REINTJES
POWERTRAIN SOLUTIONS

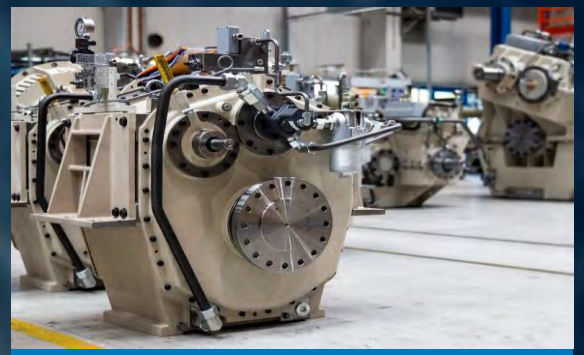
PRESENTATION

Nautisch-Technischer Inspektoren-Kreis Hamburg e.V.

REINTJES Powertrain Solutions

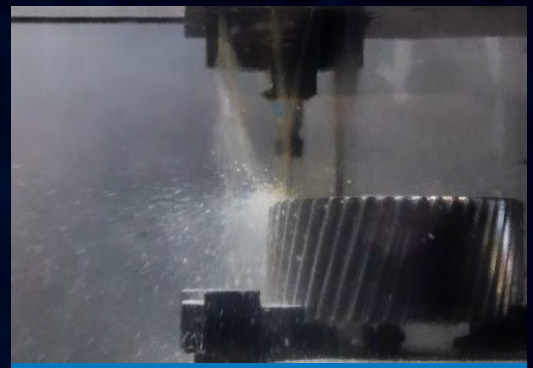
What we stand for and what we are capable of

Company profile



Gearbox portfolio

Auxiliary drives



Modifications

REINTJES
Electrification

REINTJES
Propulsion Systems

REINTJES
Next

REINTJES
References

?

REINTJES
POWERTRAIN SOLUTIONS

Company Profile

Quality delivered worldwide from Hameln, Germany

REINTJES company profile

Overview

Business Areas

REINTJES in Numbers

REINTJES Vision

History of REINTJES

Management-Team

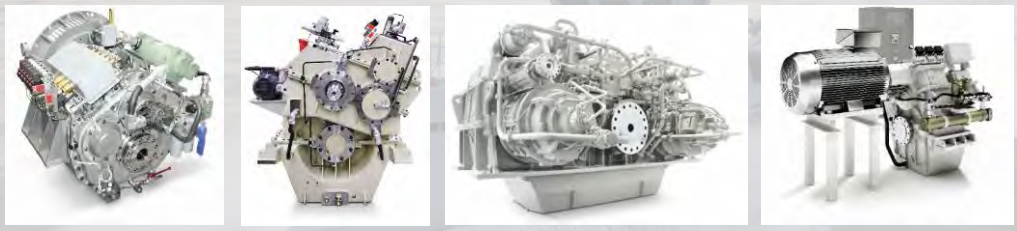
REINTJES Network

REINTJES Hamburg

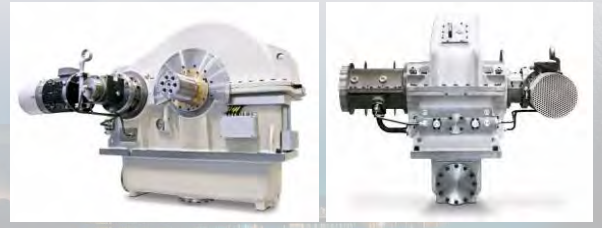
Our Business Areas

We are transmitting power, wherever it is needed. (250 kW – 30+ MW)

World-class marine gearboxes & propulsion systems



Cutting-edge industrial turbo gearboxes



High-profile gearbox components & contracting

Global 24 / 7 / 365 after-sales service

REINTJES Marine Business

World-class gearboxes and marine propulsion systems

Offshore

Tugs

Fishing

Pleasure Crafts

Dredgers

Merchant

Passenger / Ferries

Naval & Governmental

Inland Waterways

REINTJES

The home of innovative propulsion systems

- REINTJES headquarters is situated in the city of Hameln, pop. 60,000, Lower Saxony, Germany
- Hameln is a historic town, 45 km out of Hanover, well-known for the saga of the Pied Piper
- 67,000 sqm overall space, thereof 29,000 sqm production, warehouse and logistics
- 380+ employees including 25+ apprentices

REINTJES At A Glance

Key figures

Owner

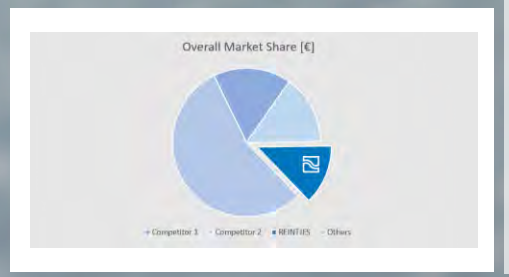
Eugen-Reintjes-Stiftung

(foundation, since 1962)

Turnover 2021

74.1 million €

670+ units



Market Position 2021

Top 3 player overall

Employees 2021

450+ employees world-wide

370+ thereof in Hameln

Products

100 % made in Germany

Installed base 90,000+ units

Export

Share 95+ %

Future REINTJES

Our transformation approach – from a hardware to a solution provider

Marine gearboxes

CPP / FPP propulsion systems

Hybrid / electric systems

Value-added services, training & support

Gearbox Provider

Running Together REINTJES 2030

Powertrain Solutions

State of our journey today

History And Legacy

We built our future up-on more than 140 years of experience, resilience and agility

1879 — Foundation of a mechanical work-shop in Emmerich by Theodor Reintjes

1912 — Eugen Reintjes took over in 1912, first gearbox delivery in 1929

1929

1944 — Factory in Emmerich completely destroyed by air raids

1955 — Relocation to Hameln in 1955, Eugen-Reintjes-Foundation in 1962

1962

1970 — New factory at the current location

1976 — Introduction of a heat treatment center

1982 — New-building of a hall for large gearboxes

2009 — In the 2000s plant extension, new machining centers, in 2009 new offices and test & service facilities

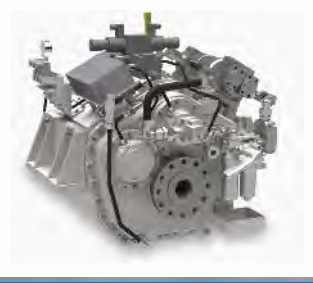
Product Milestones Before 2000

100 years of ground-breaking gearbox and power transmission innovations

1960s/70s
60s: WAV, WGV, BGA
70s: VA, VAL (roller bearing)

VA

1980
Aluminum gearbox WVS for yachts and small patrol boats



1981
Reverse reduction WAF for FPP

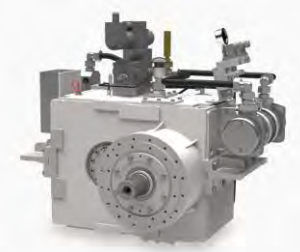
1982
Reduction gearbox LAF for CPP

1984
SVAL and SVA for high-power applications (offshore) and CPP

SVA

1986
First PTO/PTI w/ SVAL in MS Ocean Diamond

1989
VLJ for waterjet applications in yachts and patrol boats



1995
Twin in, single out

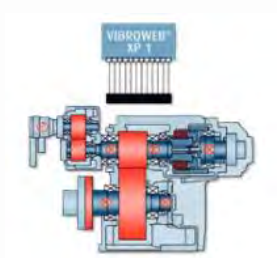
DLG

Product Milestones Since 2000

100 years of ground-breaking gearbox and power transmission innovations

2001 — 1st gearbox with PTO/PTI, electrically controlled shaft brake and turndrive

2004 — First prototype of a condition monitoring CMS



2010 — Dredger gearbox series RDG

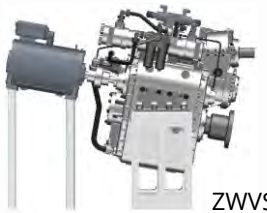
2011 — Turbo gearbox RTG

2012 — FORTJES propulsion system

2012 — 1st REINTJES Hybrid System

2014 — Step-up gearbox series RSG

2018 — Down angle series



Eugen-Reintjes-Stiftung (Foundation)

Social commitment for the citizens of Hameln

- State of the art day care facility and pre-school
- Founded 2014
- Situated on our premises
- 40 kids, two groups

- Co-working space, innovation community, digital hub
- Flexible working hours
- Work-from-home options
- Health and sport offerings
- Broad training and education programs

- Established in 1962 by Eugen Reintjes
- His vision: promoting health and social care in Hameln

Management Team

Key roles and persons

Klaus Deleroi
Managing Director

Alex Choe
Global Network / Business Development

Christoph Höhr
Sales & Service

Rainer Golloch
R&D / Production

Nadine Weber
Quality

Jona Schwinge
Human Resources

Andreas Mühle
Finance / Procurement / IT

REINTJES
POWERTRAIN SOLUTIONS

Global Sales & Service Organization

From Hameln to the world - together for success

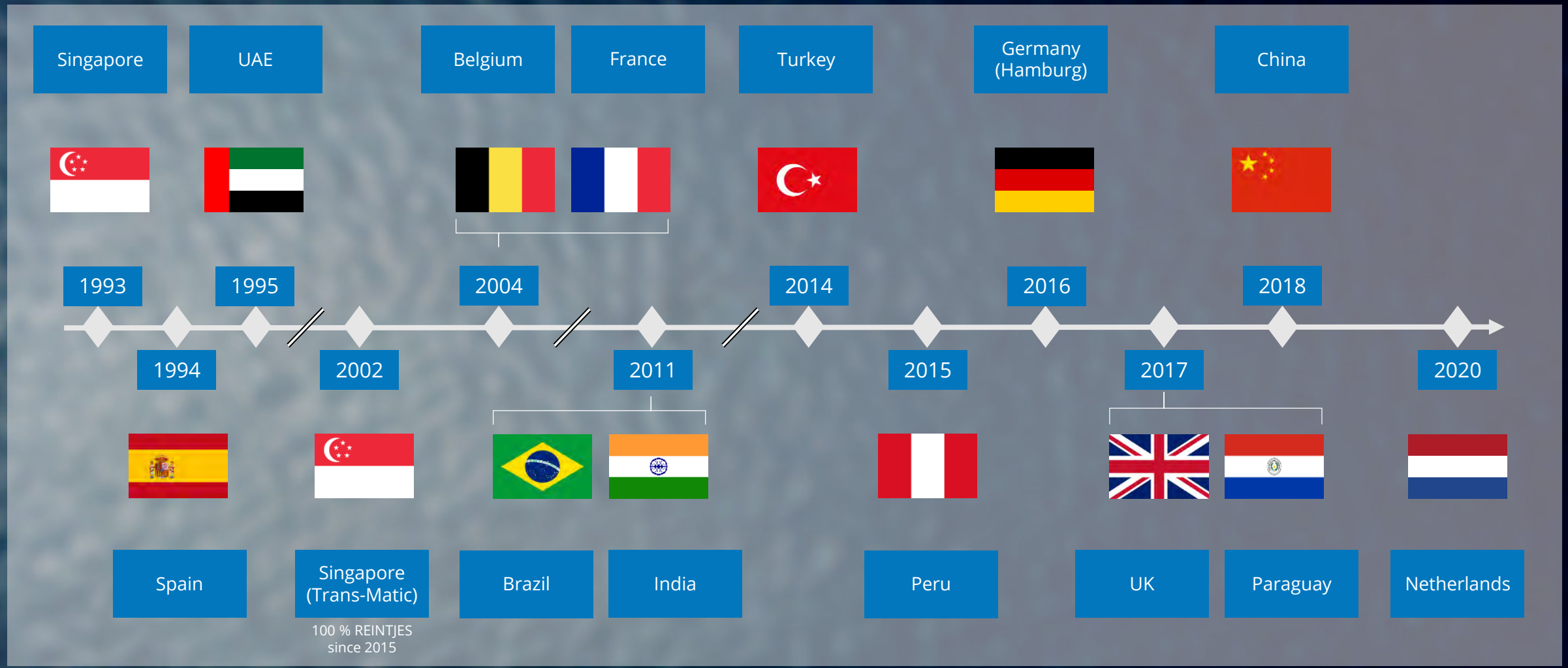
Global Sales & Service Organization

From Hameln to the world – together for success

- Group headquarters in Hameln / GER
- 10 REINTJES subsidiaries w/ branch offices
- 40+ certified sales & service partners
- 60+ locations over all
- 100+ trained and experienced service technicians
- All time zones covered
- 24 / 7 parts and service availability all year round

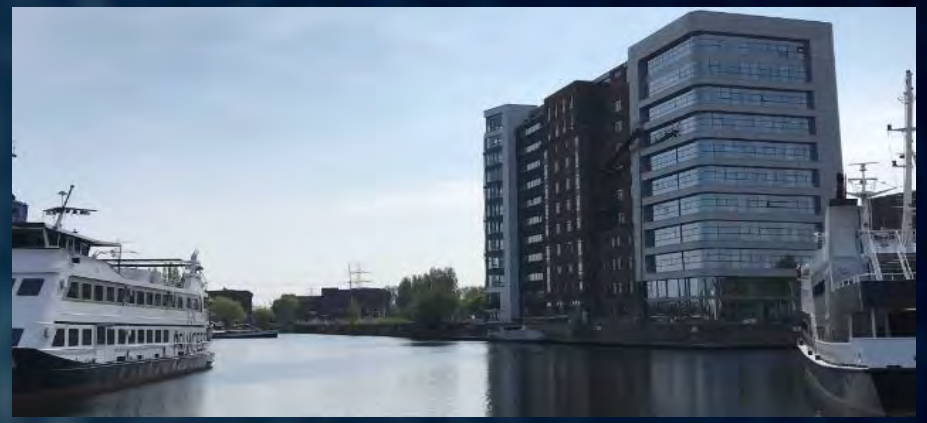
REINTJES Global Development

From Hameln to the world – together for success



REINTJES In Germany

From Hameln to the world – together for success



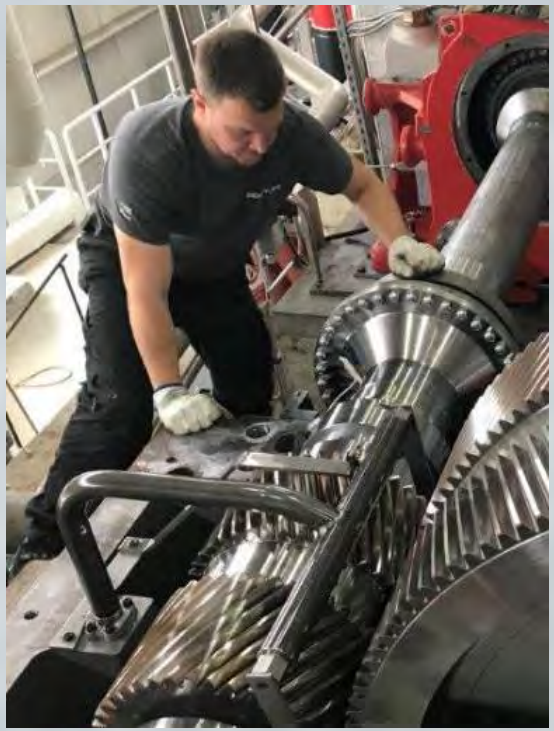
REINTJES Branch Office Hamburg

- Established 2016
- Subsidiary of REINTJES, Hameln
- Based in Hamburg-Harburg
- Employees (2023): 4
- Head: Louis Zander
- Responsible for Germany, Poland, Denmark, Finland, Norway
- Key Account Management for Zeppelin Power Systems, MTU, Schottel, Wärtsilä

REINTJES Service

Product support, genuine spare parts, maintenance and more - for peace of mind

Global Coverage Through REINTJES Experts



- Commissioning, inspections, maintenance and repairs by qualified service technicians

- Original spare parts and retrofit kits for perfect fit and operation

Lifetime Support 24 / 7 / 365

- Support for optimized gearbox lifetime and best value
- Tailored maintenance concepts

- Gearbox condition and operation monitoring w/ reporting
- REINTJES Training Center

REINTJES
POWERTRAIN SOLUTIONS

Gearbox Portfolio

Explanation of series and sizes

Gearbox Types

Explanation of series and sizes

Nomenclature of gearbox sizes

Gearbox designation, with roller bearings (LAF, WLS, LGF, ...)

Series	Size	Design	Ratio
LAF	1963	HL	6.130 : 1

gearbox size based on the used hydraulically clutch size

≈ max reduction ratio possible

design version of the gearbox, "3" means the design was revised 3-times

Legend

Design	
HL/HR	Input shaft is horizontally left / right from the output shaft (seen from aft)
DL/DR	Input shaft is diagonal left / right from the output shaft (seen from aft)
P	Modified special gearbox
U	U-Drive, input and output shaft on the same side
UEK	Overhead Gearbox, output shaft is above the input shaft

Gearbox Types

Explanation of series and sizes

Nomenclature of gearbox sizes

Gearbox designation, with slide bearings (SVA, SVAL)

Series	Size	Design	Ratio
SVAL	1200-99	HL	6.130 : 1

gearbox size

based the offset in mm,

here 1200 mm

size of the hydraulically clutch

Legend

Design	
HL/HR	Input shaft is horizontally left / right from the output shaft (seen from aft)
DL/DR	Input shaft is diagonal left / right from the output shaft (seen from aft)
P	Modified special gearbox
U	U-Drive, input and output shaft on the same side
UEK	Overhead Gearbox, output shaft is above the input shaft

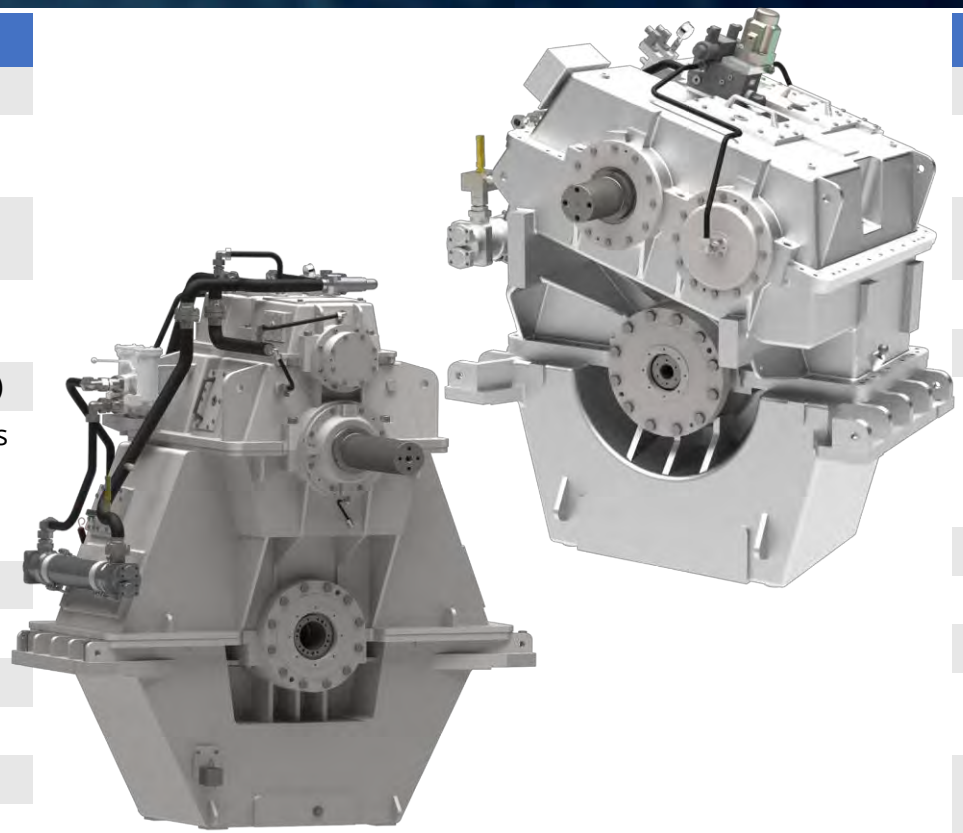
Gearbox Types

Explanation of series and sizes

REINTJES POWERTRAIN SOLUTIONS

Roller bearing gearboxes

AF	
Gearbox type:	Reduction gearbox
Main application:	Workboats, ideal for electric drive
Driven component:	Controllable / Fixed Pitch Propeller
Shaft rotation:	Counter-rotating input and output shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	None
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / full-electric



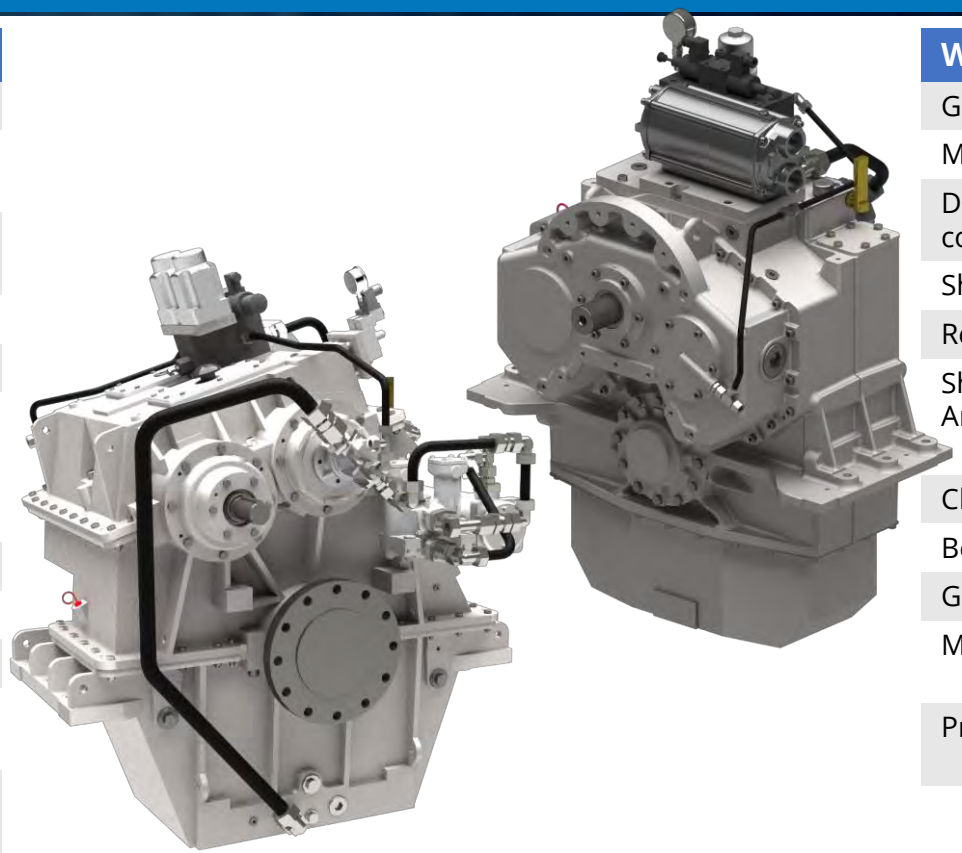
LAF	
Gearbox type:	Reduction gearbox
Main application:	Workboats, Fishing, displacement Mega Yachts
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing / closed-coupled with SAE housings (small sizes)
Propulsion system:	Diesel-mechanic / hybrid ready (optional

Gearbox Types

Explanation of series and sizes

Roller bearing gearboxes

WAF	
Gearbox type:	Reverse reduction gearbox
Main application:	Workboats, displacement Mega Yachts
Driven component:	Fixed Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing / closed-coupled with SAE housings (small sizes)
Propulsion system:	Diesel-mechanic / hybrid ready (optional)



WF	
Gearbox type:	Reverse reduction gearbox
Main application:	Workboats
Driven component:	Fixed Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Cast iron design
Mounting:	Free-standing / closed-coupled with SAE housings
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

Gearbox Types

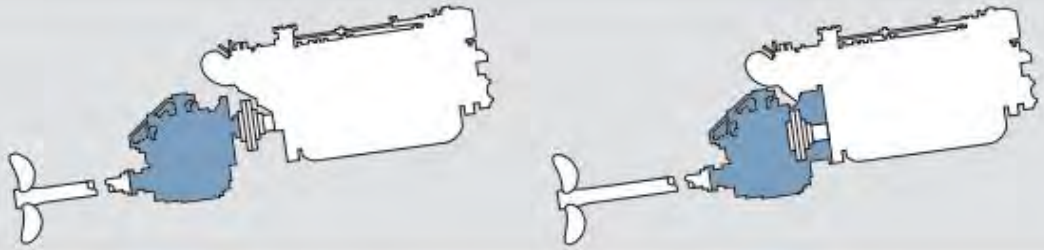
Explanation of series and sizes

REINTJES POWERTRAIN SOLUTIONS

Roller bearing gearboxes

WAF series

Free-standing
Close-coupled



WAF series

Reverse-reduction gearbox for propulsion with fixed pitch propeller

Counter or identical rotation of input and output as standard

LAF series

Reduction gearbox for propulsion with controllable pitch propeller

Counter rotation of input and output as standard, identical rotation available as option

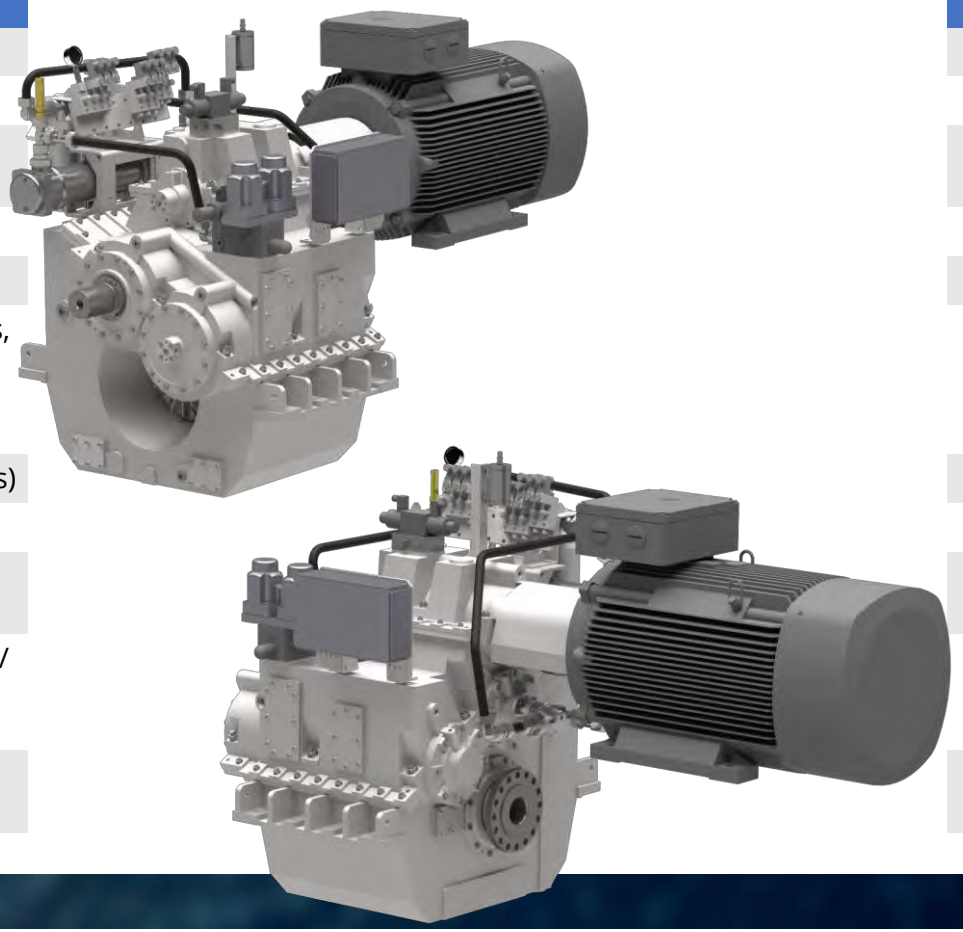
Gearbox Types

Explanation of series and sizes

REINTJES POWERTRAIN SOLUTIONS

Roller bearing gearboxes

WVS	
Gearbox type:	Reduction gearbox
Main application:	Fast vessels
Driven component:	Fixed Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts, U-driver or on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Aluminum alloy, weight optimized design
Mounting:	Free-standing / closed-coupled / U-drive with SAE housings (small sizes)
Propulsion system:	Diesel-mechanic / hybrid ready (optional)



