For more than one hundred years and thousands of ships

Aker Solutions is a leading global supplier of marine and offshore products and services, and is recognised worldwide as a leader in the design, engineering and supply of the innovative Pusnes™ deck machinery and Pusnes™ mooring and loading systems for marine and offshore applications.

Aker Solutions' aim is to be its customers' preferred partner, based on its ability to understand their business and add value to their projects.

Close co-operation with classification societies and maritime authorities, combined with innovative design, quality products and world wide lifecycle service, makes Aker Solutions the perfect partner for your marine and offshore projects.
Reliable deck machinery

Aker Solutions is one of the world’s largest manufacturers of deck machinery. Several thousand ship sets of Pusnes™ hydraulic and electric deck machinery have been delivered to vessels sailing all over the world.

The production of winches was established in 1875 and today both Pusnes™ electric deck machinery and high-pressure Pusnes™ hydraulic deck machinery are important products in the company’s portfolio. The deck machinery has been developed and improved over the years in order to fulfil new requirements and meet new market demands. Winches designed to operate in Arctic conditions are just one example of recent developments.

Pusnes™ lifecycle services has an established worldwide network to assist customers wherever the need occurs. When purchasing equipment, our customers not only receive quality products, they make an investment in the future, and Pusnes™ lifecycle services ensures that this investment reaches its full potential.

Achievements
- Original patent holder of Pusnes split drum™
- Innovator of spring applied fail-safe band brakes
- Innovator of high slack rope speed mooring winches
- Low speed / high torque motors

Our business areas
- Deck machinery
- Mooring systems
- Loading systems
- Lifecycle services

Main skills
- Research and development
- Project execution
- Engineering
- Procurement
- Fabrication follow-up
- Commissioning
- Lifecycle service

Developments
- Standardisation
- 3D modelling
- OCIMF winches
- Single point mooring (SPM)
- Arctic technology
Aker Solutions has a worldwide lifecycle network which supplies customers with spare parts, service and support wherever the need occurs.

Pusnes™ lifecycle services offers fast and efficient delivery of spare parts and skilled personnel for commissioning, maintenance and repair work. Beneficial equipment upgrades and modification of existing equipment and systems is also provided.

Pusnes academy™
Pusnes academy™, located in Arendal, was officially opened January 2009. The academy is equipped with top class, modern facilities ensuring the perfect learning environment. Operator courses are available for the company’s entire product range and include theory, operation and hands-on experience. Tailored courses are available upon request.
Pusnes™ hydraulic deck machinery

Aker Solutions delivers high-pressure Pusnes™ hydraulic deck machinery based on a “ring main” system with a working pressure of approximately 250 bar. The equipment design meets the requirements of all classification societies and satisfies the demand for flexibility and easy maintenance.

Product range
- Winch/windlasses for ø46 mm – ø144 mm anchor chain (other sizes on request)
- Mooring winches from 10 tons – 40 tons (other sizes on request)
- Hydraulic power unit (HPU)

The hydraulic system utilises small diameter piping thereby facilitating installation and saving space on deck and in pump rooms. The complete “ring main” system includes electric motors, variable axial piston pumps, valves and miscellaneous hydraulic components, all mounted on the hydraulic power unit, minimising the yard’s installation work.

Integration of equipment driven by a common hydraulic power unit in a “ring main” system enables all units to be operated simultaneously. This simple piping consists of main and branch lines and no valves are needed between the pipes. All or any combination of the following hydraulic equipment may be integrated in the ring main system, thereby reducing both equipment and installation costs.

- Cargo pumps
- Cargo valves
- Cranes
- Deck machinery
- Hatch covers
- Thrusters

Benefits for yards
- Flexible design for drum layout
- Simple installation
- Compact piping design
- Low material cost
- Low weight
- Low installation cost
- Easy integration with other onboard hydraulic systems
- Commissioning and support
- No need for separate servo system

Benefits for owner
- Redundancy
- Easy, safe and quick operation
- High slack rope speed
- Low lifecycle cost
- Proven system design
- Automatic torque limitation
- Worldwide lifecycle service and support
- Reliable partner

Options
- Hydraulic operated band brake and/or disc brake
- Stainless steel brake drum surfaces
- Isolation valves for easy maintenance
- Shipsite remote control
- Automatic mooring
- Chain length and/or speed measurement
- Bridge operated anchor drop
- Monitoring of brake holding force
- Wireless remote control
- Enclosed type windlass gearing
- Tube, plate or air coolers available
Solution overview

Features

- Simplified hydraulic system
- Various cooling arrangements to maximize operation
- High torque and high slack rope speed ensuring the shortest possible mooring period
- Constant pull on all units
- Integration of other equipment
- Low weight
- Ship-side remote control with auto high/low speed

Hydraulic deck machinery solution consists of

**Anchoring systems**
- Windlasses for chain dimensions up to 144 mm
- Materials selected for easy maintenance
- Fulfils all Classification Societies’ requirements
- Split type bearings for drive shaft
- Strong, durable design
- Easy maintenance
- Proven design
- Advanced braking systems available
- Chain stoppers

**Mooring winches**
- Mooring winches from 10 tons and above
- Optimal control of torque and high slack rope speed ensuring shortest possible mooring period
- All mooring winches can operate simultaneously at full load
- High brake holding capacity
- Primary gearbox totally enclosed with gears running in oil bath
- Easy automatic mooring operation

**Hydraulic power unit**
- Self-contained and skid-mounted easing shipyard’s installation
- Pumps located outside the tank for easy maintenance
- Oil coolers water type as standard, air type as option
- Full flow filter for return oil
- Floating mount of pump/electric motor unit minimising noise and vibration
- Fulfils all Classification Societies’ requirements
- Pulse dampers available (silencer)
Pusnes™ electric deck machinery

The increase in environmental awareness is becoming more and more apparent in the type of equipment that shipowners are choosing for their vessels. A direct result is the increasing popularity of diesel electric propulsion systems and electric deck machinery.

