SERVING SAFETY

Nieaf-Smitt Maritime

Analogue panel indicators

NIEAF SMITT™

Mors Smitt
A Wabtec Company

SERVING SAFETY

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Analogue panel indicators

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Reliable indication is vital in all use

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Nieaf-Smitt Maritime technology

Company NIF (Netherlands Instrumentation Factory) later became Nieaf-Smitt started in 1900 as one of the first companies in the world with design and manufacturing of instrumentation.
Manoeuvring large maritime vessels today, often in congested port environments, has a heavy demand on the visibility, accuracy and reliability of instrumentation as well as the skills and experience of the crew/pilot. Both have to offer unquestioned dependability.

Nieaf-Smitt maritime instruments are designed, engineered and manufactured for bridge, bridge-wing and control/rudder room applications on board of ships. Prime applications such as propulsion, steering and navigation are covered with a wide range of dedicated products. All are made to the strictest prevailing standards and carry type approval and MED certification (Marine Equipment Directive) for applications such as speed, RPM, rudder angle, pitch and rate of turn.

Seagoing merchant vessels, cruise & ferry lines, naval ships, special work boats, inland shipping and tugs or dredging vessels all are served with specialized instrumentation. Most units are tailored to specific client requirements.

Worldwide availability is assured by a network of professional, trained and dedicated subsidiaries, distributors and agents, offering local service and support.

Nieaf-Smitt has certified quality and environmental management systems according to the leading international standards. ISO 9001:2000 and ISO 14001 are obtained.

Nieaf-Smitt not only has a clear eye directed at reliability, dependability, safety and cost-effectiveness, but also to the demands of our planet. Environmental consciousness is woven closely into design, manufacturing and commercial operations. The company is contributing to the safety of the world in more ways than one.

NIEAF SMITT™

All maritime instruments are marketed under the Nieaf-Smitt brand.

Mors Smitt
A Wabtec Company

Mors Smitt is part of Wabtec Corporation, the NYSE stock exchange listed, global supplier of highly engineered components and solutions for rail and selected industrial markets. Operations in 17 countries and world wide sales in over 100 countries. Wabtec Corporation holds over 1.200 patents and has world class internal processes based on lean manufacturing and continuous improvement principles (Wabtec Performance System).

Within the Wabtec group Mors Smitt has its own name & identity and is focused on satisfying the needs of customers in the maritime, power grid, industry and installation sectors.

Utrecht,October 2016

Tailored indicators for ultimate flexibility

Contents

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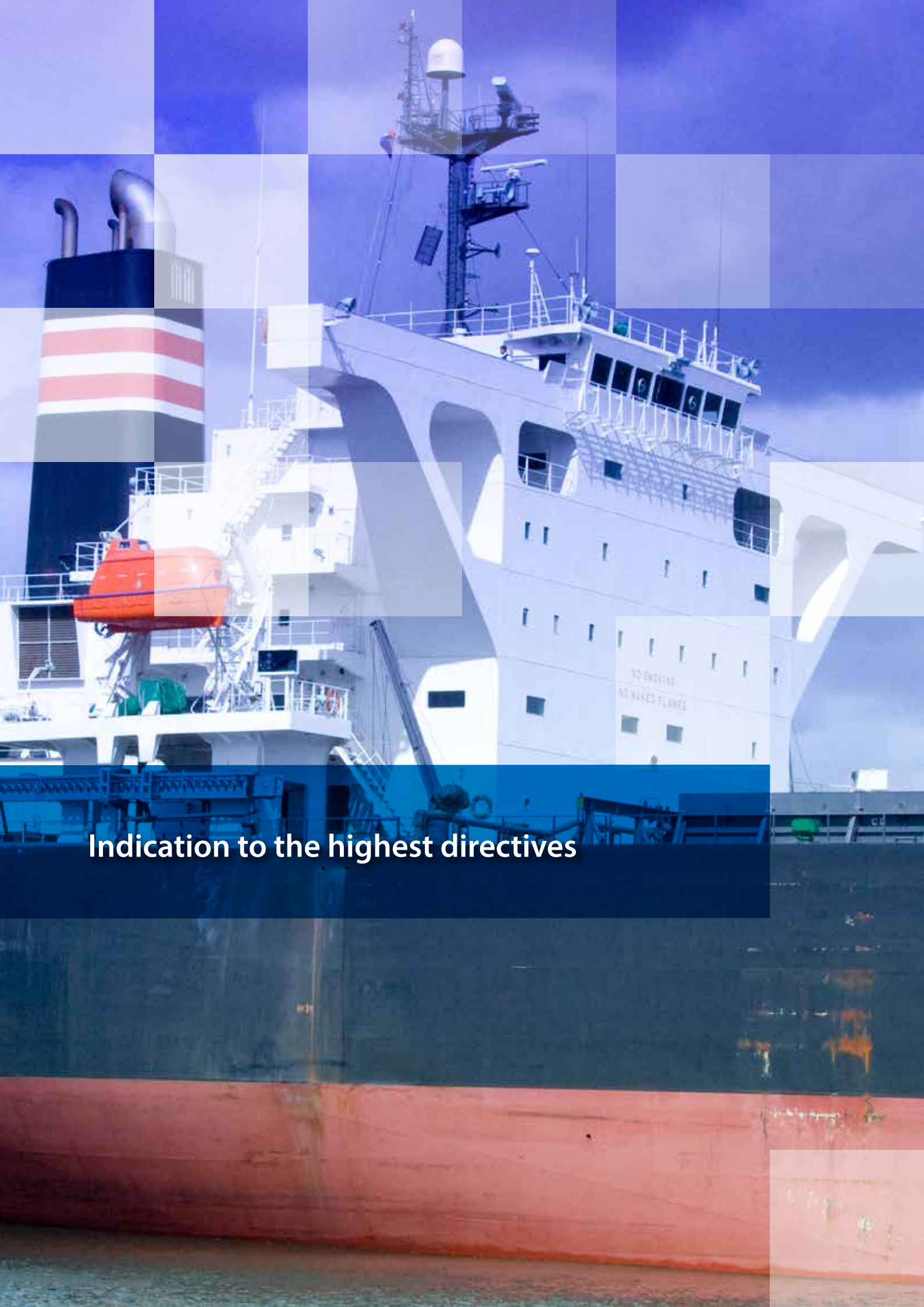


Indication to the highest directives

Maritime equipment directive

The EU Directive on Marine Equipment entered into force 1 January 1999. The directive requires that certain marine equipment is certified and specifies basic requirements to manufacturers as well as products. The directive applies to equipment manufactured and being placed on board of a new or existing ship under flag of the EFTA countries (EU, Norway and Iceland).

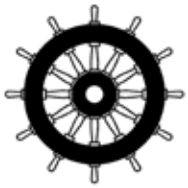
Purpose of the Marine Equipment Directive (MED) is to:

- Enhance safety at sea and the prevention of marine pollution through uniform application of international instruments (IMO Conventions, Resolutions, Circulars and relevant international testing standards) related to the equipment in question
- Ensure the free movement of equipment within the European Economic Area (EEA), consisting of the EU and EFTA Member States

The MED directive states:
The International Maritime Organisation and the European standardisation organisations have adopted standards, including detailed testing standards, for a number of items of equipment which are listed in Annex A.2 to Directive 96/98/EC or which, albeit not listed, are considered relevant for the purpose of the said Directive. Therefore such items of equipment should be included in Annex A.1 or transferred from Annex A.2 to Annex A.1, as appropriate.

For indicators 5 directives are stated:
A.1/4.7 Speed and distance measuring equipment (SDME)
A.1/4.9 Rate of turn indicator
A.1/4.20 Rudder angle indicator
A.1/4.21 Propellor revolution indicator (RPM)
A.1/4.22 Pitch indicator

Each directive refers to testing standards for indication on board of vessels. The standards define accuracies of systems and indicators.



Schedule

Size (mm)	Type	IP	Analogue	CAN-OPEN	Speed (SDME)	ROT	RAI	RPM	PITCH
48 x 48	Dv48S	54	•		•		•	•	•
	Dv48S	66	•		•		•	•	•
	D3v48S	54	•		•		•	•	•
	D3v48S	66	•		•		•	•	•
72 x 72	Dv72S	54	•		•		•	•	•
	Dv72S	66	•		•		•	•	•
	D3v72S	54	•		•		•	•	•
	D3v72S	66	•		•		•	•	•
96 x 96	Dv96S	54	•		•		•	•	•
	Dv96S	66	•		•		•	•	•
	D3v96S	54	•		•		•	•	•
	D3v96S	66	•		•		•	•	•
	SXv96	54	•	•	•		•	•	•
	SXv96	66	•		•		•	•	•
	BCI-1-96	66	•		•		•	•	•
144 x 144	Dv144S	54	•		•		•	•	•
	Dv144S	66	•		•		•	•	•
	D3v144S	54	•		•	•	•	•	•
	D3v144S	66	•		•	•	•	•	•
	SXv144	66	•	•	•		•	•	•
	BCI-1-144	66	•		•	•	•	•	•
	BCI-2-144	66	•		•	•	•	•	•
	BCI-3-144	66	•		•	•	•	•	•
	BCI-4-144	66	•		•	•	•	•	•
192 x 192	D3v192S	54	•		•	•	•	•	•
	D3v192S	66	•		•	•	•	•	•
	NOA-1-192	66	•		•	•	•	•	•
PANORAMA	RCI-400	54	•				•		

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Maritime products

Nieaf-Smitt produces analogue indicators for maritime applications. Keyword for our production and R&D is flexibility. All instruments are produced on customer request and built on order.

