Normand Installer
Deep Water Installation Vessel
Flag:
Norwegian.

Certificates:
All necessary certificates for worldwide operation, 1966 Loadline Conv., SOLAS, MARPOL.
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Classification:
DnV 1A1, Tug, DYNPOS AUTRO, E0, CLEAN, COMF-V(3) C(3), HELDK-SH, SF, ICE C, CRANE, Register notations DK(+). The ship is also equipped according to the former TMON requirements.
The Normand Installer is a new generation multi-purpose deep water construction vessel. The design of the vessel is based on the 35 years experience of SBM and Solstad in offshore installation and construction activities worldwide, in deep waters and in remote areas, using DP vessels, AHVs and barges.

Efficiency, redundancy, safety and versatility are the prominent qualities of the Normand Installer. These enable her to outpace all other vessels in her category and allow in most cases for the mobilization of only one vessel rather than several to execute the same scope of work. In addition, her characteristics make the Normand Installer suitable to compete with more expensive larger vessels for a number of applications.

**Efficiency:**
The AHV capabilities of the Normand Installer allow her to install mooring systems and hook-up floating units efficiently. The additional upper deck doubles the storage capacity and working area and allows simultaneous operations to take place. This relatively compact and powerful (23 MW) vessel remains a light solution considering the variety of heavy construction works she can handle and the range of water depths in which she can operate (up to 3000 m).

**Redundancy:**
Redundancy is compulsory to limit stand-by time and is implemented for the Normand Installer with the DP3 feature, the two Work Class ROVs, the two independent Heave Compensation systems (250 t offshore crane and 175 t under deck AHC system), two overboarding means for heavy loads (250 t crane and 350 t stern A-frame), and five deep water lowering means (four winches 200 t / 2 x 400 t / 500 t and the main offshore crane).

**Safety:**
The additional upper deck allows personnel to work clear from the wires or chains running under tension on the lower / working deck. The DP3 standard for dynamic positioning offers maximum safeguards in marine operations. Safety in design is also enhanced by compliance with latest DNV rules, US Coastguard for foreign flag ships, Norwegian Maritime Directorate and international rules.

Safety in operations is the main focus of the marine crew, the key functions are held by Norwegian nationals and the experienced offshore work staff provided by SBM Offshore.

**Versatility:**
The Normand Installer combines the advantages of an AHV, of a construction vessel (with an additional upper deck not affected by wire and chain operations, and with an offshore crane) and a working barge (flat and versatile upper deck to store, mobilize and demobilize all kinds of equipment very easily). The reinforced moonpool can accommodate a Vertical Laying System, the upper deck can be fitted with a Horizontal Laying System, and a hold in the hull contains a 2000 t carousel.
The vessel can therefore perform full field development activities, such as: installation of mooring systems; hook-up of floating units; installation of deepwater subsea structures (manifolds, X-mas trees, CDUs, foundations, etc); installation of flexible flowlines; installation of risers or umbilicals in vertical or horizontal mode; installation of electrical cables in vertical or horizontal mode; installation of TLPs using the SBM Offshore tendon installation tower and saturation diving with a portable saturation diving system that can be easily mobilized on the upper deck without interfering with wire and chains routings.

The Normand Installer was designed by Vik Sandvik and built by Ulstein Verft in 2005: both Norwegian companies have a well-known track record in designing and building similar vessels, and were well qualified to work with SBM and Solstad specifications. All major equipment was sourced from first-class vendors: the DP system is a Kongsberg design, the diesel engines and the propulsion arrangement have been manufactured by Wartsila, the electrical and power management systems have been designed and supplied by Aker Elektro, the winches have been designed and supplied by Rolls Royce Brattvag and the cranes and the A-frame have been supplied by Natoil.

The Normand Installer is owned and operated by Advanced Deep Sea Installations (ADSI) Inc., which is a Joint Venture Company of SBM Offshore and Solstad. This state-of-the-art tool mostly serves SBM’s needs and achieves its strategic objectives of excellence when working on deepwater installation or construction projects.

