



MARINE & OFFSHORE

BRIDGE INSTRUMENTATION





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DEIF has a long and rich history of providing class approved, reliable bridge instrumentation, switchboard equipment and power control.

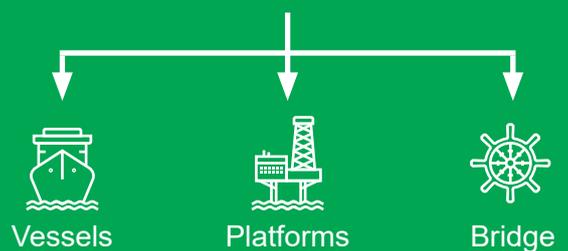
Conceived and designed to anticipate user needs today and in years to come, DEIF products respond to market demands for easier integration, improved user-friendliness, fuel economy and high ROI.

THE WORLD'S PREFERRED SUPPLIER*

**Our market share in marine bridge instrumentation is estimated at 40 %.
See www.deif.com/marine*

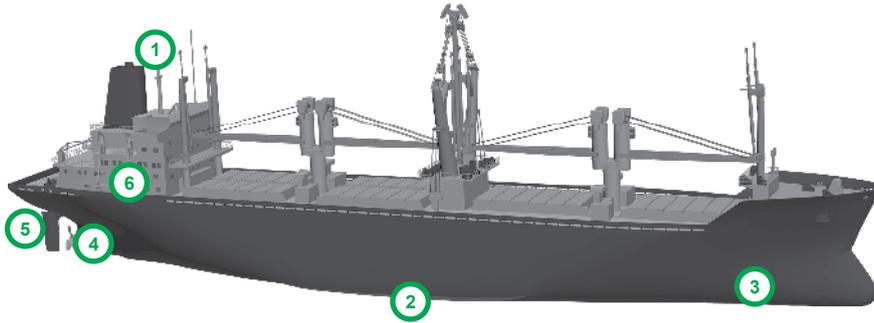
Most customers are able to install and commission our standard products working from data sheets only. In cases of doubt, DEIF's **extended** network of sales and application centres, distributors, customer care teams, and technical support teams is available to assist you and ensure you invest in and implement the **best solution for your application**.

INDUSTRIES



Bridge instrumentation

A front-runner in marine bridge instrumentation



Wind measuring	Azimuth	Tunnel thruster	Main propulsion	Rudder angle	RPM

Game changers & customised solutions

A front-runner in marine bridge instrumentation, DEIF consistently invests in R&D and has developed a number of innovative products at our research centre and manufacturing site in Skive, Denmark. These include high-accuracy illuminated indicators based on patented microprocessor-controlled X-coil technology. Increasingly, vessels shift from using analogue indicators to CAN bus-based instrumentation. DEIF's complete range is now available with this compatibility also, just as we design and develop complete customised instrumentation system solutions.

DEIF's most recent patented illuminated indicator display series, Flexible Display Indicator, XDi, has been described as a game changer in bridge instrumentation. The XDi series replaces mechanical scales and pointers and takes indicator performance to a whole new level – without compromising DEIF's market-leading customisation standards and maintaining type approvals for all relevant applications.

Relevant bridge instruments

XDi	XDi-N	XL
WSS 500 series	WSS 750	XDi-N Wind

Also consider these products

RTA 602	RTC 300	RTC 600

One indicator for all thruster modes

Switch between indicator modes – automatically

»The XDi has reduced the number of indicators, installation time, and simplified operation«

Johan Spruyt
R&D Engineer
ZF Marine Krimpen



Game changer cuts costs

Until recently, renowned ZF Marine Krimpen used traditional indicator technology for its retractable azimuth thruster solutions. Individually customised to each customer, this required numerous indicators for each azimuth propeller – one for each operation mode.

Reducing installation time and costs, DEIF's virtual indicator solution, the XDi, now allows ZF Marine Krimpen to automatically change the indicator scale depending on which mode the retractable azimuth thruster is in.

"With the XDi, we take up much less space in the bridge operator panel and also simplify daily operation since there is just one thruster indicator display regardless of operation mode", R&D Engineer Johan Spruyt from ZF Marine Krimpen states.

ZF Marine Krimpen

Formally known as HRP Thruster Systems, ZF Marine Krimpen has been active on the thruster market since 1973. The company designs and produces a wide range of steerable thrusters for all types of applications throughout the marine industry.

