Pumping happiness across the Globe

Tormac PUMPS

DESIGN WITH PRECISION

Laminated core and copper windings for minimal losses and maximum efficiency.

Products from an ISO 9001 COMPANY | CE

SUBMERSIBLE MOTORS - **50 Hz**

INDEX

GENERAL DATA

BOREHOLE SUBMERSIBLE MOTORS 〉 **ECO & ELEGANT** SERIES

Model Designation 〉 BOREHOLE SUBMERSIBLE MOTORS

Submersible Motor Series
D = Water Filled
N = Non - Toxic Liquid Filled

Nominal Motor Diameter
4" = 100mm, 6" = 150mm,
8" = 200mm, 10" = 250mm

Motor Power (kW)
03 = 0.37, 05 = 0.55, 11 = 1.1, 75 = 7.5,
110 = 11, 185 = 18.5, 370 = 37, 750 = 75,
930 = 93, 1000 = 100, 1250 = 125,
1500 = 150, 1750 = 175, 2000 = 200,
2250 = 225, 2500 = 250, 3000 = 300
3500 = 350, 4000 = 400.

M - Mechanical Seal
MX - Mechanical Seal with PT Sensor
H - High Temperature Motor with Mechanical Seal
HX - High Temperature Motor with Mechanical Seal & PT100
K - Keyway Coupling

Voltage (A=110, B=180, C=200, D=220, E=230,
F=240, G=300, H=350, I=380, J=400, K=415,
L=440, M=460, N=525, P=575, Z=415 / 450)

Phase / Connection / Frequency
S - 1Ph / CSR/CSCR - 3 wire / 50Hz
T - 3Ph / DOL (△) / 50Hz
D - 3Ph / SD (Y - △) / 50Hz

Materials of Construction
(Version TAA, TA, TB & TBB, TS, TN, TL)
TAA - Cast Iron Housing with SS304 Top Shell Flange type
TA - Cast Iron Housing with SS304 Top Shell (T-Bolt Type)
TB / TBB - Cast Iron Upper & Lower Housing
TS - Fully SS304 Construction
TN - Fully SS316 Construction
TL - Fully SS904L Construction

Shaft Extension Height & Free End Play

S.No.	Description	Position	8"
01	Lift Condition	Maximum	4.05
		Minimum	4.40
02	Rest Condition	Maximum	4.0
		Minimum	3.99

* All dimensions are in inches

During every servicing, the free end play must be checked with the above values. If the shaft extension height measured differs, the motor thrust bearing could possibly be damaged and should be replaced.

GENERAL DATA

BOREHOLE SUBMERSIBLE MOTORS › **ECO** SERIES

Construction

Tormac ECO series submersible motors are ingeniously designed and developed employing latest engineering softwares, high-tech machinery & tools with the complement of cutting edge technology for hardwearing and maintenance free operations and to ensure relentless performance.

The electrical conditions such as voltage, frequency and the operating conditions are taken into account in designing the winding and cooling system. The profound experience of the company facilitate to meet out the demanding technological challenges across the world. Tried and trusted indigenously improved design, combined with the most optimized efficiency in electromagnetic design exceptionally ensures trouble free performance. The integrated and most modern quality assurance systems used at every stage of production and flawless workmanship lead to sustained and consistent operation.

Tormac ECO series motors are squirrel cage, water filled and water cooled rewindable type. The winding of these two pole motors are made of a special water proof wire of pure electrolytic copper insulated with synthetic film or thermoplastic material. All single phase motors are fitted with thermal protector to avoid winding burnouts. On the 4" & 6" Motors the stator shell, housings shell & motor base are made of fabricated SS304/316 / 904L which prevents the motor from corrosion. On 8" & 10" "B- Type" motors the stator shell is made of Fabricated SS 304 and upper Housing, Lower Housing and Motor base is made of Cast Iron.

