FINNOY

Propulsion systems

FINNØY

PRODUCT RANGE

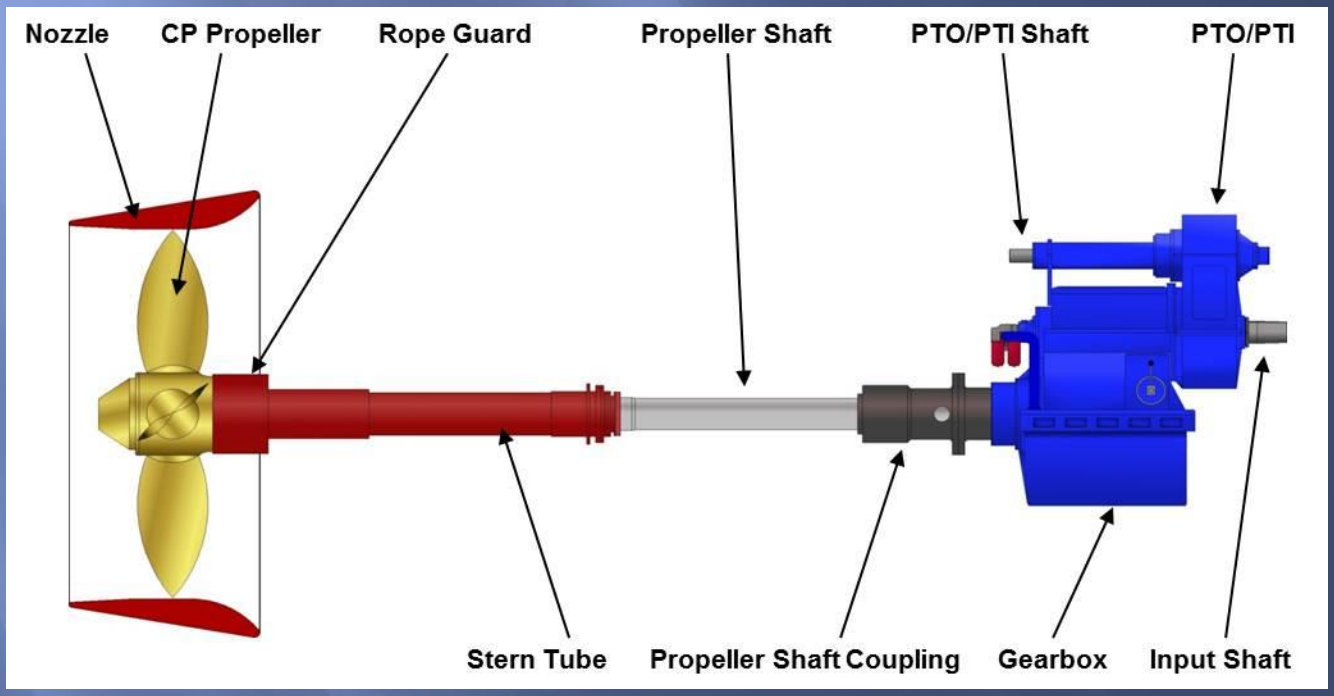
FINNØY GEAR & PROPELLER AS

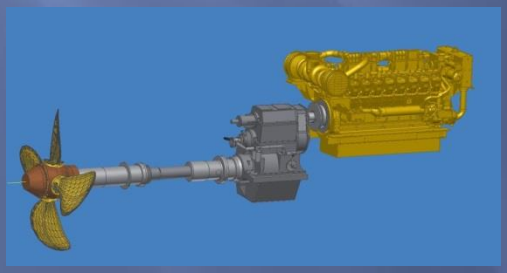
Finnøy was founded in 1884. From 1902 – 1975 we produced engines with CP propellers.
Our first hydraulic CP propeller was delivered in 1932.
Since 1975 we have specialized in design and manufacture of gearboxes, CP propellers, fixed nozzles, rudder nozzles and remote controls.

