

Maritech 2004



Genuine Complete Propulsion Packages

by



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Sales Manager, Propulsion Sales

Locations of MAN B&W Diesel



Great Britain

Paxman

Ruston

Mirrlees Blackstone

Four-stroke engines

- Marine propulsion
- Military marine
- Power generation
- Rail traction



Stockport

Colchester

France

Pielstick

Four-stroke engines

- Marine propulsion
- Military marine
- Power generation
- Rail traction
- Service
- Licensor



Paris

Saint-Nazaire

Jouet

Frederikshavn

Copenhagen

Holeby

Rostock

Hamburg

Augsburg

Denmark

MAN B&W Diesel A/S

Two-stroke engines

- Research and development
- Marine propulsion
- Power generation
- Service
- Spare parts
- Licensor

Four-stroke engines

- Complete propulsion package
- GenSets
- Power generation
- Licensor

Germany

MAN B&W Diesel AG

Four-stroke engines

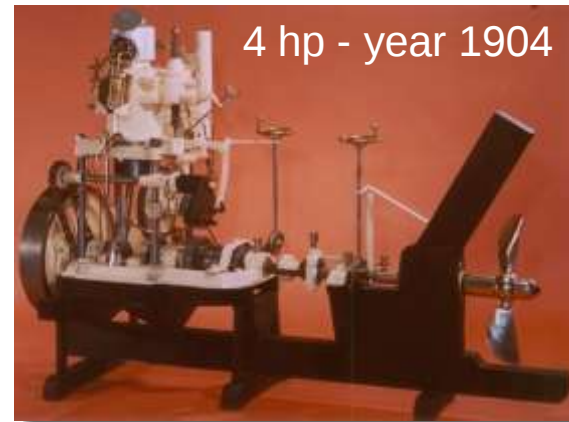
- Research & development
- Marine propulsion
- Power generation
- Service
- Licensor

The propulsion package traditions



- are based on ten decades of:

- Craftsmanship
- Experience
- Knowledge
- Research
- Technical innovations



The Works

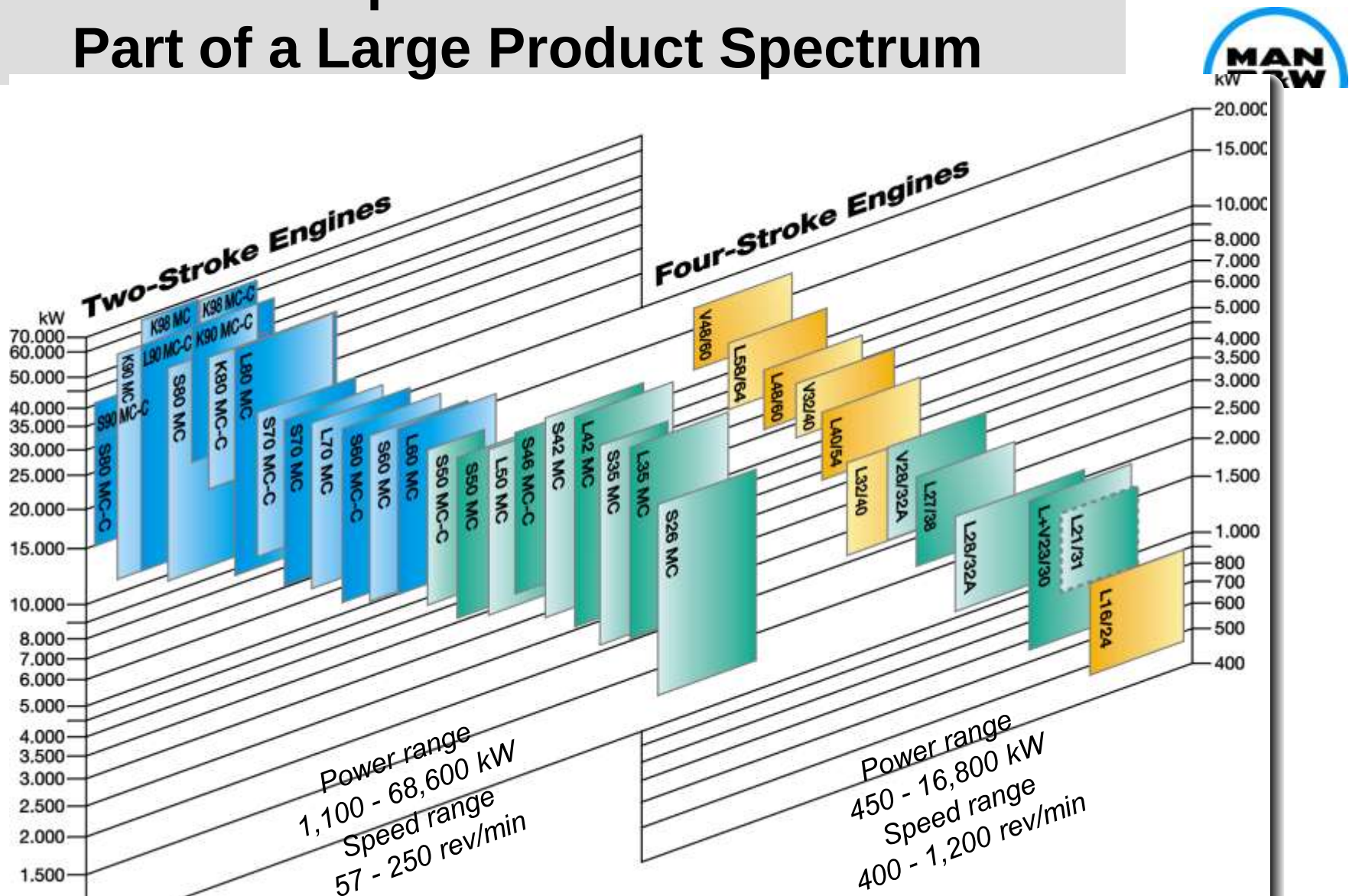


A total of 33,500 m² :

- Advanced production plant
- Foundry with pattern shop
- Engine test facilities
- Administration and service



