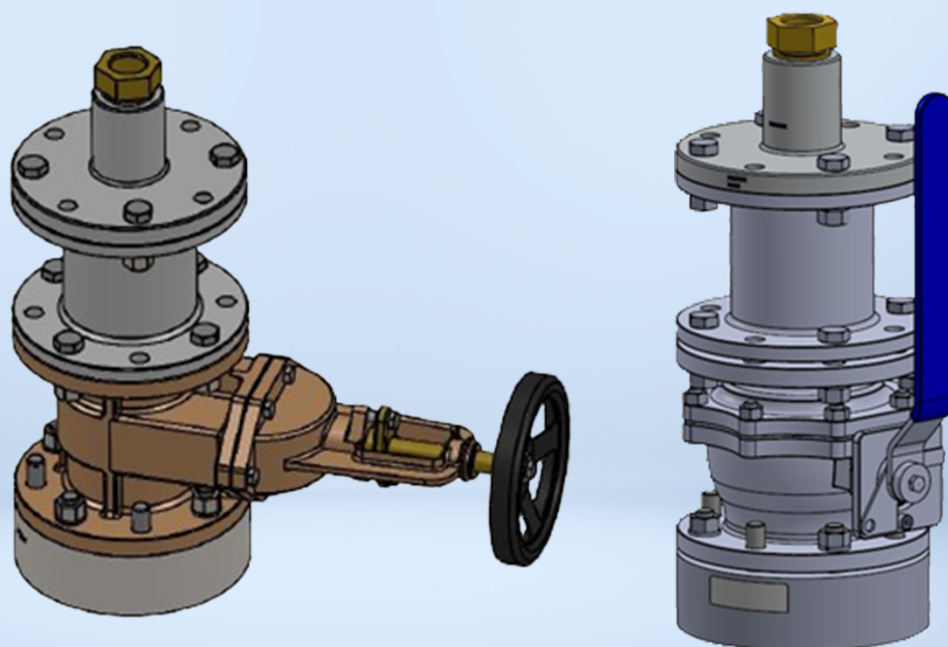


SKIPPER SB-100-XX

100mm Single Bottom Sea Valve Installation and Operation manual



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1 Document information

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2 Safety instructions

**CAUTION:**

Be aware that the Sea Valve contains high precision parts and therefore proper handling when mounting is essential for the final result.

**CAUTION:**

When handling the Sea Valve, all lifting devices must be attached on the outside of the valve. It is very important to not insert any chains, wire, rope or any other device into the valve chamber. This is to avoid damage and any kind of pollution of the Sea Valve.

3 Introduction

The SKIPPER SB Sea Valve 100 mm is used for installation of SKIPPER speed log sensors and echo sounder transducers fitted with adaptor for XB-100-XX.

1. Echo Sounder transducer type (50, 200 and 50/200 kHz).
2. Speed log sensors: DL2, DL21, DL1, DL850(270kHz), EML224.



Important:

Do **not** use liquid sealants, and do **not** paint the inside of a valve.

The SKIPPER SB Sea Valve 100 mm is delivered partly assembled for transport. The parts required for final assembly are supplied in a separate box, which must be purchased separately. Part number: SB-100-SB-M-KIT.

First, it must be decided where the Sea Valve should be installed. Normally, this will be in the fore part of the ship, in the centerline, or as close to the centerline as possible. Optimal system operation is achieved by fitting the transducer/sensor as deep as possible on the hull.

- The active surface of the sensor must be installed with its front face a maximum of ± 1 degree to the ship's horizontal plane. (Speed Logs)
- The active surface of the transducer must be installed with its front face a maximum of ± 7 degrees to the ship's horizontal plane. (Echo Sounder)

Do not mount transducers close to the bow thruster propeller outlets, or aft of other hull installations (outlets, vents or other protruding details) that may create aeration or turbulence.

It is necessary to select a part of the hull that is submerged and free from turbulence and aeration under all load and speed conditions, and to avoid positions where air is trapped in heavy weather.

If a flat, horizontal section is not available for transducer fitting, the shipyard must construct a suitable bed. Welding seams in this area should be smoothed and rounded off, in order not to create turbulence or aeration at speed.

