EN

Ortlinghaus

MARINE

propulsion technology

Keeping vessels
on course

Content

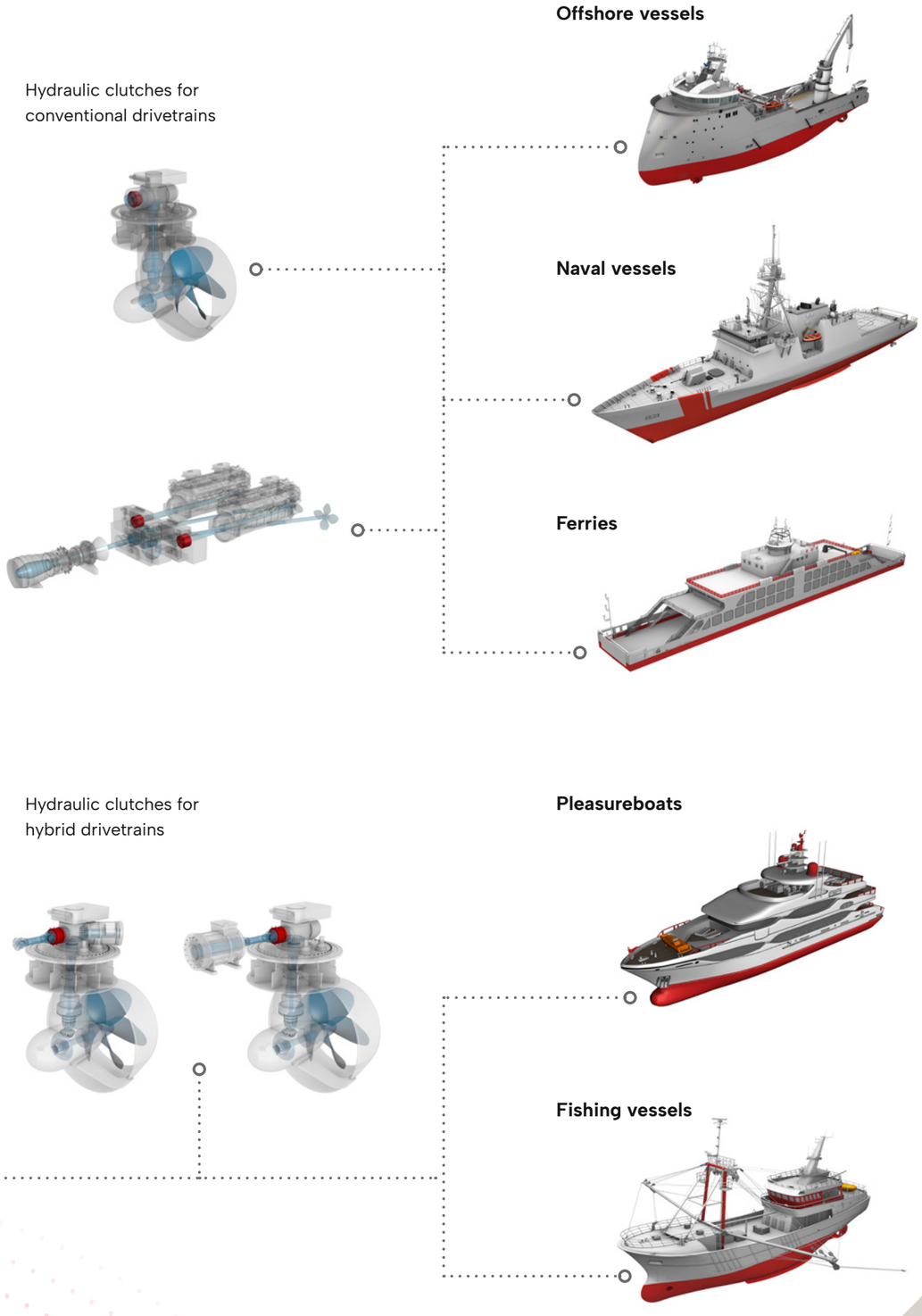
Marine propulsion technology

The optimal design of marine propulsion solutions and the selection of best-fitting components for an operational profile is a big challenge for today's shipowners, shipbuilders, and shipdesigners. The scope of options is growing, and it is difficult to keep up with the quick developments. With an extensive history in the marine market, Ortlinghaus has delivered innovative products such as clutches, brakes, and propulsion system solutions to customers worldwide. All these products have proven themselves in this field for many decades.

To keep up with the rapid pace of development and the growing requirements of new intelligent drive solutions Ortlinghaus uses its experience and market presence together with its customers and partners to meet these challenges.

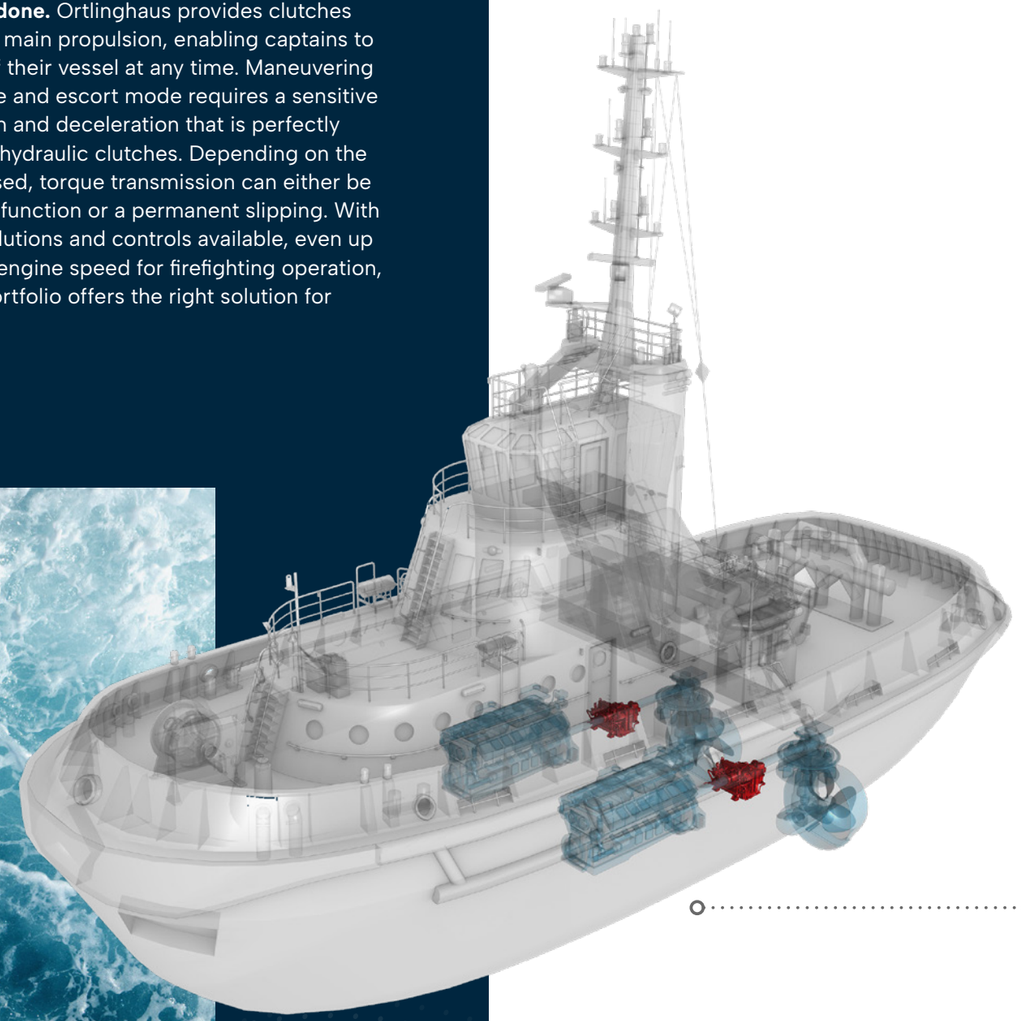
There are many factors that need to be taken into account when deciding which solution is the best for specific drivetrain application and Ortlinghaus is aware of these. Choosing the right solution for the different types of drivetrain application, is our daily business. With our new end of line test bench for our slipping clutch units Ortlinghaus has taken the next step towards the future to provide proven and tested quality.

This brochure is designed to introduce you to our products and solutions for marine propulsion technology.

