SUBSEA TRENCHING

SUBSEA TRENCHING

SMD is the world's leading subsea trenching equipment supplier, committed to high quality and performance, founded on thorough engineering and solid support. SMD offer the world's largest range of subsea trenching products. The trenching business stream supplies towed and self-propelled vehicles, with a comprehensive range of in-house engineered launch and recovery systems (LARS) and state-of-the-art control systems.

SMD has delivered over one hundred subsea trenching systems spanning a thirty year period, developing a unique and comprehensive, world class product range with cutting edge technology. The success of these systems is reflected in repeat business from a valued, worldwide customer base. SMD seek to continuously improve and develop new products and new technologies to satisfy the ever evolving technical challenges.

SMD's trenching product range has been created in a way which provides tailored solutions for a variety of different markets and end uses.

SELF PROPELLED SYSTEMS

The self propelled systems include the QTrencher (QT) and heavy tracked trencher ranges. QTrenchers are SMD's fourth generation trenching ROV. Subsea power available ranges from 400hp through to 2800hp all able to free fly with track upgrades. Heavy tracked trenchers are available in a range of chassis sizes and power ratings to suit trenching in hard ground up to 50MPa. Trenchers can be configured to carry multiple tools, simultaneously or in interchangeable cartridges, including rock and clay chains, jetters, dredges, eductors and backfill tools to suit every soil combination.

Bespoke, self propelled systems developed for customers include RT-1, the world's most powerful subsea tractor and UT-1, the world's largest trenching remotely operated vehicle (ROV). RT-1 (180Te) was designed to trench 1.5m diameter pipelines to 2m deep in 40MPa rock. UT-1 (60Te) was designed to trench 1m diameter pipelines at water depths of 1500MSW.

Self Propelled		Power (hp)	Oil & Gas	Power Cables	Telecoms
QTrencher	QTrencher 400	400			✓
	QTrencher 600	600			✓
	QTrencher 800	800		✓	✓
	QTrencher 1000	1000	✓	✓	✓
	QTrencher 1400	1400	✓	✓	✓
	QTrencher 2800	2800	✓	✓	
CBT	CBT800	800	✓	✓	✓
	CBT1100	1100	✓	✓	
	CBT2100	2100	✓	✓	
	CBT3200	3200	✓	✓	
	LBT1100	1100		✓	

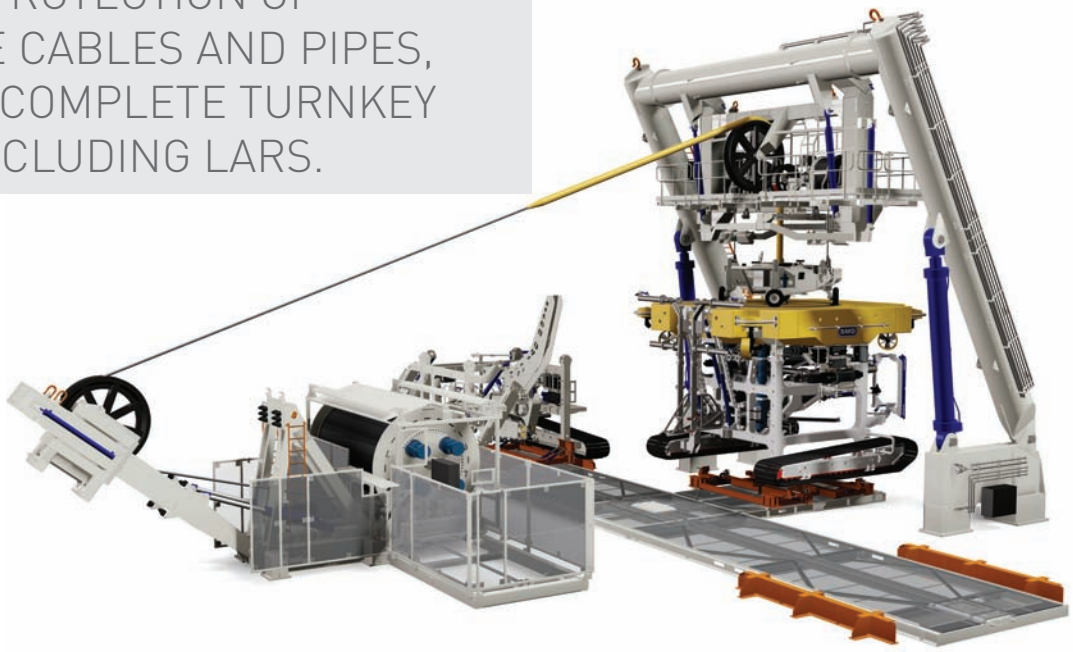
TOWED SYSTEMS

SMD's towed systems are designed to bury subsea telecommunication and power cables up to 350mm diameter and pipelines up to 1500mm diameter. Available systems include the Multi-Depth Plough (MD3) Heavy Duty Plough (HD3), Ultra Duty Plough (UD4) and Multipass Plough (MP) systems, supplied with tow load capability of 80Te, 120Te, 150Te, 250Te and 350Te.

SMD Smart Ploughs (MD3, HD3 and UD4) all have powered steering and variable depth control to maximise cable protection. All Smart Ploughs have optional jetting to transform progress rates in dense sands.

