TOSHIBA

TEWC

LOW & MEDIUM VOLTAGE MOTORS

TOTALLY ENCLOSED WATER-COOLED SEVERE DUTY MOTOR

Toshiba's Totally Enclosed Water-Cooled (TEWC) Motors are manufactured to stringent specifications and are an ideal choice for use with mining applications, tunnel boring machines, and die-cast molding presses. These advanced design motors are built to minimize exhaust heat and produce higher horsepower within a smaller footprint. The TEWC motors are ideal for environments with high ambient temperatures, low noise requirements, or minimal space for motor operations. This motor series can be used on indoor or outdoor applications and is CSA-approved for hazardous locations.

PRODUCT SCOPE

HP	75 to 800 HP
Pole Speed	Up to 3600 RPM
Voltage	Up to 7200 V
Frame Size	*Available upon Request*
Design	NEMA Design B
Enclosure	Totally Enclosed Water Cooled (TEWC)
Service Factor	1.15
Construction	High Strength Steel Frame, End Bells are Cast Iron
Insulation	Class H Random Wound, Class F Form Wound
Mounting	F1 or F2 Mounting
Protection	IP55
Sound Pressure	<80 dBA
Environment	Indoor and Outdoor Use

FEATURES

WATER-COOLED MOTORS:

- Suitable to Operate in Extreme Environment Conditions
- High Ambient Temperature Level Capabilities
- Constant Torque and Wide Speed Range Operations
- Ingress Protection up to IP67

BENEFITS

- Advanced Design with Smaller Footprint and Well Suited for Environments of High Ambient Temperatures
- Reduced Noise Level
- Maximum Performance and Reliability with High Quality Copper Rotor Construction
- Lower Operating Temperature for Longer Insulation Life

TEWC

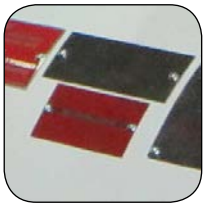
WATER-COOLED DESIGN FEATURES BUILT FOR SEVERE DUTY APPLICATIONS

FRAME DESIGN

Thermal Analysis Used to Determine Optimal Rigidity

Designed to Reduce Vibration by Maintaining Stator-to-Frame Concentricity

HARDWARE DESIGN



ROTOR: High Grade Silicon Electrical Steel (M22), Copper/Copper Alloy Bars, Swaged Bars, Coat of Red Epoxy Varnish, Precision Balancing

NAMEPLATES: Stainless Steel, Engraved

All Hardware is Grade 5 and Higher, Plated with Zinc Chromate or Cadmium Plated Drain Provision

FINISH: All Parts are Primed with Red Zinc-Chromate Iron Oxide Primer with a Final Coat of Enamel Paint

WINDING INSULATION SYSTEM: Third Coat of Epoxy Varnish

STATOR CORE: High Grade Silicon Electrical Steel (M22), .0185" Thick with Molecularly Bonded C5 Coating (Up to 750°F)

MOTOR-DRIVE SOLUTION

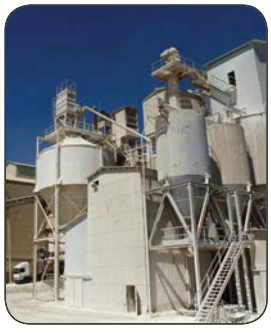
Insulation Meets NEMA MG1 Part 31

Can Be Paired with UL-Listed Medium Voltage Drive

Medium Voltage Drive Contains Motor-Friendly Multiphase Neutral Point Clamped Output

APPLICABLE APPLICATIONS

- Mining
- Tunnel-boring Machines
- Die-cast Molding Presses
- Blowers
- Fans
- Low Noise Requirements
- Hydraulic Power Units
- Textile
- Minimal Space
- Deck Cranes
- Power Train
- Compressors
- High Ambient Environments
- Injection Machines
- Thrusters
- Water Treatment Plants
- Winches
- Propulsion Systems
- Engine Room Pumps
- Steering Pumps



STANDARD FEATURES

- Side Mounted Cast Conduit Box, Rotatable (90°)
- Random or Form Wound Coils to Suit Voltage Required
- Epoxy Sealed (VPI) Insulation Systems (Form Wound)
- Frequent Starts Design
- High Efficiency and Power Factor
- Copper Rotor Construction
- Labyrinth Seals
- Water Inlet and Outlet Connection (Top Position for DE and ODE)
- Dowel Holes
- Custom Fabricated Frames
- Cast Iron or Fabricated Steel Main Terminal Box Exceed NEMA MGI Volume Requirement
- Sufficient Clearance Between Box and Floor for Easy Connection
- Available Copper Bar Design with API Style End Ring to Eliminate Need for Trim Balancing