Illuminated bridge indicators

Platform overview

Digital accuracy, analogue or display-based readability

DEIF's range of sturdy illuminated bridge indicators features high accuracy, meeting or exceeding international standards for optimal readability and precision.

Analogue indication: The XL series

Offering digital accuracy and analogue readability, the well-proven XL series is based on DEIF's patented microprocessor-controlled X-coil technology. The range is available for panel, ceiling and bridge wing mounting with a variety of stocked standard designs. Custom designs are available on request.

Display-based indication: The XDi series

A game changer in bridge instrumentation, DEIF's new, patented illuminated indicator display series, XDi, offers highly accurate display-based indication. The compact, easy-to-install, versatile and user-friendly revolution in bridge instrumentation, gives you more flexibility and the ability to configure and make repairs on-site. The XDi series replaces mechanical scales and pointers with high quality displays without compromising DEIF customisation standards and maintaining approvals for all relevant applications. It is available in various sizes with dual- or multi-indicator display libraries.



XL series

Q72, Q96, Q144 or Q192 with single-indicator display.



XDi series

Available in various sizes and with dual-, multi-, wind-, weather- or navigation indicator libraries.

Features	XL	XDi
CANopen interface	1 or 2	2
XDi-net protocol		x
Analogue single or dual (SIN/COS) input	V/mA	V/mA* Selectable
Digital input e.g. RPM pickup		x*
Relay output		x*
Serial data – NMEA0183 (IEC61162-1 & -2)		Input/Output*
Extention modules		AX1, DX1, NX1, NX2
Backlight dimmer	Analogue/CAN	CAN/Analogue*/Digital*/NMEA*/ Front buttons
Day/night scale	Fixed	Day/night (dusk)
Scale type	Printed scale	TFT Display
Display sizes		3.5, 5, 7"
X-coil indicator	x	
Library with multiple virtual indicators		x
Indication/readout	Fixed (needle/disc)	Selectable
Number of indications	1	1 or more
DIN Cut out	Q72, Q96, Q144, Q192	Q96, 144 x 96, 192 x 144
Outdoor bridge wing indicator	x	

* Extension module required

Bridge instrumentation

Product type overview

Indicators



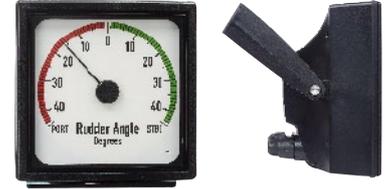
Flexible display indicator

Display-based illuminated bridge indicators with preinstalled designs.



Illuminated indicator

Digital accuracy, analogue readability. Panel mounting.



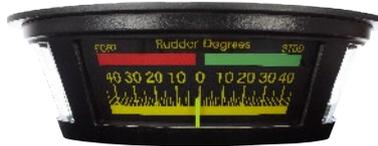
Bridge wing indicator

Digital accuracy, analogue readability. In-/outdoor mounting.



Bridge wing indicator

Digital accuracy, analogue readability. Outdoor mounting.



Panorama rudder indicator

250 ° reading of rudder position. Analogue or CAN input.

Wind measuring



Wind sensor

Superior performance wind sensors. No moving parts; no wear.



XDi-N Wind

Display-based illuminated bridge indicators with preinstalled designs.

Transmitters



Rudder angle transmitter

No touch magnetic angle detection technology. Analogue or CANopen.

Flexible display indicator

The game changer in illuminated bridge instrumentation



DEIF's XDi illuminated indicator display series is a compact, easy-to-install, versatile and user-friendly revolution in bridge instrumentation.

The ultimate all-in-one solution, the XDi saves you panel space and installation time, gives you greater choice, more flexibility and the ability to configure and make repairs on-site.

With the XDi series, we have replaced mechanical scales and pointers with high quality displays, taking indicator performance to a new level without compromising DEIF customisation standards and maintaining approvals for all relevant applications.

XDi features high accuracy analogue readout (no mechanical or parallax's reading error), high precision digital readings, wide viewing angle and optimised day and night colour pallets, even a custom dusk pallet.

The XDi series comes in two different sizes with dual- or multi-indicator display libraries. You can order XDi with a DEIF standard indicator library – or you can have your own customised. Already a market-leader with record delivery times, the XDi series also enables us to ship your orders even faster.

Depending on functionality, all units are MED-certified. Approvals from major classification societies are available depending on application. DEIF has developed the XDi series cooperating closely with DNV GL.

