

FINNOY

Complete propulsion systems to modern shipping

SINCE 1884

Finnøy Gear & Propeller is a family owned company that for more than 135 years has evolved from being a local production workshop to today's company that operates worldwide.

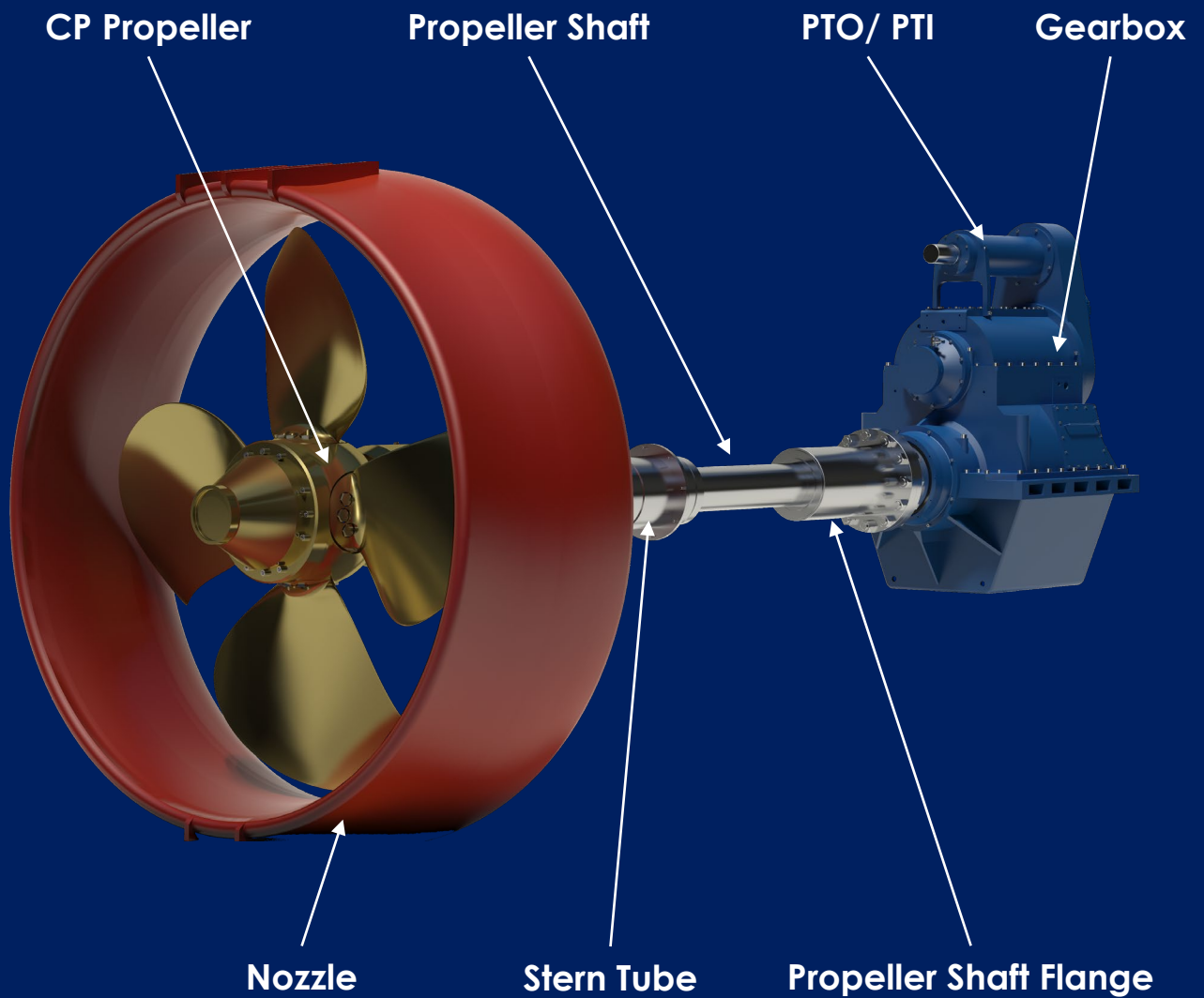
The company is a leading developer and manufacturer of turnkey propulsion systems for modern shipping. Our product portfolio consists of gears, propellers, nozzles and remote controls that are characterized by high quality throughout the value chain.