Protect the active element of the transducer/sensors during transport and installation, and **do not paint the surface.**

The Sea Valve should be placed in a service-accessible place, large enough for installation and disassembly of the sensor unit. See [Space considerations \(on page 9\)](#).

3.1 Important

Sensors for Speed Log and Echo Sounder are delivered with a fixed cable. Ensure that cable routing allows for easy replacement or installation of new cables during maintenance.

Jotron can assist in recommending suitable installation positions, if GA-drawings (General arrangements), lines drawings and frame drawings are available for review.

We reserve the right to make changes without prior notice.

3.1.1 Condition

The welding to hull structures and structural support of the items may be subject to separate approval by classification societies for each installation on board a ship.

4 Space considerations

The Sea Valve should be placed in a service accessible place, large enough for installation and disassembly of the transducer/sensor unit.



Important:

The drawings below are version-specific. Please verify the dimensions of the supplied unit, as size variations may occur between versions.

Figure 1. Space considerations for SB-100-SA

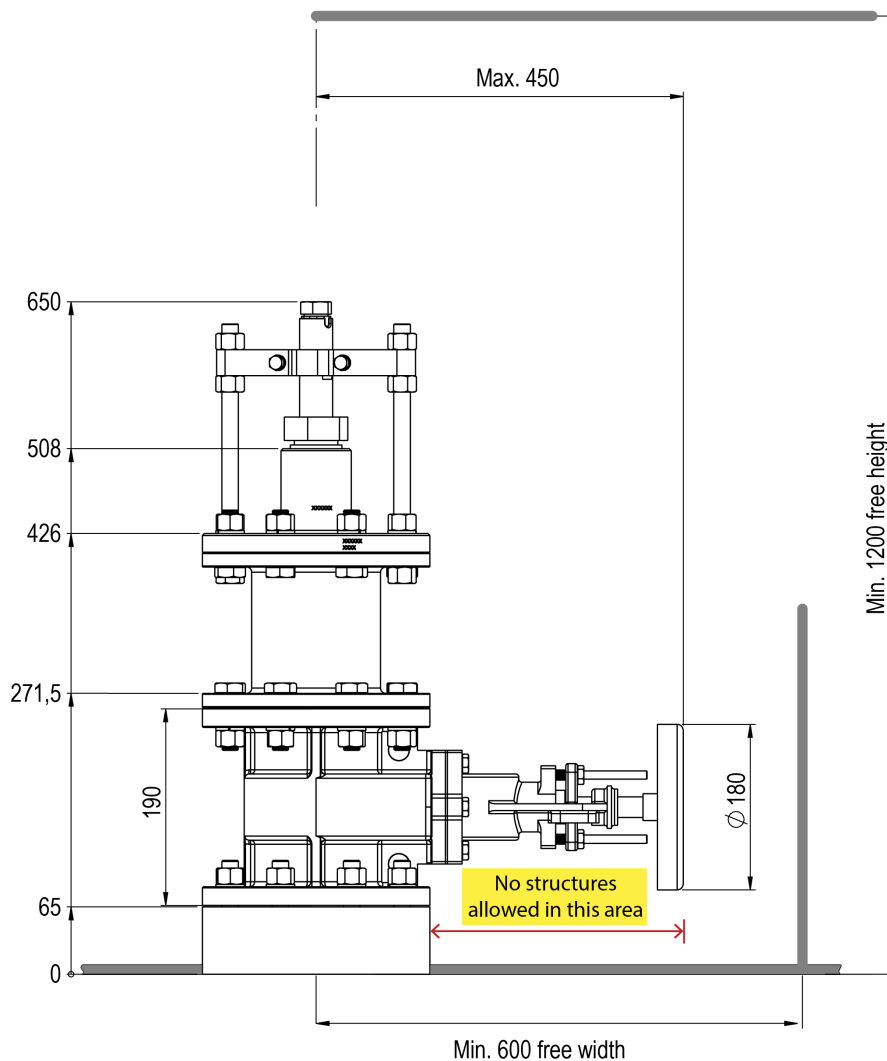
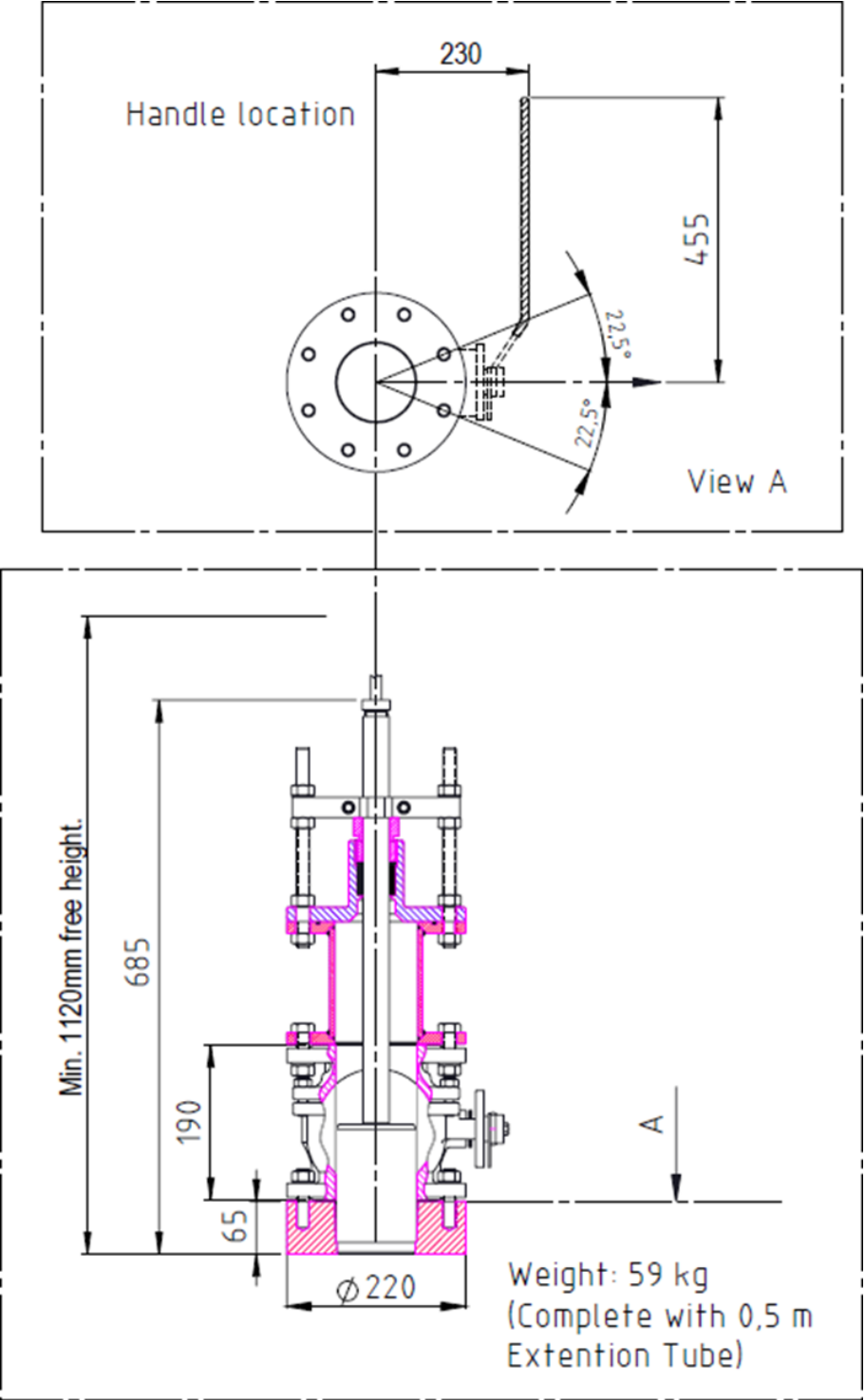


Figure 2. Space considerations for SB-100-SB



5 Welding the bottom flange

1. When the position has been decided, cut a hole for the 220 mm bottom flange in the hull.
2. Weld the bottom flange, Item (1), into the hull. Welding shall be performed in accordance with approved welding procedures, applicable standards, and good workmanship practices.