WLS	
Gearbox type:	Reduction gearbox
Main application:	Fast vessels
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts, U-driver or on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Aluminum alloy, weight optimized design
Mounting:	Free-standing / closed-coupled / U-drive with SAE housings (small sizes)
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

Gearbox Types

Explanation of series and sizes

REINTJES POWERTRAIN SOLUTIONS

Roller bearing gearboxes

WGF	
Gearbox type:	Reverse reduction gearbox
Main application:	Workboats, Fishing
Driven component:	Fixed Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, reduced vertically offset (std.), reduced horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

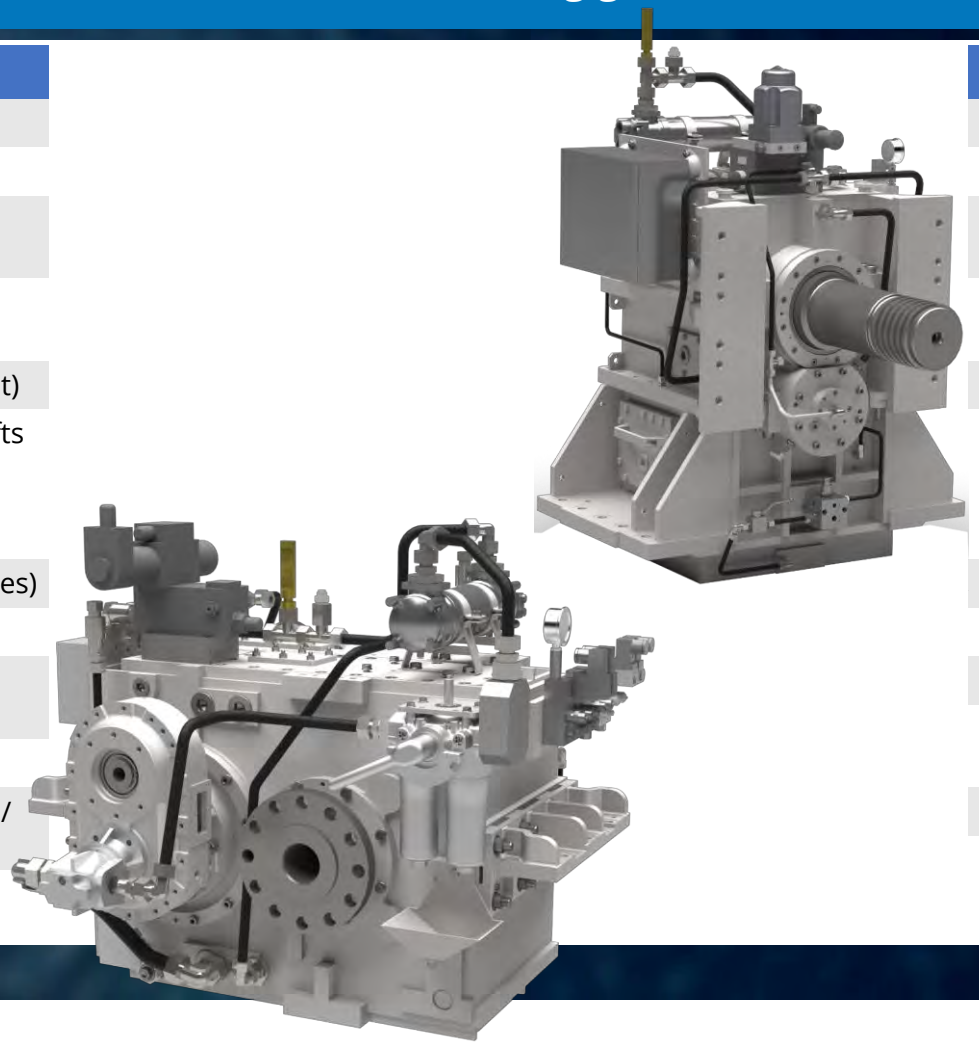
LGF	
Gearbox type:	Reduction gearbox
Main application:	Workboats, Fishing
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, reduced vertically offset (std.), reduced horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

Gearbox Types

Explanation of series and sizes

Roller bearing gearboxes

VLJ	
Gearbox type:	Reduction gearbox
Main application:	Waterjets
Driven component:	Jet Propulsion
Shaft rotation:	Counter-rotation input and output shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Aluminum alloy, weight optimized design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / full-electric / Hybrid ready (optional)



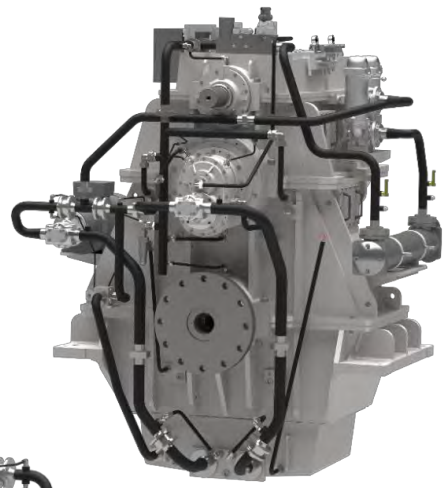
RDGL	
Gearbox type:	Reduction gearbox
Main application:	Dredgers
Driven component:	Dredging pump
Shaft rotation:	Counter-rotation input and output shafts
Reduction ratios:	Custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing / closed-coupled with SAE housings (small sizes)
Propulsion system:	Diesel-mechanic / full-electric

Gearbox Types

Explanation of series and sizes

Slide bearing gearboxes

SVA	
Gearbox type:	Reduction gearbox
Main application:	Workboats
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Counter-rotating input and output shafts
Reduction ratios:	custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	None
Bearing type:	Slide bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / full-electric / hybrid ready (optional)



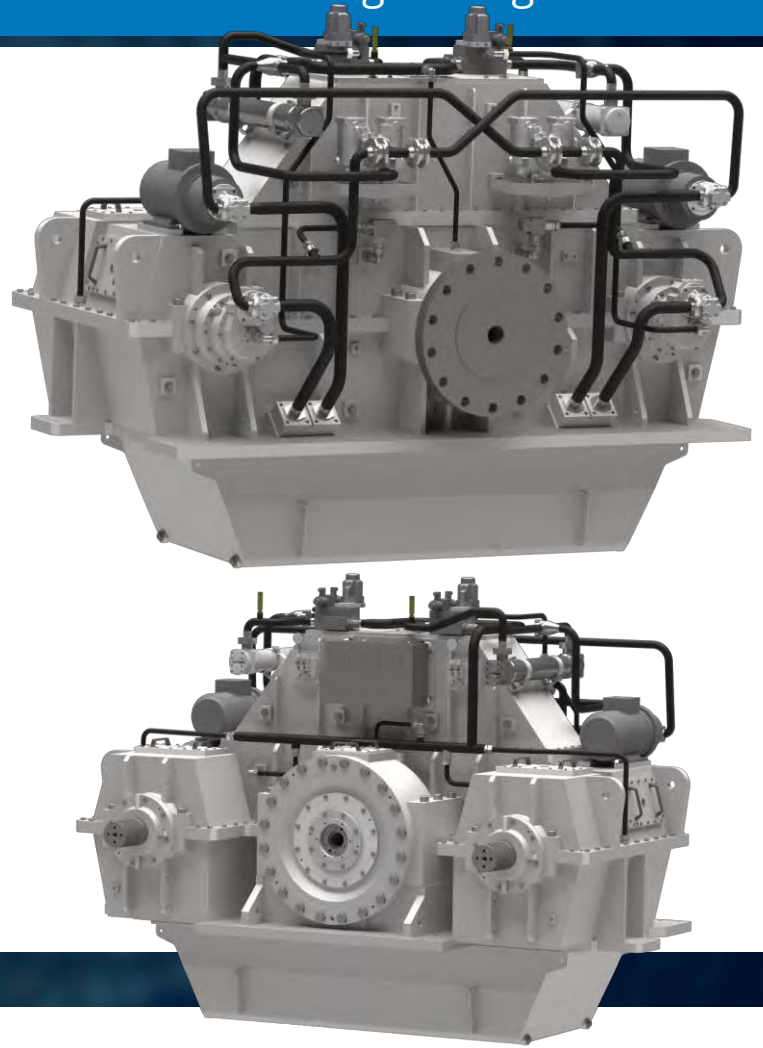
SVAL	
Gearbox type:	Reduction gearbox
Main application:	Workboats
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Counter-rotating input and output shafts
Reduction ratios:	custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Slide bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

Gearbox Types

Explanation of series and sizes

Twin-in single-out gearboxes

DUG	
Gearbox type:	Reduction gearbox
Main application:	Workboats, Ferries, possible for electric drive
Driven component:	Fixed / Controllable Pitch Propeller
Shaft rotation:	Counter-rotating input and output shafts
Reduction ratios:	custom (on request)
Shaft Arrangements:	2 parallel input and 1 output shafts, horizontally offset (standard), others (on request)
Clutch(es):	None
Bearing type:	Roller bearings (standard) Slide bearings (for large sizes)
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / full-electric / hybrid ready (optional)



DLG	
Gearbox type:	Reduction gearbox
Main application:	Workboats, Ferries
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Counter-rotating input and output shafts
Reduction ratios:	custom (on request)
Shaft Arrangements:	2 parallel input and 1 output shafts, horizontally offset (standard), others (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings (standard) Slide bearings (for large sizes)
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / hybrid ready (optional)

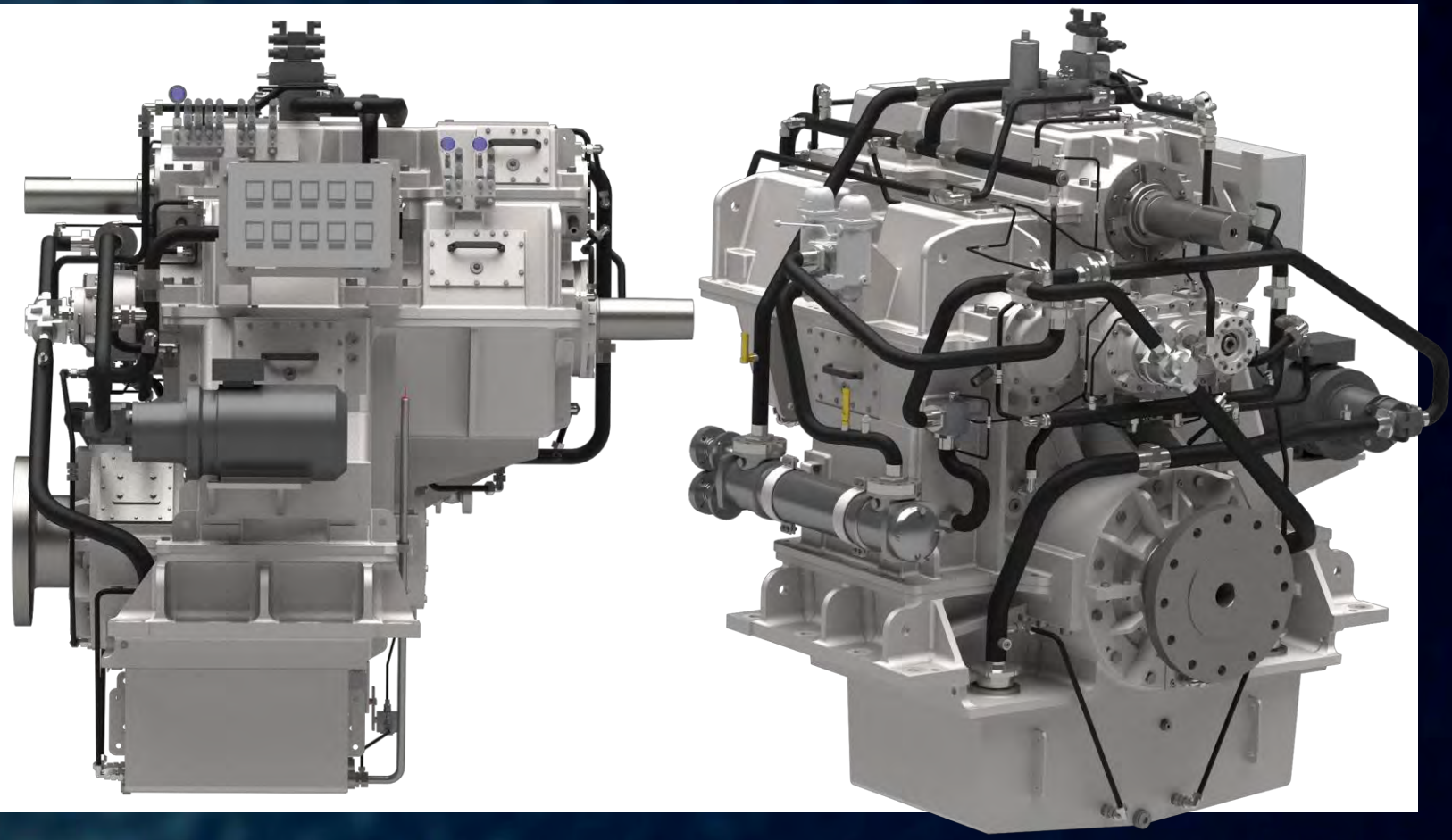
Gearbox Types

Explanation of series and sizes

REINTJES POWERTRAIN SOLUTIONS

Two-speed gearboxes

ZSVAL	
Gearbox type:	Two-speed reduction gearbox
Main application:	Workboats
Driven component:	Controllable Pitch Propeller
Shaft rotation:	Counter-rotation input and output shafts
Reduction ratios:	custom (on request)
Shaft Arrangements:	Parallel input and output shafts on opposite sides, vertically offset (standard), horizontally offset (on request)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Slide bearings
Gearbox housing:	Steel / Cast iron design
Mounting:	Free-standing
Propulsion system:	Diesel-mechanic / hybrid ready (optionally)



REINTJES
POWERTRAIN SOLUTIONS

Auxiliary Drives

Explanation of PTO/PTI/Boost possibilities

Gearbox Types

Explanation of series and sizes

Nomenclature of auxiliary drives

PTO = **P**ower **T**ake **O**ff

PTI = **P**ower **T**ake **I**n

PTH = **P**ower **T**ake **H**ome

Booster = Power to enlarge system power

		design	type
designation	K31A	K31	A / B

basic design

variation

primary drive

secondary drive

PTO Designation

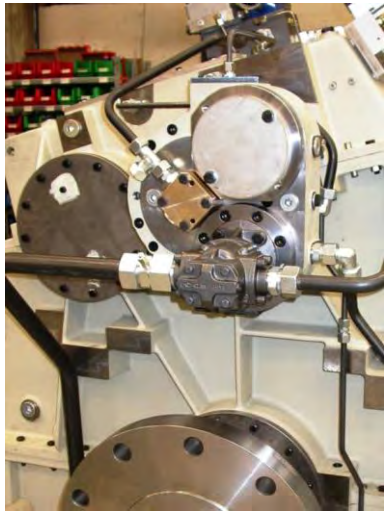
Type	
K 1...	pump drive for external pump
K 2...	directly connected on intermediate shaft
K 3...	additionally mounted step-up gear in separate housing
K 4...	step-up gear built in, non-controllable
K 5...	step-up gear built in, controllable
K 6...	combination of PTO (primary drive) and PTI (secondary drive)
K 7...	additionally mounted step-up gears in separate housing with 2 PTO`s
K 8...	additionally mounted step-up gears in separate housing with 3 PTO`s

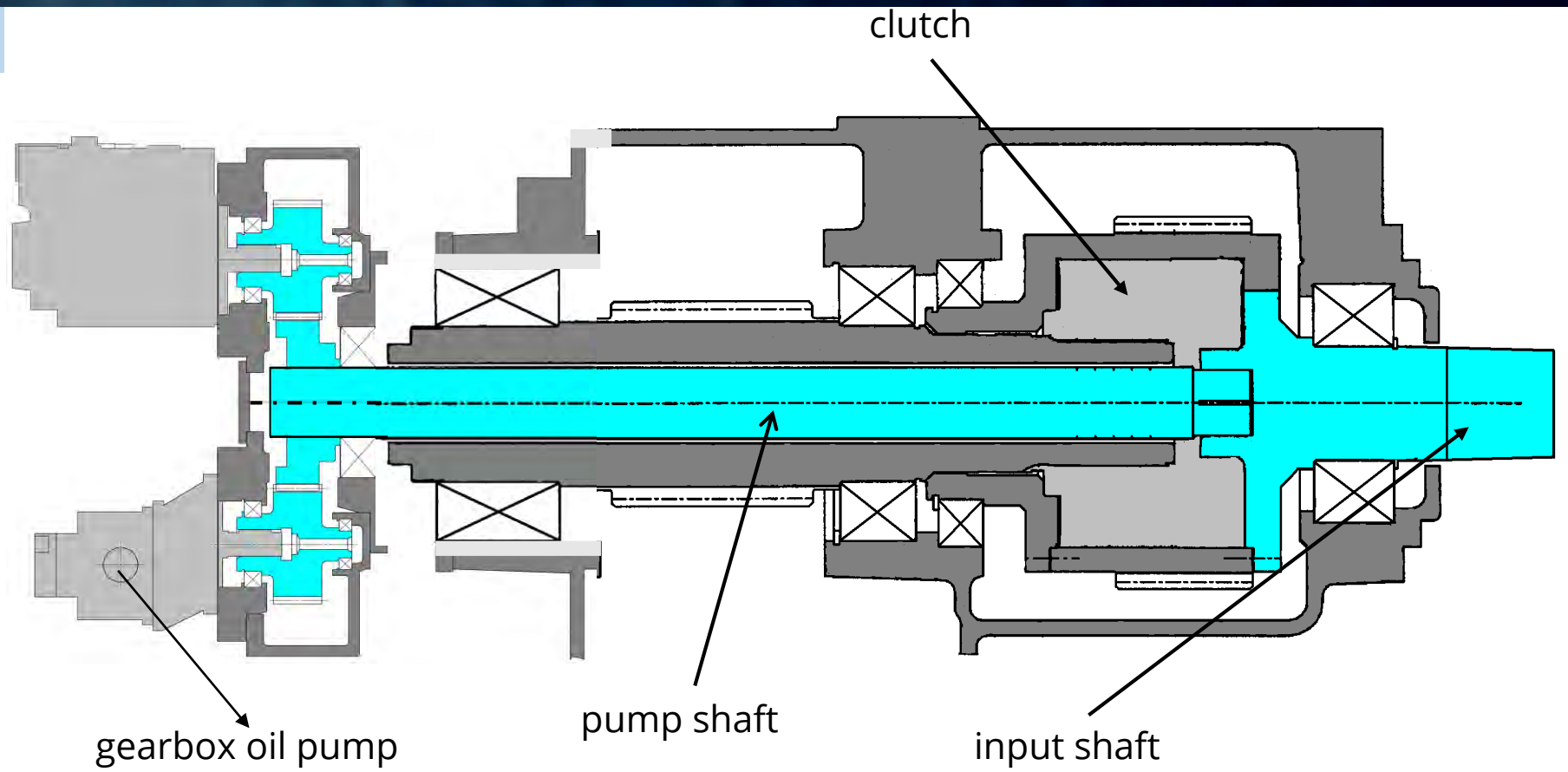
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO K1... (pump drive)



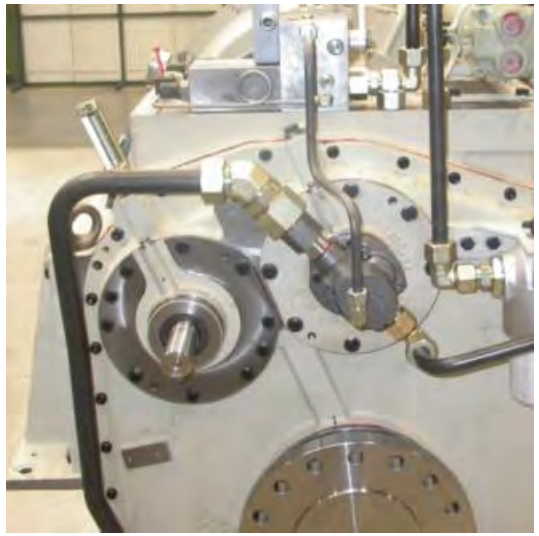


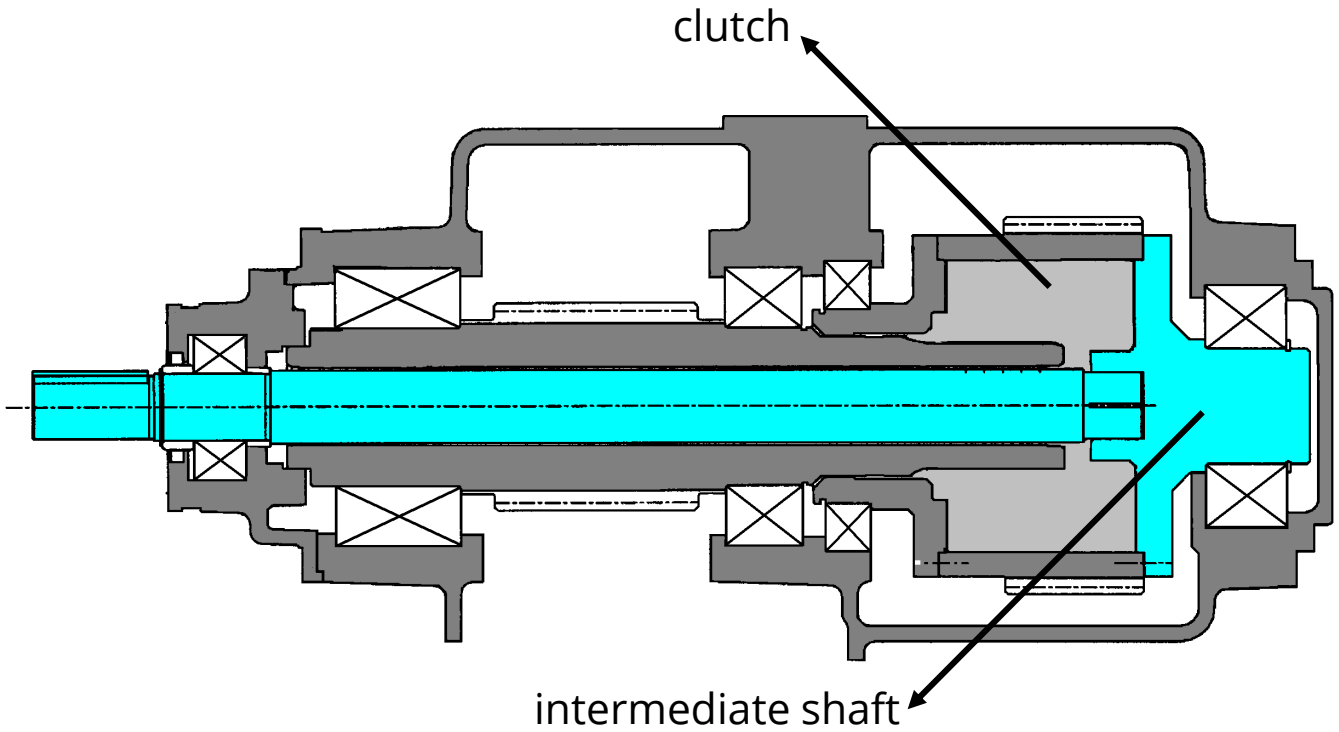
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO K2...