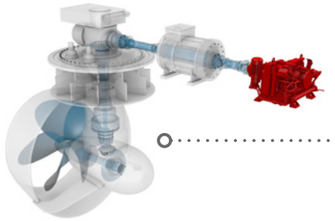


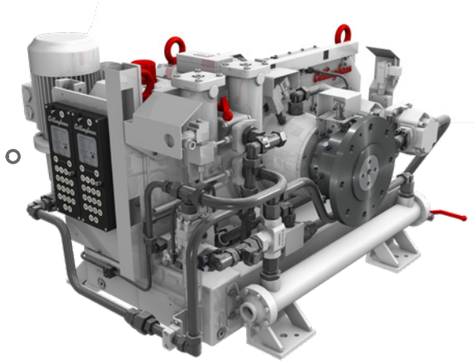
Solutions for tugboats

Getting the work done. Ortlinghaus provides clutches and brakes for the main propulsion, enabling captains to have full control of their vessel at any time. Maneuvering during assist mode and escort mode requires a sensitive speed acceleration and deceleration that is perfectly achieved with our hydraulic clutches. Depending on the driving concept used, torque transmission can either be realized by on/off function or a permanent slipping. With different clutch solutions and controls available, even up to a trolling at full engine speed for firefighting operation, the Ortlinghaus portfolio offers the right solution for each application.

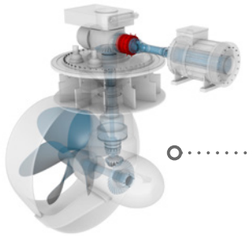


Hybrid drivetrains

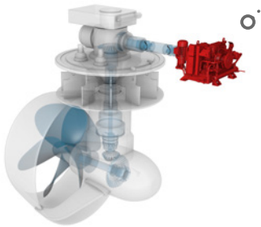




Prop.act
Self-sufficient, ready-to-install clutch unit



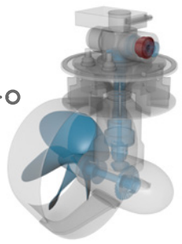
Series 021
Hydraulic multi-plate clutch



Conventional drivetrains

Series 022
Hydraulic brake

Series 088
Oil inlet



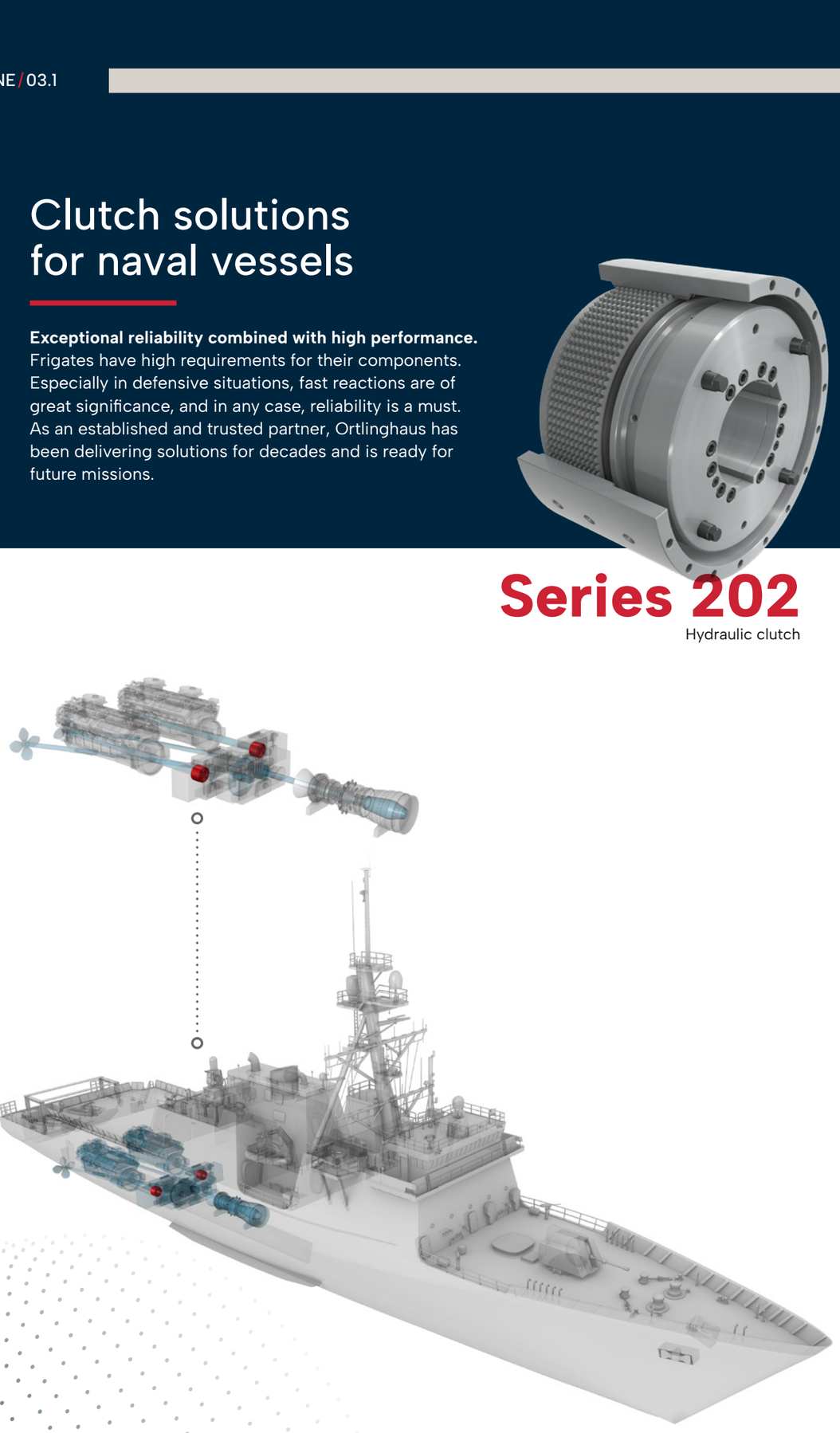
Series 021/202
Hydraulic multi-plate clutch

Clutch solutions for naval vessels

Exceptional reliability combined with high performance. Frigates have high requirements for their components. Especially in defensive situations, fast reactions are of great significance, and in any case, reliability is a must. As an established and trusted partner, Ortlinghaus has been delivering solutions for decades and is ready for future missions.

Series 202

Hydraulic clutch



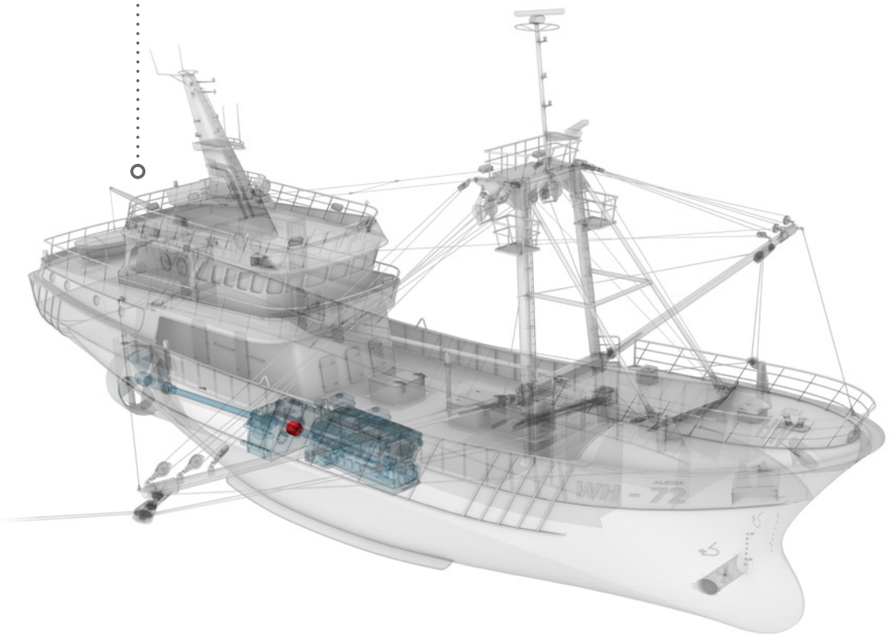
Clutch solutions for fishing vessel

Full of dedication for the catch. High-quality functionality and crew safety during all sea conditions are what count for a fishing vessel and this is what Ortlinghaus drivetrain solutions define.

Series 021

Hydraulic clutch

Series 202
Hydraulic clutch



Clutch series 021 and 202

Hydraulic multi-plate clutch. Ortlinghaus clutches unite the properties of high torque and high thermal absorption rates into a compact design. This brings the highest performance into the smallest space in combination with low weights and costs. The customer interface can be adapted to customer needs and this offers design flexibility and low integration efforts on the customer side.

High power density
The Ortlinghaus sinter lining combination inside these clutches combines highest torques in compact clutch designs.

High engineering competence
With many decades of experience, Ortlinghaus has designed thousands of clutches for different applications and drivetrain solutions safely and reliably.

Optimal maintenance conditions
These clutches deliver durability and long service intervals.

Maneuverability
With the wet-running frictions system inside Ortlinghaus clutches, constant performance is ensured.

Lower dry docking costs
Due to long service intervals lower dry docking costs can be achieved.

