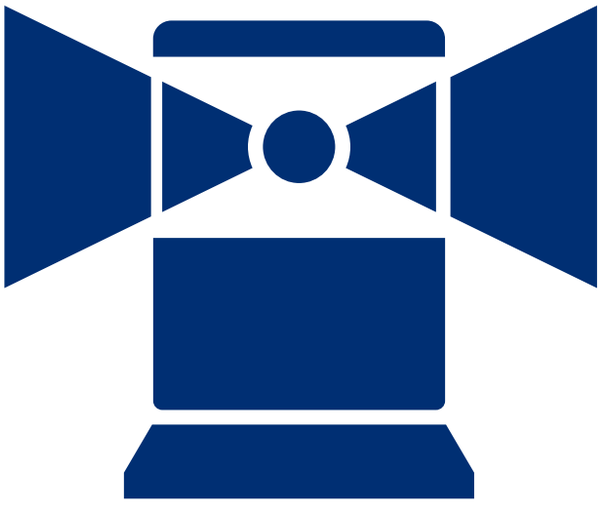
TECHNICAL MANUAL

DHR40 LED



MED96/98/EC

46 CFR 111.75-17

Den Haan Rotterdam

DISCLAIMER

Despite constant care and attention DHR puts in its manuals it is still possible that information in this manual is incomplete or incorrect.

We do not guarantee that the information in the manual is suitable for the purpose for which the information was consulted. All information is offered in the state in which it actually is and without any (implicit) guarantee or warranty regarding its validity or its suitability for a particular purpose or otherwise. All illustrations are for illustrative purposes only. This manual is not intended to cover every possible detail about the product.

We exclude all liability for any damages, direct or indirect, of any nature whatsoever, arising from or in any way connected with the use of this manual. In addition we are not liable for damages, direct or indirect, arising from the use of information obtained from this manual.

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TECHNICAL DATA

Application:

Base and side mounting models

- As Navigation light for all sea-going vessels of more than 12m or more in length, but less than 50m
- As Navigation light for all vessels in Rhine and European inland navigation
- As general signalling light for all types of sea-going vessels with a length up to 50m
- As general signalling light for all vessels in Rhine and European inland navigation

In compliance with:

- International Regulations for Preventing Collisons at Sea; COLREG 72 and latest amendments
- Rhine and European inland navigation rules
- The Directives 2014/90/EU and 82/714/EC, following the European standard: EN 14744 (2005) AC(2006), Inland navigation vessels and sea-going vessels - navigation light
- 46 CFR 111.75-17 - Navigation lights, following UL 1104 - Standard for navigation lights - second edition - October 29, 1998
  - **A.** Part I - Navigation lights for use on boats and vessels 65 feet or more in length (or equivalent standard under 46 CFR 110.20–1)
  - **B.** Part II - Navigation lights for use on boats and vessels less than 65 feet in length (or equivalent standard under 46 CFR 110.20–1)

Approval:

- MED 2014/90/EU Wheelmark
- UL 1104

Materials:

- Housing: Seawater resistant aluminium, hard anodised, matt black
- LED driver: epoxy potted
- Screen: Seawater resistant aluminium, hard anodised
- Lens: Borosilicate glass
- Base: Delrin black

Min. visibilty:

Sector lights		All-round	
Starboard - bright	2 NM	White - bright	2 NM
Port - bright	2 NM	Red - bright	2 NM
Masthead - bright	3 NM (< 20m)	Green - bright	2 NM
Masthead - Intense	5 NM (< 50m)	Yellow - bright	2 NM
Stern - bright	2 NM	Blue - normal	1 NM
Towing - bright	2 NM		

Electrical insulation class:
III, extra low voltage (SELV)

Power supply:
24VDC -20% +30%

Protection class:
IP 66

life time:
50,000 Hours

Operation temperature:
-25°C up to +55°C

Mounting:
Base, Side or Hoistable

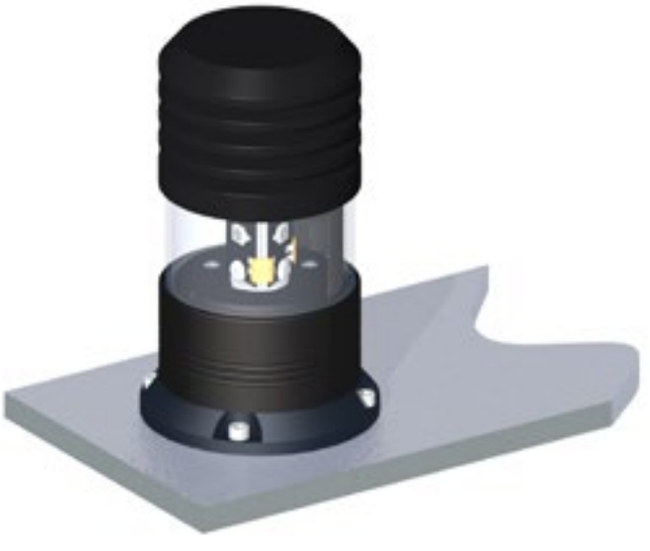
Cable entry:
Cable gland PG9, for cable diameter **4 - 8** mm

