



Rolls-Royce

**Reliable solutions
make efficient operations**

deck machinery



The winch maker

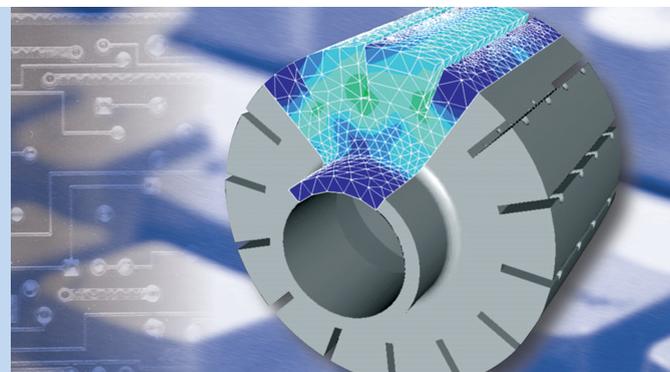
For more than half a century Rolls-Royce has been the leading manufacturer of highly reliable winch systems to customers worldwide.

A supplier who has the capability to meet customer demands regarding performance and cost-effectiveness.

Ongoing research and development is the key to the success of Rolls-Royce, with a total company investment exceeding £5 billion in the last decade. Combining technology and skills accumulated over 100 years, Rolls-Royce today has the broadest range of deck machinery products, services and expertise in the world.

The Rolls-Royce commitment to customer satisfaction is your guarantee for the highest levels of quality, expertise and performance.

With a truly international presence, Rolls-Royce provides service availability and maintenance worldwide.



The high standard of Rolls-Royce product range is attributed to years of continuous research and development.

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A pioneer in technology and development



Deck machinery

There is a proud tradition behind the name Rauma Brattvaag. The first Rauma Brattvaag hydraulic winch was manufactured as early as 1942. The name itself is a result of the merger of Hydraulic Brattvaag, Norwinch and Rauma Winches. Today, the winch systems have practically become an industry standard for offshore, merchant, fishing and naval applications.

Rolls-Royce is one of few suppliers worldwide that offer low-pressure

hydraulic, high-pressure hydraulic and electric drive options for its winch range. This provides the customer with the best option programme available for customised installations on all types of vessels.

To ensure the best performance, Rolls-Royce has a test facility for winches located in Brattvåg, Norway. The test centre has automatic hoisting capacity up to 15 tonnes, and manual hoisting capacity above 100 tonnes. Six winch stands are

available; two for re-generative tests and four for tests with load.

Focusing strongly on continuous development, the customer benefits from fully optimised performance and consistent equipment support – an approach that delivers quality at the lowest operating cost.



The ergonomically-designed Captain's chair features integrated winch controls in the armrests.



At the test centre the new winches are tested and approved. It is also used for testing and calibration of winches after repairs.



The Rauma Brattvagg modular concept offers tailor-made anchoring and mooring winch solutions from a range of standard modules.

Rauma Brattvaag™ drive options for all types of vessel



The low-pressure drive gives dynamic braking, low noise level and is easy to operate.

Rolls-Royce offers three different drive options suitable for all types of vessel.

The power source for the winch systems can be, as required by the customer, low-pressure hydraulic, high-pressure hydraulic, frequency-converter electric drive or pole-change electric drive. The choice of drive type often depends on type of application and the actual winch operations.

Low-pressure

The low-pressure drive has been produced by Rolls-Royce since 1942. The key characteristics of the motor are foremost reliability and robustness. In addition, the low-pressure drive gives dynamic braking, low noise level and is easy to operate. Further advantages are stepless speed regulation and high-torque. Because it has few mechanical parts, the low-pressure drive is less

exposed to wear and tear, giving low maintenance costs.

High-pressure

The hydraulic system for the high-pressure drive is of an open loop, constant pressure type. One pump can simultaneously supply a number of winches and other hydraulically driven devices. The high-pressure drive has excellent stalling and effective low speed performance. It is easy to install, operate and maintain.

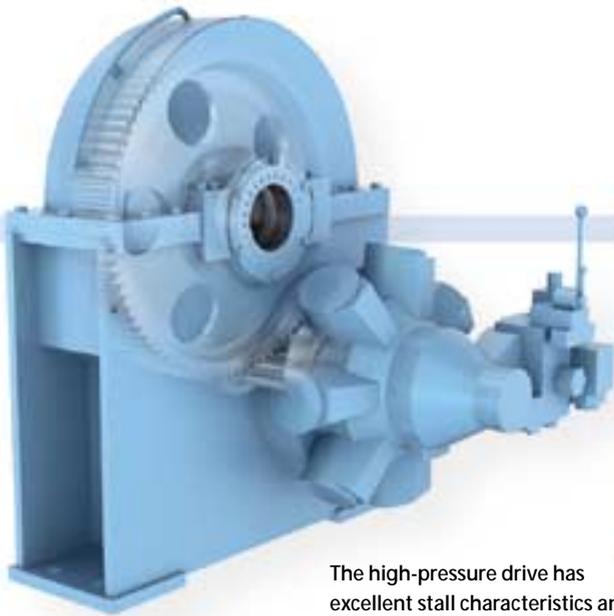
Three speed pole-change drive

The nearly maintenance-free electric motor is of squirrel-cage rotor type, without mechanical contact between the rotor and the stator. The motor is equipped with standstill heating, temperature sensors and a fail-safe brake. The winch control is precise and easy. Speed steps in both directions are obtained by a single lever. Electric systems are easy to install and provide quick start in all environmental conditions.