Efficient operation
The nearly loss-free torque transmission ensures efficient operation.

Simple integration
Customizable interfaces of these clutches allow a simple integration into different drivetrain applications.

Sustainability
Environmentally compatible oils (e.g. EAL oils) can be used for our clutches according to our released oil list.

Series 021[1)]

Hydraulic clutch

Feature		Size 81	Size 85	Size 89	Size 91	Size 94	Size 96
Dynamic torque	$T_{dyn.}$	125.000 Nm	180.000 Nm	250.000 Nm	315.000 Nm	450.000 Nm	630.000 Nm
Operating pressure	p_B	25 bar	25 bar	25 bar	25 bar	25 bar	25 bar
Speed[2)]	n	1.000 min^{-1}	900 min^{-1}	800 min^{-1}	750 min^{-1}	650 min^{-1}	600 min^{-1}
Outer diameter	A	620 mm	700 mm	785 mm	860 mm	970 mm	1.050 mm
Max. bore diameter	$B_{max.}$	235 mm	265 mm	285 mm	315 mm	370 mm	400 mm
Length	L	325 mm	360 mm	385 mm	410 mm	460 mm	510 mm

1) extract of available executions / other executions on request
2) higher speeds on request

Series 202[1)]

Hydraulic clutch

Feature		Size 66	Size 72	Size 75	Size 78	Size 80
Dynamic torque	$T_{dyn.}$	22.000 Nm	32.000 Nm	45.000 Nm	63.000 Nm	90.000 Nm
Operating pressure	p_B	25 bar	25 bar	25 bar	25 bar	25 bar
Speed[2)]	n	1.800 min^{-1}	1.600 min^{-1}	1.400 min^{-1}	1.200 min^{-1}	1.000 min^{-1}
Outer diameter	A	365 mm	425 mm	465 mm	515 mm	580 mm
Max. bore diameter	$B_{max.}$	125 mm	150 mm	165 mm	190 mm	210 mm
Length	L	230 mm	260 mm	282 mm	326 mm	350 mm

1) extract of available executions / other executions on request
2) higher speeds on request

Prop.act series 212

Self-sufficient, ready-to-install clutch system solution. The Prop.act is a self-sufficient clutch system which comprises an operationally ready clutch unit and the Prop.act control system. The unit can be freely positioned in the drivetrain and is bottom mounted in the engine room of the vessel. The engine and thruster can be connected using drive shafts, for example.

The Prop.act control system is connected to the ship's control. The supplied cooling system is integrated into the ship's cooling circuit. Free accessibility of the Prop.act facilitates ideal service conditions with a self-sufficient oil circuit, which is optimally adapted to the clutch system.

Extreme continuous slipping
The possibility of continuous slipping makes safe manoeuvring possible even under rough sea conditions and challenging escort maneuver.

Trolling to speeds close to 0
The slipping function of the clutch in combination with the additional brake makes it possible to vary the propeller speed to almost zero.

Safety
The slipping function offers a high level of safety against stalling of the diesel engine. The captain therefore always has a secure drive system at his disposal, allowing fast reactions to avoid loss of drive or control of escorted ships.

Costs
The combination of Prop.act and rudder propeller drive with fixed pitch propeller (FPP) is a cost-effective alternative to controllable pitch propeller (CPP) drives.

Simple integration
Straightforward integration of the Prop.act into the drivetrain is facilitated by free positioning into the drivetrain between the thruster and the engine, together with the control system supplied as an option and a cooling system.

Compact design
This type of installation saves space compared to separate firefighting drives.

Long service life
If deployed and operated correctly, the unit achieves a main service interval of at least 40,000 operating hours.

Sturdy construction
The sturdy construction of the unit offers a high level of operational reliability.

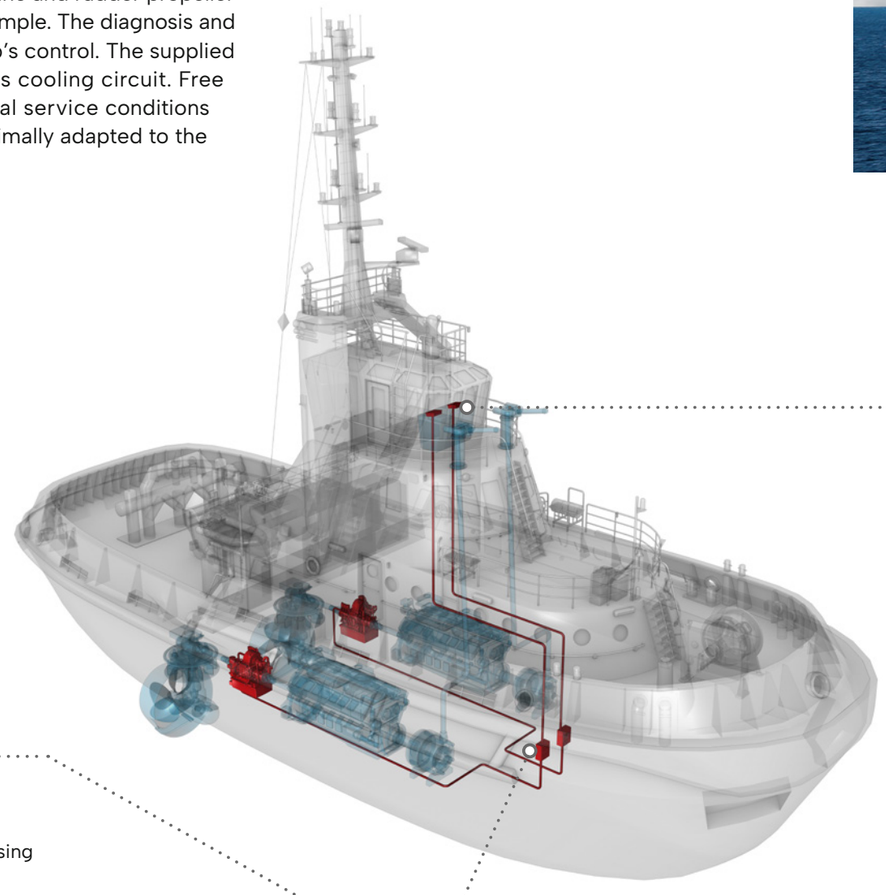
Self-sufficient, ready-to-install system solution

The Prop.act is a self-sufficient clutch system which comprises an operationally ready clutch unit and the diagnosis and control unit DC650. The unit can be freely positioned in the drivetrain and is mounted on the floor of the vessel. The engine and rudder propeller can be connected using drive shafts, for example. The diagnosis and control unit DC650 is connected to the ship's control. The supplied cooling system is integrated into the ship's cooling circuit. Free accessibility of the Prop.act facilitates ideal service conditions with a self-sufficient oil circuit, which is optimally adapted to the clutch system.

Prop.act Local Control

Control of Prop.act and customers interface housing

Enables local control of the Prop.act unit for the ship engineer. Houses the electrical connections for the customer interface. Additionally, the integrated touch display allows the same configuration and monitoring features as the remote control display.

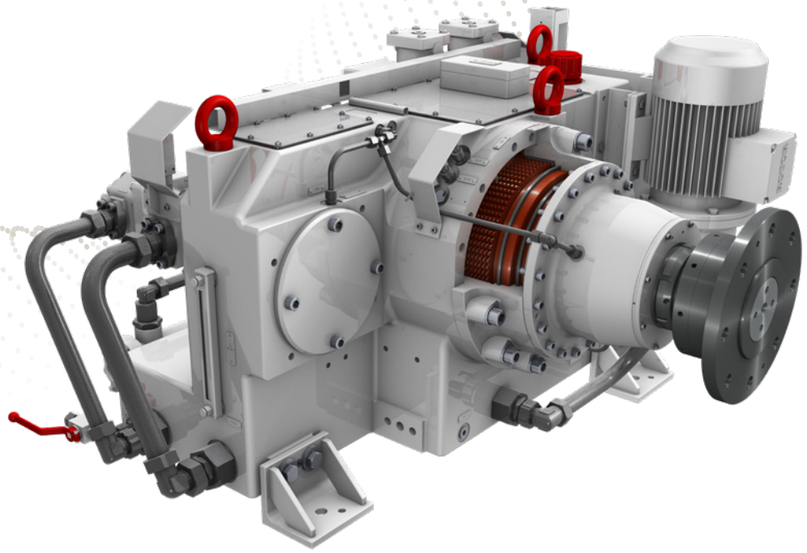


Prop.act Remote Control

Human Machine Interface (HMI)

The display provides an overview of all the necessary details concerning the condition of the clutch, possible fault messages, and warnings. It also enables the adjustment of parameters and the control of the unit.