"Minor Propulsion" Part of a Large Product Spectrum



MAN B&W Two-stroke Package

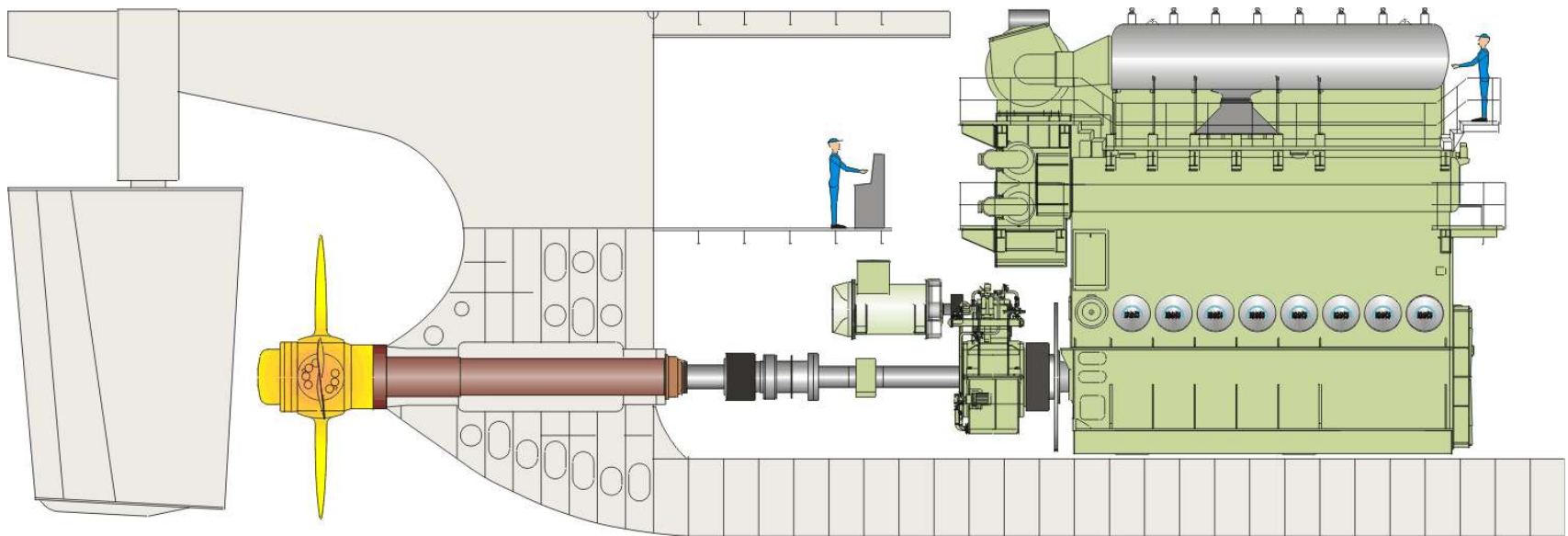


Type of vessel: 1600 TEU Container Vessel

Main engine: 8S50MC-C 12640 kW at 127 rpm

Tunnel gear: Renk 1800 kW_e

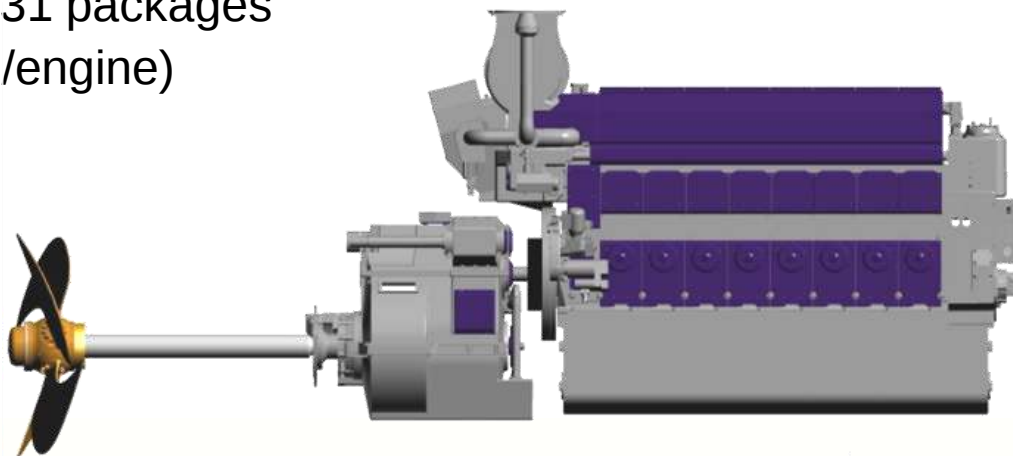
CP propeller: VBS1680 dia. Ø 5700 mm (GL ice E4)



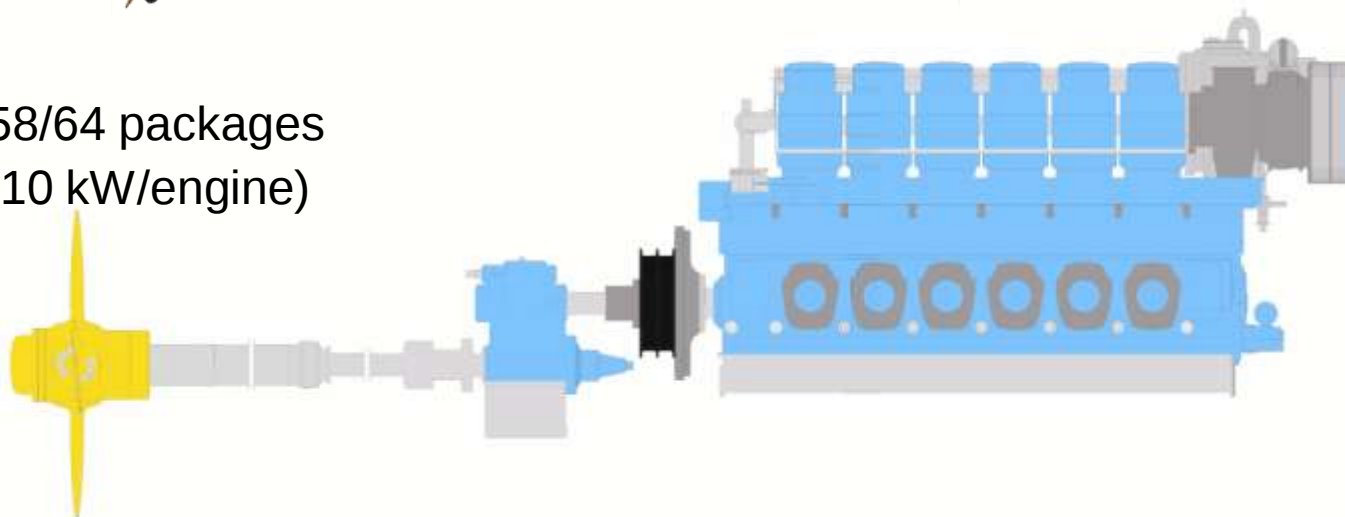
Four-stroke MAN B&W packages



From L21/31 packages
(1,290 kW/engine)



To L58/64 packages
(12,510 kW/engine)



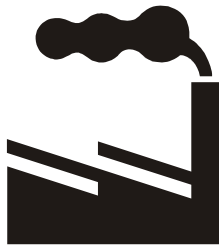
Market trends



- Shipbuilding is moving to countries with low knowledge
- Shipyards are out-sourcing project and technical work
- Fewer suppliers with more complex product portfolio
- More complex requirements to the propulsion plant
- Propulsion systems and components are more complex

- All of the above market trends call for genuine complete packages

Trade packages from more locations



Engine experts



+



Gear experts



+



Propeller experts



+



Control experts



⇒ 80% focused on the shipyard

The genuine package

- All under one roof



- during the entire life cycle !

⇒ 80% focused on the shipowner

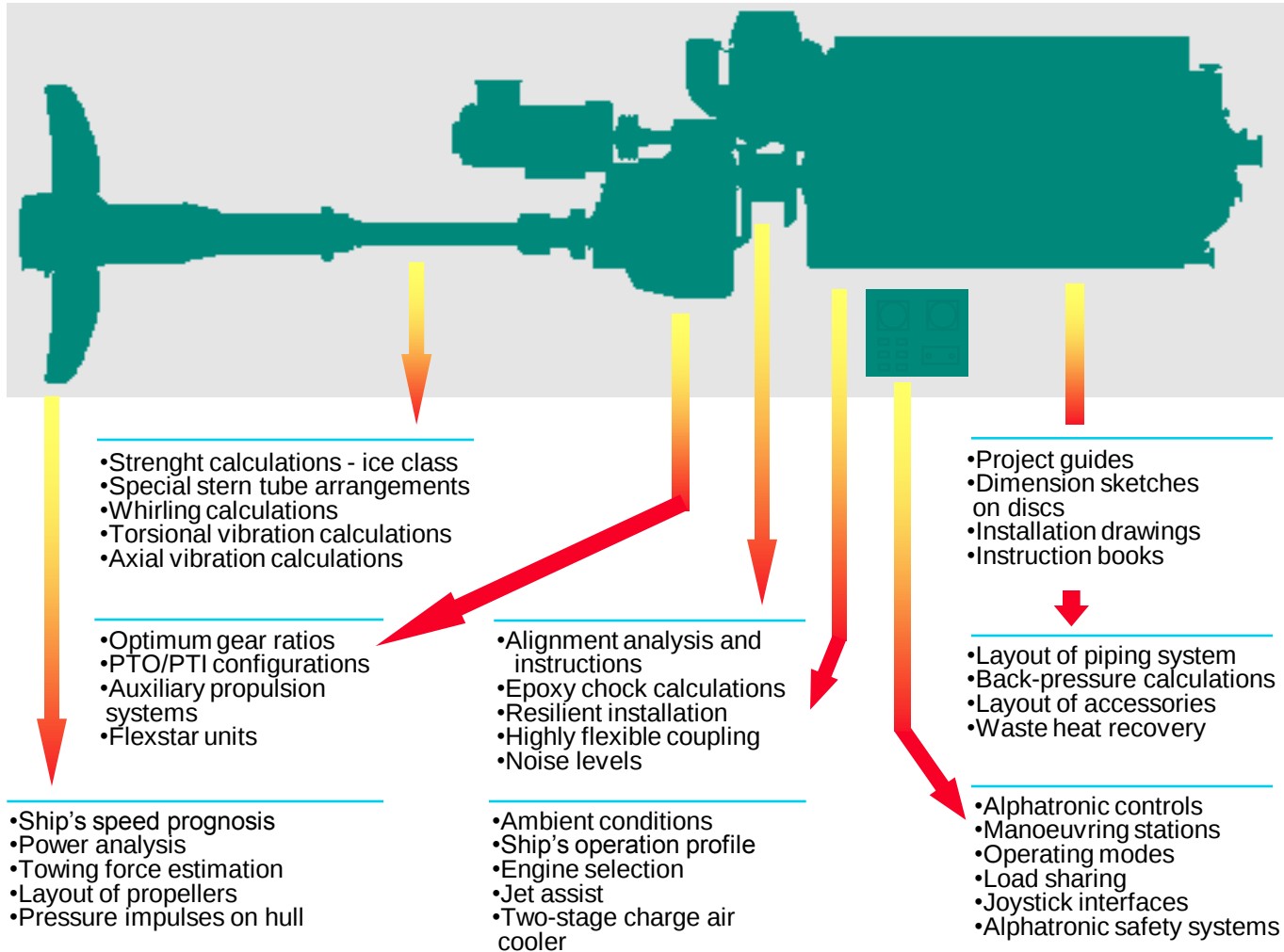
The concept of the genuine propulsion package