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

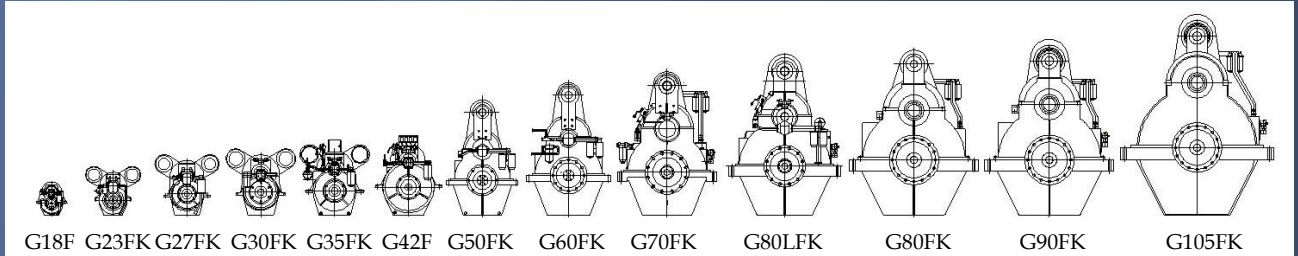
FINNØY REDUCTION GEARBOX

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



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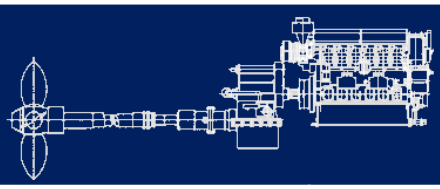
SINGLE STAGE REDUCTION GEARBOX

SINGLE STAGE REDUCTION GEARBOX



Gearbox type Vertical offset: G18-G105 Horizontal offset: G50-G105	Power (kW)	Speed (rpm)
G18 – F – K – FK – FKV	250	3200
G23 – F – K – FK – FKV	310	2800
G27 – F – K – FK – FKV	460	2400
G30 – F – K – FK – FKV	740	2100
G35 F – FK – FKV	850	2100
G42 F – FK – FKV	1000	2100
G50 F – FK – FKV – FP	2000	1800
G60 F – FK – FKV – FP	3200	1600
G70 F – FK – FKV – FP	4000	1200
G80LF – LFK – LFKV - LFP	4500	1200
G80 F – FK – FKV – FP	5000	1000
G90 F – FK – FKV – FP	6000	1000
G105 F – FK – FKV - FP	8000	1000

F = Free standing, K = Power take out, P = Power take in
V = Extra gear train for large reduction, H = Horizontal offset

