INLAND RUDDER AND STEERING SYSTEMS

WORLD'S FINEST MANOEUVRING

MARINE SYSTEMS
VAN DER VELDEN®
REGISTERED TRADEMARK OF DAMEN MARINE COMPONENTS

DAMEN

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RUDDER SYSTEMS

VAN DER VELDEN® HD

Designed with an asymmetrical profile, the HD rudders assure your vessel of excellent manoeuvring performance and course-stability. With their main purpose to smoothen challenging manoeuvring operations, these rudders have proven themselves in the most stringent tank tests and in practice since 1984.

Another feature of this reliable rudder system are the asymmetric rudder angles of 60/80 degrees, which provide optimal slipstream guidance. The HD rudders have been designed to increase manoeuvrability on inland waterways, particularly at low speeds. Tapping into years of experience and proprietary technology, these rudders have a long lifespan and require minimal maintenance.

KEY FEATURES

- Excellent manoeuvrability
- Long lifespan
- Optimal slipstream guidance
- Minimal maintenance

ESPECIALLY SUITED FOR

- Vessels sailing on inland waterways

VAN DER VELDEN® XR

Built to provide optimal propulsion efficiency, the XR rudders are designed for inland vessels, for which course-keeping is most important. With their slim profile, these rudders are designed to be eco-friendly. This refinement results in considerable fuel savings, as well as reducing drag and noise levels.

The slim rudder profile allows the water to flow along the rudders with minimal resistance. With their dedicated design philosophy for this specific operational profile, the XR rudders are excellent for ahead operations.

The position of the rudders can be changed according to client specific requirements.

KEY FEATURES

- Optimal propulsion efficiency
- Reduction of resistance
- Eco-friendly design
- Reduction of noise levels

ESPECIALLY SUITED FOR

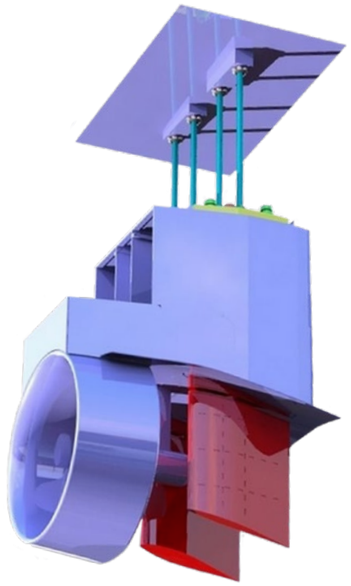
- Vessels sailing on inland waterways

RUDDER SYSTEMS

VAN DER VELDEN® FLEX FLANKING

The FLEX Flanking rudder system is an innovation delivering substantial efficiency improvement to the inland shipping industry. The FLEX Flanking rudders are positioned in front of the propeller(s), providing increased manoeuvrability performance during astern operations. As opposed to a conventional flanking rudder system, the FLEX Flanking rudders are fully retractable and therefore not obstructing inflow to the propeller(s) during ahead operations.

During astern operations, the system can be lowered to provide the required manoeuvring performance. As the majority of operations will be ahead, the unrestricted inflow offered by the FLEX Flanking rudder system will lead to considerable fuel savings.



KEY FEATURES

- High efficiency when sailing ahead
- Unobstructed inflow to propellers
- Considerable fuel savings
- Increased astern manoeuvrability

ESPECIALLY SUITED FOR

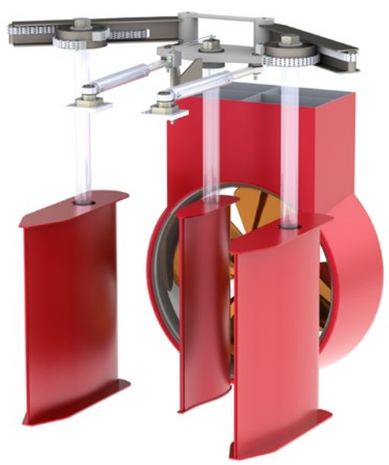
- Inland towboats

VAN DER VELDEN® THREE-RUDDER-SYSTEM

For inland waterways, high manoeuvring performance is required to secure your operation. The three-rudder-system is famed for its performance and is designed to provide premium manoeuvrability. Whether you are sailing on narrow inland waterways or handling other challenging navigating situations, such as port operations and locks, the three-rudder-system of Van der Velden® has been the best of its kind since 1963.

The three-rudder-system has been designed with a combination of chain drives and cylinders, of which the three slim-profiled rudders optimise the wakefield of the ship. These refinements result in less rudder correction, which leads to considerable fuel savings.