In line with the increasing awareness of environmentally sound solutions, Pusnes™ electric deck machinery has undergone significant modernisation and streamlining. Electric deck machinery eliminates the need for hydraulics and therefore risk to the environment.

The new generation of Pusnes™ electric deck machinery has either frequency controlled or pole changing motors. This is just one example of Aker Solutions commitment to further developing deck machinery solutions tailored to meet future market demands.

### Benefits for yard
- Easy installation
- Reduced commissioning costs
- No piping
- No flushing
- Compact size
- Less cabling
- Reduced cable sizes
- Low weight

### Benefits for owner
- No environmental pollution
- Low lifecycle cost
- Proven system design
- Low noise
- Short start-up time in cold climates
- Frequency control has step-less and smooth operation
- Automatic torque limitation
- Low power consumption
- Tension indication available
- Remote diagnosis available
- Extensive customer support

### Options
- Automatic mooring with or without monitoring
- EX motors for hazardous areas
- Chain length and speed measurement
- Tension indication
- Portable or wireless remote control
- Closed type windlass gearing
- Remote control of drum brake and clutch
- Remote control of chain stoppers
- Stainless steel brake drum surfaces
- Hydraulic operated disc brake on Cable lifter unit
- Automated anchor drop
Solution overview

Electric deck machinery solution consists of

**Anchoring systems**
- Windlases for chain dimensions up to 144 mm
- Material selected for easy maintenance
- Fulfils all Classification Societies’ requirements
- Split type bearings for drive shaft
- Strong, durable design
- Easy maintenance
- Proven design
- Advanced braking systems available
- Chain stoppers

**Mooring winches**
- Mooring winches from 10 tons and above
- Optimal control of torque and high slack rope speed ensuring shortest possible mooring period
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- Easy automatic mooring operation
Pusnes emergency towing system™

The two main features of the Pusnes emergency towing system™ are simplicity and durability.

The Pusnes emergency towing system™ (Pusnes ETS™) was originally designed for tankers loading at the Statfjord field in the North Sea. It has been further developed and today fulfils all new regulations with respect to single point mooring (SPM), yield strength and safety factors. The forward Pusnes chain stopper™ design makes it suitable as the strongpoint for SPM.

High quality and compact design with easy installation at low cost, both for newbuildings and existing vessels, are important factors for ensuring complete customer satisfaction. The Pusnes ETS™ meets these criteria.

Product range
Aft Pusnes ETS™
- Storage drum for towing wire with retrieval gear
- Complete pick-up gear stored in separate container

Complies with:
- IMO resolution MSC.35 (63)
- SOLAS V/15-1(b)
- LOOP regulations
- OPA 90
- OCIMF

Forward Pusnes ETS™
- Combined chain stopper including foundation for ETS and SPM
- Smit bracket for ETS and SPM
- Panama fairlead – 4 rib type
- Chafing chain
- Complies with:
  - IMO resolution MSC.35 (63)
  - SOLAS V/15-1(b)
  - LOOP regulations
  - OPA 90
  - OCIMF

Pusnes escorting and pull-back system™
- Fairleads, Panama deck mounting
- Tug towing bollard

Benefits for yard
- Low installation cost
- Compact design
- Easy installation
- Type approved

Benefits for owner
- Safety against fire
- Towing wire on a storage drum
- Centrifugal brake for controlled payout
- Gear for retrieval of towing wire
- Combined strongpoint & fairlead
- Type approved

Options Pusnes ETS™ aft
- Portable air-motor for retrieval of the towing wire
- Below deck installation
- Strength calculation
- Deck support

Options Pusnes ETS™ forward
- Bow shackle, D-type
- Guide roller
- Panama fairlead – 8 rib type
Exploring the Arctic and sub-Arctic regions

Aker Solutions has met the challenge of functional and reliable systems for rough and extreme weather conditions. As development of the Arctic continues, the need for specialised equipment for these harsh and environmentally vulnerable areas becomes significant.

When Roald Amundsen planned his exploration of the Arctics he chose an anchor winch from Pusnes Mekaniske Verksted for his polar vessel FRAM. He was well aware that reliable systems were a must if he should succeed in being the first to reach the South Pole.

The majority of today’s shuttle tankers operate in the extreme weather conditions of the North Sea or in the Arctic north of Russia, where reliable systems are a must. Customers continue to depend on Aker Solutions to develop and deliver equipment that meets these demands.

With over 100 years of experience supplying deck machinery designed for extreme conditions, Aker Solutions has acquired extensive expertise and skill, which is reflected in other innovative products such as the Pusnes Arctic crane offloading system™. Arctic and sub-Arctic deliveries include mooring and loading systems to the northern territories of Canada and Russia.