

RoPax Ferry "Norröna"



RoPax Ferry “Norröna”

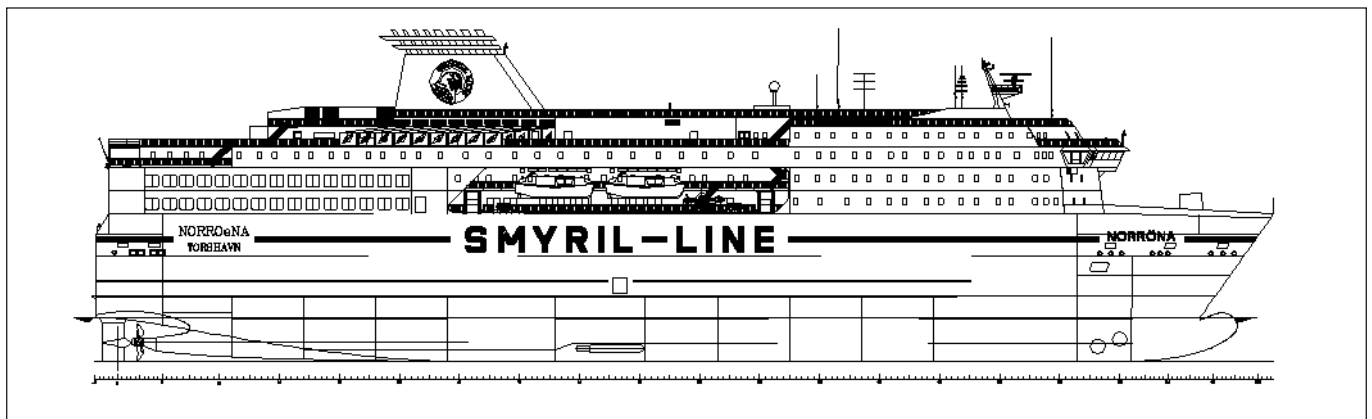
The RoRo passenger vessel “Norröna” is being built at German Flender Werft for Torshavn-based (Faroe Islands) shipping company Smyril Line to a design by Flensburger Schiffbau-gesellschaft specifically developed for the special conditions encountered in all ports of call.

The new four-deck “Norröna” replaces an older vessel of the same name and is being built as both a passenger and cargo ship.

She will serve routes via the Faroes between Hanstholm in Denmark and Iceland, Shetland and Bergen in Norway. She can accommodate 1482 passengers in 93 double cabins, 40 three-berth cabins and 166 four-berth cabins. A further 6 four-berth cabins are available for disabled passengers in addition to 12 deluxe cabins and one suite. During crossings, a further 324 non-berth passengers can be routinely accommodated while the ship has a crew complement of 118.

Vehicles can be stowed on two car decks comprising a total of 1830 lane metres. They embark on to deck No 3 via a stern ramp and can also proceed to deck No 4 via an internal tiltable ramp.

The 36000 GRT “Norröna” is 164 metres in length and 30 metres wide. Four main engines with a total power output of 21600 kW at 500 rpm drive two controllable pitch propellers, enabling the ship to sail at a speed of 21 knots.



References

- Name of vessel: “Rocknes” (ex “Stones”)
- Yard: J.J. Sietas, Hamburg
- Year of building: 2000
- Power of thruster motor: 1500 kW
- Power of PTO generator: 2250 kVA
- Voltage: 450 V
- Frequency: 60 Hz

- Name of vessel: “Kvitnes”
- Yard: J.J. Sietas, Hamburg
- Year of building: 2001
- Power of thruster motor: 1500 kW
- Power of PTO generator: 2250 kVA
- Voltage: 450 V
- Frequency: 60 Hz

- Name of vessel: “Sandnes”
- Yard: J.J. Sietas, Hamburg
- Year of building: 2004
- Power of thruster motor: 1500 kW
- Power of PTO generator: 2250 kVA
- Voltage: 450 V
- Frequency: 60 Hz



Electrical Thruster Drive System

For manoeuvring operation the ship is equipped with 2 bow thrusters each of 2000 kW and are mechanically limited to 1750 kW.