XDi-N features

- ▶ TFT graphical LED 3.5, 5 or 7" display
- ▶ Two CAN ports with CANopen and XDi-net
- ▶ Redundant power inputs
- ▶ XDi-Net – add multiple XDi indicators
- ▶ Up to six NMEA inputs & up to four outputs
- ▶ NMEA data offset and averaging functions
- ▶ Dimmer controllable using front/external pushbuttons, analogue, NMEA or CAN/XDi-net.
- ▶ 3 level priority data fall-back function
- ▶ True wind data calculation
- ▶ Calculate magnetic or true heading
- ▶ XDi-net group dimmer and day/night colour shift
- ▶ Toggle between up to four predefined indicator screens using the mode function
- ▶ Quick-switch between measuring units either locally or for the entire system
- ▶ Customised indicator designs available on request
- ▶ Standard day and night designs, dusk on request
- ▶ Optional analogue or digital inputs
- ▶ Optional warning and alarms/relay output
- ▶ MED and other relevant class approvals

Variants

Extension modules

XDi-N Main	NX2
XDi-N Indicator	None required

Accessories

- ▶ AX1 analogue extension module
- ▶ DX1 digital extension module
- ▶ NX1 NMEA output extension module
- ▶ NX2 NMEA I/O extension module
- ▶ Front frames
- ▶ Dimmer potentiometer kit

Variant overview



XDI 96 Dual



XDI 96 Multi



XDI 144 Dual



XDI 144 Multi



XDI 192 Dual



XDI 192 Multi

Flexible display indicator – navigation

Advanced navigation indicators



Offering a number of advanced functions, including direct access to the main functions using the pushbuttons on the front, the XDi Navigation version (XDi-N) is the top model of DEIF's display-based indicator range.

With the XDi-N you can implement the same design across your bridge and combine propulsion and steering indication with a number of navigation indicators. Use DEIF's standard libraries or have your own created. Utilise the two standard CAN busses and the XDi-net data sharing and system integration functions to optimise your system with centralised group control functions.

XDi-N main NMEA indicator

The XDi-N main indicator is delivered with one NX2 NMEA input/output (I/O) module that in most cases covers all the needs for NMEA I/O.

XDi-net indicator

The standard XDi-N without NMEA extension module will use data transmitted via XDi-net from a main XDi-N indicator on the CAN bus. The XDi-net plug & play protocol is built on top of CANopen and makes system integration easy and cost effective.

XDi-N navigation indicator library

DEIF offers a selection of standard navigation or wind indicator libraries. Over time, these will come to include heading, rate of turn, speed, depth, position, date/time, steering and WP info, distance, weather, etc.

NMEA data interface

NMEA data in compliant with IEC 61162-1 is standard for the XDi-N which supports more than 80 different data types, including dimming control.

NMEA setup features:

- ▶ Automatic NMEA input scanning and selection
- ▶ Input overview with easy access to make changes
- ▶ NMEA sentence routing from input to output
- ▶ NMEA output configuration

XDi features

- ▶ TFT graphical LED 3.5, 5 or 7" display
- ▶ Multiple virtual indicator layouts selectable from library
- ▶ Standard and custom scale designs
- ▶ Displays 1 or more values
- ▶ 96, 144 or 192 DIN cutouts
- ▶ XDi-Net – a short-cut to CAN open
- ▶ Double CAN as standard
- ▶ Reduced wiring and installation
- ▶ Instant repairs on board
- ▶ Analogue and digital readout combined
- ▶ Standard day and night designs
- ▶ Dusk designs on request
- ▶ Redundant power inputs
- ▶ Optional analogue or digital input
- ▶ Optional NMEA or relay outputs
- ▶ MED and other relevant class approvals
- ▶ Optional double CAN connectors for daisy chaining
- ▶ Optional IP66 protection

Variants

No. of input values

XDi Dual	1 or 2
XDi Multi	Application-dependent

Accessories

- ▶ AX1 analogue extension module
- ▶ DX1 digital extension module
- ▶ NX1 NMEA output extension module
- ▶ NX2 NMEA I/O extension module
- ▶ Front frames
- ▶ Dimmer potentiometer kit
- ▶ Azimuth/rudder transmitters RTA 602, RTC 300 or 600

Illuminated panel indicator

Digital accuracy, analogue readability



XL features

- ▶ High shock/vibration resistance (robust)
- ▶ Class 0.5 accuracy
- ▶ 360 ° deflection
- ▶ Analogue or dual CANopen interface
- ▶ Optional IP66 protection
- ▶ LED illumination
- ▶ Q72, Q96, Q144 and Q192 scale sizes

Patented range of illuminated panel indicators designed to indicate e.g. rpm, pitch and rudder angle. These indicators are based on microprocessor-controlled X-coil technology.