Towed		Product Size (mm)	Oil & Gas	Power Cables	Telecoms
Slot Plough	MD3-160	160		✓	✓
	HD3-200	200	✓	✓	✓
	HD3-300	300	✓	✓	
	UD4-400	400	✓	✓	
'V' Plough	MP	1500	✓	✓	
	BP		✓	✓	

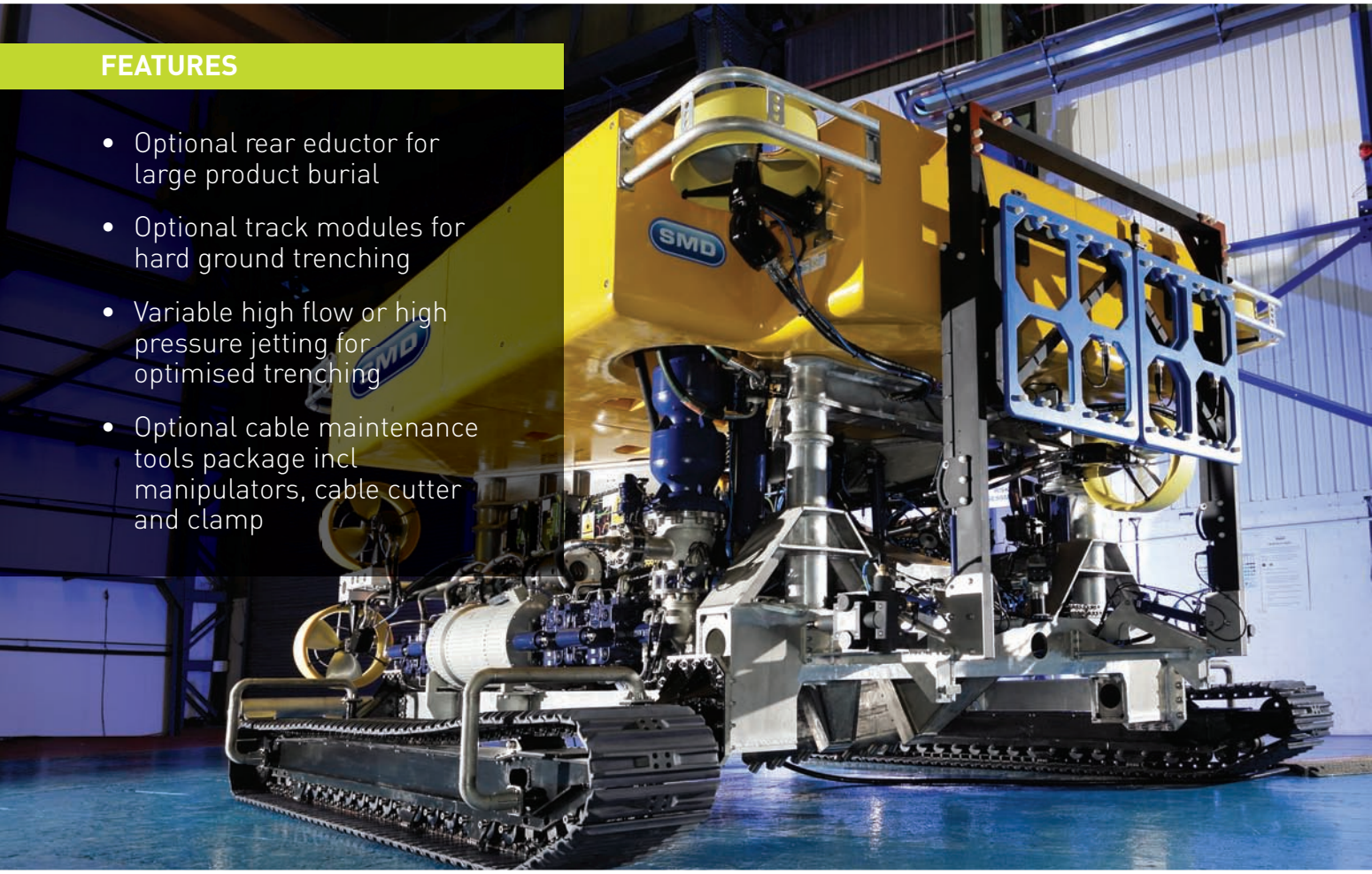
THE TRENCHING BUSINESS STREAM IS DEDICATED TO THE SAFE AND EFFICIENT PROTECTION OF SUBMARINE CABLES AND PIPES, SUPPLYING COMPLETE TURNKEY SYSTEMS INCLUDING LARS.



QTRENCHER

INSTALLATION AND MAINTENANCE ROV

The QTrencher (QT) 400 to 1000 remotely operated vehicles (ROVs) are based on two aluminium chassis designs which provide high power trenching capability for the burial of cables, umbilicals and small diameter pipes up to 3m deep in various water depths. The ROVs use variable high flow or high pressure jetting to optimise the trenching to suit the anticipated conditions. Vehicles can be fitted with tracks and/or a rear eductor to enhance burial of large diameter products, as well as a suite of tools for maintenance operations. With their high thrust, the vehicles are capable of rapid post lay survey. This forth generation range of cable maintenance ROVs includes the lessons learned (access, maintainability and fault diagnostics) critical to achieving maximum vehicle availability.



FEATURES

- Optional rear eductor for large product burial
- Optional track modules for hard ground trenching
- Variable high flow or high pressure jetting for optimised trenching
- Optional cable maintenance tools package incl manipulators, cable cutter and clamp

GENERAL	QTRENCHER 400	QTRENCHER 600	QTRENCHER 800	QTRENCHER 1000
Depth rating	10-1500/2000/3000msw	10-1500/2500msw	500-2000msw	500-2000msw
Dimensions				
Length (Excl. Swords)	3.8m	5.0m	5.0m	5.0m
Width	3.2m-4.6m	4.2-5.0m	4.2-5.0m	4.2-5.0m
Height	2.5m	3.3m	3.3m	3.3m
Weight in air (skids)	9.5Te	17.0Te	19.0Te	21Te
Submerged Weight	Buoyant	Buoyant	Buoyant	Buoyant
Max Tow Load	1500kg	2100kg	2100kg	2100kg
Power (hp)	400	600	800	1000

