION PTY LTD



STANDARD FEATURES OF TOSHIBA Exd MOTORS INCLUDE



1. MOUNTING

- TOSHIBA "FLEXI MOUNT" Explosion Protected Exd motors up to and including frames 315, are designed to enable the fitting and removal of the motor feet, and B5 flanges (also C face flanges up to & including 160 frames), in the workshop or on-site, without modification. This flexibility is a particular advantage during engineering, or for the consolidation of spares, and gives our "FLEXI MOUNT" range its name. The range complies with AS1359 and MEPS 2006 requirements.

2. CONSTRUCTION

- The motor chamber and terminal box are isolated from each other to give added explosion protection. The winding leads are fed into the terminal box through flameproof glands. Due to their high degree of protection, Toshiba "FLEXI MOUNT" motors are suitable for use in zone 1 and 2 hazardous areas.
- Frames are high-grade cast iron, with some features of the frame construction being:
 - Close tolerance machining to ensure accurate alignment and fits in accordance with IIC gas requirements, and Toshiba's high standards.
 - Exceptional corrosion resistance & high structural rigidity are inherent in TOSHIBA'S "FLEXI MOUNT" motor construction.
- Fan covers are pressed steel. Stainless Steel covers are also available upon request.
- Nameplates are stainless steel and include bearing sizes.

- Cooling fans are polypropylene on motor frames 200 and below, and cast alloy on larger frames. Fabricated steel fans are available as an option on all frame sizes, and are fitted to all motors where Group 1 Mining is a requirement.
- Suitable for operating in ambient temperatures of $-20^{\circ}\text{C} \sim +40^{\circ}\text{C}$ without de-rating.
- Motors & terminal boxes are IP56 standard, terminal boxes can be upgraded to IP66.
- MEPS compliant to AS /NZS1359.5.2004 table B2.

3. WINDING

- TOSHIBA "FLEXI MOUNT" Exd motors are designed to achieve higher efficiency by the use of greater cross sectional area of copper in stator windings. This lowers windings resistance and reduces copper losses due to lower current density. This also means cooler motor operation through lower winding temperature rises.
- All winding insulating materials comply with Class F as a minimum. Utilization of the over-temperature limit in continuous operation S1 corresponds to thermal Class B, for constant speed motors.

4. LAMINATIONS

- The Premium-grade low-loss core steel used in these motors, reduces eddy current losses and improves motor efficiency. The longer stator cores reduce losses due to lower operating flux densities, giving greater overload capacity, more reliable operation and extended motor life.



5. ROTOR

- Pressure cast aluminum rotors on frames 63 to 315, with integrally cast bars, end rings and cooling fins give reliable operation. On 355 and larger frames, rotor cages are hard soldered copper, deep bar construction for direct actuation. All these specially designed rotors ensure TOSHIBA "FLEXI MOUNT" motors, have advantageous torque characteristics and minimal losses.

6. SHAFT SEALS

- All TOSHIBA "FLEXI MOUNT" Exd motors are fitted with lip seals to the Drive-end and Non Drive-end shafts.
- Motor drive shafts are drilled and tapped with standard internal metric threads.

7. TERMINAL BOXES

- Terminal boxes frames 315 and below are constructed of cast iron GG20, terminal boxes 355 and above are constructed of fabricated steel, and when fitted to the motor, are in themselves an Exd enclosure.
- Terminal boxes are mounted on the top of the motor as standard, and can be ordered from our factory on the right or left hand side, viewed from drive end.
- Terminal boxes may be rotated 90° by four positions for conduit entry.
- Each terminal box is routine pressure tested at 1.5 x reference pressure, after all machining is completed.
- Table 3 on page 14 indicates various certified terminal box cable entry options for TOSHIBA'S "FLEXI MOUNT" motors.
- Some variations to the above cable gland entries are permitted, provided all minimum certified dimensions are not encroached. Refer to your Toshiba International Corporation office for details.
- At the time of catalogue printing, the M63 cable gland was the largest available, locally certified gland.

Important:

- Ensure all cable glands, cables and lugs are appropriately certified and correctly fitted in accordance with all relevant procedures and authorities.
- Only persons with the relevant qualifications should connect/disconnect electrical apparatus.
- Each motor should be checked individually.

8. BEARINGS

- The use of only the highest quality bearings assures long reliable motor life and quiet operation. Motors in frame sizes up to and including CD132 have sealed bearings. Larger frame sizes have regreasable bearings. Refer to the tables 3 & 4 on page 14.

9. NOISE LEVELS

- Special attention to fan and cowl design achieves quiet operation with efficient cooling. Toshiba can supply motors with special low noise level fans if required.

10. NAMEPLATE

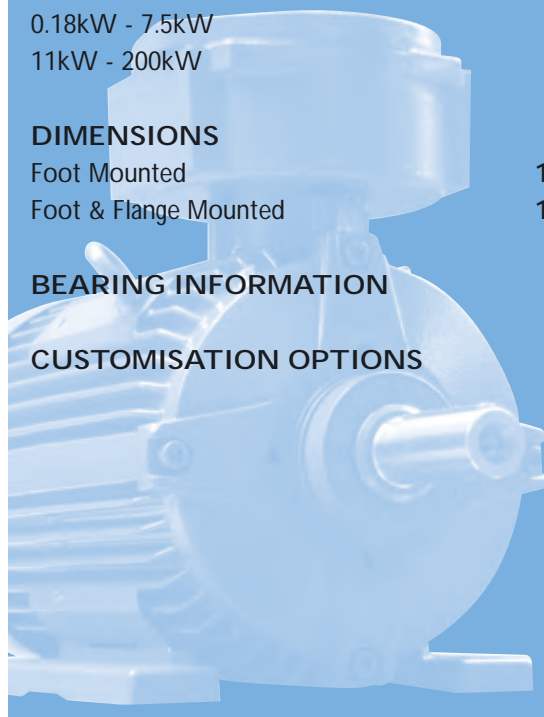
- Stainless steel nameplates provide complete motor ratings including bearing sizes for quick reference.

11. FINISH

- As pretreatment, all parts are cleaned and degreased. Steel cast and cast iron parts are sand blasted in accordance with DIN 18 364.
- The prime coat for steel parts (and cast parts CD160 frame and above) is one-part Synthetic Alkyd Resin Primer. For cast parts of smaller frames, Polyvinyl Butyral (zinc chromate free) is used.
- The standard finish coat of TOSHIBA "FLEXI MOUNT" Exd motors is two-part polyurethane based Percotex structured lacquer, to an approximate minimum thickness of 70 micron.
- This gives a non-abrasive, elastic, scratch and impact resistant finish, and excellent protection against water, steam and saltwater.
- The temperature range suitability for this paint system is -40°C to 130°C.
- Standard Paint Colour is RAL 5009 Azure blue.

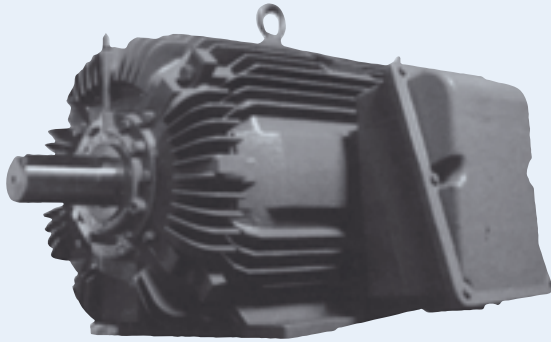
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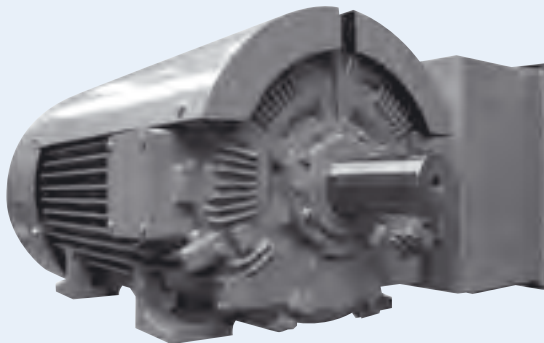




LOW VOLTAGE MOTOR RANGES



PREMIUM EFFICIENCY MOTOR



LARGE HEAVY DUTY MOTOR - HIGH EFFICIENCY



EXPLOSION PROTECTED MOTOR

PREMIUM EFFICIENCY MOTORS

(Premium Efficiency)

Ratings: 0.37kW to 800kW (200V - 1100V)
2,4,6,8 Pole (Specials Available)
Protection Classification IP56 - IP66

Benefits: High starting torque with low starting current ensures premium performance under arduous load conditions. Easily adapted for VVVF control or reduced voltage starting, this range offers a high degree of flexibility in application while providing efficient performance. Refer to Toshiba "Premium Efficiency Catalogue".