Recent research by DST- Development Centre for Ship Technology and Transport Systems compared prior rudder technology to today's rudder configurations. Once again research confirmed and proved that the three-rudder-system still provides ultimate manoeuvring and course-keeping capabilities.



KEY FEATURES

- Premium manoeuvrability
- Energy efficiency
- Emissions reduction (CO_2)
- Premium course-keeping

ESPECIALLY SUITED FOR

- Vessels sailing on inland waterways

STEERING SYSTEMS

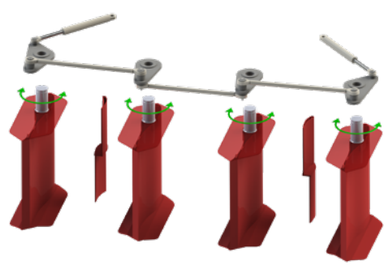
VAN DER VELDEN® 2DWK AND 4DWKK

To guarantee the safety of your vessel, a reliable steering system is of the utmost importance. Our heavy-duty asymmetrical steering systems are built to provide security and have a long history of excellence.

Designed using proven technology, the 2DWK and 4DWKK provide optimal slipstream guidance as well as a high-end manoeuvring performance. Tapping into the highest quality materials, our steering systems require minimal maintenance and have a long lifespan.

At Damen Marine Components, each steering system configuration is specifically designed and built depending on a number of parameters such as sailing profile, power and speed. The 2DWK and 4DWKK perform optimally in combination with our HD and XR rudder systems.

2DWK WITH XR RUDDERS AND HYDRO SPOILER



4DWKK WITH HD RUDDERS AND HYDRO SPOILERS

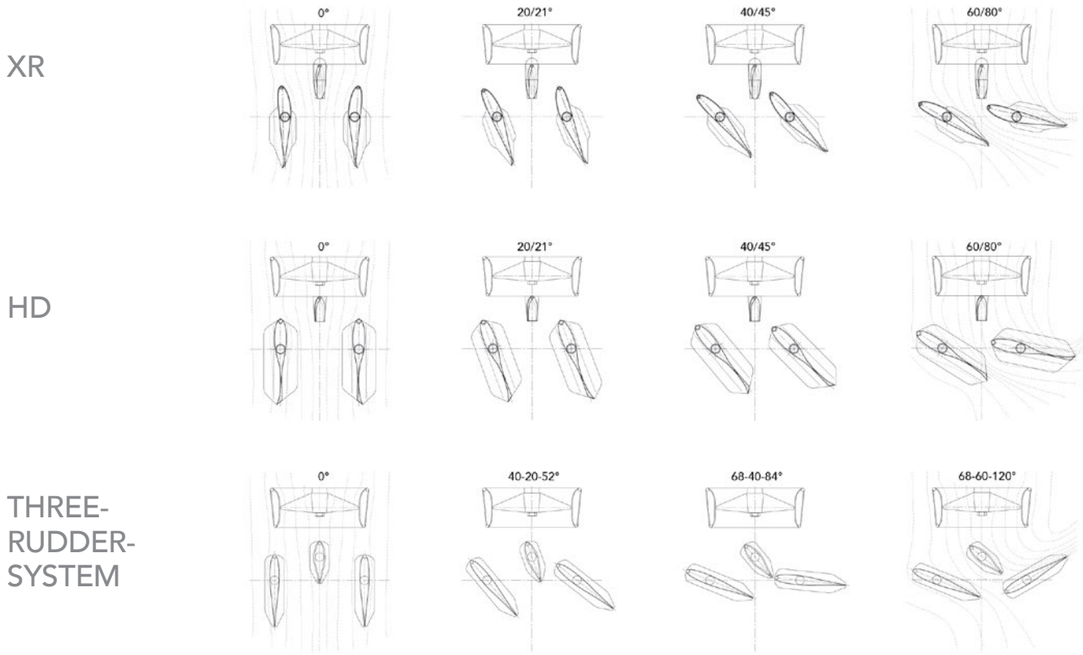
KEY FEATURES

- Minimal maintenance
- High-end manoeuvring performance
- Long lifespan
- Customizable