Finnøy Gear & Propeller is located in modern production premises on idyllic Finnøy, close by Ålesund in Norway. The Finnøy team consist of 55 employees at our head office in Finnøy and sales office in Ålesund. In addition, we are represented through an agent network in North America, Europe, Asia, Oceania and South-Africa. Our vision is to create tailored solutions for advanced ships, with a continuous focus on meeting and exceeding customer expectations both in precision and efficiency.



Nils Erling Finnøy
General Manager

SCOOP OF SUPPLY

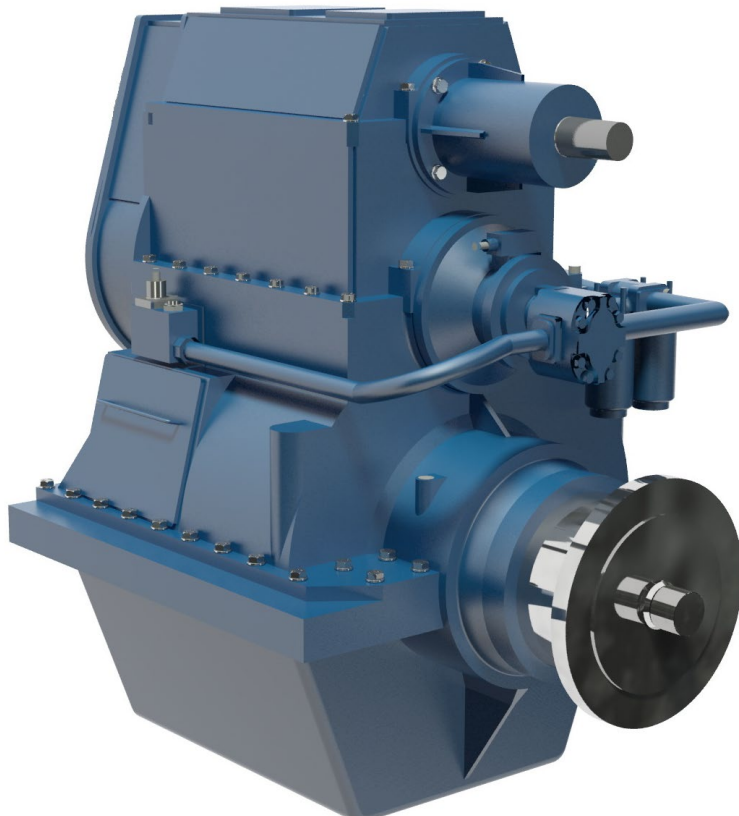


SINGLE STAGE REDUCTION GEARBOX

LONG LIFETIME – ROBUST DESIGN

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 systems
- 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



The gearbox range covers input powers from 150 kW and up to 12 000 kW.

Three different model types

1. SINGLE STAGE REDUCTION GEARBOX
2. GXU REDUCTION GEARBOX
3. TWIN INPUT – SINGLE OUTPUT REDUCTION GEARBOX

GEARBOX TYPE Vertical offset: G18-G120 Horizontal offset: G50-G120	Power (kW)
G18 – F – K – FK – FKV	250
G23 – F – K – FK – FKV	310
G27 – F – K – FK – FKV	460
G30 – F – K – FK – FKV	740
G35 F – FK – FKV - FR	850
G42 F – FK – FKV - FR	1000
G50 F – FK – FKV – FP – FR	2000
G60 F – FK – FKV – FP	3200
G70 F – FK – FKV – FP	4000
G80LF – LFK – LFKV - LFP	4500
G80 F – FK – FKV – FP	5000
G90 F – FK – FKV – FP	6000
G105 F – FK – FKV - FP	8000
G120 F – FK – FKV - FP	12 000
F = Free standing, K = Power take out, P = Power take in V = Extra gear train for large reduction H = Horizontal offset, available from G50 – G105 R = Extra gear train for turning the propeller rotation	

GXU REDUCTION GEARBOX

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

GEARBOX TYPE	Power (kW)
GXU270 F – FK – FP - FKV	370
GXU300 F – FK – FP – FKV	550
GXU420 F – FK – FP – FKV	1000
GXU500 F – FK – FP – FKV	1500
GXU600 F – FK – FP - FKV	2000
GXU700 F – FK – FP - FKV	2500
GXU800 F – FK – FP - FKV	3000

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

TWIN INPUT – SINGLE OUTPUT

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.

