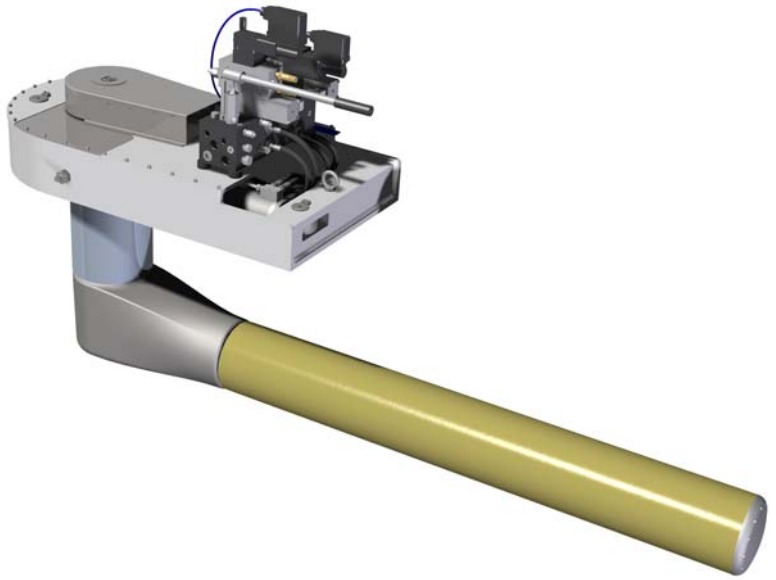
ML300-AS

ROTOR STABILIZER HULL UNIT



DESCRIPTION:

The ML300 Series hull unit is designed to provide maximum energy transfer in terms of lift force based on the Magnus Effect. The unit is a compact rugged design built to withstand the most demanding military and commercial applications.

For maximum roll reduction, the ML300 is mounted in the turn of the bilge with the rotor oriented perpendicular to the vessel hull during underway operations. Rotor spin direction and speed are altered during operation, as needed, to obtain optimal performance. To minimize appendage drag, the rotor stows neatly, parallel to the vessel hull, when the stabilizers are not in use. The rotor orientation and spin functions are precisely managed by Quantum's hydraulic and electrical control systems.

Designed using the latest technology and high-quality materials the ML300 Series hull unit offers the best performance of any system where significant roll reduction is required at loitering speeds.

FEATURES:

- **SIMPLE INSTALLATION:** The stabilizer unit is delivered fully assembled with minimal disassembly required for installation. Since no customized hull pocket is required for the rotor's stowed position, complicated hull shape fabrication is avoided.
- **SMOOTH OPERATION:** The unit provides smooth power transfer from the rotor to the ship's hull via precision roller bearings used in both the spin drive shaft and the main shaft.
- **PRECISION CONTROL:** By varying the RPM and direction of rotation of the tube, the lift force can be controlled with razor sharp precision, resulting in instantaneous response.
- **EFFICIENCY:** When properly sized and operating within acceptable vessel speeds, rotary stabilizers provide exceptional hydrodynamic efficiency compared with other stabilizer systems available.
- **SAFETY:** The rotor's hydraulic system is equipped with automatic retract mechanism to allow the rotor to swiftly stow in case of impact during operation. While not in operation, the rotor is elegantly stowed along the hull, where it offers minimal possibility of impact and minimal effect during maneuvering conditions. In case of severe impact, half of the rotor tube will break away, in a design feature intended to sacrifice the rotor unit in order to preserve hull integrity.

Equipment is covered by Quantum's 1 year comprehensive warranty.
Service and technical support are available worldwide.