G50F

G60FP – PTI for E motor

G60FP – PTO/PTI

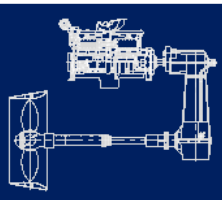
G80FK –
PTO for shaft generator

G70FK –
PTO for shaft generator

G70HF

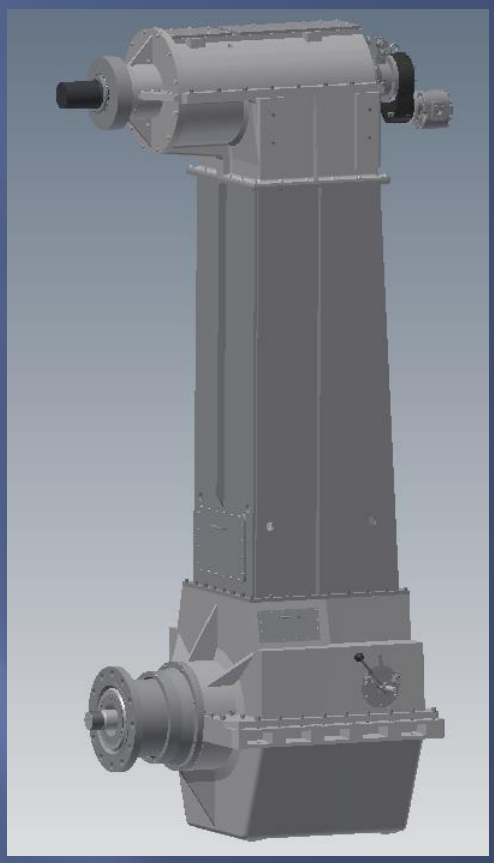
GXU REDUCTION GEARBOX

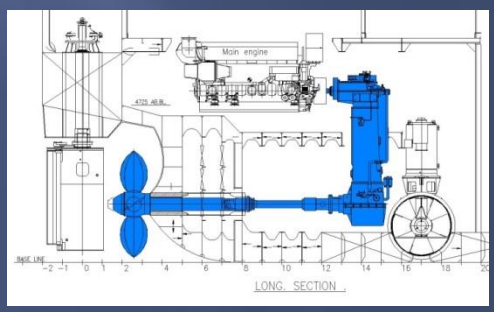
GXU
REDUCTION GEARBOX



Gearbox type	Power (kW)	Speed (rpm)
GXU270 F – FK – FP - FKV	370	2400
GXU300 F – FK – FP – FKV	550	2100
GXU420 F – FK – FP – FKV	1000	2000
GXU500 F – FK – FP – FKV	1500	1800
GXU600 F – FK – FP - FKV	2000	1500

F = Free standing
K = Power take out
V = Extra gear train for large reduction
P = Power take in





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

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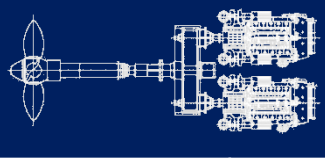
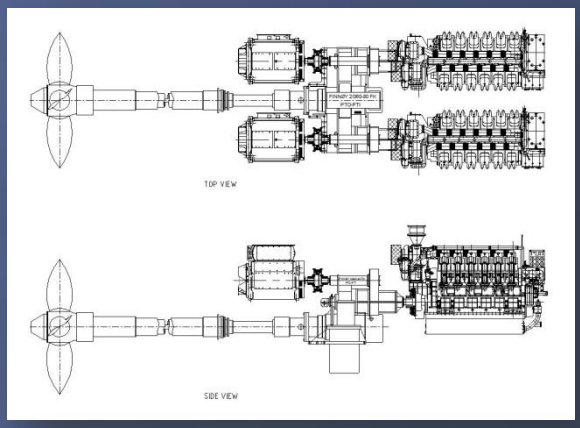
TWIN INPUT – SINGLE OUTPUT REDUCTION GEARBOX

TWIN INPUT – SINGLE OUTPUT REDUCTION GEARBOX



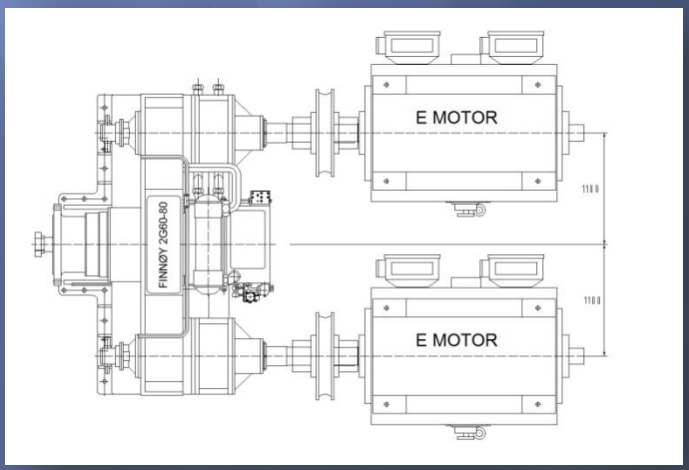
Gearbox type	Power (kW)	Speed (rpm)
2G23-35 F – FK – FP	2x370	2400
2G27-42 F – FK – FP	2x500	2100
2G30-50 F – FK – FP	2x1000	1800
2G42-60 F – FK – FP	2x1750	1600
2G50-70 F – FK – FP	2x2000	1200
2G60-80 F – FK – FP	2x3000	1000
2G70-90 F - FK – FP	2x4000	1000

