PRAXIS
AUTOMATION TECHNOLOGY

Electric Propulsion Motor

Electric Propulsion Motor

Features

The Mega-Guard Electric Propulsion Motor (EPM) is a highly efficient permanent magnet motor for ship's propulsion. The Electric Propulsion Motor is able to directly drive the propeller shaft or can be used in parallel with a combustion engine. Electric propulsion is applied in case of requirements regarding zero emission, better manoeuvrability and/or less fuel consumption for vessels with large difference in sailing profile. Silent running is another application of electric propulsion in combination with Mega-Guard Electric Energy Storage. The Electric Propulsion Motor is controlled by other Mega-Guard products: High Power Inverter, Propulsion Control System, Energy Management System and/or the DC bus Generator. Various sizes of Mega-Guard EPM are available to suit all applications for full electric, serial hybrid or parallel hybrid propulsion.

Electric Propulsion Motor 200kW

Full electric propulsion

The full electric propulsion uses the Mega-Guard Electric Propulsion Motor to drive the propeller shaft. Electric power is coming from the Mega-Guard Electric Energy Storage and charging is done through shore power. The AC grid for hotel load is generated from the Electric Energy Storage as well.

Serial hybrid propulsion

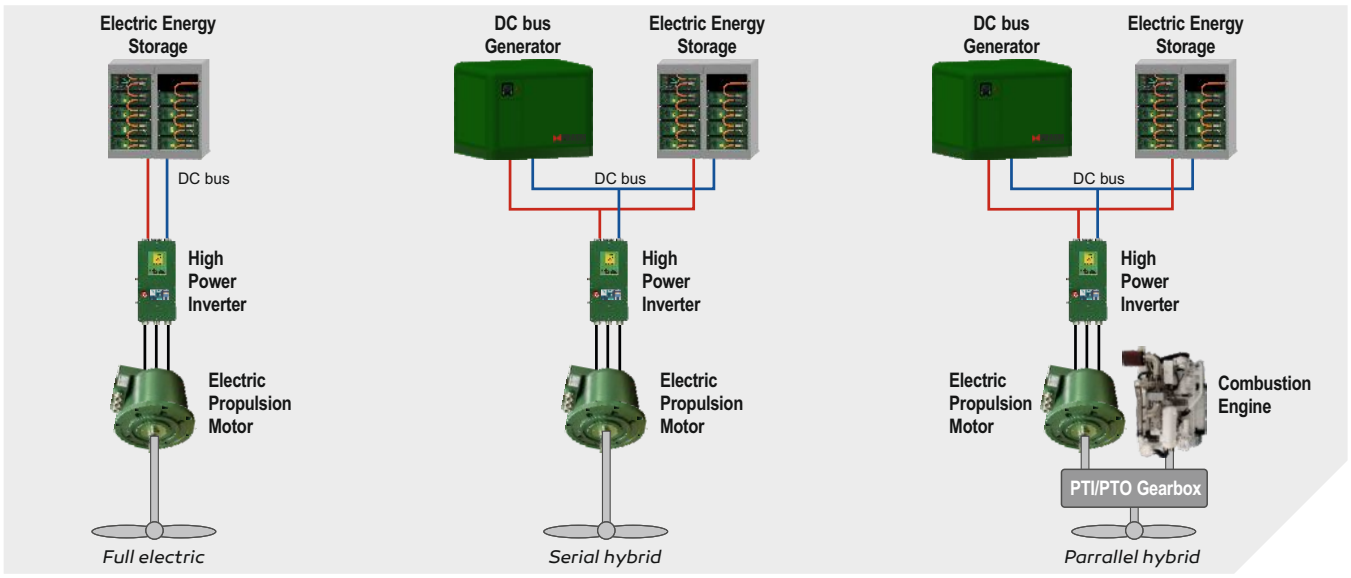
The serial hybrid uses the the Mega-Guard Electric Propulsion Motor as well to drive the propeller shaft. Electric power is coming from either the Electric Energy Storage or the DC bus Generator. Charging of the battery bank is done through the DC bus Generator or by shore charging.

Parallel hybrid propulsion

The parallel hybrid propulsion system use a combustion engine and an Electric Propulsion Motor to drive the propeller shaft. The combustion engine and the electric motor are mounted in parallel in one of following ways:

- Electric Propulsion Motor is mounted in-line with shaft
- Electric Propulsion Motor is mounted on the gearbox via a PTI/PTO connection
- Electric Propulsion Motor is mounted between gearbox and combustion engine

The Electric Propulsion Motor also works as generator for battery charging in case combustion engine is running.