	QTRENCHER 400	QTRENCHER 600	QTRENCHER 800	QTRENCHER 1000
PERFORMANCE				
Vertical	1.5 knots	1.5 knots	1.5 knots	1.5 knots
Fore / Aft	3.5 knots	4.0 knots	4.0 knots	4.0 knots
Lateral	3.0 knots	2.0 knots	2.0 knots	2.0 knots
ROV power	400hp (300kW) total: 1 x 400hp (300kW) 4-pole Curvetech™ HPUs	600hp (450kW) total: 2 x 300hp (225kW) 4-pole Curvetech™ HPUs	800hp (600kW) total: 2 x 400hp (300kW) 4-pole Curvetech™ HPUs	1000hp (750kW) total: 2 x 500hp (375kW) 4-pole Curvetech™ HPUs
JETTING SYSTEM				
Main jet tooling configuration Twin leg jet tool with fwd/downward facing jets (sub seabed) and cable depressor	✓	✓	✓	✓
Trench depth	up to 2.0m legs	0-2.0m standard, 0-3m with extended swords	0-2.0m standard, 0-3m with extended swords	0-2.0m standard, 0-3m with extended swords
Width control - leg spanning (between inside of legs) 50mm to 400 mm - remotely variable	✓	✓	✓ +250/600	✓ +350/700
Water supply (in tracked mode)	up to 250kW	twin hydraulically driven water pumps absorbing up to 400kW	twin hydraulically driven water pumps absorbing up to 550kW	twin hydraulically driven water pumps absorbing up to 700kW
Forward jet tool Configuration - twin jet device (above seabed) which jets down either side of product	✓	✓	✓	✓
Trench depth - up to 1.0m (soil dependent)	✓	✓	✓	✓
OPTIONAL TRACK MODULES				
Bolt on modules (interchange with skids)	✓	✓	✓	✓
Plastic track plates on standard running gear	✓	✓	✓	✓
Speed	0 to 2km/hr	0 to 2km/hr	0 to 2km/hr	0 to 2km/hr
OPTIONAL DREDGE SYSTEM				
Twin leg aft mounted eductor (Hydraulically driven dredge pump)		✓	✓	✓
0 to 2.0m standard dredge depth		✓	✓	✓
CABLE TRACKING PACKAGE				
Tone detection TSS350	✓	✓	✓	✓
Pulse induction TSS440 (including deployment frame)	✓	✓	✓	✓
O/A and multi beam Sonar and cameras	✓	✓	✓	✓
OPTIONAL CABLE TOOLS PACKAGE				
2 x 7 function manipulators	✓	✓	✓	✓
Armoured cable cutter - up to 100mm	✓	✓	✓	✓
Softline cable cutter	✓	✓	✓	✓
Cable clamp - up to 100mm	✓	✓	✓	✓
SUBSEA ELECTRONICS				
Electronics pod - one atmosphere pressure vessel	✓	✓	✓	✓
Depth rating	up to 3000m	up to 3000m	up to 2000m*	up to 2000m*
Fibre optic MUX communication	✓	✓	✓	✓
Connection point for vacuum checking of seals	✓	✓	✓	✓
Built in spare channels RS232, RS485, Ethernet 110V, 24V	✓	✓	✓	✓

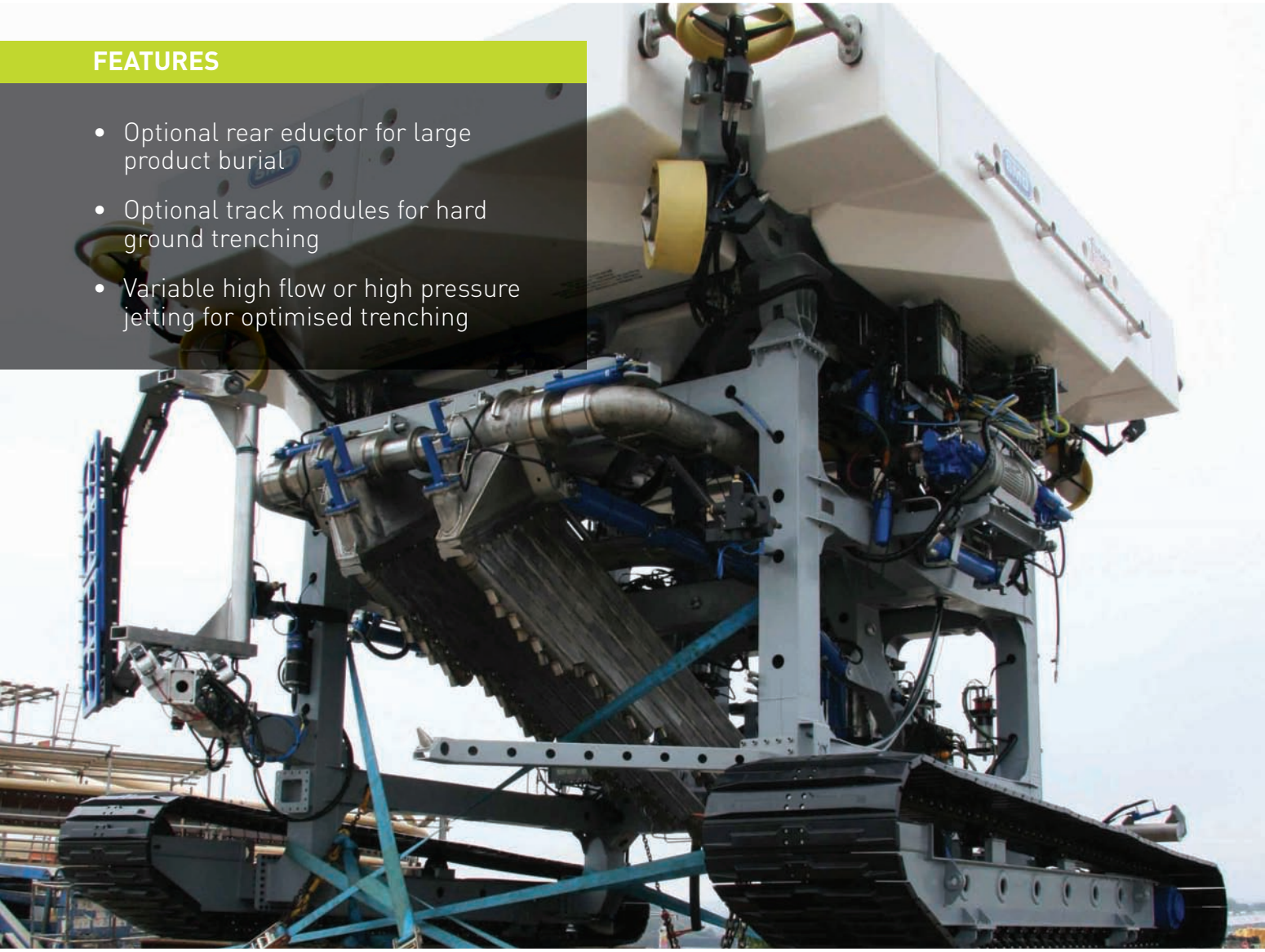
* STANDARD ARRANGEMENT - BESPOKE SOLUTIONS AVAILABLE