OPTIONS

- Cable Glands or Quick Disconnect Plug
- RTDs for Overload Protection
- Extended Warranty
- NEMA A, C, & D Design
- Flange Mounting on One or Both Ends With Feet or Without Feet, Vertical or Horizontal Mounting
- Stator RTD 2-Phase Wired to a Separate Auxiliary Terminal Box
- Provisions for Vertical Jacking Screws for Easy Alignment
- Space Heaters (120 V Single Phase) in Auxiliary Terminal Box
- Bearing RTD Provisions
- NEMA MG1 Type II Main Terminal Box
- Vibration Provision Mounting Pads (Un-machined)
- Auxiliary Boxes for Space Heater and RTDs in F2 (Option for F1 Field Conversion)
- Special Shaft Configurations and Spline Shaft
- Explosion Proof Available on Certain Models
- Consult Factory for Other HP, Speed, and Voltage

ADDITIONAL OPTIONS AND AUXILIARIES

STATOR INSULATION

- Tropical Protection
- Fungicidal Treatment
- Abrasion Resistance Treatment

STATOR PROTECTIVE DEVICES

- Stator Resistance Temperature Detectors
- Stator Winding Thermocouples
- Thermoguards
- Thermistors (Guardistors)
- Space Heaters (Wrap Around Belt Type)
- Heater Switch and Light
- Sealed Insulation

ROTOR/SHAFT MODIFICATIONS

- Special Shaft Extensions
- Pressing on Customer Coupling
- Torsional Analysis Data
- Shaft Guard
- Zero Speed Switch/Plugged Switch
- Tachometer

BEARING MODIFICATIONS

- Resistance Temperature Detectors
- Thermocouples
- Thermometers
- Temperature Switch (Relay)
- Special Grease
- Taconite Services
- Inpro/Seal®
- Insulated Drive End Bearing

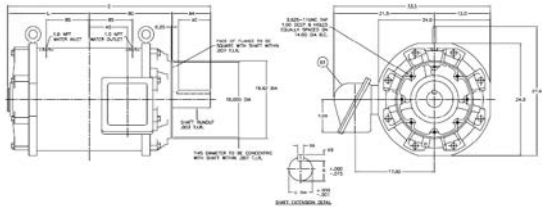
WATER FLOW REQUIREMENTS TEWC ENCLOSURE MOTORS

Hp	RPM	Hz	Frame	Volts	Min. Water Flow @25°C L/MIN	USGPM
75	1800	60	ET375	380/460/575	8.0	2.5
75	1500	50	ET375	380/460/575	9.0	2.5
100	1800	60	ET375	380/460/575	9.0	2.5
100	1500	50	ET375	380/460/575	10.5	3.0
125	1800	60	ET375	380/460/575	11.0	3.0
125	1500	50	ET375	380/460/575	12.0	3.5
125	1200	60	ET375	380/460/575	14.0	4.0
150	1800	60	ET415	380/460/575	13.0	3.5
150	1500	50	ET415	380/460/575	16.0	4.5
200	1800	60	ET415	380/460/575	16.0	4.5
200	1500	50	ET415	380/460/575	18.0	5.0
250	1800	60	ET417	380/460/575	18.0	5.0
250	1500	50	ET417	380/460/575	20.0	5.5
300	1800	60	ET417	380/460/575	20.0	5.5
300	1500	50	ET419	380/460/575	23.0	6.0
350	1800	60	ET419	380/460/575	22.5	6.0
350	1500	50	ET419	380/460/575	25.0	7.0
400	1800	60	ET419	380/460/575	25.0	7.0
400	1500	50	ET459	380/460/575	28.0	7.5
450	1800	60	ET459	380/460/575	28.0	7.5
450	1500	50	ET459	380/460/575	30.0	8.0
500	1800	60	ET459	380/460/575	30.0	8.0
500	1500	50	ET459	380/460/575	32.0	8.5

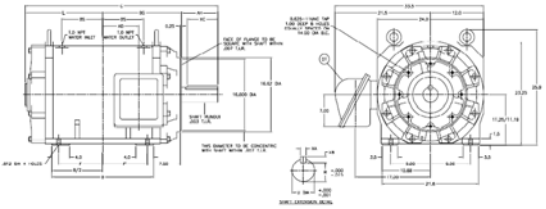
Notes:
- *Flows based on a maximum water temperature of 25°C.*
- *For 30°C add 10%.*
- *For 20°C sub 10%.*
- *Setting for alarm of the bearings is 100°C, and for shutdown is 110°C.*

DIMENSIONS

FLANGE MOUNTED



FOOT MOUNTED



Notes:
A. This outline is not to be regarded as indicating the exact details of construction. It is properly dimensioned for erection purposes only.
B. Each foot must be mounted on a base equal to or larger than pad area.
C. Mounting bolts, dowels, and shims are not supplied by Toshiba.
D. Anti-friction bearings must be regreased while motor is running.