ESPECIALLY SUITED FOR

- Various vessel types, mainly designed for inland vessels

RUDDER ANGLES



GENERAL INFORMATION AND PACKAGES

STEERING YOU IN THE RIGHT DIRECTION

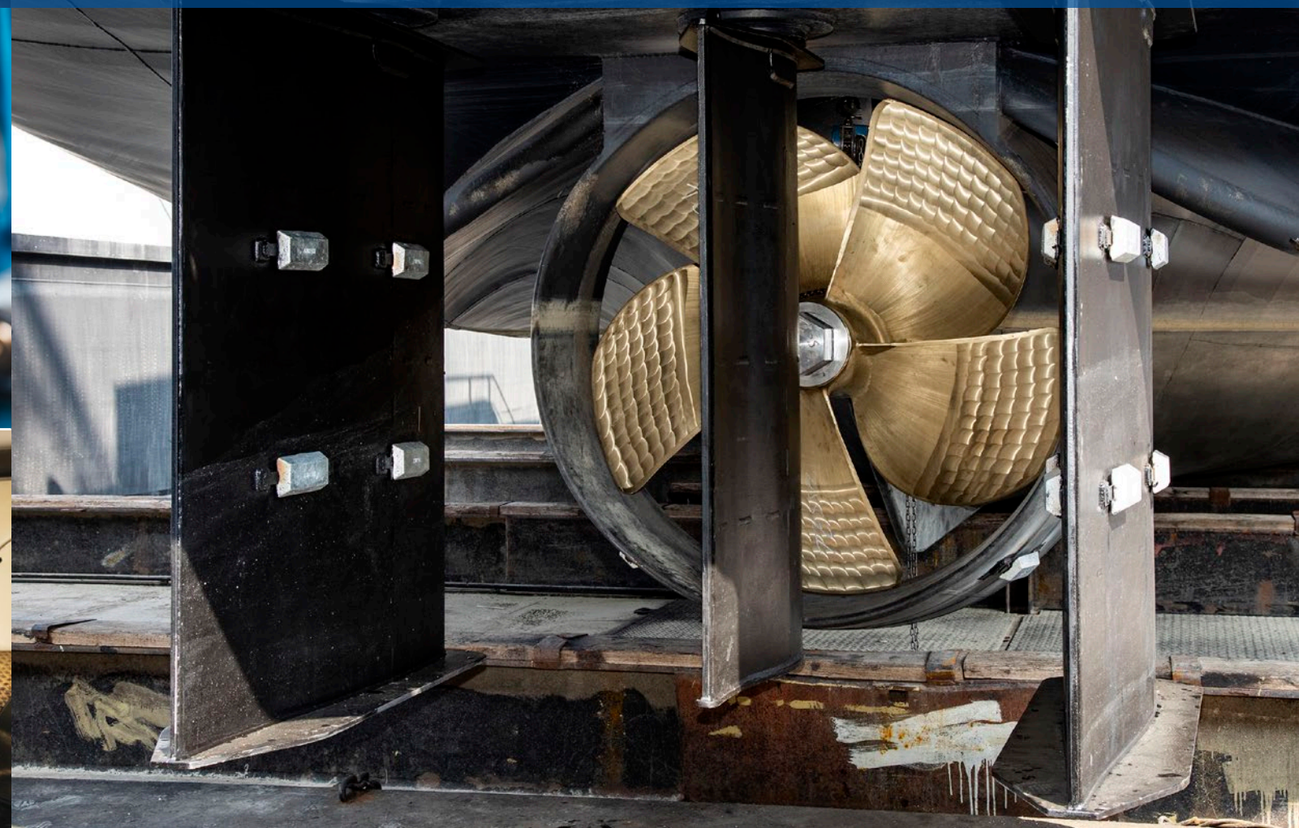
A reliable manoeuvring system is the key to a safe and expeditious voyage. Circumstances such as weather conditions, current and water levels in inland waterways can differ widely from one route to another. Challenging manoeuvring situations often come along, be it shallow waters, narrow passages or locks.

That's where high-quality steering gear and propulsion efficiency come in. Damen Marine Components specialises in the engineering, construction and installation of manoeuvring systems for the highly specific operational profile of inland vessels.

To maximise your performance it is advised to add a Van der Velden® hydro spoiler to your package. A spoiler is placed behind, and on, the centreline of the propeller to minimise water rotation. It bends revolving water into a straight-outgoing flow, which results in more equable outflow of the propeller water. Additionally, a more equable water flow results in reduced noise and vibrations. Research and practical experience have shown that these refinements increase vessel efficiency up to 8%.

At DMC, there are three spoiler options to choose from: HD-B spoiler, XR-B spoiler and XR-T spoiler. These hydro spoilers improve the propulsion efficiency and speed performance of a vessel, and enhance the ship's course-keeping capabilities.

The Van der Velden® XR rudders are often combined and integrated with **the Van der Velden® FLEX Tunnel system**. This system consists of a retractable tunnel, which offers many benefits such as increased energy efficiency and resistance reduction. The Van der Velden® FLEX Tunnel system is considered to be Damen Marine Components' most efficient energy saving system for the inland shipping industry. See our FLEX Tunnel system brochure for more information.



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