PRODUCT PHOTOS



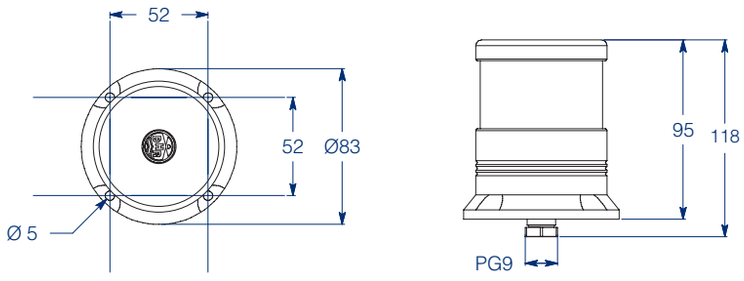




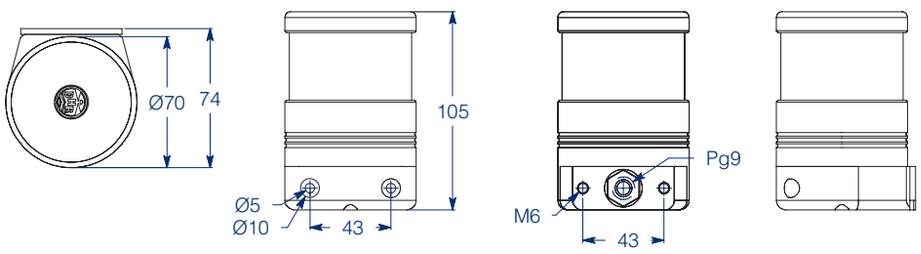


DIMENSIONS

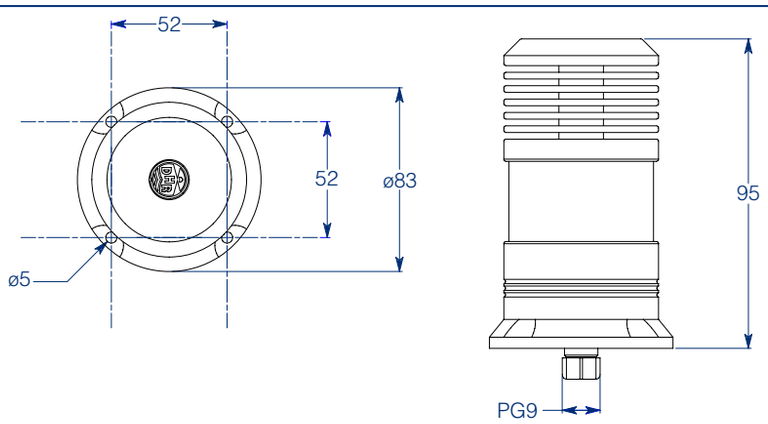
Base mounting



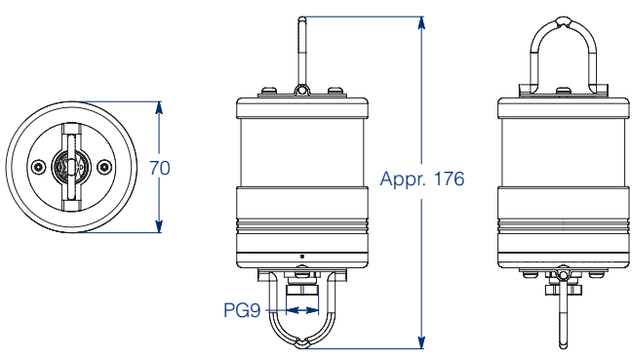
Side mounting



DHR40 5NM



Hoistable



All dimensions in mm.

