

Creating technology and solutions
that power Australian industry

VHE SERIES

HEAVY DUTY ELECTRIC
MOTORS WITH EX OPTIONS
FOR HAZARDOUS AREAS



Toshiba creates technology and solutions that power Australian industry.

Toshiba International Corporation has been supporting Australia's growth for over 44 years.

Since 1978, Toshiba has provided some of the world's most energy-efficient engineered products to local and international customers alike.

Today, most of the base load energy generated in NSW is delivered by Toshiba. We have been involved in driving efficiency and operational improvements supporting some of Australia's largest mining, industrial, and petrochemical projects. Our people, our motors, control systems, and services have played an essential part in Australia's power network and infrastructure development.

Born in Japan, built in Australia

Toshiba Industrial Division was built on Australian soil, from humble beginnings as Maddrell Brothers, a family-run business in Sydney that supplied Toshiba's Japanese made equipment throughout Australia. This long-term partnership became the seed for Toshiba International Corporation Industrial Division.

Toshiba International Corporation has always done things differently.

Innovative thinking is in our DNA. Since our inception, our engineers and sales teams have proactively sought to understand our customers' needs and develop tailored technology solutions suited to Australia's unique environment.

This customer-first approach is the backbone of Toshiba International Corporation's culture. It is what drives us forward, enabling us to build a reputation of high quality and exceptional reliability.



Providing the solutions that power industry

From mine sites, power plants, and industrial facilities across the country, our people, products, and services have helped move industry forward.

As the needs of Australian industry grow and adapt, so too does Toshiba. Our teams are looking to the future, focusing on developing cyber physical solutions that will help create a more responsive, more efficient, and more agile industry. Our motivation is to deliver solutions that reduce our carbon footprint, while enabling our customers to confidently achieve their business goals.

Building a business for the next generation

Toshiba International Corporation has been a building block in Australian industry providing knowledge, support and exceptional service across generations.

Toshiba will continue improving and enhancing the performance of our range. We are preparing the next generation of equipment and associated service capabilities, to support our portfolio of products, systems and solutions.

Our commitment is to develop and innovate, to support our clients by delivering solutions that will continue to power Australian industry.

Applicable Standards and Regulations

Toshiba HE motors meet the requirements of relevant IEC and AS/NZ Standards and regulations

Greenhouse and Energy Minimum Standards (GEMS) Requirements

Toshiba VHE Series three phase electric motors comply with or exceed the latest energy efficiency regulations as set out in the Greenhouse and Energy Minimum Standards (Three Phase Cage Induction Motors) Determination 2019© issued by the Commonwealth of Australia.

VHE Motors in this brochure Comply with Table 2 of the above determination and meet the High Efficiency requirements. (Equivalent to IE3 as per IEC 60034-30-1 Ed. 1.0)

Made by Toshiba

Toshiba is focused on producing premium quality products equivalent to IE3 Efficiency Standards.

The VHE Series motors are manufactured by Toshiba Industrial Products Asia Co. Ltd (TIPA) in Vietnam.

Construction of the TIPA factory began in April 2009 on an 80,000 m² site on the outskirts of Ho Chi Minh City.

With modern manufacturing equipment spanning a floor area of approximately 24,000m², this facility provides employment for approximately 1450 people and produces around 50,000 motors a month.



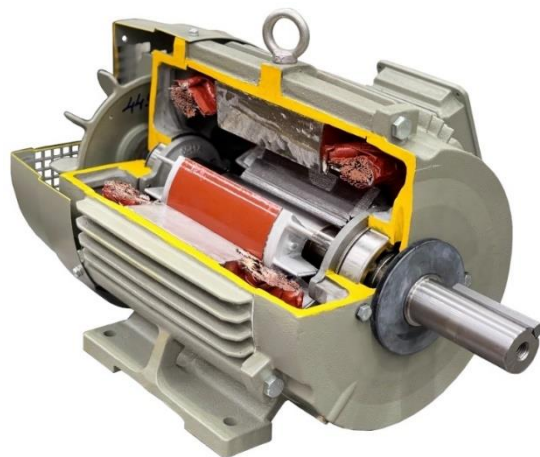
Export markets include Australia, USA, China, Europe, Japan and the rest of Southeast Asia.

HEAVY DUTY CONSTRUCTION

Frames

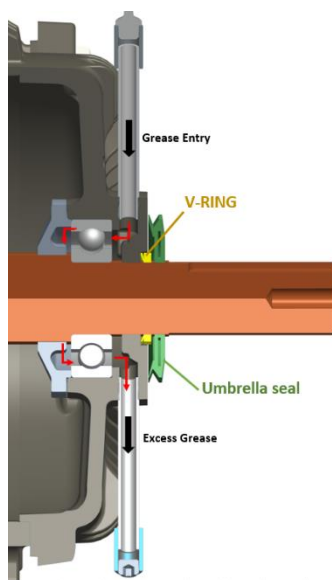
Frames of VHE Series motors are made of high-grade Cast Iron and are machined to close tolerances to ensure accurate alignment and fit in accordance with our high-quality standards. Exceptional corrosion resistance and high structural rigidity are inherent in Toshiba motor construction. Solid mounting foot pads are integrally cast for mechanical strength and easy alignment during installation.

Steel fan covers are standard while Cast Iron fan covers are available as an option.

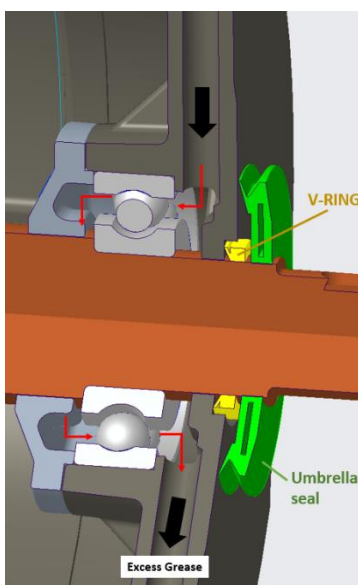


IP Rating and Seal Arrangements

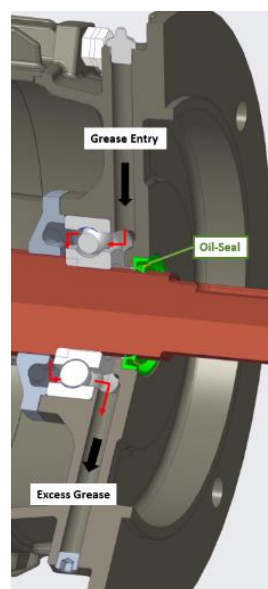
All VHE Series motors are verified to IP66 by Testsafe in Australia. Motor seals provide protection against the ingress of dust and water. Foot mounted IM1001-B3 motors are fitted with a V-ring and Umbrella Seal configuration on the Drive End (DE) and Non-Drive-End (NDE). Flange and Foot / Flange mounted motors feature a Double Lipped Oil Seal on the DE. The NDE has a V-ring and Umbrella Seal configuration.



Typical Example DE V-ring / Umbrella Seal



Typical Example NDE V-ring / Umbrella Seal



Typical Example Flange DE Oil Seal

Bearing Lubrication

D80 to D132 frame motors have Sealed for Life Bearings. Frame D160 and above have Re-greasable Ball Bearings. However please note that a Roller Bearing is fitted on the DE from Frame D225 4P.

