FINNØY GEAR & PROPELLER AS

Finnøy was founded in 1884. From 1902 – 1975 we produced engines with CP propellers. Our first hydraulic CP propeller was delivered in 1932. Since 1975 we have specialized in design and manufacture of gearboxes, CP propellers, fixed nozzles, rudder nozzles and remote controls.

Finnøy supplies a full range of CP propulsion packages. Taking power from a diesel engine, electrical motor, LNG engine or dual fuel engine. Each package is tailor made to suite the ship and customers requirements.

All design, production and testing are carried out at our factory on the west coast of Norway

Below is a typical arrangement showing the scoop of supply

From 3D design to finished product
FINNØY REDUCTION GEARBOX

The gearbox range covers input powers from 250 kW and up to 8000 kW. They are divided into 3 model types:

- SINGLE STAGE REDUCTION GEARBOX, with vertical or horizontal offset
- GXU REDUCTION GEARBOX
- TWIN INPUT – SINGLE OUTPUT REDUCTION GEARBOX

The gearboxes are manufactured with the following main components:
- Cast iron gearbox housing
- Input shaft arranged for flexible coupling
- Hydraulic operated multi-plate clutch with soft-valve for secure and soft engagement
- Gearwheels with hardened and ground helical teeth for silent operation
- Common oil system for lubrication, clutch and pitch servo
- Bearings of roller type with a low friction losses and long lifetime
- Spherical roller thrust bearing with low friction losses and long lifetime
- Output shaft with flange arrangement for connection to propeller shaft
- Servo system for pitch adjustment built into the gearbox
SINGLE STAGE REDUCTION GEARBOX

<table>
<thead>
<tr>
<th>Gearbox type</th>
<th>Power (kW)</th>
<th>Speed (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G18 - F - K - FK - FKV</td>
<td>250</td>
<td>3200</td>
</tr>
<tr>
<td>G23 - F - K - FK - FKV</td>
<td>310</td>
<td>2800</td>
</tr>
<tr>
<td>G27 - F - K - FK - FKV</td>
<td>460</td>
<td>2400</td>
</tr>
<tr>
<td>G30 - F - K - FK - FKV</td>
<td>740</td>
<td>2100</td>
</tr>
<tr>
<td>G35 F - FK - FKV</td>
<td>850</td>
<td>2100</td>
</tr>
<tr>
<td>G42 F - FK - FKV</td>
<td>1000</td>
<td>2100</td>
</tr>
<tr>
<td>G50 F - FK - FKV - FP</td>
<td>2000</td>
<td>1800</td>
</tr>
<tr>
<td>G60 F - FK - FKV - FP</td>
<td>3200</td>
<td>1600</td>
</tr>
<tr>
<td>G70 F - FK - FKV - FP</td>
<td>4000</td>
<td>1200</td>
</tr>
<tr>
<td>G80LF - LFK - LFKV - LFP</td>
<td>4500</td>
<td>1200</td>
</tr>
<tr>
<td>G80 F - FK - FKV - FP</td>
<td>5000</td>
<td>1000</td>
</tr>
<tr>
<td>G90 F - FK - FKV - FP</td>
<td>6000</td>
<td>1000</td>
</tr>
<tr>
<td>G105 F - FK - FKV - FP</td>
<td>8000</td>
<td>1000</td>
</tr>
</tbody>
</table>

F = Free standing, K = Power take out, P = Power take in, V = Extra gear train for large reduction, H = Horizontal offset
The GXU gearbox is designed to give a short and compact engine room, where the engine are mounted above the propeller shaft. This gives the possibility to use more of the length of the vessel for cargo.

The GXU gearbox can be powered by: diesel engines, LNG engines or E motors.

Typical vessels using this gearbox are:
- Bulk carriers
- General cargo vessels
- Live fish carriers
The twin input – single output gearbox gives a flexible solution.
By using the correct combination of main engines and E motors, the fuel consumption and emissions are reduced. The system gives flexibility, redundancy and safety.

The gearbox can be powered by diesel engines, LNG engines, E motors or a combination of this.
A hybrid propulsion system is suitable for ships with variable power requirements, enabling the engines and propeller to run optimally over a wide power range. The E motor can be with a synchronous speed, but in order to have optimal propeller speed it is preferable to control the speed with a frequency converter for fuel savings and lower emissions. The hybrid propulsion system combines the best from two systems; - diesel electric and diesel mechanical propulsion.

**DIESEL MECHANICAL DRIVE:**
Used for transit from A to B.

**DIESEL ELECTRICAL DRIVE:**
Used for standby, DP or other operations modes with a benefit of variable propeller speeds.

«**BOOST» DRIVE:
Used for heavy loads like towing, anchor handling or trawling. Main engine and electric motor operating together, for max. power.

«**TAKE ME HOME» DRIVE:
Use of electrical motor in case of main engine breakdown.

A large number of operational modes are available. Ranging from basic to more complex configurations, following are 3 examples:

ALT. 1 “Diesel electric mode”
ALT. 2 “Diesel electric mode”, “Boost mode”
ALT. 3 “Diesel electric mode”, “Generator mode” and “Boost”

**TWIN INPUT - SINGLE OUTPUT**
PTO/PTI connected prior to the main clutch (C1 – C2). With separate clutches (C3) and (C4) on the main engine.

“CP-Generator Mode”
“Diesel Electric Mode”
“Boost Mode”
“Combination Mode”

This feature is also used on twin screw vessels, giving the possibility to operate the vessel with only one main engine running.
2 SPEED GEARBOX

The 2 speed gearbox are used on vessels with large difference in power need. This configuration has the following advantages:

- Two different propeller speeds at constant engine speed
- The propeller can be operated at optimum speed both at high and low load
- Minimized zero pitch loss at “low gear”
- Minimized propeller noise at “low gear”
- Fuel saving at low load

DIESEL ELECTRIC PROPULSION

This configuration is mainly used for ships with large capacity of electric power in combination with large differences in propulsion power.