HEAVY DUTY INDUSTRIAL MOTORS

(Energy Efficient) - Motors Above AS1359.30

Ratings: 185kW to 800kW (200V - 1100V)
2,4,6 Pole (Specials available)
Protection classification IP55 - IP66

Benefits: Designed and built for Heavy Duty Industrial applications. Adaptable for VVVF control or reduced voltage starting, this range offers a high degree of flexibility in application.

HAZARDOUS AREA MOTORS

Both our Premium Efficiency and High Efficiency Motor ranges are suitable for modification to suit Hazardous Areas, Exe, Exn and DIP classifications and are certified to current Australian and IEC standards. Refer to table on page 7, for more detail.

EXPLOSION PROTECTED MOTORS

Ratings: 0.18kW to 700kW (200V - 1100V)
2,4,6,8 Pole (Specials Available)
Protection Classification IP55 - IP66
Exd certified to current Australian Standards including Group I mining.

Benefits: Suitable for Industrial applications such as mining and petrochemical. Versatile construction, side or top mounting of terminal box, foot, foot & flange and flange mounting options. Modifications to satisfy individual customer requirements and specifications.

SPECIAL MOTORS

Toshiba offers a range of motors to suit individual customer requirements. Special applications include: Hazardous area motors certified to ATEX, GOST, Aus Ex, IEC Ex, Nepsi, & EExd(e), Offshore application, multi-speed motors, brake motors, direct current motors, open drip proof motors, Wound Rotor Induction Motors, Variable Speed motors, CENELEC & NEMA standard motors and most special application motors.



GENERAL INFORMATION

DEFINITIONS AND FORMULE

Power: Power is the rate of doing work and in metric system, it is expressed in Watts (W) or often in kilowatts (kW).

Output Power of 3-Ph Electrical Motor:

$$P(\text{kW}) = \frac{(1.732 \times \text{Line Voltage} \times \text{Line Current} \times \text{p.f.} \times (\frac{\text{Motor Eff}}{100}))}{1000}$$

$$P(\text{kW}) = 0.746 \times \text{Horsepower}$$

Torque: Torque is a twisting force about an axis of rotation. It is measured in units of force times distance from the axis (Nm). For an electric motor, Torque is its turning capacity and hence, its most useful characteristic.

Torque and Power are related to each other by the following equation:

$$\text{Power(kW)} = \frac{\text{Torque(N m)} \times \text{Speed(rpm)}}{9550}$$

Inertia: Inertia is the name for the tendency of an object in motion to remain in motion. Typically for cylindrical objects, it is given by:

$$GD^2 (\text{kg-m}^2) = 1/2 \times \text{Mass} \times (\text{Diameter})^2$$

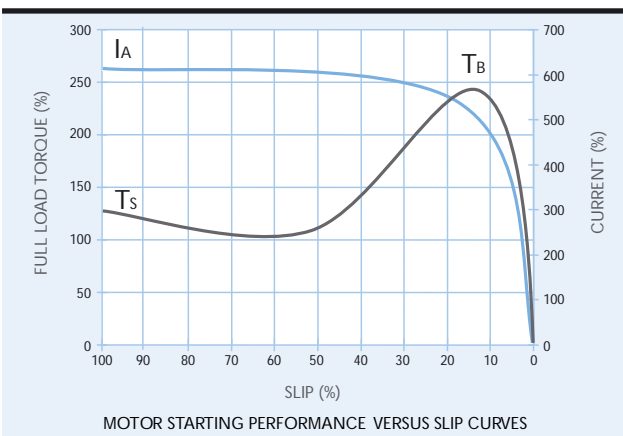
Acceleration Time Acceleration Time of a motor is related to Total Inertia at the motor shaft as well as Acceleration Torque by the following equation:

$$\text{Acceleration Time(sec)} = \frac{GD^2(\text{kgm}^2) \times \text{Speed(rpm)}}{375 \times \text{Acceleration Torque(Nm)}}$$

Acc. Torque of a motor can be approximated as follows:

For Constant Torque Loads (e.g. Conveyors, Mixers etc)	$T_{\text{acc}} = 0.4(T_s + T_b) - T_L$
For Quadratic Torque Loads (Cent. Fans / Pumps)	$T_{\text{acc}} = 0.4(T_s + T_b) - 0.33 \times T_L$

Where T_s = Starting Torque , T_b = Breakdown Torque , T_L = Load Torque at Motor Shaft.
 T_{acc} = acc. time (sec).



MOTORS WITH VVVF DRIVES

More and more motors in industries are getting driven by VVVF drives for accurate speed control. While accurate speed control results into better product quality end product and/or saving of energy, performance of motors with VVVF drives is considerably different than when they are fed directly by mains supply.

Unless the motors have separate forced fan-cooling, reduced speeds requires that their outputs are re-rated to allow generated heat to be adequately dissipated. This is of particular importance when motors are running at very slow speeds but still requiring constant torques through out the speed range.

Further, unlike the mains supply, VVVF supply voltage is non-sinusoidal and is often in the form chopped waveforms. This pulse Width Modulated (PWM) waveform has detrimental effects on motor torque capability as well as its thermal characteristics. This also calls for additional de-ration of its output. PWM chopped waveform also leads other motor issues such as:

- Decreased Insulation life due to dv/dt effects as well as increased voltage levels at the motor terminals due to reflected waves
- Increased noise levels – especially at low VVVF carrier frequencies
- Reduced bearing life through Electric Discharge Machining (EDM) effects.
- Motor over-heating due to harmonics in PWM waveform
- Possibility of generating shaft currents

As with most applications, proper investigation during project conceptualization, as well as prior to actual installation, often saves considerable time and money in solving some of the above mentioned issues.

With vast experience of Toshiba engineers, cost effective and reliable Motor-Drive solutions can be ensured. Following information helps in selecting the most optimum solution:

- Type of Load / Application (e.g. Conveyor/Fan/Pump/ Mixer etc)
- kW and Torque required in the required speed range
- Supply Voltage and Frequency with their tolerances
- Environmental Conditions (Temperature/Hazardous Area etc)
- Cable length from VVVF drive to the motor

ELECTROMAGNETIC COMPATIBILITY

Toshiba motors and VVVF Drives comply to Electromagnetic Compatibility (EMC) regulations as per Australian C-Tick Scheme.



MOTORS FOR HAZARDOUS AREAS

Toshiba offers the widest range of Hazardous Area certified motors in Australia.

Both our Premium Efficiency and High Efficiency motor ranges are certified for use in hazardous areas as per tables 1 and 2 on page 7.

SOME TYPICAL AREAS OF USE

- Petrochemical, Mining, Oil & Gas, Chemical.

FLAMEPROOF Exd



Motors are constructed so as to contain an internal explosion within the motor and prevent the transmission of flame to external atmosphere. External temperature during operation is kept such that the surrounding flammable atmosphere cannot be ignited.

CERTIFICATION AND APPROVALS

Toshiba's Flameproof motors are Ex d approved for explosive gas groups IIA, IIB & IIC for temperature class T4, and are also approved for underground Coal Mines, apparatus group I (methane).



INCREASED SAFETY Exe

These motors are not built to withstand an internal explosion (flameproof). They are designed to ensure safety by means of a number of special features to ensure freedom from arcs, sparks or dangerous surface temperatures. They resemble standard motors in appearance but have special increased safety terminals within an IP56 terminal box.