Toshiba recommends the use of Shell Gadus S2V100 2 or 3 lithium-based grease. End shields fitted with grease nipples can be lubricated while the motor is running and the grease exit ports are open. The appropriate amount of grease is specified in our Installation and Operation Manual.



Typical NDE



Typical DE

Typical Thru flush grease lubrication system shown in the above images and illustrations.

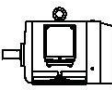
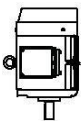
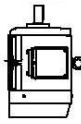
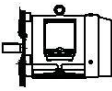
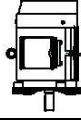
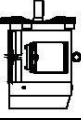


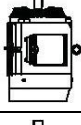



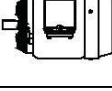

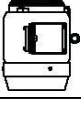
Types of Construction

The most common types of mounting options are shown in the table below.
(In accordance to IEC Standard 60034-7)

Proper motor installation and mounting position is essential in obtaining the best performance and maximum reliability.

The design of most motors is such that they can usually be operated in many mounting positions. Some mounting positions require additional construction modifications to achieve optimal performance. For example, shaft-up or shaft-down outdoor applications may require drilling of additional drain holes, fitting of rain hats and special bearings to support heavy loads. (Dependent on the application.)

Other types of mounting arrangements can be provided upon request. Please consult Toshiba regarding types of mounting arrangements available.

Types	Basic Construction Type	Derived Construction Type (Additional types available on request)	
VHE 71 - 225 Foot Mounted	IM B3 IM1001 	IM V5 IM1011 	IM V6 IM1031 
VHE 71 - 225 Foot and D-Flange Mounted	IM B35 IM 1001 	IM V15 IM 2011 	IM V36 IM 2031 
VHE 71 - 225 Foot and C-Flange Mounted	IM B34 IM 2101 	IM V17 IM 2111 	IM V37 IM 2131 
VHE 71 - 225 D-Flange Mounted	IM B5 IM 3001 	IM V1 IM 3011 	IM V3 IM 3031 
VHE 71 - 225 C-Flange Mounted	IM B14 IM 3601 	IM V18 IM 3611 	IM V19 IM 3631 

Note: For Vertical shaft mounting, bearing arrangement may need to be reviewed.

Bearing Information

Toshiba VHE Series motors are fitted with anti-friction bearings of leading manufacturers.

Frame Number	D80	D90S	D90L	D100L	D112M	D132S	D132M
Poles	2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6
Drive End	6204ZZ	6205ZZ	6205ZZ	6206ZZ	6207ZZ	6308ZZ	6308ZZ
Non-Drive End	6204ZZ	6205ZZ	6205ZZ	6205ZZ	6206ZZ	6208ZZ	6208ZZ

Frame Number	D160M & D160L		D180M & D180L		D200L		D225S & D225M	
Poles	2	4, 6	2	4, 6	2	4, 6	2	4, 6
Drive End	6310C3	6310C3	6310C3	6310C3	6312C3	6312C3	6312C3	NU313C3
Non-Drive End	6208C3	6208C3	6310C3	6310C3	6312C3	6312C3	6312C3	6312C3

Cooling

VHE Series motors are totally enclosed fan cooled (TEFC) by design and come fitted with a dynamically balanced Cast Iron, Low Noise Bi-directional external cooling fan that provides cooling independent of the direction of rotation. (IC411 to IEC60034-6).

Other versions such as non-ventilated (TENV), air over (TEAO) or forced ventilated TEFV (IC416) are available on request.

The cooling system is designed to minimise noise levels, optimise airflow and improve motor thermal efficiency. VHE Series motors are supplied with Pressed Metal Fan Cowls. Fan Cowls made with Stainless Steel or Cast-Iron material are available as an option on request.

For environments with extreme dirt, a duct with an external blower is used to bring clean air into the motors air-intake.

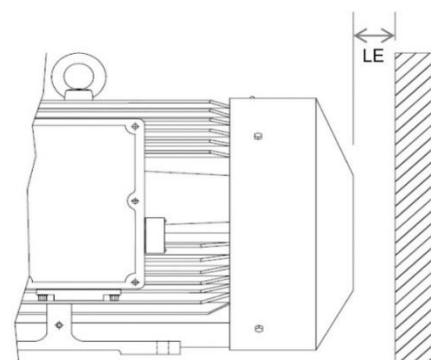
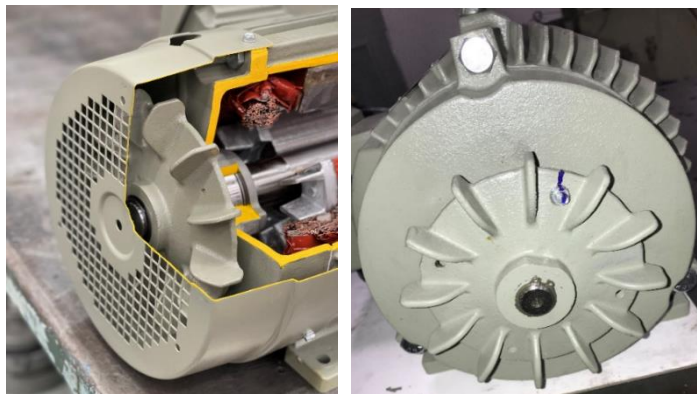
The addition of a Forced Ventilation (IC416) fan should be considered for certain duty cycle applications or when motors are operated at low speed on a Variable Speed Drive.

Toshiba can also supply motors with special low noise level fans and acoustic covers on request.

When installing the motors, a minimum clearance between the Fan Cowl and the wall (dimension LE as per illustration) must be observed to ensure correct cooling.

Minimum distance between obstacle and air inlet opening:

Shaft Height	LE (mm)
Up to 160	40
180 to 225	85



Minimum distance between obstacle and air inlet opening

Paint

VHE Series Motor Standard Paint System is suitable for C3 (environment) and L (lifespan). The Standard Toshiba paint colour is RAL 7003 Moss Grey. Special paint systems can be provided as an option to suit motors operating in harsh or corrosive environments.

Ambient Condition

Motors are designed for -20°C to 50°C ambient conditions.

Main Terminal Box

VHE Motors have Cast Iron Main Terminal Boxes that are diagonally split, with a flange mounted lid and neoprene gaskets. The Terminal Block is a stud type with terminations for the six (6) motor winding leads.

The main Terminal Box has Internal Grounding provision as per CE requirements. Motors have a grounding connection between Frame and Terminal Box.

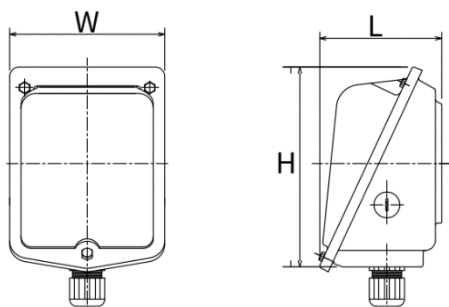
Terminal Boxes may be rotated by 90° into four positions for cable entry. They are mounted on the right-hand side as viewed from the motors drive end. The Terminal box can also be mounted on the left-hand side as an option if required.

All Terminal Boxes have threaded conduit openings with 1 x Black plastic Cable gland and 1 x M20 plastic plug for the Auxiliary cable.