### Main Dimensions / Capacities

<table>
<thead>
<tr>
<th>Main Dimensions</th>
<th>Values</th>
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<tbody>
<tr>
<td>LOA</td>
<td>123.65 m</td>
</tr>
<tr>
<td>LPP</td>
<td>110.00 m</td>
</tr>
<tr>
<td>Breadth</td>
<td>28.00 m</td>
</tr>
<tr>
<td>Depth upper work deck</td>
<td>14.80 m</td>
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<tr>
<td>Depth 1st deck</td>
<td>11.00 m</td>
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<tr>
<td>Draught scantling</td>
<td>8.30 m</td>
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<tr>
<td>Summer draught</td>
<td>8.20 m</td>
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<tr>
<td>Gross tonnage</td>
<td>14506 gt</td>
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<thead>
<tr>
<th>Propulsion</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>Max speed</td>
<td>16.8 kts</td>
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<tr>
<td>Economic speed</td>
<td>12 kts</td>
</tr>
<tr>
<td>Max bollard pull</td>
<td>308 t</td>
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<table>
<thead>
<tr>
<th>Capacities</th>
<th>Values</th>
</tr>
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<tbody>
<tr>
<td>Dead weight at D = 8.20 m</td>
<td>9511 t</td>
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<tr>
<td>Deck cargo capacity</td>
<td>4300 t</td>
</tr>
<tr>
<td>Cargo deck area</td>
<td>2450 m²</td>
</tr>
<tr>
<td>Marine Diesel Oil</td>
<td>2815 m³</td>
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<tr>
<td>Fresh water, total</td>
<td>1050 m³</td>
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<tr>
<td>Storage tanks</td>
<td>300 m³</td>
</tr>
<tr>
<td>Rig chain lockers</td>
<td>1080 m³</td>
</tr>
<tr>
<td>Ballast water</td>
<td>7000 m³</td>
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</table>
Main Offshore Equipment

Offshore Crane

One Offshore Crane on upper work deck SB side, frame 39:

- Double fall sub sea lift 250 t at 11 m radius
- Active heave compensated lift 128 t at 21 m radius. For more details see enclosed crane data

Deck Cranes

- One electro hydraulic knuckle-boom crane on upper work deck SB side, frame 99. Capacity: 15 t at 30 m radius / 50 t at 10 m radius.
- Three electro - hydraulic folding cranes Capacity : 1 off 2.1 t at 18.0 m radius / 2 off 1.6 t at 20 m radius

A-frame

The ship is equipped with a 350 t A-frame which can be used in combination with the 400 t working winch or with the 200 t heave compensated A-frame winch.

Overboarding Sheave System

One overboarding sheave is available mid-ship starboard side (where the ship motions are minimal). This overboarding sheave has been designed to be used in relation with the heave compensated 200 t winch. The maximum load on the sheave is 175 t.

Active Heave Compensation System (AHC)

An active heave compensation system (175 t) is installed in line with the 200 t winch and can be used on the overboarding sheave or the A-frame (175 t single / 350 t double).

Flexible Pipe Carousel

The vessel is equipped with a permanent Ø 19m carousel for the installation of flexible pipes and umbilicals located under the main deck into the carousel hold.

Crew Quarters

- Accommodation for 100 persons
- 4 cabins with separate bedroom and bathroom
- 30 x one man cabins with separate bathroom
- 29 x two men cabins with separate bathroom
- 1 galley with scullery, one mess, two dayrooms
- Office rooms and conference rooms for crew and clients
- Changing room male & female, helicopter reception, hospital and laundries, internet room, gymnasium and sauna
Maneuvering Systems

DP System
The Normand Installer is a DP III class vessel with redundancy in technical design and physical arrangement.

Roll Reduction
Two passive free-surface effect roll reduction tanks are arranged.