These motors are pre-filled with environmentally safe deionised water which acts as a lubricant & coolant. The prefilled water level to be ensured at the time of installation. A uniquely designed thrust bearing with high thrust capacity and good quality shaft seals are used to enhance the strength & durability. All single phase motors are supplied with suitable control boxes. The main advantage of rewindable motor construction is making the repair and rewinding easier and hassle free at field levels. All Tormac motors are produced in accordance with ISO 9001 standards and mounting dimensions with NEMA standard.

Applications	Characteristics
Public & Industrial Water Supply	Highly reliable, tried & tested.
Sumps / Reservoirs	High efficiency
Fire Fighting Equipments	Stainless steel stator shell, motor base & housings shell to prevent corrosion.
Pressure Boosting Systems	The high quality shaft seal and sand guard prevent ingress of liquid and sand.
Irrigation & Fountains	Uniquely designed thrust bearing to withstand high down thrust loads.
Water Treatment Plants	Higher starting torque to run in tough conditions.
High Rise Buildings	The shaft is designed for optimal power transmission.
Agricultural Lands	End connections & shaft extension are designed according to NEMA standards.
Stock Breeding, Laboratories	
Sprinkler Systems and Mining	

GENERAL DATA

Construction Features › **ECO** SERIES › **50Hz - 8"**

Components	Version - TB	Version - TS	Version - TN	Version - TL
Seal Housing	Cast Iron	Casted SS304	Casted SS316	SS904L
Upper & Lower Support	Cast Iron	Casted SS304	Casted SS316	SS904L
Shaft Seal	Carbon Vs Ceramic	Carbon Vs Ceramic	Carbon Vs Ceramic	Carbon vs Ceramic
Wounded Stator Shell	SS304	SS304	SS316	SS904L
Spline Shaft	SS410	SS410	SS410	SS410
Rotor Shaft	EN-8	EN-8	EN-8	EN-8
Radial Bearings	Graphite Carbon	Graphite Carbon	Graphite Carbon	Graphite Carbon
Thrust Segment Carrier/Segments	SS420	SS420	SS420	SS420
Thrust Disc	Graphite Carbon	Graphite Carbon	Graphite Carbon	Graphite Carbon
Pressure Equalizing Diaphragm	High Nitrile Rubber	High Nitrile Rubber	High Nitrile Rubber	High Nitrile Rubber
Diaphragm Cover	SS304	SS304	SS316	SS904L