Features



Active brake

As a shaft brake and for extremely precise variation of propeller rotation

As an option, the Prop.act is offered with a brake that provides two functions:

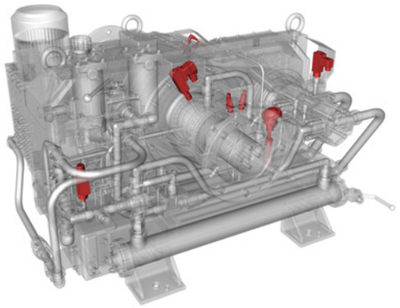
1. As a classic shaft brake for holding the propeller and thereby securing the propeller position to prevent unintended rotation. The braking torque is set at 50 % of the engine's nominal torque. Idling torque from the clutch is suppressed.

2. For variation of propeller rotational speed: The trolling range is enhanced. By applying a low braking torque, the propeller speed is regulated from zero up to the desired speed.

Sensors

Permanent condition monitoring prevents overload

The availability of our units is secured through permanent condition monitoring of all the relevant components. Monitoring of the units is achieved by recording the speeds, pressures, and temperatures. If the permissible parameters are exceeded, our control system DC650 prevents an overload.



Diagnosis and control unit DC650

Simple integration into vessel control system

We offer the Prop.act as a package complete with our diagnosis and control system DC650. Our customers do not have to bother with programming or actuation of the components and can completely rely on Ortlinghaus to do this. Integration of our controls in the vessel control system is straightforward, and described on provided integration sheet.

Electric auxiliary pump

Safe towing also at high sea

Ortlinghaus offers an electric pump that can be run independently of the diesel engine. As desired for towing manoeuvres, for example, the shaft brake can also be used with this pump while the diesel engine is switched off. Clutch operation can be maintained even if the engine speed is lowered below a critical point.

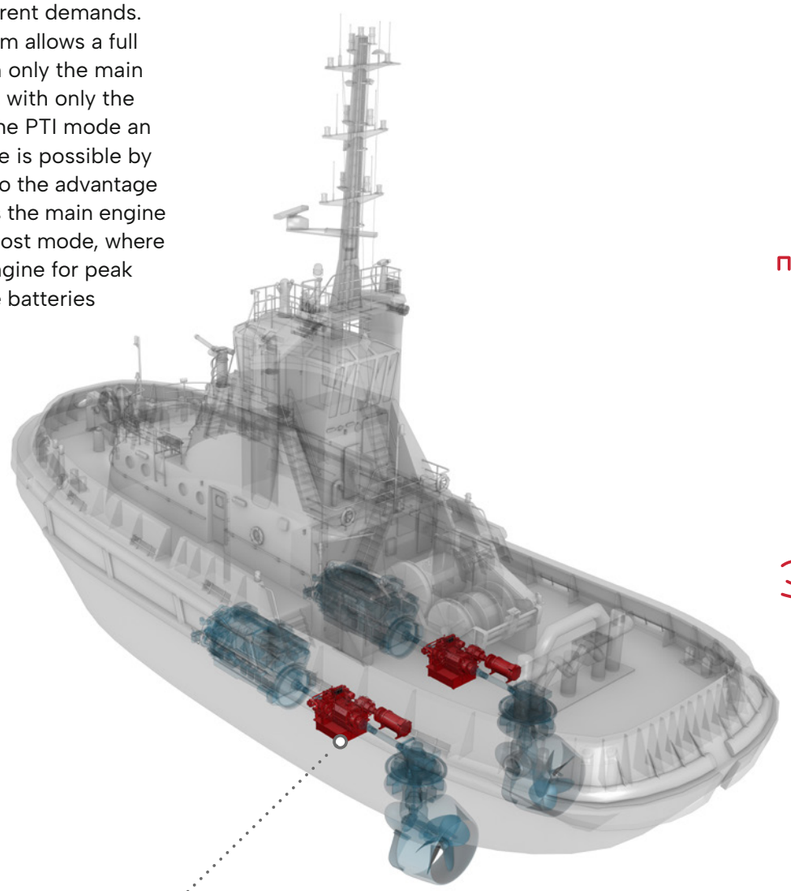
Customer – PTO

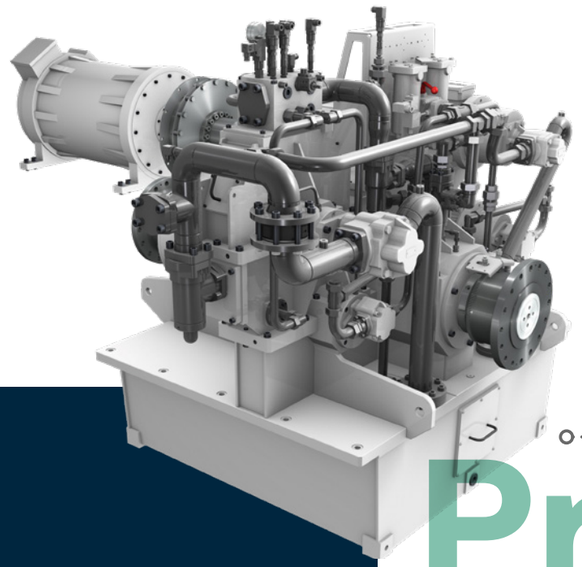
Additional power supply

The Prop.act is equipped with a power take-off (PTO). The customer can use the PTO, for example, to drive the pump for propeller adjustment.

Prop.act hybrid series 212

Reducing our carbon footprint is an important target for the marine propulsion industry. Therefore, hybrid solutions are one of the main answers for an increase in sustainability in this business. The Prop.act hybrid is a standalone clutch system, which enables the user to easily drive the ship in different modes according to the current demands. Beside the main engine mode, where the clutch system allows a full speed range down to full-slip for e.g. firefighting with only the main engine, an optional PTI gives the opportunity to drive with only the e-motor or combined with the main engine. During the PTI mode an emission-free purely electric drive with reduced noise is possible by using only the e-motor. This full-electric mode has also the advantage of reducing the operation hours of the main engine, as the main engine can be shut down. The Prop.act hybrid also offers a boost mode, where the e-motor provides additional power to the main engine for peak loads. Finally, the generator mode allows charging the batteries of the electrical power supply system.





Slow speed running
Efficient slow speed running by e-motor to ensure high manoeuvrability in combination with saving operational costs.

High manoeuvrability
Flexible usage of e-motor and slipping clutch in all working conditions to ensure best possible manoeuvrability.

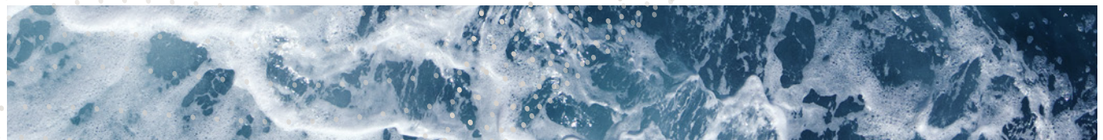
High efficiency
Charging the batteries using the generator mode of the e-motor.

Green shipping
Environmental regulations-compatible harbour entrance by using the e-motor.

Max. power
Additional thrust power by the boost of the e-motor.

DC650 hybrid control
Optimally adjusted clutch monitoring and control according to the PTI usage.

Prop.act hybrid

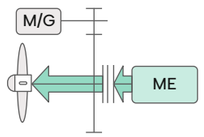


Operating modes

During MAIN ENGINE MODE (1), the clutch is fully engaged, and the propulsion line is driven with the complete speed range of the main engine (nominal speed down to idle speed). The FIREFIGHTING MODE (2) allows low-speed propulsion for a precise positioning of the ship due to the slipping clutch, while the main engine drives the firefighting pump at up to nominal speed. Driving in IDLE SLIP MODE (3) enables low-speed propulsion up to idle speed as the clutch is slipping during this mode.

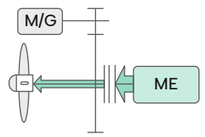
Alternatively to the IDLE SLIP MODE (3), where propulsion is done by the main engine, a purely electric propulsion is enabled by the PTI MODE (4), offering a similar speed range up to idle speed while the clutch is open and the main engine is switched off. Combining main engine and electric propulsion, BOOST MODE (5) provides additional power to the propulsion line for peak loads while the clutch is fully engaged. During GENERATOR MODE (6), the clutch is engaged, and the e-motor is driven by the main engine. Working as a generator, it feeds the power supply system on board with electrical power while the propulsion depends on the main engine speed.