QTRENCHER

PIPELINE AND POWER CABLE INSTALLATION ROV

The QTrencher (QT) 1400 and 2800 remotely operated vehicles (ROVs) are based on two high strength steel chassis designs which provide high power trenching capability for the burial of cables, umbilicals and large diameter pipes up to 3m deep in various water depths. The ROVs use variable high flow or high pressure jetting to optimise the trenching to suit the anticipated conditions. The QT1400 can be fitted with tracks and/or a rear eductor to enhance burial of large diameter products, it can also be supplied with independent track bases for chain cutting trenching, core drilling or cutter dredge applications.

The QT2800 is the world's most powerful free-swimming jet trencher. With more than 2 megawatts of total power, the trencher delivers 1.5 megawatts of jetting power. SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems.



FEATURES

- Optional rear eductor for large product burial
- Optional track modules for hard ground trenching
- Variable high flow or high pressure jetting for optimised trenching

	QTRENCHER 1400	QTRENCHER 2800
GENERAL		
Depth rating	1000, 2000 & 3000msw options	1500msw
Dimensions		
Length	7.8m	7.8m
Width	6.5m	7.8m
Height	5.0m	5.6m
Weight in air	30-40Te	60Te
Submerged Weight	Neutral	Neutral
Max tow load	1000kg	5800kg
PERFORMANCE		
Vertical	2.0 knots	2.0 knots
Fore / Aft	3.0 knots	3.0 knots
Lateral	2.0 knots	2.0 knots
ROV power	1400hp (1050kW) total: 1 x 300kW, 4160V 2 x 375kW, 4160V	2800hp (2100kW) total: 2 x300kW, 3300V 4 x375kW, 3300V
JETTING SYSTEM		
Twin legged jet tool providing constant jet angle	from 0.5m to 3.0m	from 0.75 to 2.5m
Max trench depth	Variable 2.5-3.5m	Variable 0-2.5m
Jetting pressure	Variable 7-15bar	Variable 4-9bar
Width control (remotely variable)	Leg spanning (between inside of legs) Min 150mm Max 900mm	Leg spanning (between inside of legs) Min 250mm Max 1200mm
Water pumps	up to 2 x 375kW	Up to 4 x 375kW
Water supply (approx.)	2400m3/hr@7bar or 1200m3/hr @ 15bar (2 pumps)	3600m3/hr4bar or 2400m3/hr @ 9bar (2 pumps)
EDUCTOR SYSTEM		
Configuration	Twin legged eductor mounted on constant angle linkage system	Twin legged eductor mounted on 180° pivoting system
Trench depth	Variable from 0.25m	Variable from 0.25m
Trench width	0.5-1.2m remotely controlled	0.5-1.2m remotely controlled
SUBSEA ELECTRONICS		
Electronics pod	One atmosphere pressure vessel	One atmosphere pressure vessel
Depth rating	3000m	1500m
Test pressure - 1.25 x working pressure	✓	✓
Connection point for vacuum checking of seals	✓	✓

QTRENCHER

MULTI TASK BASE MODULES

The QTrencher (QT) 1400 system utilises a core buoyancy module with integral HPUs, thruster pack, water pumps, cameras, central control pod, etc. This can be attached quickly and easily to various functional base modules which include, but are not restricted to, jet trenching module, chain trenching module, core drilling module and crane dredge cutter module. The base modules are connected to the core buoyancy module with mechanical linkage pins, wet connectors, water hosing and hydraulic piping where necessary for minimal change-over time.

SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems. The LARS can be supplied with deck transfer system for module change-out in sea state 3 - 6.