GEARBOX TYPE	Power (kW)
2G23-35 F – FK – FP	2 x 600
2G27-42 F – FK – FP	2 x 750
2G30-50 F – FK – FP	2 x 1000
2G42-60 F – FK – FP	2 x 1750
2G50-70 F – FK – FP	2 x 2000
2G60-80 F – FK – FP - E	2 x 3000
2G70-105 F - FK – FP	2 x 4000
2G80-120 F - FK – FP	2 x 6000

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



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 fixed 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.

«TAKE ME HOME» DRIVE

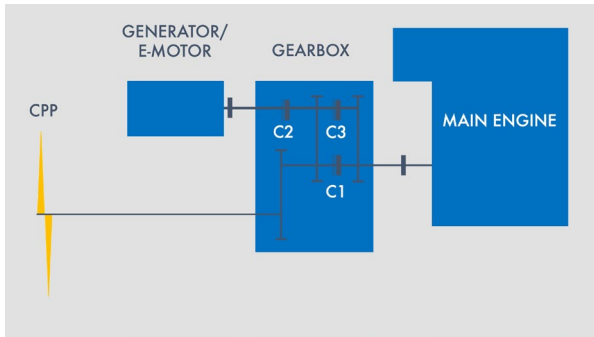
Use of electrical motor in case of main engine breakdown.

«BOOST» DRIVE

Used for heavy loads like towing, anchor handling or trawling.

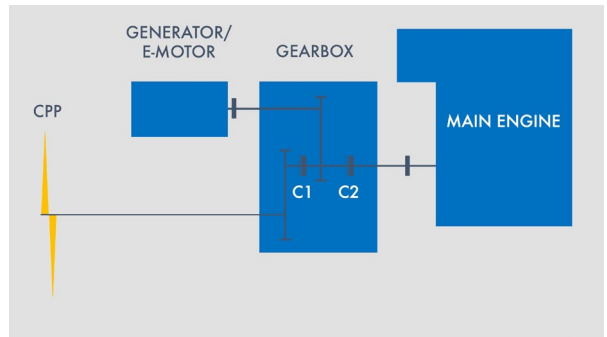
Main engine and electric motor operating together, for max. power.

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



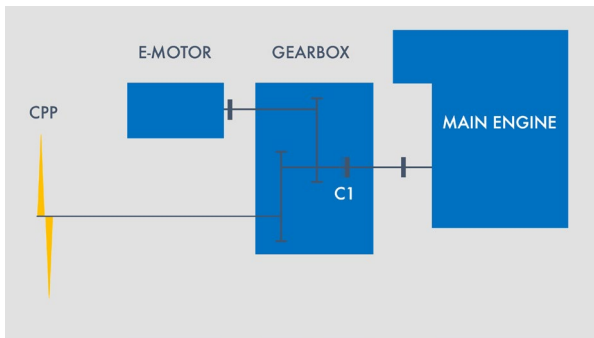
Alternative 1

- “Diesel electric mode”
- “Diesel mechanic mode”
- “Generator mode”



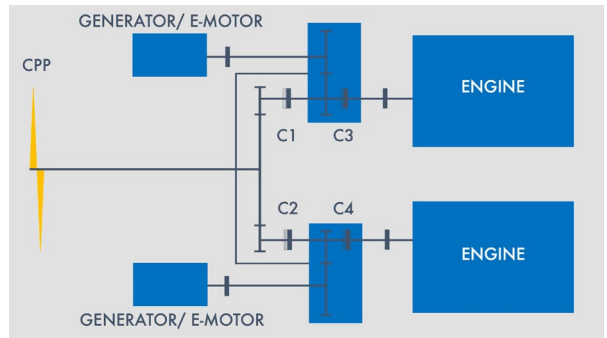
Alternative 2

- “Diesel mechanic mode”
- “Diesel electric mode”
- “Generator mode”
- “Boost mode”