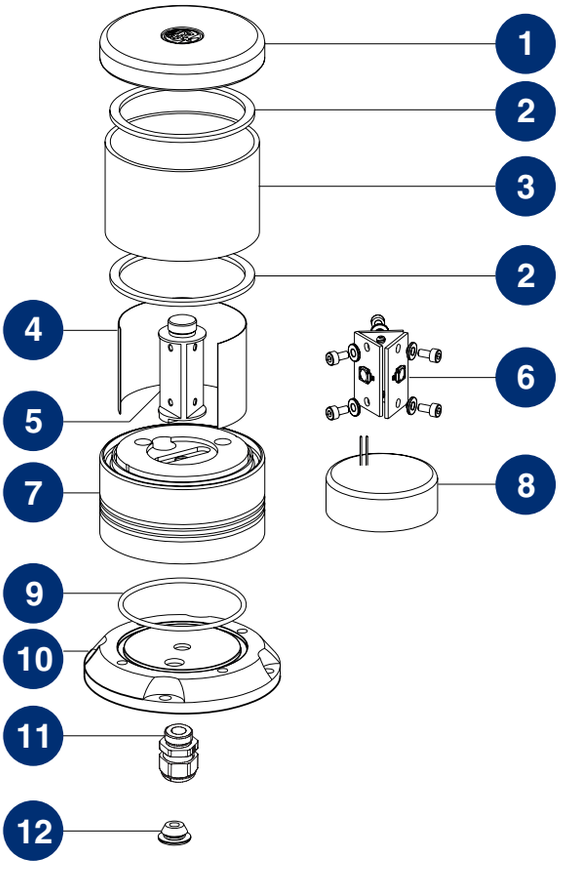
AVAILABLE MODELS

Sector	Min. visibility	Pnom.	Base mounted	Side mounted	Approval
Starboard	2 NM	4.2 W	40.01.00.00	40.01.00.01	Wheelmark/UL1104
Port	2 NM	3.2 W	40.02.00.00	40.02.00.01	Wheelmark/UL1104
Masthead	3 NM	4.1 W	40.03.00.00	40.03.00.01	Wheelmark/UL1104
Masthead Intense	5 NM	11,4 W	40.03.10.00	NA	UL1104 (pending)
Stern	2 NM	4.1 W	40.04.00.00	40.04.00.01	Wheelmark/UL1104
Towing	2 NM	3.1 W	40.04.09.00	40.04.09.01	Wheelmark/UL1104
Panama steering light	-	4.1 W	40.10.00.05		

All-round lights	Min. visibility	Pnom.	Base mounted	Hoistable	Approval
All-round white	2 NM	4.1 W	40.06.00.00	40.06.00.03	Wheelmark/UL1104
All-round red	2 NM	3.2 W	40.07.00.00	40.07.00.03	Wheelmark/UL1104
All-round green	2 NM	4.2 W	40.08.00.00	40.08.00.03	Wheelmark/UL1104
All-round yellow	2 NM	3.1 W	40.09.00.00	40.09.00.03	Wheelmark/UL1104
All-round blue	1 NM	4.1 W	40.10.00.00	40.10.00.03	Wheelmark

All-round lights	Min. visibility	Pnom.	Retrofit	Approval
All-round white	2 NM	4.1 W	40.06.00.02	Wheelmark
All-round red	2 NM	3.2 W	40.07.00.02	Wheelmark
All-round green	2 NM	4.2 W	40.08.00.02	Wheelmark
All-round yellow	2 NM	3.1 W	40.09.00.02	Wheelmark
All-round blue	1 NM	4.1 W	40.10.00.02	Wheelmark