CUTTING DREDGE

- Track based free fly crane mounted cutting head or jet cutter with integral dredging for site clearance operations
- Dredge pump capable of transporting up to 200m³/hr solids
- Depth of operations to 3000m

JETTING

- Track based jetting module for jetting in sand and clay up to 100Kpa
- Burial depth from 1m to 3m for cables and pipelines up to 800mm diameter
- Rear eductor system for trench clearing
- Depth of operations to 1500m and 3000m

CORE DRILLING

- Track based wire line core drilling module for soil investigations with 75mm drill rods and up to 10Te push force, together with drill casings and CPT capability
- Supplied with subsea loaded drill magazines for drilling depth beyond 90m
- Depth of operations to 500m, 1000m, 2000m and 3000m

CHAIN CUTTING

- Track based chain cutting module for trenching in clays up to 400KPa
- Burial depth from 1m to 2m with integral depressor and cable handling equipment
- Suitable for cables up to 200mm diameter and 3m MBR
- Depth of operations to 500m and 1000m

MD HD UD

SLOT PLOUGHS

The Smart Plough range including the Multi-Depth Plough (MD3), Heavy Duty Plough (HD3) and Ultra Duty Plough (UD4), is recognised globally as setting the standard in cable ploughing. It provides assured cable burial in most soils including sands, clays and soft rock. The range is designed to handle 160 to 400mm diameter cables (with repeaters and joints for telecommunication systems). The ploughs come with a further range of cable MBR capability from 1.5m to 6.0m.

Using patented technology, the ploughs are designed to minimise pull force requirements and provide effective trenching capability from 0 to 4m depth. Their performance can be enhanced with jetting and rock ripping upgrades. Coupled with tow winches, umbilical winches and wide angle A frames, SMD are able to supply a turnkey flexibles burial solution for a wide range of cable sizes and vessel tow loads together with cable handling systems such as drum cable engines (DCEs) and linear cable engines (LCEs).

FEATURES

- Diverless subsea loading and unloading
- Emergency cable unload
- Multi depth burial capability
- Steering bridle +/- 12 degrees
- Jetting system for enhanced burial in sand
- Jetting thruster for positional accuracy when landing on seabed

Image courtesy of Technip Offshore Wind

	MD3/160	HD/200	HD/300	UD4/400
GENERAL				
Depth rating	2000msw	1500msw	1500msw	500msw
Dimensions				
Length	9.1m	13.5m	15.0m	20.0m
Width	5.1m	6.3m	6.5m	8.0m
Height	4.4m	6.6m	6.6m	9.5m
Weight in air (std)	22Te	35Te	45Te	120Te
Submerged weight	19Te	30Te	39Te	106Te
Max tow load	80Te	150Te	150Te	250Te
PERFORMANCE				
Trench depth	Variable 0 to 3.0m	Variable 0 to 3.0m	Variable 0 to 3.3m	Variable 0 to 4.0m
Max. cable dia.	20mm to 160mm	30mm to 200mm	30mm to 300mm	200mm to 400mm
Min. cable bend radius	1.5-2.0m	2.0-3.5m	2.5-5.0m	5-6.0m
Steering.	+/- 15 deg.	+/- 12 deg.	+/- 12 deg.	+/- 12 deg.
Max repeater diameter	380m			
MECHANICAL				
Ultra high strength steel chassis	✓	✓	✓	✓
Replaceable wear-resistant steel wear parts	✓	✓	✓	✓
TRENCHING SYSTEM				
Configuration - passive parallel sided share	✓	✓	✓	✓
Optional jetting - 250-500kW	✓	✓	✓	✓
Water supply (approx) - 800m^3/1600m^3 @ 6bar (approx)	✓	✓	✓	✓
Plough share tip, knife jetting & forward jetting arm	✓	✓	✓	✓
DIVERLESS SUBSEA UNLOADING				
Crane - knuckle boom		✓	✓	✓
Slewing depressor - to assist cable into share		✓	✓	✓
Front bellmouth tines - load cable into front bellmouth		✓	✓	✓
Jetting thruster - to assist landing over cable		✓	✓	✓
Tipping trough - to assist with unloading		✓	✓	✓
ROV intervention panel - emergency unload		✓	✓	✓
HYDRAULIC & INSTRUMENTATION				
Installed power	15kW	15kW	15kW	25kW
Smart heavy duty marine cylinders	36lpm@250bar	36lpm@250bar	36lpm@250bar	45lpm@250bar
Stainless steel, oil compensated valve packs	✓	✓	✓	✓
Stainless steel manifolds, pipes & fittings	✓	✓	✓	✓
Forward vertical and lateral cable sensing	✓	✓	✓	✓
Rear cable sensing and load measurement	✓	✓	✓	✓

PIPELINE V PLOUGH

The Multipass Plough (MP) builds on SMD's reputation for the continuous development of innovative products. The MP sets the standard globally for multipass pipeline ploughing offering remotely variable multipass capability. This allows the operator to remotely adjust the spoil depth during trenching. The plough system also includes SMD advancements such as Hi-Tow points and the active share track, making the MP the most advanced pipe trenching technology in the world. Towing capability ranging 250Te, 300Te and 350Te vessel pull, combined with the track drive and jetting ensures maximum burial capability with minimal power consumption. The ploughs are also available with air tank buoyancy for minimum ground pressure.

FEATURES

- 2x25Te to 2x75Te pipe handling capacity
- Large pitch capability
- Hi-Tow points reduce tow force requirements
- Optional active share track reduces tow force requirements
- Optional jetting on share reduces tow forces in sands
- SMD powered steering

GENERAL

Depth rating	1000msw
Dimensions	
Length	18.5-21.4m
Width	9.8-11.75m
Height	8.5-9.65m
Weight in air (std)	140-180Te
Submerged weight	125-155Te
Max tow load	250/300/350Te

PERFORMANCE

Trench depth	1st pass - 1.5-2.0m 2nd pass – 2.0-2.5m
Max. product diameter	700-1460mm dia.
Steering	+/- 8 deg.
Soft ground capability	5kPa at full trench depth

MECHANICAL

Construction	High strength steel chassis
Wear parts	Replaceable wear-resistant steel
Other	Stainless steel fittings and housings

TRENCHING SYSTEM

Main share	Passive blades 35 deg. V trench
Fixed mouldboards	25 deg. slope spoil heaps either side of trench
Share track	Reduces tow forces up to 80Te down force up to 1400m/hr track speed
Optional jetting	150kW Plough share jetting Upgrade to Umbilical and Winch Upgrade to Power and Control System

PIPELINE BACKFILL PLOUGH

The Backfill Plough (BP) builds on SMD's reputation and long history of pipeline protection. The BP sets the standard globally for pipeline stabilisation and protection through backfill. The backfill plough comes with a number of features to simplify and de-risk operations such as remotely variable mouldboard depth control, trench following front skids and steering. The ploughs are also available with air tank buoyancy for minimum ground pressure. The backfill plough can share the hydraulic surveillance and electric systems, lift point and remote intervention system with the MP (Multipass Plough) to reduce cost.