Alternative 3

- “Diesel mechanic mode”
- “Diesel electric mode”
- “Boost mode”



Twin input – single output

- “CP-generator mode”
- “Diesel electric mode”
- “Boost mode”
- “Combination mode”

Twin input – single output

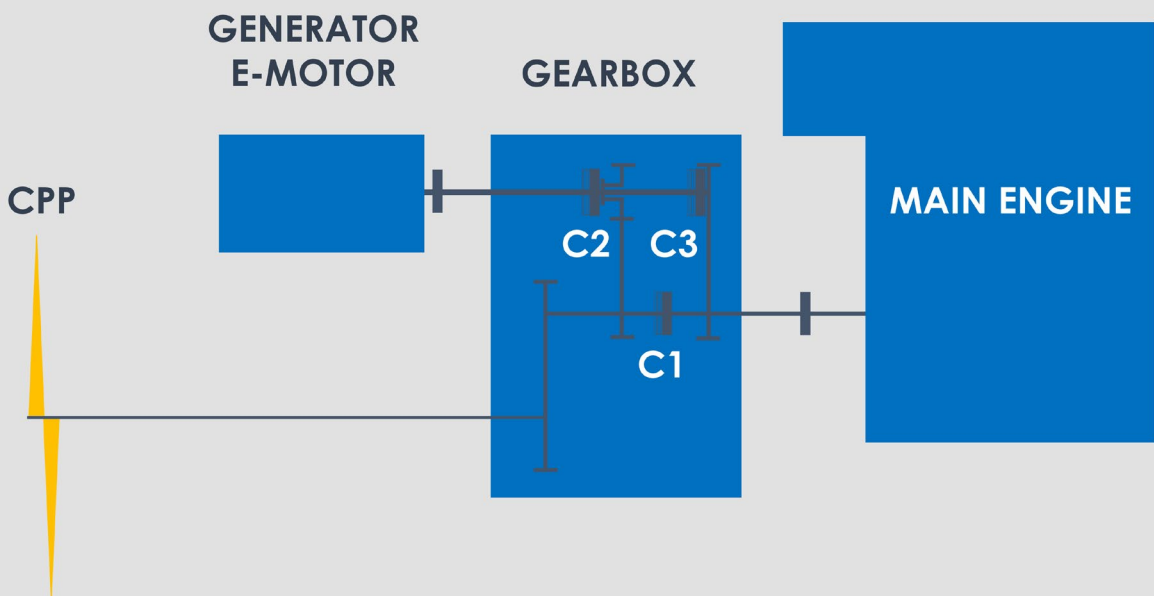
PTO/PTI connected prior to the main clutch (C1 – C2) with separate clutches (C3) and (C4) on the main engine. This feature is also used on twin screwed vessels, giving the possibility to operate the vessel with only one main engine running.

2- SPEED GEARBOX

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 optimal 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



High gear

- C1 is engaged, C2 is disengaged
- Can give full engine power to propeller
- Excess power to shaft generator

Low gear

- C1 is disengaged, C2 is engaged
- Reduced engine power to propeller due to lower propeller speed
- Excess power to shaft generator

Electric propulsion

- C2 is engaged, C1 and C3 is disengaged
- Generator/E motor can power the prop.



In addition to the 2 SPEED gearbox the ship can have floating frequency. Allowing the engine speed to be lowered also in “generator mode”. Variations in engine speed are corresponding with 60-50 Hz from the shaft generator.

Above is an example from the vessel “Smaragd”. A combination of 2 - speed gearbox and floating frequency gives them a variation of propeller speed between 148 and down to 105 rpm, which allows optimal propeller speed in the full operation range.