The starting current for these thruster motors is DOL approximately 19 kA. Due to the voltage drop it is difficult to start these motors on the common ship network. Therefore SAM Electronics implemented the soft start procedure of the electrical thruster motors during reduced voltage of the Power Take Off (PTO) shaft generators.

During operation at sea, two PTO's (each 2500 kVA) deliver power for the ship's network. For manoeuvring operation it is necessary for the diesel generators to assume the load.

The start procedure of the thruster motors begins with demand of power from the power management system

of the electrical plant. After synchronising, the diesel generators take over the load and the PTO generators is disconnected from the shipnet. Each PTO can then be connected in single operation to one of the thruster motors.

Technical data of the PTO shaft generators

Power	2.500 kVA
Operation	S1
Voltage	400 V
Frequency	50 Hz
Rated current	3608 A

Technical data of the thruster motors

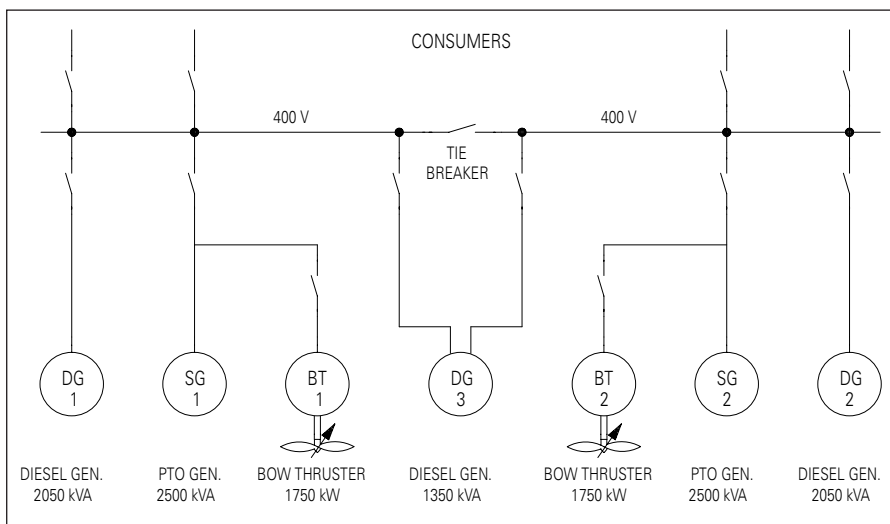
Power	2000 kW (mech. limited to 1750 kW)
Operation	S 2 - 30 min
Voltage	400 V
Frequency	50 Hz
Rated current	3195 A



PTO shaft generator



Thruster motor



Single line diagram

Control System

All conditions needed to start and monitor thruster motors are checked, monitored and indicated by a SPS storage programmable control system with text display. When the start signal is indicated, the PTO circuit breaker is checked to determine whether connection to the ship's network has been discontinued.

For safety reasons, this check is carried out via both the hardware and software.

This is the precondition for switching on the circuit breaker installed in the main switchboard to start the thruster motor. The voltage controller of the PTO is then activated so that the voltage is reduced by approximately 50%. After voltage reduction and verification, the power switch for starting the thruster motor is activated. After a brief run-up phase of approximately 6 to 8 seconds, the signal for reduction of the voltage is terminated.

The generator is then smoothly brought to its rated voltage without serious current peaks.

The thruster motor is then ready for operation.

During operation, the SPS continuously checks the following conditions:

- Stopping demand signal.
- Starting release signal from the power distribution / power available.
- Hydraulic pressure signal.
- Mooring flaps.
- Over temperature of driving motor (stator windings) for alarm and immediate shut down.
- Override function to eliminate shut down of the motor with regard to dangerous high temperatures.
- Bearing temperature.

If any of these conditions should fail or be activated, the operations will be halted.



Control panel for 2 thruster motors