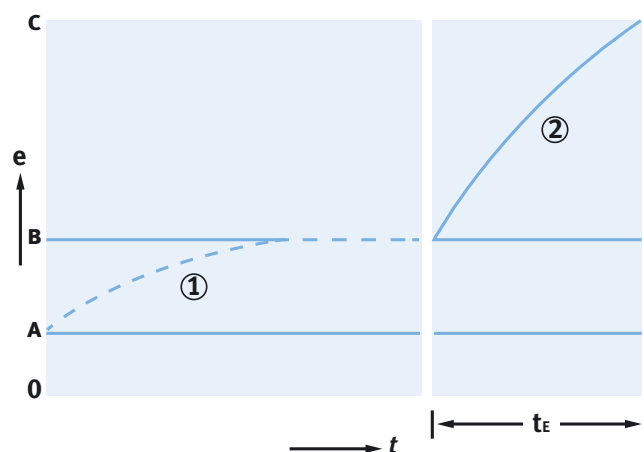
The main features of increased safety motors are:

- Special attention to air gap concentricity and clearance of all rotating parts
- Components subject to impact tests
- Temperature rise 10°C lower than the permitted maximum for that class of insulation
- Maximum surface temperature T2 or T3
- Compliance with t_E characteristics
- Special terminal block to accommodate specified creepage and clearances
- Terminal block material ensures anti tracking

The maximum surface temperature (T) applies to all surfaces of the motor, both internal and external. Under locked rotor conditions, the rotor temperature in certain designs increases faster than that of the stator windings. In either event this is catered for in conjunction with the t_E time.

t_E TIME

t_E time is defined as the time taken for a.c. windings when carrying the starting current I_A to be heated up from temperature reached in rated service and at maximum ambient temperature, to the limiting temperature. In the graph below, 'A' represents the maximum ambient temperature and 'B' represents temperature reached under normal load. If a fault occurs and the rotor becomes locked, then the conditions shown in part 2 of the graph will apply. The motor temperature will increase very rapidly to 'C', which is less than the T classification for the motor. The time taken to reach limiting temperature point 'C' from temperature level B is called t_E time. Control gear must be provided to disconnect the motor from the supply within this time t_E . These motors are certified and suitable for use in zone 1 and have a maximum temperature level of T3. They are intended for continuous running and are unsuitable for duties involving frequent starts/stops or long run-up times or VVVF operation.



$O =$ temperature °C

$A =$ max. ambient temperature

$B =$ temperature in rated service

$C =$ limiting temperature

$t =$ time

$e =$ temperature

1 = temperature rise

in rated service

2 = temperature rise during

stalled motor test

TOSHIBA INTERNATIONAL CORPORATION PTY. LTD.								
3 ~ mot. CD 280S-4 XY No. 499856004 H								
V ± 10%	Hz	A	I_A / I_N	kW	min^{-1}	$\cos \varphi$	Icl.	
Y	1000	50	64	7,8	90	1485	0,85	155(F)
IP 56			820 kg	02.10	DIN EN 60034			
		L.S.: 6316 C3						
		O.S.: 6315 C3						
II 2G Ex d IIC T4		AUS Ex 00.369 .X						
PTC 145 °C		DIN 44081, t_A 33 s						
manufactured by						GERMANY		
Typical Exd nameplate								



NON SPARKING Exn



These motors are for use in Zone 2 hazardous locations. The Exn motor is very similar in construction to the TEFC machine. The main points of difference are:

- Special attention to air gap concentricity and clearance of all rotating parts
- Components subject to impact test
- Maximum internal or external surface temperature T3
- Terminal block material to ensure anti-tracking
- Special terminal block to stop creepage.

It can be observed that many of the above Exn features are similar to type Exe except that the standard outputs are obtained from these motors, i.e. no de-rating is involved. Because Exn motors are used in Zone 2 hazardous locations, internal and external surfaces are limited to T3 at all times except during the starting period.

Temperature class	T1	T2	T3	T4	T5	T6
Temperature limit °C	450	300	200	135	100	85

DUST-EXCLUDING IGNITION-PROOF DIP



These motors are built to exclude dust and to prevent, sparks or heat otherwise generated or liberated inside the enclosure to cause ignition of exterior accumulations or atmospheric suspensions of a specific dust on or in the vicinity of the enclosure.

Dust is excluded from the motor and terminal box enclosure and the exterior temperature is kept below the ignition temperature of a dust cloud or layer, up to 5mm thick. As a rule dust layering should be avoided.

Examples of such dusts are wood, starch, coal dust and grain dusts including flour, cocoa, sugar, milk powder and tea, as well as various metals and chemicals including bronze, zinc, sulphur and toner.

It should be noted that the distinction between dust types does not affect the selection of equipment for dust areas.

TABLE 1

HAZARDOUS AREA CLASSIFICATION	
Zone 0	Zone where explosive atmosphere is continuously present for long periods (> 1000 Hrs)
Zone 1	Zone where explosive atmosphere is periodically present in normal operation (> 10 Hrs – 1000 Hrs)
Zone 2	Zone where explosive atmosphere is not likely to be present in normal operation and if present it exists for short periods only (< 10 Hrs)

GROUP CLASSIFICATION		HAZARD CLASSIFICATION	
Group 1	Coal Mines	Class 1	Gas
Group 2	Other	Class 2	Dust

GAS GROUPING FOR ELECTRICAL APPARATUS EN 50014 AND IEC 60079-0	
Group	Gas
I	All underground Coal Mining applications Firedamp (methane)
IIA	Industrial methane, propane, gasoline and most industrial gases
IIB	Ethylene, coke oven gas and other industrial gases
IIC	Hydrogen, acetylene, carbon disulphide

TABLE 2

TYPICAL TIC AUSTRALIAN / IEC STANDARD EXPLOSION PROTECTED CERTIFICATES				
TYPE OF HAZARD	EXPLOSIVE GASES			EXPLOSIVE DUSTS
Area of Classification	Zone 1 or 2 (Class 1)		Zone 2 (Class 1)	Zone 21 (DIV 1) Zone 22 (DIV 2)
Type of Motor Protection	Explosion Protected Ex d	Increased Safety Ex e	Non-Sparking Ex n	Dust Ignition Proof DIP
Toshiba Certifications of Compliance	AUS Ex 00.3695X,7X, 8X	AUS Ex 1174X	IEC Ex TSA 09.0034X	AUS Ex 1078X
	IECEX PTB 06.0009,30U,36,37			
	IECEX PTB 06.0021,22,23,24			
Apparatus Group	IIA, IIB & IIC (including GROUP I Mining)	IIA, IIB & IIC	IIA, IIB & IIC	ZONE 21 & 22
Temperature Class	T4 (options T5 & T6)	T3 (and T2)	T3	T4
Referenced Standards	IEC 60079 AS/NZS 60079	AS/NZS 60079	IEC 60079 AS/NZS 60079	AS/NZS 61241