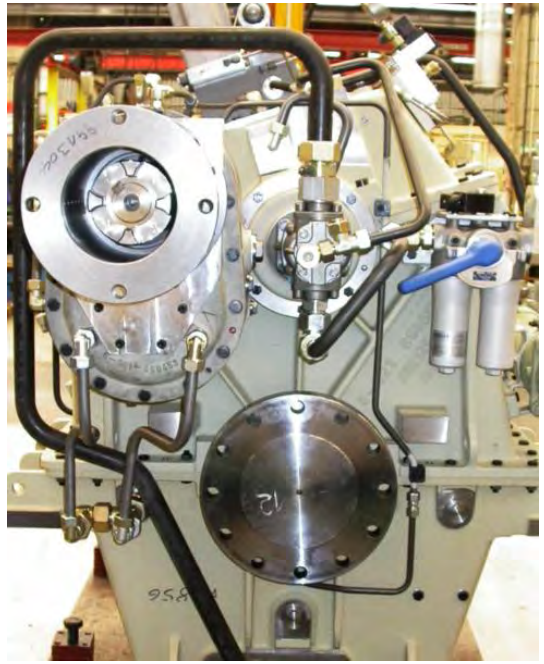


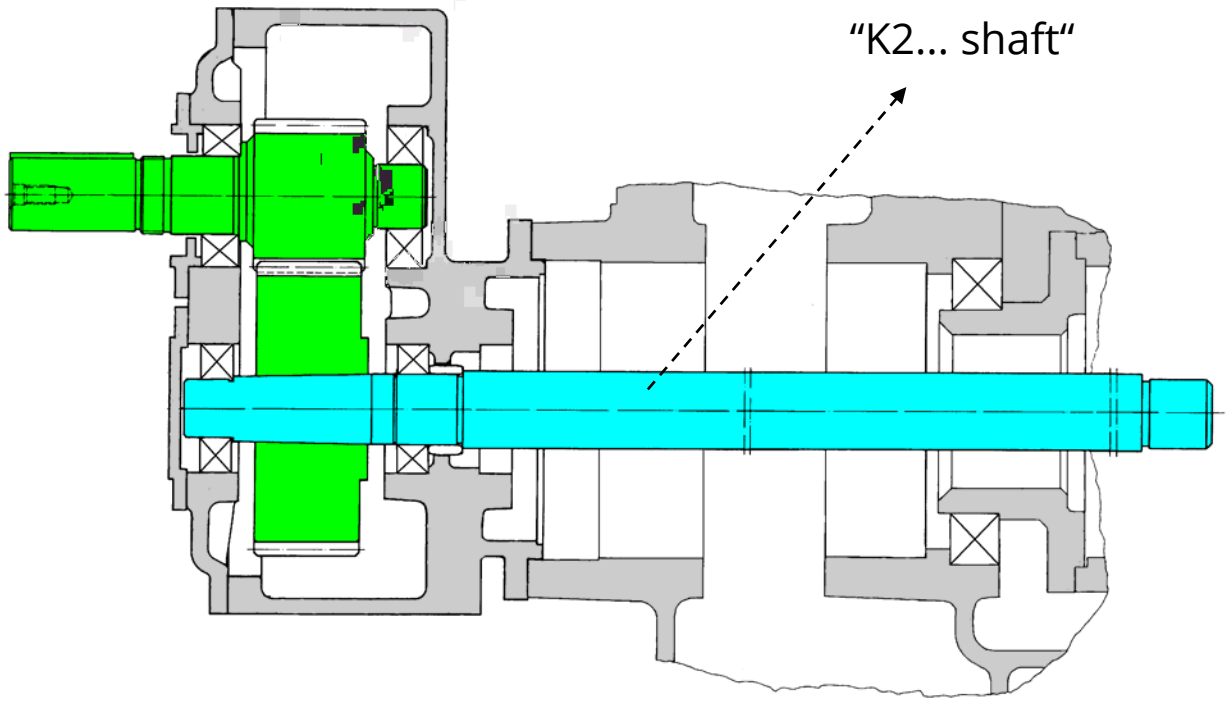
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO K31A





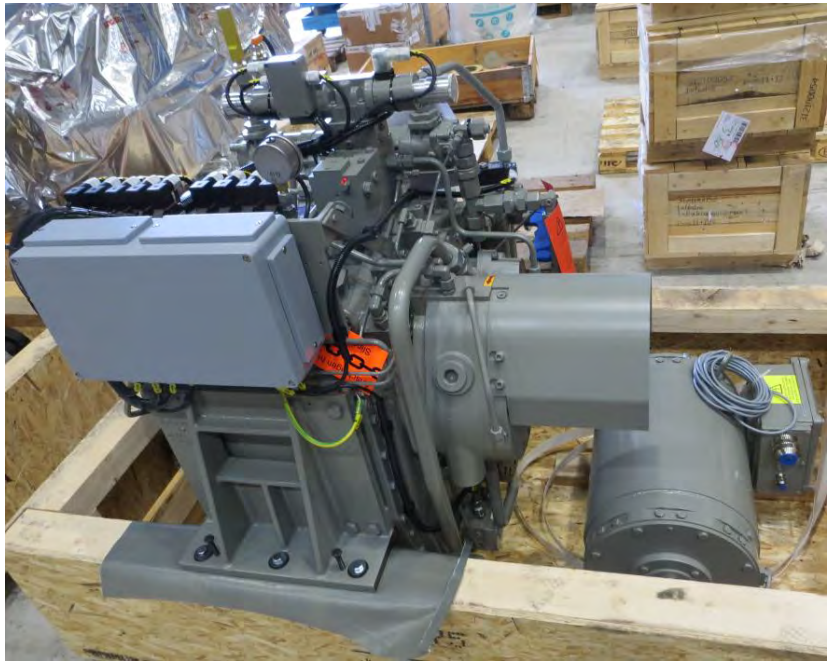
Auxiliary Drives

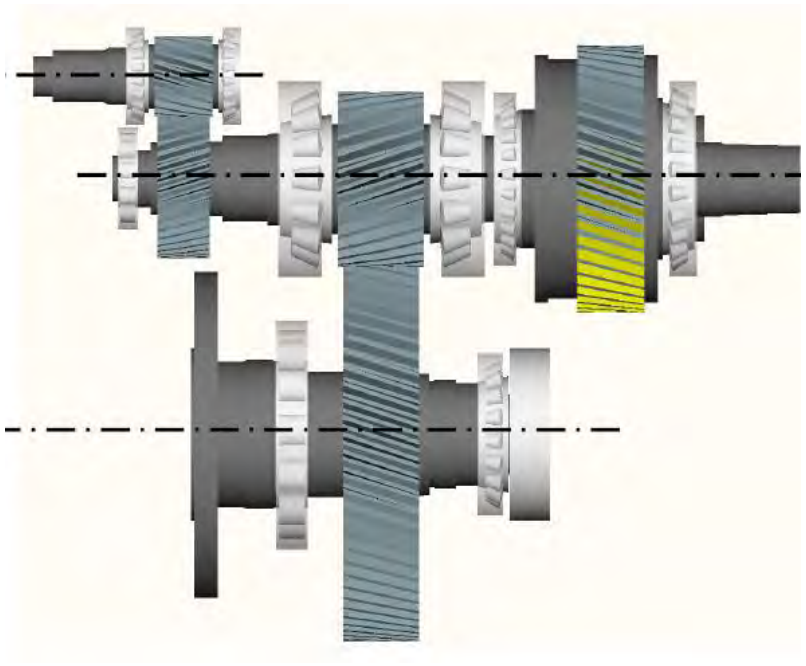
Explanation of PTO/PTI possibilities

REINTJES POWERTRAIN SOLUTIONS

Nomenclature of auxiliary drives

PTO/PTI K31B



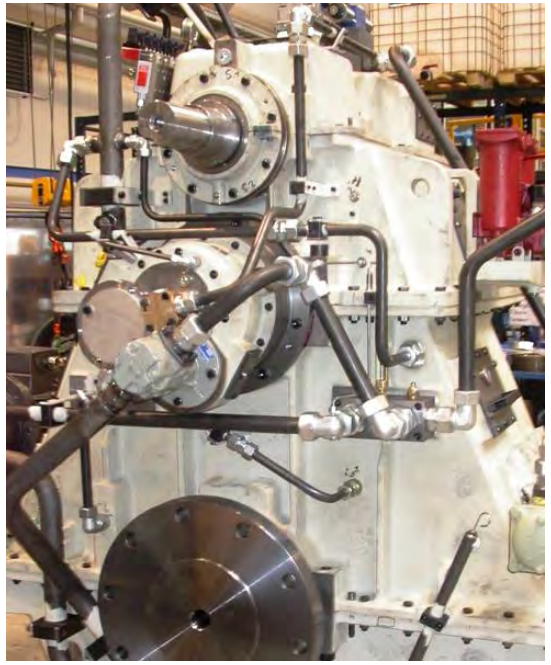


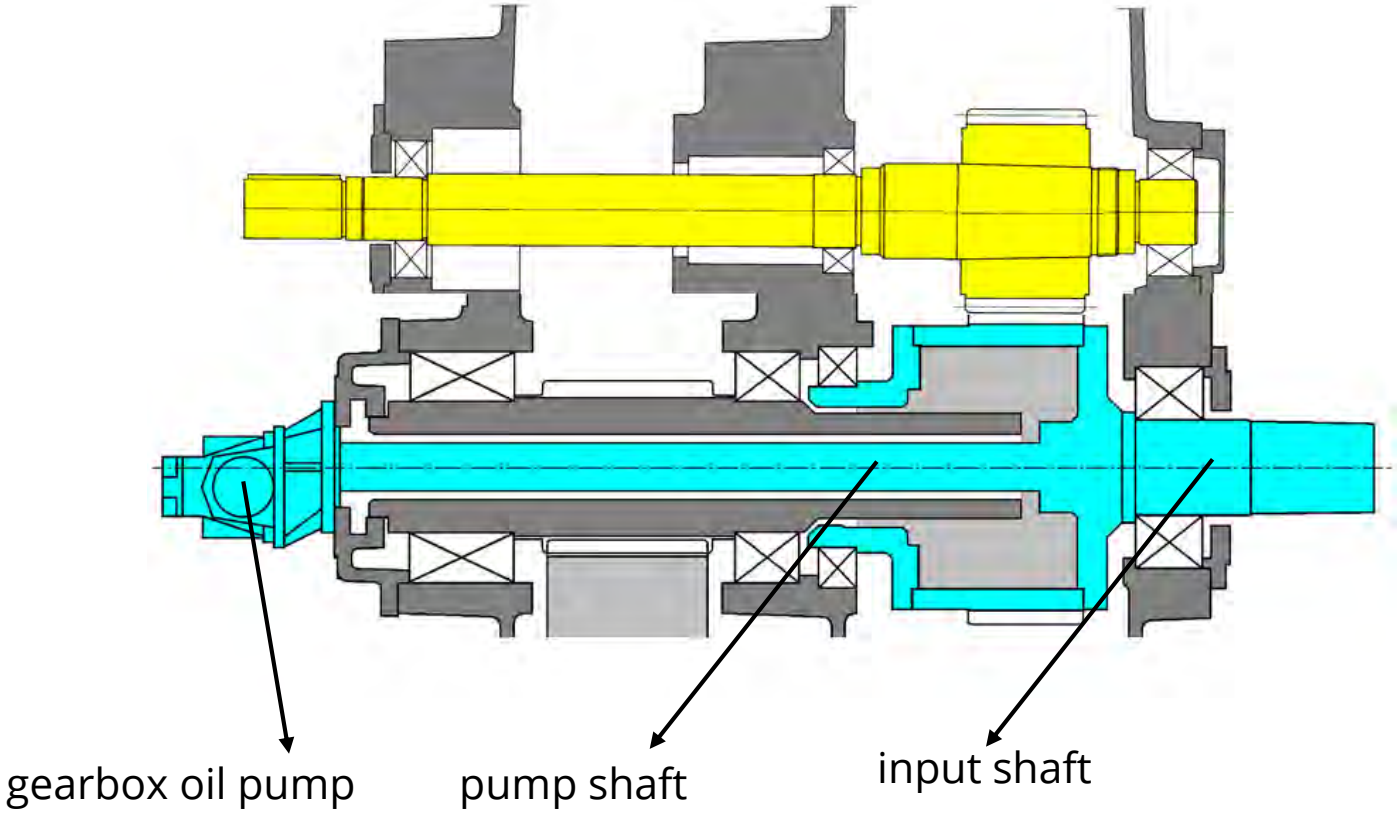
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO K4...



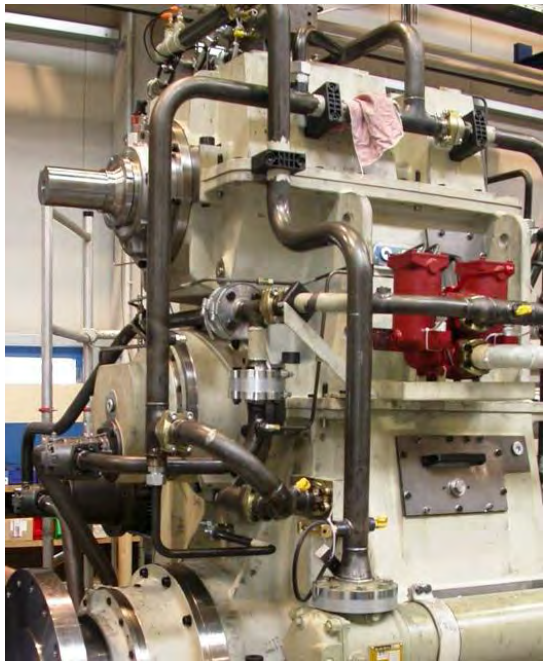


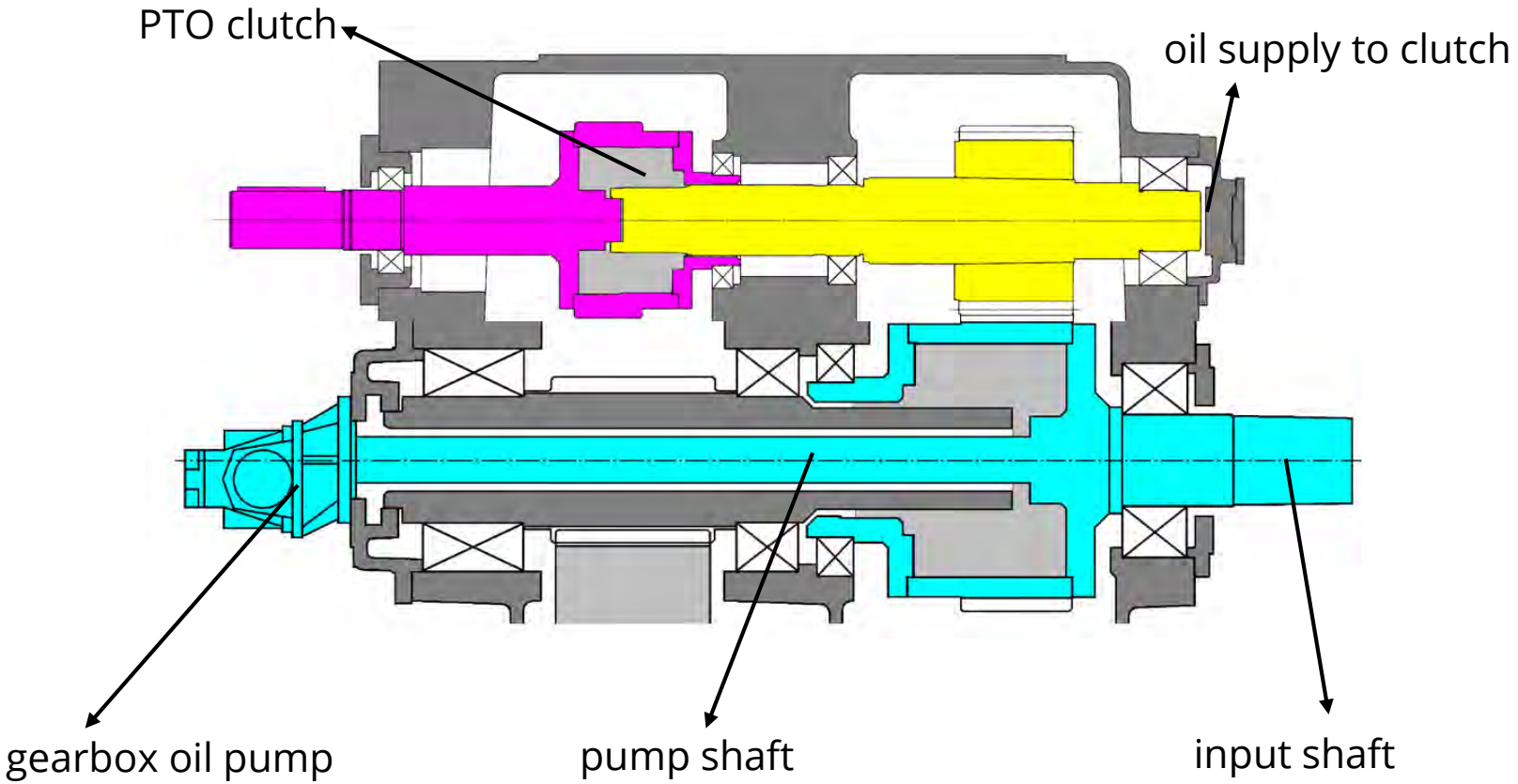
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO K51A



