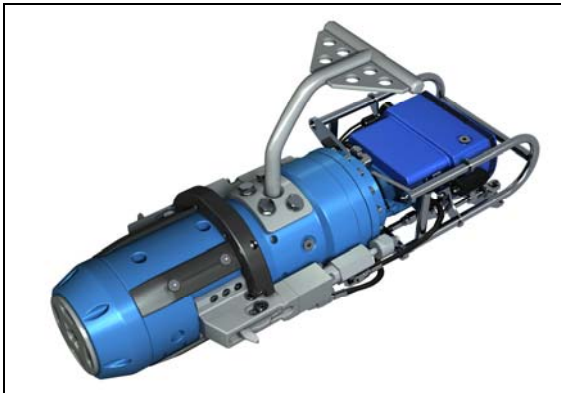


# TORNADO TRO SUBSEA TORQUE TOOL

## OVERVIEW

The **TORNADO TRO** subsea torque tool is specifically designed for operation with an ROV or a diver, and features integrated torque and turns count sensors for real-time readout of torque and turns. When matched with a “smart” torque tool control manifold, full torque and speed feedback and control can be achieved.

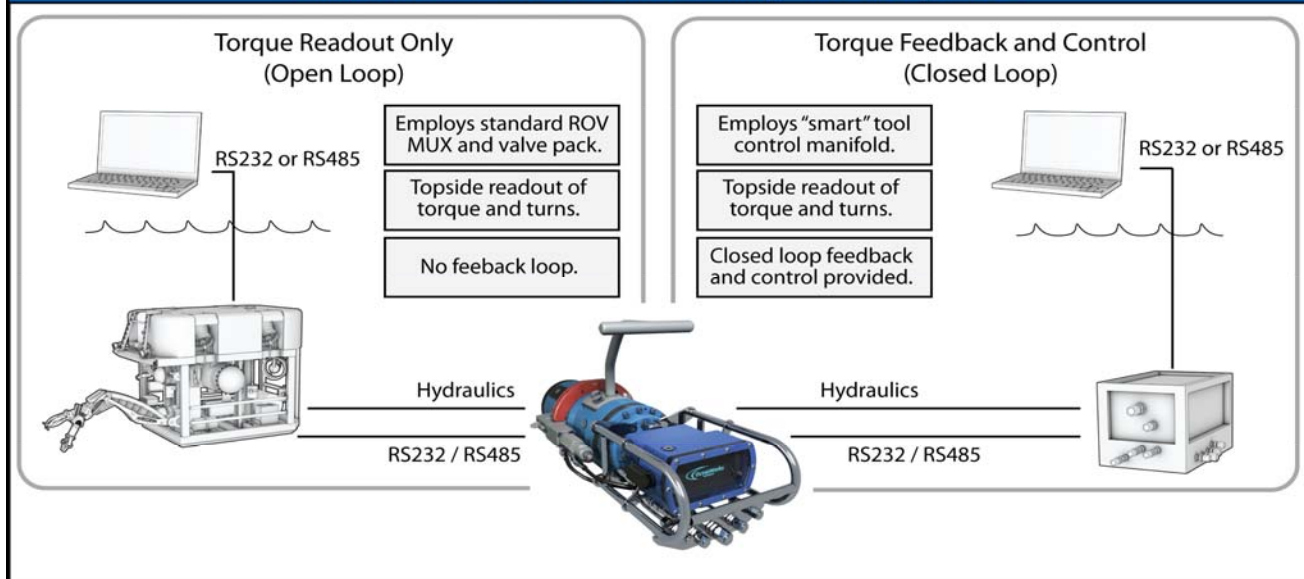


The TORNADO TRO features a robust, light weight tool design that is compliant with API17D & H, Class 1 -4, (as incorporated in ISO 13628-8), and provides a maximum torque output of 2,000 ft lbs (2700 Nm). Conversion between Class 1 – 4 end effectors is easily achieved without disassembly of oil-filled gearbox, and clamping latches are fail-safe, enabling removal of the tool from the API receptacle when hydraulic pressure is removed.

## FEATURES

- ISO 13628-8 / API 17D & H Class 1 -4
- Lightweight, compact design
- Suitable for use with ROVs or Divers
- 4,000 meter depth rated
- Real-time torque and turns readout available surface and subsea
- Extended battery life
- Supports torque/speed feedback & control

## Tornado TRO - Tool Control Configuration Options



**SPECIFICATIONS**

**Torque Tool**

- Weight in air: 68 lbs (30.8 kg)
- Weight in water: 53 lbs (25.9 kg)
- Depth Rating: 4,000 meters
- Interface: API 17D & H, Class 1-4
- Torque output:
  - Class 1: 0 to 50 ft lbs (0 to 69 Nm)
  - Class 2: 0 to 200 ft lbs (0 to 270 Nm)
  - Class 3: 0 to 1000 ft lbs (0 to 1360 Nm)
  - Class 4: 0 to 2000 ft lbs (0 to 2700 Nm)
  - OWI Class 1-4: 0 to 2000 ft lbs (0 to 2700 Nm)

**Subsea LED Display & Electronics**

- Dual simultaneous display of torque / turn count
- Programmable character height (0.2" to 0.8")
- Battery charge indicator
- Torque mode indicator (Class 1-4)
- Torque readout w/rotational sign (+/-) in Nm or ft-lb
- Number of turns w/rotational sign (+/-)
- Light activated
- Automated sleep mode (programmable)
- Bi-directional RS-232 and RS-485 communications with topside
- Topside readout of torque, turns, RPM, battery charge; operator reset of number of turns
- 12v-24v external power supply w/internal hot swap battery backup
- Torque readout accuracy +/- 10%
- Oil compensated electronics / torque transducer
- Rechargeable battery
  - 100 hour battery life (display on)
  - 2 month battery life (sleep mode)
  - Ruggedized battery charger – IP 67 rating
- Environmental: -20°-140° F (-28° to 60° C)



**TORNADO TRO TORQUE TOOL KIT INCLUDES:**

- TORNADO TRO Subsea Torque Tool
- Class 1 – 4 end effectors
- Torque Multipliers
- Surface Calibration Unit
- Battery Charger
- Standard Spares Package
- Shipping Cases

**OPTIONS**

- Multiplexer – allow for multiple tools to be run from the same laptop
- Tornado TVT subsea torque verification tool

**SURFACE CALIBRATION STAND & ADAPTERS**



**CLASS 1 & 2**  
1 1/2" square



**CLASS 3**  
1 1/8" square



**CLASS 4**  
1 1/16" square

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