C-FLANGE MOUNTING NO FEET AND FOOT MOUNTING WITH C-FLANGE ON DRIVE END DIMENSIONS

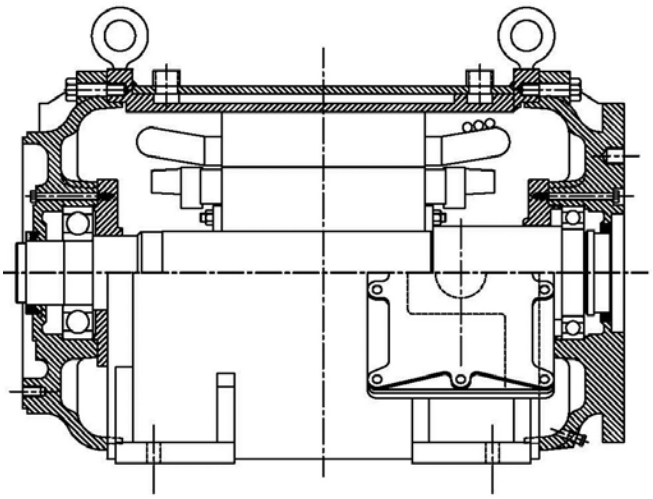
Frame Size	Rear Shaft Extension						C	L	AD	BG	BS	Approx. Weight
	U	Key Size			AH	R						
		XA	XB	XC								
455T	3.375	0.875	0.875	6.88	8.25	2.880	40.0	15.8	6.37	16.00	7.50	2000 lb
455TSC	2.375	0.625	0.625	3.00	4.50	2.021	36.3	15.8	6.37	16.00	7.50	2000 lb
457TC	3.375	0.875	0.875	6.88	8.25	2.880	43.5	17.5	8.12	17.75	9.25	2400 lb
457TSC	2.375	0.625	0.625	3.00	4.50	2.021	39.8	17.5	8.12	17.75	9.25	2400 lb
459TC	3.375	0.875	0.875	6.88	8.25	2.880	48.5	20.0	10.62	20.25	11.75	3000 lb
459TSC	2.375	0.625	0.625	3.00	4.50	2.021	44.8	20.0	10.62	20.25	11.75	3000 lb

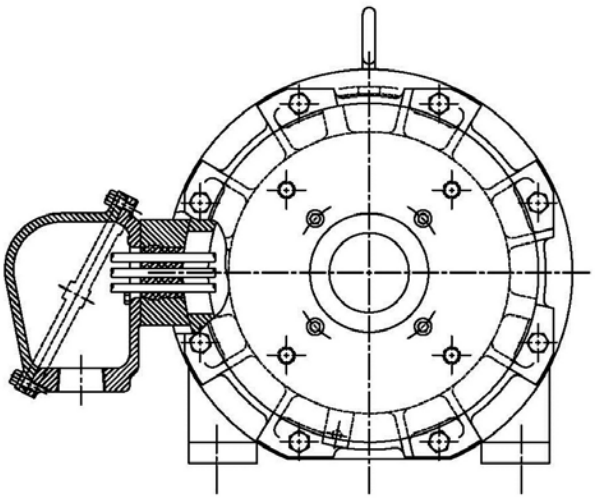
FRAME STEP CHART

Hp	460/575 V	2300 V	4000 V	460/575 V	2300 V	4000 V	460/575 V	2300 V	4000 V
	3600 RPM			1800 RPM			1200 RPM		
75	ET375	*	*	ET375	*	*	ET375	*	*
100	ET415	*	*	ET375	*	*	ET375	*	*
125	ET415	ET457	ET459	ET375	ET455	ET455	ET375	ET455	ET457
150	ET415	ET457	ET459	ET415	ET457	ET457	ET415	ET457	ET459
200	ET455	ET459	ET459	ET415	ET457	ET459	ET415	ET459	ET459
250	ET457	ET516	ET516	ET455	ET459	ET459	ET455	ET459	ET459
300	ET459	ET519	ET519	ET457	ET459	ET459	ET457	ET516	ET516
350	ET459	ET519	*	ET459	ET516	ET516	ET459	ET516	ET519
400	ET516	*	*	ET459	ET516	ET519	ET459	ET519	ET519
450	ET519	*	*	ET516	ET519	ET519	ET516	ET519	ET519
500	*	*	*	ET516	ET519	ET519	ET516	ET519	*
600	*	*	*	ET519	ET519	*	ET519	*	*
700	*	*	*	ET519	*	*	ET519	*	*
800	*	*	*	ET519	*	*	ET519	*	*

**Contact Toshiba for these motors or slower speed motors (less than or equal to 900 RPM).*

TOTALLY ENCLOSED WATER-COOLED CROSS SECTION





TOSHIBA MOTORS & DRIVES DIVISION

- Adjustable Speed Drives
- Motors
- Motor Controls
- Power Apparatus & Components

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