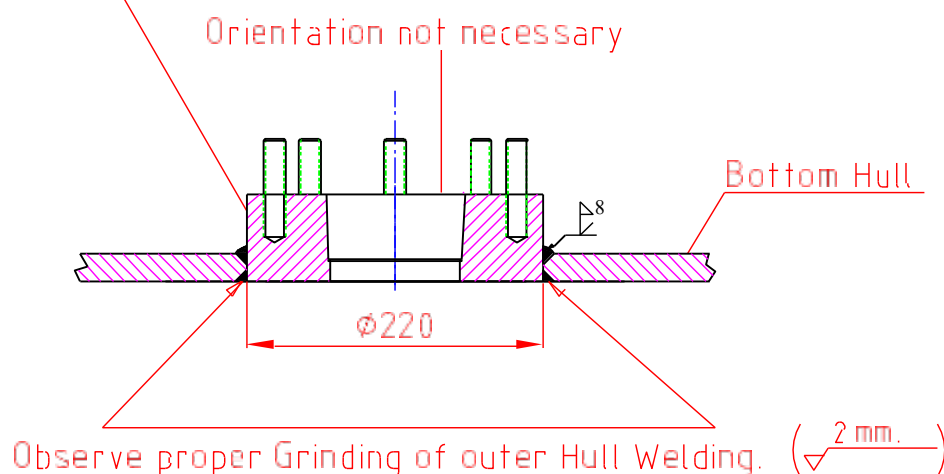
Important:

The bottom flange is a part of the Sea Valve that is machined with high accuracy, and it should be protected after mounting to avoid damage to the bottom flange surfaces. This is to avoid leakage. If the valve is pre-mounted, be sure to protect the valve from being polluted by welding debris.

All bottom parts and flanges for welding are precisely machined parts. During welding of these parts to the ship's hull plates, pay attention to avoid construction strain on the bottom parts and flanges.

Figure 3. Welding the bottom flange in ship's hull

Bottom Flange, Item (1)



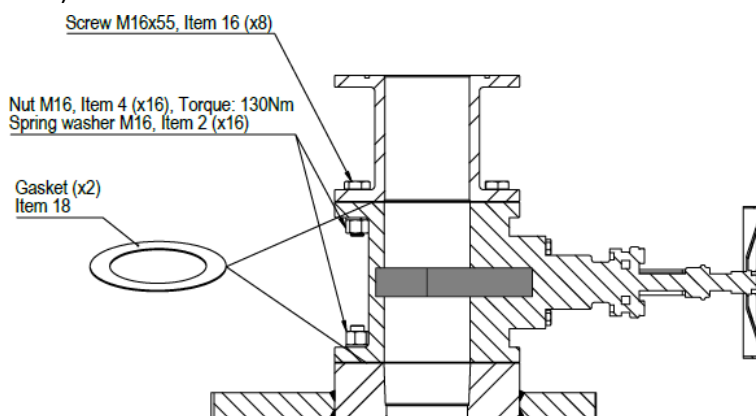
6 Mounting and installation of sea valve

6.1 Sea valve assembly

Caution must be taken when mounting sea valves that all parts are aligned correctly, and that the inside is clean. DO NOT use liquid sealants, and DO NOT paint the inside of a valve.

6.1.1 Assembly of SB-100-SA

1. Place a 1.5 mm gasket, Item (18), on top of the bottom flange, Item (1).
2. Place the main element, Item (6), on top of the bottom flange. The 16 mm nuts and washers should be mounted, **not** tightened. (Align parts before tightening the nuts).
3. Place a 1.5 mm gasket, Item (18), on top of the main element, Item (6).
4. Mount the intermediate element, Item (15), on top of the main element.
5. All 8 screws, nuts and washers should be mounted and tightened. (Align parts before tightening the nuts).



6. Place the aluminium alignment tool (2 x part SB-6033 in mounting kit), all the way, into the sea valve to ensure correct alignment of elements before bolts are tightened.
7. Tighten 8 nuts securing the valve to the bottom flange. Torque: 130 Nm.
8. Tighten 8 nuts securing the intermediate element to the valve.
9. Remove the aluminium alignment tool.