This configuration has the following advantages:

- Optimum propeller speed over the whole operating range
- Minimized zero pitch loss
- Fuel saving at low load

System with 2 x E motors on the same gearbox
- High redundancy

Horizontal gearbox G70HF
- Powered by a E motor
Our electronic remote control systems can vary from a single panel for control of pitch, and up to a larger system with multiple panels on the bridge. Also chair mounted levers can be applied.

It is an electronic system for propulsion for vessels with CP-propellers. It is designed according to the fail-safe principle and built with a high level of redundancy. The system is very user friendly, highly accurate, and can have several operating modes.

**Various operation modes are available:**
- Combinatory mode
- Individual mode
- PTO Fixed rpm mode
- PTH mode
- Boost mode
- 2 SPEED mode
- FI-FI mode

The system can be supplied with interface to VDR, Conning Display, DP and Joystick systems.
The CP Propellers have a range from 1000mm – 5000mm in diameter. They can be delivered with 3, 4 or 5 blades. The propeller hub and blades are made in Ni.Al.-Bronze. They can also be delivered in Stainless steel.

The hydrodynamic blade design calculations are based on detailed analysis in computers together with Finnøy’s long experience.

The pitch is adjusted by a pull-push rod inside the hollow propeller shaft. It transfers the axial force from the servo piston mounted inside the gearbox.

**PROPELLER DESIGN**

All ships have individual needs. To satisfy these needs Finnøy use the most suitable software together with their experience when designing propeller blades. The blades are designed for best possible performance regarding thrust, efficiency, noise, and vibration. The blades are machined and balanced according to ISO 484 standards.

**FEATHERING POSITION**

Feathering position is used to minimize the drag from the propeller when it is not in use. Typical vessels are sail ships and double ended ferries.
For vessels that require maximum towing thrust, a nozzle could be fitted. The nozzle increases the bollard pull by approx. 30-40% compared to an open propeller absorbing the same power. It can be delivered as a fixed nozzle or rudder nozzle.

**FIXED NOZZLE - NACA 19A PROFILE**

The “standard” nozzle gives high nozzle thrust in towing condition and is a excellent choice for trawlers, tug boats, AHTS etc.

**FIXED NOZZLE - FINNØY HIGH SPEED PROFILE**

The Finnøy high speed nozzle is designed to give the same nozzle thrust as 19A type at low speed. But this nozzle is designed to reduce drag at higher speed.

**RUDDER NOZZLE**

- No need of rudder as a fixed rudder plate is mounted on the nozzle
- Larger propeller diameter as the propeller center can be moved astern
SERVICE:
Finnøy have their own service team that is available 24h a day.

Our service team consists of experienced persons that are dedicated for service jobs worldwide. Depending of the place of the vessel, we may be in place within 48h.

Gearbox - shaft - propeller is of our own design, and are produced, assembled and tested at our factory here in Norway.

Our highly trained technicians are trained to work on all sections of our products.

We keep a large stock of spare parts to be ready for shipment in a short time.

24 hour service phone no: +47 918 16 758

SALES AGENTS:
Our sales agents are located in all major shipping areas in the world.

- Russia
  - Marine Propulsion Systems - St. Petersburg
- Germany/Holland
  - Steinbach Ingenieurtechnik - Ratzeburg
- UK
- Turkey
  - BetuMar Ltd - Istanbul
- Greece
  - Kaminco - Athens
- Romania
  - Martrade SRL - Galatzi
- Spain
  - Sedni - Alicante
- USA
  - Ships Machinery International Inc. - Miami
- India
  - Ardee Saigal Group - Mumbai
- Singapore/South China
  - Scanvik Marine Services Pte. Ltd - Singapore
- Australia
  - Headland Engineering Pty. Ltd - Sydney
- South Africa
  - Tamarix Marine C.C Inc. - Cape Town
- Korea
  - Boema Hi-Tec Ltd. - Seoul
- China (North)
  - For Win Equipment & Engineering Co Ltd - Beijing
1884
Nils N. Finnøy founded the company.
He started as a blacksmith at 19 years old.

1895-96
Patented a new type of line hauling winch.

1900
Silver Medal for the winch at the World Exhibition in Paris.

1902
First engine delivered to the fishing vessel “ERLING”.
With manually operated CP-propeller.

1913
First 4-cylinder engine above 100 hp. delivered.

1932
First hydraulic operated CP-propeller delivered.

1975
Last engine produced, totally 668 engines delivered.
Built a new factory. Focus on reduction gearboxes and CP prop.

1976-77
Series of “small” gearboxes designed, G18 - G42

1979
First propeller in nozzle delivered

1985
Delivery of G50 gearbox, the first “large” gearbox

1989
Gearbox type G60-G70 developed.

2001
Extension of workshop.

2002
Gearbox type G80-G90 developed.

2004
New large propeller series developed.
P95, P105, P125 Diameter 3,2 – 5,0m

2012
New office building and extension of workshop
Gearbox type G105 developed.
VESSELS AND PRODUCTS

"GUNNERUS"

5 blade CP propellers P52, Ø2000mm

"SANCO SPIRIT"

Horizontal offset Gearbox G70FH

"DALFOSS"

CP propeller P105, Ø4000 mm

"L ÁDROIT"

Gearbox G60FP – PTO/PTI
VESSELS AND PRODUCTS

"GEO BARENTS"

"ARIES WARRIOR"

CP propeller P105, Ø4000

CP propeller P85, Ø2900 mm

"ARIES WARRIOR"

Gearbox G60FK