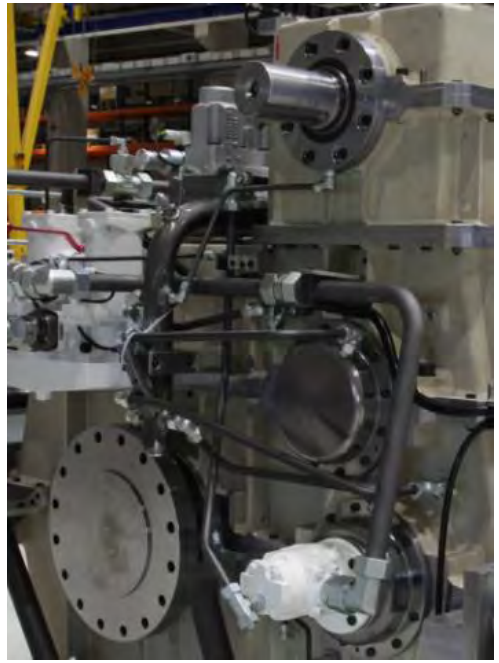


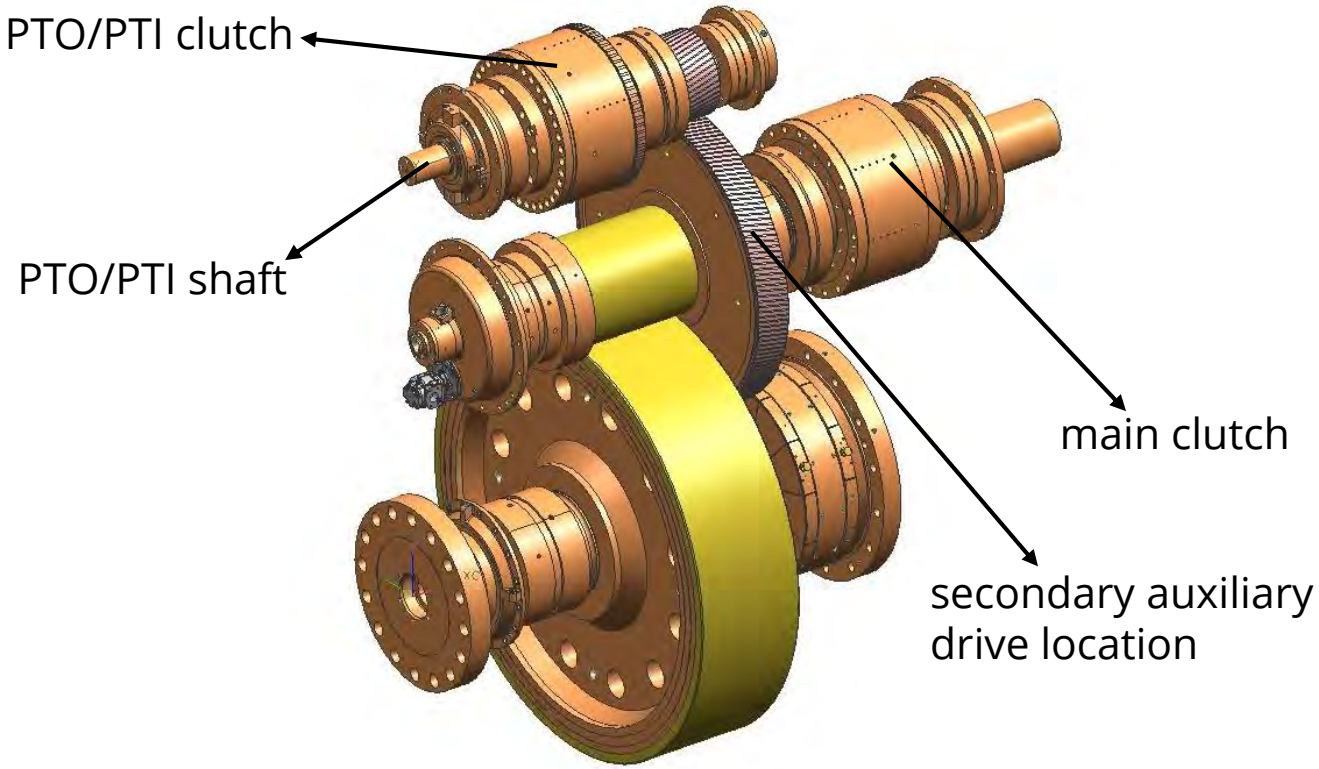
Auxiliary Drives

Explanation of PTO/PTI possibilities

Nomenclature of auxiliary drives

PTO/PTI K55B



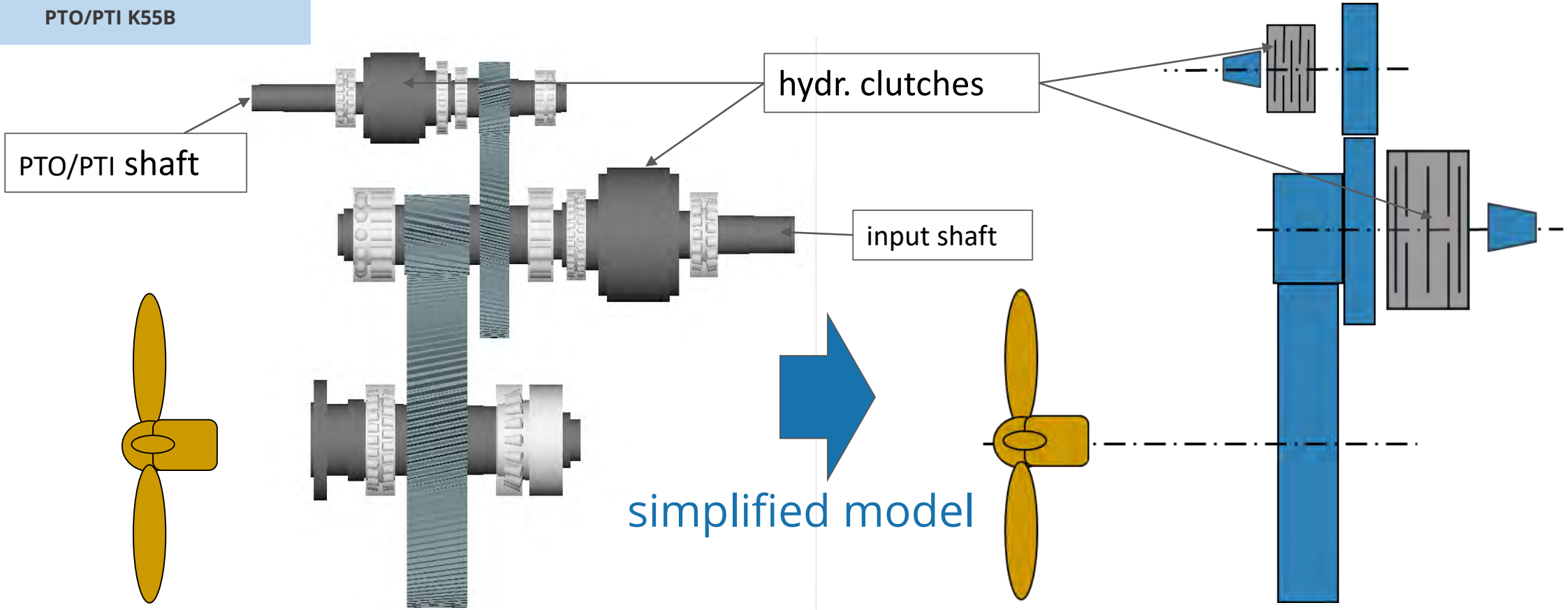


Auxiliary Drives

Explanation of PTO/PTI possibilities

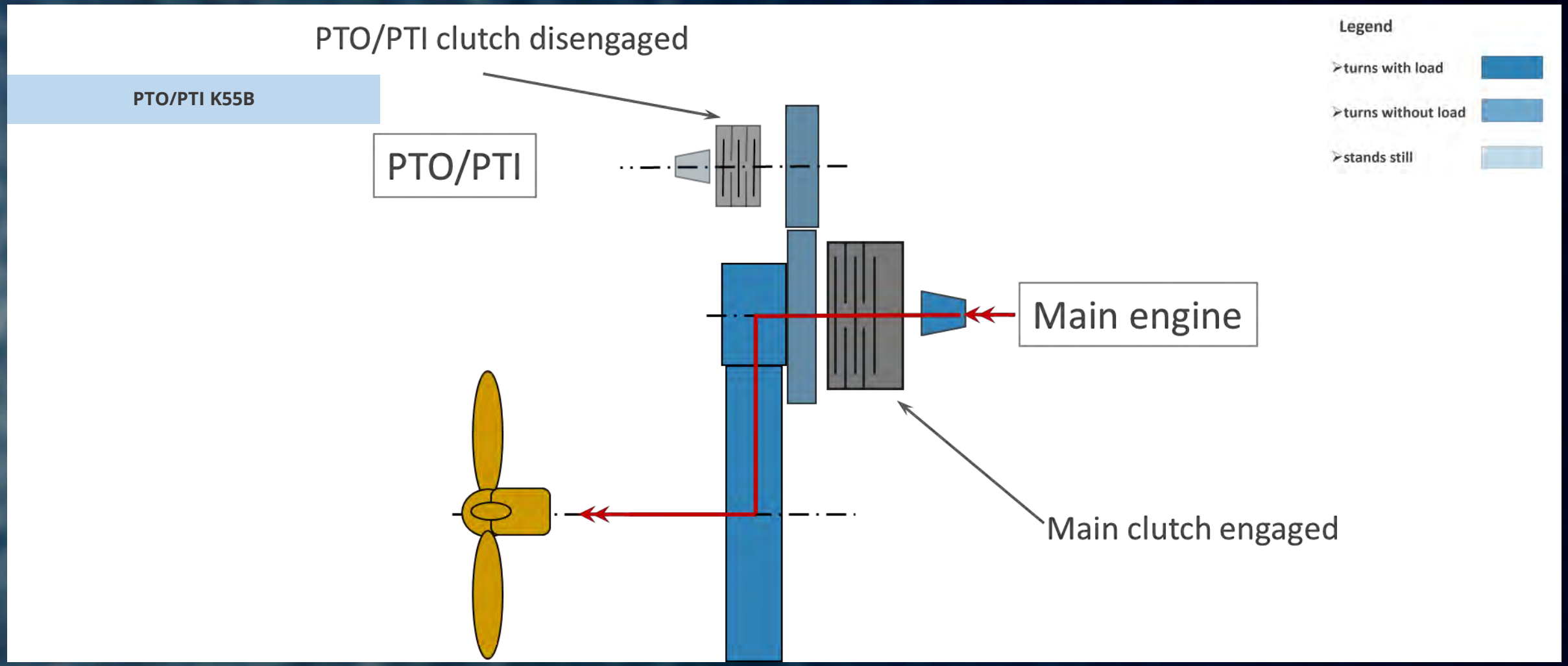
Nomenclature of auxiliary drives

PTO/PTI K55B



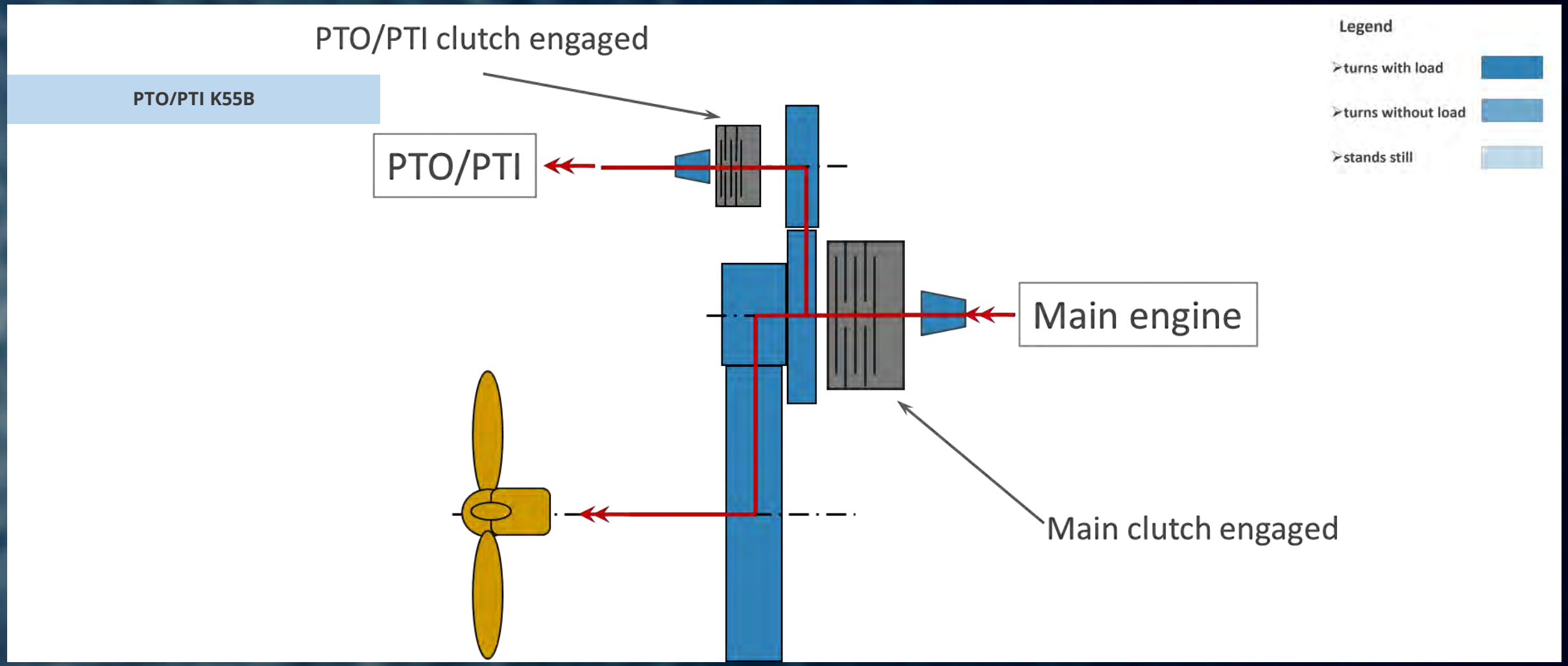
Auxiliary Drives

Explanation of PTO/PTI possibilities – 1 main engine mode



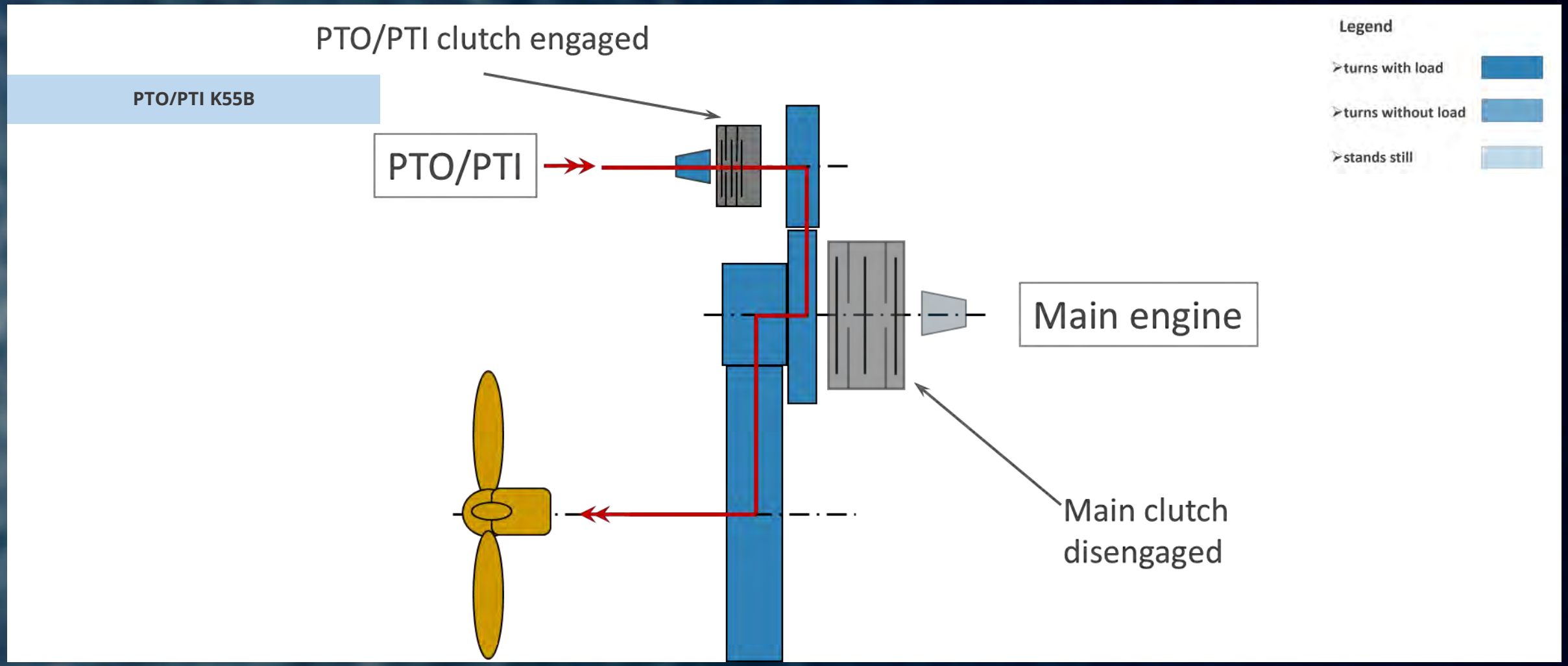
Auxiliary Drives

Explanation of PTO/PTI possibilities – 2 PTO mode



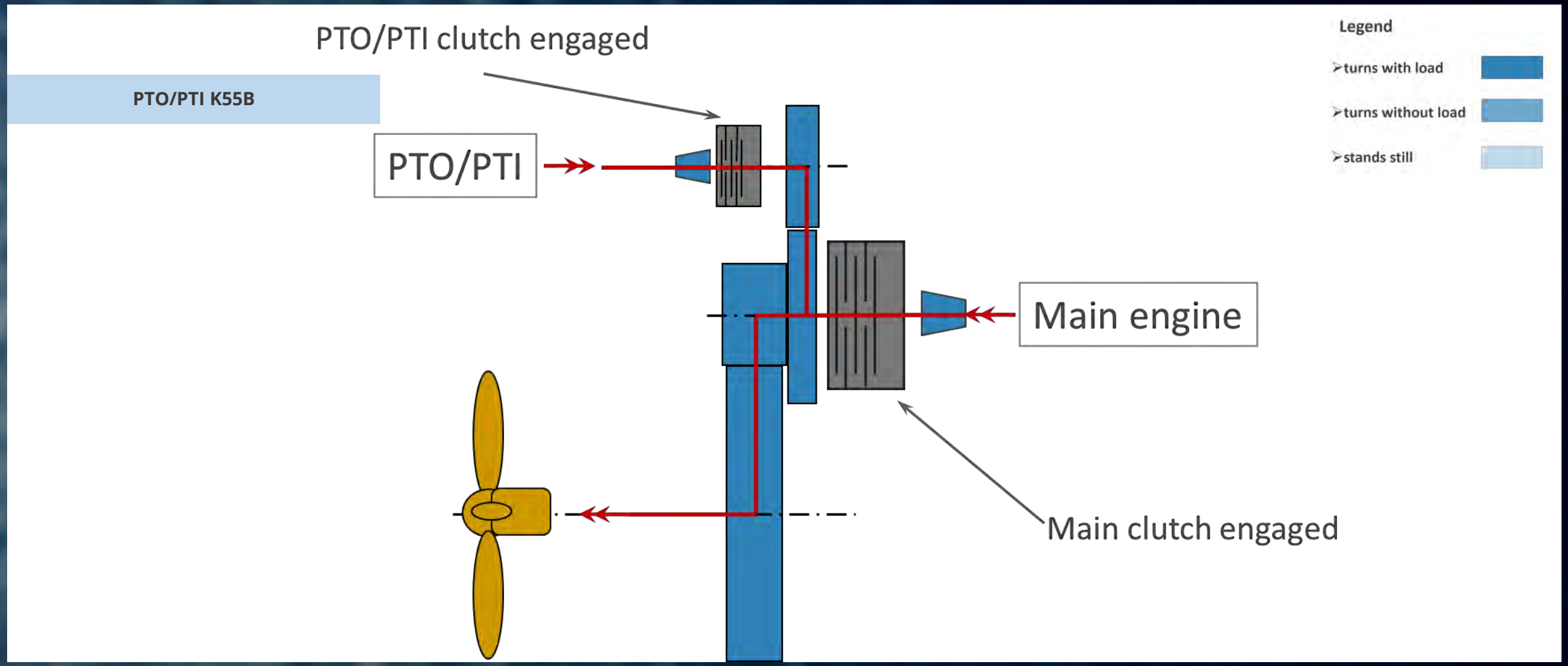
Auxiliary Drives

Explanation of PTO/PTI possibilities – 3 PTI mode



Auxiliary Drives

Explanation of PTO/PTI possibilities – 4 Boost mode



Auxiliary Drives

Build example – ZLAF 2355 with K61

Gearbox Data	
Gearbox Type:	ZLAF 2355 with K61
Housing type:	fabricated steel
Gearbox mounting:	rigid
Main clutch:	yes
Offset, configuration:	660 mm, vertical
Power moment:	4.0 (2560 kW @ 900 rpm)
Ratio:	4,565 : 1 | 5.290 : 1
Toothing quality:	Q5 DIN
Bearing type:	roller bearing
Oil cooler inlet temperature:	32 °C
Autom. & Monitoring:	Acc. to DNV-GL
PTO/PTI:	1200 kW / 800 kW at ca. 1200 rpm
Main oil pump:	electrically
E-stand-by pump:	included
PTO/PTI offset:	570 mm vertically

REINTJES
POWERTRAIN SOLUTIONS

Modifications

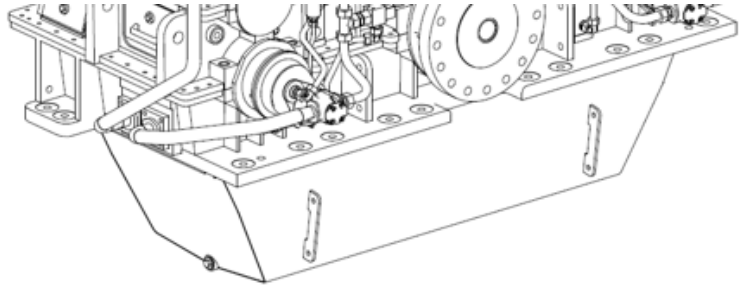
Expand the standard to your needs

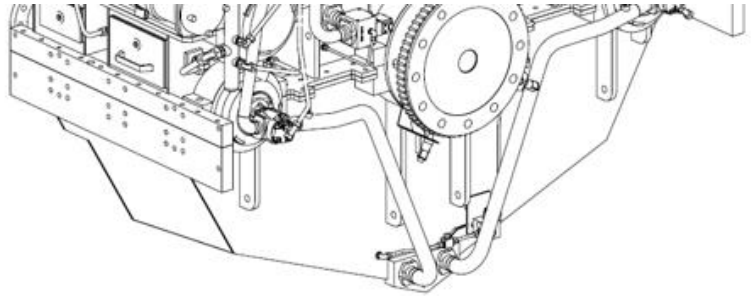
Modifications

Expand the Standard to your needs

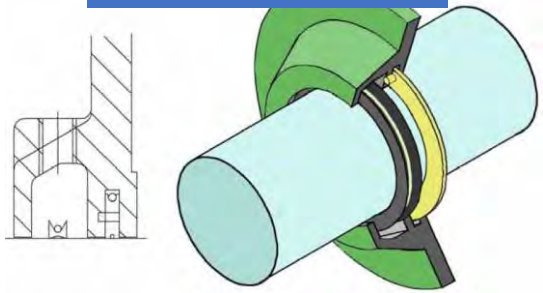
Possible adaptations

Housing Adaptations





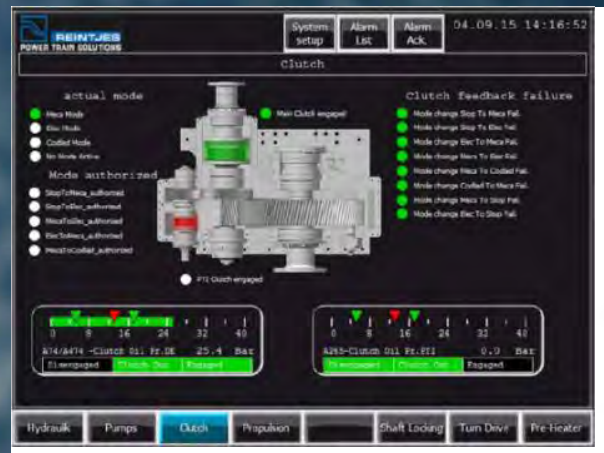
Watertight Sealing's

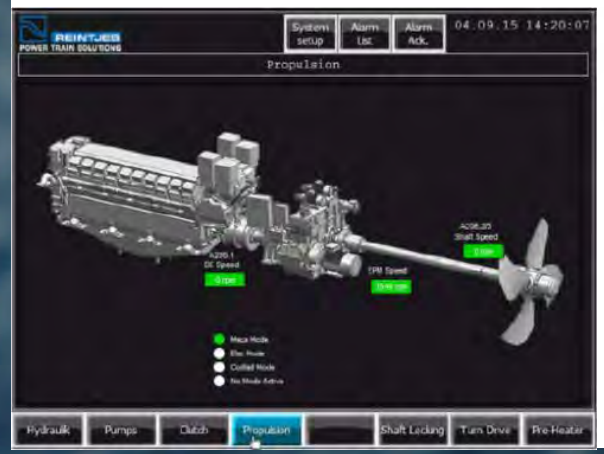


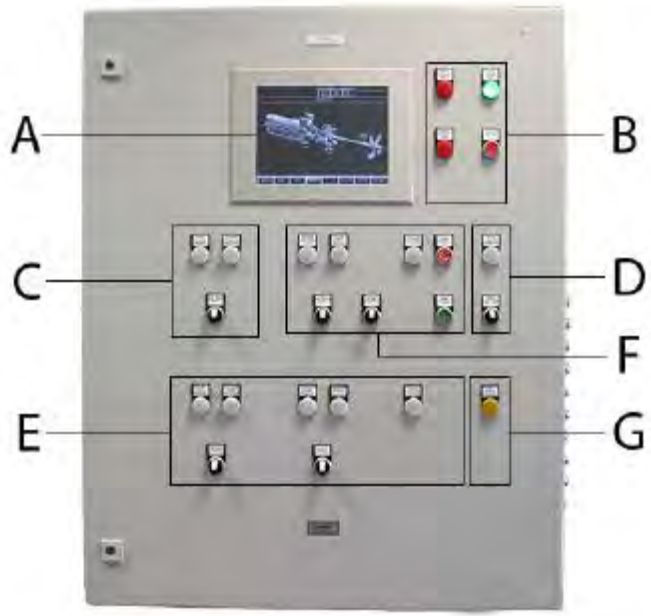
Modifications

Expand the Standard to your needs

LOP (Local Operating Panel)







A	**High-resolution touch screen display**
B	**Signal lamps to indicate gearbox alarms**
C	**Local/remote switchover**
D	**Release oil pre-heater (not included)**
E	**Clutch control**
F	**Electric pump control**
G	**Display of shaft locking device**

Key Features & Functions

- Monitors temperature and system pressure
- Includes all clutch interlocks
- Active part of the ship control system
- Connection to IPMS by MODBUS
- Remote clutch control
- Locally clutch control using the LOP buttons
- Activation of local control only by selector switch at the LOP

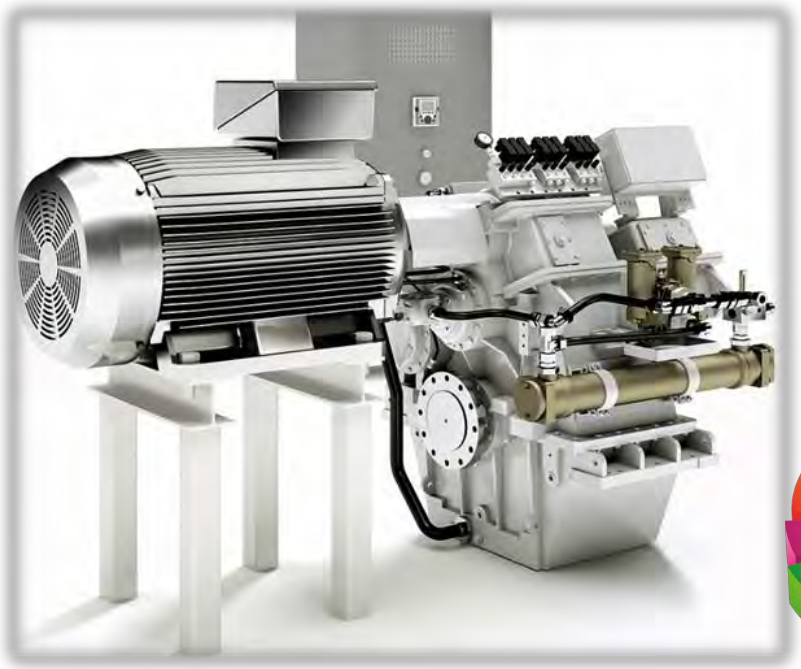
REINTJES Electrification

hybrid and lean electric solutions

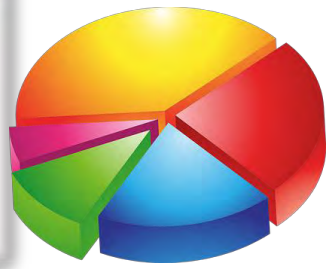
Hybrid Drives

System explanations

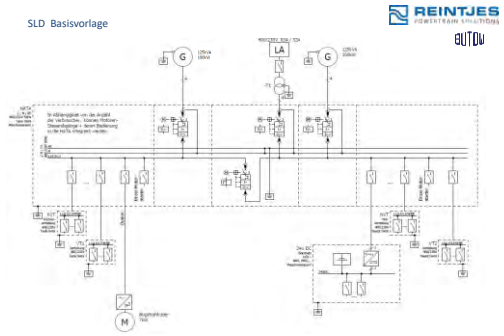
Two worlds combined



Hybrid Setup
mechanical + electrical



Basis:
Operation profile of the vessel



Variability of combinations

Design Philosophy

- Hybrid solution for each gearbox possible
- All components from one hand as an aligned system
- Normal range: 60 - 800 KW, larger power on request
- Each project is designed acc. the project requirements

Hybrid Drives

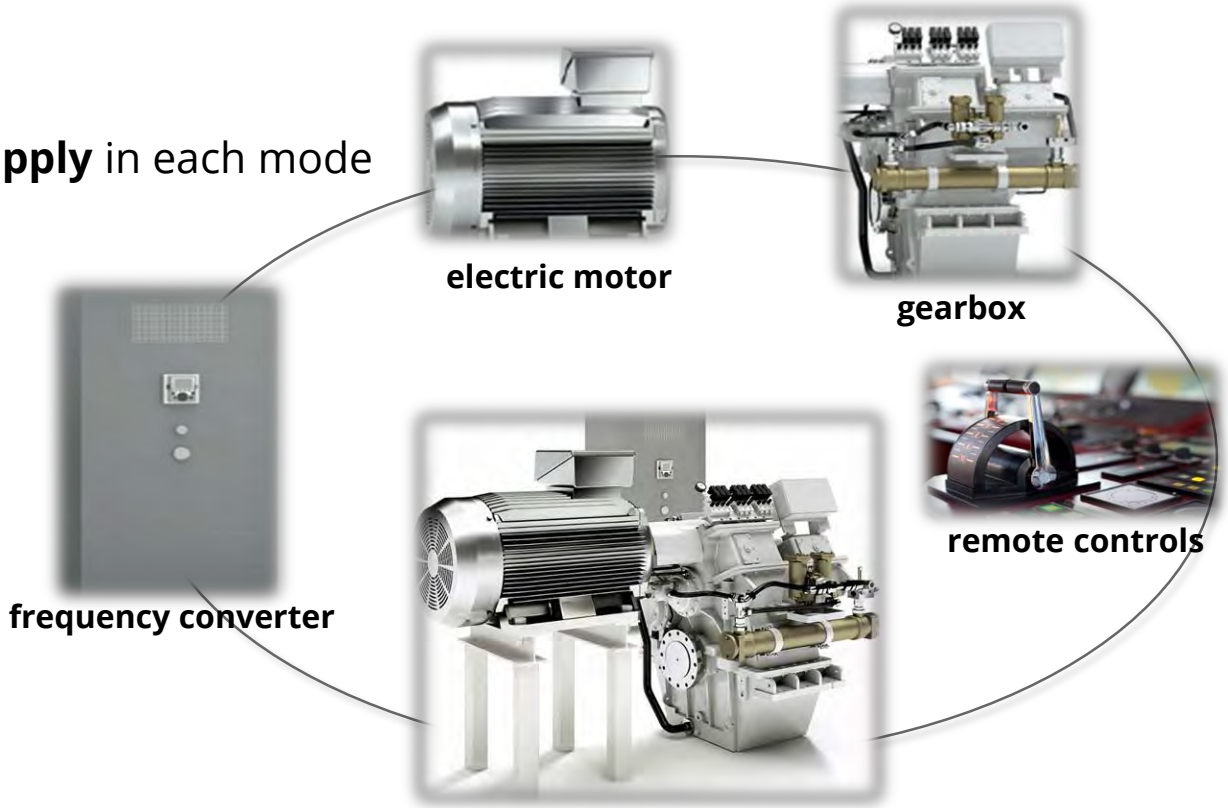
System explanations

REINTJES POWERTRAIN SOLUTIONS

Two worlds combined

Optimizing with REINTJES Hybrid System

- Optimized **performance and power / torque supply** in each mode
- **Reduced noise level** in most operating modes
- **Reduced emissions and fuel burn**
- **Reduced maintenance**
- **High flexibility and redundancy**

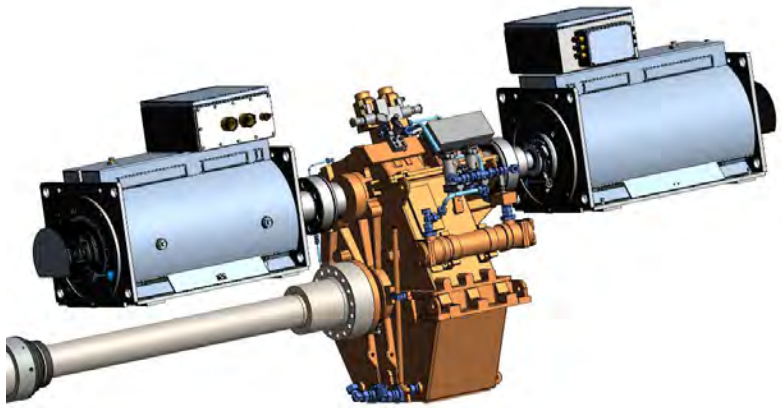


Electric Drives

System explanations

REINTJES POWERTRAIN SOLUTIONS

Solutions with gearbox



Design freedom

AEM

Danfoss

VEM

RAMME ELECTRIC MACHINES GMBH

BEN

weg

Variability

Design Philosophy

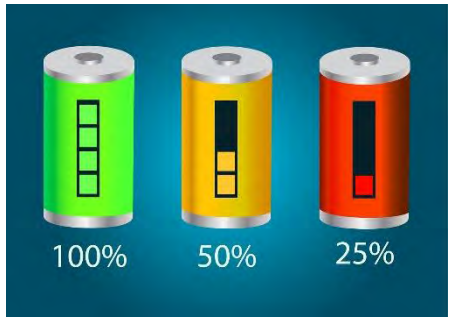
- Robust solution
- No separate thrust bearing needed
- More smaller components which are easier to handle
- Clutchable solutions possible
- Design according to the engine room as a perfect fit

Electric Drives

System explanations

Minimal Solution

Small passenger vessel	
Vessel length:	20m
Vessel speed:	12 kn
Class. society:	None
Duty class:	Continuous
Engine type:	E-Motor
Nominal power per engine:	200 kW
Engine speed:	e.g. 1500 rpm
Type of propeller:	FPP (single screw)
Propeller diameter:	Approx. 1000 mm
Propeller speed:	Approx. 620 rpm
Thrust:	Approx. 22 kN
Electrical system:	400V, 50 Hz



Electric Drives

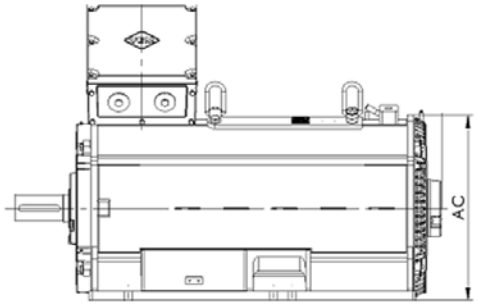
System explanations

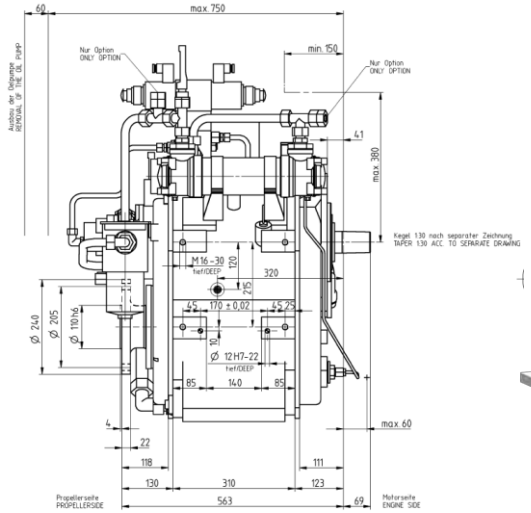
REINTJES POWERTRAIN SOLUTIONS

Minimal Solution

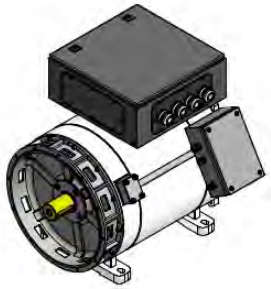
AF 244 – price optimized	
Housing type:	cast iron
Mounting:	rigid
Main clutch:	no
Offset:	215 mm, vertical
Power moment:	0.133 kW/rpm
Ratio:	2 - 4: 1
Toothing quality:	Q5 DIN
Bearing type:	roller bearing
Oil cooler:	max. 32 °C inlet temperature
Automation:	acc. to REINTJES standard
Main oil pump:	electrical (≈1 kW)
Gb weight:	≈ 400 - 450 kg
Async. EM	≈ 1270 kg (Air cooled)
PM EM vers. 1	≈ 580 kg (Water cooled)
PM EM vers. 2	≈ 300 kg (Water cooled)

Asynchronous EM





Permanent magnet EM (V1)



Permanent magnet EM (V2)

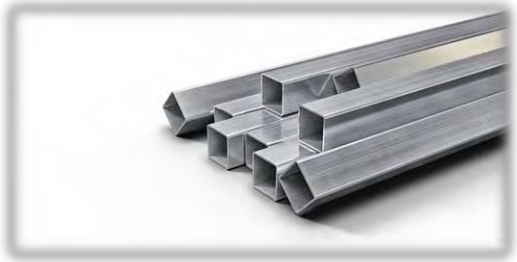
Electric Drives

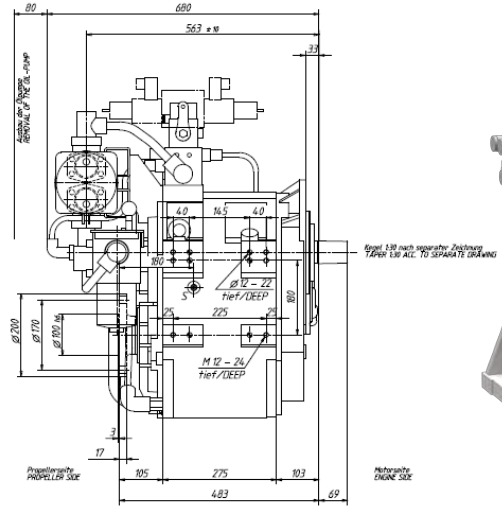
System explanations

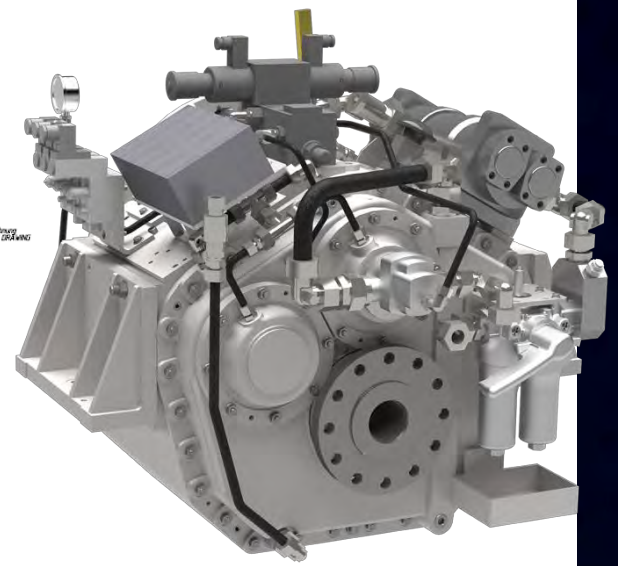
REINTJES POWERTRAIN SOLUTIONS

Minimal Solution

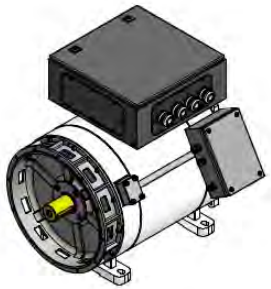
VS 234 – weight optimized	
Housing type:	weight optimized design Aluminum alloy
Mounting:	rigid
Main clutch:	no
Offset:	215 mm, vertical
Power moment:	0.133 kW/rpm
Ratio:	2 - 3: 1
Toothing quality:	Q5 DIN
Bearing type:	roller bearing
Oil cooler:	max. 32 °C inlet temperature
Automation:	acc. to REINTJES standard
Main oil pump:	electrical (≈1 kW)
Gb weight:	≈ 220 - 240 kg
PM EM vers. 1	≈ 580 kg (Water cooled)
PM EM vers. 2	≈ 300 kg (Water cooled)