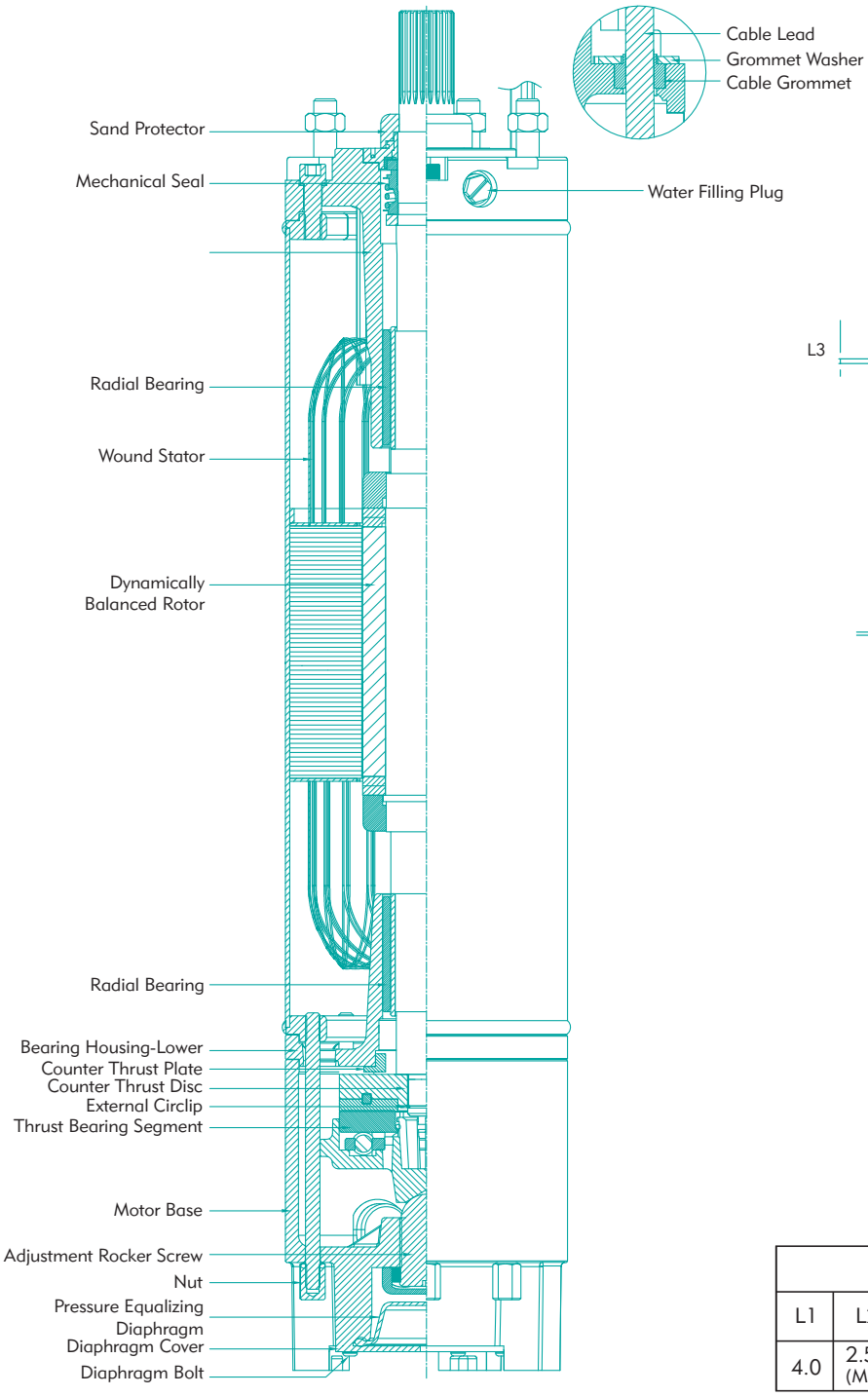
Technical Data

Specifications	Nominal Diameter
Rated Output & Voltage	37 to 110kW - 380/415V, 3Ph, (WYE-DELTA)
Rated Speed	2900 rpm
Voltage Tolerance	-15% + 6%
Protection	IP 68
Rotation Sequence	CW, CCW - 3Ph
Outer Diameter	193mm (37-93kW) & 197mm(110kW)
Duty	S1 (Continuous)
Linear flow	0.16m/sec
Liquid Temperature	Standard - 35°C, Optional: High Temp - 50°C
Switching Frequency	10 Times / hour
Thrust load	45500N/10000lbs
Mounting Dimensions	NEMA Standard
Starting Method	37 to 110kW - DOL & SD
Motor Lead out type	3/4 core Rubber Insulated Flat Cable leads, internally Connected with the windings
Class of Insulation	Y
Thermal Protection	High Temperature Motors for 70°C / 90°C can be supplied with PT Sensor & PE2 / PA Winding