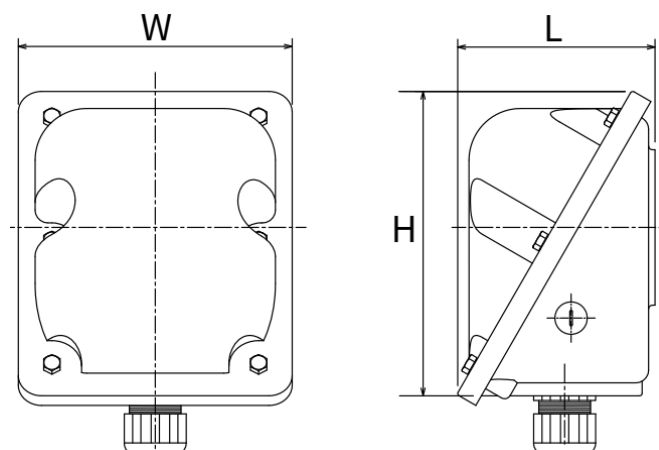
Motors in frames D112 and below may be configured for 220V-240V Delta or 380V-415V Star operation. Motors in larger frames are suitable for Direct-On-Line, Auto- transformer, Star-Delta, Soft Starter and VVVF Drive starting with 380V-415V power supplies. Toshiba motors can be supplied with Voltages up to 1100Volts. (Special motors or Ex motors may have 3 winding leads only.)

One set of 155°C rated PTC Thermistors are fitted as standard in all motors. Thermistor terminals are marked T1 and T2 and are terminated in the Main Terminal Box. Auxiliary Terminal boxes can be fitted as an option when required. An earthing terminal is provided inside the Main Terminal Box, with an additional external earthing facility on all motor frames.

Standard Cast Iron Terminal Box Construction:

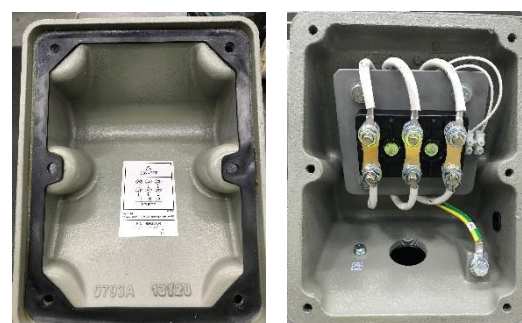
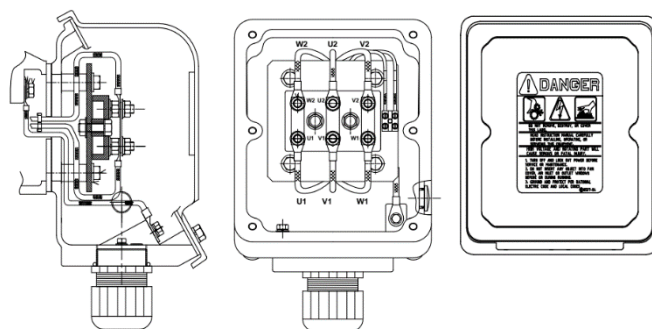


80-112 Frame

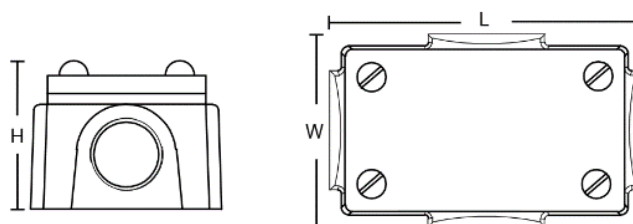


180-225 Frame

Cast Iron Standard Main Terminal Box			
Frame Sizes	H (mm)	W (mm)	L (mm)
80-112	154	134	85
132-160	198	150	118
180-225	242	212	153



Terminal Box with Internal Earth Points



Cast Iron Standard Auxiliary Terminal Box			
Box Size	J1001	J1002	J1003
L x W x H (mm)	134 x 106 x 82	162 x 122 x 84	197 x 136 x 115
Please Note: Other Versions or Special Auxiliary Terminal Boxes may be used from time to time.			

Large Oversized and Special Terminal Boxes are available on request. For non-standard Terminal Box positions please contact Toshiba.

External Earth

An External Earth bond is drilled and tapped. Bonding fasteners are fitted with lug, spring washer and flat washer as follows:

M5 for 63~112M
M6 for 132~160L
M8 for 180~225M



External Earth

Premium Grade Laminations

Longer stator core packs with laminations constructed from Premium-grade silicon steel contribute to lower operating densities and losses thus achieving optimum efficiency levels.



High Torque Rotor

Pressure cast aluminium rotors with integrally cast bars, end rings and cooling fans, provide reliable operation. Specially designed rotors give Toshiba motors advantageous torque characteristics and minimise losses.

Rating plate

Our standard stainless-steel rating plate displays the most important motor information including serial number, kW rating, voltage, frequency, current, IP protection, power factor, speed, thermal class, IE efficiency rating and construction type. Explosion Protection classification is listed (when applicable).

The scope of information may vary according to motor type. Rating plates are attached to the housing so that they are permanently secured. Consultation is required if any additional plates are required.

TOSHIBA				VHE SERIES			
MODEL NO. SERIAL NO.		FRAME WT.		TYPE FORM			
DUTY TYPE	IP:	°C ≤ Tamb. ≤	°C	TH. CLASS	ENCL.	DESIGN	
kW	RPM	Hz	IC	L.S.:		O.S.:	
VOLT	AMP	COS φ		MFG. DATE		MAX SAFE RPM	
FL EFF.	3/4 EFF.	1/2 EFF.					
kW	RPM	Hz	IC				
VOLT	AMP	COS φ					
FL EFF.	3/4 EFF.	1/2 EFF.					
THERMISTOR TEMPERATURE-LIMITING DEVICES CONNECTION BETWEEN TP1-TP2 THERMISTOR FITTED TYPE PTC PROTECTION TO AS/EC 60947.8 WARNING MAX VOLTS 2.5 TRIP TEMP P °C/T1000							
TOSHIBA INTERNATIONAL CORP. PTY LTD - AUSTRALIA MADE IN VIETNAM							
3 PHASE MOTOR IEC 60034-1							

Insulation System

For improved Efficiency, VHE series motors use greater cross-sectional area of copper thereby reducing winding resistance. VHE Series motors have a Class H (180°C) Insulation system with motor temperature rise limited to Class B levels. This provides increased thermal reserves and a longer motor life.

VHE Series motors are random wound with high quality Inverter Duty enamelled copper wire. (Based on IEC 60317-0-1 and IEC60317-13)

This ensures VHE motors have not only good spike resistance but they also have outstanding performance at higher temperatures.

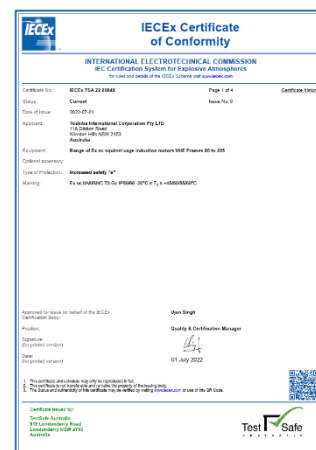
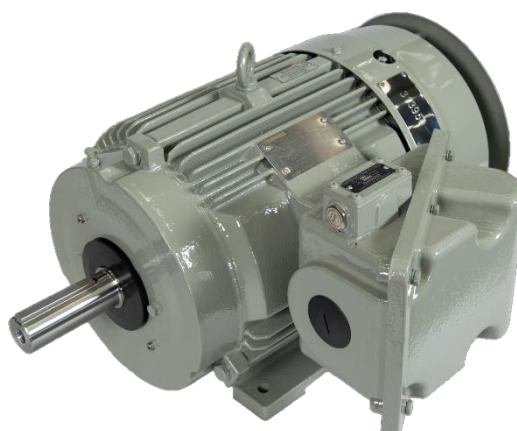
All motors undergo an Immersion Impregnation process which guarantees high mechanical and electrical strength, and ensures a prolonged service life.