FEATURES

- Remotely driven mouldboard depth control
- Hi-tow points reduce tow force requirements
- Trench following front skids
- SMD powered steering
- Detachable (shared) lift point, hydraulics and electronics
- Optional forward and rearward launch

GENERAL

GENERAL	
Depth rating	1000msw
Dimensions	
Length	17.8 –19.7m
Width (launch)	9.4-11.3m
Height	8.0-9.3m
Weight in air (std)	100-120Te
Submerged weight	90-102Te
Max tow load	120/160/200Te

PERFORMANCE

Steering	+/- 8 deg.
Soft ground capability	5kPa at full trench depth

MECHANICAL

Construction	High strength steel chassis
Wear parts	Replaceable wear-resistant steel
Other	Stainless steel fittings and housings

BACKFILL SYSTEM

Mouldboards	Variable blades

CBT

INNOVATIVE CABLE AND PIPELINE BURIAL SOLUTION

The Cable Burial Tractor (CBT) range draws on SMD's experience of tracked vehicles, trenching and product handling subsea to provide a soft or hard ground burial solution in one neat package. The vehicle is also available as a Burial Tractor configured for pipeline burial. The CBT comes equipped with a selection of powerful chain cutter trenching tools, dredge pumps and jet legs. Well proven chain cutter deployment systems allow pre or post-lay burial of cables up to 300mm diameter and 5.0m MBR, and pipelines up to 1.5m diameter. SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems.

FEATURES

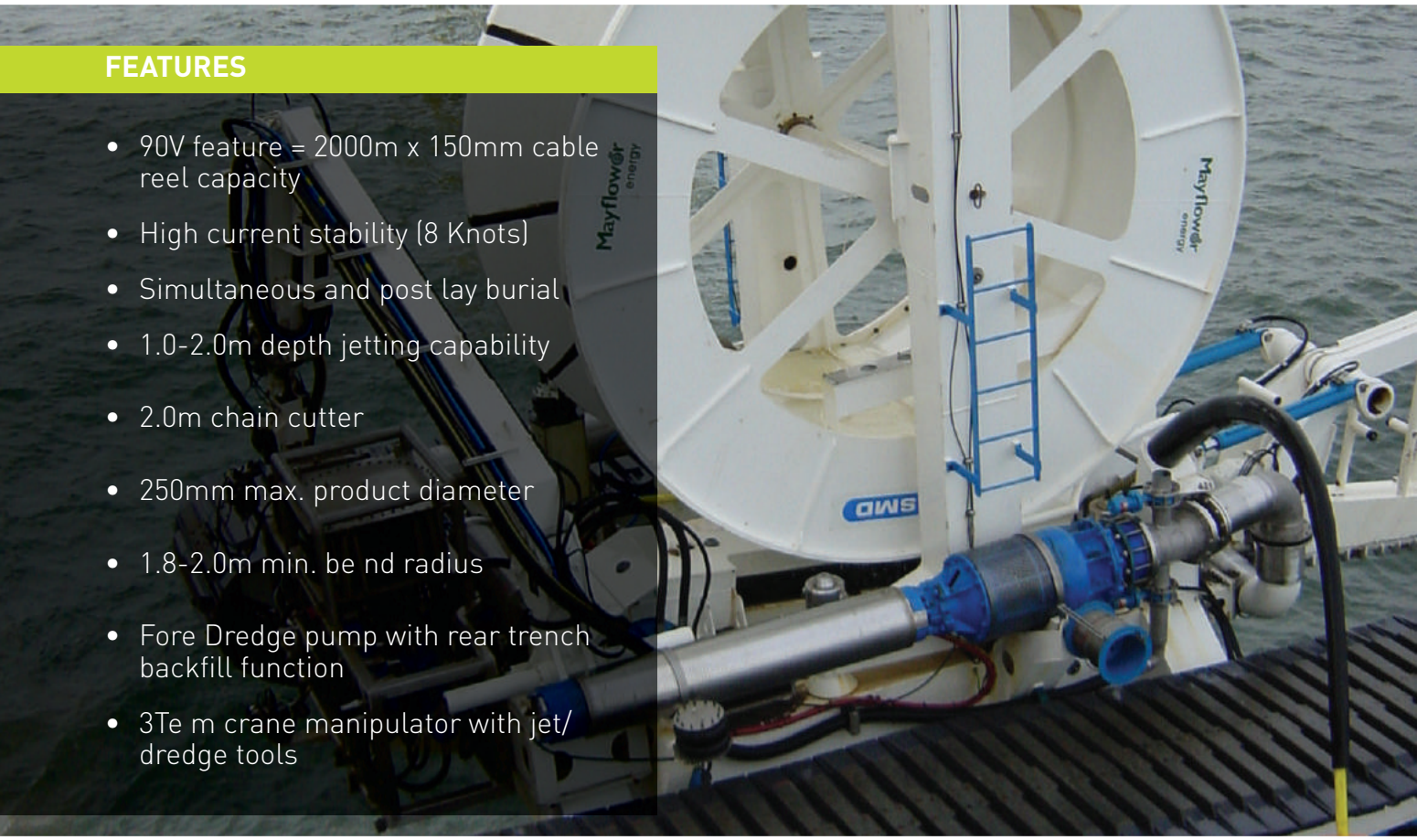
- Pre and post lay cable and pipeline burial
- 3.0m Variable jetting capability with depressor
- 2.0m to 3.0m chain cutter for hard ground up to 80MPa
- Optional fore, mid and aft dredge pumps
- 300mm max. cable/umbilical diameter with rear swords with 3.0-5.0m min. bend radius
- 1500mm max pipe diameters with pipe handling up to 75te each
- Optional 3Tem crane manipulator with tools