XL scale designs

DEIF stocks a wide range of recommended standard scale designs, including scale designs for rpm, pitch, rudder, rate-of-turn and azimuth.

The range has been designed to meet international standards for optimal readability and precision – see www.deif.com for the current list.

DEIF can also handle customised scale designs, adding logos/text or create a new visual layout to identify your brand.

Variant overview



XL

Bridge wing indicator

Digital accuracy, analogue readability



Patented range of illuminated bridge wing indicators designed to indicate e.g. rpm, pitch and rudder angle. These indicators are based on microprocessor-controlled X-coil technology.

BRW-2 and BW scale designs

DEIF stocks a wide range of recommended standard scale designs, including scale designs for rpm, pitch, rudder, rate-of-turn and azimuth.

The range has been designed to meet international standards for optimal readability and precision – see www.deif.com for the current list.

DEIF can also handle customised scale designs, adding logos/text or create a new visual layout to identify your brand.

General features

- ▶ High shock/vibration resistance (robust)
- ▶ Class 0.5 accuracy
- ▶ 360 ° deflection
- ▶ Analogue or dual CANopen interface
- ▶ IP66 protection
- ▶ LED illumination

Variants

Features

BRW-2	Outdoor bridge wing mounting. Front-mounted dimmer.
BW	Indoor and outdoor bridge wing mounting, hanging or standing on pivot foot. Rear- mounted dimmer.

Variant overview



BRW-2



BW



Wind sensor static, WSS 500/550

Ultrasonic measuring equals no wear, no tear



The ultrasonic measuring principle with no moving parts gives reliable performance without any wear-out problems and without requiring regular service.

The new WSS 550 version has a built-in heating element to prevent icing up.

WSS 500 or WSS 550 can be connected to an XDi-N wind speed and direction indicator. VDR and other ships systems can receive wind data from the RS422 NMEA output on the XDi-N.

The sensor can also be used as a stand-alone sensor. An obvious alternative if you want high performance and reliability – not low-cost/high-maintenance!

WSS 500/550 features

- ▶ Measures wind speed and direction
- ▶ IP66 housing
- ▶ Intelligent heating prevents icing up
- ▶ Working temperature down to -40 °C
- ▶ Well-proven and robust technology
- ▶ Advanced system integration with XDi-N
- ▶ Plug'n'play replacement for WSS/WSS-L
- ▶ Fully compatible with WSDI-2 indicators
- ▶ All relevant major class approvals