F = Free standing, K = Power take out, P = Power take in

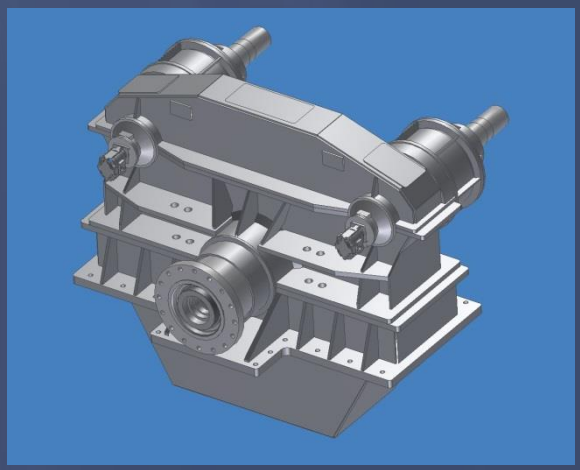


The twin input – single output gearbox gives a flexible solution.
By using the correct combination of main engines and E motors, the fuel consumption and emissions are reduced. The system gives flexibility, redundancy and safety.

The gearbox can be powered by diesel engines, LNG engines, E motors or a combination of this.



The 2G60-80F powered by E motors



3D model of 2G60-80F

HYBRID PROPULSION – PTO/PTI

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.

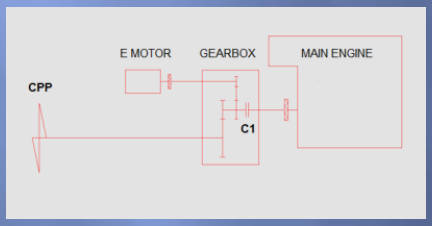
DIESEL MECHANICAL DRIVE:
Used for transit from A to B.

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

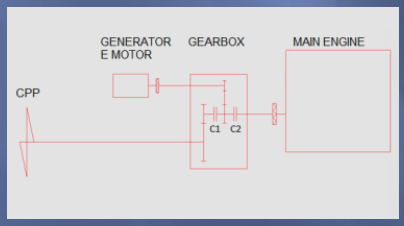
«BOOST» DRIVE:
Used for heavy loads like towing, anchor handling or trawling.
Main engine and electric motor operating together, for max. power.

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

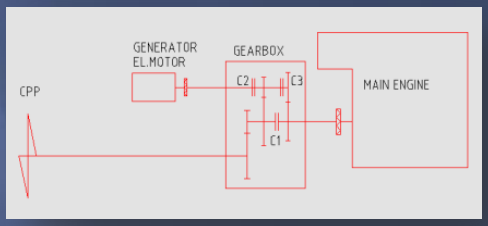
A large number of operational modes are available.
Ranging from basic to more complex configurations, following are 3 examples:



ALT. 1 "Diesel electric mode"



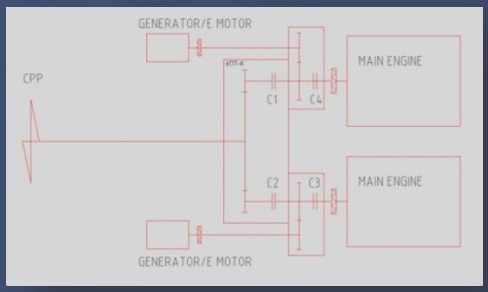
ALT. 2 "Diesel electric mode" "Boost mode"



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"

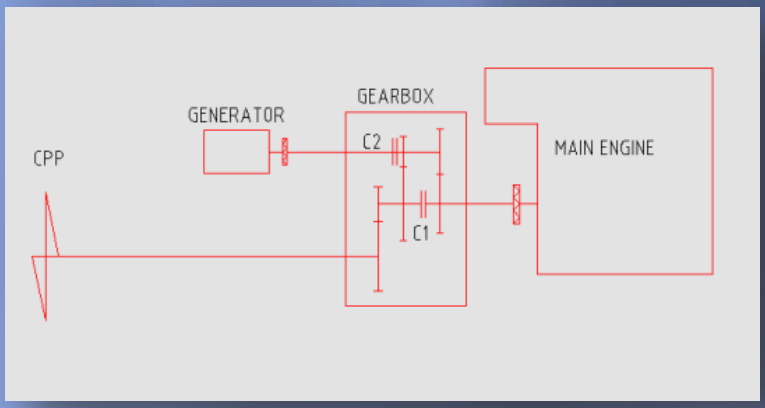
This feature is also used on twin screwed vessels, giving the possibility to operate the vessel with only one main engine running.

