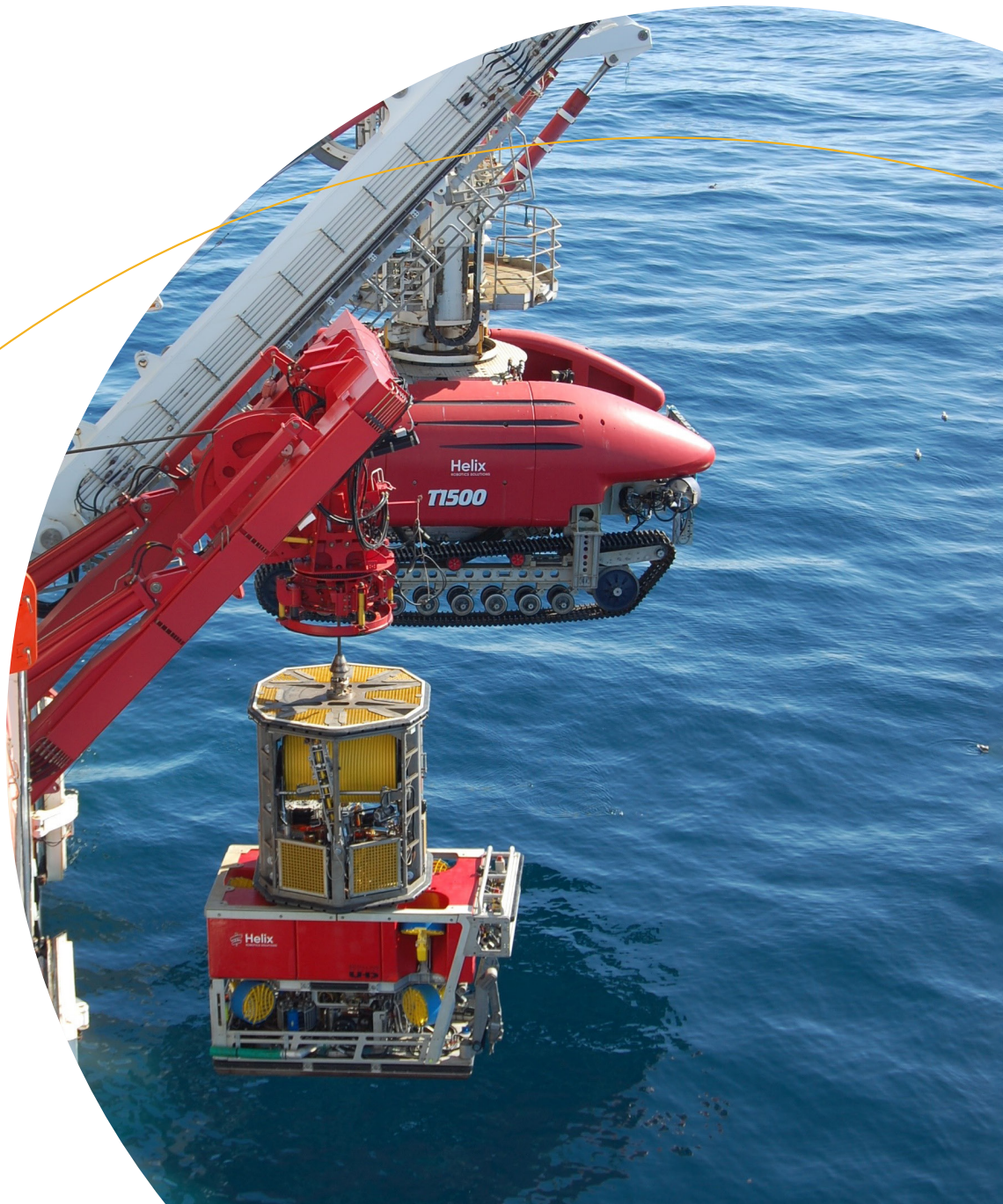


T-1500 Trencher

Jet trenching system



The **T-1500 Jet Trencher** has an extended range of jetting configurations and significantly improved HP/LP jetting.



