TEMA

YOUR PERMANENT POWER

10 KW - 1000 KW

ELECTRIC & HYBRID Marine Propulsion

PERMANENT MAGNET

Technology

www.tema.hr
info@tema.hr

LPMR 100 kw - 1000 kw
Motors & Generators Family

Efficiency
97%

Typical LPMR engine room

No wire connections inside the machine

LPMR is a series of strong permanent magnet motors/generators (PMS, PMAC) and it is the most powerful series in our production. The motors are designed for maximum power to volume ratio, highly enduring and highly efficient; these machines are built for the most demanding applications.

The unique IPM design of LPMR series rotor allows a high RPM, a wide range of constant power, and protects the magnets from mechanical damage, demagnetization and chemical hazards. These motors are capable of delivering exceptionally high torque while maintaining a low working temperature and compact design

GENERAL SPECIFICATIONS

Nominal speed: 1800 RPM
Nmax : 3000/4000 RPM
Nominal power rating: 100-1000kw
Nominal torque zero speed: 2030 - 5820 Nm
Voltage range : 380 - 750 Vac
Cooling: Water
Maintenance free
Isolat. class : H
Thrm. class : F

Video E-motor at full power

Workboats with LPMR - TEMA motors operate safely in the cold North Seas

GMV Workboats Powered-Propelled by 2 x 370 kw TEMA LPMR Motors in Hybrid and Full Electric Version

GMV
Grovfjord Mek. Verksted

Rossinavi Endeavour II
Powered- Propelled
by 2 x 850 kw TEMA LPMR
motors

Video Engine room
TEMA E - motors

VARIABLE SPEED GenSets

TEMA integrates its generators with all diesel engine brands converting it to Variable speed GENSETs

BENEFITS

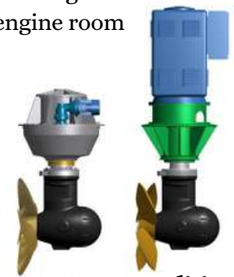
- Size decreased
- Fuel savings
- Less maintenance
- Longer diesel life

AZIMUTH THRUSTER UP TO 1300 KW

TEMA Azimuth Thruster has a fully integrated permanent magnet motor in the upper housing.

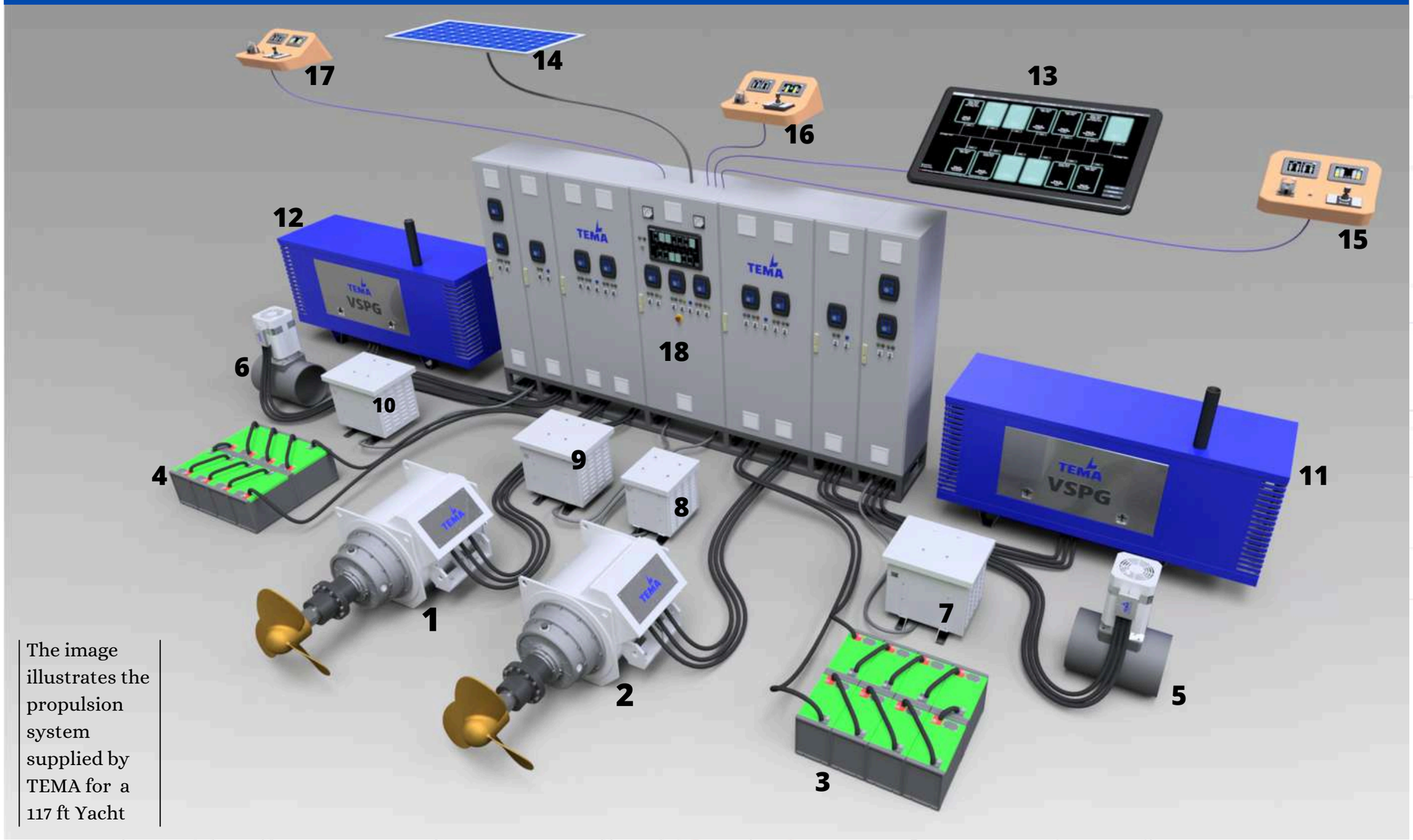
- The motor is an easily accessible from the engine room .
- This solution leaves more space in the engine room
- Single or dual prop
- performance increase

