

# GRENAA DIESEL

## GRENAA COMPLETE PROPULSION SYSTEMS

Heavy duty slow speed propulsion plants type F24



### Grenaa Marine Systems

#### Products to last a lifetime

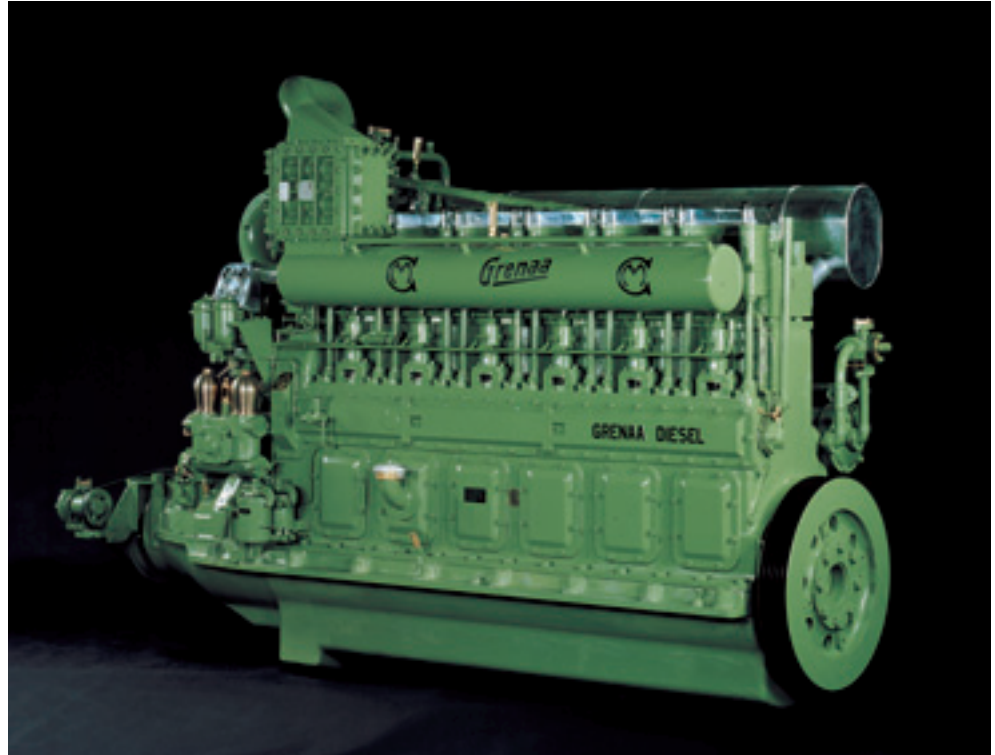
For more than 80 years A/S Grenaa Motorfabrik has been manufacturing high quality marine systems. Our philosophy is to incorporate the highest reliability into the design of all equipment.

#### True heavy duty equipment

- Diesel engines
- Reduction gears
- CP-propeller systems
- Keel coolers
- Generating sets
- Full propulsion systems

Service intervals are long and all units can be cost effectively refurbished to as-new standard. Even design of new components is done bearing retrofits in mind so owners can update their equipment if desired.

We do not believe in the "use and scrap" mentality.



#### One supplier of the full genuine package

Grenaa Motorfabrik has specialised in manufacture of complete propulsion systems covering: diesel engine, transmission unit with CP-controls and the controllable pitch propeller system. This system integration with practically all ancillaries ready fitted to the units gives significant advantages:

- Single source supply ensures equipment compatibility.
- One partner for all after sales service and spare parts.
- Easy installation with an extensive installation equipment package included.

#### Compact slow speed design

The Grenaa propulsion systems are designed as compact units with engine and transmission unit integrated. This makes the installation length short compared to other slow speed propulsion systems. At the same time it makes installation work uncomplicated since only a minimum of connections and alignment work has to be performed by the shipyard.



Based upon experience – made for the future

# GRENAA DIESEL



## At your service

Grenaa equipment is sold by reputation and we do our utmost to supply a professional engineering and spare parts service on a world wide basis.

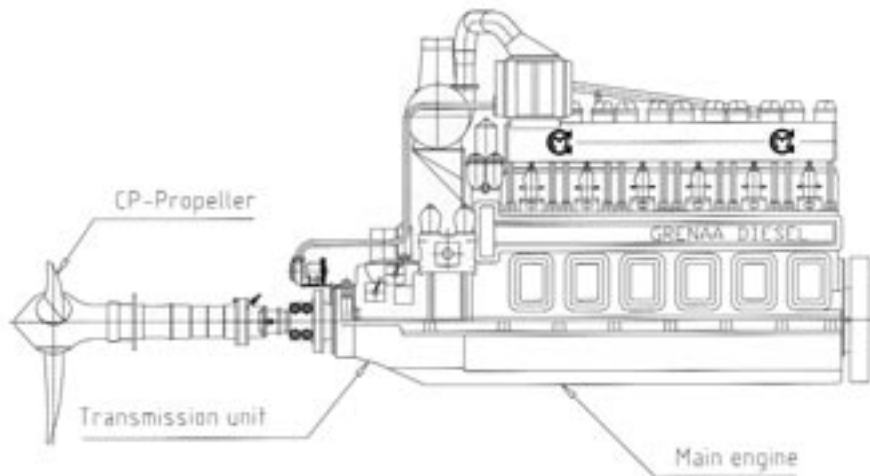
Standard spares are stocked and non-standard parts, e.g. propeller shafts are machined immediately upon order.

## A person to person relationship

Our organisation is flexible so responding to individual wishes is a matter of course. And no customer needs to feel anonymous in our company.

## Survey of Grenaa F24 slow speed engines

	3F24	3F24TK	4F24	6F24D	6F24	6F24TK
Bore, mm	240	240	240	240	240	240
Stroke, mm	300	300	300	300	300	300
Engine rpm, max	500	500	500	500	500	500
Swept volume, l	40,7	40,7	54,3	81,4	81,4	81,4
Cont. Rating, HP	165/183	300/330	220/242	125	330/366	600/660
Piston speed, m/s	5,0	5,0	5,0	5,0	5,0	5,0
Propeller rpm	500	500	500	500	500	500
Diameter, nozzle	1200	1200	1200	1200	1200	1440
Diameter, open	1300	1350	1300	1470	1470	1520



## The heavy duty concept

All Grenaa equipment is designed for continuous heavy duty operation and only materials of the highest quality are used. Component suppliers are all well recognized ones. Reliability and long time between service intervals make the Grenaa propulsion system the optimum choice for professional work vessel applications.

## Low operational costs

The long stroke of the slow running engine combined with the carefully designed combustion chamber and the best fuel injection and turbo charging systems ensure low fuel consumption. The lube oil change intervals and low specific consumption further sustains a very economical performance of the diesel engine.

The fuel consumption of the total propulsion system is kept low by careful matching

of propeller characteristics to the rest of the plant. The controllable pitch propeller system allows good performance at all loads and speeds.

Service intervals are extremely long, component wear rates are moderate and the work required is simple. All this contributes to keep the overall maintenance costs low. The basic components have a virtually infinite service life which makes it possible and economically feasible to refurbish the engine to as new condition even after many years of operational life.

## Green environmentally friendly engines

The Grenaa Diesel engines fulfill the strict emission limits set by IMO. The outlet of Nitrogen Oxides and Hydro-carbons are well below the permitted values. In some countries this is rewarded by the right to buy fuel excl. pollution related taxes.



## A/S GRENAA MOTORFABRIK

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