IEC Ex ec – Increased Safety Motors (Formerly Ex nA)

Toshiba offers a full range of IEC Ex ec Certified increased safety VHE Series IE3 motors. These motors are upgraded and designed to meet the demanding applications where increased safety protection is required.

These Increased Safety Ex ec motors do not produce sparks, arcs or dangerous temperatures in normal operation. Special measures are taken to increase the safety of the motors so that they are suitable for operation in areas endangered by explosive gas atmospheres.



Efficiency

Toshiba VHE Series three phase electric motors comply or exceed the latest energy efficiency regulations as set out in the Greenhouse and Energy Minimum Standards (Three Phase Cage Induction Motors) Determination 2018 © issued by the Commonwealth of Australia.

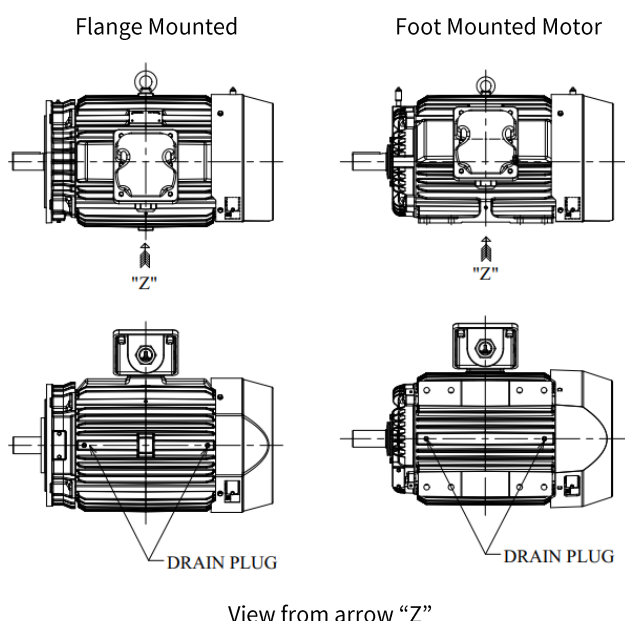
VHE Series Motors in this brochure Comply with Table 2 of the above determination and meet the High Efficiency requirements. (Equivalent to IE3 as per IEC 60034-30-1 Ed. 1.0)

Efficiency and performance are check tested in our AMPEC Test Centre in Winston Hills in Australia.

Drain Plugs

Motors in Frame D160 and above have Stainless Steel Drain Plugs as standard. Drain Plugs are not fitted on motors D80 to D132 Frame. However, this is an optional feature available on request.

Stainless Steel porous Drain Plugs are suitable for Horizontal mounting and can be included on motors for Vertical mounting when requested. This is also an Optional feature on smaller frames.



Stainless Steel Drain Plugs

Vibration and Balancing

The permissible vibration severities for electric motors are specified in standard IEC 60034-14.

Toshiba VHE Series motors comply with the limit values specified for vibration severity grade A (normal, without designation on the rating plate) in their basic versions.

Maximum vibration magnitude limits (rms values) in terms of displacement, velocity and acceleration for a frame size “H” (IEC 60034-14):

Vibration grade	Shaft Height (mm)	56 ≤ H ≤ 132			132 < H ≤ 225		
	Mounting	Displac. μm	Vel. mm/s	Acc. m/s ²	Displac. μm	Vel. mm/s	Acc. m/s ²
A	Free Suspension	25	1.6	2.5	35	2.2	3.5
	Rigid Mounting	21	1.3	2	29	1.8	2.8
B	Free Suspension	11	0.7	1.1	18	1.1	1.7
	Rigid Mounting	-	-	-	14	0.9	1.4

Grade A is applicable for machines with no special vibration requirements.

Grade B is applicable for machines with special vibration requirements.

All rotors are balanced dynamically to G2.5 with a half-key. Upon request, it is possible to perform balancing with a full key. In case of VVVF-fed operation with frequencies greater than 60 Hz, special balancing may be required.

TIC Advanced Motor Performance & Efficiency Centre (AMPEC)

Toshiba has the ability to perform the following in-house testing in Australia at our AMPEC Testing facility:



Type Test
Load Characteristics
te time test for Ex e motors

Efficiency Testing to AS1359 and IEC60034-2 Standards
T-N curve optional with limitation
Motor and Drive Performance Testing

Ex motor performance testing under Testsafe Australia approval OD24

Additional Tests:

Thermistor Resistance Test; Bearing RTD Test; Winding RTD Test; Ambient RTD Test, Heater Resistance Test; Winding Resistance Test; No Load Test Run, VVVF with Motor Test and Bearing Condition Monitoring Test

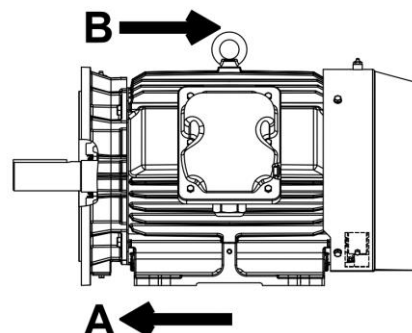


We can test motors upto the following ratings:

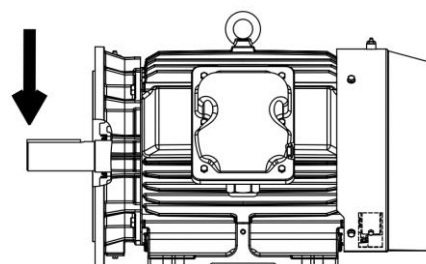
	2P	4P	6P	8P
Efficiency	150kW	150kW	150kW	110kW
Full Voltage T-N	55kW	55kW	55kW	45kW

Standard Permissible Axial and Permissible Radial Bearing Loads

PERMISSIBLE AXIAL BEARING LOADS						
STANDARD AXIAL LOAD RATING						
Frame	2 Pole		4 Pole		6 Pole	
	D.E (A)	N.D.E (B)	D.E (A)	N.D.E (B)	D.E (A)	N.D.E (B)
80M	18.7	13.1	26.2	20.6	31.6	26.0
90S,L	20.2	13.9	28.6	22.3	34.4	28.1
100L	30.1	22.4	41.7	34.0	50.0	42.3
112M	43.9	22.3	58.8	33.6	69.5	41.8
132S,M	73.9	39.6	97.9	57.4	115.1	70.3
160M,L	120.7	38.3	157.2	56.2	182.6	68.4
180M,L	118.3	45.4	154.3	65.3	179.7	79.5
200L	156.6	39.6	200.3	56.7	238.2	75.8
225S,M	181.2	181.2	299.3	299.3	337.9	337.9