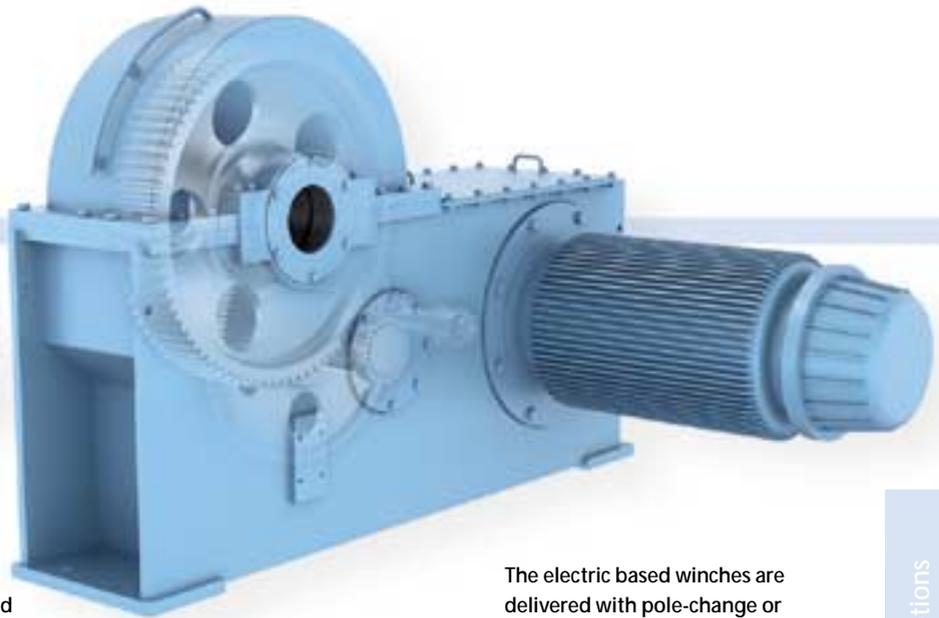
Frequency converter drive

The frequency converter model represents the latest and the most advanced electric drive technology available. The stepless control allows the use of very low speed for clutch control and anchor nesting. The drive system also offers good stalling performance, and smooth low noise operation helps to provide a good living and working environment.





The high-pressure drive has excellent stall characteristics and effective low speed performance.



The electric based winches are delivered with pole-change or frequency-converter drives.

Drive options





COOPERATION
Rolls-Royce sales representatives are experienced in module-based system technology, and are highly knowledgeable about the possibilities that it offers. They give advice to suit customer requirements early in the project stage.



SHORT RESPONSE TIME
When Rolls-Royce or our international representatives receive your enquiry, our marine engineers will configure a module-based system to meet your requirements.



CONFIGURATION
Using our database system we can customise the winches with our wide range of standard options and get quotation and dimensional drawings for the winch system.

Anchoring and mooring – the modular concept



The Rauma Brattvaag modular concept offers tailor-made anchoring and mooring winches made up from standard modules for naval and commercial vessels. The production process enables flexibility and efficiency in customer applications as well as in delivery times. Further benefits are short lead times, high quality, elimination of prototype

Typical applications:

Suitable for all kinds of vessels such as:

- tankers
- dry cargo ships
- passenger ships
- ferries
- workboats
- offshore vessels
- fishing vessels
- naval vessels

risks, variety of lay-out and low life-cycle costs.

Both mechanical and system design are our own, and the Rolls-Royce team controls the whole delivery process. The equipment is tested in our own assembly workshops before delivery.

Anchoring & mooring



TIMELY DELIVERY

Global production and distribution ensures that the module-based winches are produced close to our customers at competitive prices, to an agreed quality and with the promise of timely delivery.