We primarily produce navigation instruments for bridge, bridge wing and control room installation. For example for speed, RPM, rate of turn, and pitch. Especially rudder indication is an important application.

Coming from traditional electromechanical technology, the latest developments in maritime instrumentation are based on processor controlled stepper motor technology and digital communication (bus). Offering ultimate flexibility in terms of interfacing with 'the outside world'.

Dv.... models

Moving coil indicator

Indicators for maritime applications, pointer rotation max. 90 °

White scale, IP54

Black scale, IP54

Black scale, IP66

Model	Dimensions	Weight
Dv48S	48 x 48 mm / 52 mm	100 g
Dv72S	72 x 72 mm / 60 mm	210 g
Dv96S	96 x 96 mm / 60 mm	270 g
Dv144S	144 x 144 mm / 60 mm	350 g
Dv48/66	58 x 58 mm / 52 mm	130 g
Dv72/66	86 x 86 mm / 60 mm	250 g
Dv96/66*	112 x 112 mm / 60 mm	350 g
Dv144/66*	158 x 158 mm / 60 mm	500 g

Illumination options

Illuminated pointer	24 VDC
Illuminated scale by LED's	24 VDC

Input options / Load

0…10 V	10 kΩ
0…12 V	12 kΩ
10…0…10 V	20 kΩ
12…0…12 V	24 kΩ
0…20 mA / 4…20 mA	< 30 Ω
1…0…1 mA	< 30 Ω
10…0…10 mA	< 30 Ω
20…0…20 mA	< 30 Ω

Other voltages and currents on request

Scale options

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Pointer options

Deflection	90 degrees
Colour	black / white / yellow
	Other pointer colours on request

Temperature ranges

Operation	-25…0…70 °C
Storage	-40…0…80 °C
Influence on accuracy	0.5 % / 10 °C

Vibration test

3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

Glass	low-reflecting glass
Protection class	IP54 (standard) / IP66 (optional)
Accuracy	Class 1.5
Mounting	In all positions mountable

** also BCI housing available*

Standards

DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Compliancy

EN 61554
ISO 20673:2007
ISO 22554:2007
ISO22555:2007
EN 60051
EN 60945:2002

Lloyds approval TA

MED directives

- Speed A.1/4.7
- Rudder A.1/4.20
- RPM A.1/4.21
- Pitch A.1/4.22

D3v.... models

Moving coil indicator

Indicators for maritime applications, pointer rotation max. 240 °

Models	Dimensions	Weight
D3v48S	48 x 48 mm / 52 mm	190 g
D3v72S	72 x 72 mm / 60 mm	310 g
D3v96S	96 x 96 mm / 60 mm	400 g
D3v144S	144 x 144 mm / 60 mm	530 g
D3v192S	192 x 192 mm / 60 mm	600 g
D3v48S/66	58 x 58 mm / 52 mm	230 g
D3v72S/66	86 x 86 mm / 60 mm	340 g
D3v96S/66*	112 x 112 mm / 60 mm	480 g
D3v144S/66*	158 x 158 mm / 60 mm	680 g
D3v192S/66**	208 x 208 mm / 60 mm	800 g

Illumination options

Illuminated pointer	24 VDC
Illuminated scale by LED's	24 VDC

Input options	Load
0…10 V	10 kΩ
0…12 V	12 kΩ
10…0…10 V	20 kΩ
12…0…12 V	24 kΩ
0…20 mA / 4…20 mA	< 30 Ω
1…0…1 mA	< 30 Ω
10…0…10 mA	< 30 Ω
20…0…20 mA	< 30 Ω

Other voltages and currents on request

Scale options

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Pointer options

Deflection	240 degrees
Colour	black / white / yellow
	Other pointer colours on request

Temperature ranges

Operation	-25…0…70 °C
Storage	-40…0…80 °C
Influence on accuracy	0.5 % / 10 °C

Vibration test

3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

Glass	low-reflecting glass
Protection class	IP54 (standard) / IP66 (optional)
Accuracy	Class 1.5
Mounting	In all positions mountable

** also BCI housing available*
*** also BCI and NOA housing available*

Standards
DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Compliancy
EN 61554
ISO 20673:2007
ISO 22554:2007
ISO22555:2007
EN 60051
EN 60945:2002

Lloyds approval TA

MED directives:
- Speed A.1/4.7
- Rate of turn A.1/4.9*
- Rudder A.1/4.20
- RPM A.1/4.21
- Pitch A.1/4.22

* only for 144 / 192

White scale, IP54

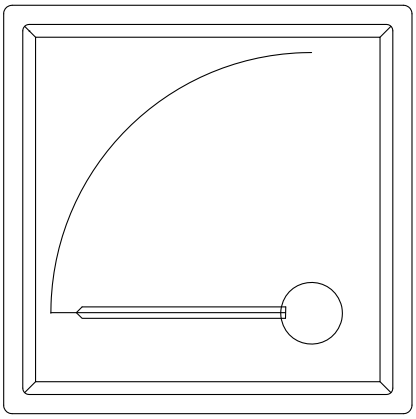
Black scale, IP54

Black scale, IP66

Pointer positions

Dv.... models

Pointer rotation max. 90°



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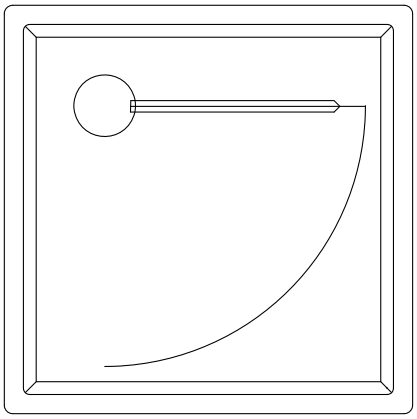
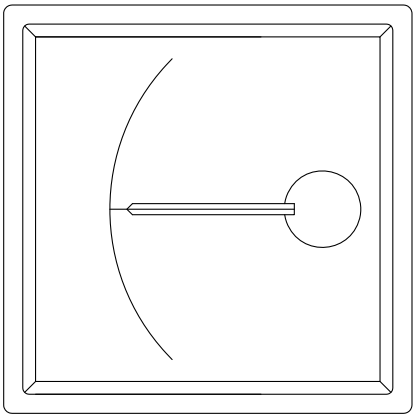


Upper, left



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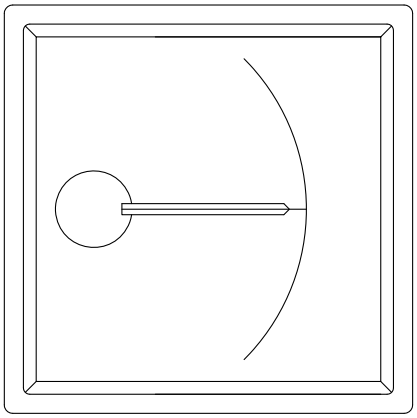
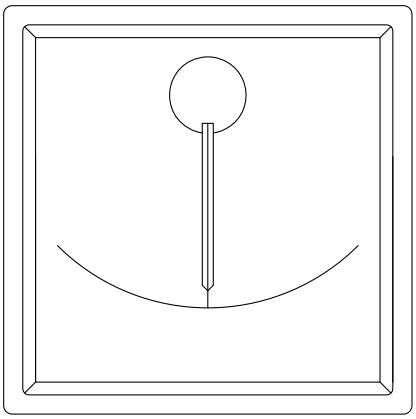
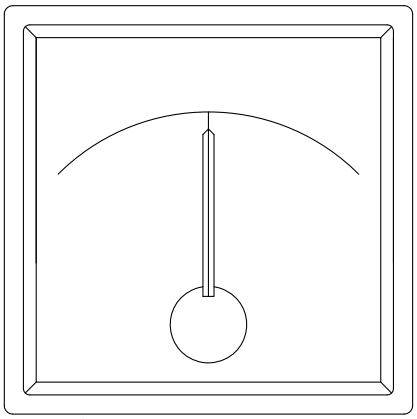