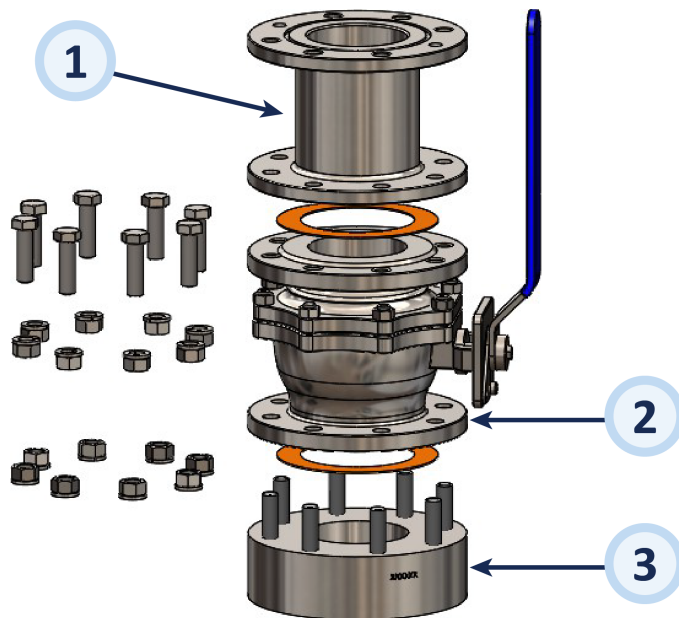


The alignment tool height is about 37 mm higher than the top of the intermediate element on the gate valve SB-100-SA.



6.1.2 Assembly of SB-100-SB

1. Place a 1.5 mm gasket on top of the bottom flange.
2. Place the Ball Valve element on top of the bottom flange. The 16 mm nuts and washers should be mounted, not tightened.
3. Place a 1.5 mm gasket on top of the ball valve element.
4. Mount the intermediate element on top of the ball valve element. The track for the o-ring must be upwards.
5. All 8 nuts and washers should be mounted, not tightened.

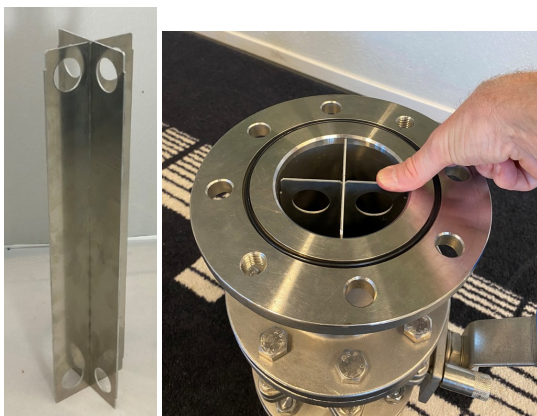


1: Intermediate element

2: Ball valve

3: Bottom flange

6. Place the aluminium alignment tool (2 x part SB-6033 in mounting kit), all the way, into the sea valve to ensure correct alignment of elements before bolts are tightened.
7. Tighten 8 nuts securing the valve to the bottom flange. Torque: 130 Nm.
8. Tighten 8 nuts securing the intermediate element to the valve.
9. Remove the aluminium alignment tool.