The genuine package provides added value to all customers

- Optimised combination of products and system solutions
- Optimised quality of products
- Single source of contact to all experts under one roof
- One point of responsibility for the complete system
- One point of service contact during operational lifetime

The 5th product



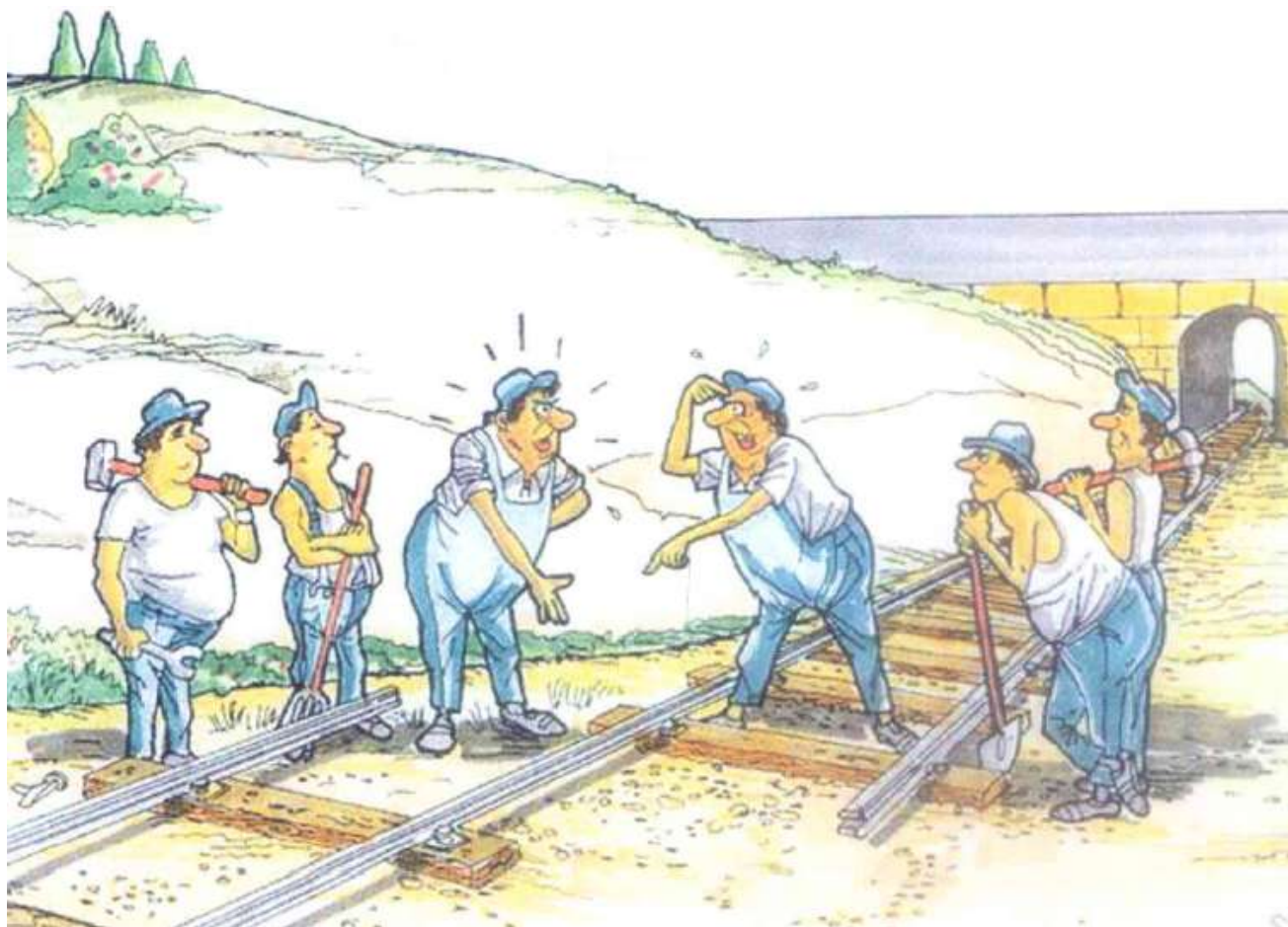
Advantages for the shipyard



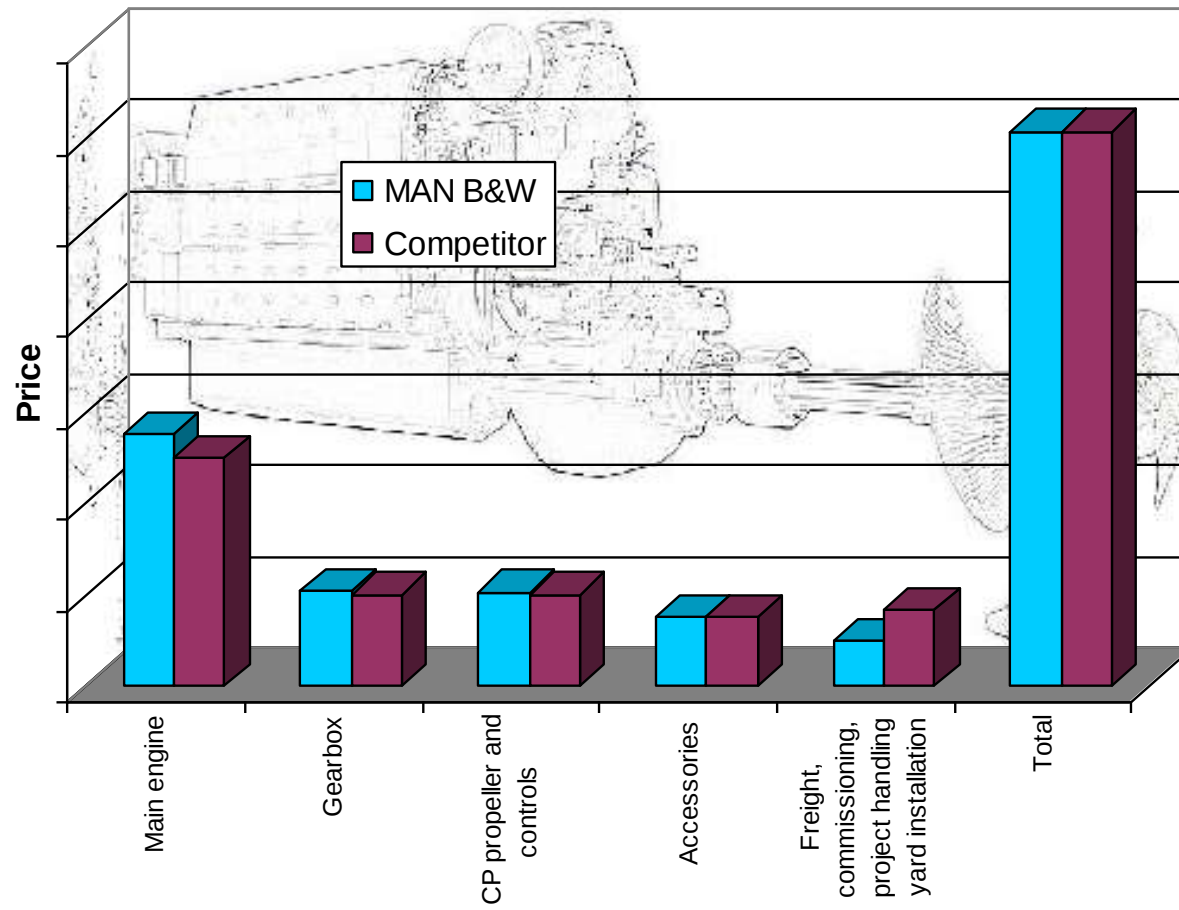
Offered by the genuine propulsion package:

- No hidden costs, since interfaces and integration matters are solved
 - Thorough design integration of engine, gearbox, propeller and control systems leads to minimal installation work on a reduced number of connecting points
 - One "Plant Information" package of integrated documentation for the installation of the entire power train
 - Shop tests at one location
 - One batch delivery of all package elements is possible
 - One team of multi-skilled commissioning engineers for starting up, quay tests and sea trials
- installation costs may be reduced by up to 10%

Technical clarifications



Package prices



Advantages for the shipowner



Offered by the genuine propulsion package:

-  Optimal operating economy is ensured thanks to the optimised layout of engine, reduction gearbox, propeller and control systems
-  Operating reliability, durability and predictable service intervals are assured without compromise, from individually optimised components
-  Only one type of lube oil needed for engine, reduction gear and propeller. Simple and reduced on board handling and storage
-  One integrated package of service documentation, maintenance programmes and spare parts catalogues
-  One service organization addressing all propulsion plant support requirements
-  Warranties, service agreements etc available for the complete power train

- total operational economy improved by 2-3 %

Advantages for the shipowner



Confidence in genuine propulsion package:

-  Technical guarantees
 -  SFOC, bollard pull, propeller efficiency
 -  Product guarantees
 -  General warranties, guaranteed TBO's, pro rata guarantees
 -  Service agreements
- offering predictable operational costs for the operator

The New Generation of Propulsion Systems



- New Generation of Propulsion Engines
- Continuous development on Reduction Gearboxes
- Continuous development on CP Propellers
- New Generation of Remote Control System