LOCAL EXPERTISE

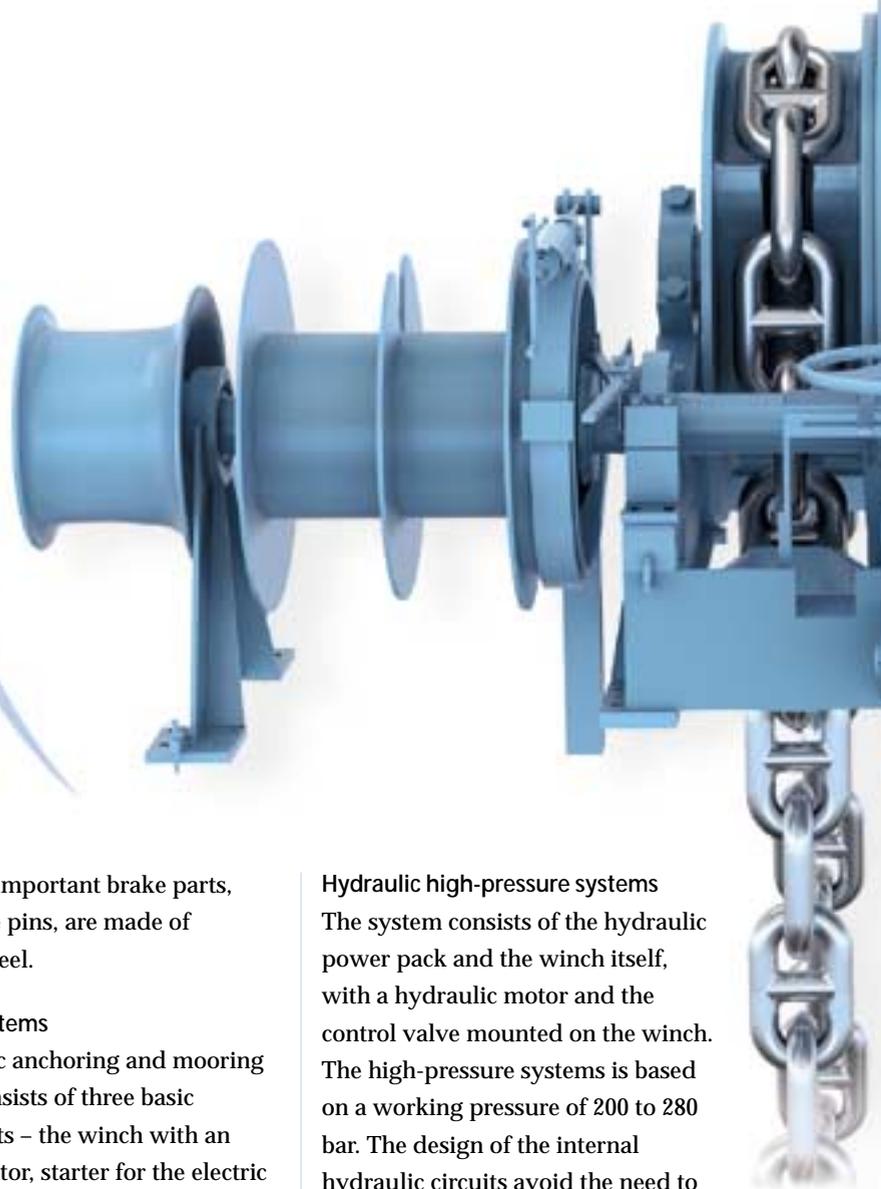
Through a number of subsidiaries around the world, our experienced service engineers can carry out close product follow-up on site. This covers technical back-up and installation assistance, consultancy services and quality assurance.



GLOBAL SERVICE AND SUPPORT

Rolls-Royce provides worldwide back-up for its winches. Our service engineers carry out scheduled inspections and maintenance programmes under specific agreements with an owner. We take life-long care of supplied equipment!

The Rauma Brattvaag™ module-based system



The range of anchoring and mooring winches is light, compact and easy to install. The modular design and the standard option programme allows the customer to combine the relevant modules to meet the strictest budgetary constraints and optimum performance.

All shafts, including the main shaft, run on roller bearings. The drum brake is an external contracting band

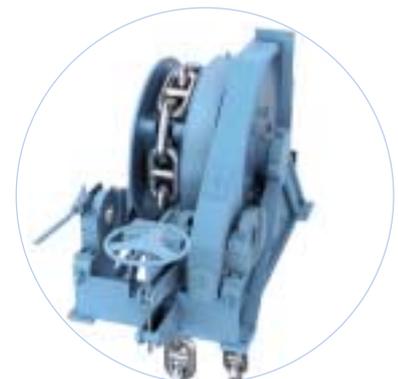
brake. All important brake parts, such as the pins, are made of stainless steel.

Electric systems

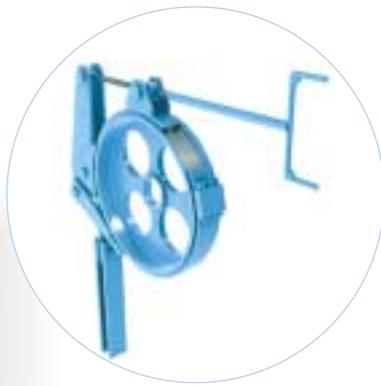
The electric anchoring and mooring system consists of three basic components – the winch with an electric motor, starter for the electric motor and one or more freely locatable control stands. Only the starter is located below deck.

Hydraulic high-pressure systems

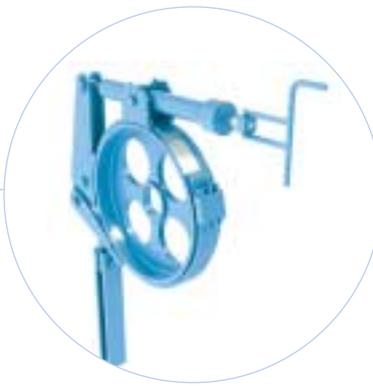
The system consists of the hydraulic power pack and the winch itself, with a hydraulic motor and the control valve mounted on the winch. The high-pressure systems is based on a working pressure of 200 to 280 bar. The design of the internal hydraulic circuits avoid the need to install separate drain lines – instead, oil is led through return lines.