Permanent magnet EM (V1)



Permanent magnet EM (V2)

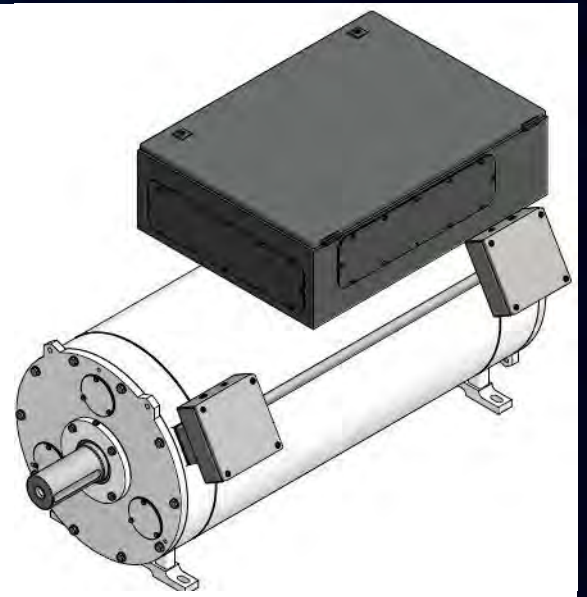
Electric Drives

System explanations

REINTJES POWERTRAIN SOLUTIONS

Minimal Solution

Direct drive 200 kW	
Housing type:	t.b.d.
Mounting:	rigid
Main clutch:	no
Offset:	0 mm
Power moment:	0.323 kW/rpm
Ratio:	1 : 1
Toothing quality:	None
Bearing type:	roller bearing
Oil cooler:	t.b.d.
Automation:	acc. to REINTJES standard
Main oil pump:	None
Thrust bearing:	≈ 150 - 250 kg (incl. flexible coupling)
PM EM	≈ 700 -1000 kg (Water cooled)



Permanent magnet EM

additional thrust bearing needed

750kg (GB + PM) vs. 1000 kg (TB + PM)

Electric Drives

System explanations

REINTJES POWERTRAIN SOLUTIONS

Modest Solution

Pushboat	
Vessel length:	20m
Vessel speed:	-
Class. society:	Bureau Veritas (BV)
Duty class:	Continuous
Engine type:	E-Motor
Nominal power per engine:	1000 kW
Engine speed:	2000 rpm
Type of propeller:	FPP (twin screw in nozzel)
Propeller diameter:	Approx. 1620 mm
Propeller speed:	Approx. 365 rpm
Thrust:	Approx. 95 kN
Electrical system:	690V, 50 Hz

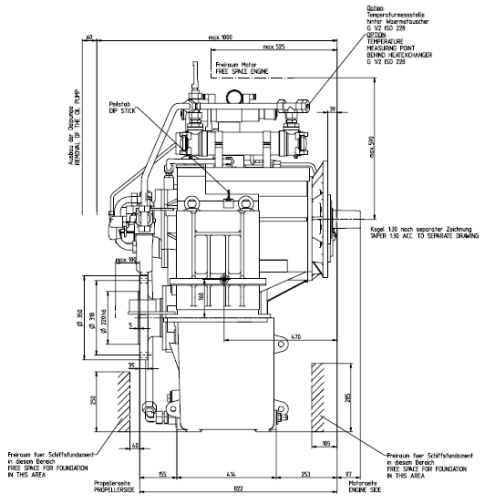
Electric Drives

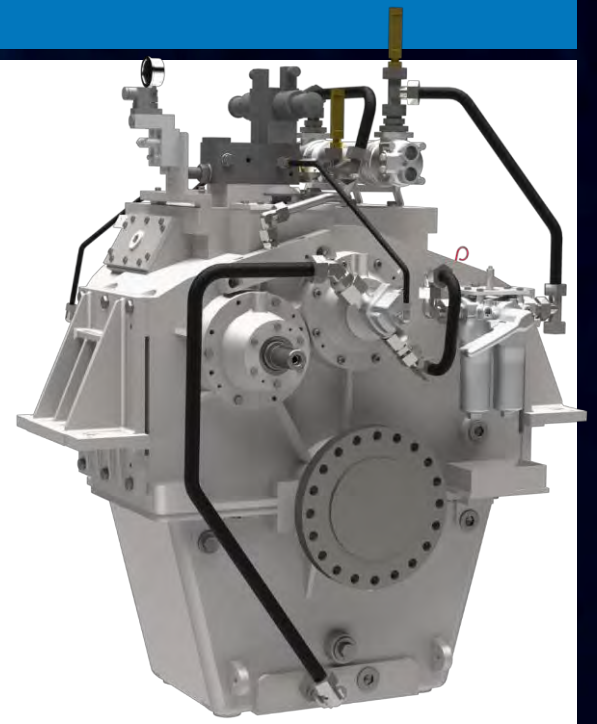
System explanations

REINTJES POWERTRAIN SOLUTIONS

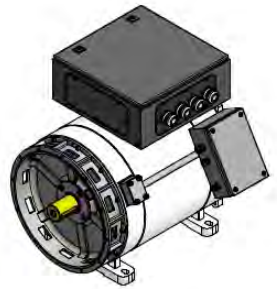
Modest Solution

AF 563	
Housing type:	cast iron
Mounting:	rigid
Main clutch:	no
Offset:	410 mm, vertical
Power moment:	0.5 kW/rpm
Ratio:	5.421 : 1
Toothing quality:	Q5 DIN
Bearing type:	roller bearing
Oil cooler:	max. 32 °C inlet temperature
Automation:	acc. to BV
Main oil pump:	electrical (≈1.5 kW)
Gb weight:	≈ 1350 kg
Async. EM	≈ 3500- 4300 kg (Air / water c.)
PM EM	≈ 850 kg (Water cooled)





Permanent magnet EM



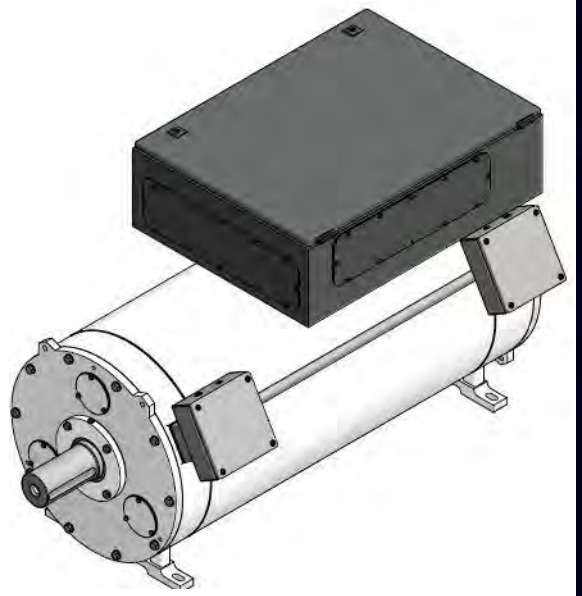
Electric Drives

System explanations

REINTJES POWERTRAIN SOLUTIONS

Modest Solution

Direct drive 1000 kW	
Housing type:	t.b.d.
Mounting:	rigid
Main clutch:	no
Offset:	0 mm
Power moment:	1 kW/rpm
Ratio:	1 : 1
Toothing quality:	None
Bearing type:	roller bearing
Oil cooler:	t.b.d.
Automation:	acc. to REINTJES standard
Main oil pump:	None
Thrust bearing:	≈ 350 - 450 kg (incl. flexible coupling)
PM EM	≈ ca. 4700 kg (Water cooled)



Permanent magnet EM

additional thrust bearing needed

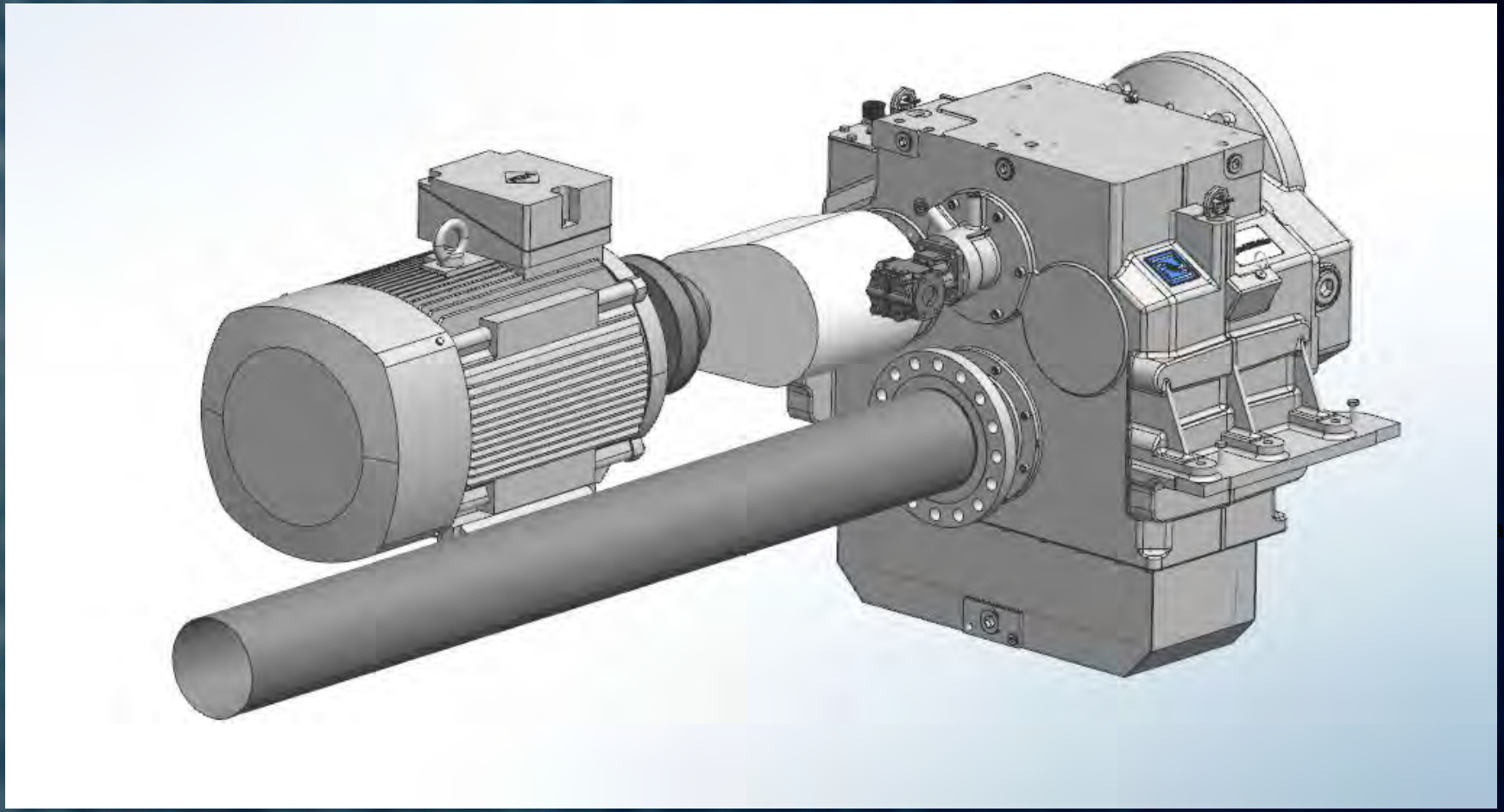
2200kg (GB + PM) vs. 4000 kg (TB + PM)

Electric Drives

Designstudy WF 550

REINTJES POWERTRAIN SOLUTIONS

WF 550 asynchronous motor

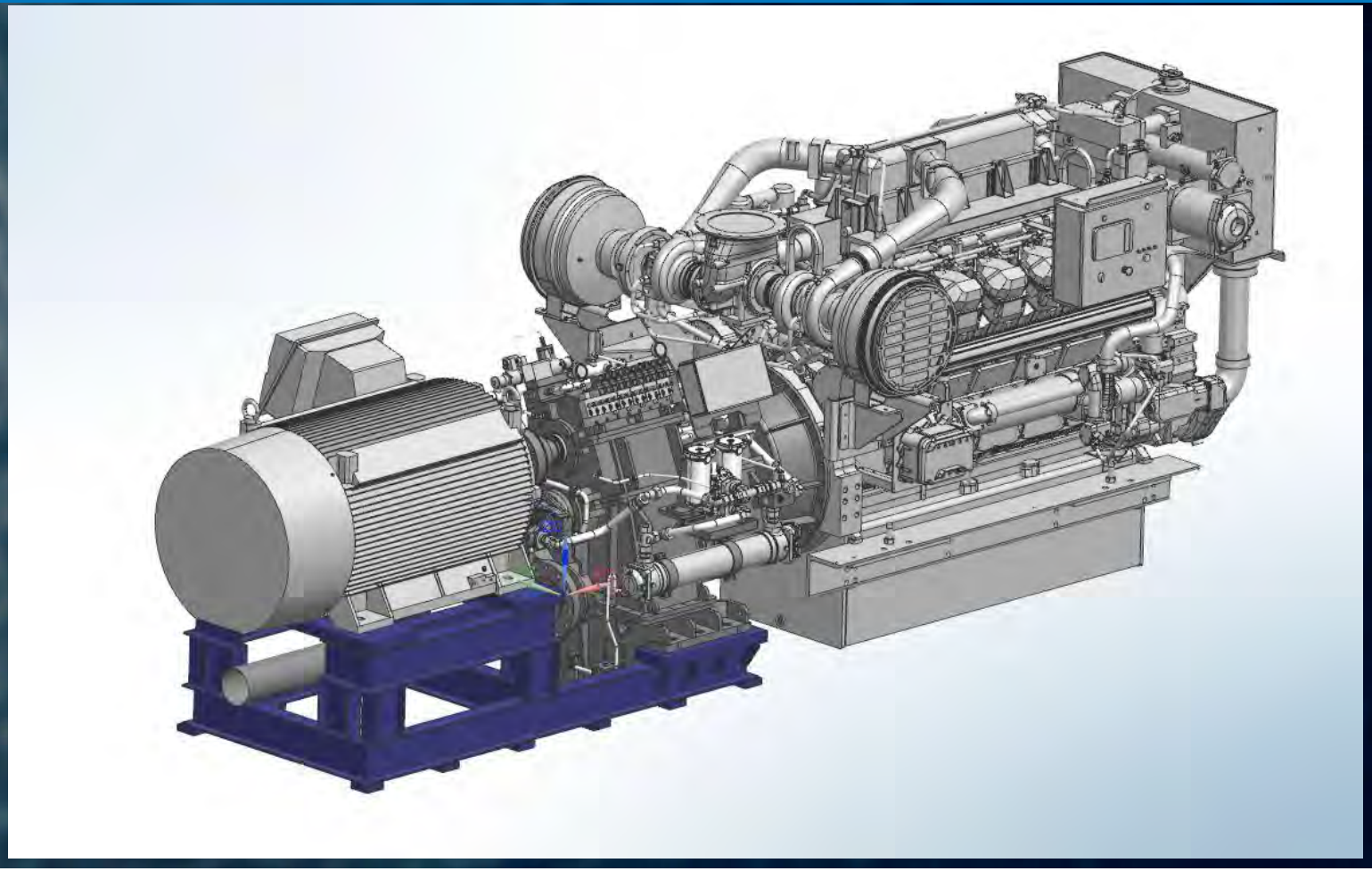


Electric Drives

Designstudy WAF 743

REINTJES POWERTRAIN SOLUTIONS

Common Frame - WAF 743 k 55 with 600kW asynchronous motor



Permanent magnet EM

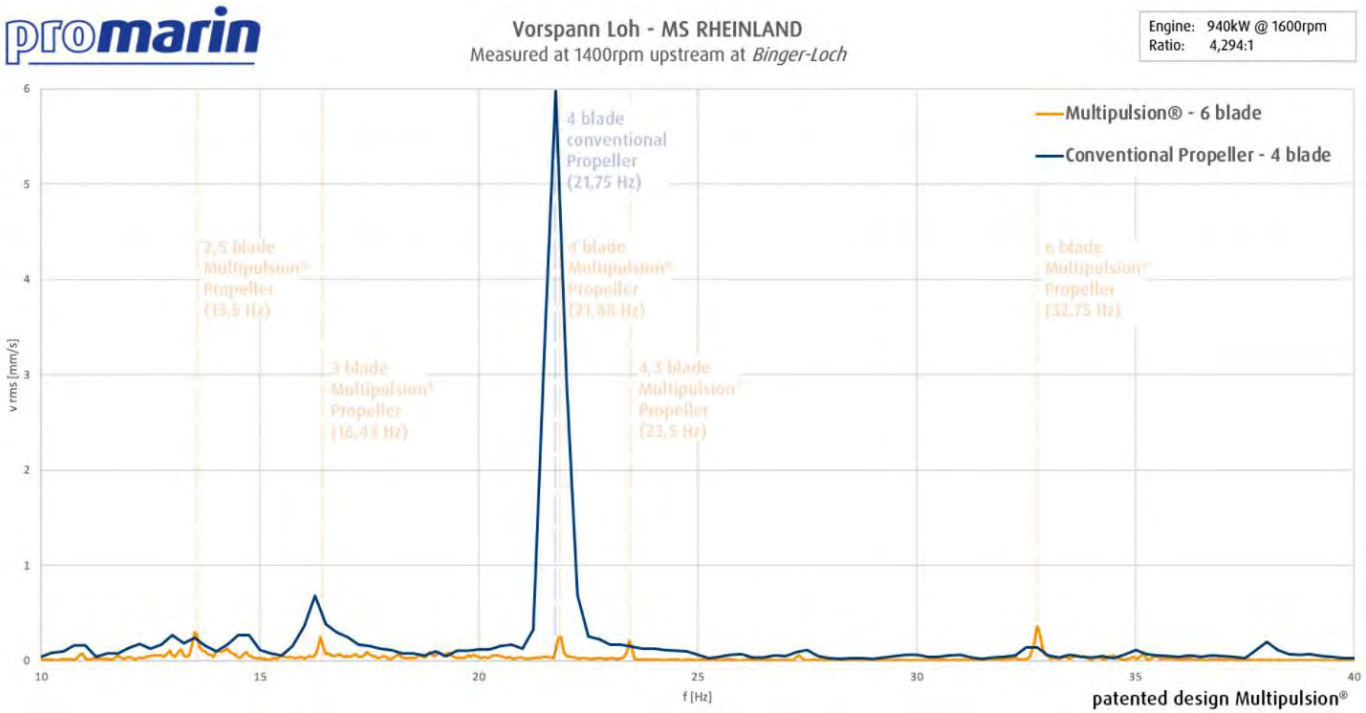
Propulsion Systems

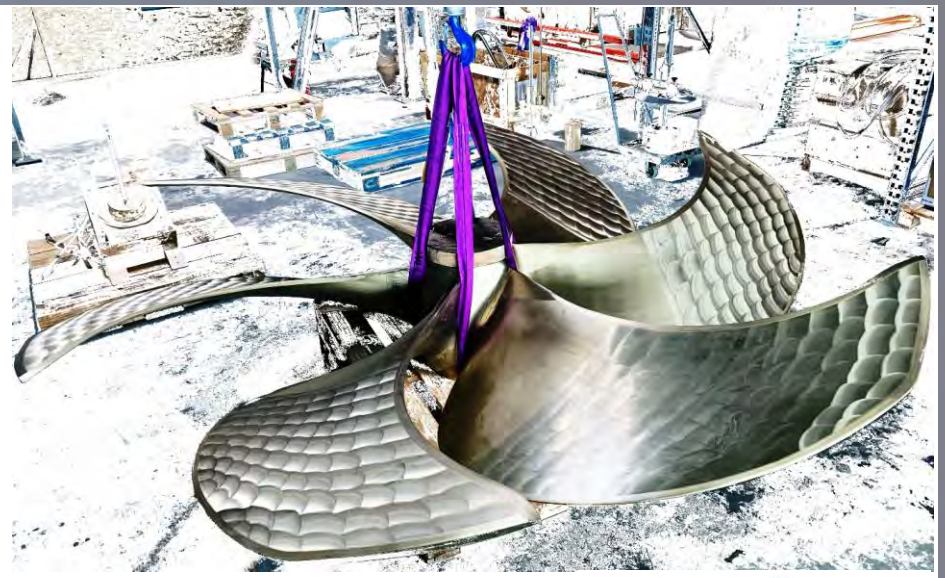
Key Facts – Fixed Pitch Propeller

REINTJES POWERTRAIN SOLUTIONS

New Development – MULTIPULSION ®

- Six blades with unique design
- acoustically optimized for the vessel's design





REINTJES Next

what‘s new – what‘s next

REINTJES next

Preparing for the future with a strong partner at your side

New Small GB Series

- efficiency revised -

New downangle GB Series

- efficiency revised -

PTI for PM E-Motors

- low weight, maximum function -

Gearbox Automation GBX

- even smoother operation -

REINTJES Automation

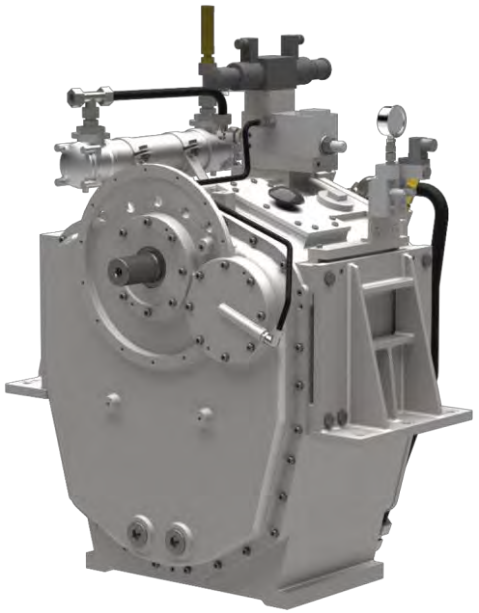
- every thing in one hand-

REINTJES next

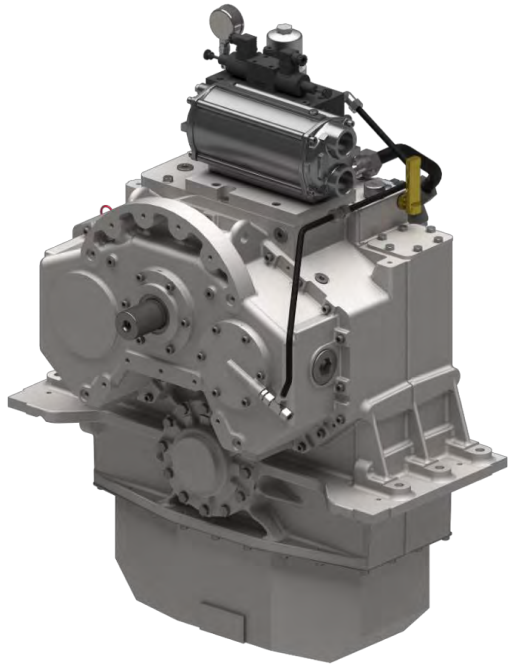
New small gearbox series

REINTJES POWERTRAIN SOLUTIONS

Developed to the customers needs

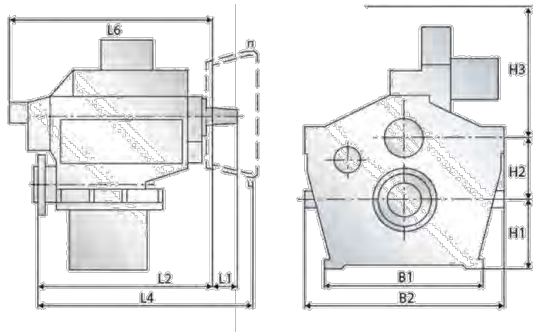


WAF 364

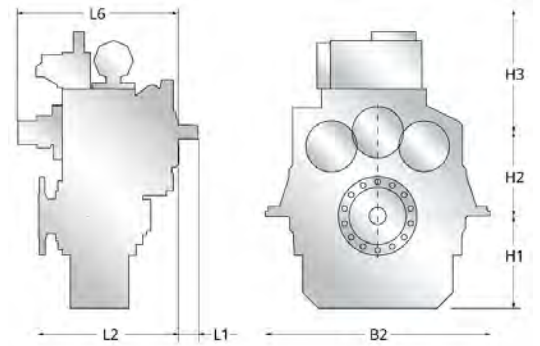


WF 370

WAF 364



WF 370



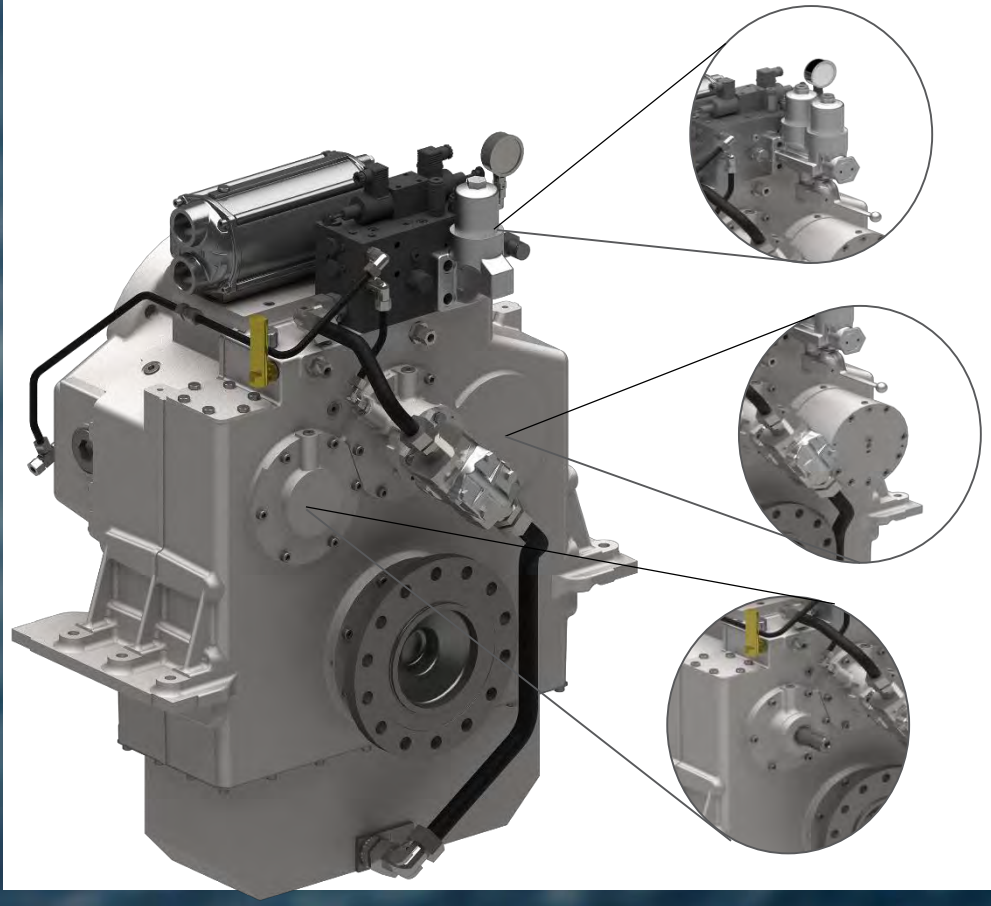
WAF 364		WF 370
88	L1 (mm)	69
667	L2 (mm)	587
820	L6 (mm)	760
620	B1 (mm)	490
1010	B2 (mm)	930
380	H1 (mm)	380
345	H2 (mm)	346
560	H3 (mm)	525
950	Weight (kg)	730
38	Oil (l)	25