EXPLODED VIEW - BASE MOUNTING

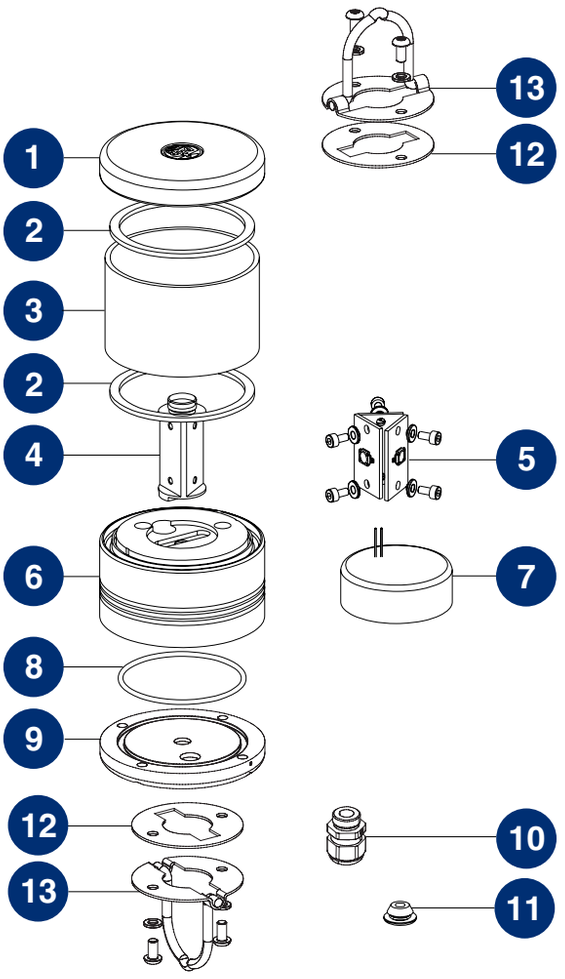


Item	Part	Material
1	Cover	Seawater resistant aluminium, hard anodized black
2	Gasket DHR40	EPDM
3	Glass Tube	Borosilicate glass
4	Screen	Seawater resistant aluminium, anodized black
5	Heatsink	Seawater resistant aluminium
6	LED PCB	MC-PCB, aluminium 1.55 mm
7	Housing	Seawater resistant aluminium, hard anodized black
8	LED driver	Potting material: Polyurethane
9	O-ring DHR40	NBR 70 Compound
10	Base plate	Seawater resistant aluminium, hard anodized black
11	Cable gland Pg9	- Body: Nickel plated brass - Insert: Polyamide - Seal: CR
12	Membrane Vent	- Body: Silicone rubber - Membrane: ePTFE

EXPLODED VIEW - DHR40 5NM

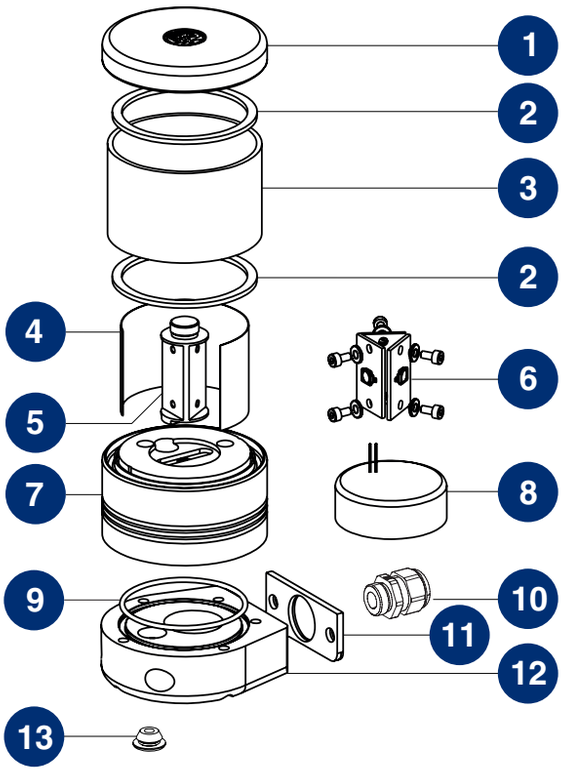
TBA

EXPLODED VIEW - HOISTABLE



Item	Part	Material
1	Cover	Seawater resistant aluminium, hard anodized black
2	Gasket DHR40	EPDM
3	Glass Tube	Borosilicate glass
4	Heatsink	Seawater resistant aluminium
5	LED PCB	MC-PCB, aluminium 1.55 mm
6	Housing	Seawater resistant aluminium, hard anodized black
7	LED driver	Potting material: Polyurethane
8	O-ring DHR40	NBR 70 Compound
9	Base plate hoistable	Seawater resistant aluminium, hard anodized black
10	Cable gland Pg9	- Body: Nickel plated brass - Insert: Polyamide - Seal: CR
11	Membrane Vent	- Body: Silicone rubber - Membrane: ePTFE
12	Gasket suspension bracket	Silicone
13	Suspension bracket	Stainless steel 316

EXPLODED VIEW - SIDE MOUNTING

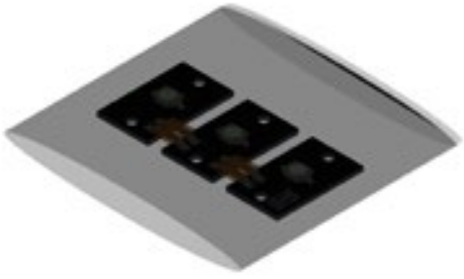


Item	Part	Material
1	Cover	Seawater resistant aluminium, hard anodized black
2	Gasket DHR40	EPDM
3	Glass Tube	Borosilicate glass
4	Screen	Seawater resistant aluminium, anodized black
5	Heatsink	Seawater resistant aluminium
6	LED PCB	MC-PCB, aluminium 1.55 mm
7	Housing	Seawater resistant aluminium, hard anodized black
8	LED driver	Potting material: Polyurethane
9	O-ring DHR40	NBR 70 Compound
10	Cable gland Pg9	- Body: Nickel plated brass - Insert: Polyamide - Seal: CR
11	Gasket DHR40 Side	Neoprene
12	Side mounting piece	Delrin black
13	Membrane Vent	- Body: Silicone rubber - Membrane: ePTFE