Easy integration with any L or Z drive azimuth thruster



TEMA vs Traditional

TEMA - THE SUPPLIER OF COMPLETE TURNKEY PROPULSION SYSTEM



The image illustrates the propulsion system supplied by TEMA for a 117 ft Yacht

1.TEMA port PMAC propulsion motor

2.TEMA starboard PMAC propulsion motor

3.Starboard battery bank

4.Port battery bank

5.Stern thruster

6.Bow thruster

7.Starboard hotel inverter

8.Single phase shore charging connection

9.Three phase shore charging connection

10.Port hotel inverter

11.Starboard variable speed generator

12.Port variable speed generator

13.PMS (Power management system) monitoring and control*

14.Photovoltaic panel

15.Starboard wing command station

16.Bridge command station

17.Port wing command station

18.DC Bus main switch board

13.TEMA Power Management System (PMS) is specialy designed for complex fully electric and hybrid marine propulsion systems based on TEMA AC synchronous permanent magnet electric motors and variable speed generators and other onboard energy generating and consumption systems all connected to the common DC Bus. The system controls overall available and requested power ratio in real-time and assures optimal propulsion system functionality. PMS Human Machine Interface (HMI) is adapted to specific needs of these complex systems providing overall and detailed overview of data and statuses for all system components. Additionally operator interaction with the system is supported while taking care of each request feasebility. The PMS HMI can be implemented on multiple operating station locations with different priorities

During FAT and DNV commissioning

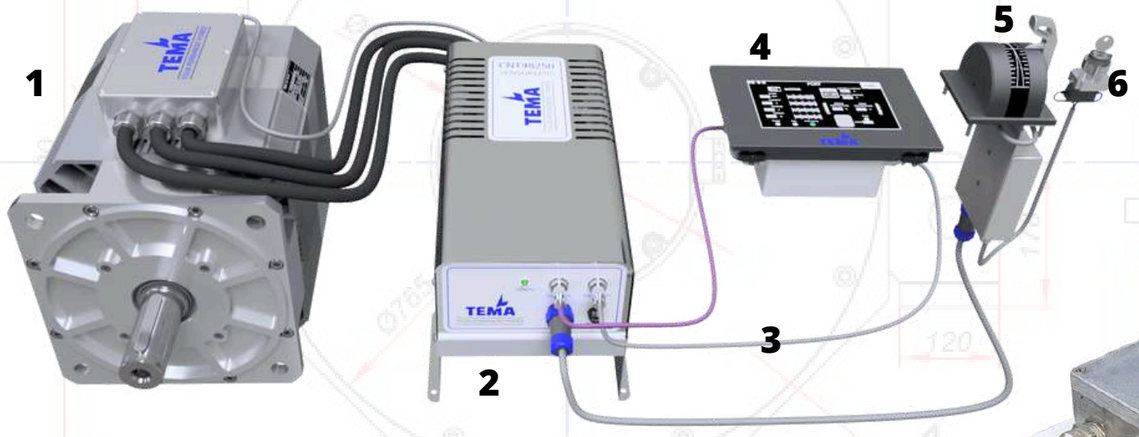
TEMA 400 kW Permanent magnets Electric motor
Direct shaft drive or Azimuthal drive
Single or twin propeller system.