PRAXIS AUTOMATION TECHNOLOGY

EPM-230 specification

Motor Length (mm)	Motor Ø (mm)	SAE (No)	Torque (Nm)	RPM=3600 Power (kW)	RPM=1800 Power (kW)	RPM=900 Power (kW)	RPM=450 Power (kW)	Weight (kg)	Shaft Ø (mm)
155	266	6	56.5	21.3	10.65	5.3	2.65	18	35
190	266	6	113	42.6	21.3	10.65	5.3	35	35
260	266	6	226	85.2	42.6	21.3	10.65	45	35
330	266	6	339	127.8	63.9	31.95	16	65	35
400	276	5	452	170.4	85.2	42.6	21.3	100	35
540	276	5	678	255.6	127.8	63.9	31.95	125	45
680	280	5	904	340.8	170.4	85.2	42.6	160	45
820	285	5	1130	426	213	106.5	53.25	220	45

EPM-230

EPM-292 specification

Motor Length (mm)	Motor Ø (mm)	SAE (No)	Torque (Nm)	RPM=3600 Power (kW)	RPM=1800 Power (kW)	RPM=900 Power (kW)	RPM=450 Power (kW)	Weight (kg)	Shaft Ø (mm)
155	328	4	133	50	25	12,5	6,25	31	35
190	328	4	265	100	50	25	12,5	42	35
260	328	4	531	200	100	50	25	86	35
330	328	4	796	300	150	75	37,5	129	45
400	348	4	1061	400	200	100	50	210	50
540	348	4	1592	600	300	150	75	300	70
680	348	4	2122	800	400	200	100	350	70
820	368	3	2652	1000	500	250	125	550	90

EPM-292

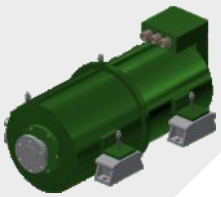
EPM-390 specification

Motor Length (mm)	Motor Ø (mm)	SAE (No)	Torque (Nm)	RPM=3600 Power (kW)	RPM=1800 Power (kW)	RPM=900 Power (kW)	RPM=450 Power (kW)	Weight (kg)	Shaft Ø (mm)
175	435	2	270	102	51	25.5	12.7	55	45
210	435	2	540	215	107.5	53.7	26.8	80	45
280	435	2	1080	407	203.5	101.7	50.8	140	70
350	435	2	1620	611	305.5	152.7	76.4	200	70
420	440	2	2160	814	407	203.5	101.7	295	90
560	440	2	3240	1221	610.5	305.2	152.6	455	100
700	450	1	4320	1628	814	407	203.5	535	110
840	450	1	5400	2036	1018	509	254	665	120

EPM-390

Electric Propulsion Motor with planetary gear

Type	Power (kW)	RPM	Max Torque (Nm)	Length (mm)	Motor Ø (mm)	Weight (kg)	Shaft Ø (mm)
EPM-292-155 with gear 08	50	918, 740, 600 or 509	938	563	328	180	50
EPM-292-190 with gear 08	100	918, 740, 600 or 509	1876	598	328	210	70
EPM-292-260 with gear 08	200	918, 740, 600 or 509	3751	668	328	350	100
EPM-292-330 with gear 10	300	585 or 497	5764	798	388	550	120
EPM-292-400 with gear 10	400	585 or 497	7685	868	388	760	130
EPM-292-540 with gear 10	600	585 or 497	11527	1028	402	1125	160



EPM with Gear

Electric Propulsion Motor specification					
Efficiency	EPM 98% Motor with Gear 96%	Shaft	Splined output, hollow shaft or Shaft with flange	Coolant flow	5l/min for each 100kW
Power	Rated at S6 operation Deduct 25% for S1 operation	Terminations	via EMC cable glands	Coolant pressure drop	0.05 bar for each 100kW
Casing	Aluminium seawater protected	Protection	IP66	Ambient temperature	-25 ~ +70°C
Mounting	4x vibration damper or SAE Flange	Cooling medium and temperature	Water/ glycol up to 35°C inlet Derating above 35°C: 2% per °C	Environmental cond.	IEC60945
				Class approval	LRS, DNV-GL, ABS and risk based assessment

PRAXIS
AUTOMATION TECHNOLOGY

Vessel Management System

Power Management System

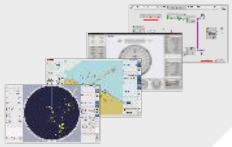
Fire Alarm System

CCTV Video Distribution

Ship Performance Monitor

Fleet Management System

Integrated Navigation System



Heading Control System

Propulsion Control System

Dynamic Positioning System

BNWAS Watch Alarm System

Navigation Light Control

Wiper Control System

Energy Management System

Electric Propulsion Motor

Electric Steerable POD

High Power Inverter

DC bus Generator

Electric Energy Storage

Electric Fin Stabilizer

Ship automation, navigation and electric propulsion

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