REPAIR KIT



Gasket DHR40



LED PCB



LED driver



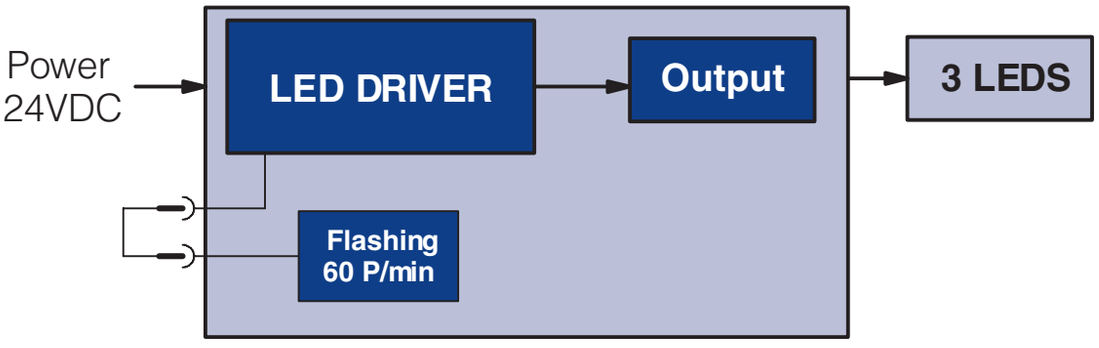
Membrane Vent



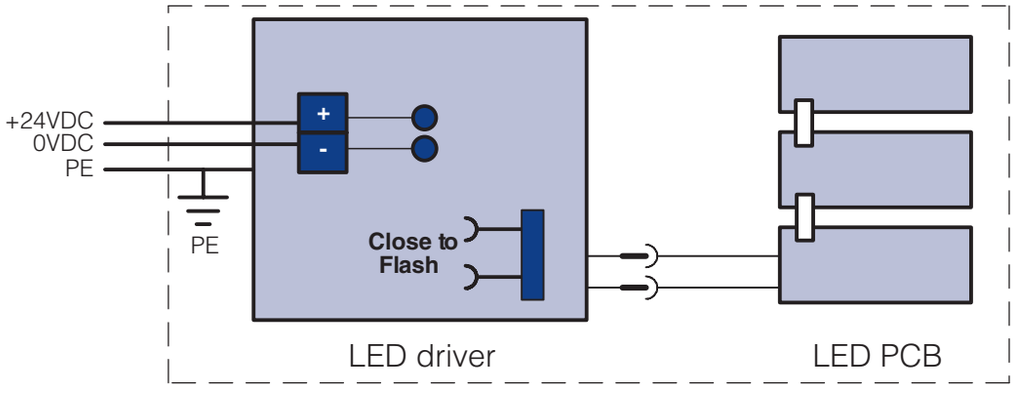
O-ring DHR40

Item	Navigation light	Description	Number
A	Starboard All-round green	Maintenance kit for: green	40.99.00.30
B	Port light Stern Red All-round red	Maintenance kit for: red	40.99.00.31
C	Masthead Stern All-round white	Maintenance kit for: white	40.99.00.32
D	Towing light All-round yellow	Maintenance kit for: yellow	40.99.00.34
E	Panama steering light All-round blue	Maintenance kit for: blue	40.99.00.35
F	Masthead (DHR40 5NM)	Maintenance kit for: masthead intense	TBA

ELECTRICAL SPECIFICATION

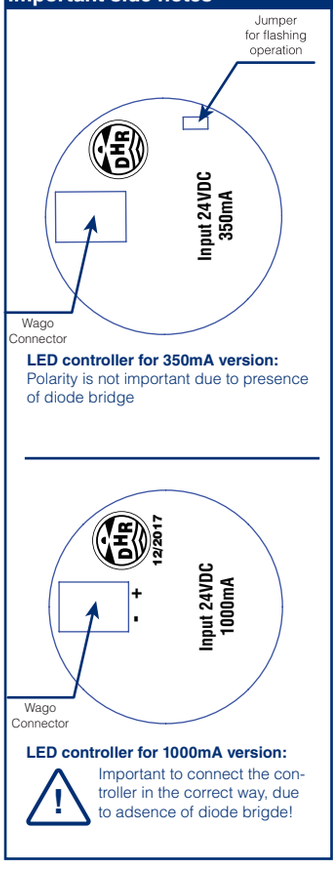


Important note: flashing option not available for DHR40 5NM



Grounding (PE) is not required, but gives better ESD/EMI protection

Important side notes



Navigation light	Power supply	Nominal voltage	Typical wattage*	Typical current*	Error value for monitoring	Error current	Inrush current
Standard types	350 mA	24 VDC	3 W-4.2 W	125mA	>40 mA	<10 mA	40 A
DHR40 5NM	1.000 mA	24 VDC	11,4W	470mA	>200 mA	< 10 mA	40 A