Rudders
Two spade rudders with flaps & steering gears.

DP Sensors and Positioning Reference System
- 2 dual computers in operating consoles
- 3 gyro compasses and two wind sensors
- 2 motion reference units and one fan beam
- 2 DGPS (one Seatex DPS 116, one Seatex DPS 132).
- 3 differential signal decoders
- 1 hydro acoustic position reference system HIPAP 500
- 3 transponders rated for 3000 m water depth with acoustic release

Maneuvering Machinery
- Two tunnel thrusters forward each rated 1500kW plus two tunnel thrusters aft each rated 1500 kW. One retractable azimuth thruster forward rated 1500kW.

Anti Heeling Tank System
- Anti heeling system arranged for crane operation (2 x 250 m³/h), operated both automatically or manually

Miscellaneous

Helicopter Deck
A 19.5 m diameter helicopter deck is located at the vessel’s bow end. The octagonal shape, aluminum deck is dimensioned to receive Super Puma type helicopters and has a maximum load capacity of 9.3 t.

Lifesaving Equipment
The vessel is outfitted with 2 enclosed lifeboats with davits, each for 102 persons; and 6 life rafts, each for 35 persons. One MP-741 Springer fast rescue craft with one-armed davit is installed on port side.

Project Control Center
On the bridge, one specific desk is arranged to conduct the offshore operations. Crane, winch and ROV operations can be monitored in close co-operation with the bridge and survey.
Machinery and Propulsion

Power Generation
- Total installed power: 23 000 kW (31 000 bhp).
- Two Wärtsilä main generator engines, rated 7680 kW – 720 rpm
- Two Wärtsilä main generator engines, rated 3840 kW – 720 rpm
- One Caterpillar harbor generator, rated 968 kW

Propeller
The vessel is equipped with two electric driven CP propellers (Ø 4500 mm) with variable rpm in fixed HR-nozzles.

Propulsion Motors
- Four AC asynchronous water-cooled motors, two-inline on each gearbox
- Rating 4500 kW (6100 hp) at 900 rpm
- Voltage 690/6600 V at 0-60 Hz supplied from two frequency converters

Vessel Automation and Control System (IAS and PMS)
Complete integrated computer-based system for vessel management including a power management system.

Emergency Generator
- Rating 200 kW / 250 kVA
- Voltage 450 V at 60 Hz
- Speed 1800 rpm

Central Boiler
One central oil fired boiler 500000 kcal/h.

Deck

Double Deck Concept
The double deck concept consisting of an upper and lower deck combines efficiency with the highest safety standards possible. Whilst personnel are working on the upper deck, the lower ‘anchor handling’ deck can be used to run chains over the stern under tension.

Upper Deck
The 1270 m² upper deck provides a large cargo area and is reinforced for 10 t/m² all over; and up to 30 t/m² on the girders. The deck is equipped with numerous
lashing points like D-rings, rollers and pad-eyes. A robust and removable handrail is installed on the sides of the deck.

**Lower Deck**

The 1180 m² lower deck presents a large covered working and storage area. The aft section of the deck is reinforced for 15 t/m² for anchor handling operations. A Double Triplex package (shark jaws, guide/towing pins, lifting/stop pins) is located on the reinforced aft deck. The 700t SWL shark jaws can accommodate chain (from 64 to 215mm diameter) and wire (30 to 178mm diameter) handling. Two wire clamps are installed in front of the shark jaws, they can handle wire from 55 to 100mm diameter. Stores, workshops and a duty mess room are located adjacent to the lower deck.

**Moon pool Hatches**

The ship is fitted with a 49 m² moon pool (7 m x 7 m). The moon pool has been designed with a large radius bell mouth for flowlines or any type of flexible type deployment.

A large access to the moon pool is obtained by removing one or two pontoon hatches (11.95 m x 16.75 m each) from the upper working deck (1 ACC deck).