PERMISSIBLE RADIAL BEARING LOADS			
STANDARD RADIAL LOAD RATING			
Output (kW)	2 Pole	4 Pole	6 Pole
0.75	45.6	57.3	69.8
1.1	45.4	60.9	72.5
1.5	48.2	63.3	100.1
2.2	50.0	86.8	129.7
3	68.6	86.5	196.6
4	90.2	112.7	205.1
5.5	136.1	170.7	203.8
7.5	135.4	177.5	303.1
11	211.1	265.5	312.0
15	210.5	273.4	313.2
18.5	216.7	27.8	420.1
22	211.9	273.2	416.5
30	290.0	331.4	848.8
37	287.0	745.2	1214.9
45	281.7	751.9	1225.1



Note:

1. Unit for all values are kg
2. This table applies to B3, B5, B35 TEFC motors only
3. Values based on 25000 hours of bearing life
4. Values multiplied 0.794 will give 50000h bearing life
5. Values multiplied 0.633 will give 100000h bearing life
6. All values are just a guide for reference only

Motors with VVVF Drives

Toshiba VHE Series motors are “Converter Capable Motors”, as defined in IEC60034-1 (2022). The winding Insulation System can withstand the Impulse Voltage Insulation Class (IVIC) C level between phase to phase and IVIC B Level between phase to ground

Toshiba VVVF Drive and Motor systems when used together improve efficiency, reliability and productivity while minimising overall operating costs. If you require any further information regarding our Motor and Drive packages, please contact your Toshiba representative.

