RENK power take-off (PTO) systems are reliable and scalable solutions for two-stroke engines. They enable fuel savings and CO₂ emission reductions and improve the EEDI index.

The systems can either be operated in parallel, with one or more gensets to cover peak loads, or as individual sources of power. Furthermore, the maintenance costs of auxiliary generators are reduced thanks to fewer operating hours.

**Integrated front-end power system**

The integrated front-end power system (IFPS) consists of a front-end mounted PTO system on a two-stroke engine. It features a single-stage gearbox, one or multiple generators with associated frequency converters, and transformers for connecting the system to the ship’s grid. The gearbox design is flat and the generator length is short, that is less than 1,600 mm, which typically equals two frames on a ship. The system can deliver from 500 to 2,000 kW power.

Installation of the integrated front-end power system requires only a few simple alterations on the main engine housing and the crankshaft. The IFPS housing design includes a space-saving arrangement, which can be adapted to the tuning wheel. Directly mounted on the engine’s front-end, the system needs no additional foundation, thereby reducing installation costs.

The modular concept allows the adaption of multiple generators of the same size. The main advantage is that the system’s power rating is scalable from 500 kW to 2,000 kW without the demand for additional axial space in front of the engine.
For a specific ship project, the decision on whether or not an IFPS PTO solution is suitable must be made on the basis of an analysis of the torsional vibrations and the selected propeller, shafting system, and main engine.

**MARHY system**

MARHY is a stand-alone PTO/PTI/PTH-system with a power range of 500 kW to 10,000 kW. It is a reliable hybrid system consisting of well-proven standard components, such as a tunnel gear unit, a propeller shaft clutch, and standard electronics components. The MARHY system provides the following options:
- redundancy for single-screw vessels with the power take-home (PTH) solution, ensuring the vessel manoeuvrability if the main engine malfunctions,
- operation in low-emission zones,
- or it can be used for boosting of the engine power by utilising the power take-in (PTI) solution.

MARHY is a modularised system which is also available without a propeller shaft clutch.

The 3 propulsion modes available can be summarised as:
- propulsion mode and simultaneous production of electric current, power take-off (PTO),
- propulsion mode and simultaneous power boosting via electric motor, power take-in (PTI),
- electric propulsion mode, power take-home (PTH)

For further details regarding this Market Update Note, please contact our Marine Project Engineering department at: bento.nielsen@man-es.com