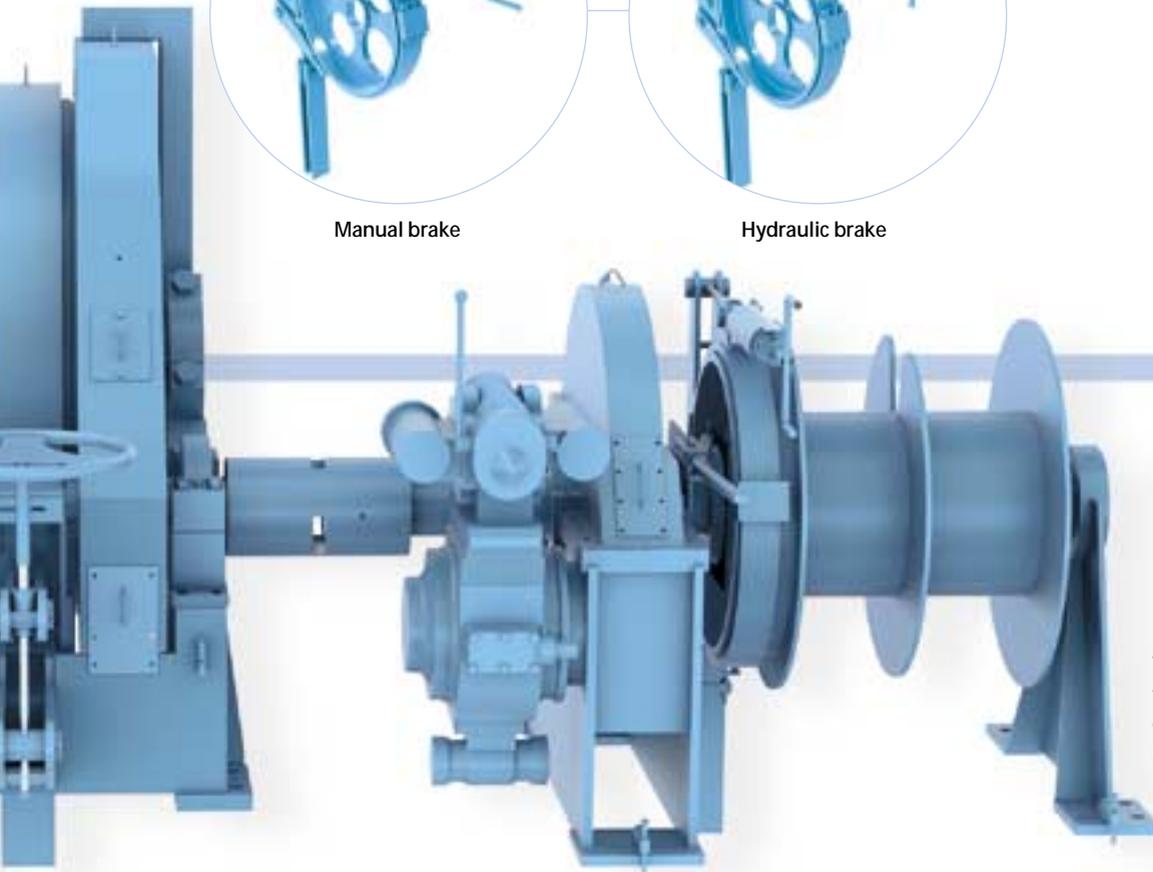
Cable lifter



Manual brake



Hydraulic brake



The range of mooring winches is from 5 to 40 tonnes of pulling capacity and anchor windlasses up to 137 mm chain.

Low-pressure systems

The system is characterised by simple, yet extremely, reliable solutions. The low-pressure system has dynamic braking as standard and high lowering speed and no over-speed. In addition, use of band brake during anchor operation is unnecessary, which reduces wear and tear, safe and easy operation.

OPTIONS

Mooring winches

- autotensioning
- remote control for speed, direction of rotation, brakes and clutches
- stainless steel brake drums

Windlasses

- automatic remote control for anchor lowering
- independent driving gear
- cable length indicator
- chain stopper
- stainless steel brake drum surface

Anchoring & mooring



Chain stopper



Power pack

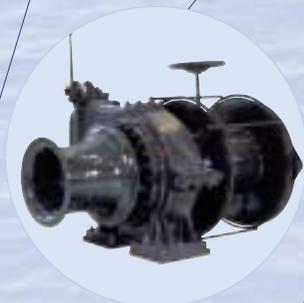


Control stand

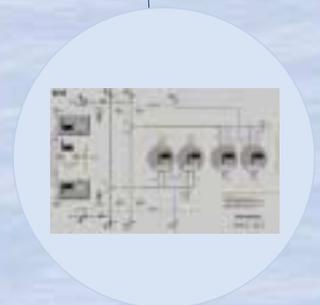
A total system supplier for supply and service vessels



Capstan winches from
1.5 - 15 tonnes.



Tugger winches from
1.5 - 30 tonnes.



Rolls-Royce bulk tank
systems are delivered for
Cement, Barite and
Bentonite with dome or
cone-shaped tanks.



