



## AMAWATERWAYS, AMAMAGNA PASSENGER VESSEL

MARINE PRODUCTS



<b>Fleet:</b>	AmaWaterways River Cruises, California USA
<b>Shipyard:</b>	Vahali Gendt Holland B.V. Scheepswerf & Machinefabriek
<b>Designer:</b>	Kamphuisen Design & Projects in Wageningen, Holland
<b>Dimensions:</b>	443 ft x 72 ft (135 m x 22 m)
<b>Propulsion:</b>	Four counter-rotating Veth Hybrid Drives, type VZ-900-CR-VHD
<b>Combined Power:</b>	800 kW @ 1800 rpm, of which 300 kW is electric power
<b>Bow Thrusters:</b>	Two Veth Compact Jets, type CJ-1000V incl PM motor
<b>Thruster Performance:</b>	330 kW @ 1500 rpm
<b>Engines:</b>	Four Scania engines
<b>Power:</b>	515 kW @ 1800 rpm
<b>Hotel Load:</b>	6 Veth generator sets
<b>Genset Power:</b>	411ekW, 400V/50Hz
<b>Location:</b>	Danube





## Twin Disc propels the largest river cruise ship in Europe.

At twice the width of a traditional river cruise ship, AmaMagna relies on Twin Disc to navigate narrow waterways.

### Situation

AmaWaterways envisioned a one-of-a-kind luxury river cruise experience on its new flagship, AmaMagna. The vessel would be twice the width of traditional European river cruise ships in order to offer all the luxury amenities and leisure space AmaWaterways imagined.

### Implication/Problem

The enormity of the ship meant that to reach cruising speed while maintaining the maneuverability needed to navigate the river and tight waterway locks, significantly more power would be required. However, installing larger thrusters with bigger propellers would cause problems with the vessel draft in shallow water. An additional challenge would be keeping the vessel fuel efficient despite its greater size.

### Solution

The ship's main propulsion comes from four Veth Propulsion VZ-900-CR-VHD thrusters, each powered by a 515kW Scania engine, and a 300kW electric motor. These four counter-rotating thrusters feature a total of eight highly optimized propellers enabling the vessel to be quick and nimble. Additionally, installed in the bow of the ship are two compact jet thrusters.

The electric main engines and the electric bow thruster engines are powered by hotel load generator sets and the power management system is optimized to use only the generators that are necessary to keep fuel consumption as low as possible.

### Results

The combination of these six Veth thrusters gives the vessel's captain a level of control such that the ship can sail into waterway locks with only a few centimeters to spare on each side. Additionally, the setup of the power management system enables the vessel to sail downstream in full-electric mode and will only use the combined power of the diesel and electric motors in heavy water conditions.

The Veth thrusters deliver essential benefits:

- 360 degrees full thrust, thus optimum maneuverability
- Higher efficiency as a result of propeller design and angle
- Lower fuel consumption over total speed range
- Possibility for flexible suspension, which provides better insulation from noise and vibration
- Compact, easy-to-install construction allows for more room for passengers and cargo
- No separate reduction gearbox is needed from the engine output to the thruster input
- Safer, through shorter emergency stopping distance and improved maneuverability
- Possibility to sail in complete silence with added batteries