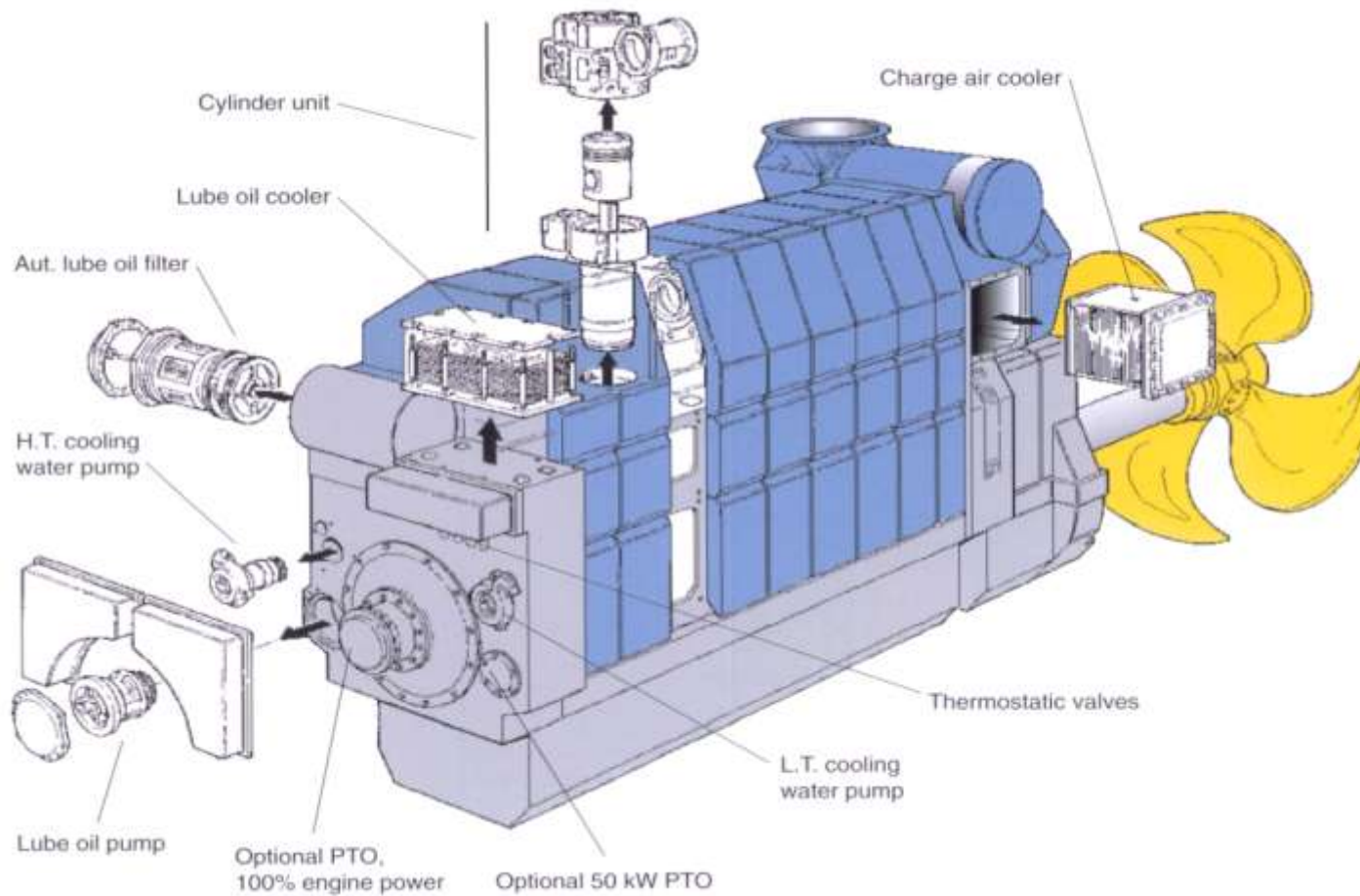


Main data - propulsion engines

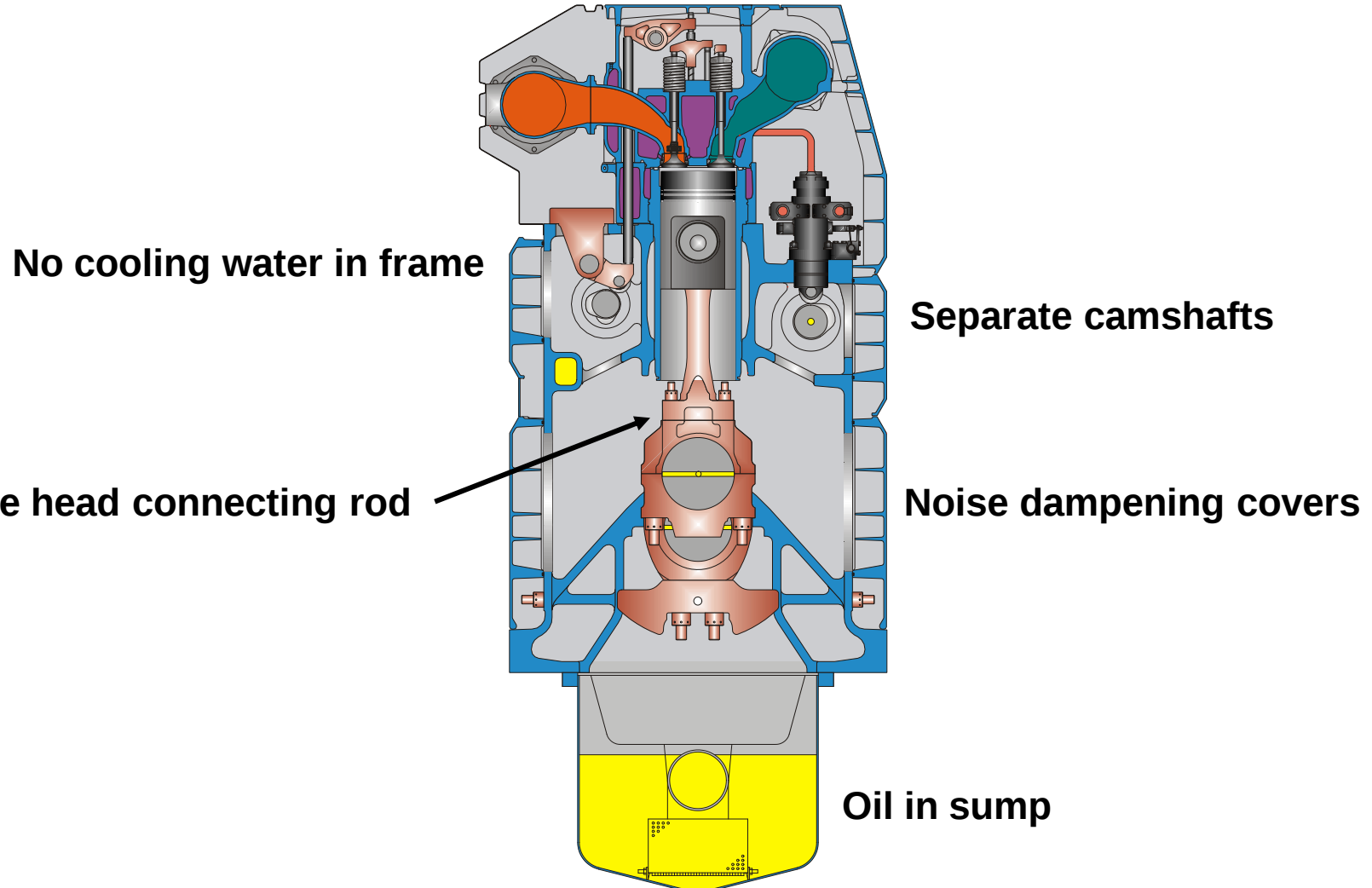


Designation	Unit	L21/31	L27/38
Bore	mm	210	270
Stroke	mm	310	380
Stroke/bore	ratio	1.5 : 1	1.4:1
Swept volume/cyl	ltr	10.7	21.8
Cyl nos	in line	6-7-8-9	6-7-8-9
Power/cyl	kW	215	340
Power range	kW	1,290-1,935	2,040-3,060
Speed	rev/min	1,000	800
SFOC (mcr)	g/kWh	184	182
SLOC	g/kWh	0.5-0.8	0.5-0.8
Bmep	bar	24.1	23.5
Mean piston speed	m/s	10.3	10.1
Pmax	bar	200	200

The New Concept



Engine L27/38



Cylinder Unit Concept

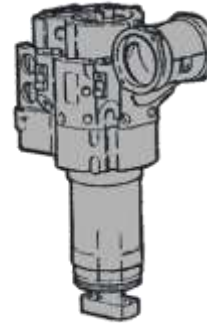
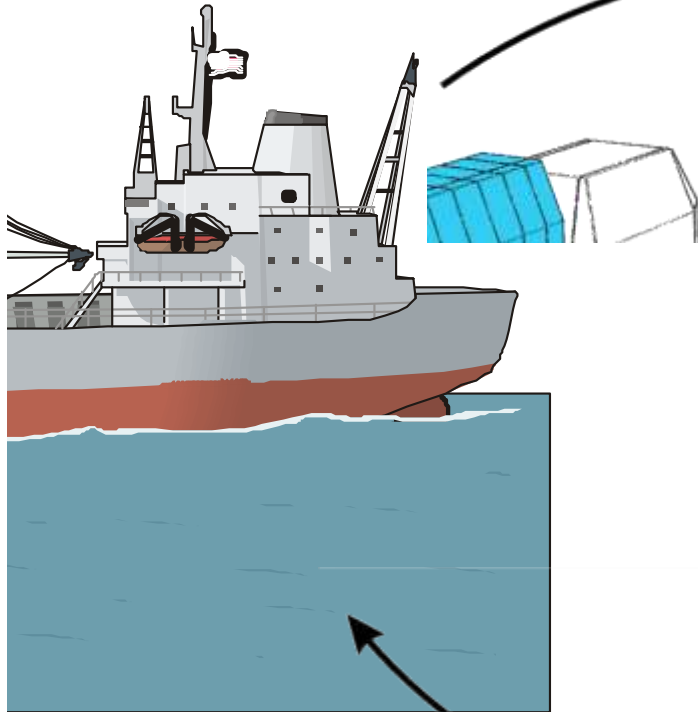


- Easy withdrawal of complete cylinder unit, incl piston and connecting rod.
- Overhaul intervals are 20-25,000 hours.
- Quick and easy 'pit-stop' replacement is possible.
- Professional workshop overhaul ensure optimal performance and life time.
- Exchange/overhaul contracts are available.