The air dryer de-humidifies
compressed air before entering
the dry bulk tanks. De-humidified
air reduces the possibility for
pipe clogging.



The compressors compress
the air (5.6 bar) which is used
for transport of dry bulk
material.



The cargo handling system is
delivered with easily operated
monitoring and control
systems.



Anchoring and mooring windlasses are tailored to the vessel and its operation. Up to 30 tonnes.

Rolls-Royce is the most experienced supplier to the offshore supply and service fleet. The range comprises all kinds of winches, spooling devices, chain rollers, stern rollers, power pack systems, control and monitoring systems. Rolls-Royce also offers tailor-made cargo handling systems with remote controls, tanks and valves, air dryers and compressors. Solutions that meet our customer requirements – from individual products to integrated systems.

The Rauma Brattvaag products are developed by utilising the latest technology in design and production,

Typical applications:

- Suitable for:
- platform supply vessels
 - offshore support vessels
 - diving support vessels
 - stand by/field support vessels
 - anchor handling tug supply vessels

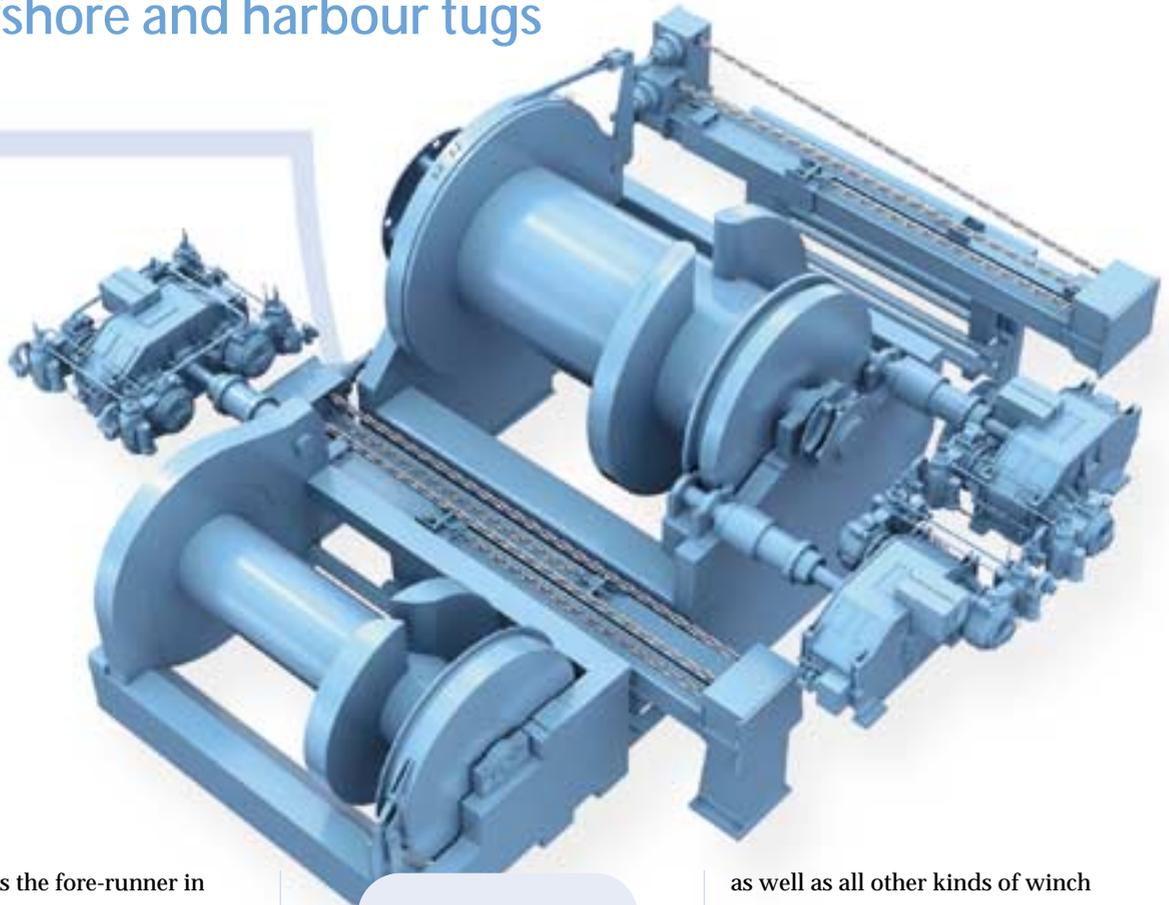
to satisfy the supply and service market to the best of our ability. This includes winches with pull capacity from 1.5 tonnes to 625 tonnes. The low maintenance costs throughout the vessel's lifetime contributes further to ensure high operating profitability.

The winches can be delivered with all available types of drive systems. This capability is unique to Rolls-Royce and has been developed in close cooperation with customers. The dimensions of the winches are tailored to the specific application.



Electric driven windlass/mooring winch.

Winches and winch equipment for offshore and harbour tugs



Rolls-Royce is the fore-runner in developing the largest anchor-handling and towing winches. The strongest towing winch ever built is a Rauma Brattvaag solution. These winches are used by operators worldwide to secure valuable applications.