Middle, left



Centre, up

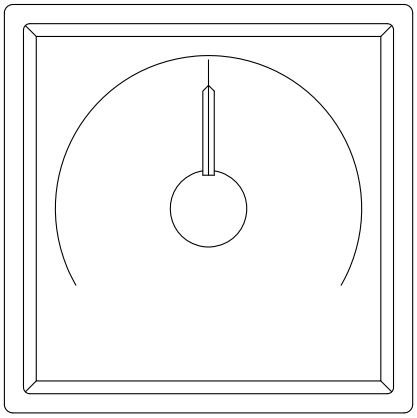


Centre, bottom

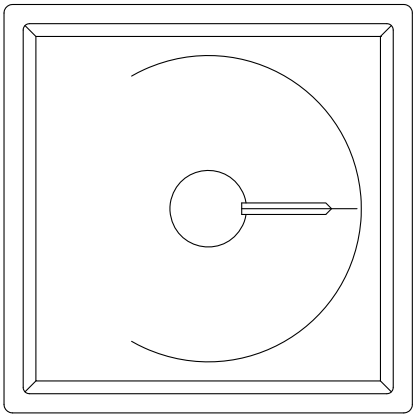
Pointer positions

D3v.... models

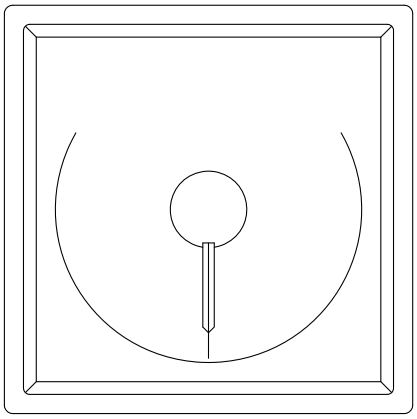
Pointer rotation max. 240°



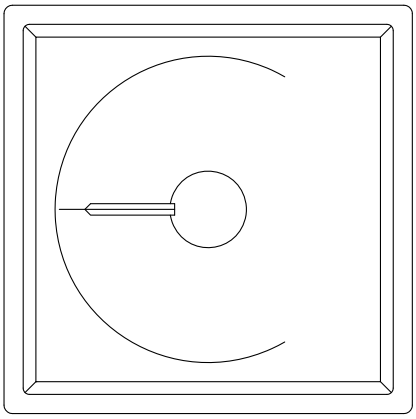
Centre, pointing up



Centre, pointing right



Centre, pointing down

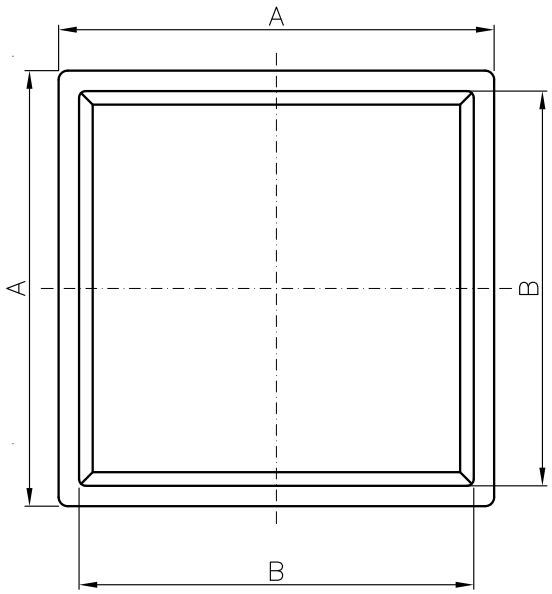


Centre, pointing left

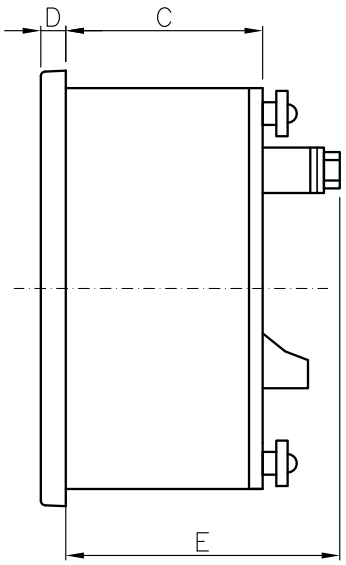
Dimensions

IP54 models

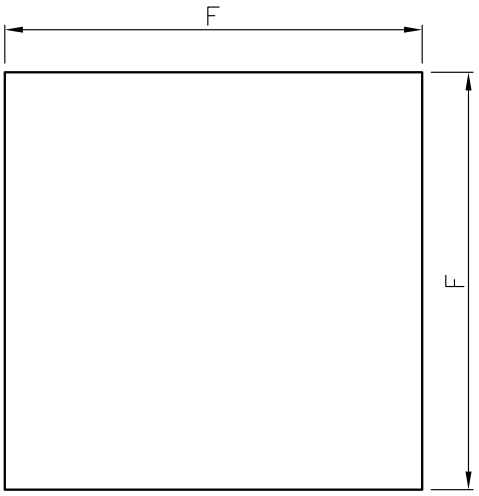
Front protection class, IP54



Front view



Side view



Panel cut out

	A	B	C	D	E	F
D(3)v48S	48	42	44	5	52	45+0.6
D(3)v72S	72	63	43	5	60	68+0.7
D(3)v96S	96	86	43	5	60	92+0.8
D(3)v144S	144	134	45	5	60	138+1.0
D3v192S	192	164	45	7.5	60	186+1.1

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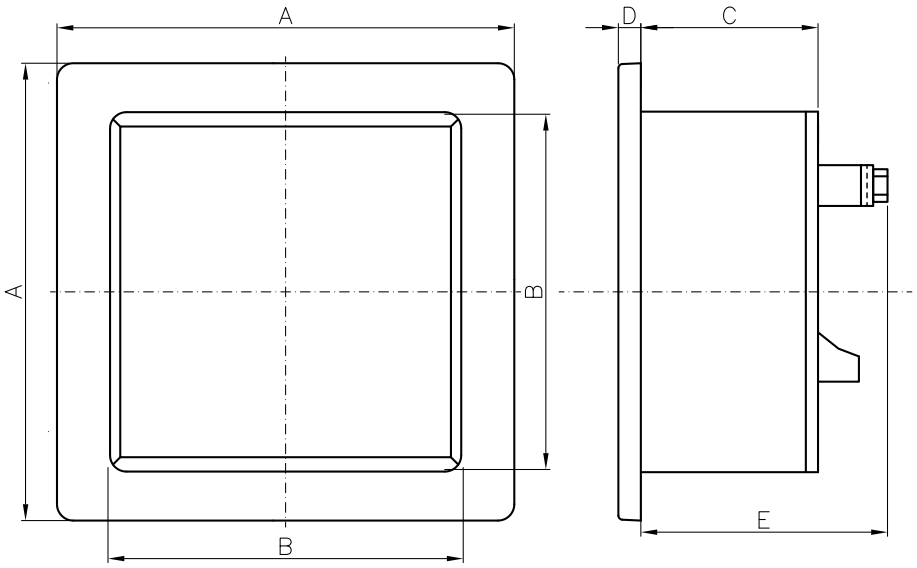
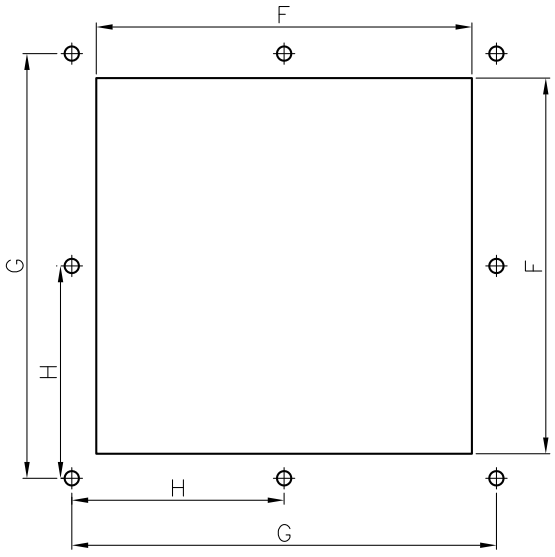
IP66 models

Front protection class, IP66



Front view

Side view



Panel cut out

	A	B	C	D	E	F	G	H
D(3)v48S/IP66	58	42	44	5	52	45+0.6	51	-
D(3)v72S/IP66	86	63	43	5	60	68+0.7	78	-
D(3)v96S/IP66	112	86	43	5	60	92+0.8	104	-
D(3)v144S/IP66	158	134	45	5	60	138+1.0	150	75
D3v192S/IP66	208	164	45	7.5	60	186+1.1	198	99

SXv....

Stepper indicator with analogue input

Maritime bridge & bridge-wing instruments based on hybrid stepper motor technology.

The pointer needle is full scale 360° rotated in over 6.400 micro-steps, resulting in 0.25 % accuracy.

With this accuracy the SXv96 stepper indicator complies with all latest standards and MED regulations and is considered to be the best available in the market.

Type	Dimensions	Weight
SXv96	96 x 96 mm / 87.1 mm	320 g

Illumination

Illuminated pointer	24 VDC
Illuminated scale by LED's	24 VDC

Input

0…10 V
0…12 V
10…0…10 V
12…0…12 V
0…20 mA
4…20 mA
1…0…1 mA
10…0…10 mA
20…0…20 mA
Other voltages and currents on request

Supply

24 VDC

Scale

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Pointer

Deflection	270 degrees
Colour	black / white / yellow
	Other pointer colours on request

Temperature

Operation	-25…0…70 °C
Storage	-40…0…80 °C
Influence on accuracy	0.05 % / 10 °C

Vibration test

3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

Glass	Non-reflecting glass
Protection class	IP54 (standard) / IP66 (optional)
Accuracy	Class 1.5, 6400 steps over 360°
Mounting	In all positions mountable

Standards

DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Compliancy

DIN 61554
ISO 20673:2007
ISO 22554:2007
ISO22555:2007
EN 60051

Lloyds approval TA

MED - speed A.1/4.7
- rudder A.1/4.20
- RPM A.1/4.21
- Pitch A.1/4.22

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SXv....

Stepper indicator with dual-CAN input

Maritime bridge & bridge-wing instruments based on hybrid stepper motor technology.

The pointer needle is full scale 360° rotated in over 6.400 micro-steps, resulting in 0.25% accuracy.

With this accuracy the SXv96 stepper indicator complies with all latest standards and MED regulations and is considered to be the best available in the market.