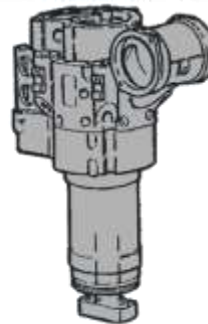
Cylinder Unit – 'Pit-stop' Exchange



Dismantling: 2 men – 1 hour



Mounting: 2 men – 1 ½ hour



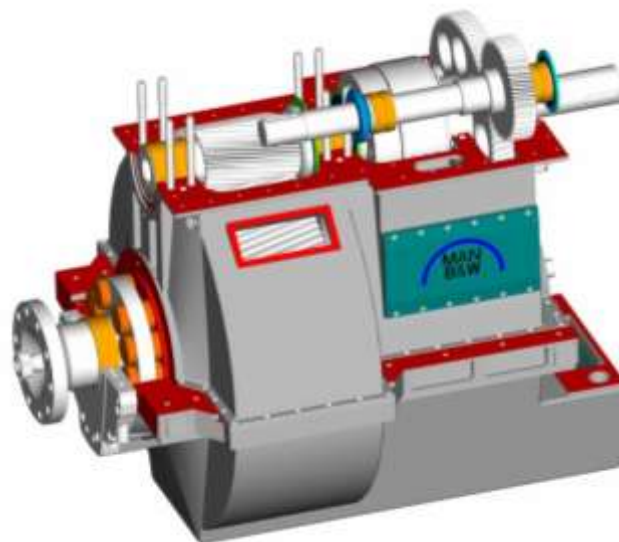
Alpha Module Reduction Gearbox



Type
AMG28EV



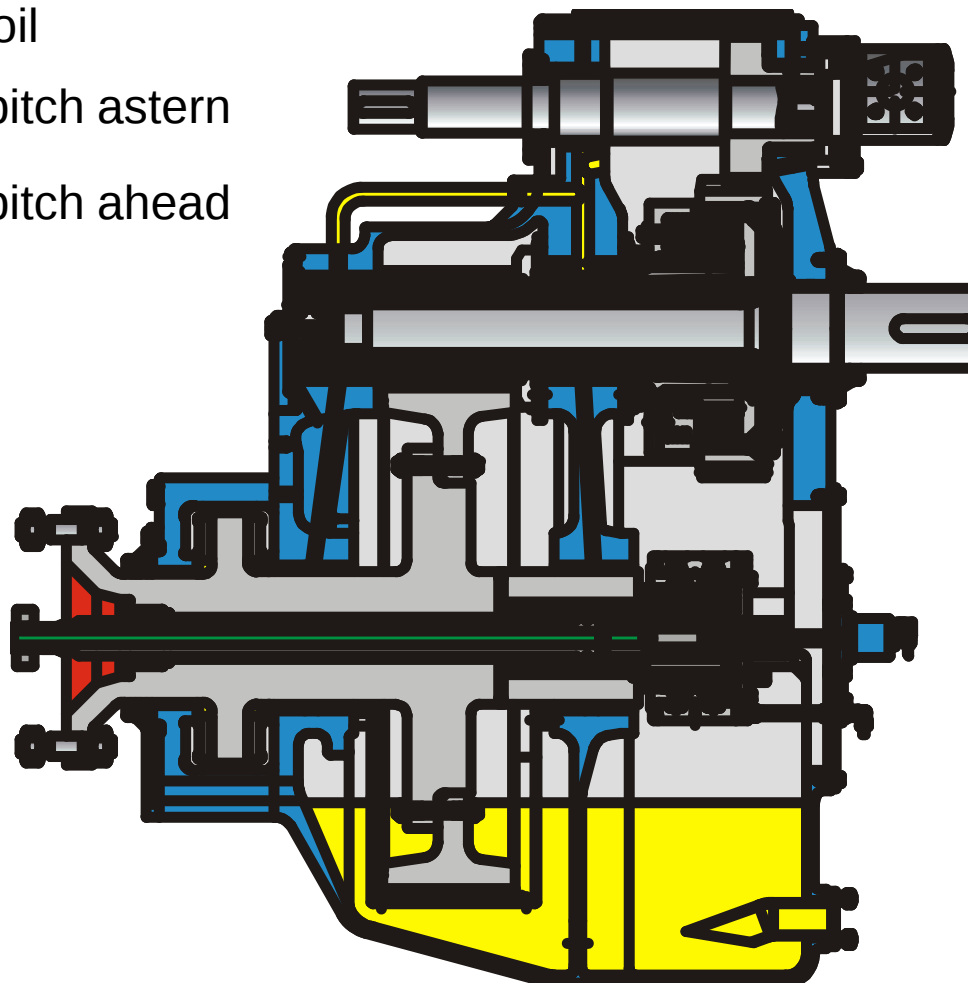
Type
AMG55EV



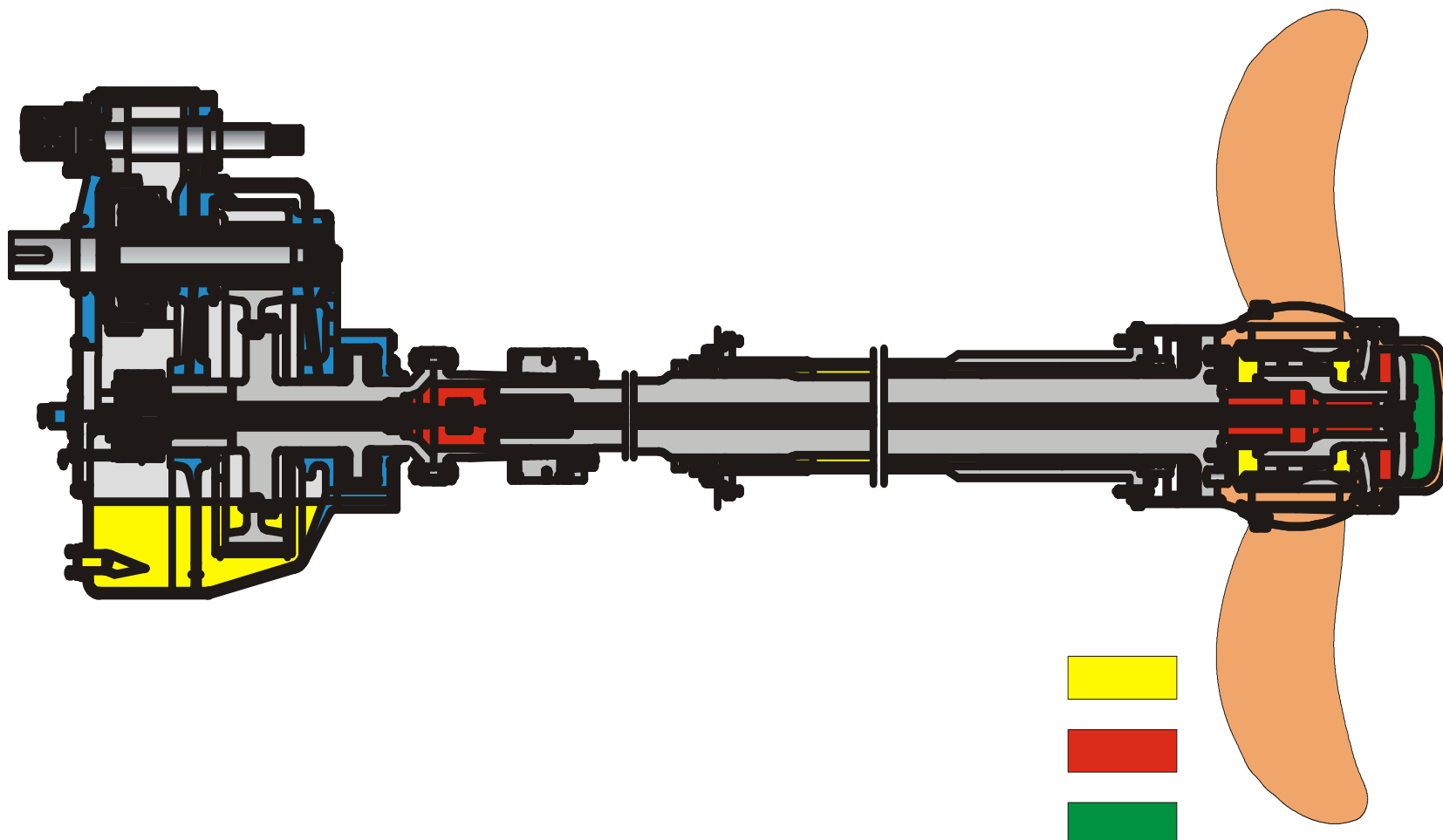
AMG28EV Gearbox



-  Lubricating oil
-  Servo oil – pitch astern
-  Servo oil – pitch ahead
-  Clutch oil



VBS Propeller and AMG28EV Gearbox



Propeller for a Chemical Tanker

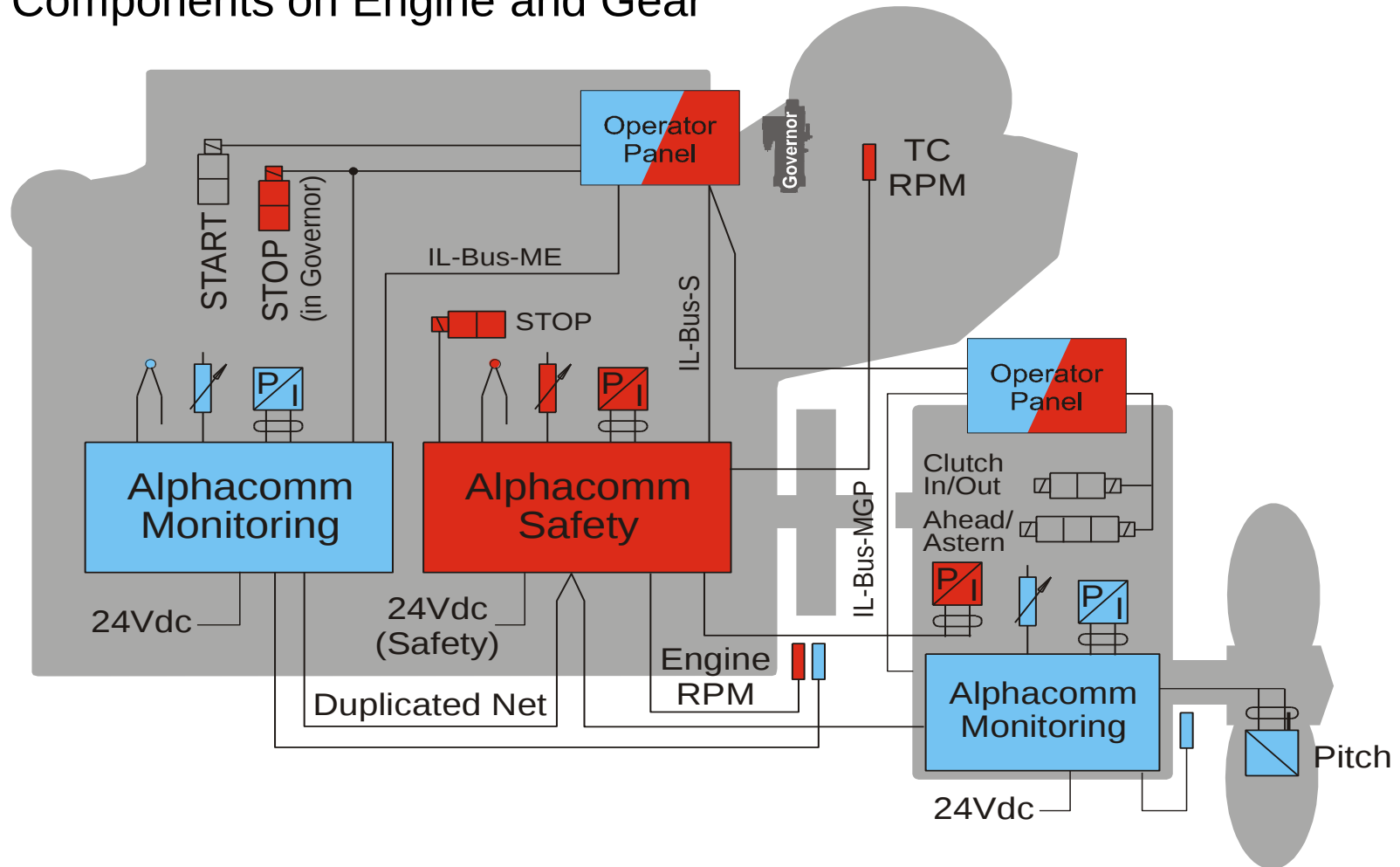


Engine	9L27/38
Output	3060 kW
Gear	56VO78
Red. Ratio	800/144
PTO/PTI	750 kW
CPP	VBS 980
Diameter	3900 mm