REINTJES next

New small gearbox series

REINTJES POWERTRAIN SOLUTIONS

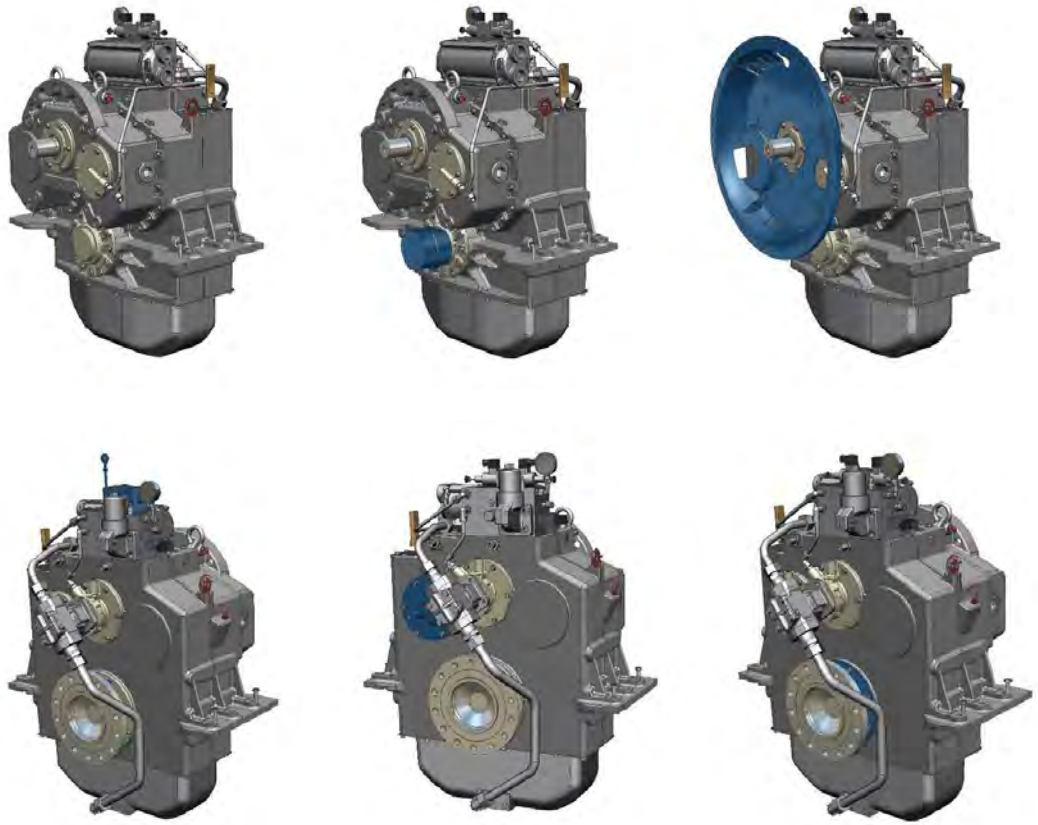
Modularity is key



plug & play z.B. duplex oil filters, control valves

simple to add: shaft brake with PTO

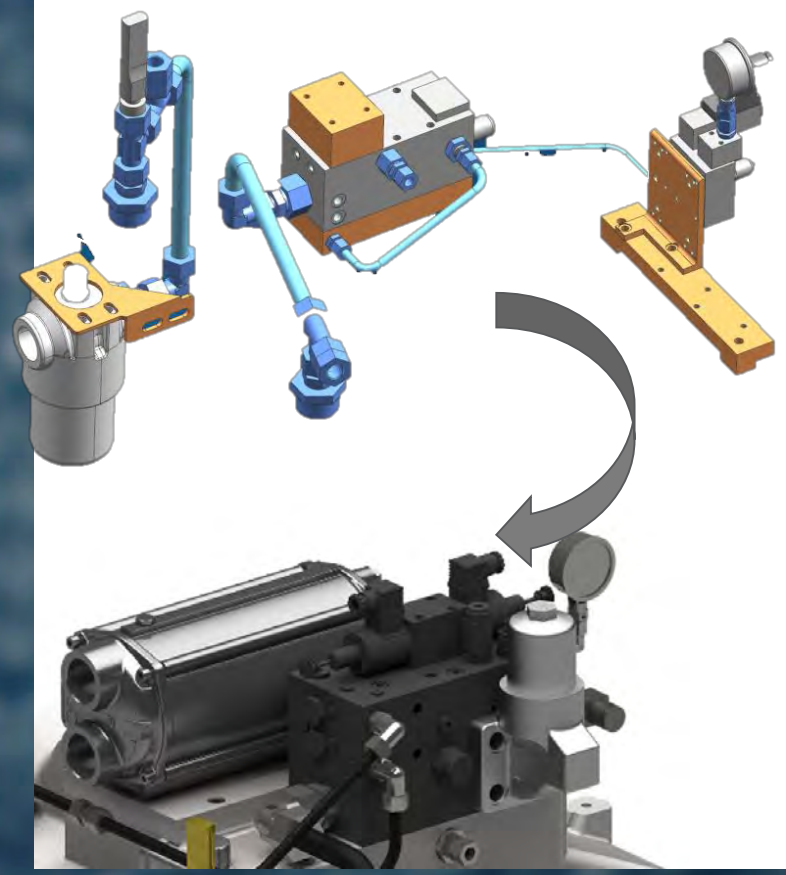
plug & play PTO K21, enhanced PTO, two PTOs

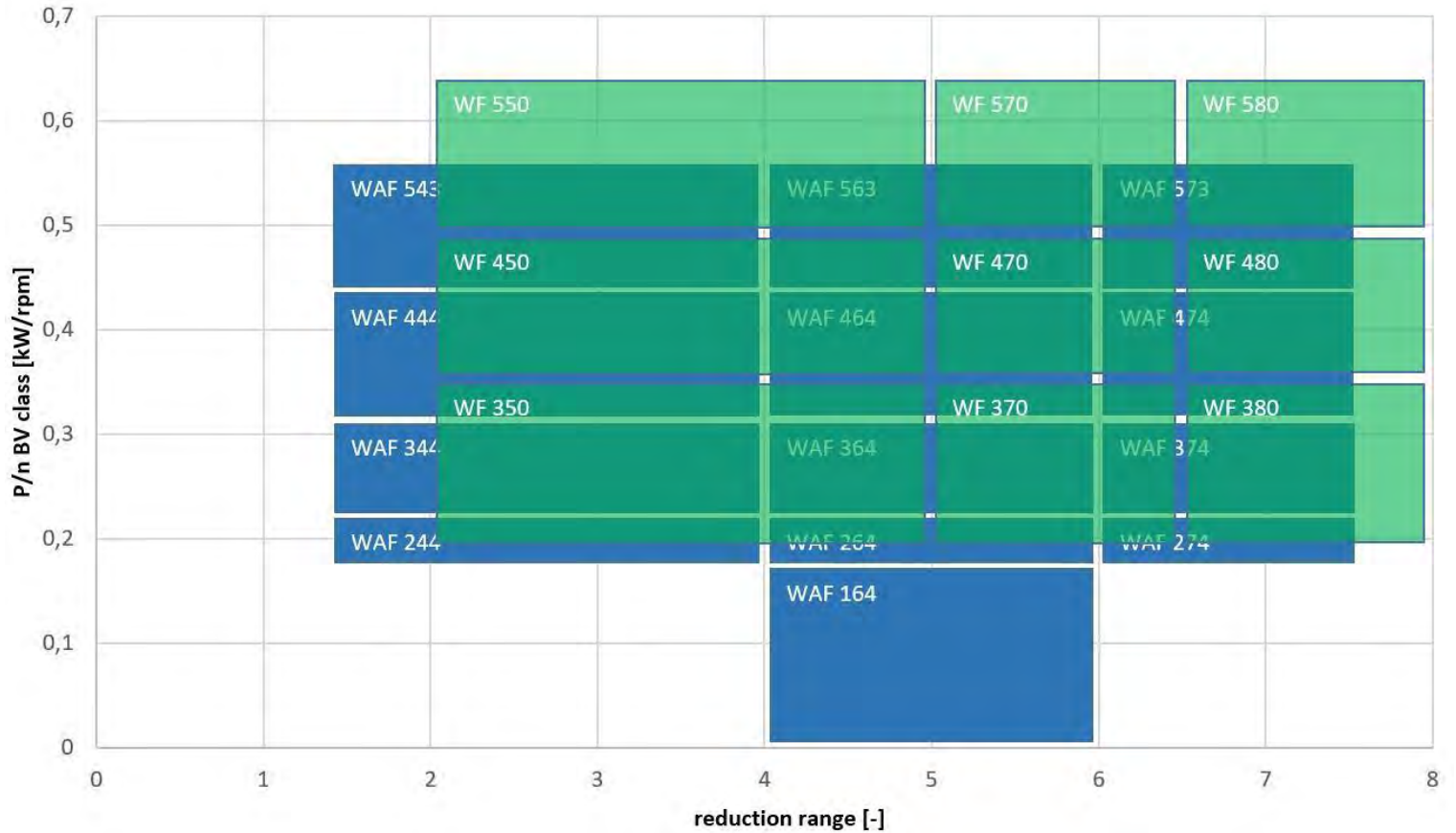


REINTJES next

New small gearbox series

More compact, more power, higher ratios



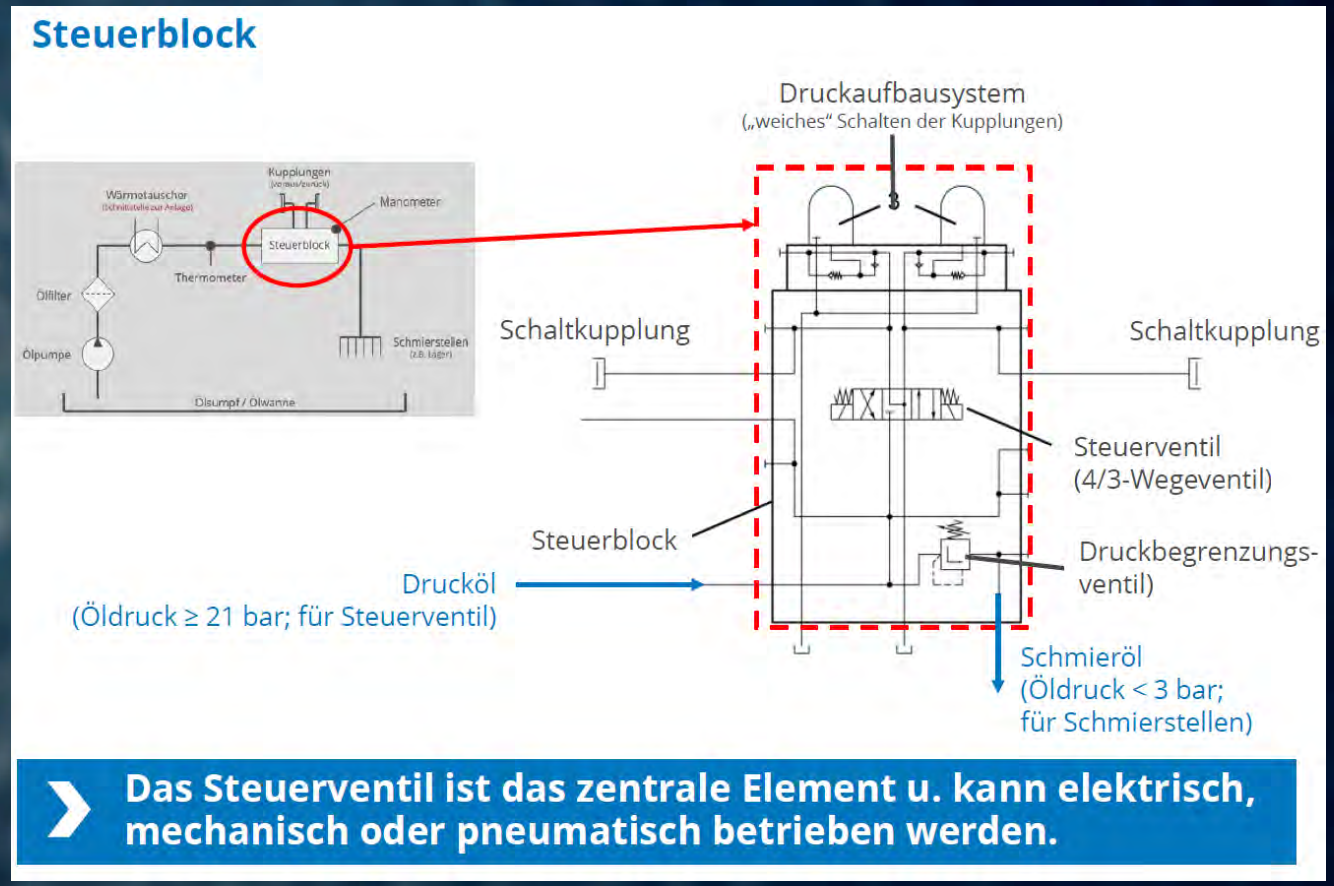


REINTJES next

Gearbox Automation

REINTJES POWERTRAIN SOLUTIONS

Control valve Block

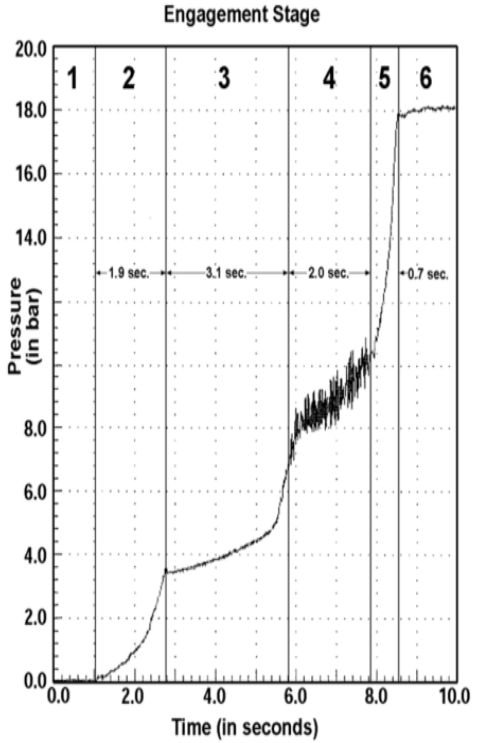


REINTJES next

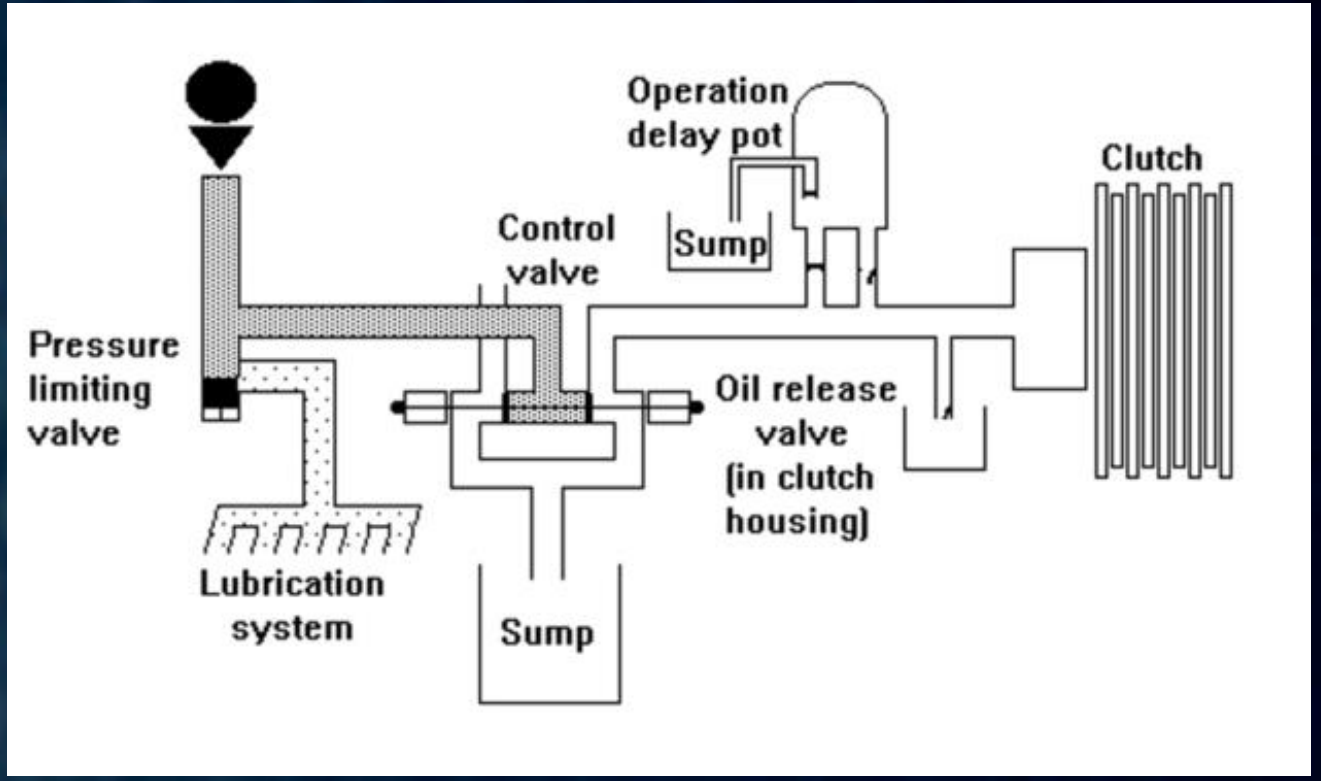
Gearbox Automation

REINTJES POWERTRAIN SOLUTIONS

Control valve Block



1 Gearbox disengaged
2 Lines fill
3 Piston expands
4 Operation delay pot fills
5 Final pressurization
6 Normal operation



REINTJES next

Gearbox Automation – REINTJES GBX

“Complete rework of gearbox control”

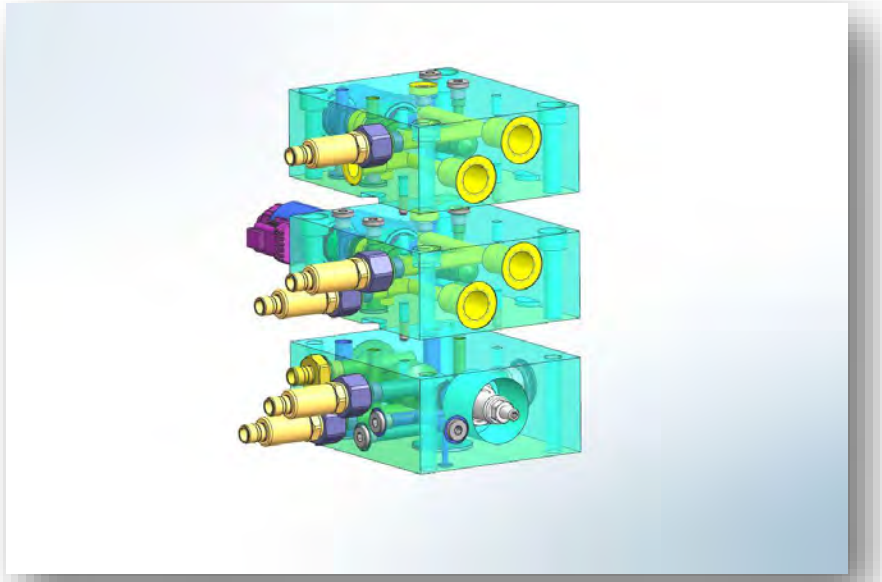
- Common hydraulic clutch control system to cover all REINTJES Gearboxes → ONE for ALL
- Complete adjustable clutch curve to realize application related times and amplitudes
- Improve gearbox performance and integration
- Create Maritime 4.0 interfaces to the gearbox
- Substitution of supervision hardware / avoid double installation per trade

REINTJES next

Gearbox Automation – REINTJES GBX

Great customer benefits

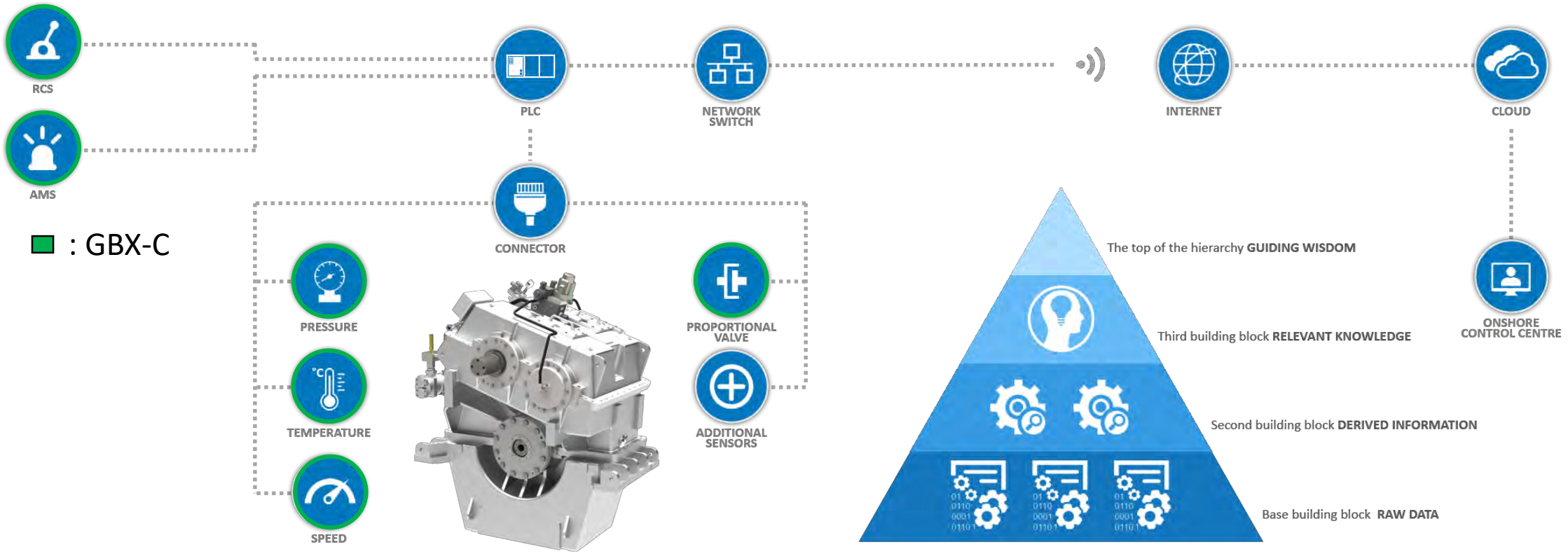
- Easier installation
  - central electric connecting point
  - central connection harnesses
  - hydraulic shaft brake reduces installation effort
- Easier commissioning
  - clutch curve individual on site adoptable to existing powertrain by clutch curve calibration function
- Operation
  - standard clutch curve
  - crash stop recognition
  - less influence of temperature and therefore, viscosity of oil
  - LOP available
  - CMS ready, also Remote Vibration CMS
  - Bus connection to higher-level systems
  - additional features available by updating the software