**Storage**

**Carousel Hold**

The large carousel hold is located between the tank top and the lower deck level. One carousel (Ø19.0 m; H: 5m) is installed with an overall 2000 t product capacity.

**2000 t capacity carousel**

Fitted below decks is a carousel presenting a large storage capacity for flowlines or umbilicals without hindering the deck space on the work deck. The carousel has a diameter of 19m; an adjustable minimum core diameter of 4.5m and a height of 5m, and offers more than 20km of 6” ID flexible flowline and 40km of 5” OD umbilical. The carousel is fitted with a 15 t horizontal deck tensioner and a dedicated spooling arm in order to facilitate loading and offloading of various types of products.

**Chain Lockers**

Six chain lockers, with a storage capacity of 180 m³ each (140 m³ effective), are located aft of the winch area. Hydraulic constant-tension chain haulers ease the supply of chain to the lockers.

**Cargo Hold**

The Normand Installer accommodates an unusually spacious cargo hold, located under the lower deck. This cargo hold is outfitted with numerous shelves for pallets and a dedicated forklift.
Cranes

**Offshore Crane**
The 250 t Natoil electro-hydraulic knuckle-boom crane is equipped with Constant Tension (CT) and Active Heave Compensating (AHC) capabilities, a 20 t auxiliary winch and two 5 t constant tension tugger winches for load stabilization. The Crane drum can accommodate up to 2600m of 76 mm non-rotating wire and the crane can be reeved in single or double fall. The maximum working radius stretches up to 36m.

**Cargo Crane**
A 50 t TTS electro-hydraulic knuckle-boom is installed starboard fore of the upper deck. The crane has ship-to-ship capacity and is approved for man-riding.

**Deck Handling Cranes**
3 Palfinger PK6000M electro-hydraulic folding cranes for wire, chain, shackle and provision handling. The cranes are man-riding approved.

- 2 off SWL 1.6 t at 20 m aft on the lower deck
- 1 off SWL 2.1 t at 18 m fore above the upper deck

Winches

**500 t anchor handling/towing winch**
The 500 t anchor handling/towing winch is a valuable tool to deploy mooring lines, either spiral strand type or polyester rope type, in deep water. The 3.80 m diameter drum has a length of 11 m and is the largest ever built by Rolls-Royce Brattvaag. Two socket compartments can accommodate up to 152 mm steel wire rope sockets. The winch has a maximum pull force of 500 t bare drum and can accommodate 500 t of product. The brake holding load of the winch is 690 t on its first layer. The winch can be operated in constant tension mode.

**400 t towing/working winches**
The 400 t towing/working winch is a declutchable double drum with a 400 t pulling capacity. The portside drum is mainly dedicated for deck operations and has a width of 1900mm which can accommodate 1500 m of 103 mm dia. cable. The starboard drum is fitted with Lebus grooves, has a width of 3000 mm and can accommodate 4500 m of 76 mm dia. cable or 3300m of 81mm wire. Gipsy wheels can be installed on both flanges of the winch drums and are available for a wide range of chain sizes. The following gipsy sizes are permanently available: 76 mm, 84 mm, 97 mm, 102 mm, 2 x 114 mm, 127 mm, 142 mm, 147mm, 152 mm. The winch wheel combination can be loaded up to 350 t. The two drums can be operated separately when declutched.
200 t heave-compensated A-frame winch

One 200 t constant tension winch is located on the main deck, aft of the offshore crane and is mostly used for the deployment of subsea structures. The winch drum is fitted with a Lebus pattern for a 76mm wire. It can accommodate up to 2600m of 76mm non-rotating wire. This winch can be used in conjunction with the 175 t heave compensator. The non rotating wire rope can be routed either on the mid-ship overboarding sheave (hence limited load of 175 tons in Single fall) or on the 350 t A-frame and in option to the moon pool.

Tugger winches

In total, four Brattvaag winches, constant tension, are available:

- 2 off 24t above front end of the upper deck
- 2 off 15t on the aft lower deck

They all can be controlled manually or by wireless remote control.