* Depends on temperature and LED production batch

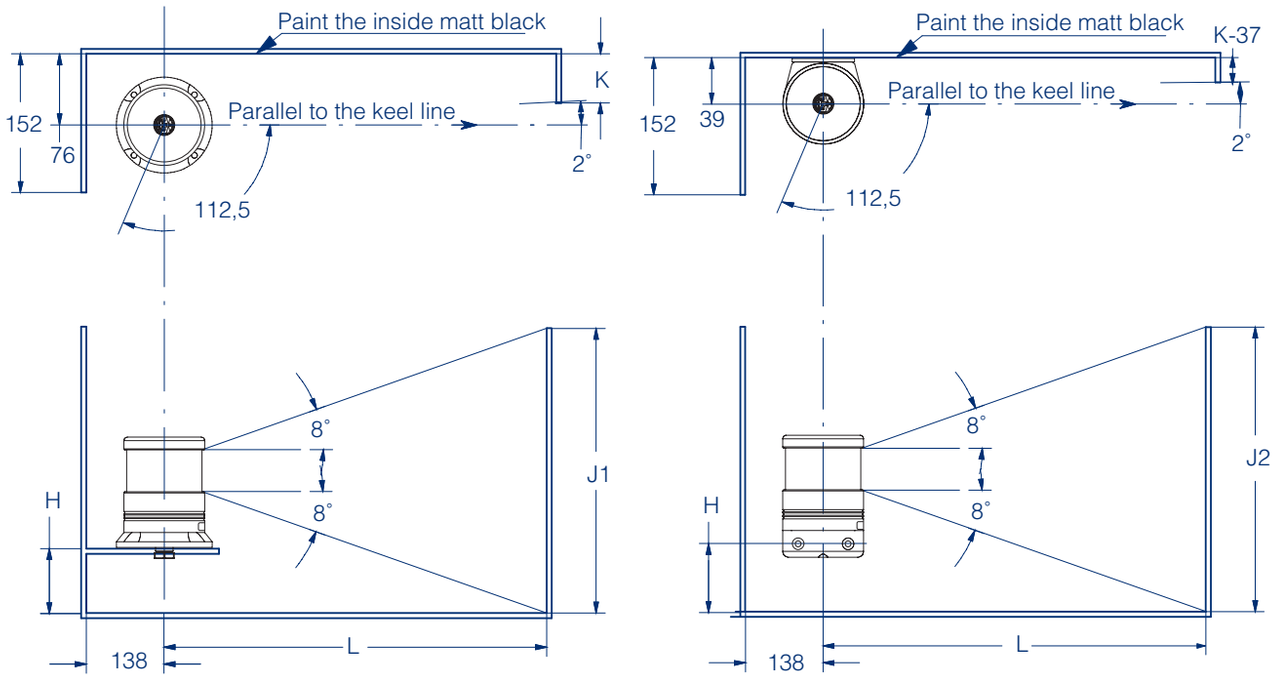
LIFETIME CONTROL

Measurements of the navigation light and specifications retrieved from the OEM, show a conformity with the minimum requirements of COLREG 72 at an operational lifetime of 50000 hrs. To guarantee a proper use of the LED navigation lights, we as a manufacturer advise the following:

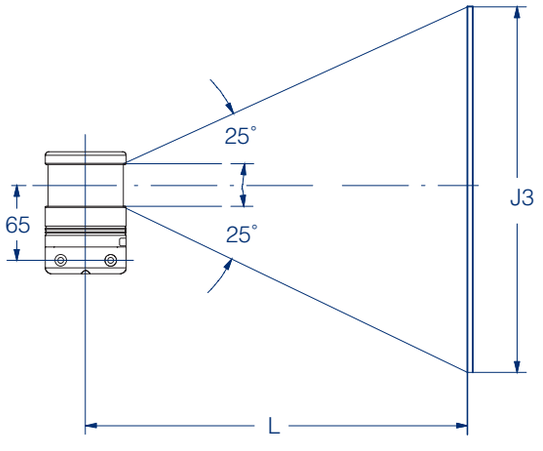
- Use the navigation light in combination with a DHR-specified control system, which monitors the status and operational life time of each individual navigation light
- Each navigation light needs to undergo a quality check at least every 5 years of use to verify it still meets the requirements of COLREG 72