MAIN ENGINE MODE
(1)



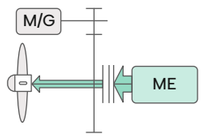
ME: running
M/G: not running
Clutch: closed

FIREFIGHTING MODE
(2)



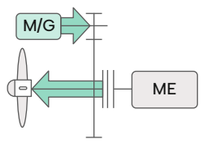
ME: running
M/G: not running
Clutch: slipping

IDLE SLIP MODE
(3)



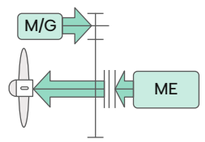
ME: running
M/G: not running
Clutch: slipping

PTI MODE
(4)



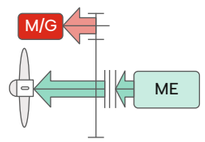
ME: not running
M/G: running
Clutch: open

BOOST MODE
(5)



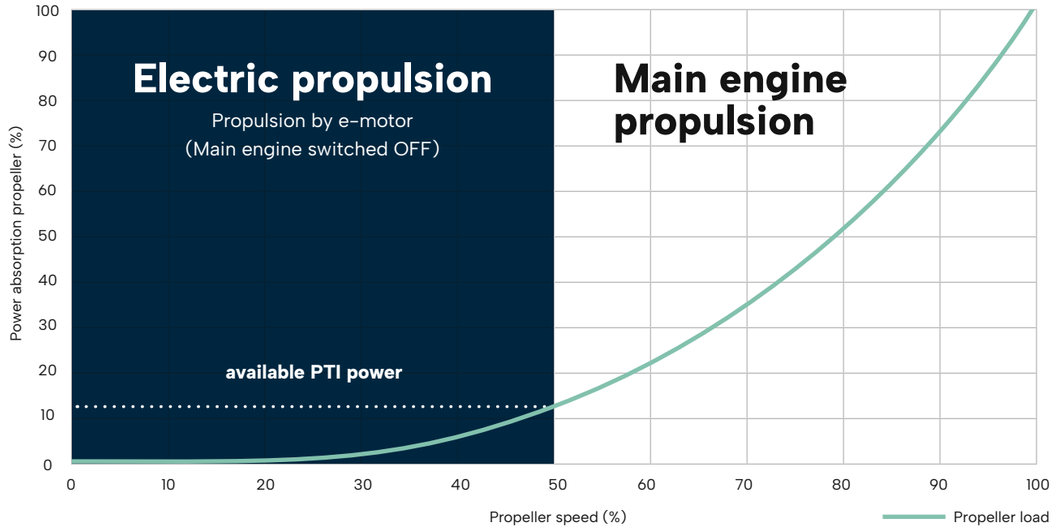
ME: running
M/G: running
Clutch: closed

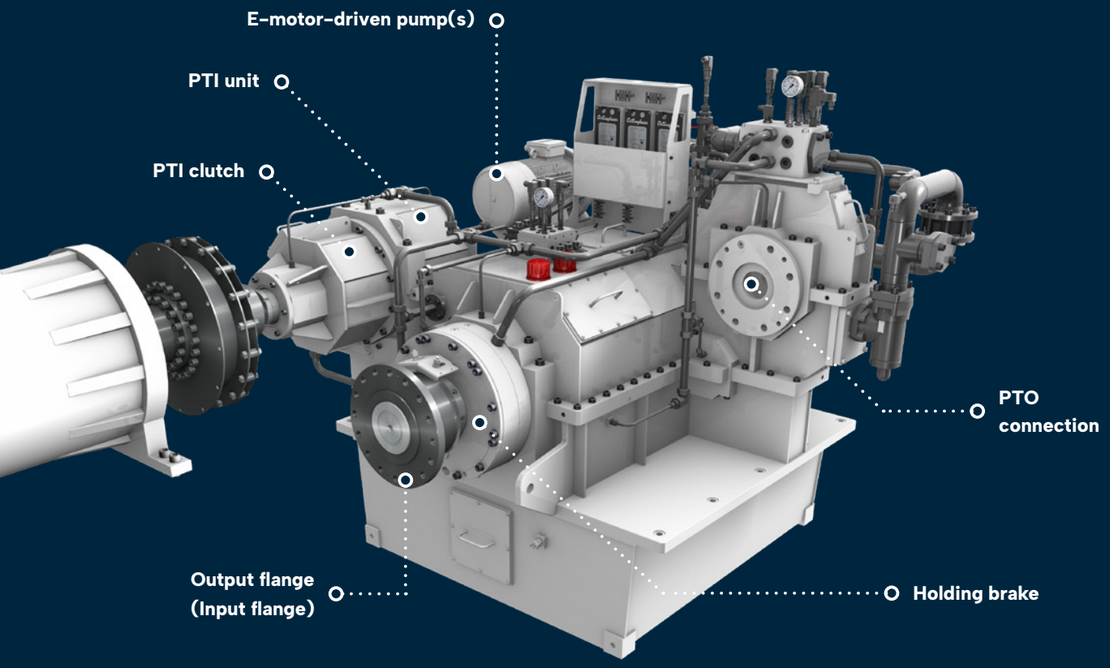
GENERATOR MODE
(6)



ME: running
M/G: running
Clutch: closed

ME: Main engine
M/G: E-motor/generator





The Prop.act hybrid is available with the following optional features:

- PTI clutch for disconnecting the e-motor/generator from the clutch system
- PTI unit for hybrid propulsion
- Holding brake with motor-driven pump (alternatively with additional pressure reservoir) for locking the propulsion line during disconnected main engine
- E-motor-driven pump for high dissipation during firefighting, for priming or lubrication during trolling
- Input and output flange according to customer's interface
- PTO connection according to customer's interface

Technical data Prop.act

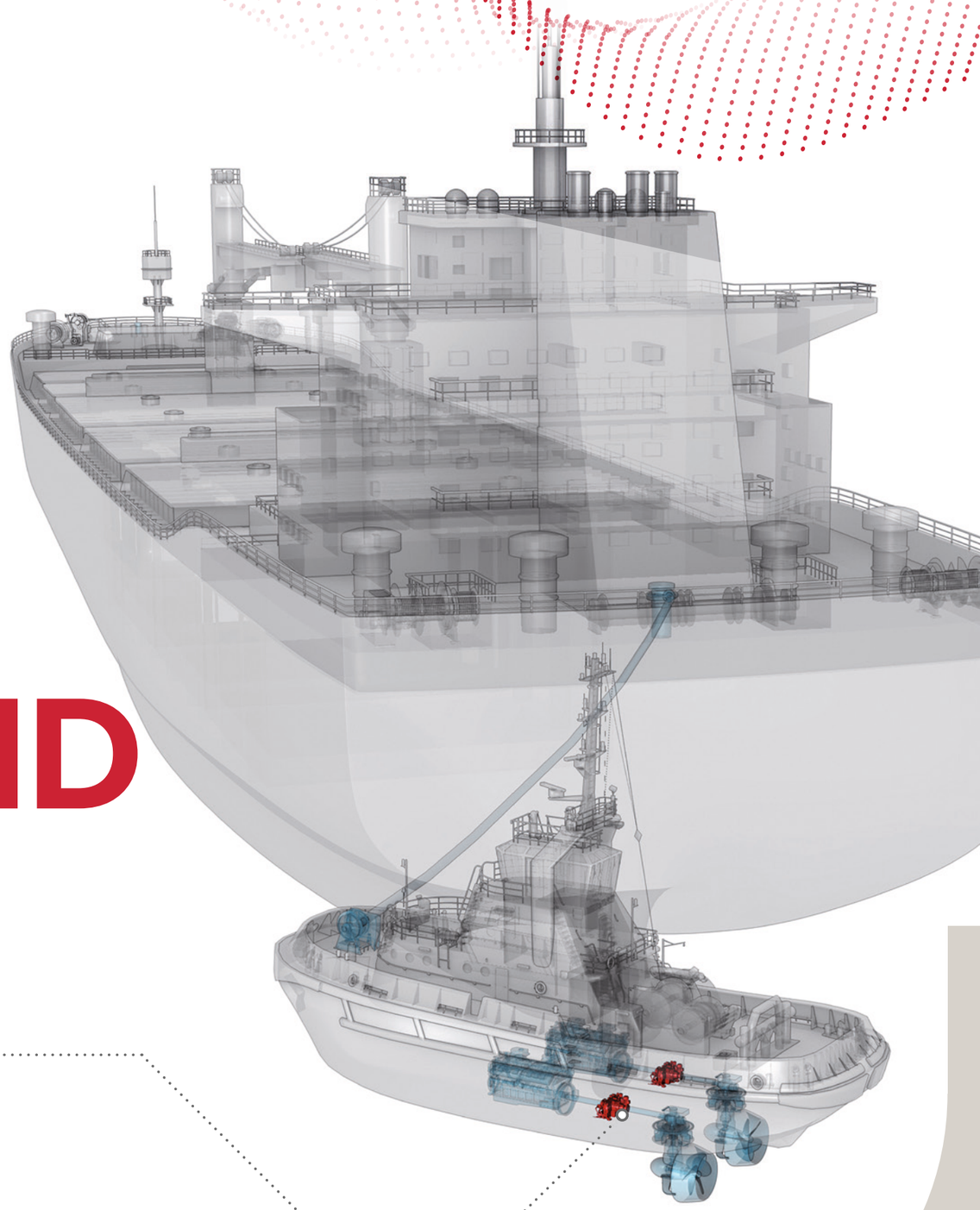
Technical data		66MD	75HD	Hybrid
Main engine power	[kW]	up to 2.950	up to 2.800	up to 3.200
Input speed	[rpm]	1.000, 1.400, 1.800	750, 1.000, 1.800	750, 1.000, 1.800
Input torque	[Nm]	up to 15.750	up to 35.650	up to 41.000
PTO power	[kW]	up to 40	up to 60	up to 120
PTO speed	[rpm]	~ 3.000	~ 1.600	~ 1.700
PTI power	[kW]	---	---	up to 500
PTI speed	[rpm]	---	---	~ 1.800 (up to 2.400)
Dimensions	[m]	1,4 × 1,25 × 0,85	1,45 × 1,95 × 1,75	2,1 × 2,1 × 1,9
Empty weight	[kg]	1.450	4.250	max. 5.710
Cooling capacity	[kW]	max. 45	max. 420	max. 480