	CBT 800	CBT 1100	CBT 2100	CBT 3200
GENERAL				
Depth rating	1000msw	1000msw	1000msw	1000msw
Dimensions				
Length (with tools)	13.0m	13.5m	14.5m	22.5m
Width	6.0m	6-7.5m	7.5m	13.0m
Height	5.4m	5.5m	5.5m	9.6m
Weight in air	35Te	50Te	60Te	180Te
PERFORMANCE				
Trench depth (jetting)	1.0-2.0m	1.0-3.0m	1.0-3.5m	2.5m
Max. product diameter	300mm	300mm	800mm	1500mm
Speed 0-250m/hr	✓	✓	✓	✓
Soil types Sands	All sands	All sands	All sands	All sands
Clays	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa
Rock	1 to 40 MPa	1 to 40 MPa	1 to 80 MPa	1 to 80 MPa
Soft ground capability (with buoyancy)	12-20 Pa	12-20 Pa	14-25 Pa	20-40 Pa
Installed power	600kW total 2 x 300kW HPU	800kW total 2 x 400kW HPU	1600kW 4 x 400kW HPU	2400kW total 6 x 400kW HPU
MECHANICAL				
High strength steel chassis	✓	✓	✓	✓
Replaceable wear-resistant steel wear parts	✓	✓	✓	✓
Stainless steel fittings and housings	✓	✓	✓	✓
TRENCHING SYSTEM - MECHANICAL				
Configuration –				
Single vertical chain	✓	✓	✓	
Multiple 'V' chains				✓
Separate rear jet tool	✓	✓	✓	✓
Trench depth	2.0m	2.0 / 3.0m	3.0m	2 / 2.5m
Trench width	0.5m	0.6m	0.6m	4.0m (90 deg.)
Chain power	300Kw	400kW	800kW	3 x 400kW
Chain width	600mm	600mm	600mm	900mm
Chain speed 0 to 4m/s	✓	✓	✓	✓
Forward dredge pump (spoil removal)	50kW 400m^3/hr	1 x 75kW 600m^3/hr	2 x 75 kW 1200m^3/hr	3 x 75kW 1800m^{3}hr
Dredge spoil backfill	✓	✓	✓	✓
Spoil fed to cover cable	✓	✓	✓	✓
TRENCHING SYSTEM - JETTING				
Configuration –				
Water pumps supply hyd. deployable	✓	✓	✓	✓
twin-legged device either side of				
cable with in-built depressor.				
Jetting power	2 x 200kW	2 x 300kW	2 x 300kW	2 x 400kW
Jet leg depth	2.0m	3.0m	3.0m	2.0m

LBT

INNOVATIVE CABLE INSTALLATION SOLUTION

The Lay and Burial Tractor (LBT) is based on the CBT800 tractor specification and draws on SMD's experience of tracked vehicles, trenching and cable handling subsea to provide lay and burial solution in one neat package. LBT comes equipped with a powerful chain cutter, spoil dredge pump and jet legs to simultaneous lay and bury cable or post lay cable burial. LBT has a driven cable reel mounted on the vehicle itself and this means it can operate independently of the installation vessel with only the umbilical attached. This has benefits in sectors such as offshore wind farm installation, significantly reducing installation time where tidal and weather windows are often restricting. The reel can be pre-loaded and installed on the vessel, or reel-to-reel loading schemes are available.



FEATURES

- 90V feature = 2000m x 150mm cable reel capacity
- High current stability (8 Knots)
- Simultaneous and post lay burial
- 1.0-2.0m depth jetting capability
- 2.0m chain cutter
- 250mm max. product diameter
- 1.8-2.0m min. be nd radius
- Fore Dredge pump with rear trench backfill function
- 3Te m crane manipulator with jet/ dredge tools

GENERAL	LBT I	LBT 1100
Depth rating	1000msw	1000msw
Dimensions		
Length (with tools)	13.5m	13.5m
Width	10.0m	12.0m
Height	9.0m	10.7m
Weight in air (with cable)	65Te	75-125Te

CABLE REEL	LBT I	LBT 1100
Core dia.	3.0m	4-5m
Drum width	2.3m	3m
Product MBR	1.5m	2-2.5m
Cable capacity	1000m (150mm dia. max.)	2000m (150mm diameter)
Weight	4Te empty 30Te loaded	6-8Te empty (options for 40Te and 50Te)
Hyd. drive	1.5Te @ 30m/min.	
Emergency brake	✓	✓
Post lay burial		✓
Dredge pump spoil removal		✓

SPECIAL PROJECTS

BESPOKE SUBSEA SOLUTIONS AND SPECIALIST HANDLING EQUIPMENT

SMD can apply expertise and experience to a wide range of problems which require a subsea remotely operated solution or specialist handling equipment. SMD has a long track record of developing innovative solutions, which mitigate risk by using, wherever possible, a standard range of components and drawing on the experience of over 350 subsea projects.

Projects undertaken include the fall pipe remotely operated vehicle (ROV) designed to control the positioning of an 800mm diameter, 2km long rock dump fall pipe with 600Kw of on board power. The system included dynamic positioning, pipe following and survey equipment.