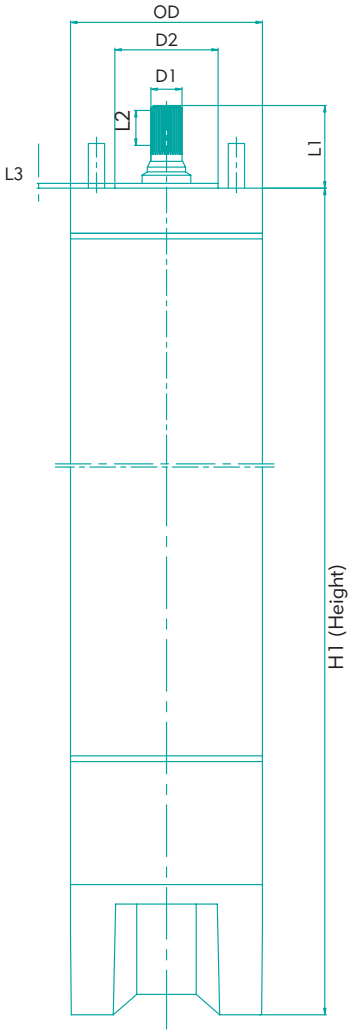
The company reserves the right to modify the technical specifications & illustrations without prior notice.

ECO SERIES (8")

Cross Sectional Drawing



Mounting Dimensions



Dimensions in inches					
L1	L2	L3	OD	D1	D2
4.0	2.56 (Min)	0.25	7.8	1.50	5.0

ELECTRICAL DATA

ECO SERIES 〉 50Hz

8", Three phase, 415V / WYE-DELTA, Submersible Motors

Motor Type*	kW	HP	Current (A)	Locked Rotor Amps	Full Load		Thrust Capacity (N)	Starting Torque (Nm)	Rated Torque (Nm)
					Eff%	Phase Angle			
D8-370 TB-TK	37	50	80	280	86	0.80	45500	200	122
D8-450 TB-TK	45	60	92	315	85	0.85	45500	268	149
D8-550 TB-TK	55	75	112	410	87	0.85	45500	370	180
D8-630 TB-TK	63	85	126	510	86	0.84	45500	410	206
D8-750 TB-TK	75	100	151	592	89	0.84	45500	520	246
D8-930 TB-TK	93	125	188	636	87	0.83	45500	680	306
D8-1100 TB-TK	110	150	225	785	87	0.81	45500	884	361

* The penultimate digit of the model identification "T" denotes DOL and which will be replaced with "D" in case of 3 phase SD Motors
* For others voltage models replace "K" with codes as mentioned in the model designation (Ref. Page 4)
* For Casted AISI 304 models replace TB with TS
* For Casted AISI 316 models replace TB with TN
* For Casted AISI 904L models replace TB with TL

DIMENSIONS & WEIGHTS

8", Three phase, 415V / WYE-DELTA, Submersible Motors

Motor Type*	kW	HP	Diameter (OD) in inches	Height (H) in inches	Nett. Wt. in lbs	Standard Motor Leads		
						DOL(mm^2)	SD(mm^2)	Length (m)
D8-370 TB-TK	37	50	7.6	46	337	4 x 16	4 x 10	4
D8-450 TB-TK	45	60	7.6	48	361	4 x 16	4 x 10	4
D8-550 TB-TK	55	75	7.6	50	396	4 x 16	4 x 10	5
D8-630 TB-TK	63	85	7.6	53	425	4 x 25	4 x 16	5
D8-750 TB-TK	75	100	7.6	57.1	473	4 x 25	4 x 16	5
D8-930 TB-TK	93	125	7.6	61	517	4 x 25	4 x 16	5
D8-1100 TB-TK	110	150	7.6	65	580	4 x 35	4 x 25	5

The penultimate digit of the model identification "T" denotes DOL and which will be replaced with "D" in case of 3 phase SD Motors
* For others voltage models replace "K" with codes as mentioned in the model designation (Ref. Page 4)