PERFORMANCE DATA

FLEXI-MOUNT PERFORMANCE DATA AT 400V - 50Hz

Output kW	RPM	Frame Number	Full Load Current (A) @ 400V	No Load Current (A)	Locked Rotor Current (% FL)	Locked Rotor Torque (% FL)	Pull Up Torque (% FL)	Breakdown Torque (% FL)	Efficiency (%)			Power Factor			Rotor GD ² (kg.m ²)	dB(A) at 1 metre
									Full Load	75% Load	50% Load	Full Load	75% Load	50% Load		
0.12	680	71L-8	0.52	0.42	238	182	180	233	51.6	49.9	43	0.67	0.58	0.48	0.0048	43
0.18	2905	63K-2	0.59	0.48	776	564	592	799	66.2	58.9	48.8	0.65	0.53	0.43	0.00112	49
0.18	1415	63L-4	0.53	0.4	472	307	278	307	69.9	68.2	63	0.7	0.6	0.49	0.00184	45
0.25	2860	63L-2	0.69	0.48	664	400	419	567	69.9	66.2	55.48	0.74	0.65	0.49	0.00112	49
0.25	1370	71K-4	0.66	0.4	379	214	214	236	68.3	69.8	67.6	0.8	0.72	0.6	0.00184	43
0.25	920	71L-6	0.82	0.73	360	221	177	261	62	59.8	53.9	0.67	0.58	0.47	0.0048	45
0.25	690	80L-8	0.91	0.82	329	217	220	237	61.3	59	52.7	0.61	0.53	0.42	0.01	44
0.37	2800	71K-2	0.89	0.48	515	265	277	375	69.8	69.3	63.9	0.84	0.78	0.65	0.00112	53
0.37	1380	71L-4	0.94	0.56	388	203	203	223	70.3	72.2	70.9	0.8	0.72	0.61	0.00252	54
0.37	925	80K-6	1.12	0.89	400	259	246	262	66.4	65.2	59.7	0.69	0.6	0.48	0.0076	45
0.55	2810	71L-2	1.31	0.84	571	348	296	430	70.5	69.1	64.1	0.82	0.75	0.63	0.00156	53
0.55	1380	80K-4	1.36	0.77	418	179	182	247	71.8	73.3	72.2	0.8	0.75	0.46	0.00368	47
0.55	925	80L-6	1.6	1.19	404	248	236	261	68.3	67.9	63.9	0.72	0.64	0.52	0.01	44
0.55	690	90L2-8	1.85	1.53	339	183	181	201	67.1	65.9	60.7	0.62	0.54	0.43	0.0184	46
0.75	2890	80 K-2Y	1.55	0.64	724	282	282	444	82.2	81.4	77.4	0.87	0.82	0.72	0.0052	60
0.75	1445	80 L-4Y	1.69	0.95	721	323	303	403	82.5	81.7	78.5	0.79	0.72	0.6	0.0116	44
0.75	955	90 L1-6Y	2	1.4	538	267	267	307	79.3	78.3	74.4	0.69	0.61	0.48	0.032	46
1.1	2885	80L-2Y	2.23	0.82	775	330	275	439	84.5	84.3	81.8	0.88	0.85	0.76	0.0072	61
1.1	1455	90L1-4Y	2.33	1.41	772	291	291	346	84	83.6	81	0.78	0.71	0.59	0.0184	51
1.1	955	90L2-6Y	2.75	1.83	581	282	264	309	80.4	79.8	76.3	0.72	0.64	0.51	0.038	48
1.1	715	100L2-8Y	3.05	2.09	464	211	218	272	79.7	79.3	76.1	0.66	0.59	0.47	0.068	52
1.5	2895	90L1-2Y	2.9	1.06	816	323	263	404	85.4	85.1	82.8	0.88	0.85	0.76	0.0116	64
1.5	1450	90L2-4Y	3.15	1.82	837	324	294	425	85.2	84.5	81.6	0.79	0.72	0.6	0.0226	48
1.5	965	100L-6Y	3.65	2.41	672	303	283	330	83.2	82.7	79.2	0.71	0.65	0.51	0.068	48
1.5	705	112M-8Y	3.65	1.88	439	207	187	261	80.6	81.4	80	0.77	0.71	0.6	0.116	58
2.2	2900	90L2-2Y	4.2	1.42	802	331	304	414	86.3	86.2	84.3	0.89	0.86	0.78	0.0156	64
2.2	1450	100L1-4Y	4.4	2.04	849	297	255	359	87.2	87	84.9	0.84	0.78	0.67	0.044	51
2.2	965	112M-6Y	4.9	2.62	662	266	262	326	85.6	85.5	83.2	0.77	0.71	0.59	0.124	60
2.2	710	132S-8Y	5.4	3.5	541	233	223	291	81	81.2	79	0.72	0.64	0.52	0.116	53
3	2910	100L-2Y	5.7	1.8	770	284	213	345	88.2	88.7	87.8	0.88	0.86	0.79	0.0204	62
3	1450	100L2-4Y	5.9	3	881	334	309	400	87.5	87.4	85.6	0.82	0.76	0.64	0.044	47
3	970	132S-6Y	6.9	4.2	787	325	325	366	85.7	85.3	83.1	0.73	0.67	0.55	0.124	57
3	715	132M-8Y	7.3	4.8	633	281	270	321	82.8	82.6	80.6	0.72	0.63	0.52	0.144	66
4	2930	112M-2Y	7.6	2.8	803	314	322	391	88.3	87.8	85.7	0.87	0.83	0.75	0.0356	62
4	1460	112M-4Y	7.9	4	827	344	306	371	88.4	88	85.8	0.81	0.74	0.62	0.088	58
4	965	132M1-6Y	8.8	5	777	293	321	371	86.3	86.4	84.7	0.76	0.69	0.57	0.148	57
4	725	160M1-8Y	8.8	4.2	513	189	248	262	85.9	86.2	84.6	0.78	0.72	0.62	0.284	54
5.5	2925	132S1-2Y	10.1	3	758	256	217	423	89	89.3	88.3	0.9	0.88	0.83	0.05	64
5.5	1460	132S-4Y	10.5	5	829	384	325	389	89.3	89.2	87.4	0.83	0.77	0.67	0.12	58
5.5	965	132M2-6Y	11.2	6.3	821	333	340	426	87.5	87.5	85.5	0.79	0.71	0.58	0.192	57
5.5	725	160M2-8Y	12.2	6.6	592	226	214	327	87.2	87	84.6	0.76	0.68	0.55	0.42	54
7.5	2930	132S2-2Y	13.6	3.5	787	315	282	380	90.6	90.9	90.1	0.92	0.9	0.84	0.0708	63
7.5	1460	132M-4Y	14	6.1	894	367	287	377	90.1	90.1	88.7	0.84	0.79	0.69	0.164	71
7.5	970	160M-6Y	14.6	6.6	832	282	253	386	88.7	88.6	86.8	0.84	0.78	0.67	0.48	59
7.5	725	160L-8Y	16.7	9.8	677	251	464	349	87.9	87.7	85.8	0.74	0.66	0.54	0.544	54



PERFORMANCE DATA

FLEXI-MOUNT PERFORMANCE DATA AT 400V - 50Hz

Output kW	RPM	Frame Number	Full Load Current (A) @ 400V	No Load Current (A)	Locked Rotor Current (% FL)	Locked Rotor Torque (% FL)	Pull Up Torque (% FL)	Breakdown Torque (% FL)	Efficiency (%)			Power Factor			Rotor GD ² (kg.m ²)	dB(A) at 1 metre
									Full Load	75% Load	50% Load	Full Load	75% Load	50% Load		
11	2940	160M1-2Y	20	8	829	280	288	341	91.2	91.2	90	0.85	0.83	0.75	0.128	66
11	1470	160M-4Y	20.5	8.9	850	334	255	343	91.1	90.9	89.4	0.83	0.81	0.72	0.316	62
11	975	160L-6Y	22	9.9	885	310	276	385	89.8	89.9	88.3	0.84	0.78	0.66	0.48	58
11	725	180L-8Y	23	12.2	692	257	236	335	89.2	89.6	88.3	0.78	0.71	0.58	0.88	56
15	2940	160M2-2Y	26.5	8.7	808	326	287	374	91.9	92	90.8	0.89	0.86	0.78	0.172	66
15	1470	160L-4Y	28.5	12.8	807	314	339	344	91.9	92	91.1	0.82	0.77	0.67	0.332	62
15	975	180L-6Y	29	13.5	848	312	346	410	90.7	90.7	89.6	0.82	0.77	0.66	0.76	58
15	730	200L-8Y	31	15.9	762	260	258	362	90.6	90.6	89	0.78	0.71	0.59	1.6	58
18.5	2940	160L-2Y	32	8.9	852	326	290	361	92.5	92.8	92	0.9	0.87	0.81	0.208	66
18.5	1470	180M-4Y	35	13.2	824	384	310	356	92.3	92.2	90.1	0.84	0.8	0.65	0.62	61
18.5	975	200L1-6Y	35	15.1	774	258	232	352	91.5	91.9	91.1	0.83	0.78	0.68	1.12	59
18.5	735	225S-8Y	37.5	19.5	734	232	198	354	91.1	91.2	90	0.77	0.72	0.61	2.24	58
22	2945	180M-2Y	38	11.4	867	306	250	355	92.2	92	90.5	0.9	0.87	0.81	0.3	69
22	1470	180L-4Y	38.5	13.4	813	320	289	344	92.9	93	92.3	0.88	0.85	0.78	0.656	59
22	975	200L2-6Y	41	17	773	226	231	342	91.8	92.5	92.1	0.84	0.8	0.69	1.24	59
30	2955	200L1-2Y	52	13.4	833	296	196	319	92.9	93	91.9	0.9	0.89	0.83	0.52	73
30	1460	200L-4Y	49	20.1	875	351	284	330	93.2	93.5	93.1	0.85	0.81	0.72	1	76
30	985	225M-6Y	56	21.7	731	351	260	264	92.6	92.7	92	0.83	0.79	0.71	2.76	59
37	2955	200L2-2Y	63	16.9	880	308	254	328	94.2	94.5	94	0.9	0.89	0.83	0.64	72
37	1475	225S-4Y	67	20.8	760	339	234	287	93.7	94.1	93.7	0.87	0.84	0.78	1.6	78
37	985	250S-6XY	69	25	758	357	220	253	93	93.1	92.1	0.83	0.8	0.71	4.12	59
45	2960	225M-2Y	77	18.7	809	264	231	279	93.9	93.8	92.8	0.89	0.88	0.84	0.96	72
45	1475	225M-4Y	80	25.2	816	377	296	309	93.9	94.2	93.7	0.87	0.85	0.78	1.92	78
45	990	250M-6XY	85	30.7	657	321	214	221	93.7	93.5	92.2	0.82	0.79	0.71	5.4	62
55	2970	250M-2Y	96	28.2	890	307	270	310	94.1	93.6	92	0.87	0.85	0.79	1.6	76
55	1475	250S-4XY	96	45.8	866	354	295	312	94.2	94.3	93.7	0.88	0.85	0.78	3	66
55	985	280S-6XY	104	37.8	659	335	198	212	93.9	94	93.4	0.81	0.78	0.71	6.8	64
75	2975	250M-2XY	130	34.7	796	264	231	262	94.7	94.2	93.2	0.87	0.86	0.82	2.6	77
75	1480	250M-4XY	134	44.7	823	331	288	255	94.8	94.8	94	0.84	0.82	0.75	5	69
75	990	280M-6XY	130	38	809	329	240	270	94.4	94.7	94.3	0.88	0.86	0.8	17.2	66
90	2980	280S-2XY	158	40.9	863	305	255	286	94.8	94.4	93.1	0.87	0.85	0.81	3.12	77
90	1485	280S-4XY	161	45.8	806	332	213	249	95	95.1	94.5	0.86	0.85	0.79	5.92	69
110	2980	280M-2XY	185	38	757	233	223	268	95.3	95.1	94	0.9	0.9	0.86	5.6	79
110	1480	280M-4XY	198	54.8	758	310	237	249	95.3	95.5	95	0.84	0.84	0.78	8.8	84
132	2975	315S-2XY	220	47.1	795	240	215	261	95.8	95.7	94.8	0.9	0.9	0.86	6.4	79
132	1485	315S-4XY	237	64	768	290	230	260	95.5	95.7	95.2	0.85	0.84	0.79	10.8	70
160	2980	315M-2XY	270	56.7	859	244	221	253	96	95.9	95.2	0.9	0.89	0.86	6.8	77
160	1490	315M-4XY	285	78	782	300	240	270	95.7	95.8	95.3	0.86	0.84	0.79	12.4	70
200	2980	315L2-2Y	335	70.35	690	230	220	260	96	95.5	95	0.9	0.9	0.87	8.8	76
200	1490	315L2-4Y	355	99.9	794	280	220	250	96	96.1	95.7	0.85	0.85	0.79	15.6	71