Type	Dimensions	Weight
SXv96	96 x 96 mm / 87.1 mm	320 g

Illumination
Illuminated pointer
Illuminated scale by LED's
Dimmable by CAN bus

Supply
24 VDC

Scale

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Pointer

Deflection	270 degrees
Colour	black / white / yellow *Other pointer colours on request*

Temperature

Operation	-25…0…70 °C
Storage	-40…0…80 °C
Influence on accuracy	0.05 % / 10 °C

Vibration test

3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

Glass	Non-reflecting glass
Protection class	IP54 (standard) / IP66 (optional)
Accuracy	Class 1.5, 6400 steps over 360°
Mounting	In all positions mountable

Standards
DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Compliancy
DIN 61554
ISO 20673:2007
ISO 22554:2007
ISO22555:2007
EN 60051

Lloyds approval TA

MED - speed A.1/4.7
- rudder A.1/4.20
- RPM A.1/4.21
- Pitch A.1/4.22

SXv.... Azimuth

Azimuth with dual-CAN input

Maritime bridge & bridge-wing instruments based on hybrid stepper motor technology.

The azimuth rotation disc is full scale 360° rotated in over 6.400 micro-steps, resulting in 0. 25 % accuracy.

With this accuracy the SXv96 stepper indicator complies with all latest standards and MED regulations and is considered to be the best available in the market.

Type	Dimensions	Weight
SXv96 Azimuth	96 x 96 mm / 87.1 mm	320 g

Illumination
Illuminated pointer
Illuminated scale by LED's
Dimmable by CAN bus

Supply
24 VDC

Scale

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Rotation disc

Deflection	360 degrees
Colour	black / white / yellow *Other pointer colours on request*

Temperature

Operation	-25…0…70 °C
Storage	-40…0…80 °C
Influence on accuracy	0.05 % / 10 °C

Vibration test

3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

Glass	Non-reflecting glass
Protection class	IP54 (standard) / IP66 (optional)
Accuracy	Class 0.25, 6400 steps over 360°
Mounting	In all positions mountable

Standards
DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Compliancy
DIN 61554
ISO 20673:2007
ISO 22554:2007
ISO22555:2007
EN 60051

Lloyds approval TA

MED - speed A.1/4.7
- rudder A.1/4.20
- RPM A.1/4.21
- Pitch A.1/4.22

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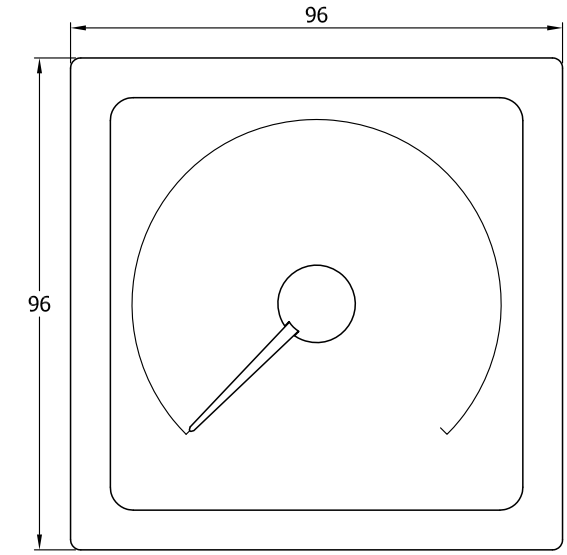
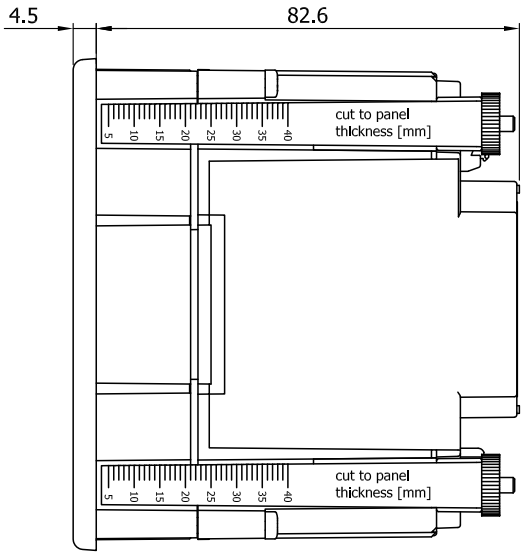
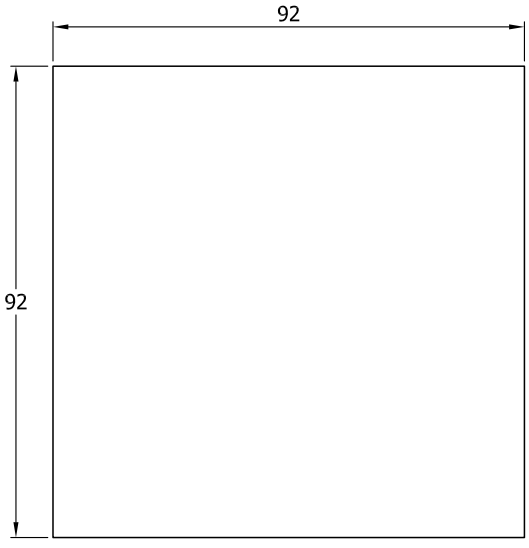
SXv....







BCI

Housing for 1, 2, 3 or 4 indicators IP66

The Dv.../66 and D3v.../66 bridge instrument models can be supplied in a 'ready to mount' housing. The BCI housing system is available as a single instrument system, but also for 2, 3 or even 4 instruments in one housing.

The user friendly dimmer knob, mounted on the front, provides an easy to adjust illumination intensity. This makes the instruments suitable for day/night operation. Equipped with 2 cableglands and venting valve.

Model	Description
BCI-1-96	Housing for 1 pc. 96 x 96 mm, IP66 instrument
BCI-1-144	Housing for 1 pc. 144 x 144 mm, IP66 instrument
BCI-1-192	Housing for 1 pc. 192 x 192 mm, IP66 instrument
BCI-2-144	Housing for 1 pc. 144 x 144 mm, IP66 instrument
BCI-3-144	Housing for 1 pc. 144 x 144 mm, IP66 instrument
BCI-4-144	Housing for 1 pc. 144 x 144 mm, IP66 instrument

Remarks

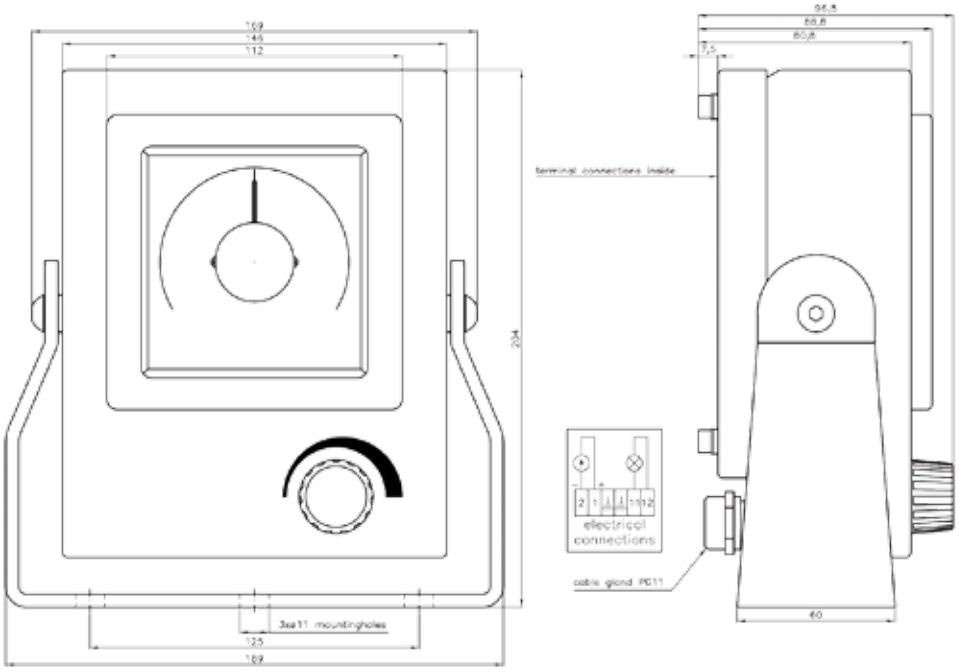
Material	Stainless steel
Finishing	Powder coated
Connections	2 cable glands for cable entry
Dimmer	The housing is equipped with a dimmer on the front.
Indicator	Must be separately specified

General

Protection class	IP66
Mounting	The housing is equipped with swivel-mounting bracket