CABLE SELECTION CHART

For Single Phase 3 wire (D.O.L.) Motor Maximum Length of Copper Cable

Motor Rating			Cable Size in Square Millimeters											
VOLTS	kW	HP	1.5	2.5	4	6	10	16	25	35	50	70	95	
230 VOLT 50Hz	0.37	0.5	120	200	320	480	810	1260	1900	2590	3580	4770	5920	**Maximum Length in Meters**
	0.55	0.75	80	1030	220	320	550	850	1290	1760	2430	3230	4000	
	0.75	1.0	60	100	170	250	430	670	1010	1380	1910	2550	3460	
	1.1	1.5	40	70	120	180	300	470	710	980	1360	1850	2320	
	1.5	2.0	30	60	90	130	230	360	550	760	1060	1440	1820	
	2.2	3.0		40	60	90	150	230	350	490	680	920	1160	

For Three Phase 3 wire (D.O.L.) Motor Maximum Length of Copper Cable

Motor Rating			Cable Size in Square Millimeters																		
VOLTS	kW	HP	1.5	2.5	4	6	10	16	25	35	50	70	95	120	150	185	240	300	400	500	630
380 - 415 VOLT 50Hz	0.37	0.5	473	788	1260																**Maximum Length in Meters**
	0.55	0.75	398	660	1050																
	0.75	1	311	518	825																
	1.1	1.5	203	338	533	795															
	1.5	2	161	270	428	638															
	2.2	3	113	188	300	450	731														
	3	4	86	143	233	345	566	885													
	3.7	5	71	120	188	285	465	735													
	4	5.5	67	113	176	263	435	683	1043												
	4.5	6	64	105	169	255	420	653	998	1358											
	5.5	7.5	53	83	135	203	330	518	795	1088											
	7.5	10	38	60	98	150	233	375	563	773											
	9.3	12.5		53	83	128	210	330	503	683	938										
	11	15		45	75	105	173	278	413	563	795	1058									
	13	17.5			60	83	150	233	353	488	668	885									
	15	20			53	75	128	203	308	428	593	788	1005								
	18.5	25				60	105	158	248	338	461	615	788	938							
	22	30					90	135	210	285	398	533	675	810	953						
	26	35					75	113	173	233	330	458	578	705	825	953					
	30	40					68	98	158	210	300	390	503	585	698	803	938				
	37	50						83	128	173	240	315	405	480	563	645	758	863			
	45	60							105	143	195	270	345	420	503	585	698	795			
	55	75								120	165	218	285	353	413	480	570	656			
	63	85								109	150	173	255	315	368	428	503	578			
	75	100									120	165	218	263	308	353	420	480	563		
	93	125										135	173	210	248	285	338	383	450		
	110	150											150	180	218	248	300	345	405	454	
	130	175											128	154	188	218	255	300	345	398	439
	150	200												135	161	188	225	263	311	349	386
	166	225													135	165	195	225	263	300	334
	185	250														150	180	210	248	278	311
	220	300															143	165	191	215	237
	260	350																143	165	188	206
	300	400																124	143	158	180

The given cable lengths are the maximum one from POWER TO MOTOR, Exceeding the lengths mentioned will void warranty.