SPM 132 12 KW - 50 KW

Motors & Generators family

Video of the propulsion set installation

SPM 132 are high-efficiency AC permanent magnet motors, designed to operate in the most demanding marine conditions, resisting corrosion, high pressures, and temperature variations typical of marine environment- engine room. Because of its robust and brushless design, it doesn't require any maintenance.



COMPLETE SYSTEM - EASY SET UP

1.Permanent magnet motor 12 kw- 50 kw
2.Motor controller
3.Signal cables
4.Display 7" -Touch screen-Waterproof
5.Throttle (Single or double lever)
6.Key switch
7.Battery - based on customer's needs

Powered - propelled by 2 x 30 kw SPM 132 TEMA Motors

The first electric boat on the second longest river in Europe -Danube operate safely with SPM 132 TEMA motors

Propelled by 2 x 12 kw SPM 132 -TEMA motors

Thanks to the efficient TEMA SPM 132 motors, the solar catamaran reaches 10 hours of autonomy at 5.5 knots using the energy only from the solar panels (9kw) during the summer months

ROLLS ROYCE AZIMUTH THRUSTER CONTROLLED BY

TEMA SPM 132 STEERING MOTORS

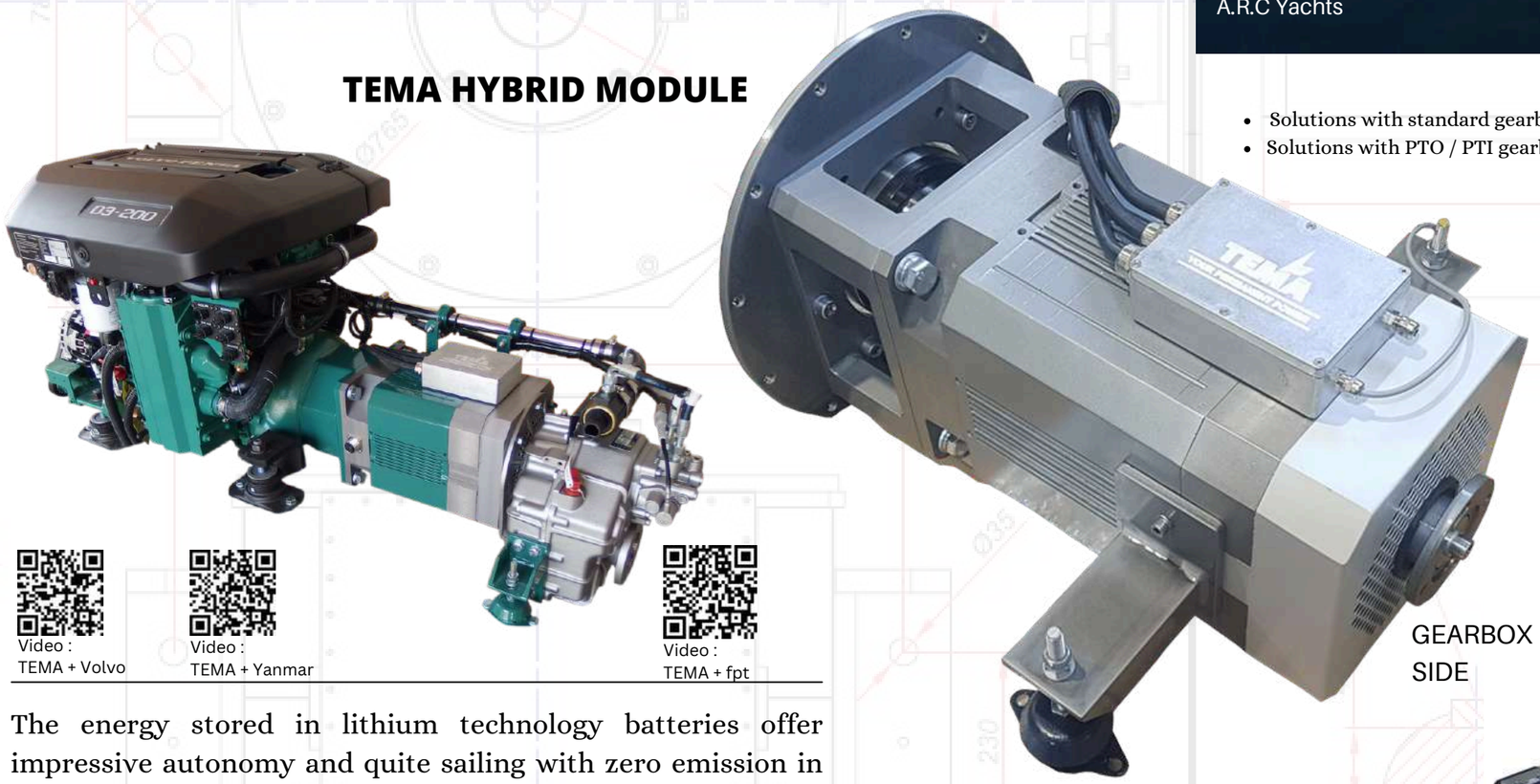
PARALLEL HYBRID up to 600 kw

Motors & Generators with all diesel brands

PARALLEL MARINE HYBRID PROPULSION SET is made with TEMA permanent magnet motor/generator. It can be coupled with all diesel engines. The electric machine can be used both as a motor (in propulsion mode) and as a generator (in diesel propulsion mode). There is no oversized complex gearbox or torque questionable belt drive. Simple but very effected and robust clutch engagement system is used providing secure torque transmission from diesel engine to electric motor and propeller shaft.

TEMA PARALLEL HYBRID
PROPELLED SERENITY
CATAMARANS
A.R.C Yachts

TEMA HYBRID MODULE



Video :
TEMA + Volvo

Video :
TEMA + Yanmar

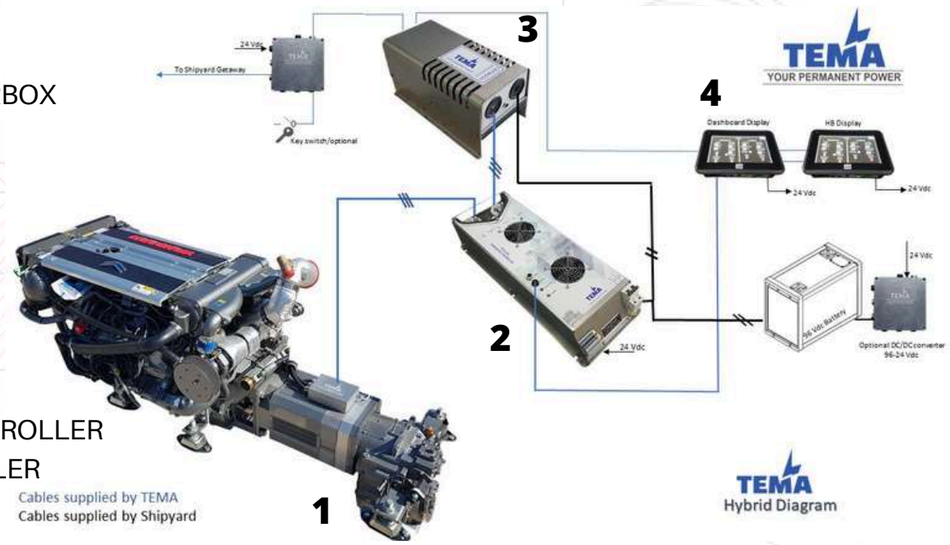
Video :
TEMA + fpt

The energy stored in lithium technology batteries offer impressive autonomy and quite sailing with zero emission in residential marinas and ambient protected areas. The Hybrid set is suitable for all kinds of drives: Jet, sail drive, stern drive, V drive, pod drive, etc.