2 SPEED GEARBOX / ELECTRIC PROPULSION

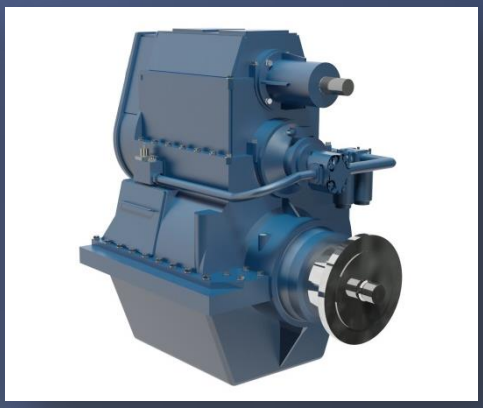
2 SPEED GEARBOX

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



2 SPEED system drawing



G80FK – 2 SPEED

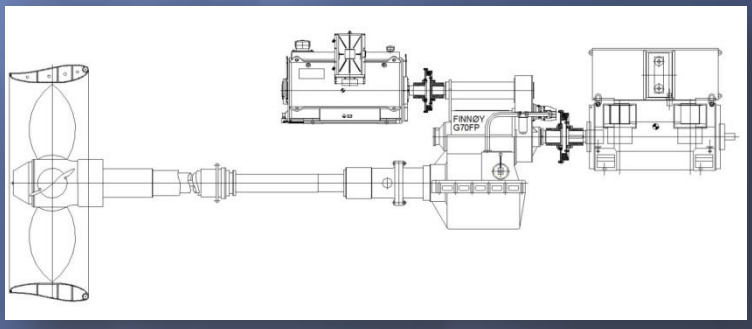
DIESEL ELECTRIC PROPULSION

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

Twin screw installation with G42F



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

Horizontal gearbox G70HF
- Powered by a E motor

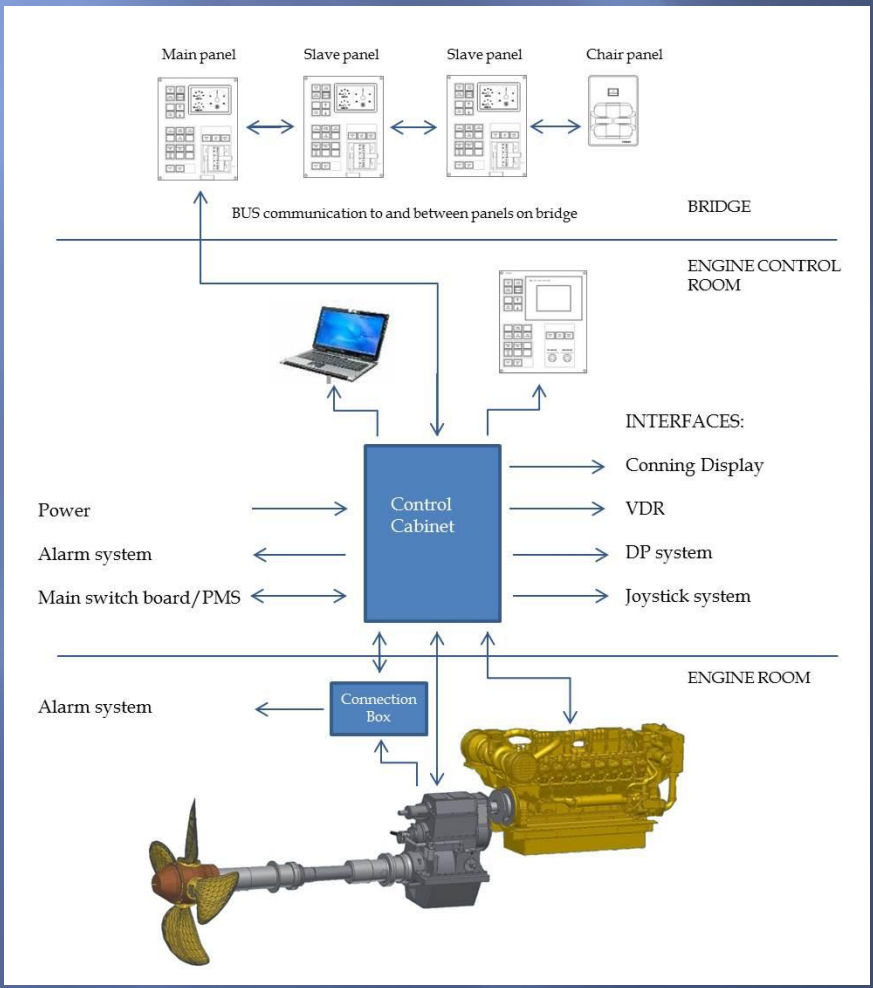
REMOTE CONTROL

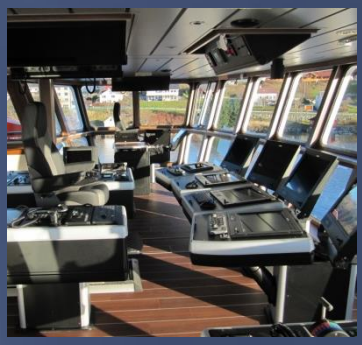