Variants

WSS 550

Features

With heating

WSS 500

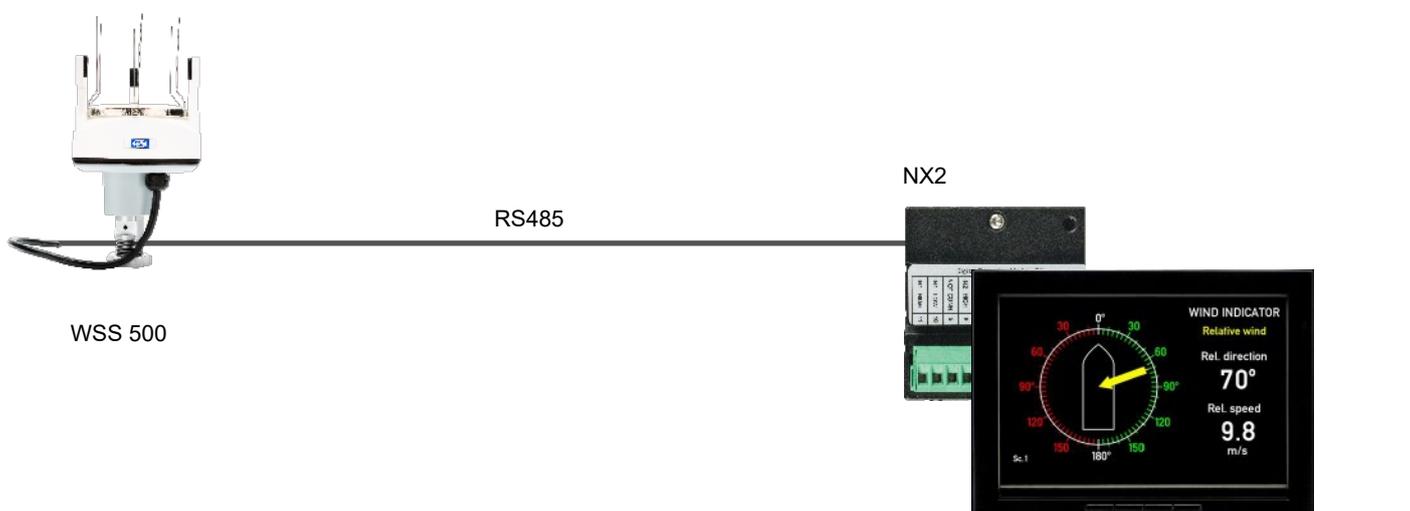
Without heating

Accessories

- ▶ Extension cables (30, 40, 50 or 100 m)
- ▶ IP66 or IP67 cable extension box

Application example

Standard relative wind indicator system



The RS485 port is used to receive NMEA data from the windsensor

XDi 192-N w/standard wind indicator library

Wind sensor, WSS 750

Superior accuracy perfect for critical applications



Two years of field testing in the North Sea and Norway's polar region have proven DEIF's WSS 750 wind sensors' reliability in providing superior wind measuring performance in all weather conditions.

The robust construction and high measuring accuracy make this sensor series the right choice for applications where precise and reliable wind data is essential to safe operation.

The WSS 750 is also highly recommended for use in dynamic positioning systems and other critical applications.

WSS 750 features

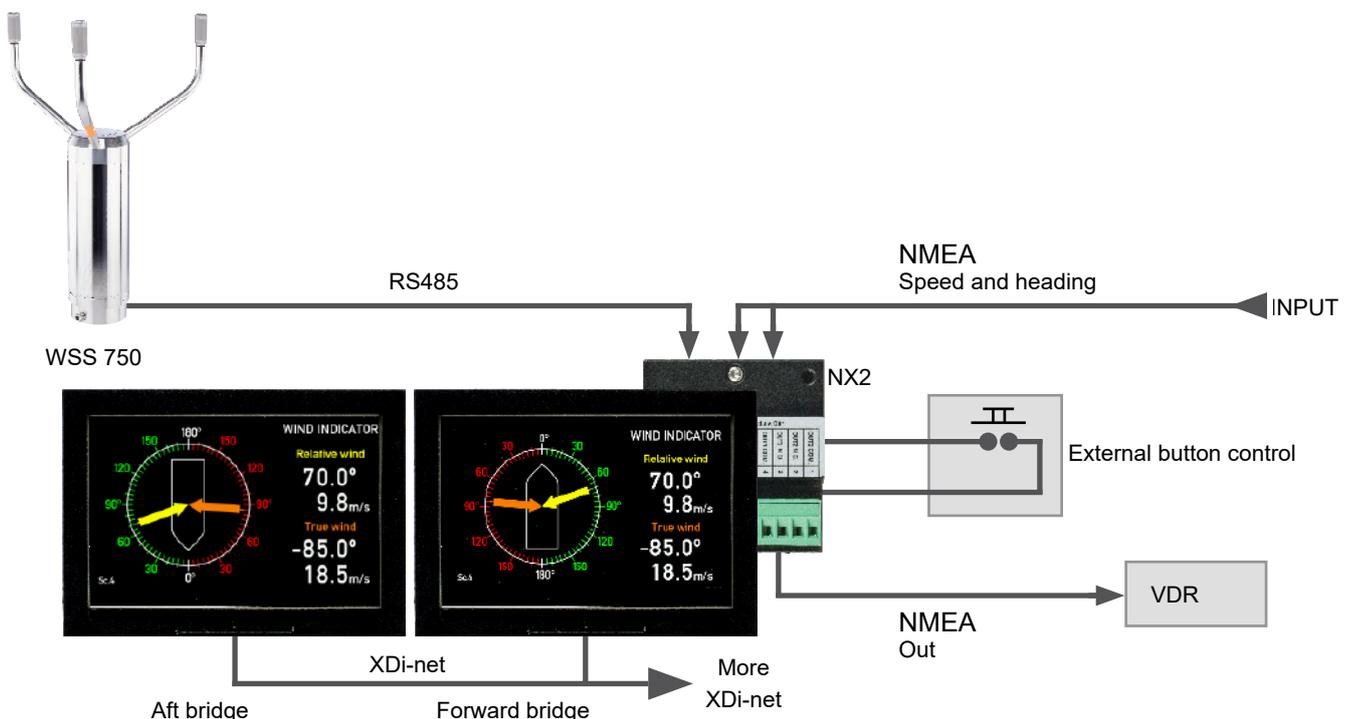
- ▶ Well-suited for dynamic positioning systems
- ▶ All stainless steel construction
- ▶ High power ultrasonic transducers in an equal-sided triangle constellation
- ▶ No moving parts; no wear
- ▶ Wind speed up to 65 m/s (120 Knot)
- ▶ Speed accuracy better than 3 % (min. +/-0.2 m/s)
- ▶ Direction accuracy better than +/- 2°
- ▶ NMEA protocol
- ▶ IP66 and IP67 fully waterproof
- ▶ Automatic power and gain control – automatic signal strength increase in case of rain or snow
- ▶ Built-in heating
- ▶ Working temperature down to -40 °C
- ▶ Advanced system integration with XDi-N
- ▶ Plug'n'play upgrade for WSS/WSS-L
- ▶ All relevant major class approvals