DIMENSIONS

FOOT MOUNTED

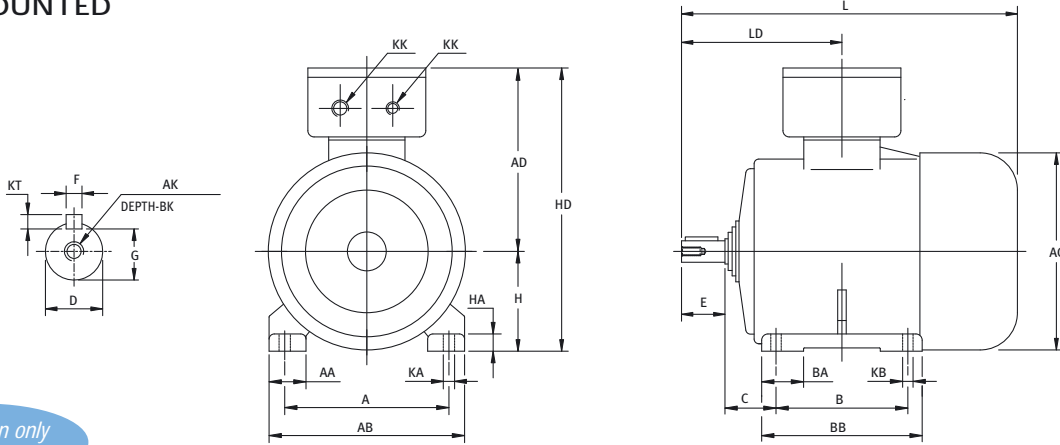


Illustration only
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2, 4, 6, 8 POLE

ALL DIMENSIONS (mm)

DIMENSIONS	FRAME															
	63K+L	71K+L	80K+L	80K+LY	90L	90L-Y	100L-Y	112M-Y	132S-Y	132S2-Y	132M-Y	132M2-Y	160M-Y	160L-Y	160L6Y	
A	100	112	125	125	140	140	160	190	216	216	216	216	254	254	254	
AA	20	30	35	35	40	38	42	45	60	60	60	60	65	65	65	
AB	120	139	160	160	180	180	200	235	266	266	266	266	310	310	310	
AC	134	145	163	158	183	178	198	218	265	265	265	265	318	318	318	
AD	161	161	175	189	178	202	209	229	266	266	266	266	304	304	304	
AK	2	M4	M5	-	M6	-	M8	M10	M10	M12	M12	-	-	M16	M16	-
	4, 6, 8	M4	M5	M6	M6	M8	M8	M10	M10	M12	-	M12	M12	M16	M16	M16
B	80	90	100	100	125	125	140	140	140	140	178	178	210	254	254	
BA	25	25	35	37	40	44	46	46	60	60	60	60	100	100	100	
BB	100	110	130	130	155	155	175	175	187	187	225	225	300	300	300	
BK	10	12.5	16	16	19	19	22	22	28	28	28	28	36	36	36	
C	40	45	50	50	56	56	63	70	89	89	89	89	108	108	108	
D	2	11	14	-	19	-	24	28	28	38	38	-	-	42	42	-
	4	11	14	19	19	-	24	28	28	38	-	38	-	42	42	-
	6, 8	11	14	19	19	24	24	28	28	38	-	38	38	42	42	42
E	2	23	30	-	40	-	50	60	60	80	80	-	-	110	110	-
	4, 6, 8	23	30	40	40	50	50	60	60	80	-	80	80	110	110	110
F	2	4	5	-	6	-	8	8	8	10	10	-	-	12	12	-
	4, 6, 8	4	5	6	6	8	8	8	8	10	-	10	10	12	12	12
G	2	8.5	11	-	15.5	-	20	24	24	33	33	-	-	37	37	-
	4	8.5	11	15.5	15.5	-	20	24	24	33	-	33	-	37	37	-
	6, 8	8.5	11	15.5	15.5	20	20	24	24	33	-	33	33	37	37	37
H	63	71	80	80	90	90	100	112	132	132	132	132	160	160	160	
HA	6	10	12	12	12	12	15	17	20	20	20	20	25	25	25	
HD	224	232	255	269	268	292	309	341	398	398	398	398	464	464	464	
KA	10	10	12	12	12	12	15	15	15	15	15	15	20	20	20	
KB	7	7	9.5	9.5	9.5	9.5	12	12	12	12	12	12	15	15	15	
KK	MAIN	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M32x1.5	M32x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5
	AUX	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5
KT	2	4	5	-	6	-	7	7	7	8	8	-	8	8	8	-
	4, 6, 8	4	5	6	6	7	7	7	7	8	-	8	8	8	8	8
L	2	240	276	-	343	-	398	419	517	529	579	-	-	713	713	-
	4	240	276	313	343	-	398	419	517	529	-	579	-	676	676	-
	6	-	276	313	-	-	398	419	517	529	-	529	579	676	-	694
	8	-	276	313	-	364	-	419	517	529	-	529	-	676	676	-
LD	2	104	111	-	127	-	139	154	189	226	226	-	-	261	261	-
	4, 6, 8	104	111	116	127	137	139	154	189	226	-	226	226	261	261	261
WEIGHT (kg)	16	17	25	35	35	48	59	100	113	115	125	117	190	190	220	

** Weight is given in kg as an approximate value.



DIMENSIONS

FOOT MOUNTED

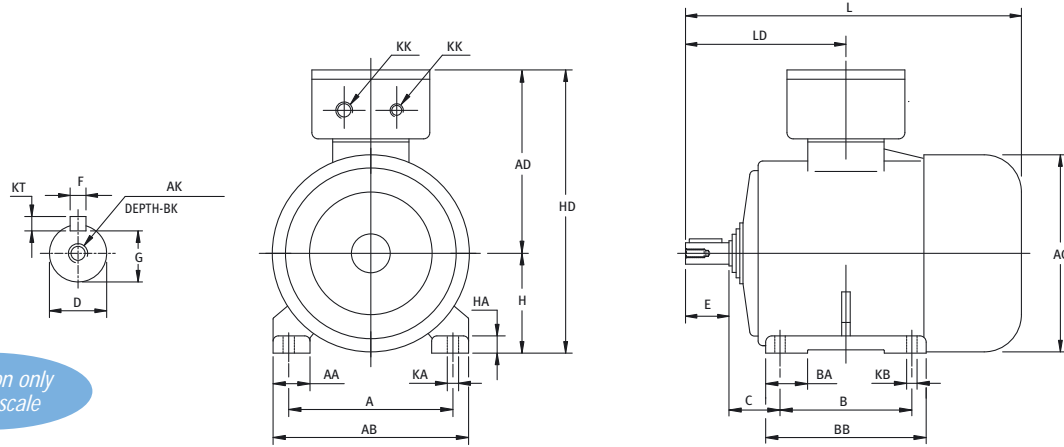


Illustration only
Not to scale

2, 4, 6, 8 POLE

ALL DIMENSIONS (mm)

