Anchor Handling/Towing winches
A broad range of winches for offshore vessels

TTS can supply complete winch packages to almost any kind of offshore vessel. 50 years of hands-on experience has contributed to our superior winch design and tailor-made solutions.

Anchor Handling/Towing winches (AHT)
TTS supplies large AHT winches to almost any size up to 600 tonnes. Delivered with dynamic braking, high torque and reliability TTS can ensure that your AHTS vessel is equipped with advanced winches designed to meet all AHTS requirements.

Offshore winch packages
Complete winch packages are available for almost any kind of offshore vessel. Windlass/mooring winches, tugger winches, mooring winches, capstans and storage winches are delivered either as standard versions or are tailor-made to customer specifications.

Training
TTS is focused on HES and preventative behaviour, and so offers training packages to cover its offshore products, within controlled environments using simulated operation. Both novice and experienced operators are therefore able to learn the workings of systems in safety. TTS can also train operators to handle unexpected situations under these controlled conditions, thus reducing risk to personnel and operations.

TTS brings a strong engineering base in cybernetics, drive systems and mechanical design to the offshore market

The provision of standard, yet flexible designs has made TTS one of the leading suppliers of offshore equipment

The following winch types are available to the offshore fleet:

- Anchor Handling/Towing winches
- Secondary winches
- Rope reels
- Storage winches
- Windlass/mooring winches
- Mooring winches
- Tugger winches
- Capstans
- Subsea winches with active heave compensation

www.tts-marine.com
Anchor Handling/Towing winches

Safety, functionality and robustness are prime drivers in the design of our winches, to meet customers’ very specific operational requirements.

Standard Features
- Drums in double or triple configuration, in waterfall
- Steel wire rope drum
- Rated pull (1st layer) up to 600 tonnes
- Brake holding up to 780 tonnes
- Wire speed: multiple ranges available
- Hydraulically operated clutch
- Hydraulically operated brake
- Dynamic breaking to facilitate high load/high speed lowering without de-clutching
- Emergency quick release
- Local control for maintenance and remote control for operation
- One, two or three spooling gears
- Delivered with complete power pack
- Delivered with complete control system both locally and from the bridge with use of the latest technology.

Customer benefits
- Custom design
- Winches produced with high quality steel and parts
- All systems prepared for remote monitoring, maintenance and service
- TTS’ worldwide service network assures availability of parts and service
- As a global supplier, TTS can offer customers both service and aftersales through company offices across the world.

The offshore industry continues to create new and more cost effective working methods without sacrificing safety, reliability and quality.

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Examples of models and capacities available

<table>
<thead>
<tr>
<th>Model</th>
<th>Line pull/1st layer</th>
<th>Drum capacity</th>
<th>Brake holding/1st layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>200 tonnes</td>
<td>1200 m of 64mm</td>
<td>300 tonnes</td>
</tr>
<tr>
<td>280</td>
<td>280 tonnes</td>
<td>2000 m of 76mm</td>
<td>350 tonnes</td>
</tr>
<tr>
<td>300</td>
<td>300 tonnes</td>
<td>2000 m of 64mm</td>
<td>400 tonnes</td>
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<tr>
<td>350</td>
<td>350 tonnes</td>
<td>2500 m of 76mm</td>
<td>450 tonnes</td>
</tr>
<tr>
<td>350</td>
<td>350 tonnes</td>
<td>3500 m of 76mm</td>
<td>450 tonnes</td>
</tr>
</tbody>
</table>

Typical arrangement of a 280 tonne, 2-drum winch

Typical arrangement of a 350 tonne, 2-drum winch

2-drum winch schematic

The TTS 500 Tonne anchor handling/towing winch

The TTS 500 Tonne anchor handling/towing winch

www.tts-marine.com
TTS control systems

Combining advanced technologies with a world-class knowledge base in automation, TTS develops the control systems of the future. All systems are delivered with remote access features for preventive maintenance and efficient problem solving.

Components used in the control systems are commercial, off-the-shelf products, and are readily available worldwide from a range of suppliers. All TTS systems have remote access features for preventive maintenance and quick problem solving. Skilled professionals can therefore access, diagnose and perform maintenance tasks within the vessel's system directly from an onshore location, saving time and money.

TTS has unique engineering expertise in cybernetics, dynamic machine control, hydraulic and electric drive systems, and mechanical design. This combination enables the development of advanced, custom-made control system solutions. All applications run on a real-time operating system core, making them robust and reliable. Throughout the development process, extensive use is made of real-time system simulation, including hardware-in-the-loop (HIL) testing, to ensure system functionality before build-up. HIL testing and simulation also ensure swift commissioning.

The technology has unique features that increase efficiency, so buying financial advantage to both vessel owners and operators.

### Anchor Handling/Towing winches

#### 3-drum models

<table>
<thead>
<tr>
<th>Model</th>
<th>Line pull/1st layer</th>
<th>Drum capacity</th>
<th>Brake holding/1st layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>350 tonnes</td>
<td>3000 m of 77mm (working drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3000 m of 77mm (towing drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6000 m of 77mm (anchor handling drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td>400</td>
<td>400 tonnes</td>
<td>1732 m of 84mm (working drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2759 m of 84mm (towing drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4503 m of 84mm (anchor handling drum)</td>
<td>500 tonnes</td>
</tr>
<tr>
<td>500</td>
<td>500 tonnes</td>
<td>4600 m of 76mm (working drum)</td>
<td>650 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4600 m of 76mm (towing drum)</td>
<td>650 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7700 m of 76mm (anchor handling drum)</td>
<td>650 tonnes</td>
</tr>
<tr>
<td><em>500</em></td>
<td>500 tonnes</td>
<td>4000 m of 76mm (working drum)</td>
<td>650 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4000 m of 76mm (towing drum)</td>
<td>650 tonnes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6500 m of 76mm (anchor handling drum)</td>
<td>650 tonnes</td>
</tr>
</tbody>
</table>

*This model has a separate drive on all drums giving both high speed and high pull on all drums simultaneously.

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Examples of models and capacities available
Norwegian-headquartered TTS Marine ASA is a global enterprise that designs, develops and supplies marine and offshore equipment. Operations are organised into five business divisions: Drilling, Deck Machinery, Marine Cranes, Dry Cargo Handling, and Port and Material Handling. The close, flexible working relationships within the group enable the deployment of complete project teams across a range of fields.

The divisions are responsible for the design of a wide range of equipment including drilling equipment, container terminal technology, cargo handling systems, cargo cranes, hose handling cranes, special load handling equipment, and anchor and mooring winches. Approximately 1450 people are employed throughout the group.

TTS Marine ASA was established in 1966 and has been listed on the Oslo Stock Exchange since 1995.