SERVING SAFETY

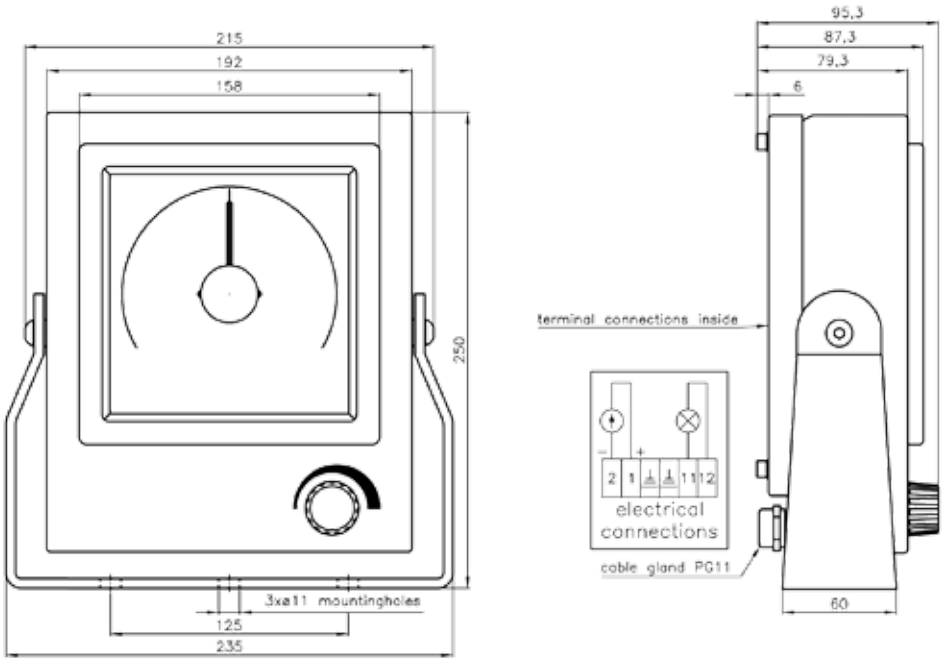
BCI-1-96



Front view

Side view

BCI-1-144

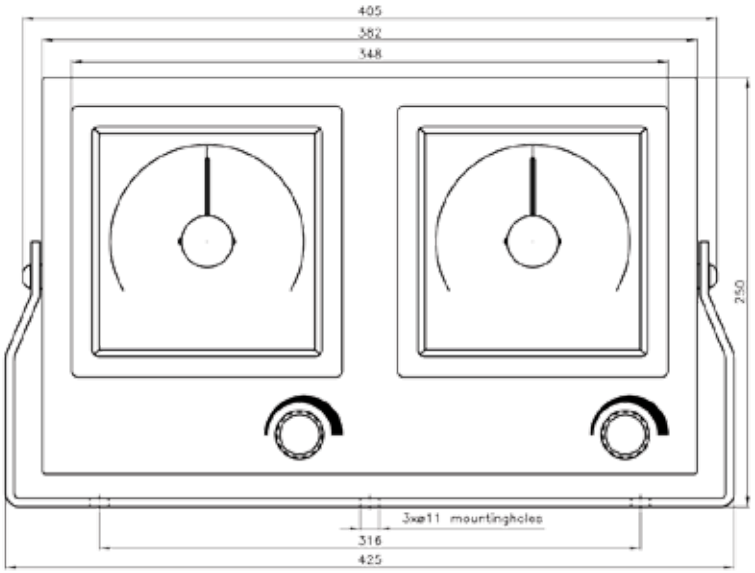


Front view

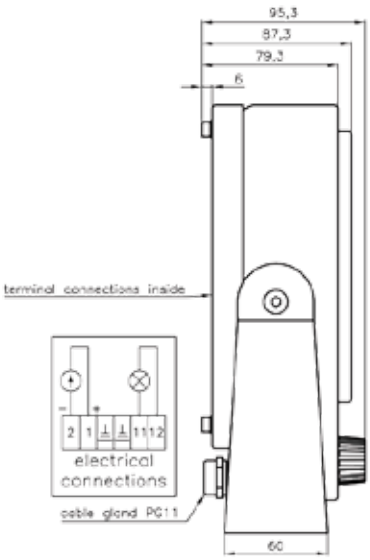
Side view

Dimensions

BCI-2-144

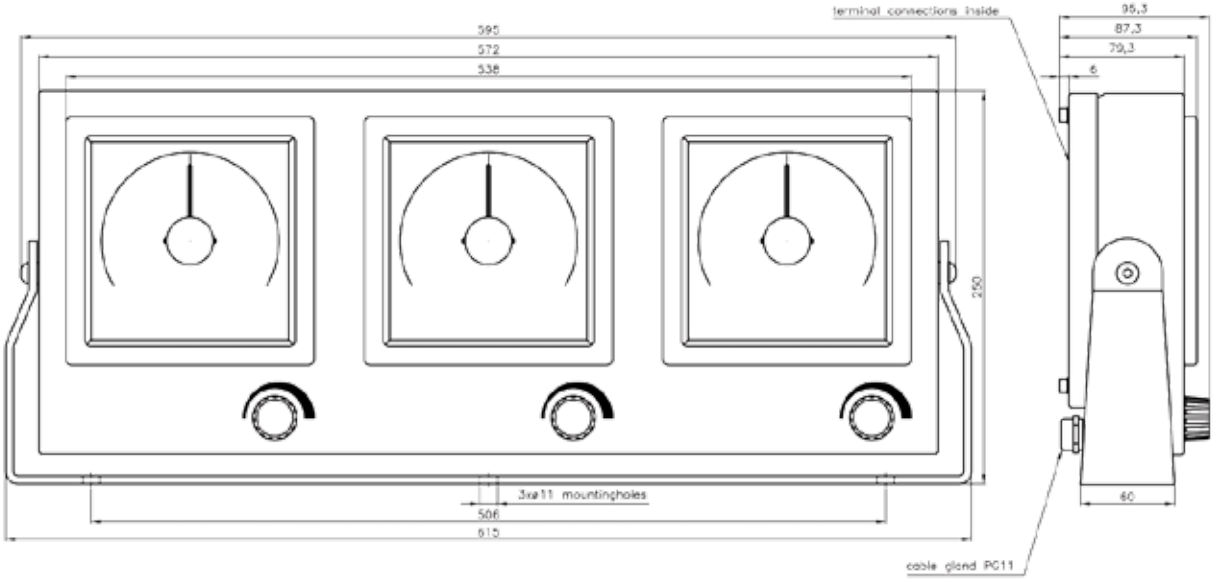


Front view



Side view

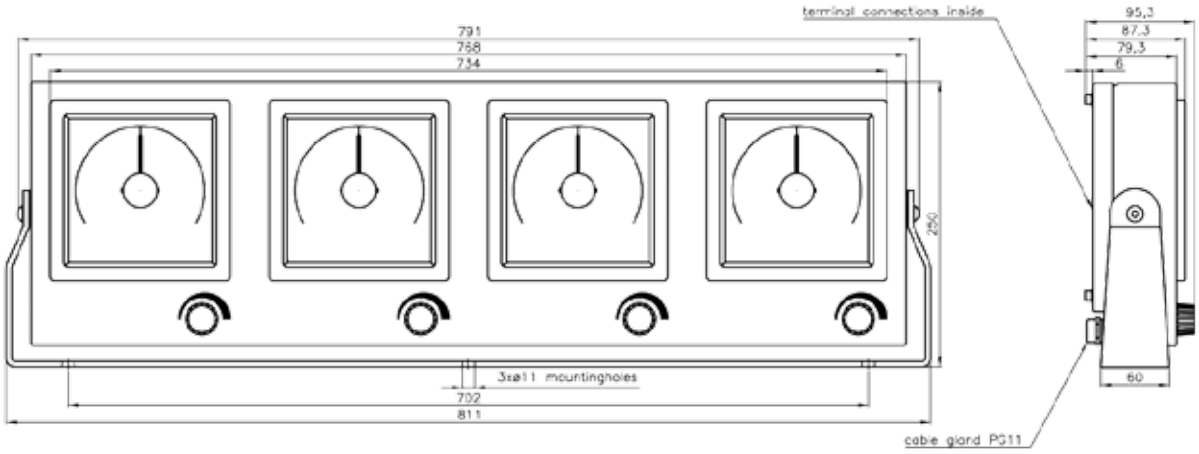
BCI-3-144



Front view

Side view

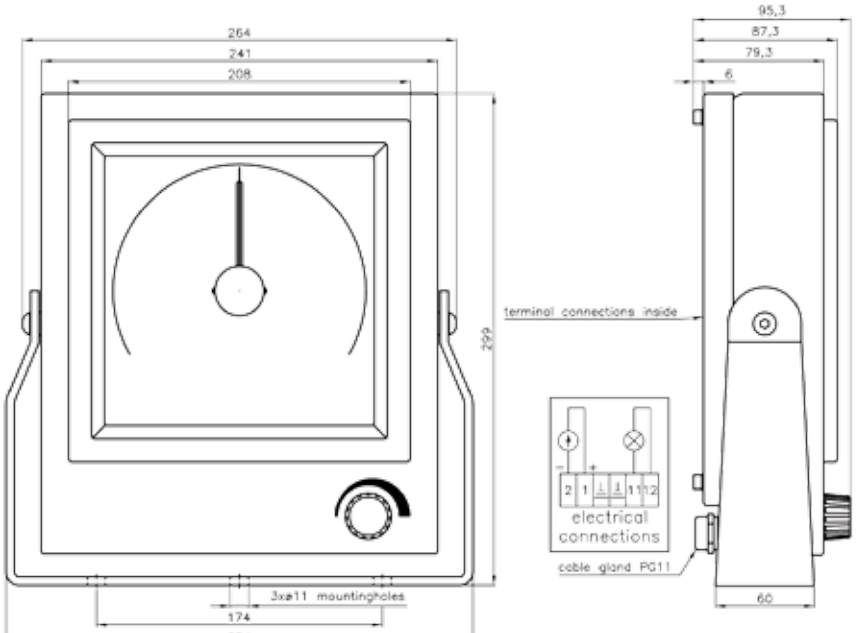
BCI-4-144



Front view

Side view

BCI-1-192



Front view

Side view

Housing for maritime bridge instruments

NOA-1-192

Housing according panama canal recommendations
IP66

The NOA-housing system is a 'Ready to mount' system for bridge wing instruments built according the Panama Canal recommendations.
The IP66 waterproof NOA-housing is suitable for a single 192 x 192 mm panel indicator. (D3v192/66 models)

The user friendly dimmer knob, mounted on the front, provides an easy to adjust illumination intensity. This makes the instruments suitable for day/night operation.