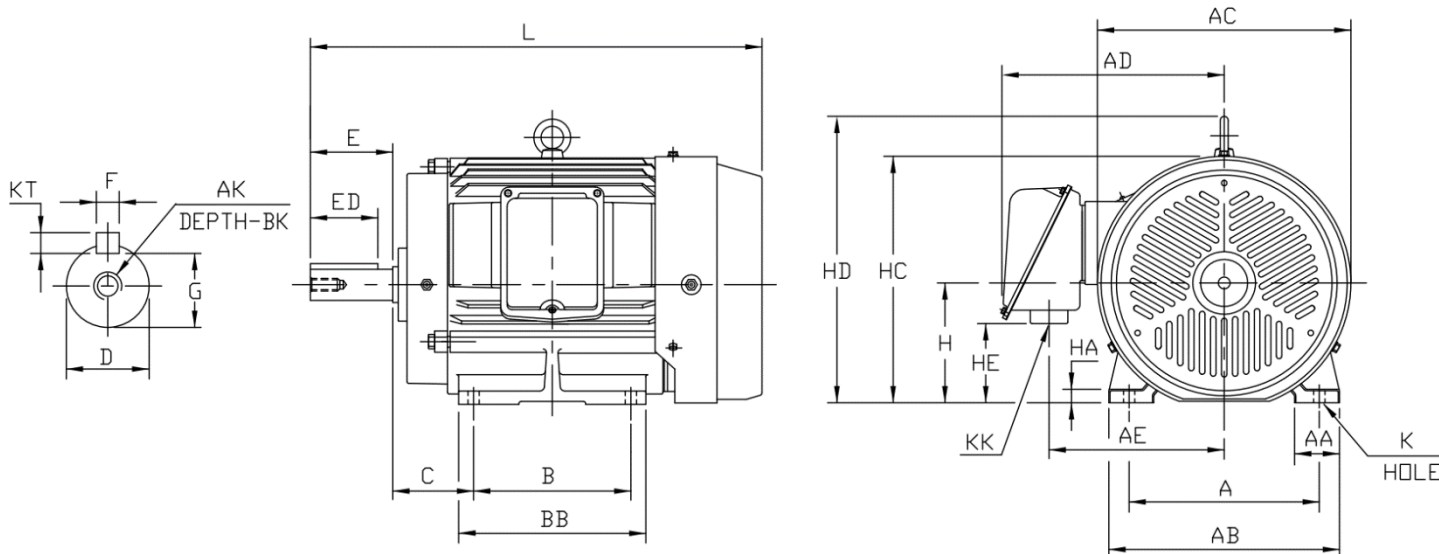


PERFORMANCE DATA AT 415V - 50Hz

Output kW	Poles	RPM	Frame Number	Full Load Current (A)	No Load Current (A)	Locked Rotor Current (A)	Locked Rotor Torque (%)	Pull Up Torque (%)	Break Down Torque (%)	Efficiency (%)				Power Factor				Rotor GD ² (kg.m ²)	Sound Pressure dB(A) at 1 metre*	Approx. NET Weight (kg)
										Full Load	75% Load	50% Load	25% Load	Full Load	75% Load	50% Load	25% Load			
0.75	2	2885	D80M	1.54	0.86	10.1	229	201	320	80.8	81.2	78.6	69.3	83.8	76.1	62.7	41.0	0.005	58	18
	4	1445	D80M	1.86	1.29	13.5	397	360	505	84.3	83.7	80.7	70.5	66.6	57.3	44.4	27.5	0.017	50	22
	6	965	D90SL	1.93	1.35	12	256	210	284	81.2	81.0	78.1	67.4	66.7	57.5	44.6	27.9	0.026	48	31
1.1	2	2895	D80M	2.1	1	17.1	320	316	447	84.9	85.8	84.7	78.4	86.0	79.6	67.4	45.2	0.008	60	21
	4	1450	D90SL	2.4	1.43	16.4	253	234	315	85.5	85.9	84.4	76.6	74.6	66.3	53.1	33.1	0.020	56	26
	6	970	D90LL	2.67	1.74	19.7	331	220	416	84.5	84.6	82.5	73.7	67.9	59.1	46.1	28.4	0.038	48	39
1.5	2	2890	D90SL	2.9	1.29	24	317	278	385	85.7	86.8	86.2	80.8	83.9	78.1	66.6	45.1	0.011	60	26
	4	1450	D90LL	3.24	1.91	23.2	263	238	322	85.6	86.1	84.7	77.2	75.2	67.1	53.8	33.6	0.022	56	29
	6	970	D100L	3.64	2.4	27.9	320	280	387	84.7	84.8	82.8	74.0	67.7	58.8	45.8	28.0	0.056	46	43
2.2	2	2895	D90LL	4.14	1.77	34.6	346	271	326	87.1	88.1	87.6	82.0	84.8	79.2	67.9	45.5	0.015	58	30
	4	1455	D100L	4.56	2.55	38.1	358	269	405	88.9	89.2	88.1	81.9	75.5	67.8	54.8	34.1	0.040	57	40
	6	965	D112ML	4.84	2.77	40	316	232	417	85.9	86.8	86.2	80.1	73.6	65.8	52.9	32.8	0.116	49	57
3	2	2895	D100L	5.49	2.13	49.7	382	294	328	87.7	88.9	88.8	82.7	86.7	81.8	71.5	48.8	0.019	59	38
	4	1450	D100L	6.54	3.98	53	340	289	409	87.7	88.0	86.6	79.4	72.7	64.4	51.2	31.2	0.042	56	41
	6	970	D132S	6.34	3.44	44.4	257	244	324	88.5	89.1	88.3	82.7	74.4	67.1	54.7	34.2	0.156	49	70
4	2	2915	D112ML	6.96	2.32	61.7	257	244	335	89.0	90.1	90.0	85.7	89.8	86.0	77.6	56.2	0.035	58	46
	4	1455	D112M	7.76	3.54	61.4	281	235	350	88.8	89.9	89.8	85.3	80.7	75.0	63.7	41.5	0.084	56	50
	6	965	D132M	8.24	4.19	56.4	244	230	312	88.4	89.3	89.0	84.4	76.3	69.6	57.5	36.3	0.208	49	79
5.5	2	2910	D132S	9.85	3.34	69.7	240	208	302	89.4	90.4	89.6	84.2	86.9	83.4	74.3	53.8	0.074	64	67
	4	1465	D132S	10.9	5.82	87.1	288	240	355	91.2	91.3	90.1	84.6	76.6	69.5	57.0	35.9	0.154	57	74
	6	970	D132M	11.1	5.64	85.6	294	240	345	90.0	90.6	90.1	85.4	76.3	69.6	57.5	36.4	0.268	49	92
7.5	2	2920	D132S	13.6	5.63	114	313	273	375	90.5	91.1	90.2	85.0	84.5	79.2	68.4	46.7	0.091	62	78
	4	1460	D132M	14.2	6.65	110	295	230	350	91.4	91.9	91.3	87.1	80.2	74.3	62.7	40.8	0.194	57	85
	6	965	D160M	14.6	6.76	96	255	218	282	90.6	91.4	91.1	86.9	78.9	73.2	62.2	40.2	0.408	70	127
11	2	2935	D160M	19.4	6.85	146	236	200	316	91.5	92.3	92.0	89.1	86.2	82.3	73.4	51.4	0.183	68	120
	4	1470	D160M	20.8	9.63	167	287	220	355	92.0	92.4	91.6	87.3	80.0	74.1	62.5	40.8	0.350	66	132
	6	970	D160L	22.1	11.5	166	311	255	327	90.3	91.1	90.7	86.4	76.5	69.8	57.3	35.8	0.564	70	152
15	2	2940	D160M	26.8	10.4	226	276	230	405	91.9	92.3	91.5	87.6	84.8	80.2	69.9	48.3	0.227	77	132
	4	1470	D160L	28.1	12.9	228	310	225	360	92.4	92.8	92.1	88.1	80.2	74.3	62.7	40.8	0.452	65	152
	6	975	D180L	30	15.2	183	256	220	270	91.2	91.7	91.1	86.4	76.4	69.7	57.7	36.2	1.000	64	187
18.5	2	2940	D160L	32.3	11.4	284	306	251	423	92.4	93.0	92.5	89.1	86.2	82.3	73.0	52.6	0.279	79	149
	4	1475	D180M	33.9	15.8	304	239	190	345	93.7	93.9	93.2	89.4	81.0	74.8	63.0	40.4	0.840	62	201
	6	980	D200L	34.83	14.82	230	237	230	300	92.3	93.1	93.0	90.2	80.1	74.8	63.8	42.0	1.372	65	269
22	2	2955	D180M	37.7	12.6	348	270	217	374	92.8	93.3	92.8	89.4	87.4	83.5	74.8	54.1	0.672	79	209
	4	1475	D180L	40.6	19	359	242	190	325	93.4	93.7	93.2	89.4	80.6	74.6	62.7	39.7	0.896	59	205
	6	980	D200L	41.31	18.17	282	210	200	250	92.4	93.2	93.2	90.4	80.2	74.8	63.7	41.4	1.576	68	301
30	2	2960	D200L	50.9	14.9	431	255	230	301	93.7	93.9	93.2	89.4	87.5	84.7	77.5	58.5	1.110	77	311
	4	1475	D200L	52.6	19.1	398	177	140	300	93.7	94.0	93.5	89.6	84.7	80.8	72.0	50.9	1.936	65	298
	6	980	D225M	56.9	27	451	317	250	340	93.7	94.0	93.5	89.6	78.3	71.7	59.8	37.7	3.152	74	356
37	2	2960	D200L	63.2	20.73	634	300	200	350	94.1	94.2	93.5	89.8	86.5	83.1	74.8	54.6	1.332	83	338
	4	1475	D225S	63	20.3	515	194	137	310	94.6	95.0	94.6	91.7	86.4	83.4	75.6	54.9	2.060	71	337
45	2	2960	D225M	75.4	21.7	698	259	202	305	94.4	94.7	94.3	91.1	87.9	85.6	78.7	60.3	1.492	74	359
	4	1475	D225M	76.3	24.7	643	196	125	320	94.5	94.9	94.7	91.8	86.9	83.7	76.3	56.0	2.480	68	382

Notes:

1. The values shown are for guideline only, these are guaranteed only when confirmed by Toshiba.
2. Other kW/Frame Outputs Available on request, please contact Toshiba for more information.
3. Weight provided above is an approximate value.
4. Test Method 2-1-1B according to IEC 60034-2-1.