Our electronic remote control systems can vary from a single panel for control of pitch, and up to a larger system with multiple panels on the bridge. Also chair mounted levers can be applied.

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.





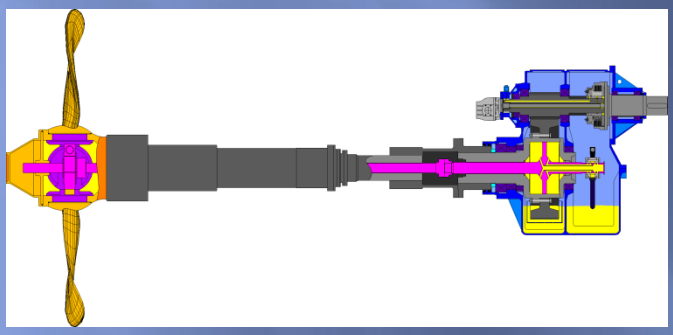
FINNØY

CP PROPELLER

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.

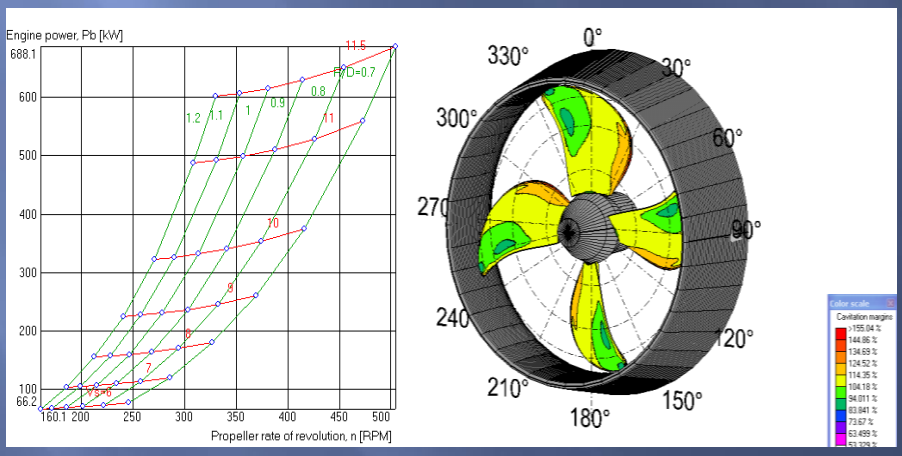
The hydrodynamic blade design calculations are based on detailed analysis in computers together with Finnøy's long experience.

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.