ROV System

Two independent systems from Oceaneering are permanently installed on board with a common control room.

Specification

**Vehicle**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>L x W x H</td>
<td>3.07 x 1.85 x 2.10 m</td>
</tr>
<tr>
<td>Weight (in air)</td>
<td>4 876 kg</td>
</tr>
<tr>
<td>Depth Rating</td>
<td>3,000 m</td>
</tr>
<tr>
<td>Payload</td>
<td>500 kg</td>
</tr>
<tr>
<td>Horsepower</td>
<td>2 ea 110 hp Hydraulic Power Units (220 hp)</td>
</tr>
<tr>
<td>Hydraulic Flow</td>
<td>65 Gallons Per Minute Nominally</td>
</tr>
<tr>
<td>Thrust</td>
<td>Fore/Aft/Lateral&gt; 1450 lb, Vertical Lift&gt; 1850 lb</td>
</tr>
<tr>
<td>Spare Tooling Valves</td>
<td>5 each Directional Proportional Pressure and Flow Valves (10 gpm each)</td>
</tr>
<tr>
<td></td>
<td>1 each Directional Proportional Flow Valve (up to 40 gpm @ system pressure)</td>
</tr>
<tr>
<td></td>
<td>19 each Solenoid Operated Rate Valves</td>
</tr>
<tr>
<td>Lighting</td>
<td>8 x 250 W (2000 W total)</td>
</tr>
<tr>
<td>Cameras</td>
<td>1 x Low Level – P&amp;T Mounted</td>
</tr>
<tr>
<td></td>
<td>1 x Color Zoom – P&amp;T Mounted</td>
</tr>
<tr>
<td></td>
<td>1 x Manipulator Mounted</td>
</tr>
<tr>
<td></td>
<td>1 x B&amp;W CCD Aft</td>
</tr>
<tr>
<td></td>
<td>4 x extra interfaces for cameras</td>
</tr>
</tbody>
</table>

**Navigation**

- Tritech Sea King Sonar System
- Ocean Tools Fiber Optic Gyro
- Paroscientific Digiquartz depth transducer
- Auto Depth/auto heading/auto altitude with full-time bathymetry display

**Manipulators**

- 1 x 5 Function Schilling Rigmaster Grabber
- 1 x Shilling Titan 4 (Spatially Correspondent Parallel or intermeshing jaws)

**Video & Data**

- 16 RS232 / RS485 Serial Channels (9 Spare)
- 8 Video Channels

**Tooling Packages**

**Standard**

- 1.50” Dia. wire rope cutter
- 3” Dia wire rope cutter
- 1” fibre rope cutter
- Ring gasket replacement tool package
- TP03 dredge/jet pump, Rotary grinder/cutter/buffer
- 1 x 2500 psi @3.5gpm Intervention Pump w/2.5 gallon reservoir
- High-pressure (10,000 psi) intervention package

**Specialized**

- SBMs Suction Pile System

**Tether Management System**

**Tophat Design**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tr>
<td>L x W x H</td>
<td>2.13 x 1.50 x 1.90 m</td>
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<tr>
<td>Weight (in air)</td>
<td>3 600 kg</td>
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<td>Tether length</td>
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<td>Horsepower</td>
<td>110 hp</td>
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<tr>
<td>Hydraulic Flow</td>
<td>33 Gallons Per Minute Nominally</td>
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</table>

**Winch with Heavy Weather Deployment**

Dynacon 5521 Traction Winch with Oceaneering Overboarding Launch and Recovery Aframe System

Overboarding reach: 7m

**Umbilical**

10,000 ft (3 500 m max – drum capacity) - High-strength, Armored Opto-electro-mechanical

Note:

Technical data enclosed in this brochure are given for information purposes only. For actual and updated values please contact SBM Services department.
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The sole intention of this brochure is to share general information.

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