Fields of application: Independent trolling solution

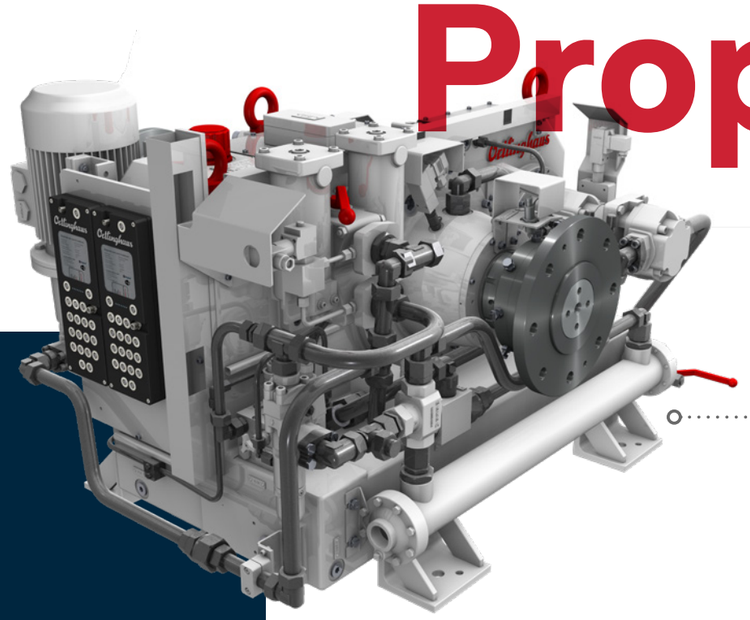
Precise and safe manoeuvring. The Prop.act is a self-sufficient, ready-to-install clutch unit that makes it possible to steplessly vary the propeller rotation at constant engine speed and, in doing so, vary the thrust via the control lever.

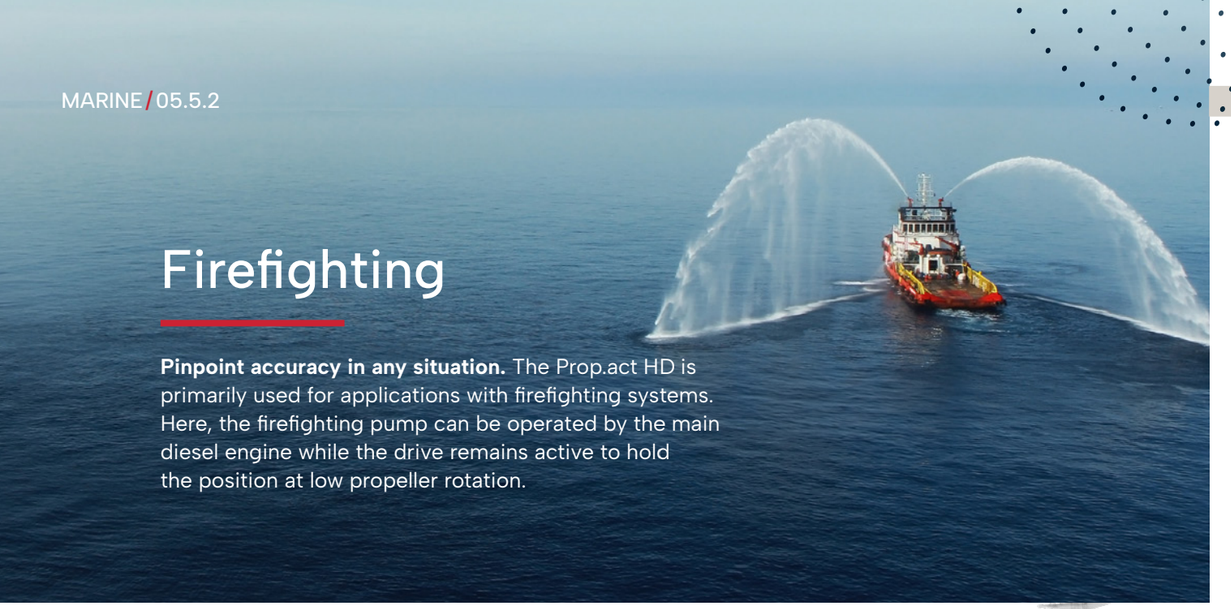
Prop.act MD

Variation of propeller rotation at engine idling speed.
For operation at idling speed, the Prop.act has the benefit of facilitating precise manoeuvring with low thrust while the engine is idling. At the same time, undesired turbulence in the water can be avoided by setting the thrust in the forward direction.



Prop.act MD





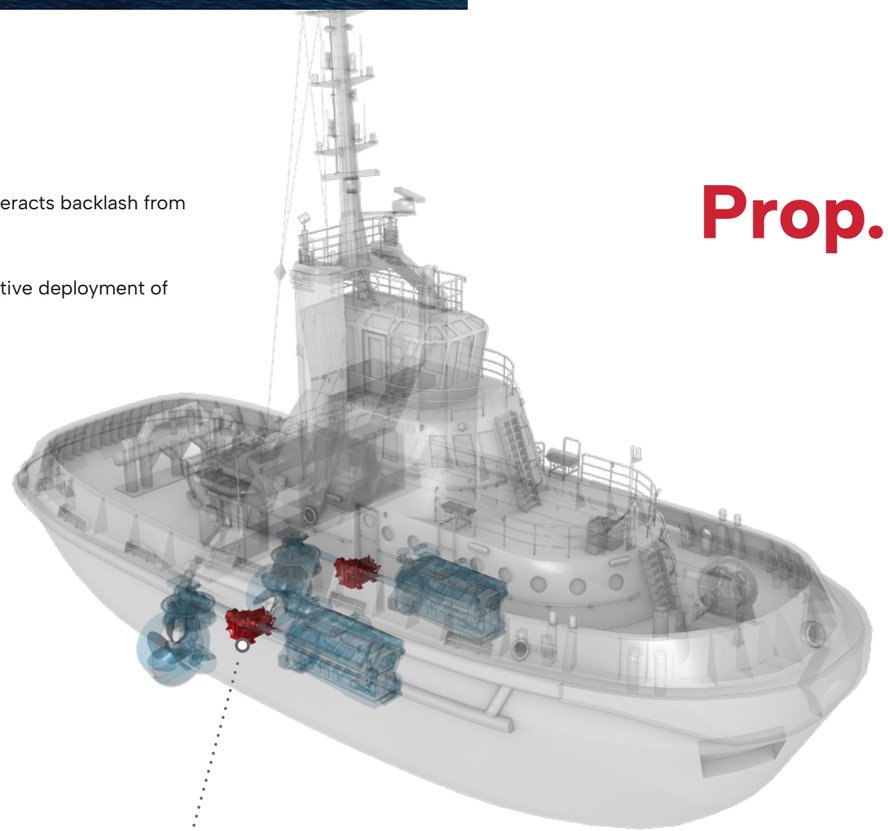
Firefighting

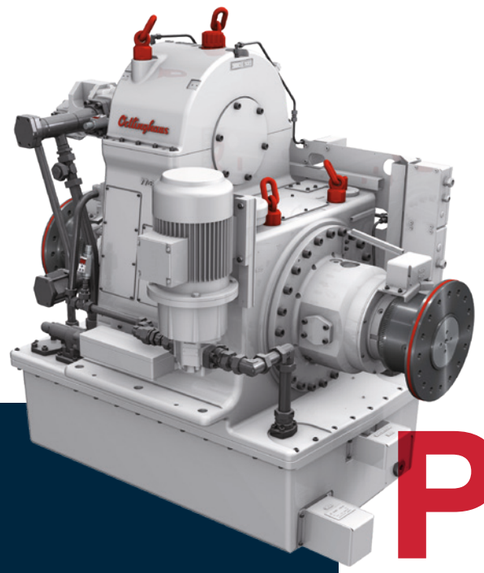
Pinpoint accuracy in any situation. The Prop.act HD is primarily used for applications with firefighting systems. Here, the firefighting pump can be operated by the main diesel engine while the drive remains active to hold the position at low propeller rotation.