REINTJES next

Gearbox Automation – REINTJES GBX

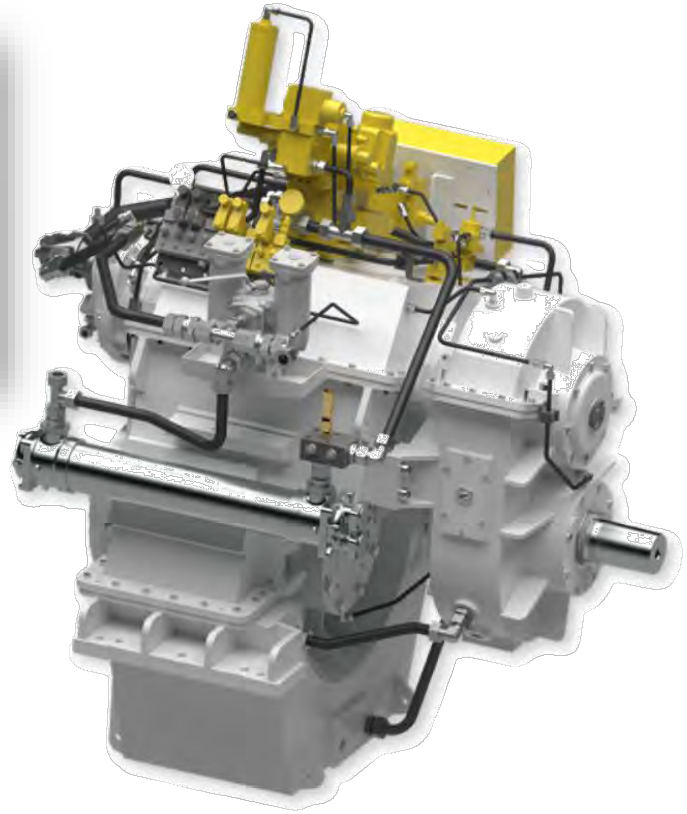
Extended Features for GBX-A



REINTJES next

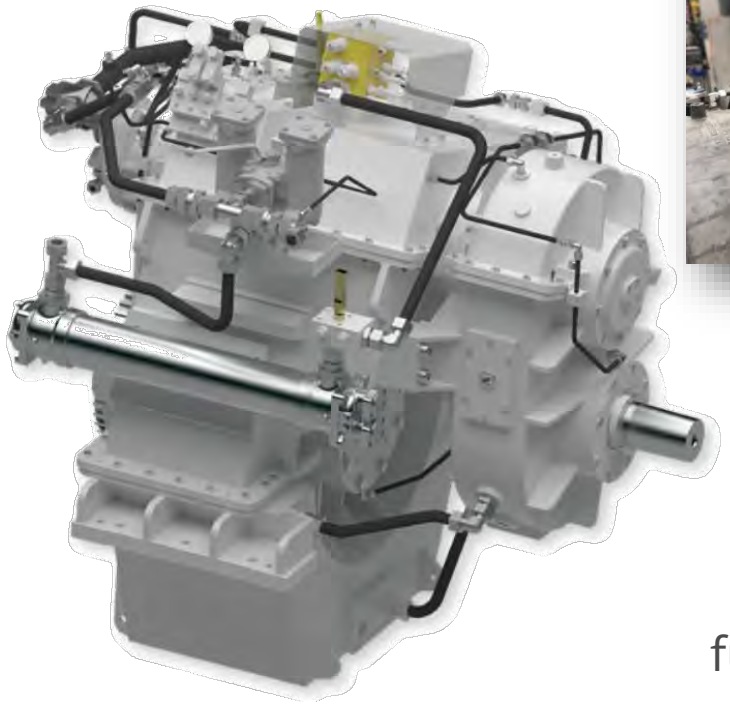
Gearbox Automation – REINTJES GBX

Space saving due to less components – example WGF 863 V / 14.286 : 1



today

high content of hydraulic components



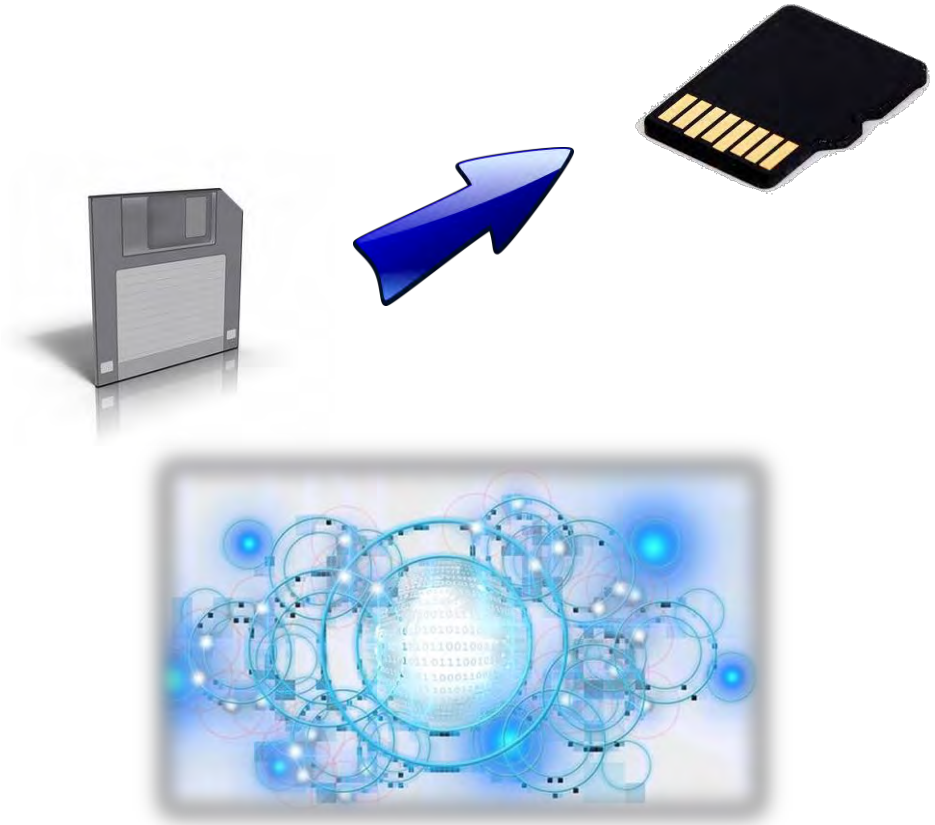
future

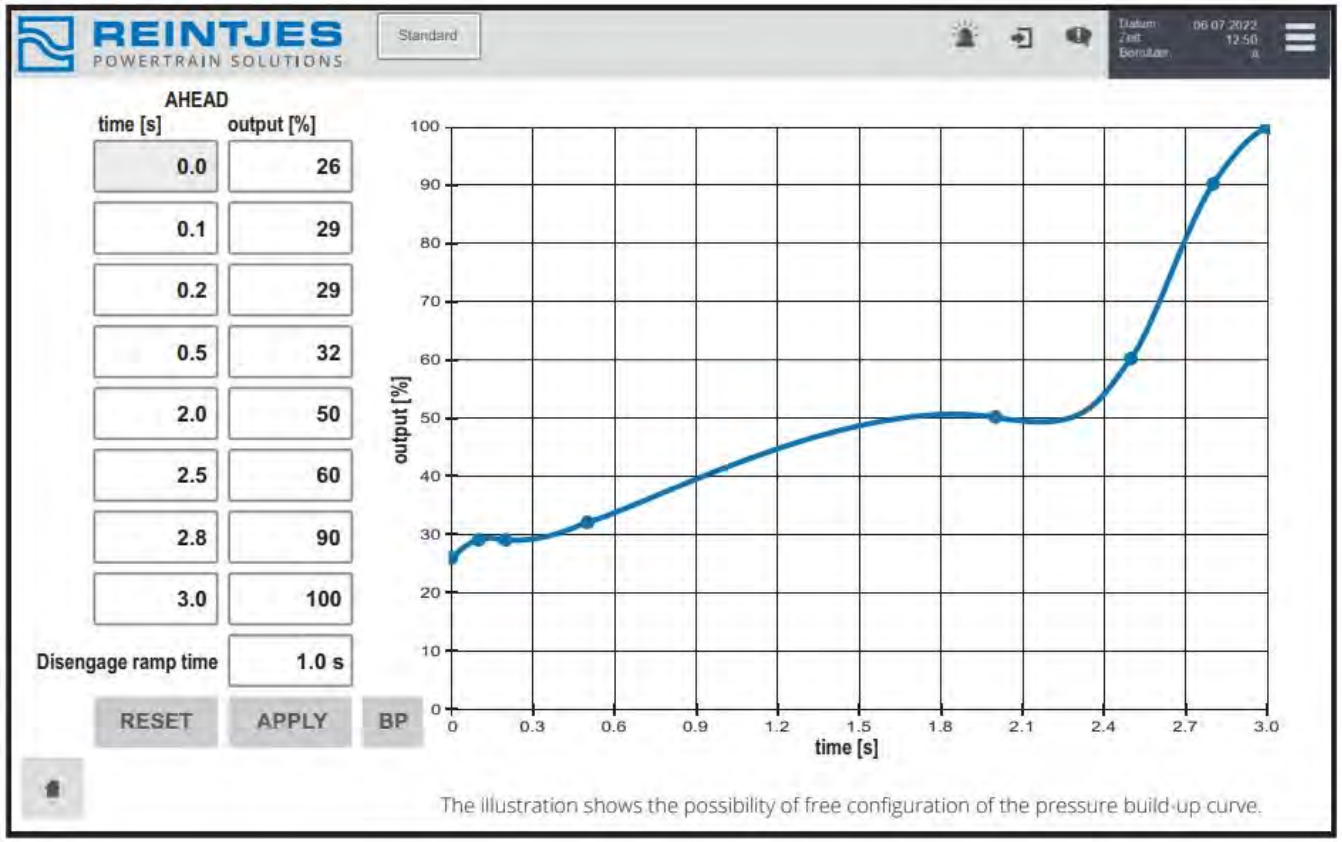
one hydraulic block with proportional valves

REINTJES next

Gearbox Automation – REINTJES GBX

Sum up REINTJES GBX





REINTJES next

REINTJES Control System

REINTJES POWERTRAIN SOLUTIONS

Ergonomic and functional

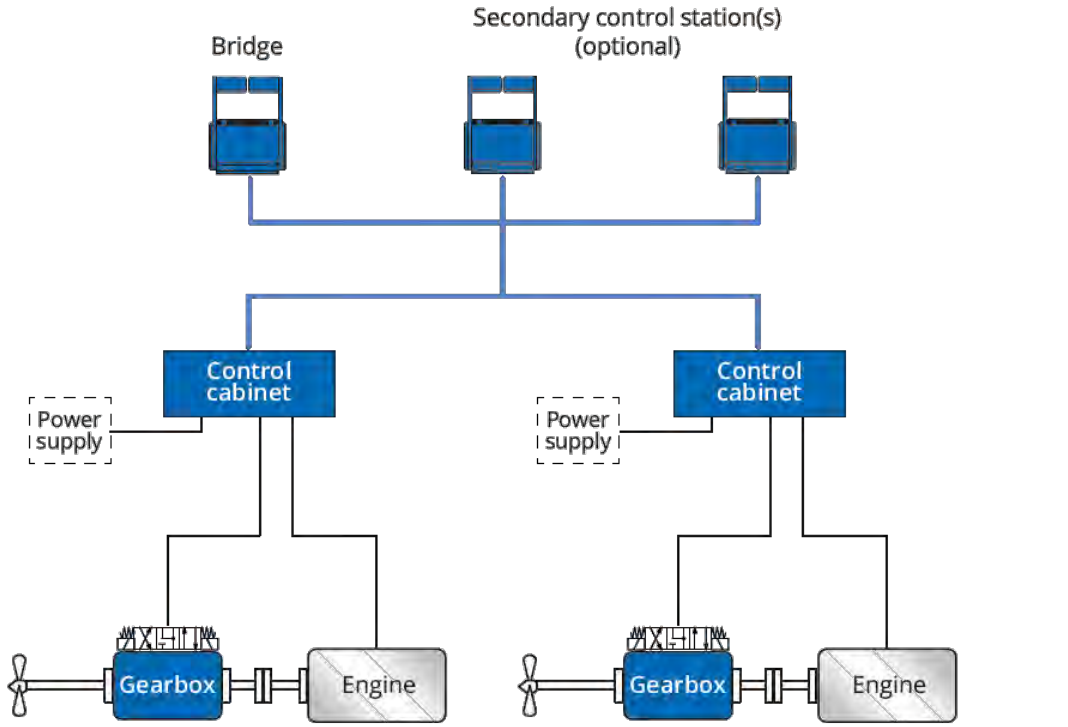
RCS

Name	FPP Propulsion Type	Bridge Components	Scope of Supply & Features
Basic	■ Vessels with reverse reduction gearbox		■ 1 Main control ■ Up to 3 side controls ■ Cables and connectors
Advanced	■ Vessels with reverse reduction gearbox ■ REINTJES Hybrid System (RHS)		■ 1 Main control ■ Up to 3 side controls ■ Cables and connectors ■ Mode change only in neutral
Ultimate	■ Vessels with reverse reduction gearbox ■ REINTJES Hybrid System (RHS)		■ 1 Main control ■ Up to 5 stations ■ Automatic mode ■ Mode change outside of neutral ■ Cables and connectors

REINTJES next

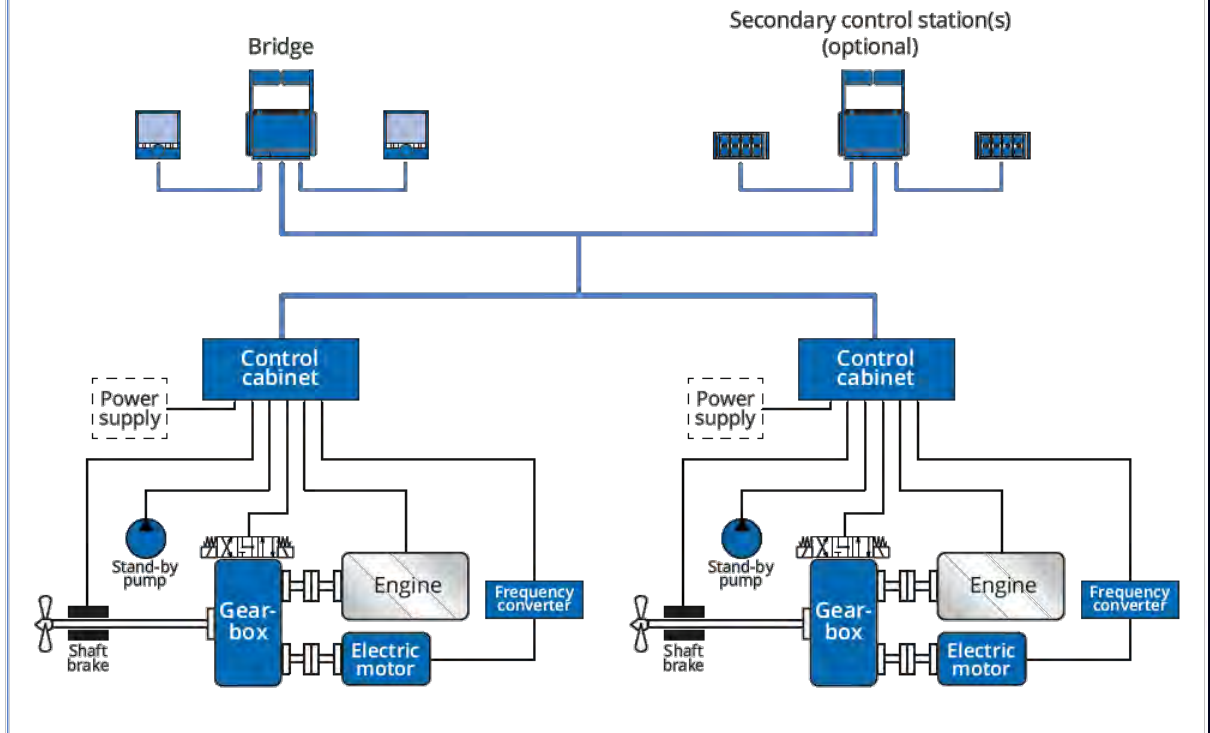
REINTJES Control System

Ergonomic and functional



Basic

* REINTJES scope of supply



Advanced

* REINTJES scope of supply

REINTJES next

REINTJES Control System

Developed for FPP propulsion

- Perfectly linked to REINTJES Gearbox Automation (GBX-C & GBX-A)
- Synchronized to REINTJES Hybrid System (RHS)
- High flexibility and custom requirement possible
    - control of PTO, PTI, Trolling, Slip & Grip
    - Interface to Dynamic Positioning (DP) systems, etc.
- lean design and user-friendly operation
    - single hand control of engine and gearbox
    - operation element suitable for long-term outdoor use
- possible for all popular marine engines
- staff training online, in the factory or locally
- class-approved by DNV, BV, KR, LR, CCS, ClassNK, ABS (others on request)

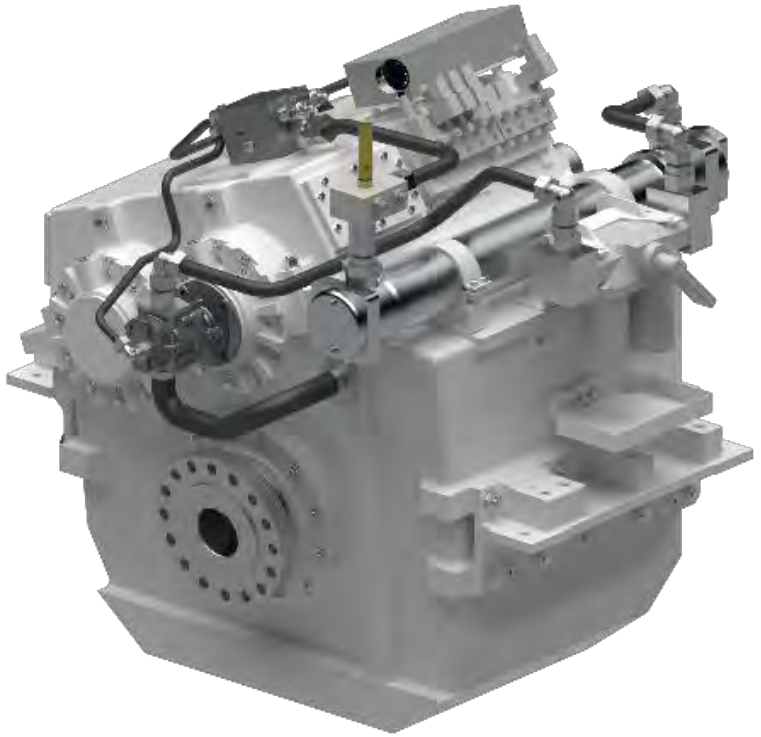
"Liinsand" - equipped with ultimate solution

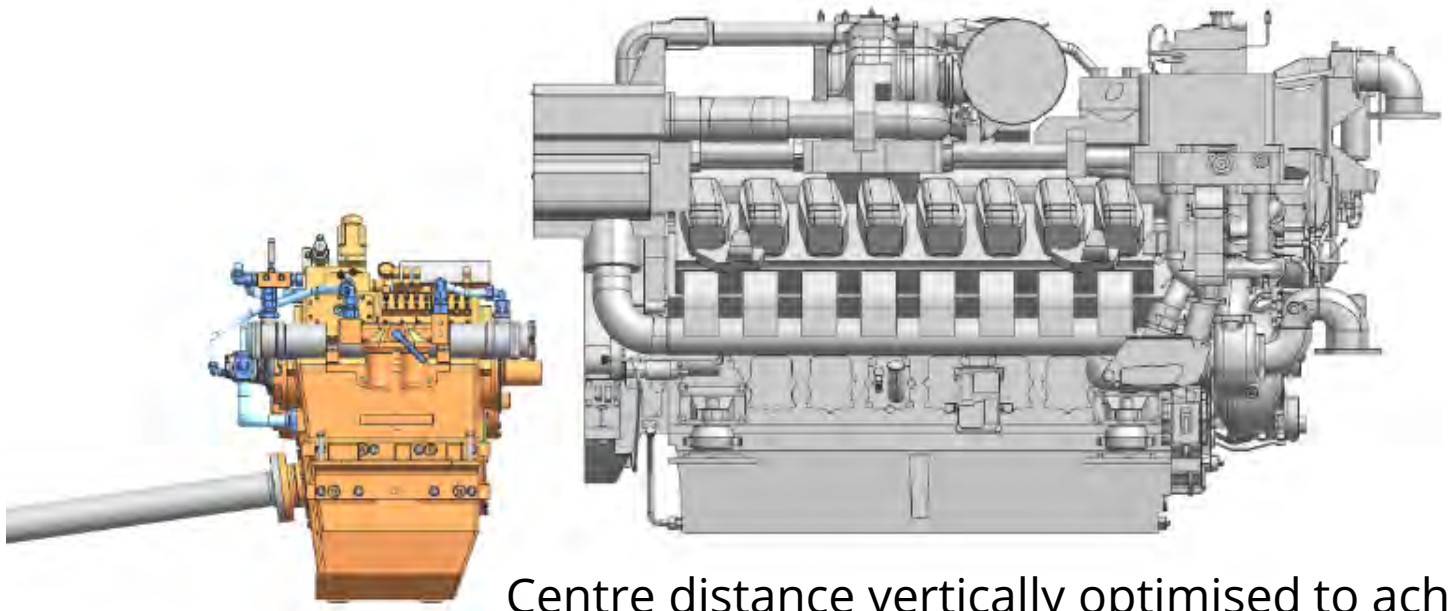
REINTJES next

New down angle gearbox series – available solutions

REINTJES POWERTRAIN SOLUTIONS

WVSA





Centre distance vertically optimised to achieve a **lower centre of gravity of the power train**

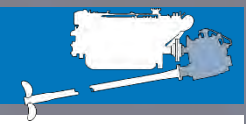
- Improved driving behaviour
- Shorter stabilisers

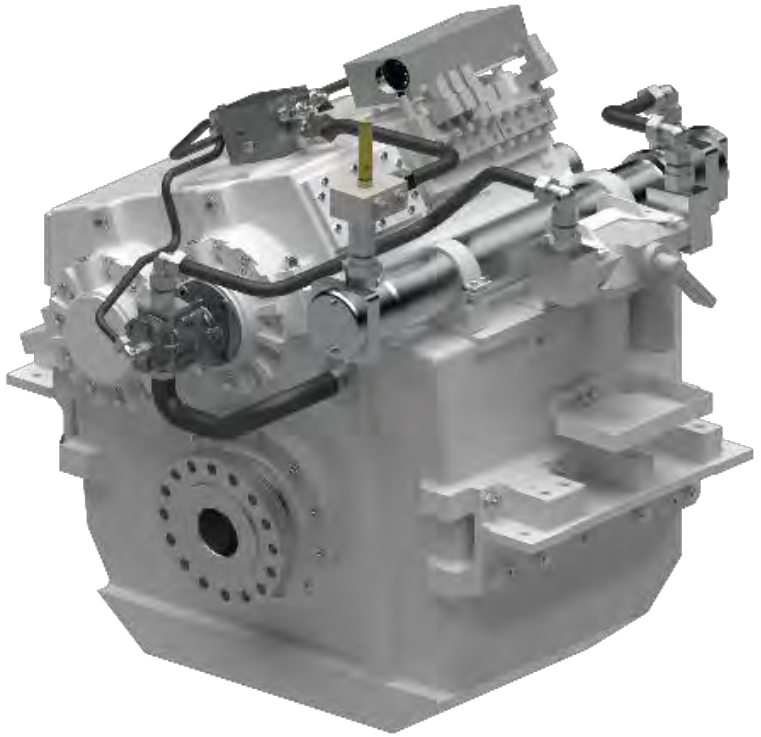
REINTJES next

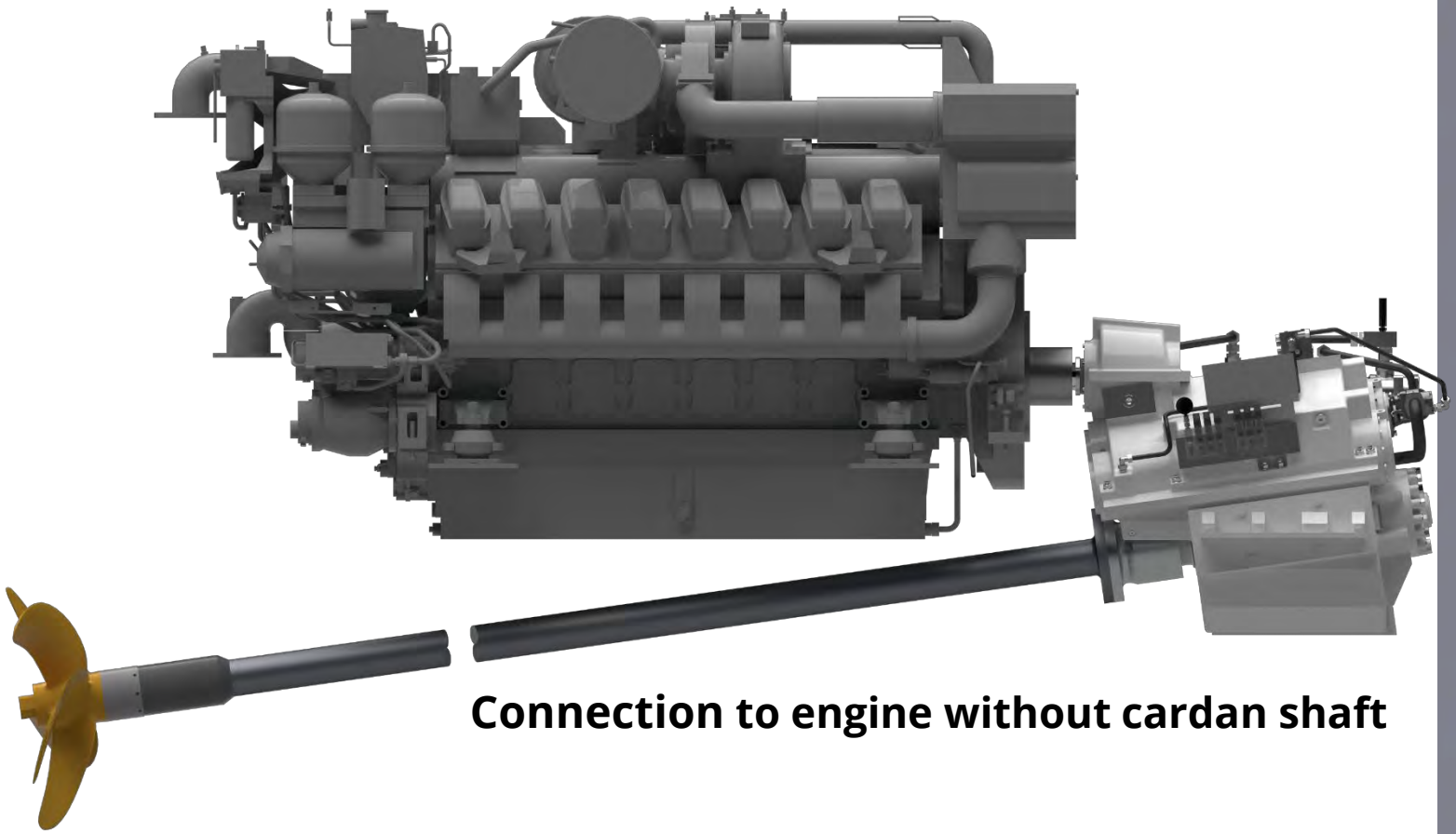
New down angle gearbox series – available solutions

REINTJES POWERTRAIN SOLUTIONS

WVSFA / ZWVSFA





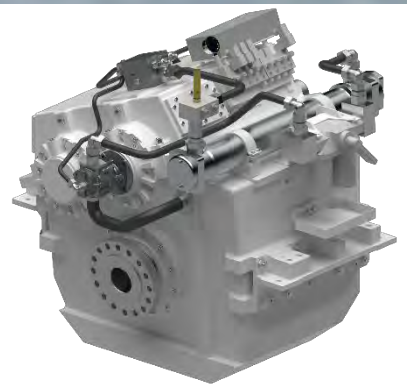


Connection to engine without cardan shaft

REINTJES next

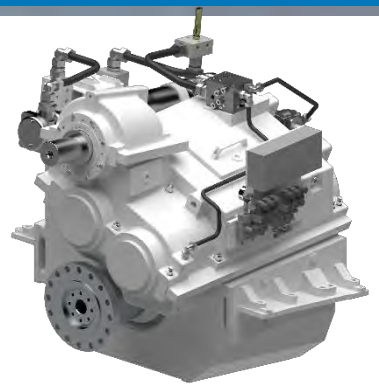
New down angle gearbox series – available solutions

WVSA

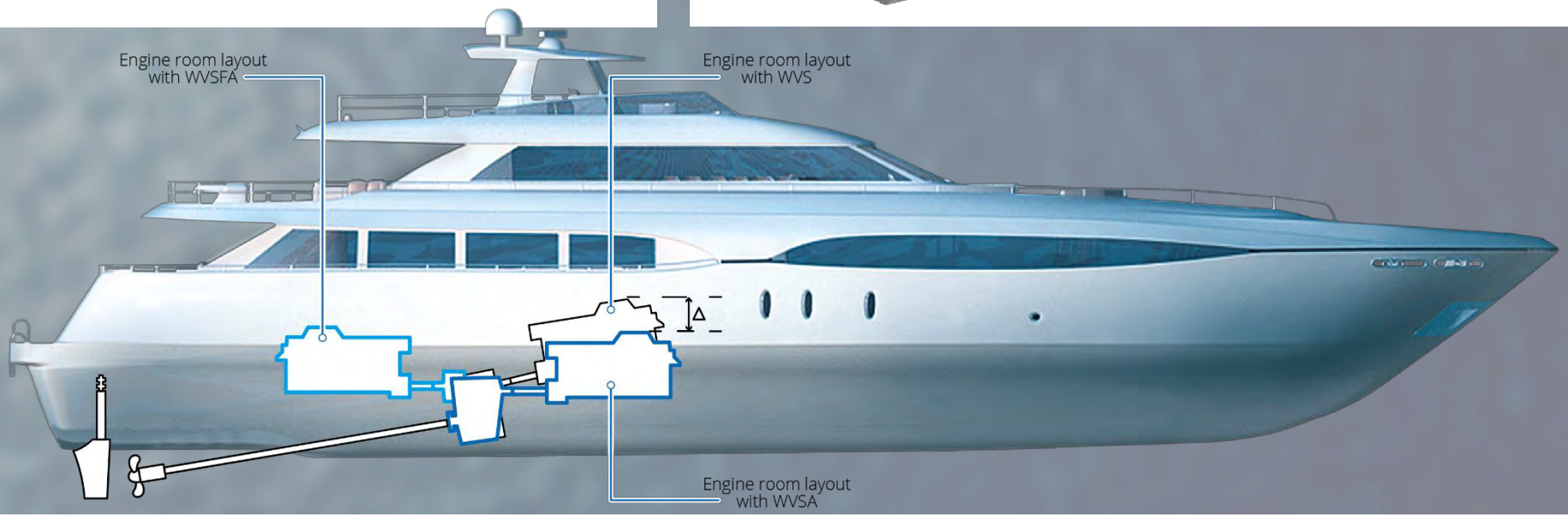


- Reverse reduction gearbox w/ disc clutch
- For fast vessels with FPP
- Ratio range 2.031 – 4.389
- Power range 1,496 kW – 4,692 kW
- Vertical shaft offset minimised
- Aluminum housing

WVSFA / ZWVSFA



- Reverse reduction gearbox w/ disc clutch
- For fast vessels with FPP
- Ratio range 1.973 – 5.111
- Power range 733 kW – 3,844 kW
- Shaft offset vertically optimised to avoid cardan shaft arrangements
- Aluminum housing