As a result of the specific scale and pointer design of this instrument, combined with the 'state of the art' illumination system, it provides the largest and easiest to read scale printing in the market.

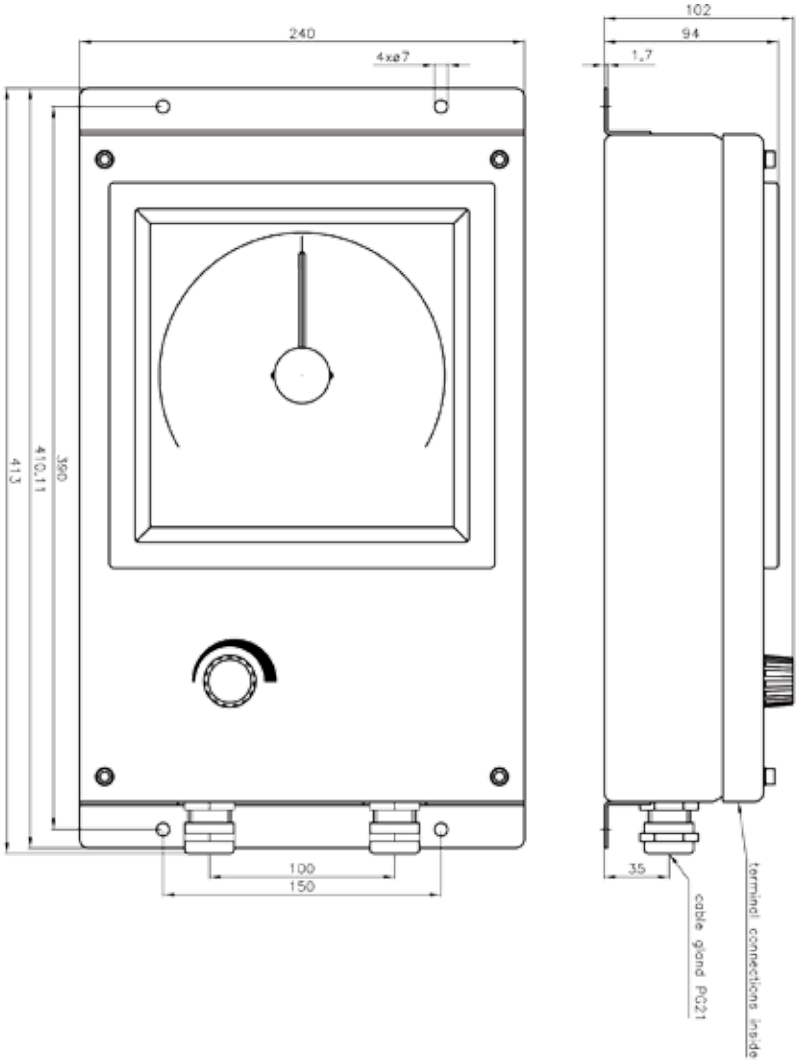
Model	Description
NOA-1-192	Housing for 1 pc. 192 x 192 mm indicator Designed according the Panama Canal recommendations

Remarks	
Material	Stainless steel
Finishing	Powder coated
Connections	2 cable glands for cable entry
Dimmer	The housings are equipped with a dimmer on the front.
Indicator	Must be separately specified

General	
Protection class	IP66
Mounting	The housing is equipped with 4 mounting holes, fot fixed mounting on panel/wall

SERVING SAFETY

NOA-1-192



Front view

Side view

RCI-400

Panorama rudder indicator

Servo-drive operated deckhead rudder indicator with 3 scales and pointers. Suitable for ceiling mounting. Integrated illumination dimmer and 2 cable glands.

Standards
EN 60945: 2002

Compliancy
ISO 20673:2007

Lloyds approval TA

MED - rudder A.1/4.20

Model	Dimensions	Weight
RCI-400	400 x 122 mm (diameter x height)	3960 g

Illumination
Dimmable pointer illumination
Dimmable scale illumininationn

Input	Load
0…10 V	80 kΩ
0…12 V	80 kΩ
10…0…10 V	80 kΩ
12…0…12 V	80 kΩ
0…20 mA	100 Ω
4…20 mA	100 Ω
1…0…1 mA	1000 Ω
10…0…10 mA	100 Ω
20…0…20 mA	50 Ω

Scale

Background	black / white
Inscription	black / white / yellow
Coloured marks and bands	On customer request
Company logo	On customer request

Pointer

Deflection	3 x 70°
Colour	black / white / yellow *Other pointer colours on request*

Temperature

Operation	0…55 °C
Storage	-40…0…80 °C
Influence	0.5 % / 10 °C

Vibration test

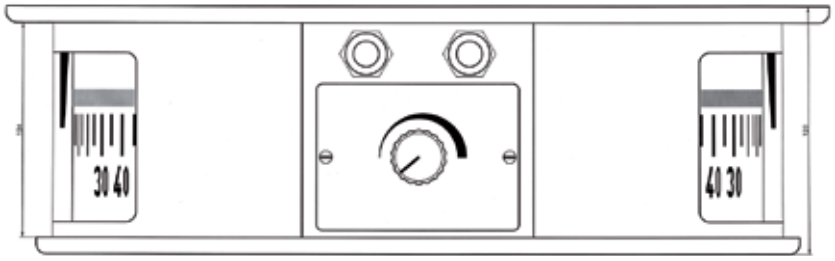
3…13.2 Hz	2 mm
13.2…100 Hz	0.7 g

General

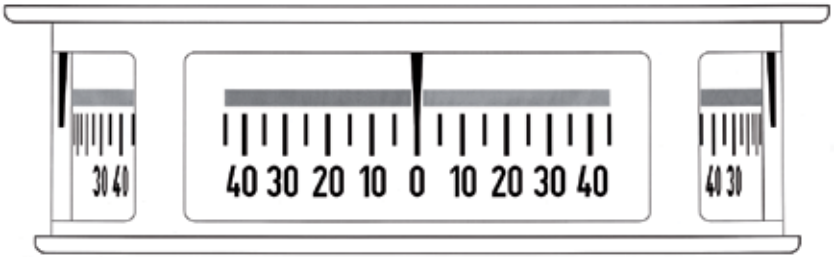
Glass	Non-reflecting glass
Protection class	IP40
Accuracy	Class 1.5
Mounting	On ceiling of the bridge

Dimensions

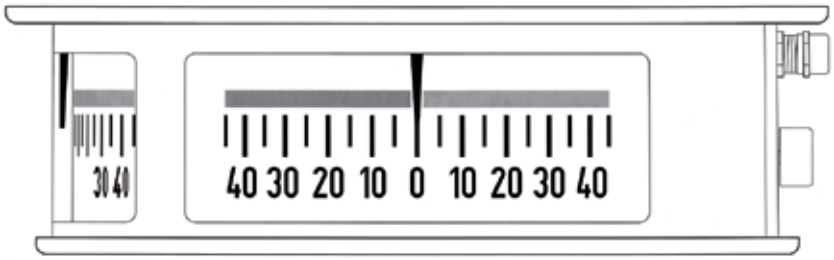
Rear view



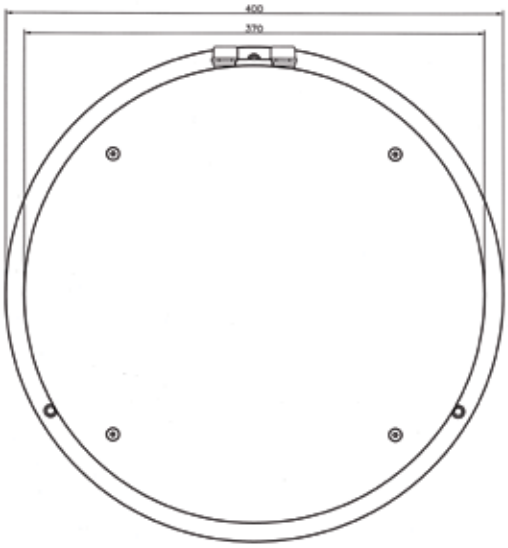
Front view



Side view



Bottom view



SCB

Signal calibration box

The signal calibration box (SCB) is designed to convert signals from a sensor and display these corrected signals on one or more panel indicators.