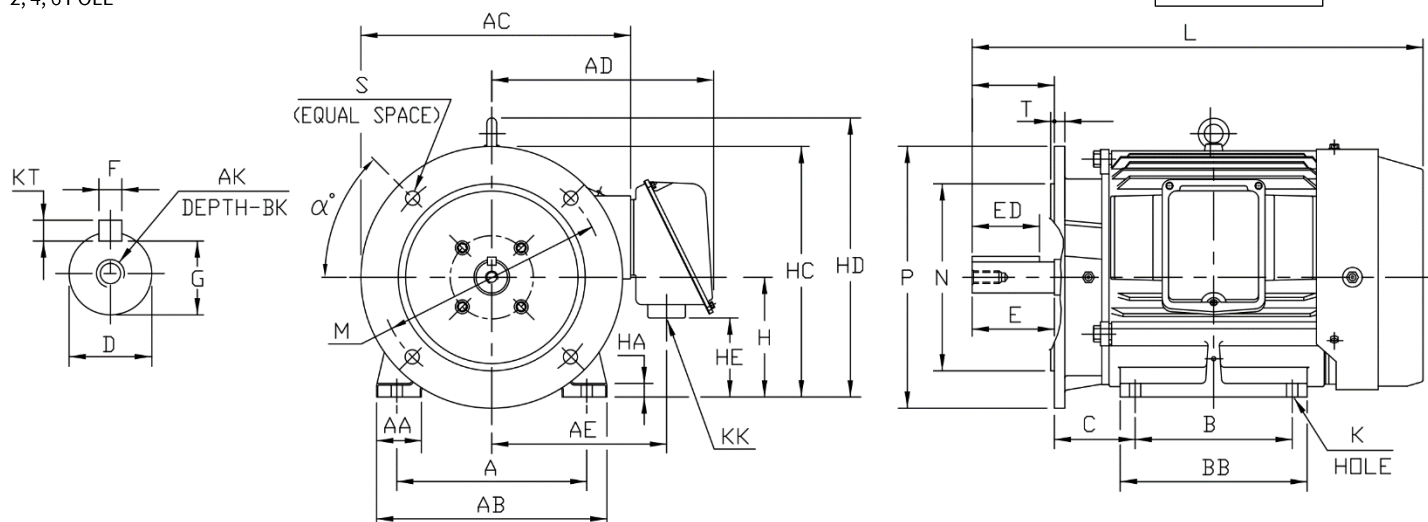


DIMENSIONS		FRAME													
		80	90SL	90LL	100L	112ML	132S	132M	160M	160L	180M	180L	200L	225S	225M
A		125	140	140	160	190	216	216	254	254	279	279	318	356	356
AA		35	38	38	38	40	50	50	56	56	63	63	80	84	80
AB		155	172	172	196	220	260	260	300	300	327	327	378	416	413
AC	2	180	202	202	202	243	285	285	324	324	390	390	441	440	443
	4,6														439
AD		181	195	195	195	211	269	269	289	289	360	360	378	377.5	377.5
AE		132	146	146	146	162	203	203	223	223	275	275	295	295	295
AK	2	M6	M8	M8	M10	M10	M12	M12	M16	M16	M16	-	M20	-	M20
	4,6											M16		M20	
B		100	100	125	140	140	140	140	210	254	241	241	305	286	311
BB		155	149	169	212	206	175	213	250	294	324	324	440	391	436
BK	2	20	25	25	28	28	28	28	36	36	36	-	42	-	42
	4,6											36		42	
C		50	56	56	63	70	89	89	108	108	121	121	133	149	149
D	2	19	24	24	28	28	38	38	42	42	48	-	55	-	55
	4,6											48		60	
E	2	40	50	50L	60	60	80	80	110	110	110	-	110	-	110
	4,6	40	50	50	60	60	80	80	110	110	110	110	110	140	140
ED	2	32	40	40	45	45	63	63	90	90	90	-	90	-	90
	4,6	32	40	40	45	45	63	63	90	90	90	90	90	110	110
F	2	6	8	8	8	8	10	10	12	12	14	-	16	-	16
	4,6	6	8	8	8	8	10	10	12	12	14	14	16	18	18
G	2	15.5	20	20	24	24	33	33	37	37	42.5	-	49	-	49
	4,6	15.5	20	20	24	24	33	33	37	37	42.5	42.5	49	53	53
H		80	90	90	100	112	132	132	160	160	180	180	200	225	225
HA		9	10	10	12	12	15	15	20	20	20	20	20	22	22
HC		185	-	-	-	-	-	-	-	-	-	-	-	-	-
HD		-	234	234	256	274	325	325	373	373	435	435	478	522	522
HE		37.5	52.5	52.5	52.5	74.5	77	77	110	110	115	115	144	175	175
K		10	10	10	12	12	12	12	14.5	14.5	14.5	14.5	18.5	18.5	18.5
KK		M20	M20	M20	M20	M20	M25	M25	M32	M32	M40	M40	M50	M50	M50
KT	2	6	7	7	7	7	8	8	8	8	9	-	10	-	10
	4,6	6	7	7	7	7	8	8	8	8	9	9	10	11	11
L	2	304	327	347	410	421	454	492	603	647	714.5	-	852.5	-	855.5
	4,6											714.5		840.5	885.5

Notes:

- The values shown are as a guideline only and are subject to change without prior notice.
- For Certified dimensions, please contact Toshiba.

DIMENSIONS - FOOT & FLANGE MOUNTED 2, 4, 6 POLE



DIMENSIONS	FRAME													
	80	90SL	90LL	100L	112ML	132S	132M	160M	160L	180M	180L	200L	225S	225M
A	125	140	140	160	190	216	216	254	254	279	279	318	356	356
AA	35	38	38	38	40	50	50	56	56	63	63	80	84	80
AB	155	172	172	196	220	260	260	300	300	324	324	378	416	413
AC	2	180	202	202	202	243	285	285	324	324	390	390	441	440
	4,6													443
AD	181	195	195	195	210	269	269	289	289	360	360	378	377.5	377.5
AE	132	146	146	146	162	203	203	223	223	275	275	296	295	295
AK	2	M6	M8	M8	M10	M10	M12	M12	M16	M16	M16	M16	M20	-
	4,6												M20	M20
B	100	100	125	140	140	140	140	210	254	241	241	305	286	311
BB	155	149	169	212	206	175	213	250	294	324	324	440	391	436
BK	2	20	25	25	28	28	28	36	36	36	36	42	-	42
	4,6												42	42
C	50	56	56	63	70	89	89	108	108	121	121	133	149	149
D	2	19	24	24	28	28	38	38	42	42	48	-	-	55
	4,6											48	60	60
E	2	40	50	50	60	60	80	80	110	110	110	-	-	110
	4,6											110	140	140
ED	2	32	40	40	45	45	63	63	90	90	90	-	-	90
	4,6											90	110	110
F	2	6	8	8	8	10	10	12	12	14	-	16	-	16
	4,6										14		18	18
G	2	15.5	20	20	24	24	33	33	37	37	42.5	49	-	49
	4,6												53	53
H	80	90	90	100	112	132	132	160	160	180	180	200	225	225
HA	9	10	10	12	12	15	15	20	20	20	20	20	22	22
HC	185	-	-	-	-	-	-	-	-	-	-	420	-	447
HD	-	234	234	254	281	335	335	380	380	435	435	478	522	522
HE	37.5	52.5	52.5	52.5	74.5	77	77	110	110	115	115	144	175	175
K	10	10	10	12	12	12	12	14.5	14.5	14.5	14.5	18.5	18.5	18.5
KK	M20	M20	M20	M20	M20	M25	M25	M32	M32	M40	M40	M50	M50	M50
KT	2	6	7	7	7	8	8	8	8	9	-	10	-	10
	4,6										9		11	11
L	2	304	327	347	410	421	454	492	603	647	714.5	852.5	-	855.5
	4,6												840.5	885.5
M	165	165	165	215	215	265	265	300	300	300	300	350	400	400
N	130	130	130	180	180	230	230	250	250	250	250	300	350	350
P	200	200	200	250	250	300	300	350	350	350	350	400	450	450
S	12	12	12	14.5	14.5	14.5	14.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
T	3.5	3.5	3.5	4	4	4	4	5	5	5	5	5	5	5
HOLES	8	8	8	8	8	4	8	4	4	8	8	8	8	8

Notes:

- The values shown are as a guideline only and are subject to change without prior notice.
- For Certified dimensions, please contact Toshiba.