Rauma Brattvaag winches for anchor-handling and towing duties use low-pressure hydraulic or electric drives, and offer capacities of up to 625 tonnes pull. These winch systems are suitable for both AHTS vessels and harbour tugs. The dimensions of the winches are tailored to the specific vessel and its operations.

The product range also includes storage winches and stern rollers

Typical applications:

Suitable for:

- AHTS vessels
- combined offshore service vessels
- harbour tugs

as well as all other kinds of winch systems that towing vessels require.

The Towcon NT monitoring system gives the operator complete control of the winch systems, whether it is deep sea or towing operations. The DTL (digital tension and length monitoring) equipment provides information about length, speed and tension of the wires.

The use of highly advanced computer based systems is of vital importance, in order to minimise the risks of human failure. In addition, they assure great precision, which is especially important in deep waters.



The DTL NT is a dual-winch monitoring system, informing the user about length, speed and tension.



Rolls-Royce offers a wide range of towing winches and systems for harbour tugs.



Towcon NT is a Windows-based monitoring system. Graphic display shows length, tension, pressure, speed, temperature, couplings and brakes.



Storage winch.



Stern rollers are delivered as single, twin and triple rollers. MWL up to 800 tonnes.

Towing and anchor handling winches

Serving the exploration and production market



Chain jacks



Windlasses



Drum winches



Traction winches



Rolls-Royce provides a complete range of deck machinery customised to applications in the offshore oil & gas industry. The Rauma Brattvaag product range comprises turret bearings and turnings, anchor mooring windlasses, anchor mooring drums, combination winches (wire/rope/chain) and traction winches. In addition, Rolls-Royce supplies fairleads, chain jacks and chain stoppers.

Most of the products are delivered with control and monitoring systems for precise handling and control.

Typical applications:

Suitable for:

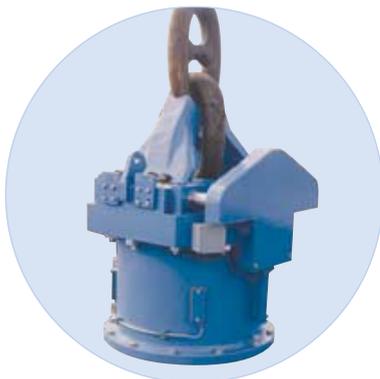
- semi-drilling vessels
- rigs
- semi-FPSO/production rigs
- FPSO
- jack-up
- pipe-laying barges
- seismic vessels
- shuttle tankers
- drilling ships

The winches can be supplied with low-pressure or high-pressure hydraulics, or electric drive.

We have a reputation for supplying high-quality and reliable machinery for safe operation in all climate zones, very much thanks to continuous close customer cooperation.

Being a total supplier with «in-house» design and production of all major items, Rolls-Royce provides a single point of contact, enabling us to develop the best solutions possible for every task.

Towing and anchor handling winches



Chain stoppers



Chain fairleads



Wire fairleads

Rauma Brattvaag™ Synchro Autotrawl system

The Synchro Autotrawl system is developed for dynamic control of single-rig demersal trawl, twin-rig demersal trawl, triple-rig demersal trawl, pelagic trawl and pair trawl. The trawl system is one of the most advanced on the market, and all essential control and monitoring functions are fully integrated.

It keeps the trawls fully open when changing course during trawling. The trawl is kept moving at constant speed, even under difficult conditions, and if the trawl snags the system pays out wire automatically to prevent damage. The Synchro Autotrawl is the optimum solution for maximising the catching ability for single-, double- and triple-trawl arrangements.

The system is based on the latest technology providing excellent stability, simple operation and great flexibility.

Key features

- Custom designed display pictures, based on monitoring system with touch screen
- Graphical display of net alignment
- «Split function», for independent length adjustment
- Automatic start/stop of required pumps in automatic mode
- Can handle single-, double- and triple-trawl systems
- Handles bottom- and pelagic trawling
- Automatic communication with net sensors, echo sounders etc.