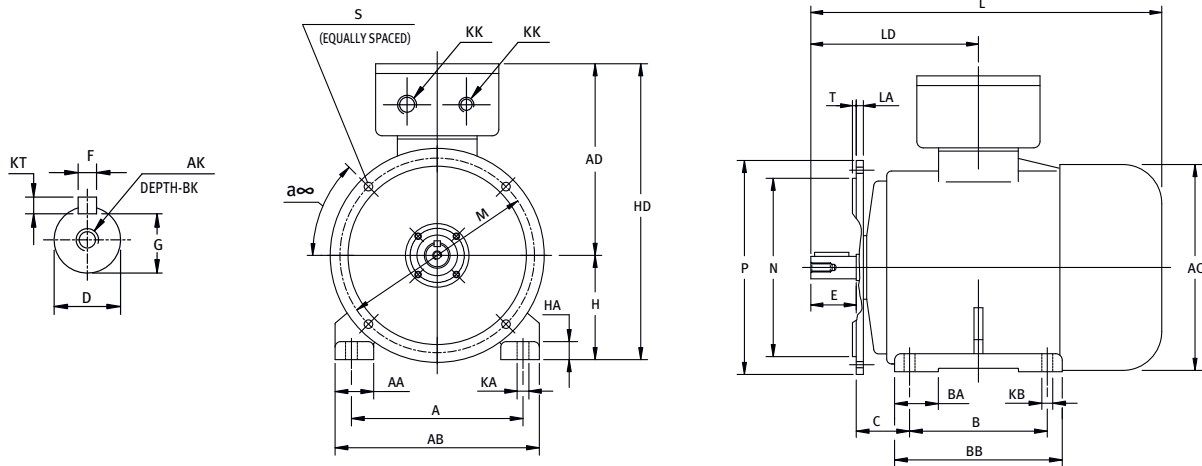
DIMENSIONS	FRAME												
	180M-Y	180L-Y	180L-4Y	200L-Y	225S-Y	225M-Y	250S-Y	250M-Y	280S-Y	280M-Y	315S-Y	315M-Y	315L2-Y
A	279	279	279	318	356	356	406	406	457	457	508	508	508
AA	75	75	68	80	85	85	115	105	110	110	150	150	150
AB	350	350	350	390	450	450	510	510	570	560	630	630	630
AC	353	353	375	393	455	455	493	548	548	635	635	635	635
AD	375	375	391	391	457	457	477	517	517	591	591	591	591
AK	2	M16	-	-	M20	-	M20	M20	M20	M20	M20	M20	M20
	4, 6, 8	M16	M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20
B	241	279	279	305	286	311	311	349	368	419	406	457	508
BA	100	100	-	90	90	90	130	110	120	120	210	210	210
BB	340	340	340	365	370	370	420	420	500	570	615	615	615
BK	36	36	36	42	42	42	42	42	42	42	42	42	42
C	121	121	121	133	149	149	168	168	190	190	216	216	216
D	2	48	-	-	55	-	55	60	60	65	65	65	65
	4	48	48	48	55	60	60	70	70	80	80	85	85
	6, 8	-	48	-	55	60	60	70	70	80	80	-	-
E	2	110	-	-	110	-	110	140	140	140	140	140	140
	4, 6, 8	110	110	110	110	140	140	140	170	170	170	170	170
F	2	14	-	-	16	-	16	18	18	18	18	18	18
	4, 6, 8	14	14	14	16	18	18	20	20	22	22	22	22
G	2	42.5	-	-	49	-	49	53	53	58	58	58	58
	4	42.5	42.5	42.5	49	53	53	62.5	62.5	71	71	76	76
	6, 8	-	42.5	-	49	53	53	62.5	62.5	71	71	-	-
H	180	180	180	200	225	225	250	250	280	280	315	315	315
HA	25	25	25	30	35	35	35	40	45	48	40	40	40
HD	555	555	571	591	682	682	727	767	797	871	906	906	906
KA	20	20	16	26	26	26	22	26	35	26	30	30	30
KB	15	15	16	20	20	20	22	26	26	26	39	39	39
KK	MAIN	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5
	AUX	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5
KT	2	9	-	-	10	-	10	11	11	11	11	11	11
	4, 6, 8	9	9	9	10	11	11	12	12	14	14	14	14
L	2	726	-	-	789	-	906	1000	1110	1110	1268	1268	1468
	4	726	726	789	789	936	936	1000	1110	1139	1298	1298	1498
	6	-	726	-	789	-	887	934	1110	1139	1298	-	-
	8	-	726	-	-	-	-	-	-	-	-	-	-
LD	2	369	-	-	390	-	347	482	483	483	496	496	496
	4, 6, 8	369	369	390	390	377	377	482	483	513	526	526	526
WEIGHT (kg)	196	225	208	280	372	404	588	740	820	1040	1120	1210	1430

** Weight is given in kg as an approximate value.



DIMENSIONS

FOOT & FLANGE MOUNTED



2, 4, 6, 8 POLE

ALL DIMENSIONS (mm)

DIMENSIONS	FRAME															
	63K+L	71K+L	80K+L	80K+L-Y	90L	90L-Y	100L-Y	112M-Y	132S-Y	132S2-Y	132M-Y	132M2-Y	160M-Y	160L-Y	160L6Y	
A	100	112	125	125	140	140	160	190	216	216	216	216	254	254	254	
AA	20	30	35	35	40	40	38	42	45	60	60	60	65	65	65	
AB	120	139	160	160	180	180	200	235	266	266	266	266	310	310	310	
AC	134	145	163	158	183	178	198	218	265	265	265	265	318	318	318	
AD	161	161	175	189	178	202	209	229	266	266	266	266	304	304	304	
AK	2	M4	M5	M6	M6	M8	M8	M10	M10	M12	M12	-	M16	M16	-	
	4, 6, 8	M4	M5	M6	M6	M8	M8	M10	M10	M12	-	M12	M12	M16	M16	
B	80	90	100	100	125	125	140	140	140	140	178	178	210	254	254	
BA	25	25	35	37	40	44	46	46	60	60	60	60	100	100	100	
BB	100	110	130	130	155	155	175	175	187	187	225	225	300	300	300	
BK	10	12.5	16	16	19	19	22	22	28	28	28	28	36	36	36	
C	40	45	50	50	56	56	63	70	89	89	89	89	108	108	108	
D	2	11	14	-	19	-	24	28	28	38	38	-	42	42	-	
	4	11	14	19	19	-	24	28	28	38	-	38	42	42	-	
	6, 8	11	14	19	19	24	24	28	28	38	-	38	42	42	42	
E	2	23	30	-	40	-	50	60	60	80	80	-	110	110	-	
	4, 6, 8	23	30	40	40	50	50	60	60	80	-	80	110	110	110	
F	2	4	5	-	6	-	8	8	8	10	10	-	12	12	-	
	4, 6, 8	4	5	6	6	8	8	8	8	10	-	10	12	12	12	
G	2	8.5	11	-	15.5	-	20	24	24	33	33	-	37	37	-	
	4	8.5	11	15.5	15.5	-	20	24	24	33	-	33	37	37	-	
	6, 8	8.5	11	15.5	15.5	20	20	24	24	33	-	33	37	37	37	
H	63	71	80	80	90	90	100	112	132	132	132	132	160	160	160	
HA	6	10	12	12	12	12	15	17	20	20	20	20	25	25	25	
HD	224	232	255	269	268	292	309	341	398	398	398	398	464	464	464	
KA	10	10	12	12	12	12	15	15	15	15	15	15	20	20	20	
KB	7	7	9.5	9.5	9.5	9.5	12	12	12	12	12	12	15	15	15	
KK	MAIN	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M32x1.5	M32x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	M40x1.5	
	AUX	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	
KT	2	4	5	-	6	-	7	7	7	8	8	-	8	8	-	
	4, 6, 8	4	5	6	6	7	7	7	7	8	-	8	8	8	8	
L	2	240	276	-	343	-	398	419	517	529	579	-	713	713	-	
	4	240	276	313	343	-	398	419	517	529	-	579	-	676	676	
	6	-	276	313	-	-	398	419	517	529	-	529	579	676	-	694
	8	-	276	313	-	364	-	419	517	529	-	529	-	676	676	-
LD	2	104	111	-	127	-	139	154	189	226	226	-	261	261	-	
	4, 6, 8	104	111	116	127	137	139	154	189	226	-	226	261	261	261	
LA	9	9	12	12	12	12	16	16	16	16	16	16	20	20	20	
M	115	130	165	165	165	165	215	215	265	265	265	265	300	300	300	
N	95	110	130	130	130	130	180	180	230	230	230	230	250	250	250	
P	140	160	200	200	200	200	250	250	300	300	300	300	350	350	350	
S	9	9	12	12	12	12	14.5	14.5	14.5	14.5	14.5	14.5	18.5	18.5	18.5	
T	3	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	5	5	5	
FLG HOLES	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
WEIGHT (kg)	16	17	25	35	35	48	59	100	113	115	125	117	190	190	220	