The T-1500 Jet Trencher is the next generation of jet trencher drawing on the principles of the T-1200 and T-750. T-1500 has an additional 300HP from T-1200 to offer an increased range of burial modes to enhance and improve jetting performance in a wider range of soil types to meet the burial challenges of today. The T-1500 can bury flexible/rigid products and power cables up to 3 meters below the seabed in its current configuration and soil conditions of up to 150kpa.

The T-1500 jet-trenching ROV can operate in water depths from 10m to 1,000m and has built an extensive track record in the North Sea and the Mediterranean. The jet leg configuration allows trenching of products up to 915mm diameter, the versatility of the system can, with modifications, increase this envelope if needed.

Trenching speeds vary depending on mode (tracked or skid), soil conditions, product diameter, and the required depth of trench required, however, speeds in sand over 400m/hr. can be attained where speeds of 80-150m/hr. are achievable for conditions where the soils are stiffer and harder to penetrate. The directly coupled water pumps work together to variable speed drives, meaning the 1500HP system is equivalent to a conventional electro-hydraulic 1900HP system that uses the power to water pumps less efficiently.

The CFD-modeled plenum machined from a solid block of aluminum takes the water from the pumps to the jet legs with minimal losses. The water system is designed to maximize water pressure and flow at the adjustable jetting nozzles. These design enhancements, coupled with unrivaled burial experience put the T-1500 and the T-1200 jet trenching systems as the most effective burial systems in their class.



Experience

Helix Robotics Solutions operates a fleet of ROVs, seabed jet trenchers, and several multi-purpose ROV and construction support vessels worldwide via strategic global offices.



Innovation

Helix Robotics Solutions works closely with our clients and vendors to seek and resolve complex technical developments to engineer practical solutions and implement them in the most efficient, safe, and economical ways possible.



Value

Helix Robotics Solutions is a market leader offering innovative and reliable specialty marine contractors globally. Helix focuses on providing leading-edge subsea, unmanned services in extreme environments and strives to deliver the safest and most cost-efficient value to our customers.

TECHNICAL SPECIFICATIONS

Main characteristics

Depth Capacity	1,000 msw
Power	1,500 hp
Maximum Speed (Free Flying)	Forward = 2.5 knots Lateral = 2.0 knots
Maximum Speed (Tracked)	Forward = 2,500 m / hr

Dimensions

Width Over Buoyancy	6,100 mm
Width Over Tracks	5,600 mm
Length	9,010 mm
Height	3,900 mm

Vehicle weight

Vehicle Weight - In Air

Tracked Mode Configuration	32,000 kg
Skid Configuration	29,000 kg

Vehicle Weight - In Water

Tracked Mode Configuration	1,000 to 3,000 kg
Skid Mode Configuration	300 to 1,000 kg

Propulsion system

Proportionally controlled thrusters
4 x 500 mm horizontal thrusters (vectored at 45°)
4 x 500 mm vertical thrusters

Track drive system

Hydraulically driven track drive system, incorporating large surface area with rubber cleats and steel guides. (derived from proven land based tracked vehicle systems)

Capable of achieving traction in over 3.5 kPa soil conditions

Hydraulic manifolds

2 x ROV, thruster control manifolds (proportional valves for pilot control of thruster motor)

3 x ROV, 12 station manifolds (12 function solenoid / proportional valve manifold)

Camera & lighting system

1 x low light camera
3 x color cameras with focus and zoom
3 x mono inspection cameras
16 x LED lights, 2 per dimming circuit standard
6 x hydraulic pan and tilt units

Depth sensor

High accuracy sensor, 0.1% over full scale for depth
Quartz resonator

Heading sensor

Solid state gyro
MRU / heading with fluxgate

Auto functions

Heading
Depth
Altitude
Product tracking

Electrical power system

2 x 281 kW / 375 hp electric motor, controlled by variable speed drive (VSD) surface transformers, directly coupled to 2 hp water pumps