Innovations since 1942

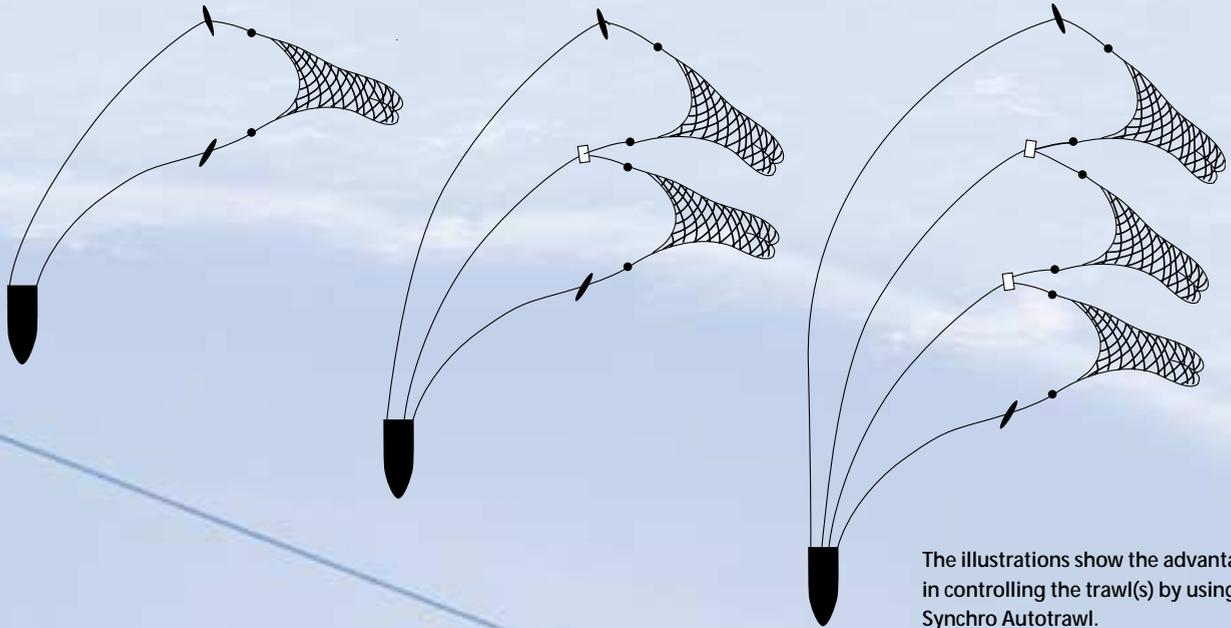
- 1942** The first hydraulic winch
- 1969** Release of the first and the original Synchro Autotrawl System
- 1988** Twin-rig trawling innovation
- 1999** New generation Synchro Autotrawl
- 2000** New generation hydraulic motor
- 2002** Electric drive systems



The first winch



Synchro RT makes it possible to trawl with split function on the winch, with both single-, double- and triple trawl.



The illustrations show the advantage in controlling the trawl(s) by using Synchro Autotrawl.



Rauma Brattvaag™ fishing solutions



Trawl purse winches
from 6 - 120 tonnes.

Rolls-Royce offers a complete system of deck machinery for all kinds of fishing vessels. The solution includes winches, Synchro Autotrawl, winch monitoring and control systems, and a choice of three different winch drives.

The power source of the drives can be electric, low-pressure hydraulic or high-pressure hydraulic according to customer requirements. The most commonly used drive system is the low-pressure hydraulic, which has a robust construction and is easy to operate.

Typical applications:

- Suitable for:
- bottom trawlers with single-, double- and triple-trawl
 - pelagic trawl
 - purse seiner
 - danish seiner
 - longliners
 - scientific research

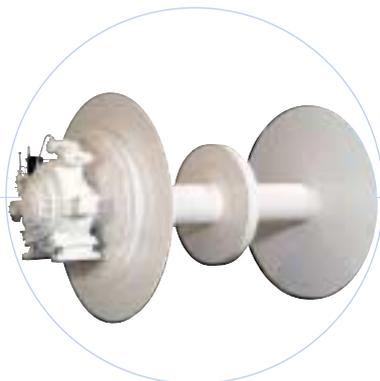
The low-pressure system also provides advantages of stepless speed regulation, low maintenance costs and flexible arrangement.

The new high-torque hydraulic motor for direct driven trawl winches from 6 tonnes to 75 tonnes provides advantages including; no gear transmission, less maintenance, higher shooting speed and very smooth-running.

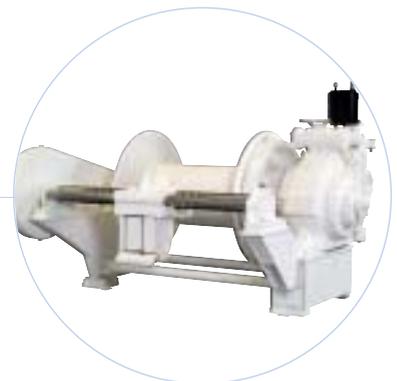
All winch systems are delivered with remote controls.



Auxiliary winches
from 0.7-50 tonnes.



Net drum winches
from 6-120 tonnes.



Net sounder winches
from 2-6 tonnes.



The radio control system ensures that the operator is free to work in direct contact with the load, or to control the winch at long range.



The picture shows a remote control panel for modern trawlers. Equipped with background light for easy night operation.

Underway replenishment and refuelling systems

The latest all-electric systems enable replenishment vessels to supply both fuels and solid stores quickly and safely in rougher conditions.

Rolls-Royce specialise in providing underway replenishment (UNREP) systems as part of an integrated package. With many modern navies moving to the low-manned all-electric ship concept, Rolls-Royce has developed fully automated all-electric systems to complement its range of conventional abeam and astern refuelling rigs. For liquids and solids transfer, the latest dual-purpose systems can automatically transfer payloads of two tonnes or hose catenaries from a single station, and operate safely up to sea-state 6 and 7. One man, from the custom designed control platform on the supply ship controls all functions. Once in automatic mode the payload accelerates as it departs the supply ship and decelerates, safely

stopping as it approaches the programmed position on the receiving vessel. The control system ensures that the position of the payload is maintained regardless of the relative movement of the vessels.

Associated equipment:

- Moveable highpoints
- Astern refuelling rigs
- Crane refuelling rigs

The latest systems enable replenishment vessels to supply both fuels and solid stores quicker and in rougher conditions.