Speed selection	Engine speed (rpm)	Propeller speed (rpm)	Approx. propeller power at max. pitch (kW)
High gear (reduction 4,05:1)	600 (60 Hz)	148	4000
	500 (50 Hz)	123	2150
Low gear (reduction 4,76:1)	600 (60 Hz)	126	2000
	500 (50 Hz)	105	1150

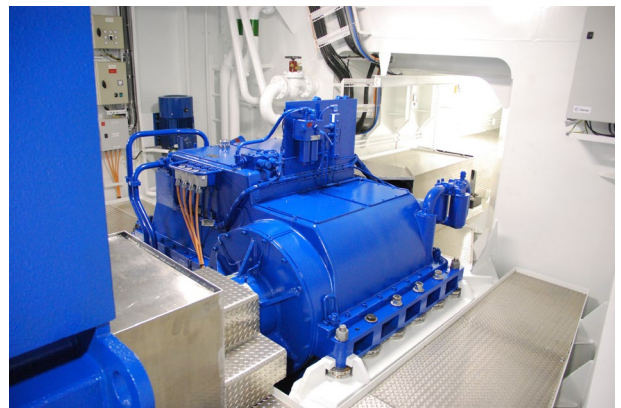
DIESEL ELECTRIC PROPULSION



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



5TH GENERATION REMOTE CONTROLS

EASY OPERATION – FULL 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.

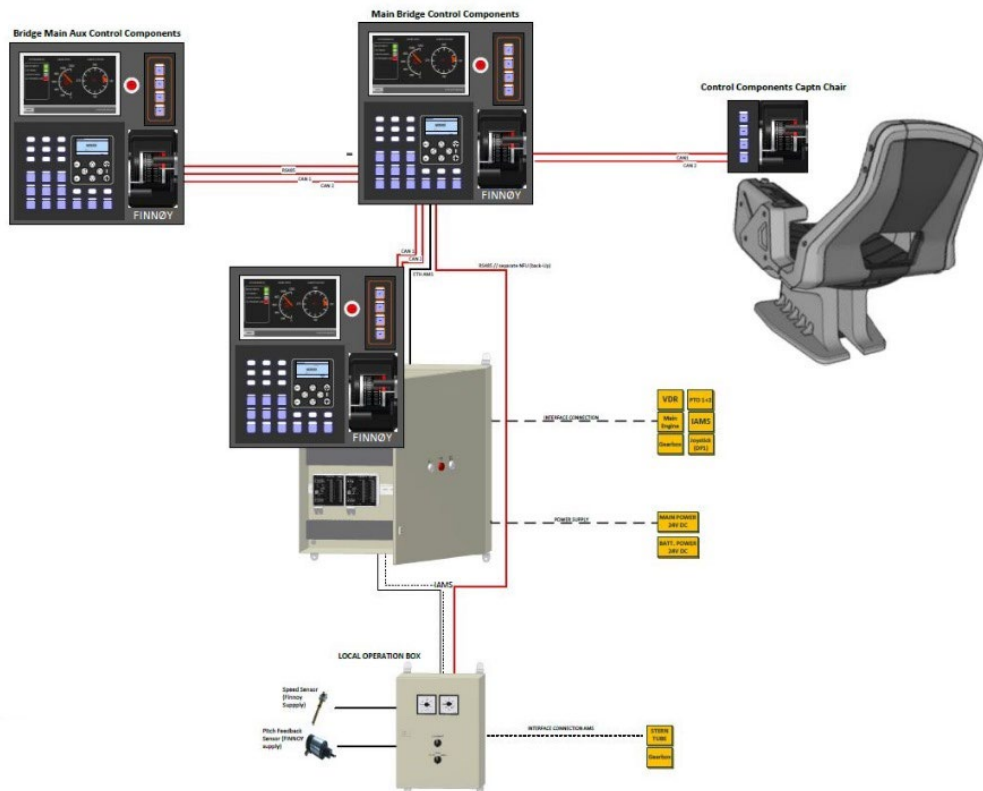
The system can be supplied with interface to VDR, Conning Display, DP and Joystick systems. Alarms from gearbox and stern tube can be monitored and displayed in the LCD screen in bridge and in ECR.