Compliancy

LR TA System
Specification 1 of 2002
EN 60945: 2002
ISO 20673: 2007
EN 20672: 2007
EN 22554: 2007
EN 22555: 2007

General specifications

Supply voltage	24 VDC (-25 % +30 %)
Power consumption	± 3.6 W
Operation temperature	-15 °C...+70 °C

Input

Three wire potentiometer	(1 KΩ - 10 KΩ)
Current signal	4...20 mA RI (max) 150 Ω
	0...20 mA RI (max) 150 Ω
Voltage signal	0...10 V RI (min) 5 MΩ
	-10...0...10 V RI (min) 5MΩ
	-12...0...12 V RI (min) 5MΩ

(the input type is selectable by software)

Output

10 x adjustable indicators output

Current signal	4...20 mA
	0...20 mA
Voltage signal	0...10 V
	-10...0...10 V
	-12...0...10 V

1 x NMEA 0183 compatible output

Talker device	Engine room monitoring systems (ER)
Sentence format	Rudder sensor angle
Baud rate	4800
Message frequency	± 10 Hz

Message format

$--RSA, x.x, A, x.x, A*hh<CR><LF>

Sensors*

Port rudder sensor	Status A = data valid / V = data invalid
Starboard (or single) rudder sensor	Status A = data valid / V = data invalid

* Relative measurement of rudder angle without units, "-" = bow turns to port. Sensor output is proportional to rudder angle but not necessarily 1:1

Communication

1x USB port for the adjustment
Software built-in to denial converter

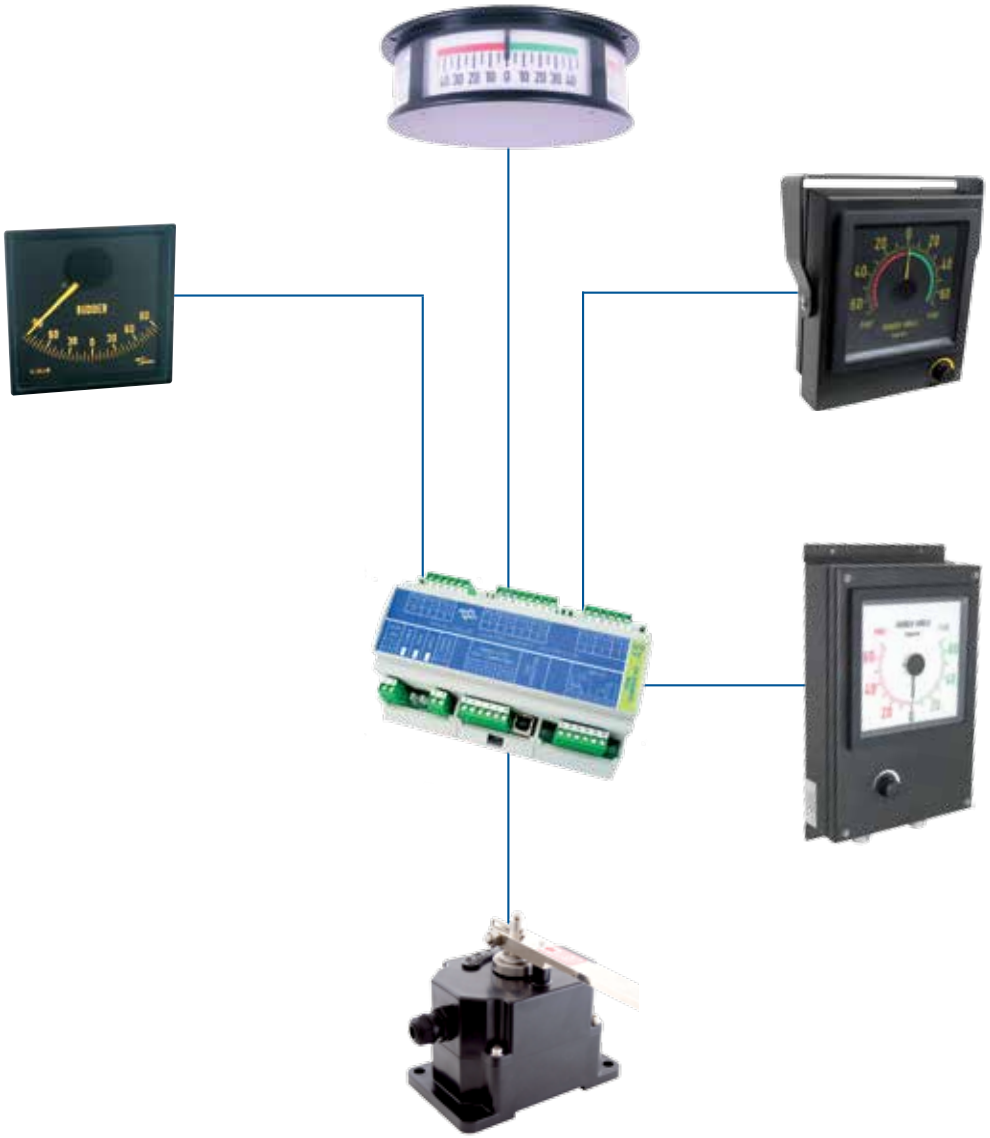
Indication LED's

Power on / Run / Input correct

Internal software	Corrects the input to a "perfect" signal Sends the "perfect" signal over the NMEA 0183 Compatible output converts the "perfect signal per indicator output Possibility to adjust via the USB port
Adjustment software	Windows[tm] based adjustment software Possibility to adjust the input and output Curves option to generate a report file
Response time	200 ms max.
Accuracy	The complete system (from rudder axis to indicator) can be calibrated to accuracy less than 0.5 % (in accordance with the standards). Initial factory accuracy 1.0 %. Accuracy over temperature range 0.2 %.
Housing	
Dimensions	155 x 110 x 62 mm (w x b x h), 35 mm rail mounting
Materials	Plastic, UL-9u V-o
Connections	Pluggable screw connectors

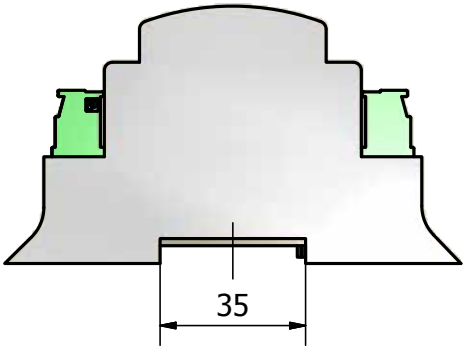
Schematic

Typical rudder indicator system

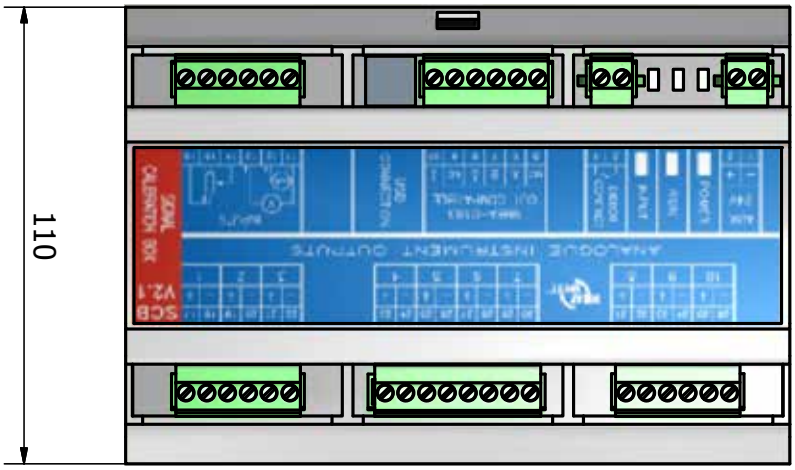


SERVING SAFETY

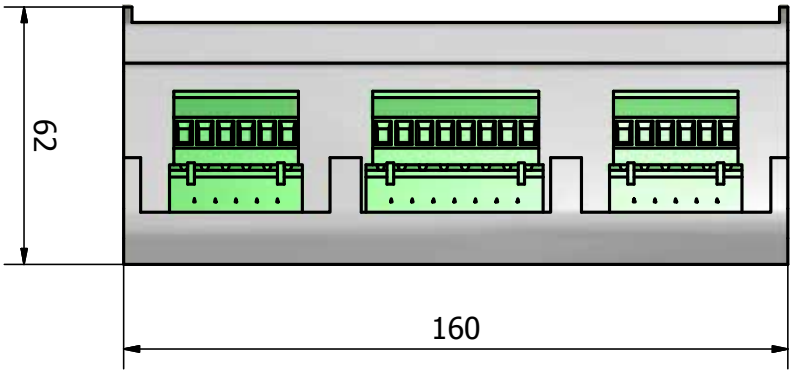
Rear view



Front view



Side view



Maritime rudder angle transmitter

RTP-...models

Rudder angle transmitter

RPT-V10
with voltage or current output

Rudder angle transmiter with integrated 'active' electronics.