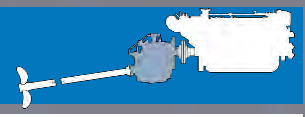


REINTJES next

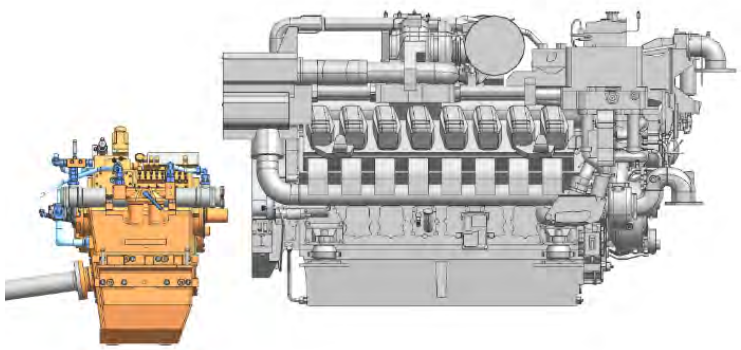
New down angle gearbox series – sizes

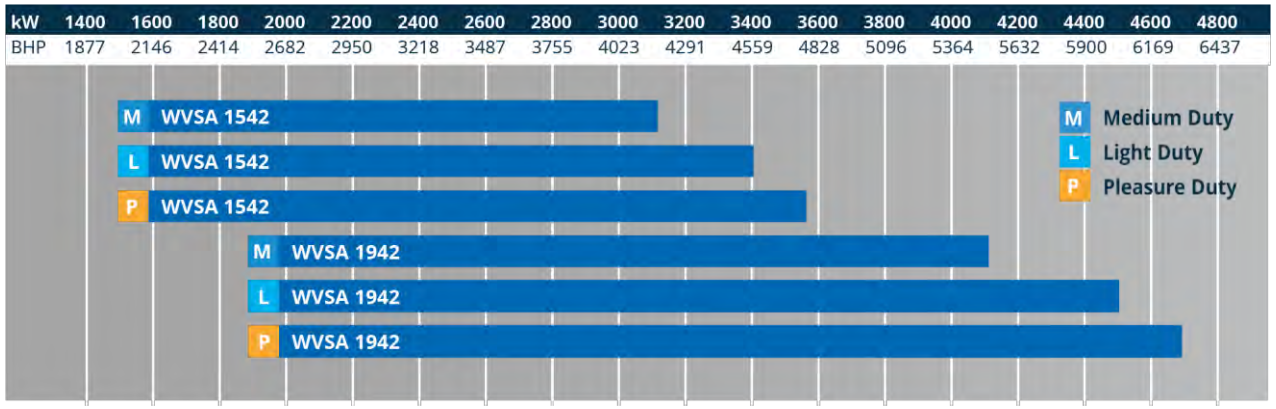
REINTJES POWERTRAIN SOLUTIONS

Type WVSA



WVSA / WLSA	
Gearbox type:	Reduction gearbox
Main application:	Fast vessels
Driven component:	Fixed Pitch Propeller (Controllable Pitch Propeller)
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Input and output shafts on opposite sides, vertically offset (standard)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Aluminum alloy, weight optimised design
Mounting:	Free-standing / on-screw surface/ resilient-mounting
Propulsion system:	Diesel-mechanic / hybrid ready (optional)
Auxiliary drives:	K21/ K31 in primary (A) & secondary (B) execution



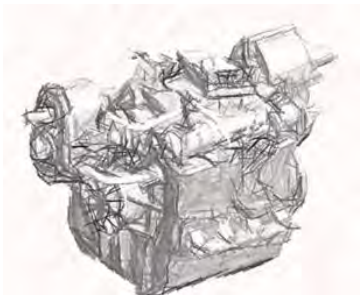


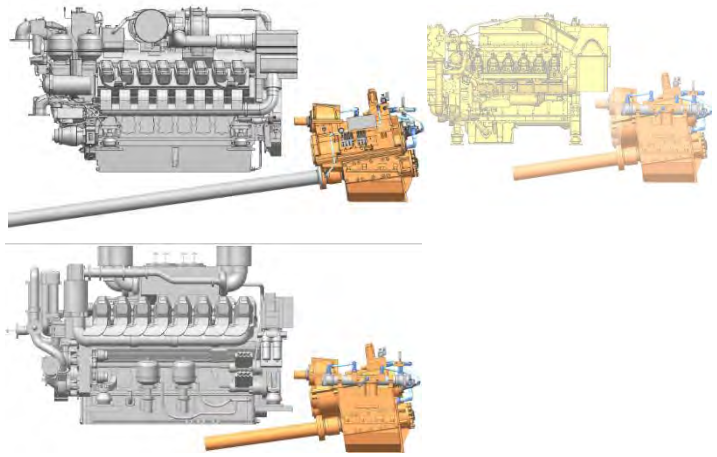
REINTJES next

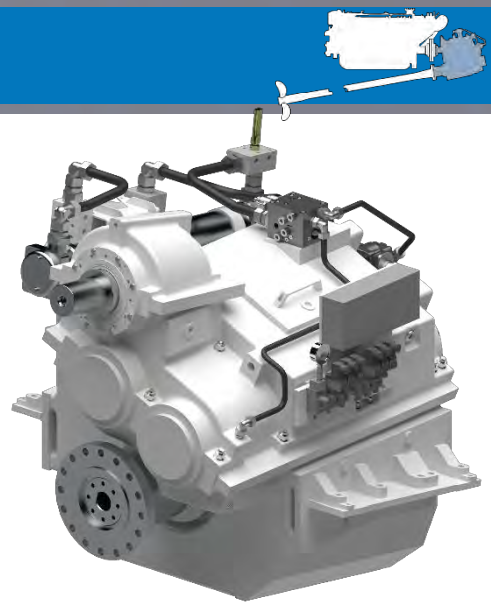
New down angle gearbox series – sizes

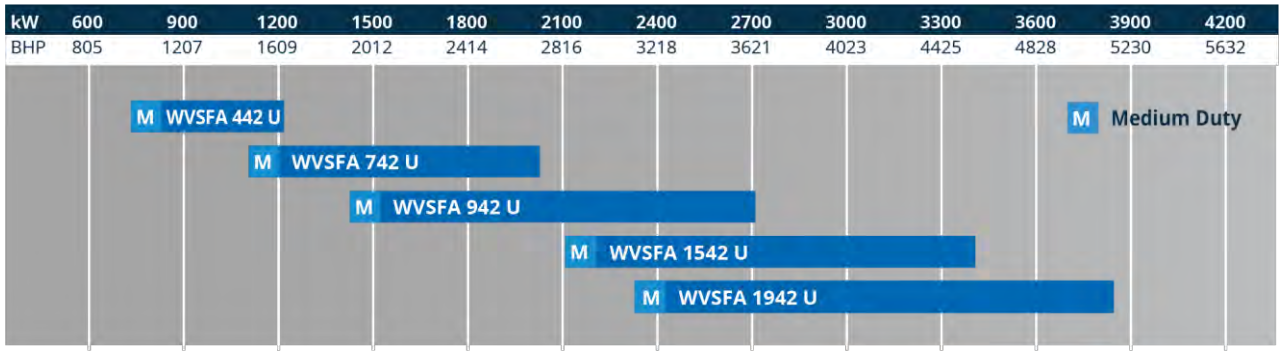
Type WVSFA / ZWVSFA

WVSFA / ZWVSFA / (WLSFA)	
Gearbox type:	Reduction gearbox
Main application:	Fast vessels
Driven component:	Fixed Pitch Propeller (Controllable Pitch Propeller)
Shaft rotation:	Co- or Counter-rotating shafts
Reduction ratios:	Standard / custom (on request)
Shaft Arrangements:	Input and output shafts on same sides (V-Drive), vertically offset (standard)
Clutch(es):	Hydraulically operated clutch(es)
Bearing type:	Roller bearings
Gearbox housing:	Aluminum alloy, weight optimised design
Mounting:	Free-standing / on-screw surface/ resilient-mounting
Propulsion system:	Diesel-mechanic / hybrid ready (optional)
Auxiliary drives:	K21/ K31 in primary (A) & secondary (B) execution









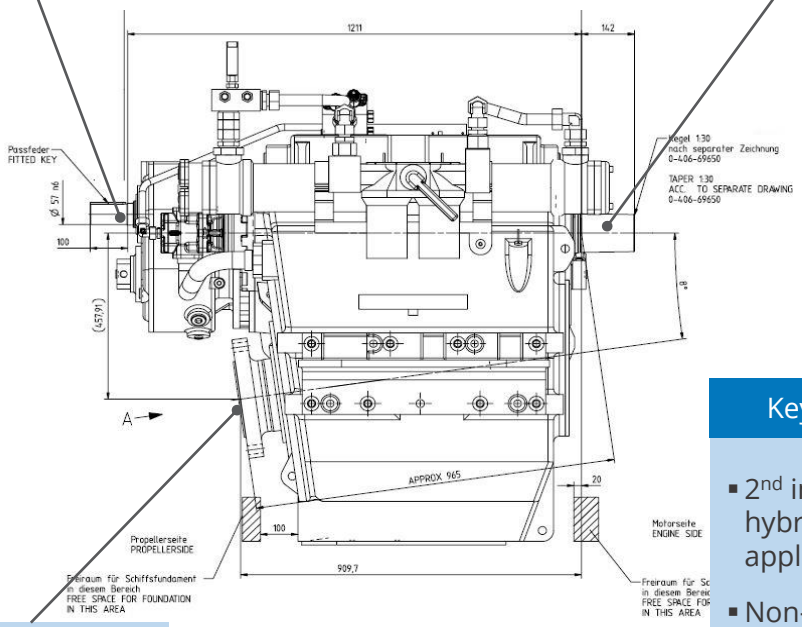
REINTJES next

New down angle gearbox series – auxillary drives

Hybrid Ready WVSA/WVSFA Series

Hybrid ready input shaft (PTI)

Standard input shaft (from main engine)



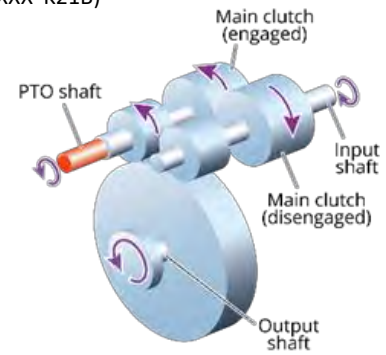
Output shaft (to propeller)

Key Features

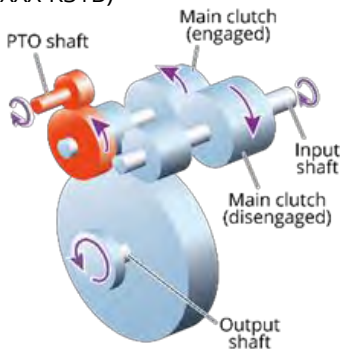
- 2nd input shaft for hybrid (PTI) applications
- Non-controllable PTI input shaft selectable

Available PTO / PTI Options

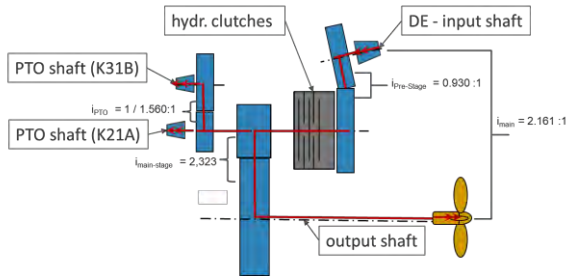
DE – Mode // PTO/PTI – Mode
(WVSA XXXX K21B)



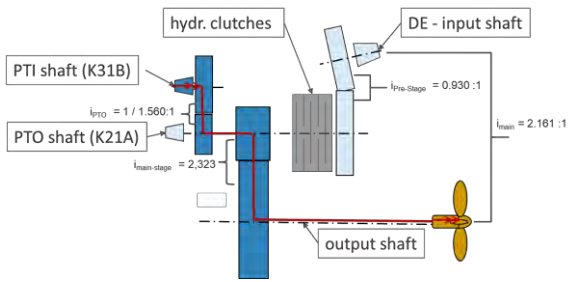
DE – Mode // PTI – Mode
(WVSA XXXX K31B)



DE – Mode // PTO – Mode
(WVSFA XXX U K21A/ K31B)



DE – Mode // PTI – Mode
(WVSFA XXX U K21A/ K31B)

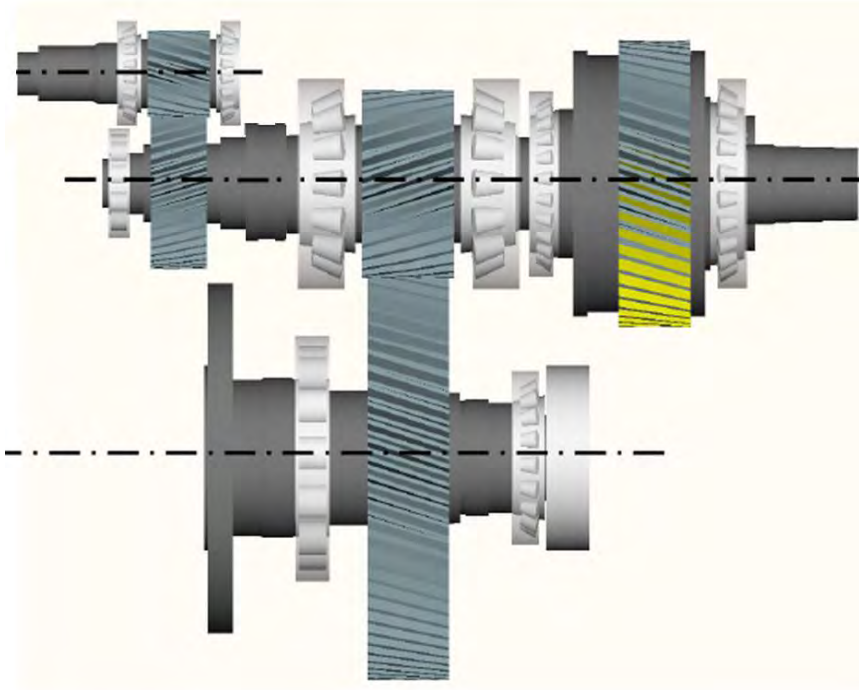


REINTJES next

New auxiliary drive designed for permanent magnet E-Motors

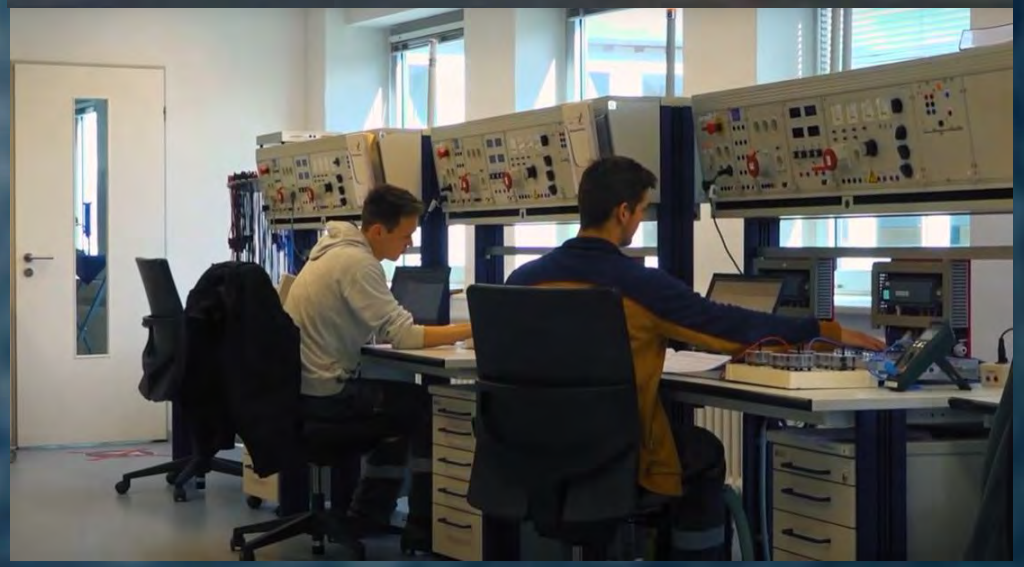
New development great benefits

PTO/PTI K35B



REINTJES next

Innovation for Tomorrow



REINTJES References

Our cutting-edge portfolio of maritime icons

Small Gearboxes

Examples from our marine product portfolio and applications

WAF 264

- Reverse reduction gearbox w/ disc clutch
- For all type of FPP applications
- Power range 250 kW – 1,200 kW
- Shaft offset
- Cast iron housing

Inland Waterway Vessel Girbaud
2 x 368 kW at 1,800 rpm
Gearbox weight 700 kg

WVS 430

- Reverse reduction gearbox w/ disc clutch
- For fast vessels with FPP
- Power range 400 kW – 2,100 kW
- Shaft offset
- Aluminum housing

Patrol Boat Guardian 1
3 x 820 kW at 2,100 rpm
Gearbox weight 490 kg

Medium Gearboxes

Examples from our marine product portfolio and applications

LAF 863

- Reduction gearbox w/ disc clutch
- For all type of CPP applications
- Power range 924 kW – 2,763 kW
- Shaft offset
- Cast iron housing

Offshore Supply Vessel Karina
2 x 2,350 kW at 1,800 rpm
Gearbox weight 3,100 kg

WVS 730

- Reverse reduction gearbox w/ disc clutch
- For fast vessels with FPP
- Power range 1,470 kW – 4,725 kW
- Shaft offset
- Aluminum housing

Fast Crew Supplier Dona Diana
4 x 1,118 kW at 1,600 -1,800 rpm
Gearbox weight 820 kg

Large Gearboxes

Examples from our marine product portfolio and applications

SVAL 1250

- Reduction gearbox w/ disc clutch
- For all type of CPP applications
- Power range 9,000 kW – 13,000 kW
- Shaft offset
- Slide bearings
- Cast iron housing

Container Feeder Oceanex Avalon
1 x 11,120 kW at 428 rpm
Gearbox weight 45,000 kg

SVA 1200

- Reduction gearbox w/o clutch
- For all type of CPP applications
- Power range 10,000 kW – 15,000 kW
- Shaft offset
- Slide bearings
- Cast iron housing

Heavy Lift Vessel Lone
1 x 12,600 kW at 428 rpm
Gearbox weight 31,000 kg

Large Gearboxes

Examples from our marine product portfolio and applications

DLG 110131

- Twin input / single output reduction gearbox w/ disc clutch
- For all type of CPP applications
- Power range 2 x 1,400 kW - 2 x 15,000 kW
- Horizontal offset
- Cast iron housing

RoRo Ferry Volcan Del Teide
4 x 8,400 kW at 500 rpm
Gearbox weight 62,000 kg

VLJ 6831

- Reduction gearbox w/ disc clutch
- For waterjet applications
- Power range 4,365 kW – 11,000 kW
- Shaft offset
- Aluminum housing

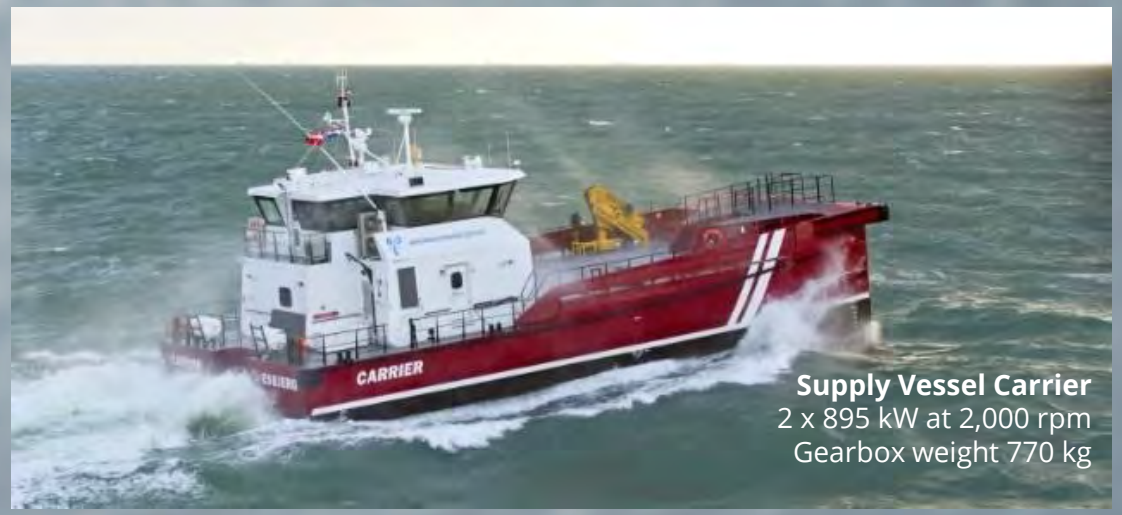
Fast Ferry Leonora Christina
4 x 10,000 kW at 1,050 rpm
Gearbox weight 3,900 kg

Special Gearboxes

Examples from our marine product portfolio and applications

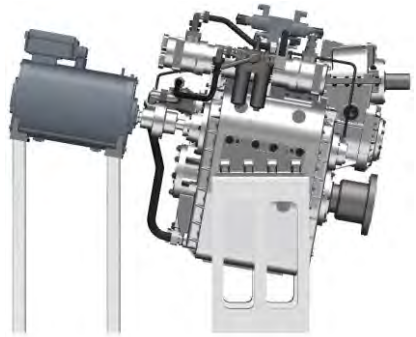
ZWVS 440

- Reverse reduction two-speed-gearbox
- For fast vessels with FPP
- Power range 580 kW – 2,040 kW
- Shaft offset
- Aluminum housing



Supply Vessel Carrier
2 x 895 kW at 2,000 rpm
Gearbox weight 770 kg

ZWVSA 440 U



- Two-speed reverse reduction gearbox
- For fast vessels with FPP
- Power range 550 kW – 1,300 kW
- U-drive
- 8 to 10 degree down angle
- Aluminum housing

Fast Crew Supplier 2710
2 x 1,081 kW at 2,000 rpm
Gearbox weight ca. 750 kg

Special Gearboxes

Examples from our marine product portfolio for yacht applications

WAF 1963 HL/HR

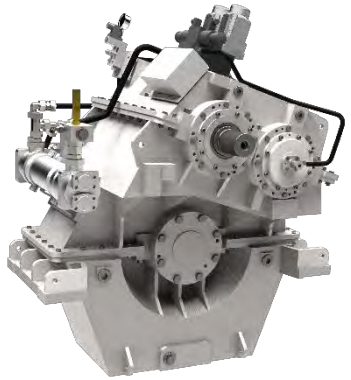
- Reverse reduction gearbox
- For displacement yachts with FPP
- Power range 3000 kW – 4,300 kW
- Horizontally shaft offset
- Fabricated housing

MY Barbara by OCEANCO
2 x 3600 kW at 2050 rpm
Gearbox weight 7020 kg

Special Gearboxes

Examples from our marine product portfolio for yacht applications

WAF 863



- Reverse reduction gearbox w/ disc clutch
- For displacement yachts with FPP
- Power range 1,650 kW – 2,480 kW
- Vertically Shaft offset
- Cast iron housing

Yacht_NorthernStar
2 x 2,000 kW at 1,600 rpm
Gearbox weight 3,290 kg

Special Gearboxes

Examples from our marine product portfolio and applications

RSG 450-1

- REINTJES step up gearbox
- Power range 500 kW - 3,000 kW
- Vertical shaft offset
- Fabricated housing

Anchor Handling Tug Alice One
2 x 2,983 kW at 430 rpm
Gearbox weight 2,750 kg

RDG 500

- Reduction gearbox w/o clutch
- For dredging pumps
- Power range 150 kW – 5,000 kW
- Vertical shaft offset
- Fabricated housing

Dredger Stella Maris
1,900 kW at 1,500 rpm
Gearbox weight 2,470 kg

Hybrid Systems

Examples from our marine product portfolio and applications

WAF 344 HS

Project-related illustration

- REINTJES Hybrid System
- Gearbox with combined electrical motor, generator and FC
- PTI power range 60 kW – 630 kW
- Cast iron housing

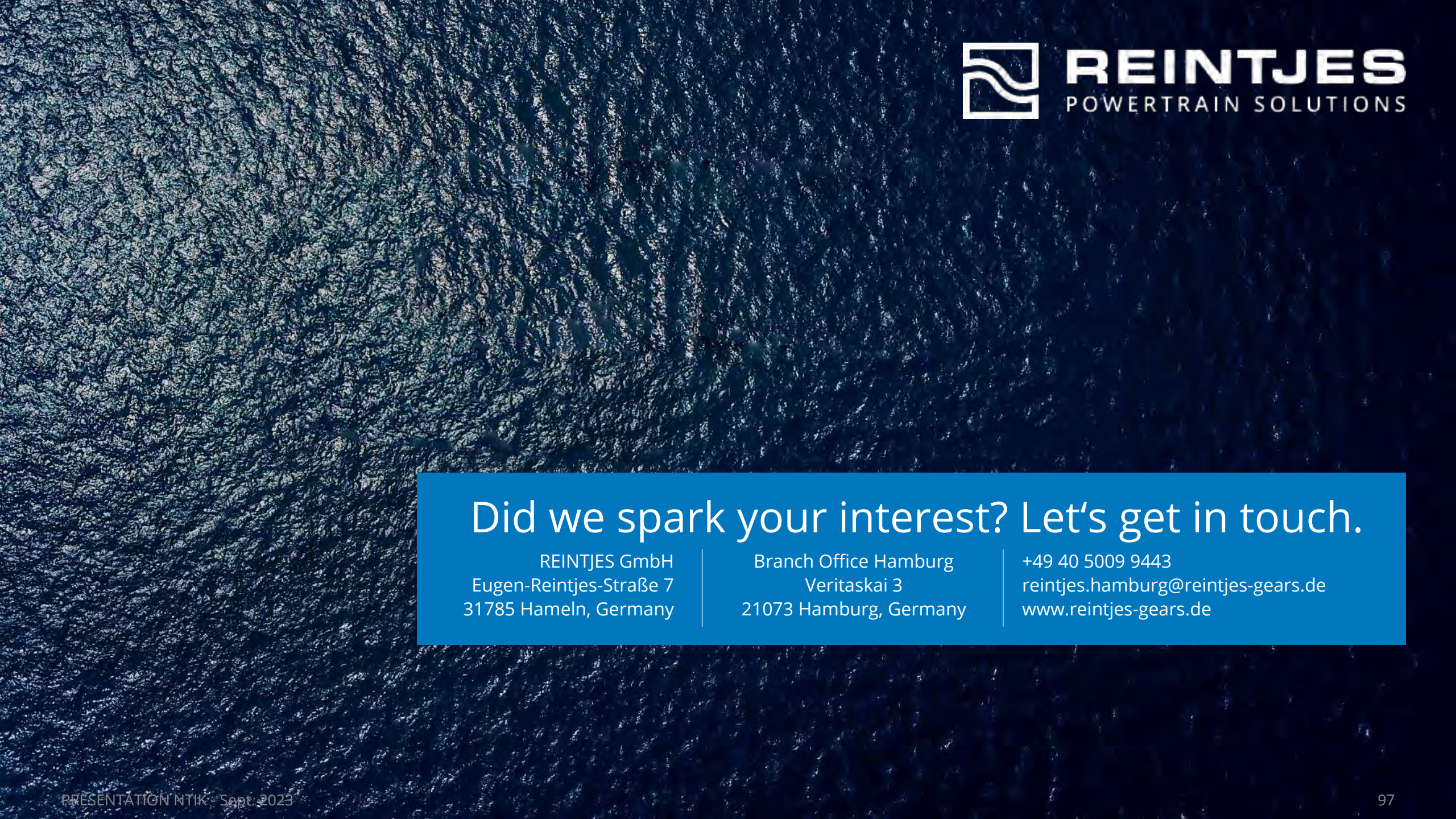
Yacht My Paradis
2 x 735 kW at 2,300 rpm
Gearbox weight 1,200kg

WAF 344 HS

Project-related illustration

- REINTJES Hybrid System
- Gearbox with combined electrical motor, generator and FC
- PTI power range 60 kW – 630 kW
- Cast iron housing

Survey Vessel Geo Focus
2 x 651 kW at 2,200 rpm
Gearbox weight 1,200kg



REINTJES
POWERTRAIN SOLUTIONS

Did we spark your interest? Let‘s get in touch.

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