YANMAR VOLVO PENTA Perkins LOMBARDINI Marine FPT POWERTRAIN TECHNOLOGIES ISUZU

- Solutions with standard gearbox
- Solutions with PTO / PTI gearbox

GEARBOX
SIDE



1. HYBRID MODULE
2. GENERATOR CONTROLLER
3. MOTOR CONTROLLER
4. DISPLAY

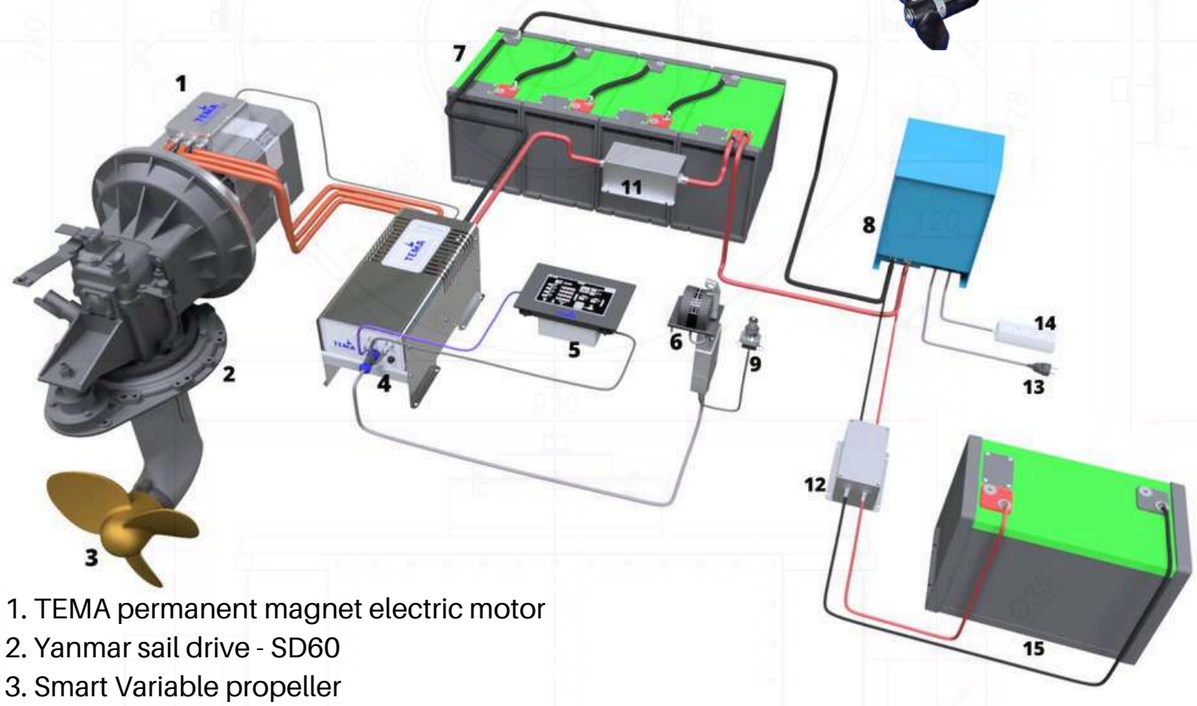
TEMA
Hybrid Diagram

TEMA ELECTRIC SAIL DRIVE

Propulsione & Rigenerazione

TEMA HYDROGENERATION SAIL DRIVE semplicemente spostando la leva di comando il saildrive si puo' utilizzare in tre modalità:

1. Forward = Propulsione
2.Neutral = Vela
3. Reverse = Idrogenerazione o inversione



1. TEMA permanent magnet electric motor
2. Yanmar sail drive - SD60
3. Smart Variable propeller
4. Motor controller
5. Display 7“
6. Throttle unit
7. Battery
8. Charger/inverter
9. Key switch
10. Signal cables
11. Main contactor, fuse
12. Dc-Dc Converter
13. Shore power connection
14. Power supply to consumers
15. Optional 12/24 Vdc battery

Orizzontale

Verticale

MWB 400

10 kw - 100 kw

Motori & Generatori

Il **MWB400** è la gamma di motori/generatori a magneti permanenti dal design unico con rotore esterno e statore interno.
Il design di questi motori consente loro di ottenere una coppia molto elevata, una potenza elevata a bassi regimi, una bassa temperatura di lavoro, un'ampia gamma di potenza costante e un elevato rapporto potenza-volume. La serie MWB400 può essere utilizzata come generatore per gruppi elettrogeni marini compatti o come motore/generatore per sistemi di propulsione ibrida.

VANTAGGI

- Coppia elevata
- Potenza elevata a bassi RPM . max 450 giri/min.
- Potenza costante

Since 1989 **TEMA** is specialised in professional Heavy -Duty marine electric & hybrid propulsion systems. In our standard production line we have about fifty different electric machine models all made in Premium Efficiency technology based on TEMA original synchronous permanent magnet motors in a power range from about 10 kW up to more than 1000 kW per unit. Our products and services make the difference, so we will continue to pursue this mission, with the aim of making our customers satisfied. In the last 10 years our marine electric propulsion motors, generators and hybrids have been installed in about 350 boats from 12m up to over 50m ships (tourist sightseeing boats, working ships up to luxury yachts).

www.tema.hr
info@tema.hr