Accessories

- ▶ Extension cables (30, 40, 50 or 100 m)
- ▶ IP66 or IP67 cable extension box

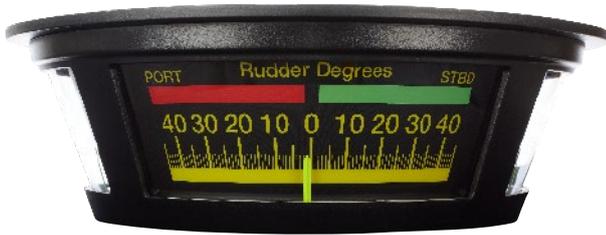
Application example

Advanced wind system - Relative, true, geographic with NMEA output



Panorama rudder indicator

Quick & easy reading from angles up to 250 °



TRI-2 is applied for the indication of the rudder position on the bridge. The indicator consists of a robust moving coil system equipped with 3 pointers mounted on a common shaft. It is suitable if you require analogue input. For CAN input, please refer to the TRI-2 with CAN interface.

With its large scales, the TRI-2 ensures a quick and easy reading of the rudder position from any angle up to 250 ° and from a distance of up to 5 metres from the indicator. The TRI-2 is housed in a matt black case for ceiling suspension.

TRI-2 features

- ▶ 3 extra large, easy-to-read scales
- ▶ Readable from up to 5 meters
- ▶ Black or white scales
- ▶ Long-life LED illumination
- ▶ Built-in dimmer
- ▶ Analogue interface or CAN

Variants	Features
TRI-2	Analogue input
TRI-2 CAN	CAN-based input

Rudder angle transmitter

Indication of rudder, azimuth & pitch angles



DEIF's rudder/azimuth angle transmitters convert the rudder or azimuth thruster's position angles into either electrical 4-20 mA signals or digital data values with a 16 bit resolution (+/-180deg. = +/-32767).

Unlike potentiometers, DEIF's angle transmitters use a "no touch" magnetic angle detection technology. The technology guarantees optimal accuracy and performance and longer life for the transmitters as they have no electromechanical parts.

DEIF's rudder and azimuth systems are MED-approved for easy use and immediate class approval.

The robust mechanical design and IP67 protection make the transmitters ideal for use aboard any ship.

General features

- ▶ "No touch" magnetic angle detection – no wear & tear
- ▶ Accuracy < 0.25°
- ▶ Analogue or CAN bus output for direct connection of one or more indicators
- ▶ Angle position range from +/- 20° to +/-180°
- ▶ Continuous shaft rotation
- ▶ Clockwise/counterclockwise, zero set & max./min. adjustment

Variants

Features

RTA 602	Analogue. 2 wire 4 to 20 mA DC. Ø19mm stainless steel shaft for direct rudder connection. Available with 90° mounting bracket Directly compatible with DEIF's RT-2 rudder angle transmitter*.
RTC 300	CAN bus. Ø6mm standard axel.
RTC 600	CAN bus. Ø19mm stainless steel shaft for direct rudder connection. Available with 90° mounting bracket Directly compatible with DEIF's RT-2 rudder angle transmitter*.
TDG210 DG	Converting 4-20mA to +/- 10 V or 0-10V

Accessories

Features

Mounting bracket	Available for RTA 602 and RTC 600
Position linkage	Available for RTA 602 and RTC 600 Length: 317 mm
Adjustable lever	Available for RTA 602 and RTC 600 Max. length: 1127 mm

Variant overview



RTA 602



RTC 600

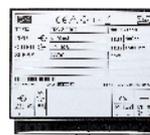


RTC 300



RTA 602

w/position linkage and lever



TDG210 DG



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