Prop.act HD

Variation of propeller rotation at nominal speed

1. Holding position (DP) at nominal speed of diesel engine counteracts backlash from firefighting water cannons
2. Operation of firefighting pump via main diesel engine for effective deployment of firefighting pumps combined with optimal use of space
3. Full firefighting pump output and simultaneous low propeller rotation for holding position via drive system
4. Reliable operation of slipping clutch across the whole speed range with aid of system control logic





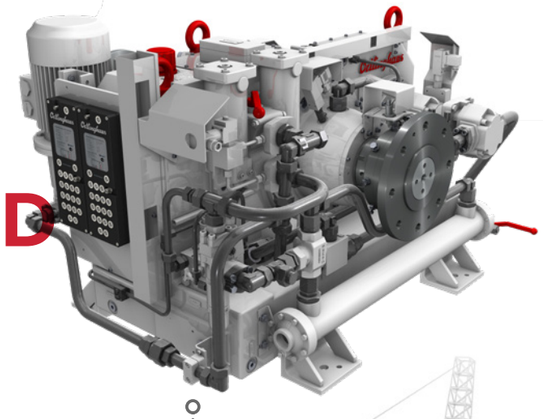
Clutch system with control

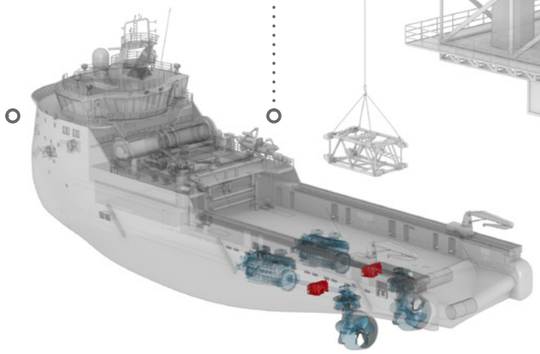
Prop.act HD

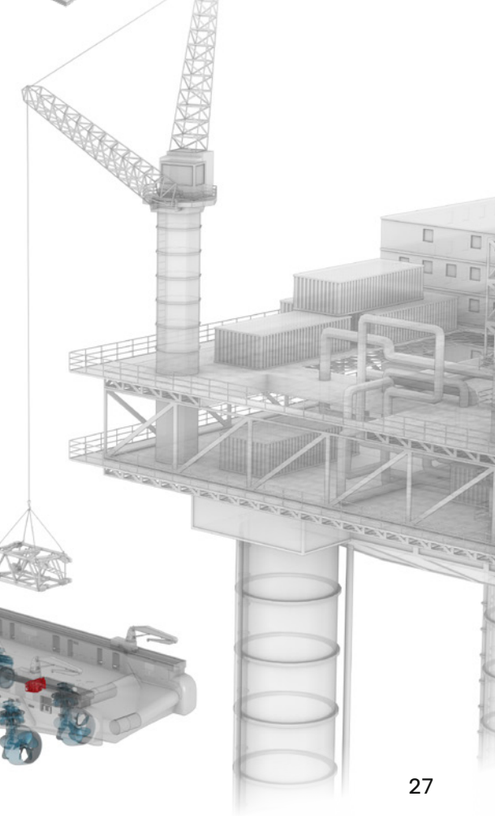
Trolling dynamic positioning

Precise and safe positioning. The Prop.act makes it possible to steplessly vary the propeller rotation at constant engine speed and vary the thrust via the control lever. The unit is configured for continuous operation and as such can be used for dynamic positioning.

Prop.act MD

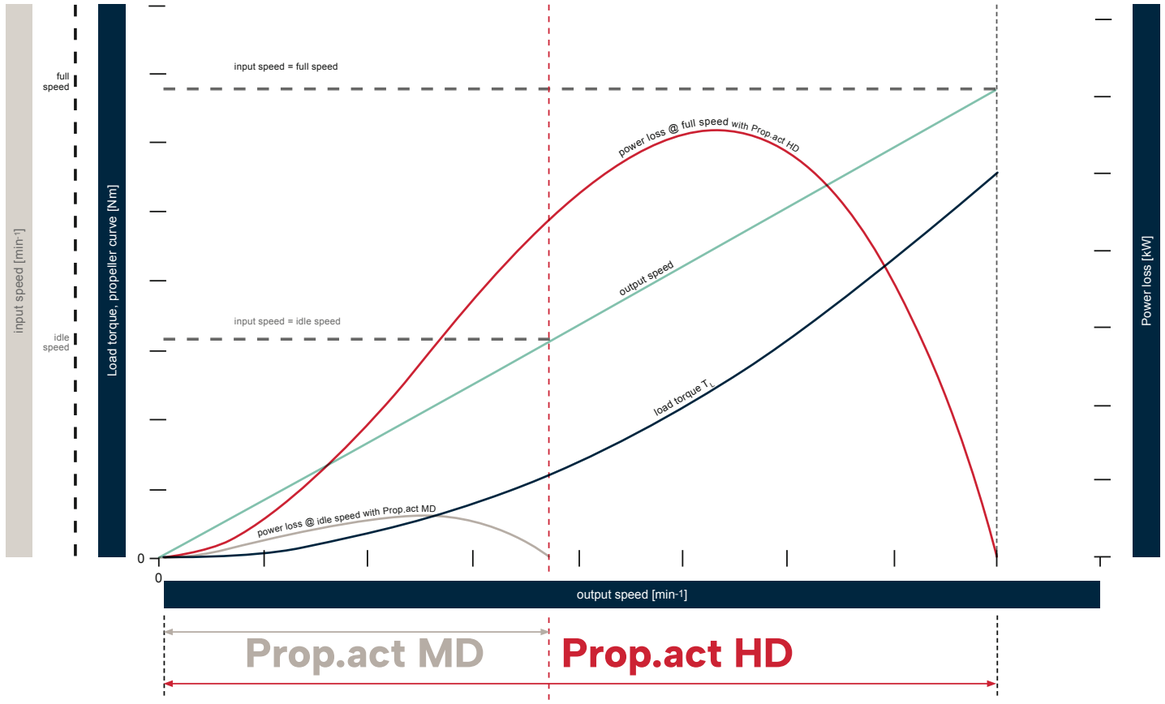






Slipping capacity during trolling

The heat generated during slipping while the main engine runs at idle speed up to full speed depends on the adjusted output speed.



Diagnosis and control platform in marine applications

The DC650 is a scalable, flexible, and highly compatible solution for both simple and complex diagnostic and control purposes. Designed for clutches, brakes and clutch units in marine propulsion technology – also for our clutch system solution of the Prop.act series. Robust hardware and modern software enable application-specific monitoring of our technology. With the integration of the DC650, condition values are measured seamlessly, critical conditions are detected, and a failure of the ship propulsion may be prevented. At the same time, the DC650 enables complex control including speed-controlled long-term slipping. Our technical support and/or necessary spare parts can then be ordered in time before a breakdown occurs, thus improving the long-term availabilty of the ship. You can benefit from the advantages of the DC650 in next to no time through simple integration into the drivetrain.

DC650

Integrated system solution

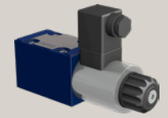
The DC650 combines Ortlinghaus hardware with a modern, self-developed and secure software.

Hardware

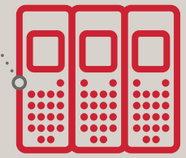
Customizable fieldbus connectivity
- Profinet, Modbus/TCP
- CAN bus based protocols

Anybus® BY HMS NETWORKS

Integrated valve control
- Power outputs for direct valve control



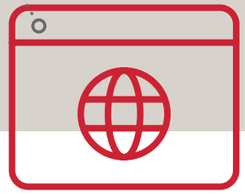
Scalability
- Multiple units can be combined to increase I/O capacity



Integration of different sensor types
- Pressure
- Speed
- Temperature
- Level switches
- etc.