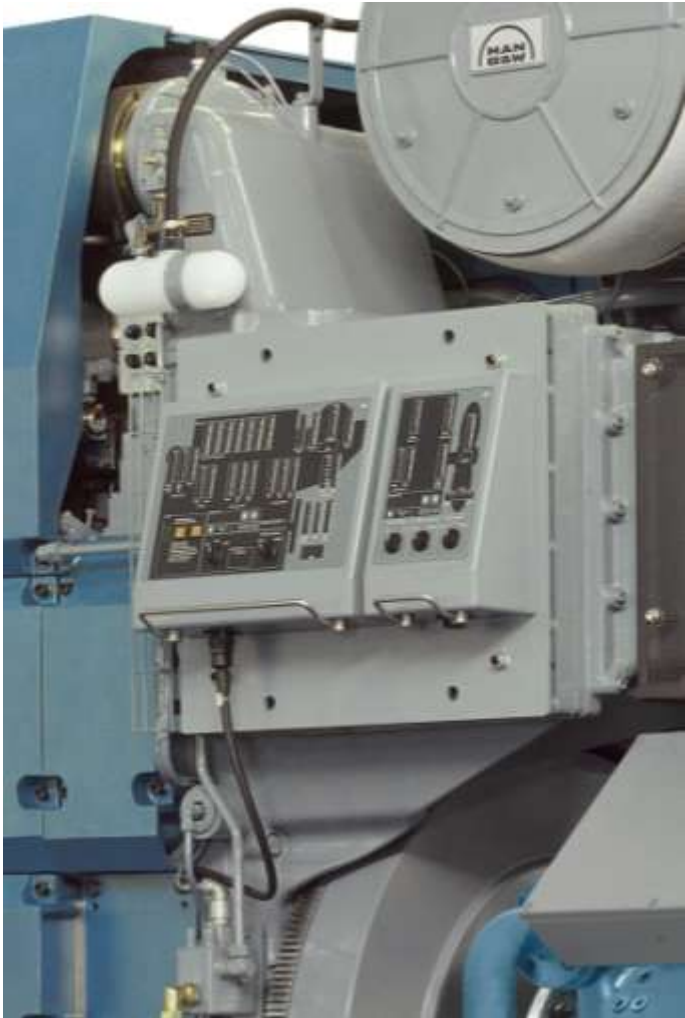
Local Monitoring, Control and Safety



Components on Engine and Gear

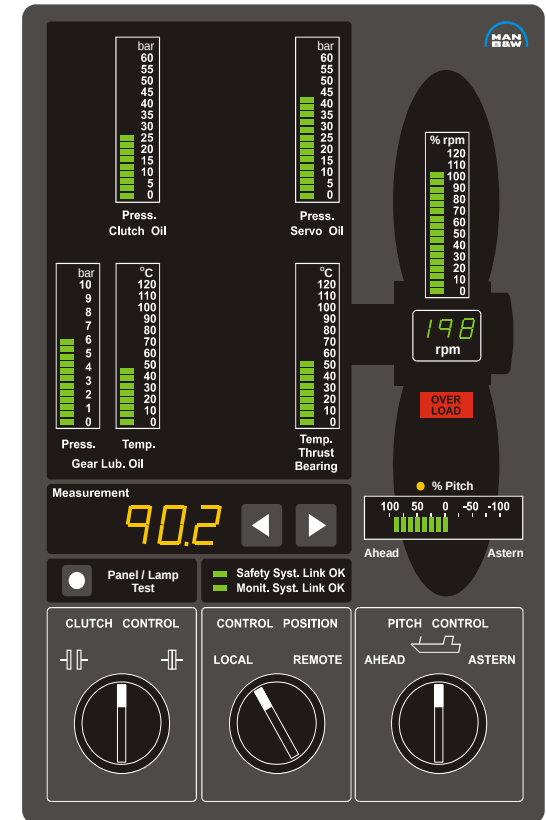


Alphatronic 2000

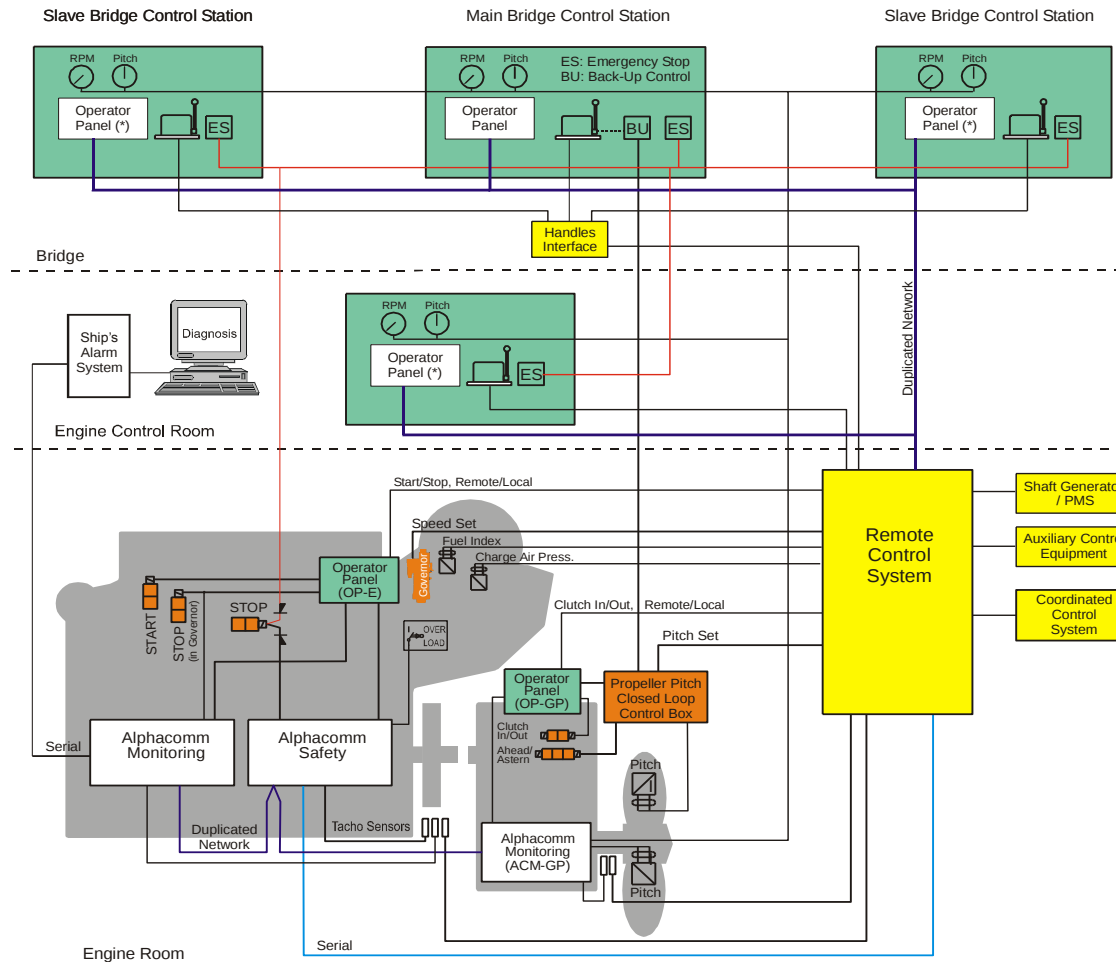


Remote control
system

Local monitoring, control
and safety system



Alphatronic 2000 Control System



Alphatronic 2000

Main Bridge Control Station - Standard



Integrated Package of Instruction Books



Reference - Example



- Owner has many years of experience with MAN B&W packages
- Ordered 6 state-of-the-art chemical tankers in 2001 with complete MAN B&W Alpha packages