1 x 281 kW / 375 hp and 2 x 150 kW / 200 hp electric motors coupled to hydraulic pumps to feed ring main to drive 4 water pumps (LP and / or HP) for jetting and vehicle motive power

Control systems

Utilizes the evolutionary ICE™ Integrated Control Engine
Fully redundant Windows®-based HMI computers
Dedicated real-time controllers
Intuitive graphic user interface (GUI)
Advanced graphical interactive diagnostics
User configurable GUI

Ergonomic pilot / co-pilot control consoles using touch screen control interfaces for diagnostics and other secondary functions

4 x 40 in. HD multi media video wall system

Data transmission

Single mode fiberoptic video and data multiplexer
8 x real-time video channels available
4 x full duplex RS232 @ 115 kbps data channels
4 x full / half duplex RS485 / 422 / 232 channels

Sensors

Fitted with a range of sensors, as per the project requirements. Product location / tracking system (TSS 440/350) (or other tracking device)

Launch & recovery system

Capability Sea state 5 / 6 LAME 2013
Capacity 3,300 m
Outreach 3.8 m
Lifting Speed 30 m / min on bottom layer

Eductor & backfill

An eductor dredge will be fitted complete with integral backwash jets to allow selection of dredge or back-wash operation remotely

A backfill tool is fitted to collapse the trench wall using water jets above and inside the trench. Backfill II is performed as a separate jetting pass.

Ability to switch between backwash and eduction in water

Real-time burial depth indicator (optional)

Rear mounted, hydraulically controlled with variable control and feedback product monitoring tool to provide calibrated real-time (continuous) burial depth indication. Subject to product specification.

Pre-cutting tools

Forward non seabed penetrating pre-cutting jetting system can be configured for LP or HP jetting. The system is designed to start the jetting process ahead of the main swords to facilitate single pass burial* when used in conjunction with the "Real-Time Depth Indicator." The tool can also be used to bury tight radius turns* (<10 m radius).

*Subject to soil conditions, soil and product specification.

Product burial capabilities

Product Size Range	100 to 915 mm diameter (depending on soil conditions and burial depth)
Cohesive Soil	Up to 150 kPa (product specification and burial depth dependent)
Non-Cohesive Soil	Sand, silt and gravel
Burial Depth	1.0 m to 3.0 m (soil and product dependent)
Burial Speed	25 to 780 m / hr (soil / burial depth / product dependent)

Jetting system

1 m, 2 m, 3 m burial swords
1,200 mm maximum opening between swords

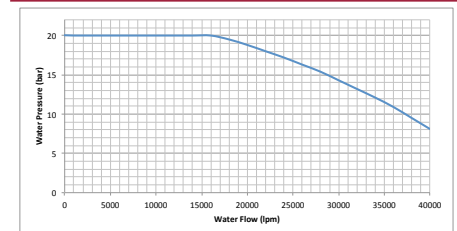
HP water pumps

HP water pressure flow and jetting sword nozzle configuration will be engineered per execution of each project and dependent of soil conditions, project specification and burial requirements

To optimize vehicle performance, detailed setup of the trencher will form part of the project procedure pack-age

Total HP Out-put 16,000 LPM at 20 bar max pressure 30,000 LPM at 13 bar

Total HP water pump output curve



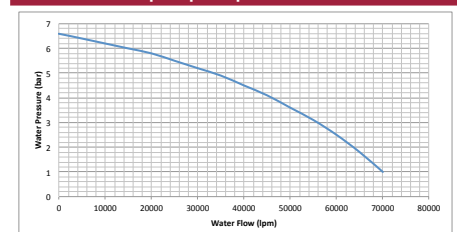
LP water pumps

LP water pressure flow and jetting sword nozzle configuration will be engineered per execution of each project and dependent of soil conditions, project specification and burial requirements

To optimize vehicle performance, detailed set up of the trencher will form part of the project procedure package

Total HP Out-put 16,000 LPM at 6 bar max pressure 70,000 LPM at 1 bar

Total LP water pump output curve





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