Naval deck machinery

The Rolls-Royce range of naval deck machinery comprises a wide range of windlasses and winches designed to meet exacting naval standards. They can be tailored to virtually any naval requirement. Operation is by thyristor controlled electric, hydro-electric or 3 speed AC electric pole change drive depending on customer preference.

Products include:

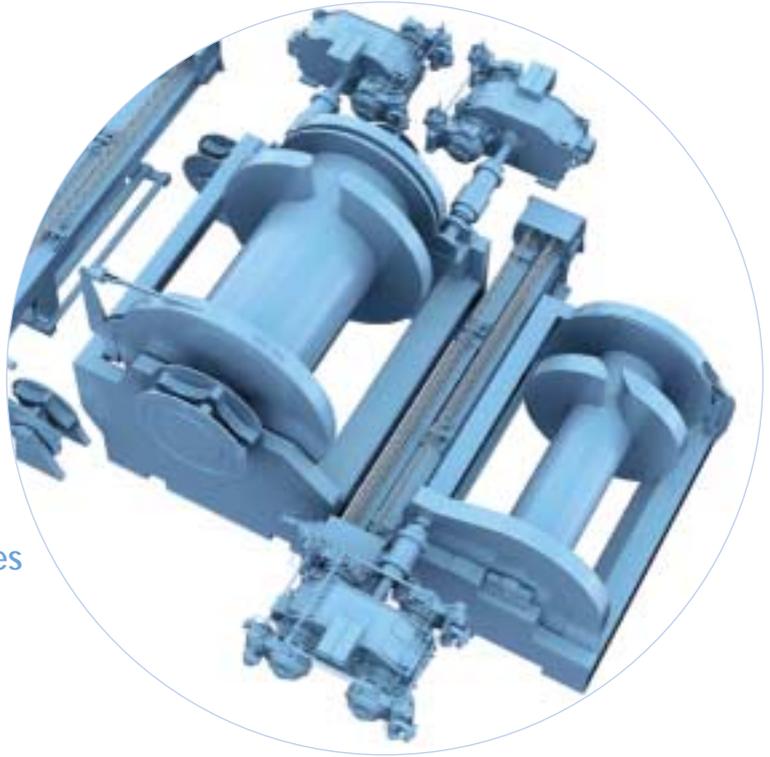
- Mooring/towing winches
- Anchor windlasses
- Mooring capstans
- Anchor cable and warping capstans
- Towed array sonar winches
- Deep-sea scientific winches



Cable and warping capstan

Upgrading is a good investment

Upgrading and replacement components can pay dividends in vessel performance and fuel savings. Once a product is in service, it is expected to last 25 years or more. During that time, there will be tremendous changes in the technology available. To continuously improve your vessel's performance, we provide a variety of upgrading solutions.



The advances in deck machinery design and new technology can help older vessels to be more effective and reliable. One has experienced that a combination of Synchro NT and an upgrading from single to double trawl has given a catch increase of up to 100%. Upgrading of drive systems is also possible. For example, the low-pressure system can be

upgraded by increasing the pressure, but with no visible changes to the installation. This will give 30% more output from existing components with no extra weight added. The Rauma Brattvaag spare parts are often developed so that when an old unit is overhauled, a new module is substituted for worn components of the original design. This upgrades

the performance of the product as well as restoring it to health. With Rolls-Royce as your service partner, our experienced engineers upgrade old applications or purpose – fit new equipment to your vessel. This means that in many cases you can meet changing markets without having to do expensive rebuilds.



Global Service and Support

The Rolls-Royce Service and Support concept has been developed to secure complete life-cycle support for your ship and its equipment.

We enable you to choose the kind of service level you need in the most cost-efficient way. Choose between day-to-day servicing, service agreements or a comprehensive service solution.

THE PARTNER SOLUTION

A comprehensive service agreement Lifelong support means less downtime, low life-cycle costs and proven high second-hand value. The Partner Solution provides you with these important advantages. This service solution allows you to optimise your daily routines, and ensures that our servicing puts your investment in the best hands. This also allows you to structure your own after-sales service to increase reliability and economy for your applications' operating conditions.

SERVICE AGREEMENTS

We save you time and money Time is crucial, so swift and correct response to enquiries or problems is of mutual benefit. Our aim is to increase your profitability by implementing long-term and cost-effective service agreements. These include delivering original replacement units, regular on-site inspections and personnel training.

BASIC SUPPORT

We get you back in business Our Service and Support is based on reliability, determination and the expertise to carry out services and deliveries at short notice. The Basic Support Agreement gives you access to our skilled field workers and genuine spare parts supplies, wherever and whenever you need them.

The agreement also includes access to our in-house repair and maintenance centres all over the world.

WORLDWIDE AVAILABILITY

We are always present A Rolls-Royce service centre is never far away, no matter where you are. With a comprehensive network of service centres around the world, we are a global company and yet still local. We offer 24-hour availability worldwide, backed by a first class logistics system, which secures you rapid response to inquiries within the shortest possible time.



Rolls-Royce gives a guarantee on all repairs carried out. The length depends on the type of work and the actual application.