Technical data for the safety tanker Type SCOT 8000

Length, oa.....	116.90	m	Main engines.....	
Length, bp.....	110.40	m	MAN B&W Alpha Diesel 6L27/38	
Breadth, moulded.....	18.00	m	Reduction gears.....	
Depth, moulded.....	9.40	m	MAN B&W Alpha 56VO28EV	
Max draught.....	7.40	m	CP Propellers.....	
Speed.....	14.5	knots	MAN B&W Alpha VBS980	
Carrying capacity.....	8,000	t	Control system.....	
Tonnage.....	5,095 BRT/2,533	NRT	MAN B&W Alphasonic 2000	
Tank contents, totally.....	9,050	m ³	Main engines.....	2 x 1,800 kW
Number of cargo/slop tanks.....	16/2		Diesel alternators.....	3 x 340 kW
Tank contents (14 tanks).....	310-1,185	m ³	Shaft alternators.....	2 x 490 kW
Pumps.....	16		Home port.....	Hamburg
Pump capacity.....	200-300	m ³ /h	In operation.....	from December 2002
Tank heating.....	up to 80	C	Classification.....	Germanischer Lloyd
Slop tank (2 x 150 m ²).....	300	m ²	+ 100 AS E Chemical tanker, Type 2/Oil	
Fuel oil (HFO).....	490	m ³	tanker, ESP COLL2 NAV 0 (CAS),	
Fuel oil (MDO).....	109	m ³	MC E AUT RP3 50%	
Crew.....	11	pers		

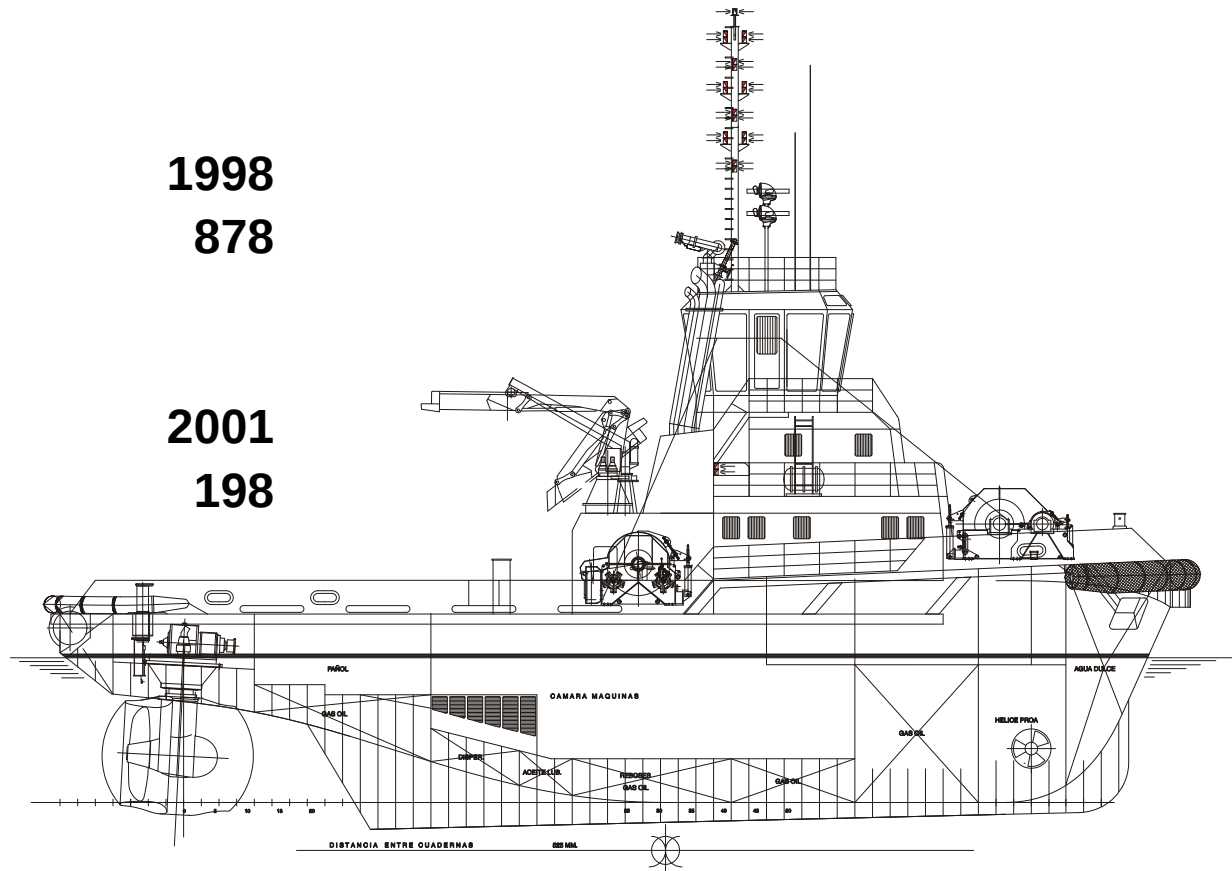
Wappen von Hamburg – 2 x 6L27/38-VBS



- **Introduced** **1995**
- **Ordered** **446**

- **Introduced** **1998**
- **Ordered** **878**

- **Introduced** **2001**
- **Ordered** **198**



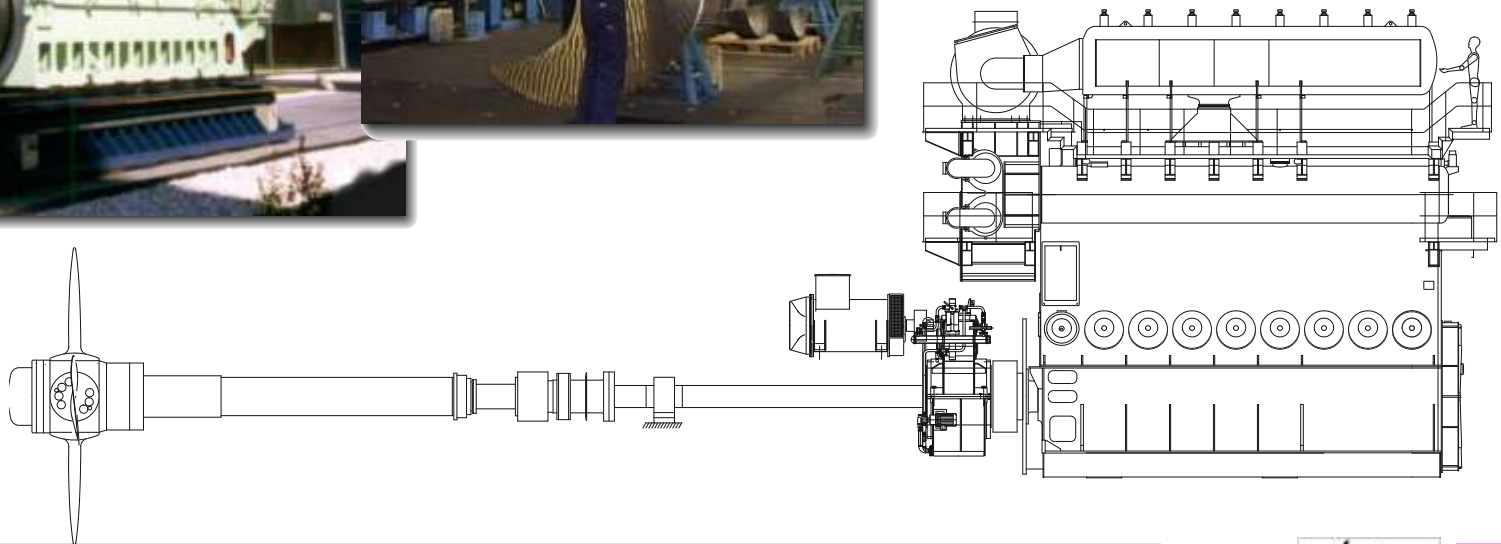
Four 1500 TEU container Vessels - Highest ice class



8S50MC-C

VBS1680

Tunnelgear PTO



The bottom line of the genuine package is:

**A unique propulsion system concept
which offers the best technical and
economical solutions from the first project
ideas to scrap of the vessel.**