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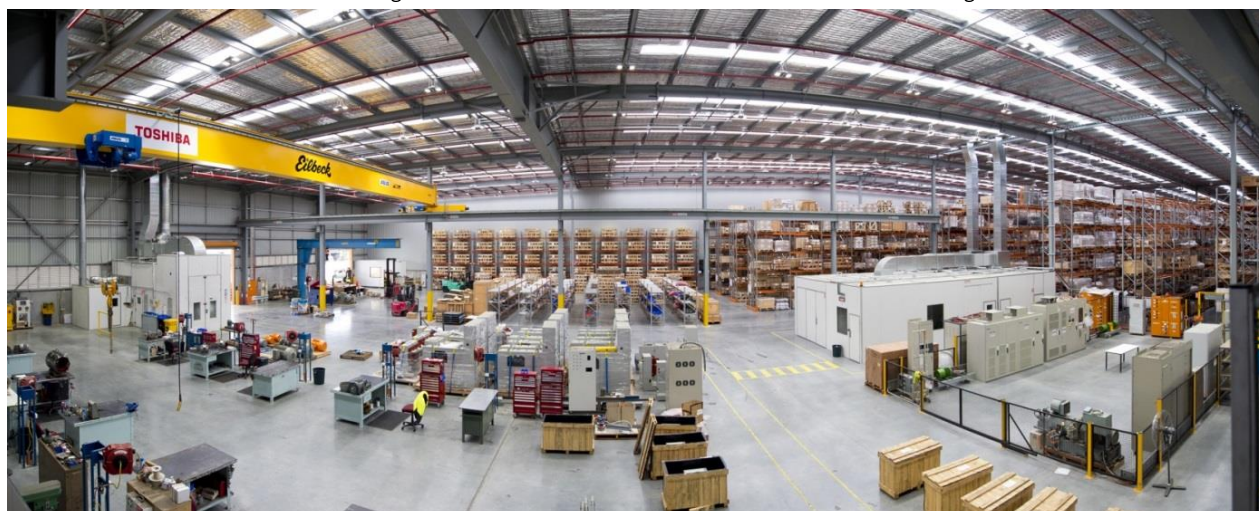
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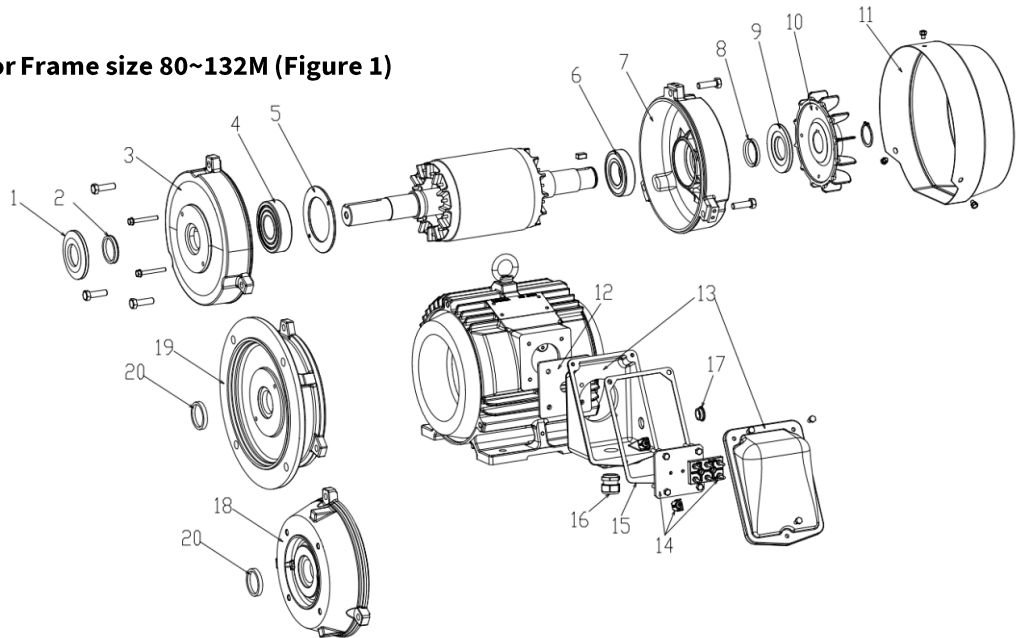


Toshiba Winston Hills Workshop

Typical Custom Options	
Anti Condensation heaters	Lifting lugs – Special fittings
Bearing change on Non drive – end	Low noise fans
Bearing change on Drive – end	Painting to special colours – Enamel
Bearing RTDs	Painting to special colours – Epoxy
Bearing sensors	Painting to special colours – Polyurethane
Brass gland plate	Porous (sintered bronze) drain plugs (Stainless Steel also available)
Blank identification nameplate	Rain hats
Captive screws for terminal box lids	Routine test (non-witnessed)
Cast iron fan cover	Routine test (witnessed)
Constant velocity cooling fan	Shaft down application modifications
Encoders	Shaft up application modifications
Earth studs – Additional	Separate terminal box auxiliary connections
Feet removal	Special non standard shafts and extensions
Flange fitting	Special voltage applications
Hazardous areas upgrades – Increased Safety Ex-ec	Stainless steel coal shield
Fail safe brake motors	Stainless steel fan covers
High grade balancing	Stainless steel fasteners
Isonel Winding (tropic proofing)	Anti-runback Bearings
B14A Flanges available	Thermistors terminated in auxiliary box
Shaft Extensions DE and NDE	Winding RTDs terminated in auxiliary box
Oil seals	Slide Rails
Left hand side terminal box	Flying Leads



Typical Parts List for Frame size 80~132M (Figure 1)



Typical Parts List for Frame size 160M~225M (Figure 2)

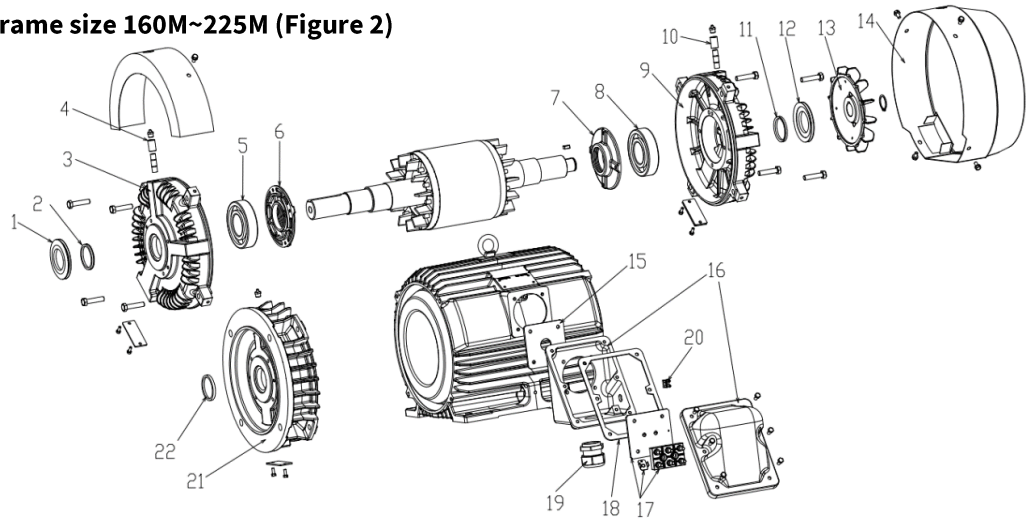


Figure 1

Frame Size	Description
1	Umbrella seal Drive End
2	V-ring seal Drive End
3	Drive End End shield
4	Bearing, Drive End
5	Bearing Cap Inner Drive End
6	Bearing, Non Drive End
7	N.D.E. End shield
8	V-ring seal Non Drive End
9	Umbrella seal Non Drive End
10	Cast Iron Fan
11	Fan Cover (Steel Std.)
12	Gasket, between Frame & Term. Box
13	Terminal Box & Terminal Cover
14	Terminal Block Assembly
15	Gasket, between T/box lid & base
16	Cable Gland
17	Plastic Plug
18	C-Face Flange
19	D-Face Flange
20	Oil seal Drive End

Figure 2

Frame Size	Description
1	Umbrella seal Drive End
2	V-ring seal Drive End
3	Drive End End shield
4	Drive End Grease Pipe
5	Bearing, Drive End
6	Bearing Cap Inner Drive End
7	Bearing Cap Inner Non Drive End
8	Bearing, Non Drive End
9	N.D.E. End shield
10	Non Drive End Grease Pipe
11	V-ring seal Non Drive End
12	Umbrella seal Non Drive End
13	Cast Iron Fan
14	Fan Cover (Steel Std.)
15	Gasket, between Frame & Term. Box
16	Terminal Box & Terminal Cover
17	Terminal Block Assembly
18	Gasket, between T/box lid & base
19	Cable Gland
20	Plastic Plug
21	D-Face Flange
22	Oil seal Drive End

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