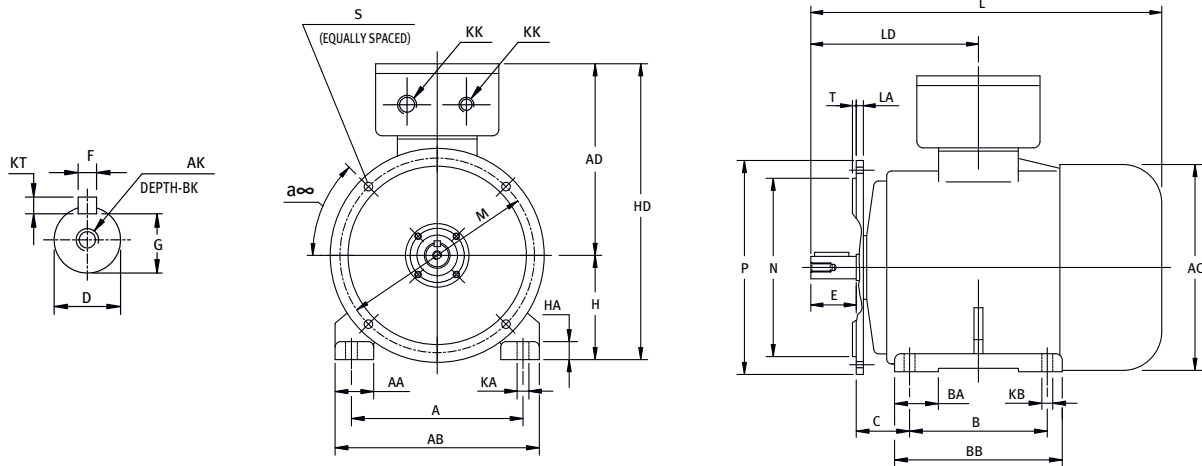
** Weight is given in kg as an approximate value.

Angle α° for 4 hole = 45° , 8 hole = 22.5° .



DIMENSIONS

FOOT & FLANGE MOUNTED



2, 4, 6, 8 POLE

ALL DIMENSIONS (mm)

DIMENSIONS	FRAME													
	180M-Y	180L-Y	180L-4Y	200L-Y	225S-Y	225M-Y	250S-Y	250M-Y	280S-Y	280M-Y	315S-Y	315M-Y	315L2-Y	
A	279	279	279	318	356	356	406	406	457	457	508	508	508	
AA	75	75	68	80	85	85	115	105	110	110	150	150	150	
AB	350	350	350	390	450	450	510	510	570	560	630	630	630	
AC	353	353	375	393	455	455	493	548	548	635	635	635	635	
AD	375	375	391	391	457	457	477	517	517	591	591	591	591	
AK	2	M16	-	M20	-	M20	M20	M20	M20	M20	M20	M20	M20	
	4, 6, 8	M16	M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20	
B	241	279	279	305	286	311	311	349	368	419	406	457	508	
BA	100	100	-	90	90	90	130	110	120	120	210	210	210	
BB	340	340	340	365	370	370	420	420	500	570	615	615	615	
BK	36	36	36	42	42	42	42	42	42	42	42	42	42	
C	121	121	121	133	149	149	168	168	190	190	216	216	216	
D	2	48	-	-	55	-	55	60	60	65	65	65	65	
	4	48	48	48	55	60	60	70	70	80	80	85	85	
	6, 8	-	48	-	55	60	60	70	70	80	80	-	-	
E	2	110	-	-	110	-	110	140	140	140	140	140	140	
	4, 6, 8	110	110	110	110	140	140	140	140	170	170	170	170	
F	2	14	-	-	16	-	16	18	18	18	18	18	18	
	4, 6, 8	14	14	14	16	18	18	20	20	22	22	22	22	
G	2	42.5	-	-	49	-	49	53	53	58	58	58	58	
	4	42.5	42.5	42.5	49	53	53	62.5	62.5	71	71	76	76	
	6, 8	-	42.5	-	49	53	53	62.5	62.5	71	71	-	-	
H	180	180	180	200	225	225	250	250	280	280	315	315	315	
HA	25	25	25	30	35	35	35	40	45	48	40	40	40	
HD	555	555	571	591	682	682	727	767	797	871	906	906	906	
KA	20	20	16	26	26	26	22	26	35	26	30	30	30	
KB	15	15	16	20	20	20	22	26	26	26	39	39	39	
KK	MAIN	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M50x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5	M63x1.5	
	AUX	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	
KT	2	9	-	-	10	-	10	11	11	11	11	11	11	
	4, 6, 8	9	9	9	10	11	11	12	12	14	14	14	14	
L	2	726	-	-	789	-	906	1000	1110	1110	1268	1268	1468	
	4	726	726	789	789	936	936	1000	1110	1139	1298	1298	1498	
	6	-	726	-	789	-	887	934	1110	1139	1298	-	-	
	8	-	726	-	-	-	-	-	-	-	-	-	-	
LD	2	369	-	-	390	-	347	482	483	483	496	496	496	
	4, 6, 8	369	369	390	390	377	377	482	483	513	526	526	526	
LA	20	20	20	20	22	22	18	18	18	18	22	22	22	
M	300	300	300	350	400	400	500	500	500	500	600	600	600	
N	250	250	250	300	350	350	450	450	450	450	550	550	550	
P	350	350	350	400	450	450	550	550	550	550	660	660	660	
S	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	24	24	24	
T	5	5	5	5	5	5	5	5	5	5	6	6	6	
FLG HOLES	4	4	4	4	8	8	8	8	8	8	8	8	8	
WEIGHT (kg)	196	225	208	280	372	404	588	740	820	1040	1120	1210	1430	

** Weight is given in kg as an approximate value.

Angle α° for 4 hole = 45° , 8 hole = 22.5° .



BEARING INFORMATION

BEARINGS FOR Exd MOTORS – TABLE 3

Frame Size	Poles	Drive End	N.D. End
63K+L	2,4	6202 2ZR	6004 2ZR
71K+L	2,4,6,8	6202 2ZR	6004 2ZR
80K+L	4,6,8	6204 2ZR	6204 2ZR
80K+L Y	2,4	6205 2ZR	6205 2ZR
90L	8	6205 2ZR	6205 2ZR
90L Y	2,4,6	6206 2ZR C3	6206 2ZR C3
100L Y	2,4,6,8	6306 2ZR C3	6206 2ZR C3
112M Y	2,4,6,8	6308 2ZR C3	6308 2ZR C3
132 Y	2,4,6,8	6308 2ZR C3	6308 2ZR C3
160 Y	2,4,6,8	6309 C3	6309 C3
180 Y	2,4,6,8	6310 C3	6310 C3

Frame Size	Poles	Drive End	N.D. End
180L-4Y	4	6312 C3	6312 C3
200L Y	2,4,6,8	6312 C3	6312 C3
225 Y	2,4,6,8	6313 C3	6313 C3
250S Y	4,6	6316 C3	6315 C3
250M Y	2,4,6	6316 C3	6315 C3
280S Y	2,4,6	6316 C3	6315 C3
280M Y	2	6316 C3	6316 C3
	4,6	6318 C3	6316 C3
315 Y	2	6316 C3	6316 C3
	4	6318 C3	6316 C3

RE-GREASING INFORMATION FOR Exd MOTORS – TABLE 4

Bearing No.	Grease Qty (Grams)	Replenish Intervals (Operating Days)			
		2P	4P	6P	8P
6309 C3	30	50	130	130	130
6310 C3	30	50	130	130	130
6311 C3	30	50	130	130	130
6312 C3	30	50	130	130	130
6313 C3	30	50	130	130	130
6314 C3	50	40	100	130	130
6315 C3	50	40	100	130	130
6316 C3	50	40	100	130	130
6317 C3	80	40	100	130	130
6318 C3	80	40	100	130	130

Maintenance-free service life for “sealed for life” bearings, with direct coupled operation running in ambient temperatures up to 40°C, 24 hr / day. Therefore for 8 hr / day multiply interval by 3.