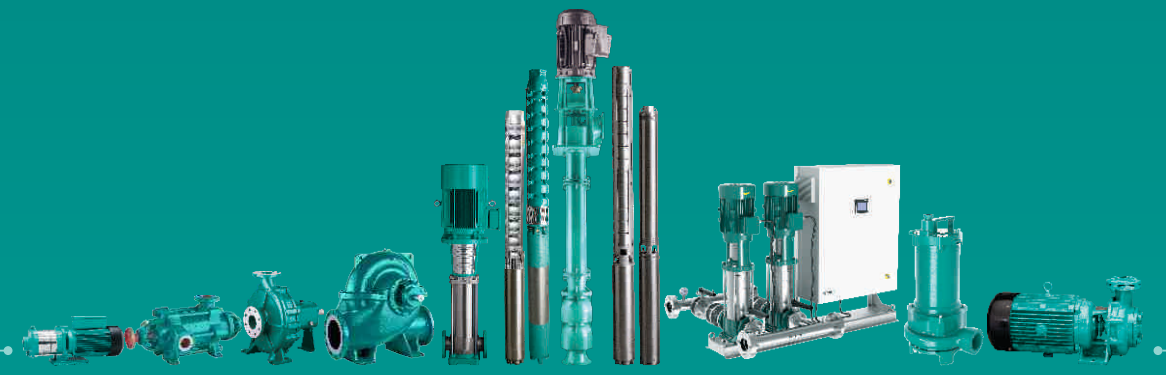
CABLE SELECTION CHART

For Three Phase 6 wire (S.D.) Motor Maximum Length of Copper Cable

Motor Rating			Cable Size in Square Millimeters																		
VOLTS	kW	HP	1.5	2.5	4	6	10	16	25	35	50	70	95	120	150	185	240	300	400	500	630
380 - 415 VOLT 50Hz	5.5	7.5	91	143	234	351	572	896	1377	1884											
	7.5	10	65	104	169	260	403	650	974	1338											
	9.3	12.5		91	143	221	364	572	870	1182	1624										
	11	15		78	130	182	299	481	714	974	1377	1832									
	13	17.5			104	143	260	403	611	844	1156	1533									
	15	20			91	130	221	351	533	740	1026	1364	1741								
	18.5	25				104	182	273	429	585	799	1065	1364	1624							
	22	30					156	234	364	494	688	922	1169	1403	1650						
	26	35					130	195	299	403	572	792	1000	1221	1429	1650					
	30	40					117	169	273	364	520	675	870	1013	1208	1390	1624				
	37	50						143	221	299	416	546	701	831	974	1117	1312	1494			
	45	60							182	247	338	468	598	727	870	1013	1208	1377			
	55	75								208	286	377	494	611	714	831	987	1137			
	63	85								188	260	299	442	546	637	740	870	1000			
	75	100									208	286	377	455	533	611	727	831	974		
	93	125										234	299	364	429	494	585	662	779		
	110	150											260	312	377	429	520	598	701	786	
	130	175											221	266	325	377	442	520	598	688	760
	150	200												234	279	325	390	455	539	604	669
	166	225													234	286	338	390	455	520	578
	185	250														260	312	364	429	481	539
	220	300															247	286	331	372	410
	260	350																247	286	325	357
	300	400																214	247	273	312

Maximum Length in Meters

The given cable lengths are the maximum one from POWER TO MOTOR, Exceeding the lengths mentioned will void warranty.



THE POWER BEHIND THE FORCE

Naargo Industries Private Limited, one of the leading manufacturers of latest state of art, large range of pumps and motors, is managed by veterans who are in the pump industry for almost half a century. The products are employed in various applications like irrigation, domestic, civil construction, de-watering etc; The Company has a strong distribution network in India for sales & service and a strong global presence.

Quality is the key factor in Naargo's products. The expansive infrastructure and environment accredited with ISO 9001 quality certification, latest engineering softwares, high-tech machinery, futuristic pumping technology and high caliber workforce facilitate the production of flawless and efficient products on par with international standards under the brand name of "Tormac". The well equipped R & D wing stays alive to the changing global trends and comes out with viable solutions for innovative product development and upgradation.

The Products currently available include Stainless Steel Submersible Pumps (SS 304, SS 316 & SS 904L), Submersible Motors (CI, SS 304, SS 316 & SS 904L - HT on optional), Starters & Control Panels, Centrifugal Monoblock Pumps, End Suction Pumps, Close Coupled Pumps, Horizontal Split Case Pumps, Horizontal & Vertical Multistage Pumps, Inline Booster Systems, Sewage, Drainage & Dewatering Pumps, Induction Motors, Submersible Cables, Riser Pipes and Column Pipes.

The power, performance and endurance of the products backed by the uncompromising teamwork and value systems will certainly propel the company's growth towards new horizons in the pump industry.

IC-SM5-I/25-EB

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Tormac PUMPS