POSITIONING LIGHTS

Power-driven vessels



Sailing vessels



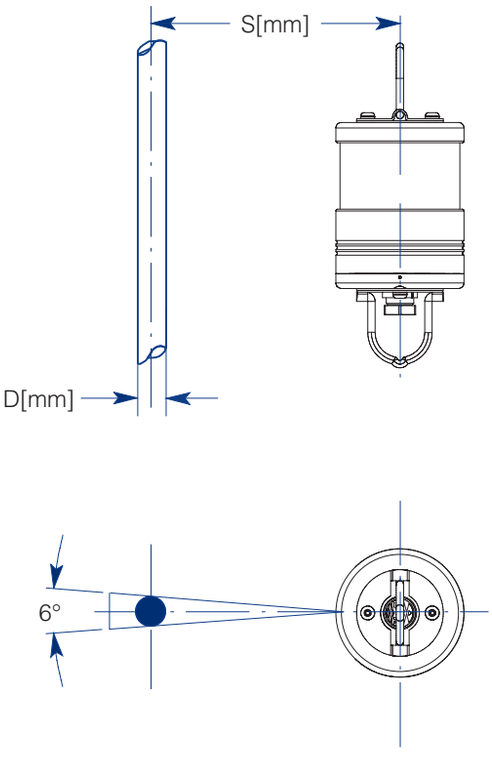
L	H	K	J1	J2	J3
400	10	62	150	-	400
500	25	58	180	180	500
600	40	55	210	210	600
700	55	51	240	240	-
800	70	48	270	270	-
910	85	44	302	302	-

[mm]

Disclaimer:

- The minimum luminous intensity requirements in the forward direction are only guaranteed if the side-lights are mounted in accordance with this drawing and table.
- This is an illustration to indicate the dimensions of the inboard screens, relative to the keel line of the vessel. By no means may this image be used to determine the position of the sidelights on the vessel. For positioning the lights at the vessel always check for compliance with COLREG 72 or local rules.

POSITIONING ALL-ROUND LIGHT



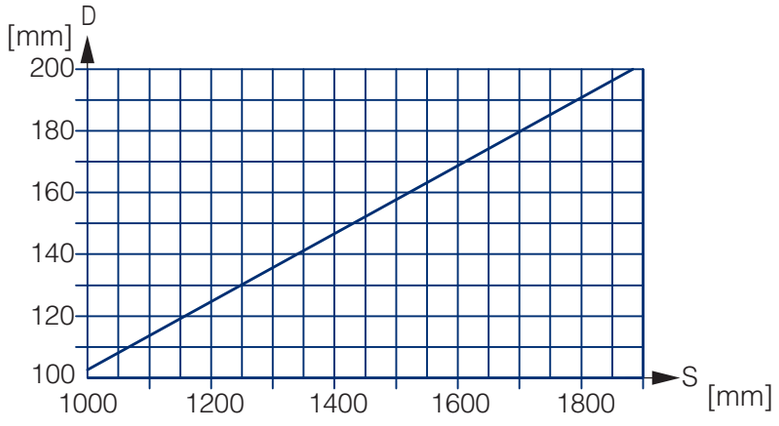
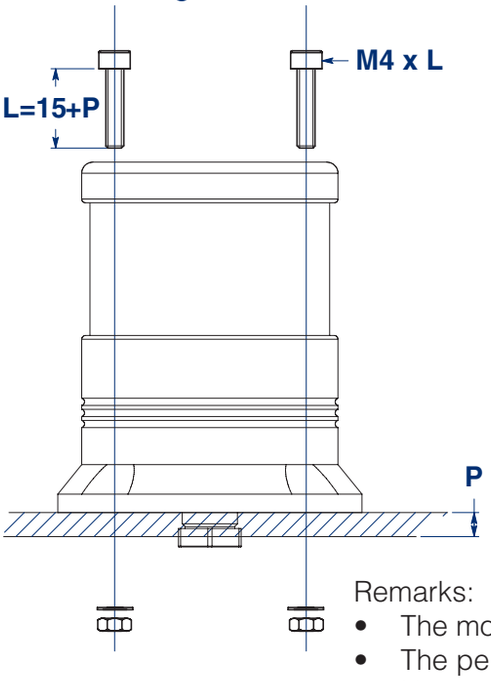


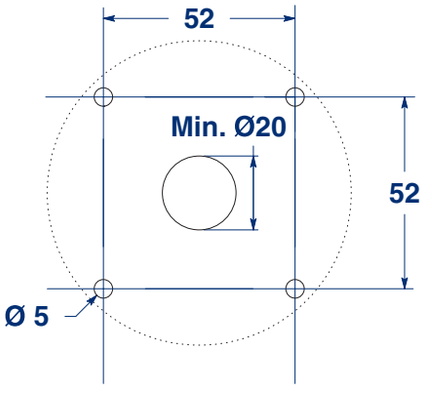
Diagram for choosing the minimum distance between obstacle and mounting plate.

Disclaimer:
This is an illustration to indicate the position of the all-round light so not to be obscured by mast, topmasts or structures within the angular sector of more than 6 degrees. By no means may this image be used to determine the position of the all-round lights on the vessel. For positioning the lights on the vessel always check for compliance with COLREG 72 or local rules.