5TH GENERATION REMOTE CONTROLS

Various operation modes are available

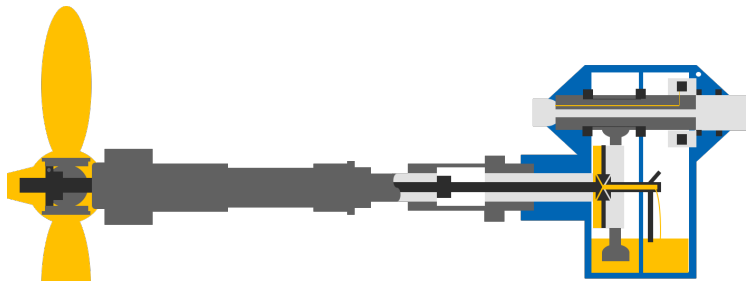
- Combinatory mode
- Individual mode
- PTO Fixed rpm mode
- PTH mode
- PTI Hybrid mode
- Boost mode
- 2- speed mode
- FI-FI mode
- Interface to VDR
- Interface to Conning Display
- Interface to DP and Joystick



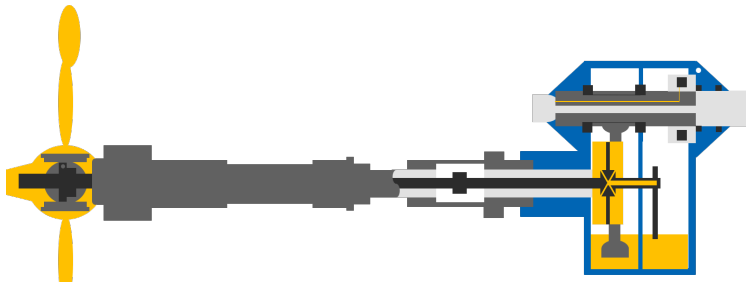
CP PROPELLER

FUEL EFFICIENCY - INCREASED UPTIME

The CP Propellers have a range from 1000mm – 6000mm in diameter and can be delivered with 3, 4 or 5 blades. The propeller hub and blades are made in Ni.Al.-Bronze, per. customer specification in Stainless steel. 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.



PITCH CONTROL: **PITCH AHEAD**



PITCH CONTROL: **0 - PITCH**



PITCH CONTROL: **PITCH ASTERN**



CP PROPELLER

3 BLADED PROPELLER

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

4 BLADED PROPELLER

Type	Shaft dia. (mm)	Propeller dia. (mm)
P31	100 - 120	1000 - 1300
P34	120 - 130	1100 - 1500
P39	130 - 150	1300 - 1700
P44	130 - 150	1600 - 2000
P50	150 - 170	1700 - 2100
P58	170 - 190	2000 - 2400
P65	200 - 220	2200 - 2700
P70	220 - 260	2300 - 2900
P78	260 - 280	2600 - 3400
P85	280 - 320	3000 - 3600
P95	320 - 360	3200 - 3800
P105	360 - 400	3500 - 4200
P115	400 - 460	4000 - 5300
P135	460 - 520	4500 - 6000

5 BLADED PROPELLER

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

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

“Standard” nozzle gives high nozzle thrust in towing condition
Excellent choice for trawlers, tugboats, AHTS etc.

FIXED NOZZLE – FINNØY HIGH SPEED PROFILE

Designed to give the same nozzle thrust as 19A type at low speed and reduce drag at higher speed.

RUDDER NOZZLE

No need of rudder as a fixed rudder plate is mounted on the nozzle.
Allows for larger propeller diameter as the propeller center can be moved astern.



SERVICE AND AFTER MARKED

CUSTOMERS FIRST PRINCIPLE

Finnøy have their own service team that is available 24 hours a day.

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

24/7 service phone number: (+47) 918 16 758

Our service team consists of experienced persons that are dedicated for service jobs worldwide. Depending on the position 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.



AGENT NETWORK

UK	Marine Systems (UK) Ltd – London
CROATIA	Imex Marine d.o.o
TURKEY	BetuMar Ltd - Istanbul
GREECE	Kaminco – Athens
ROMANIA	Martrade SRL - Galatzi
SPAIN	Sedni - Alicante
CHINA	Eternal Marine International Limited – HK
KOREA	Global Marine Products - Busan
AUSTRALIA	Headland Engineering Pty. Ltd – Sydney
SOUTH AFRICA	Tamarix Marine C.C Inc . - Cape Town
CANADA – West Coast	Electro Marine Inc. - Seattle
USA – West Coast	Electro Marine Inc. - Seattle



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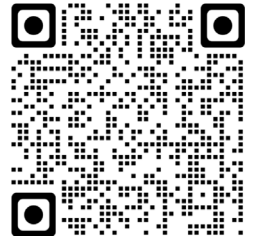
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