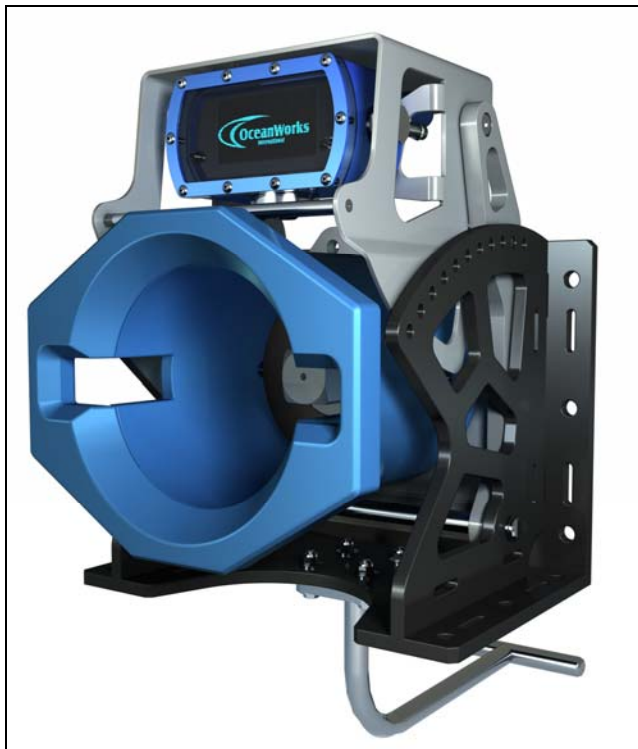


## TORNADO TVT - SUBSEA TORQUE VERIFICATION TOOL

### OVERVIEW

The **TORNADO TVT** subsea torque verification tool allows remote verification of torque output for an ROV-borne torque tool at operating depths up to 4,000 meters immediately prior to use in the operation of a subsea valve or actuator. The TVT interfaces with any torque tool configured to API 17D/H (ISO 13628-8) Classes 1-4.



The TORNADO TVT is a single, compact, ruggedized unit featuring a wide range of ROV skid mounting configurations, bi-directional communications with a topside display unit, a programmable LED Display unit, and an extended life, rechargeable lithium polymer battery.

### FEATURES

#### Subsea Torque Verification Tool

- Interfaces with any torque tool configured to API 17D / H (ISO 13628-8) Class 1 - 4
- Torque Tools configured to any Class 1 - 4 end effector can be verified using a single interface (no subsea change-out required)
- Innovative pivot frame design facilitates wide range of ROV skid mounting configurations
- Bucket swivel frame provides positioning of torque receptacle over a 50 degree range
- Display swivel frame provides positioning of LED display over a 35 degree range
- Manipulator handle reconfigurable to 8 different mounting configurations
- Oil compensated electronics / torque transducer

#### Subsea LED Display & Electronics

- Programmable character height (0.2" to 0.15")
- Battery charge indicator
- Torque readout w/rotation (+/-) in Nm or ft-lb
- Light activated
- Automated sleep mode (programmable)
- Bi-directional RS-232 or RS-485 communications with topside laptop display
- 12v-24v external power supply w/internal hot swap battery backup
- Rechargeable battery
  - 100 hour battery life (display on)
  - 2 month battery life (sleep mode)

### SPECIFICATIONS

- Torque readout accuracy: +/- 0.5%
- Dimensions: 11.5 x 11.3 x 14.8 inches (292 x 297 x 376 mm)
- Weight: Air: 18.8 kg / 41.5 lb  
Water: 13.6 kg / 30 lb
- Environmental: -20°F to 140°F (-28°C to 60°C)
- Depth rating: 4,000 meters