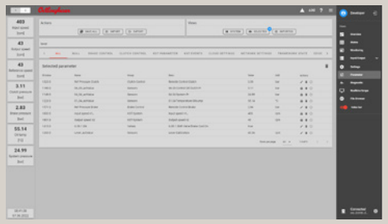
Communication with cloud services
- Connection via LAN
- Communication via MQTT

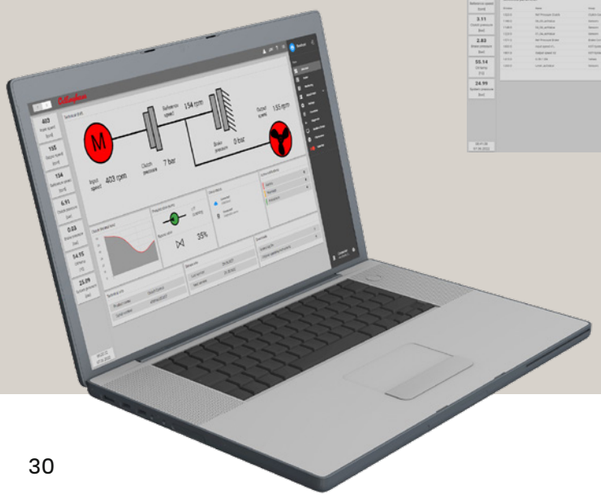
Integrated web server
- Access per web browser
- No extra software required



Software

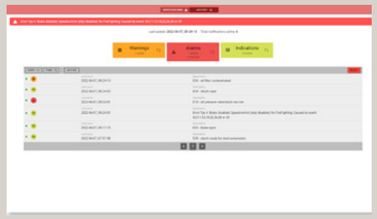
Parameter editor
- Clearly structured management of all parameters



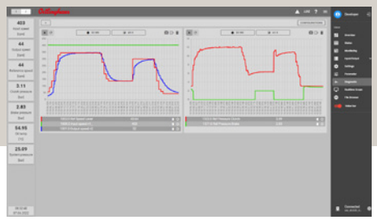


IT security
- Ortlinghaus software based on IEC 62443
- Wi-Fi can be deactivated
- No need for local network integration

Notifications and error list
- List of current and previous information
- Timecode for each entry



Scope function
- Useful scope function and convenient export function for data analysis



Application view
- Everything at a glance in the process overview
- Practical value bar for permanent control

General functions
- Intuitive software update via browser
- Easy log file download

Benefits

Arrange a product presentation with us and experience the advantages and possibilities of the DC650 for yourself.

Long-term data acquisition of operating states through:
- Integrated memory function
- Extended memory function (by use of optional cloud connection)

Lower maintenance costs through:
- Early detection of wear to minimize the need for spare parts
- Plannable maintenance intervals with optional remote maintenance

Increased ship availability through:
- Continuous condition monitoring of physical values such as speeds, pressures and flow rates
- Determination of the thermal load of Ortlinghaus clutches, brakes and clutch units
- Detection of critical conditions
- Warning in case of wear, defects and unacceptable pressure loss

Lower preventive maintenance costs through:
- Remote access to status data (optional with cloud connection)
- Condition diagnosis with the aid of memory data
- Condition diagnosis during vessel operation, which does not require drive downtime

Increased safety through:
- Warning of system-critical conditions

Streamlined commissioning process:
- Quick and easy commissioning of the Ortlinghaus technology through complete integration of the DC650 into the drivetrain

Sofisticated performance:
- Maximum maneuverability through combining the DC650 with our slipping clutch and braking solutions

Technical data

- Clutch pressure
- Output speed
- Input speed
- Propvalve clutch

DC650

Technical data	DC650
Diagnosos-LEDs	1 × Status, 1 × Warning, 1 × Error, 2 × Application, 1 × Safety warning, 1 × Safety error
Power supply	19 – 36 V DC, galvanically isolated, redundant
Interfaces	
Network	1 × Ethernet 10 / 100 Mbit / s, M12 D-coded
Bus protocols	Profinet / Modbus / TCP, CAN
Bus interfaces	2 × Ethernet, M12 D-coded
Other	
Protection class	IP65
Web visualization	Yes
Dimensions	340 mm × 120 mm × 35 mm

Hydraulic brake

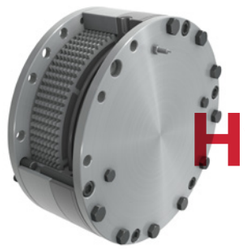
Hydraulic brake. Hydraulically actuated brakes from Ortlinghaus are efficient in their design and capabilities. They feature high torques and low mass in a very compact design. Due to the closed design, the brakes do not need additional housing for safety reasons. They provide optimal protection against external influences that could influence the brakes' behavior, leading to an extremely long service life. Combined with our experience in the field of marine brakes and our consulting expertise for selecting the best-fitting brake solution, Ortlinghaus ensures uncompromised quality. These brakes are well-established in marine applications.

Durability and safety
Ortlinghaus wet-running brakes provide a long service life and safety through optimal design, durability, and functional reliability.

High torque density
The Ortlinghaus friction lining combination inside these brakes ensures highest torques in small dimensions.

Optimal maintenance conditions
These brakes are designed for durability and therefore ensures long service intervals provided that the brakes are operated within their technical limits.

Easy assembly
Due to its flangeable design, these brakes allow an easy assembly.



Hydraulic brakes

	Feature	Size 39	Size 47	Size 55	Size 63	Size 69
Dynamic torque[1]	$T_{dyn.}$	2.400 Nm	3.600 Nm	5.600 Nm	8.900 Nm	15.500 Nm
Operating pressure	p_B	25 bar	25 bar	25 bar	25 bar	25 bar
Speed[2]	$n_{max.}$	5.500 min^{-1}	4.400 min^{-1}	2.900 min^{-1}	2.700 min^{-1}	2.500 min^{-1}
Outer diameter	A	205 mm	245 mm	295 mm	350 mm	400 mm
Max. bore diameter[3]	$B_{max.}$	65 mm	90 mm	110 mm	140 mm	150 mm
Length	L	110 mm	125 mm	175 mm	190 mm	200 mm

1) higher torques on request
2) higher speeds on request
3) bore execution with keyways or toothing according to DIN 5480

Oil inlet

Ortlinghaus has been manufacturing single and multi-channel rotary inlets for several decades. These components are commonly supplied as accessories for oil-actuated and oil-cooled clutches. They are proven machine components designed to feed pressurized oil and cooling oil into rotating shafts, serving as standard products not limited to clutch applications alone. The oil inlets are available in axial and radial variants. Additionally, Ortlinghaus develops and manufactures rotary inlets according to customers' specific requirements, which are not included in our standard product catalog. This capability allows for the production of rotary inlets with more than three channels, capable of carrying different types of media.

Oil inlets

Our oil inlets are also available as radial oil inlets.

Feature		Size 22	Size 27	Size 35
Operating pressure[1]	p_B	30 bar	30 bar	30 bar
Speed[2]	n	2.200 min^{-1}	1.800 min^{-1}	1.400 min^{-1}
Outer diameter[3]	A	120 mm	160 mm	180 mm
Length	L	165 mm	247 mm	288 mm
Number of channels / connections	i × M	2 × G1/2	2 × G3/4	2 × G1
Oil volume[4] [5]	V_{oil}	35 L/min	100 L/min	150 L/min

1) higher pressures on request
2) higher speeds on request
3) without oil catching ring, oil catching ring on request
4) multi-channel executions for higher oil volumes on request
5) at operating viscosity 68 cSt and pressure loss ≤ 2 bar at 50°C

Axial and radial executions available
Oil inlets can be supplied in axial or radial design. If there is no free access to push the radial oil inlet from one side onto the shaft, a split version is available for easy assembly.

Simple integration
For different setups Ortlinghaus can supply different mounting options of oil inlets which allows a simple integration.

One or two channel executions available
Ortlinghaus delivers one and two channel oil inlets. More channels on request.

In good hands from the beginning

Get in touch to one of our experts.

Enquiry

- via contact form on our website **www.ortlinghaus.com**
- directly via email to **marine@ortlinghaus.com**
- contact through one of our worldwide sales representatives **www.ortlinghaus.com** | Contacts & Media | Contacts

Technical consultance

- many thousands of products for different marine propulsion drivetrain applications in the field
- selection of technically and economically best fitting products

Order

- quick response times
- friendly support
- flexible order handling

Production

- more than 100 years of production know-how
- high quality

Delivery

- safe and reliable shipping methods according to customer requirements
- worldwide delivery
- known consigner

After Sales

- worldwide after-sales-services
- high availability
- commissioning
- **service@ortlinghaus.com**

Original spare parts — **Product overhaul at Ortlinghaus** — **Service & repair worldwide** — **Condition check** — **High availability of After-Sales-Service (24/7)**

● Sales & Service hub with spare parts

● Sales & Service hub

Ortlinghaus worldwide

Founded in:	1898
Subsidiaries:	Ortlinghaus (U.K.) Ltd./England Ortlinghaus France Transmissions sarl/France Ortlinghaus AG/Switzerland Ortlinghaus Drive Technology (Shanghai) Co., Ltd/China Ortlinghaus Drive Technology India Pvt.Ltd./India Ortlinghaus America Latina/Brasil
Manufacturing:	Wermelskirchen/Germany Gams/Switzerland Jinan/China
Sales:	Worldwide via agencies

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