MOUNTING INSTRUCTIONS

Base mounting

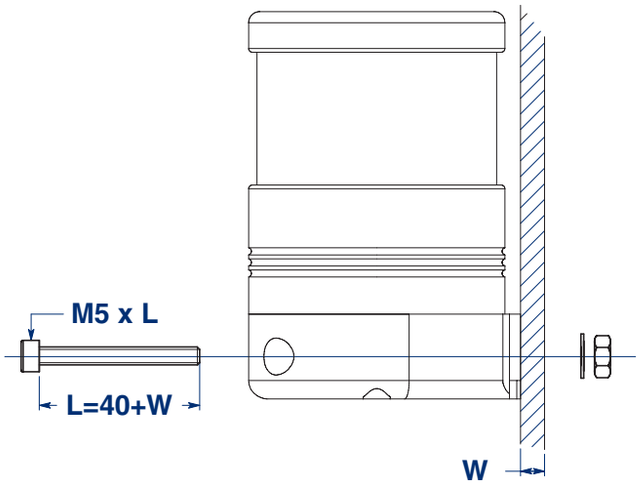


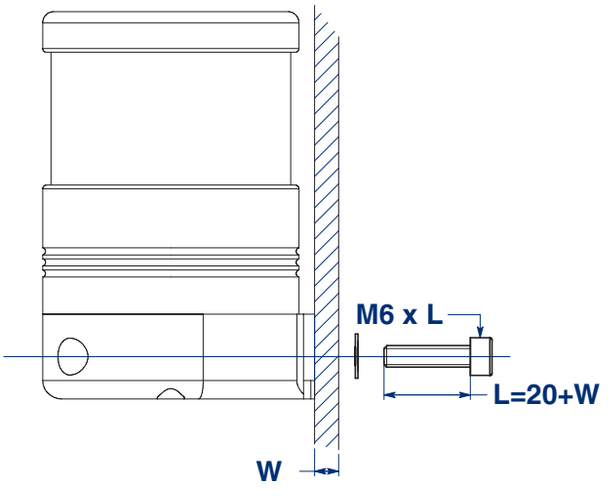


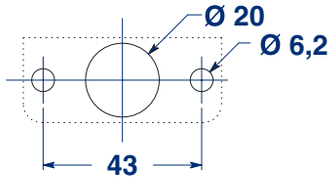
Remarks:

- The mounting plate for navigation lights should be at least 3 mm
- The permissible torque should be 1,5 Nm
- Use only A4-grade stainless steel fasteners

Side mounting







Remarks:

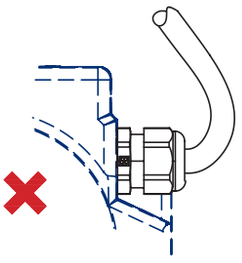
- The permissible torque should be 2 Nm for M5 and 4Nm for M6
- Use only A4-grade stainless steel fasteners

All dimensions in mm.

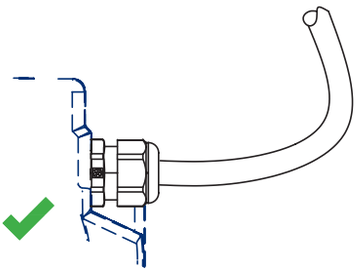
Important

Do not paint or use any other chemical for the lanterns, clean only with fresh water.

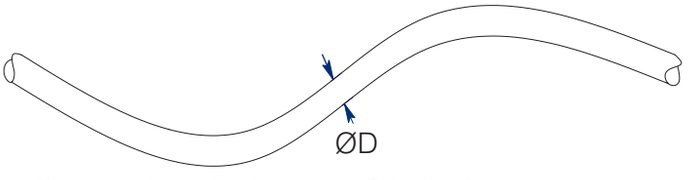
Cable glands



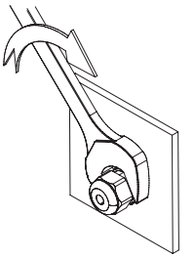
Cable too tight!
This gives unwanted stress at the sealing of the cable gland and water ingress will occur.



Include cable slack at the entering point of the cable gland



Preferred cable diameter D is 4 - 8 mm



Replacing cable gland

- Use gasket between housing and cable gland
- Tighten firmly (6,25Nm) with wrench

Wiring recommendations

EU:
- Neoprene cable H07 RN 2x1.5
- Cable diameter 4 - 8 mm

USA:
- Type SJ or equivalent and comply with UL 62 and IEEE 45- 83
- Wire gauge16 AWG
- No. of conductors 2
- Cable diameter 4 - 8 mm

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