Supply	24 VDC
Operating range	45° PORT...0...45° STBD 70° PORT...0...70° STBD
Output range	10...0...10 V (standard) 20...0...20 mA 4...20 mA For maximum 10 pcs. RAI indicators
General Protection class	IP54

Compliancy

Lloyds approval TA

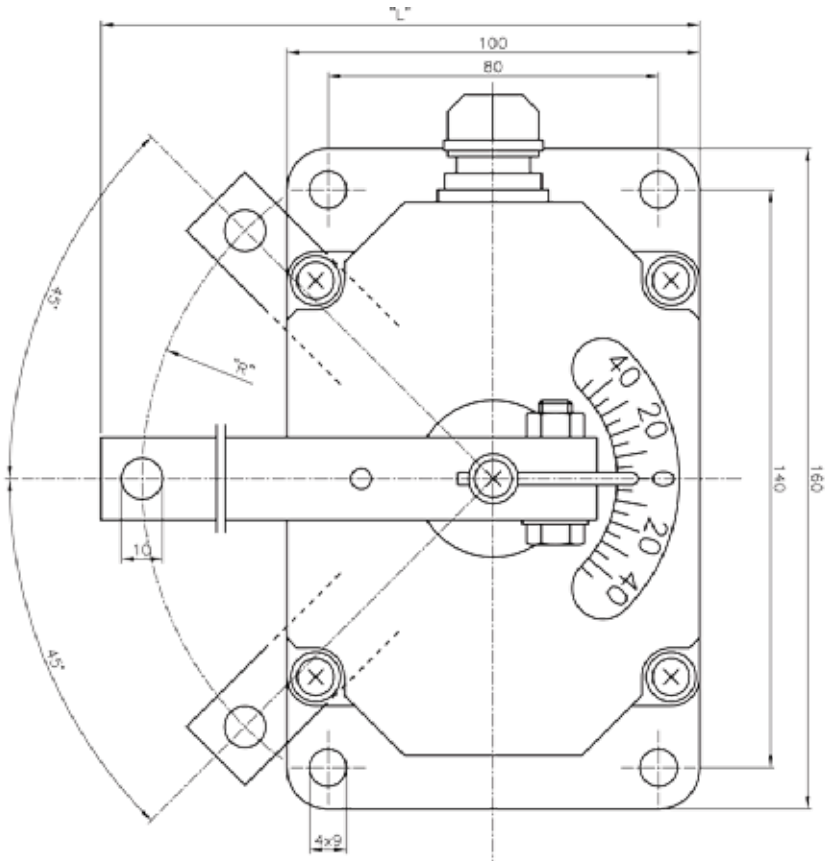
CE

RPT-P
with Ω output

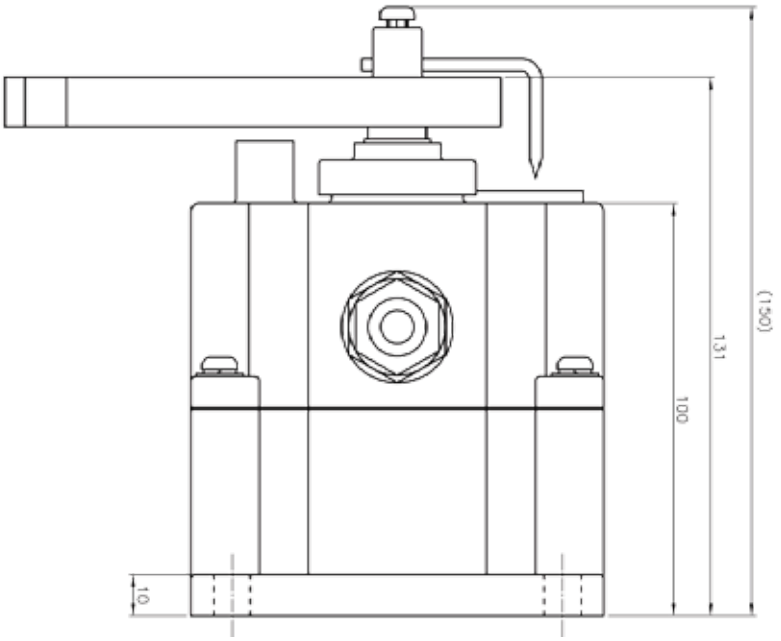
Rudder angle transmiter with internal potentiometer for resistance output.

Operating range	45° PORT...0...45° STBD 70° PORT...0...70° STBD
Output range	0...5 kΩ
General Protection class	IP54

Front view



Side view



RJB

Rudder junction box for RAI-system

The RJB-V10 is a junction box which connects 10 indicators to a rudder transmitter signal and to a supply of 24 VDC to feed the internal illumination of the RAI-indicators.

Compliancy

Lloyds approval TA

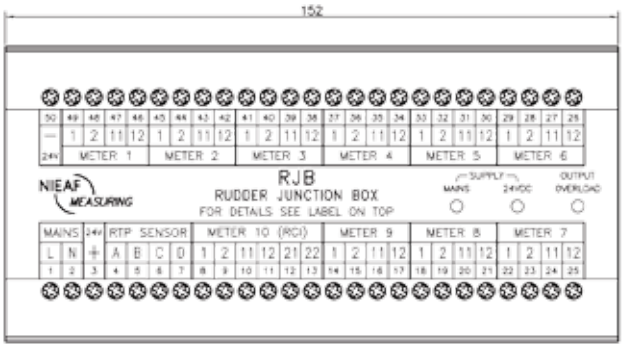
Model	Dimensions
RJB-V10	152 x 118 mm / 73 mm

Input	10…0…10 V (from RTP-V10 rudder angle transmitter)
Output	10 x 10…0…10 V to connect RAI-indicators 10 x 24 VDC to illuminate the RAI-indicators 100 mA each output
Supply	230 VAC / 24 VDC / 36 VA

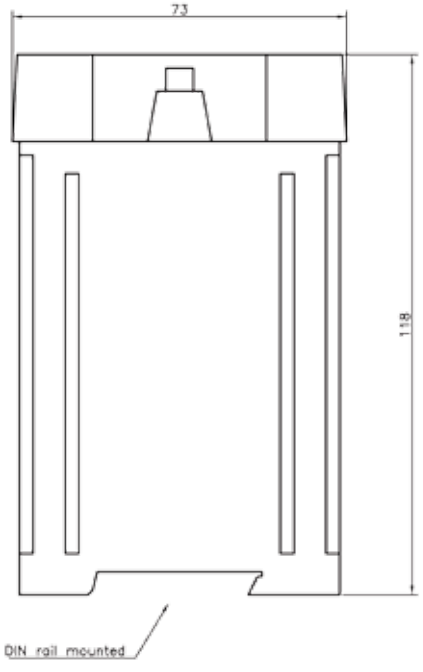
General

Protection class	IP50
Mounting	35 mm rail
Temperature range	0…55 °C

Front view



Side view



SERVING SAFETY

Navy products

For heavy-duty applications like marine/submarine ships we manufacture series of shockproof instruments.

Maximum 100 G shockproof instruments for specific marine applications. Maximum 30 G shockproof instruments according to STANAG 1008 (NATO). These instruments are designed according to request for the Royal Dutch Navy.

New:
Submarine x-rudder instrument. Four pointers in 1 instrument provide rudder angle information of all 4 rudders.

Besides the input and scale printing we can design and produce these instruments for specific applications on customer request.

D3va72S

Moving coil indicator

Navy specific

Indicator for marine applications

Standards
DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Type	Dimensions	Weight
D3va72S	72 x 72 mm / 107 mm	500 g

Schockproof
100 g

Inputs

DC Current	1 mA...10 A
DC Voltage	60 mV...500 V
AC Current	1 mA...10 mA
AC Voltage	10 V...500 V

Protection class
IP54

Accuracy
Class 1.5

Scale division
Linear Pointer deflection, 240°

Scale options
- White scale with black printing
- Black scale with white printing
- White scale with multi colour printing
- Black scale with multi colour printing

Other scales on request

Extra options
- Coloured markings

D3v...S/LED

Moving coil indicator

Navy specific

Indicator for marine applications

Standards

DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Type	Dimensions	Weight
D3v72S/LED	72 x 72 mm / 50 mm	400 g
D3v96S/LED	96 x 96 mm / 90 mm	750 g
D3v144S/LED	144 x 144 mm / 90 mm	900 g

Schockproof

60 G
STANAG 1008 (NATO)

Inputs

DC Current	1 mA...10 A
DC Voltage	60 mV...500 V
AC Current	1 mA...10 mA
AC Voltage	10 V...500 V

Protection class

IP54

Accuracy

Class 1.5

Scale division

Linear pointer deflection 240°

Scale options

- White scale with black printing
- Black scale with white printing
- White scale with multi colour printing
- Black scale with multi colour printing

Other scales on request

Extra options

Coloured markings

Marine

SERVING SAFETY

Others

By using a 'state of the art' SMD-illumination system in combination with an illuminated pointer, we consider our illumination system to be 'The best in business'.

Besides classic connection terminals, we also provide new screw terminals.

New:
Flush mount instruments for ergonomic, foil-based dashboards.
A variety of types, options, inputs and scale printings are offered.

Dv2-....

Cross pointer indicator

The unique cross-pointer instrument is equipped with 2 measuring systems, each with its own pointer and scale. The cross-point of the 2 pointers is a third value with its own scale. ('3-values-in-1 indicator'). This instrument is for example used in the dredging industry. The cross point value gives the net dredging result!

Standards
DIN 43700
DIN 43701
DIN 43718
DIN 43802
EN 60051

Type	Dimensions	Weight
Dv2-96S	96 x 96 mm / 60 mm	350 g
Dv2-144S	144 x 144 mm / 60 mm	450 g
Dv2-192S	192 x 192 mm / 90 mm	1000 g
Dv2-240S	240 x 240 mm / 100 mm	2800 g

Inputs

DC Current	100 µA...60 A
DC Voltage	60 mV...1000 V

Protection class
IP54

Accuracy
Class 1.5

Scale options
- White scale with black printing
- Black scale with white printing
- White scale with multi colour printing
- Black scale with multi colour printing

Other scales on request

Extra options
- Scale illumination
- Coloured markings
- Company logo on the scale

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