Note: Intervals should be reduced for motors with increased output operation.

Note: Table 4 is based on motor running in ambient temperatures up to 40°C, 24 hr / day. Therefore for 8 hr / day multiply interval by 3.

RELUBRICATION DEVICE AND INTERVALS

For frame sizes 160 and above, motors are equipped with relubrication devices (grease nipples) and grease distributors. Bearings with relubrication devices are packed with lithium-saponified grease. The relubrication intervals are listed in Table 4. For vertical construction types (V type), halve the relubrication times.

Always regrease bearings with the same grease type, i.e. grease with the same saponification component and the same consistency. Toshiba use lithium-saponified anti-friction roller bearing grease with a drop point above 185 °C (e.g. Esso Unirex N3). See also information plate on motor.

The collecting chamber in the bearing cover is large enough to contain the used grease accumulated during normal service life of the bearings. Flat grease nipples to DIN 3404 with thread size M10 x 1 are used.

ANTI-CONDENSATION HEATERS

As an option, strip type anti-condensation heaters can be fitted to the windings at additional cost.

Supply voltage 230 V (+/-) 10 %, Frequency 45-65 Hz.

TERMINAL BOX ENTRIES

Table 5 indicates standard terminal box entries, and certified options for Toshiba FLEXI MOUNT motors.

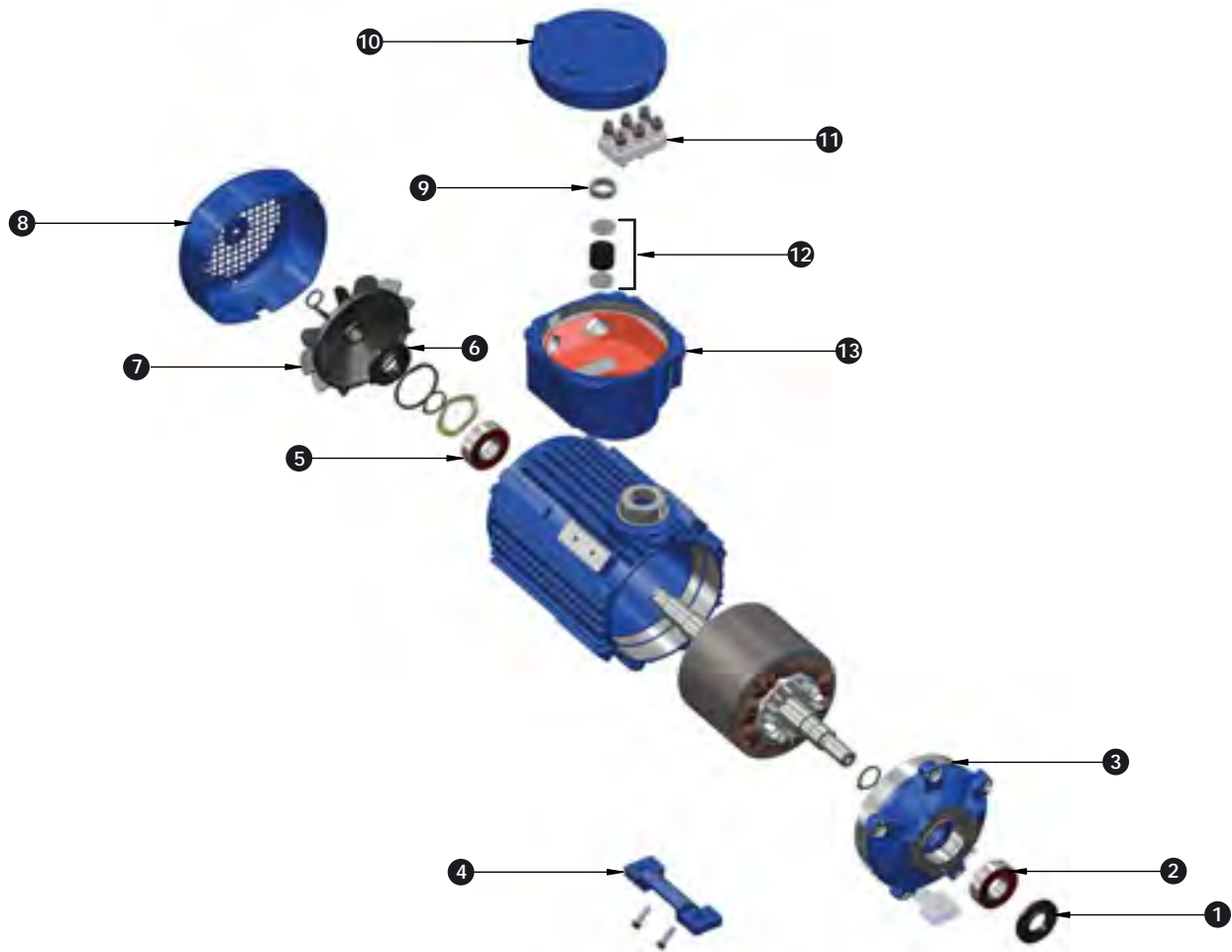
TERMINAL BOX ENTRIES – TABLE 5

Frame size	Standard Entries	Maximum Size & No. Power Cable Entries	Maximum Size & No. Auxiliary Cable Entries	Max. Total No. Entries
63 – 90	M25 x 2	M32 x 1	M32 x 1	2
100 – 112	M32 x 1 +M25 x 1	M32 x 1	M32 x 1	2
132 – 160	M40 x 1 +M25 x 1	M50 x 1 or M40 x 2	M25 x 1 (with M50 x 1)	2
180 – 225	M50 x 1 +M25 x 1	M63 x 1 or M50 x 2	M25 x 1 (with M63 x 1)	3
250 – 280	M63 x 1 +M25 x 1	M63 x 2	M25 x 1 (or M25 x 3 with M63 x 1)	4
315	M63 x 1 +M25 x 1	M63 x 2	M25 x 1 (or M25 x 3 with M63 x 1)	4
355 – 450	M63 x 1 +M25 x 1	M63 x 2	M25 x 3	5



TYPICAL PARTS LIST

TYPICAL PARTS LIST		Example: Toshiba Flexi Mount Exd Motor			
		EXPLODED VIEW DRAWING			
MODEL N°	714-B0003				
OUTPUT kW	0.37	POLES	4	FRAME	CD71



ITEM N°	DESCRIPTION	PRODUCT CODE
1	SHAFT SEAL - DRIVE END	RSSCD6371
2	BEARING - DRIVE END	6202-2ZR
3	ENDSHIELD - DRIVE END	15448 75 E307
4	FOOT	FOOT CD71
5	BEARING - NON DRIVE END	6004-2ZR
6	SHAFT SEAL - ND END	RSSCD6371
7	FAN	FANCD71
8	FAN COWL	PMCD71
9	THRUST SCREW	15501 59 E407
10	TERMINAL BOX LID	TBOXLIDCD63112
11	TERMINAL BOARD SET	TBCD 63112
12	LINE BUSHING ASSEMBLY	15454 67 A407
13	TERMINAL BOX BASE	TBOXBASECD6390Y



Variable Speed Drives
(0.4kW – 630kW)



Electronic Soft Starters
(7.5kW – 3MW)



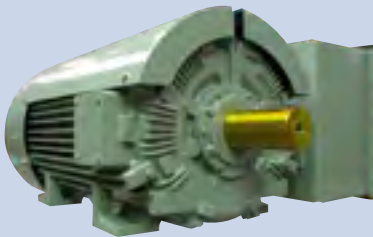
Large Drives/Drive Systems



nv Controller



Microwave Density Meter



High Efficiency HC Motor



Explosion Protected Motor



Protection Relays

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