3 BLADED PROPELLER

Type	Shaft Diameter (mm)	Propeller Diameter (mm)
P26	100	1000 - 1250
P30	100 - 120	1200 - 1500
P35	120 - 130	1400 – 1700

Shaft diameter and propeller diameter are just for guidance

4 BLADED PROPELLER

Type	Shaft Diameter (mm)	Propeller Diameter (mm)
P31	100 - 120	1000 - 1300
P34	120 - 130	1100 – 1500
P39	130 - 150	1300 – 1700
P50	150 - 170	1700 – 2100
P58	170 - 190	2000 – 2300
P65	200 - 220	2200 - 2700
P70	220 - 260	2300 - 2900
P78	260 - 280	2600 - 3200
P85	280 - 320	3000 – 3600
P95	320 - 360	3200 – 3800
P105	360 - 400	3500 – 4200
P125	400 - 440	4000 – 5000

Shaft diameter and propeller diameter are just for guidance

5 BLADED PROPELLER

Type	Shaft Diameter (mm)	Propeller Diameter (mm)
P45	130 – 150	1200 – 1500
P52	150 – 170	1400 - 2000
P60	170 – 200	1600 - 2100
P68	200 - 220	1900 – 2300

Shaft diameter and propeller diameter are just for guidance

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.

NOZZLE

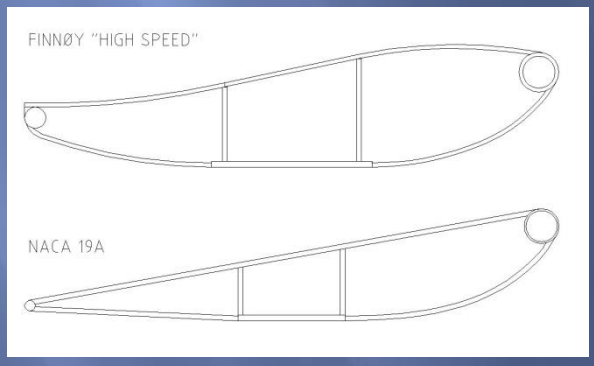
For vessels that require maximum towing thrust, a nozzle could be fitted. The nozzle increases the bollard pull by approx. 30-40% compared to an open propeller absorbing the same power.
It can be delivered as a fixed nozzle or rudder nozzle.

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

FINNØY

SERVICE AND AFTER MARKET

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	Marine Systems (UK) Ltd - London
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

FINNØY HISTORY

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

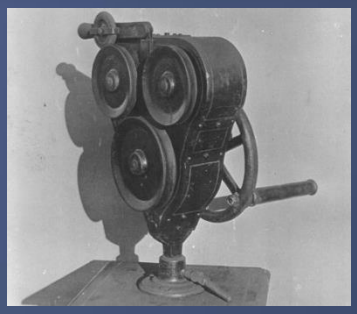
1989
Gearbox type G60-G70 developed.

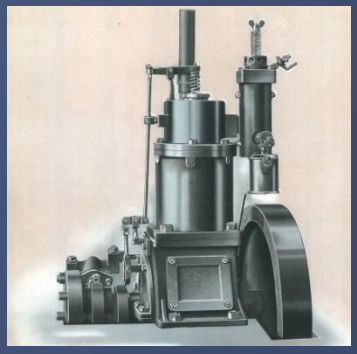
2001
Extension of workshop.

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.


Line hauling Winch


Engine no 1


Testing of 4 cylinder engine, 1922

Workshop 2001

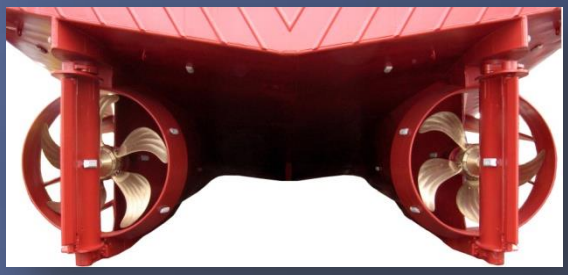

P105 – 4,0 m diameter


New office

FINNØY

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

FINNOY

VESSELS AND PRODUCTS

"GEO BARENTS "

CP propeller P105, Ø4000

"ARIES WARRIOR"

CP propeller P85, Ø2900 mm

"ARIES WARRIOR"

Gearbox G60FK

FINNØY

FINNØY GEAR & PROPELLER AS

FINNØY, N-6487 HARØY +47 71 27 60 00
post@finnoygear.no www.finnoygear.no

Versjon 2, July 2013