



# Electric Propulsion Systems for Midget Submarines & SDV's

## Key Features:

- High reliability, Rugged Design
- Unique Sealing Technology
- Continued Operation in the event of seal failure
- Maximum Propulsion Efficiency
- Dual Prop / Contra Rotating Designs
- Various Voltage Options AC/AC, DC/AC & DC/DC
- Internal or External (pressure compensating design options.
- Direct Drive Reliability (no gearbox)
- Lightweight Design
- Drive Electronics
- Low RPM ..... Silent Operation



## Marine Propulsion Solutions Naval Group

Singapore / Batam Offices

[www.marinepropulsionsolutions.com](http://www.marinepropulsionsolutions.com)

Phone : +62 7784168866

Mobile: +62 811 7788802

Email:

[Info@marinepropulsionsolutions.com](mailto:Info@marinepropulsionsolutions.com)

Marine Propulsion Solutions – Subsea Group introduces a series of Electric Propulsion Systems, designed for Midget Submarines, Seal Delivery Vehicles (SDV's) and other manned naval applications breaking New grounds in thrust, low weight yet ruggedly built with enhanced reliability.

- Low RPM - AC Induction or Asynchronous Motors for inverter operation.
- Low RPM - AC Permanent Magnet Synchronous Motors for inverter operation.
- Low RPM - DC Brushless Permanent Magnet motors with controllers
- Hi RPM Electric Propulsion Torpedo Modules

**Power ranges offered: 25 to 800Kw**

Marine Propulsion Solutions, a member of the MPS Group introduces both as and syn submarine propulsion motor drives that are more compact and efficient for the new generation of Midget and SDV submarines and vehicles. These MPS Propulsion Motors are smaller and lighter than conventional propulsion solutions, but achieve a significantly higher level of efficiency at very low signatures.

## Reliable..... Small and difficult to trace...

An especially high degree of reliability and availability is demanded from submarine motors and they must have low signatures to make them hard to trace. Additionally, the more efficient the propulsion system, the longer the submarine can remain submerged.



Electric Propulsion Slow Speed (rpm) air cooled - AC (400/50/3) Drives, mounted on shock absorbing frame including:

- Drive Shaft arrangement (length to be determined)
- Thru hull pressure compensating shaft/seal penetration assembly
- Propeller designed for silent running and low rpm (matl in NAB or Carbon fibre option).
- Electric Motor (Inverter) Controller (variable rpm control) with low harmonics.
- Bridge Controls for propulsion system
- Main Switch board



## Marine Propulsion Solutions – Naval Group Electric Propulsion Systems designed for Midget Submarines

Low heat emission, economy of space and good accessibility to the components for maintenance purposes are criteria that additionally play a particularly important role in submarine design.

**Option 1** – Electric Motor designed to be mounted inside the vessel pressure hull.

**Option 2** – Electric Motor designed to be mounted outside the pressure hull and oil filled / pressure compensated.

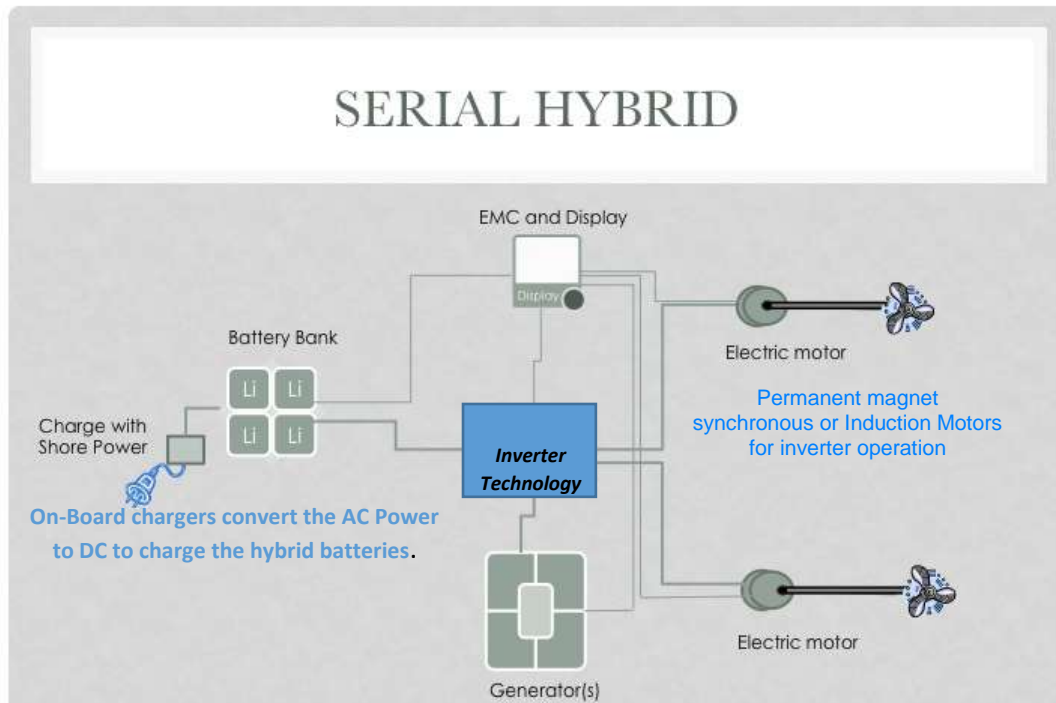


### Innovative drives for Midget Submarine, Seal Delivery Vehicles (SDV), Auv and other Manned SubSea Vehicles

The reduction of CO<sub>2</sub>-emission is the big challenge of our time. Thus the reduction of energy consumption is the main topic in many applications. Especially modern speed-controlled electric drives offer the chance to save maximum energy. A solution with remarkable energy efficiency is offered by using permanent magnet ac synchronous motors (PM motors).

They are operated exclusively with frequency inverters and are characterized by a significantly higher efficiency and an improved part load behavior than asynchronous motors.

In addition PM-motors can reach a higher output than asynchronous motors of the same size. Because of the rotor following exactly the rotating field, PM-motors can be used with several drives that are operated synchronously. All types of constructions and a multitude of modifications of standard motor design are available from PT. Marine Propulsion Solutions.



#### Advantages

- Highest energy efficiency
- Approved robust and low-vibration design
- Compact design with minimized dimensions
- Low-noise operation
- High operational reliability by modern production technologies



Power range 12 to 350 Kw  
4, 6, 8 and 12-pole designs  
200 to 3000 rpm options