Typical Vessel Length*	35-50m (115 -164ft)
Operating Speed Range	2-16 knots
Rotor Dimensions	344mm x 2500mm
Length ***(inside vessel after installation)****	1770mm (70″)
Width**	920mm (36″)
Height ***(overall)****	957mm (38″)
Weight ***(dry)***	2800kg (6173lbs)

**Provided for reference only. Consult a Quantum representative for system sizing.*
*** Dimensions are of the equipment, and do not include service allowances.*

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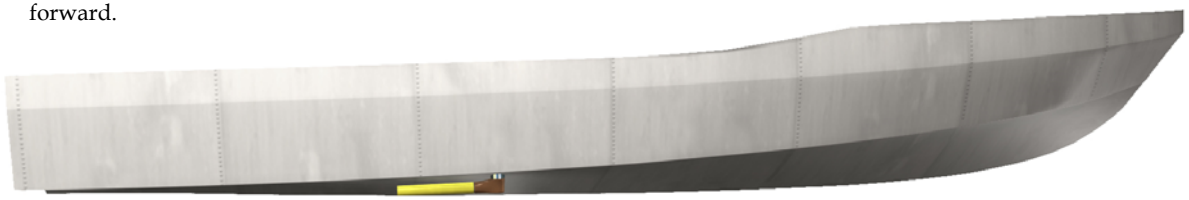
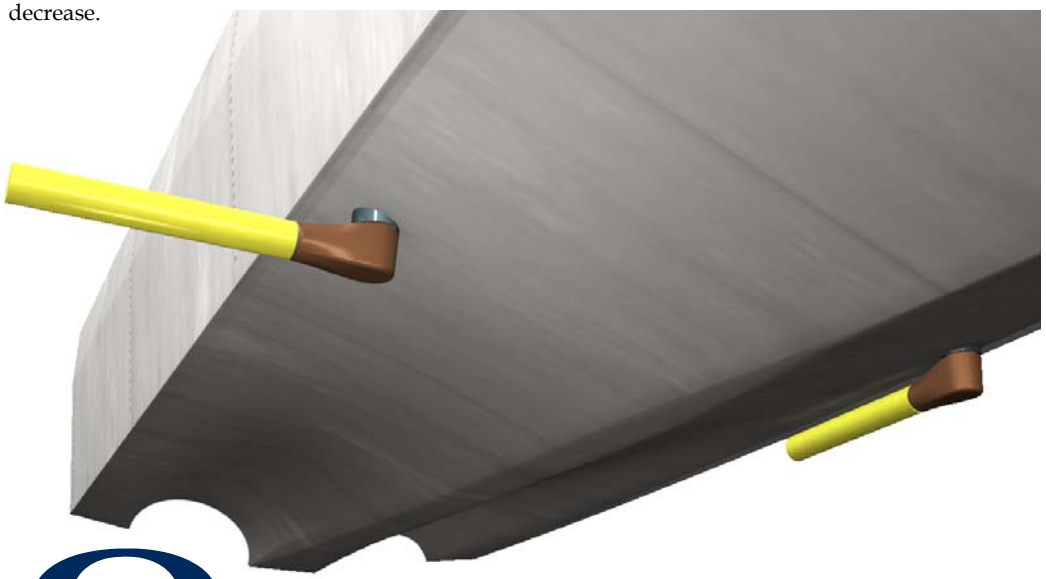
LONGITUDINAL LOCATION

A rotor has distinct advantages over a fin because it can be placed in a much larger longitudinal region on the hull. A fin is restricted to the mid 1/3 of hull length due to pitching forces and steering effects, however this is where the fullest shape of the hull exists and therefore restricting the size of the fin. A rotor however does not influence steering if placed too far aft and will not experience excessive forces due to pitching if placed too far forward.



OPERATION SUMMARY

The rotor has an outer fiberglass tube (shown in yellow) which spins on its shaft. When deployed perpendicular to the vessel (shown on the vessel's starboard side) this will create a righting moment when the vessel is moving thru the water. When the stabilizers are off, they fold back to cause less drag and unobtrusive to docks and overboard operations (as shown on the vessel's port side). One rotor can be stowed while the other is working if coming along side another vessel, however performance will decrease.



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UNDERWATER APPENDAGES

At lower vessel speeds, the rotors are deployed as shown. As the vessel increases in speed, the rotors are swung aft to reduce drag, however due to the increased water flow over them, the effective power is not significantly reduced. Finally, as the vessel passes the effective speed of the rotors, they turn off and swing fully aft for minimum drag.

PERFORMANCE OF A FIN COMPARED TO A ROTOR

The graph compares the lift force of a ML300 rotor with an equivalent fin. The rotor is shown with two curves: a fully deployed rotor for loitering speeds and swept back 30 degrees for higher vessel speeds.