Facilitated by over 40 years of experience in subsea engineering, SMD offer a range of specialist marine cable handling equipment, which utilises hydraulic and electric drive systems. One notable development is SMD's range of self fleeting cable drums, such as the drum cable engines (DCE's) and linear cable engines (LCE's). Both are particularly suited to handling sensitive cables.

RESEARCH AND DEVELOPMENT PROJECTS

Modular-based Design Ethos

SMD has employed a modular-based design ethos which enables the subsea vehicle system to be broken down into manageable key vehicle components. Each of the components is designed to be integrated with one another, allowing a larger permutation of functionalities on a singular platform while reducing customer costs.

Integrating Technologies

In all subsea operations, the client requires visibility, both from a data-logging perspective and a visual aspect; the latter enabling the operator/pilot to have awareness of their surrounding environment. SMD has been developing back-office systems to integrate with control systems platforms to provide data feedback and thus performing trend analyses of these systems. The condition monitoring system gives the added advantage of charting vehicle performance and improving operational stability. In terms of subsea scene analysis, SMD is currently researching capabilities with a technology provider in the aerospace industry to provide a new vision technology which penetrates obscurants and uses low processing power but produces image results in real-time and in high-resolution.

Analysis & Modelling Packages

SMD has developed an analysis and modelling package for jetting applications in various soil conditions. This model further enhances our design capabilities in terms of utilising the appropriate jet swords against parameters such as trench width, sword length, jet nozzle configuration/angle, water pressures and flows. SMD is currently developing a similar model for cutting applications.

In-line contamination monitor

LARS

FULL DECK SPREAD CAPABILITY

SMD bring years of knowledge and experience to the design and manufacture of launch and recovery systems (LARS) for some of the world's largest subsea machines to offer a range of A-frames specifically designed for handling subsea trenching equipment. All have attained Lloyds Design Approval and are tested according to Lloyds Rules.

WIDE ANGLE A FRAME

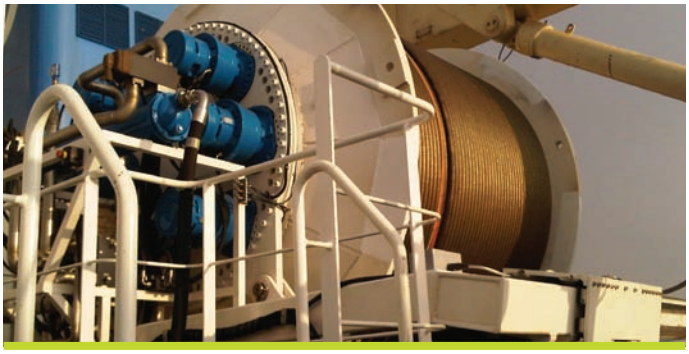
- Large range supplied.
- Suitable for cables ploughs and trenching ROVs.
- Load ranges from 20Te sea state 6 to 75Te sea state 5.
- Can allow tow wire/lift wire to run over central sheave when A frame is in board towing.
- Can maximise outreach and vessel clearance in trenching ROV.

NARROW ANGLE A FRAME

- Large range supplied.
- Suitable for trenching ROVs, tractors and pipeline plough systems.
- Load ranges from 8Te sea state 6 to 300Te sea state 5.
- Simple robust systems minimising maintenance and weight.

TOW WINCH

- Tow capacities from 35Te to 200Te tow load.
- Incorporate fleeting systems in conjunction with render functions for various towing speeds.



UMBILICAL WINCH

- Lifting umbilical winches can handle loads up to 25Te in sea state 7.
- Lifting umbilical winches are double armoured and operate from 3300 to 4500V.
- Steel wire armoured or buoyant umbilical cable handling capabilities available.
- Operating depth ranges up to 4000m.
- Non lifting umbilical winches provide power to heavy tractors, large cable ploughs and pipeline ploughs.

PASSIVE HEAVE COMPENSATOR

- Supplied for lifting operations to land subsea machines from 100Te to 350Te on the sea bed in a controlled manor.
- For sea states up to and including sea state 6.
- Manual, Automatic, Slack wire and Taut wire operating modes.

FOR MORE INFORMATION CONTACT ONE OF OUR OFFICES
OR EMAIL THE TRENCHING TEAM - TRENCHING@SMD.CO.UK

HEAD OFFICE & HEAVY PRODUCTION

SOIL MACHINE DYNAMICS LTD
TURBINIA WORKS, DAVY BANK, WALLSEND,
TYNE AND WEAR,
NE28 6UZ, UK

T +44 191 234 2222 E INFO@SMD.CO.UK

WWW.SMD.CO.UK

i19 - SMD ROV SYSTEMS

SOIL MACHINE DYNAMICS LTD
UNIT L3, INTERSECT 19, TYNE TUNNEL TRADING
ESTATE, NORTH SHIELDS, TYNE AND WEAR,
NE29 7UT, UK

T +44 191 234 2222 E INFO@SMD.CO.UK

WWW.SMD.CO.UK

HOUSTON OFFICE

SOIL MACHINE DYNAMICS USA LLC
4321 WEST SAM HOUSTON PKWY NORTH,
SUITE 120, HOUSTON, TX 77043, USA

T +1 713 338 3700 E INFO@SMD-US.COM

WWW.SMD-US.COM

SINGAPORE OFFICE

SOIL MACHINE DYNAMICS SINGAPORE PTE LTD
33 UBI AVE 3, VERTEX #01-59,
SINGAPORE 408868

T +65 6576 9160 E INFO@SMD.SG

WWW.SMD.SG

BRAZIL SUPPORT OFFICE

E BRAZIL@SMD-US.COM