6.2 Assembling the extension tube and sensor

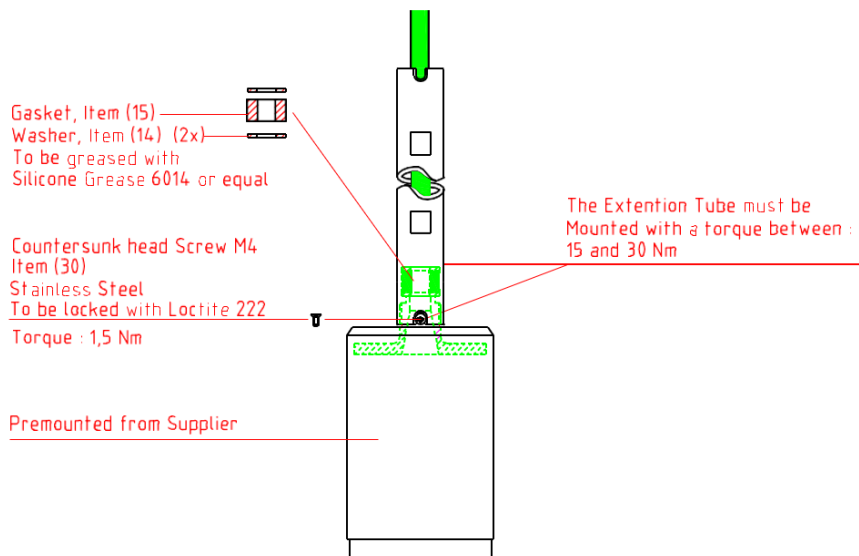
**Note:**

Gaskets and washers are supplied as part of Speed log sensors/Echo sounder transducers.

6.2.1 11mm cable diameter

Sensor type with 11mm cable diameter:

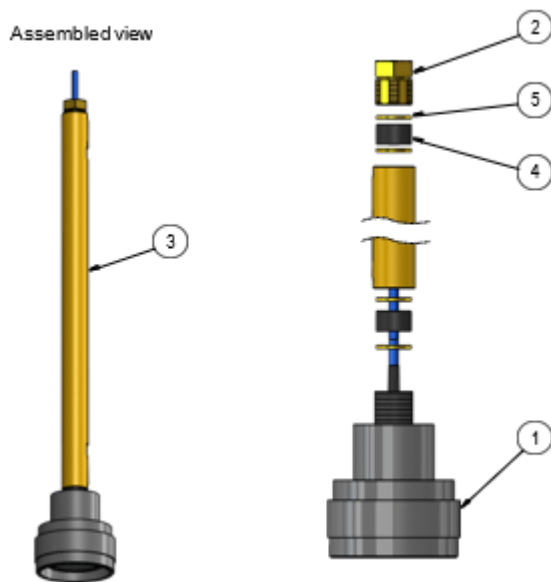
- Echo sounders:
 - ETN050G, ETN050XG, ETN200SG, ETN200SXG
- Speed logs:
 - DL2SG-SA, DL21SG-SA, DL850S27G-SB, EML224SDB-SD, DL1SDB-SA



6.2.2 7mm cable diameter

Sensor type with 7mm cable diameter:

- Echo sounders:
 - ETS50200G-SA, ETS50200XG-SA



POS.	PART NUMBER	DESCRIPTION	QTY.
1	ETS50200-SA	Transducer 50/200kHz in 100mm housing w/25m cable	1
2	DB-2039	Nut M28 Brass	1
3	DB-2026	Extension Tube 0,5m SB-100	1
4	DB-2020	Gasket Ø25,9/8 x15mm	2
5	DB-2019	Washer Brass Ø25,9 Ø9 x2,5mm	4

Pos. 2 and 3: Included with the sea valve. Mounting kit SB-100-SB-M-KIT.

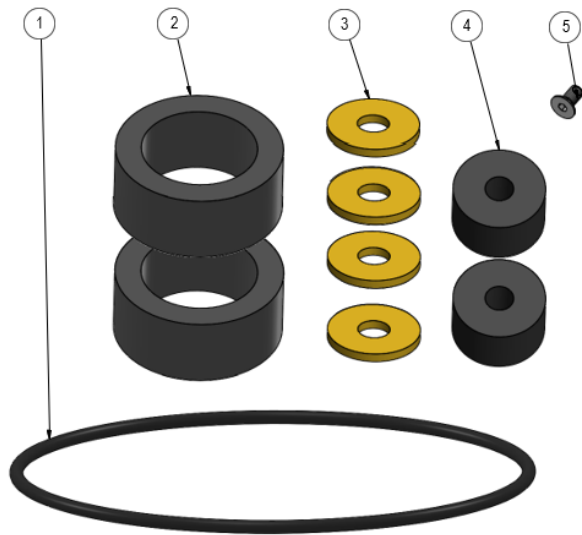
Pos. 4 and 5: Included with the sensor. Sensor installation kit INSTKITVALVE100-7mm.

6.2.2.1 Installation kit

The kit 'INSTKITVALVE100-7mm' is included with every sensor.

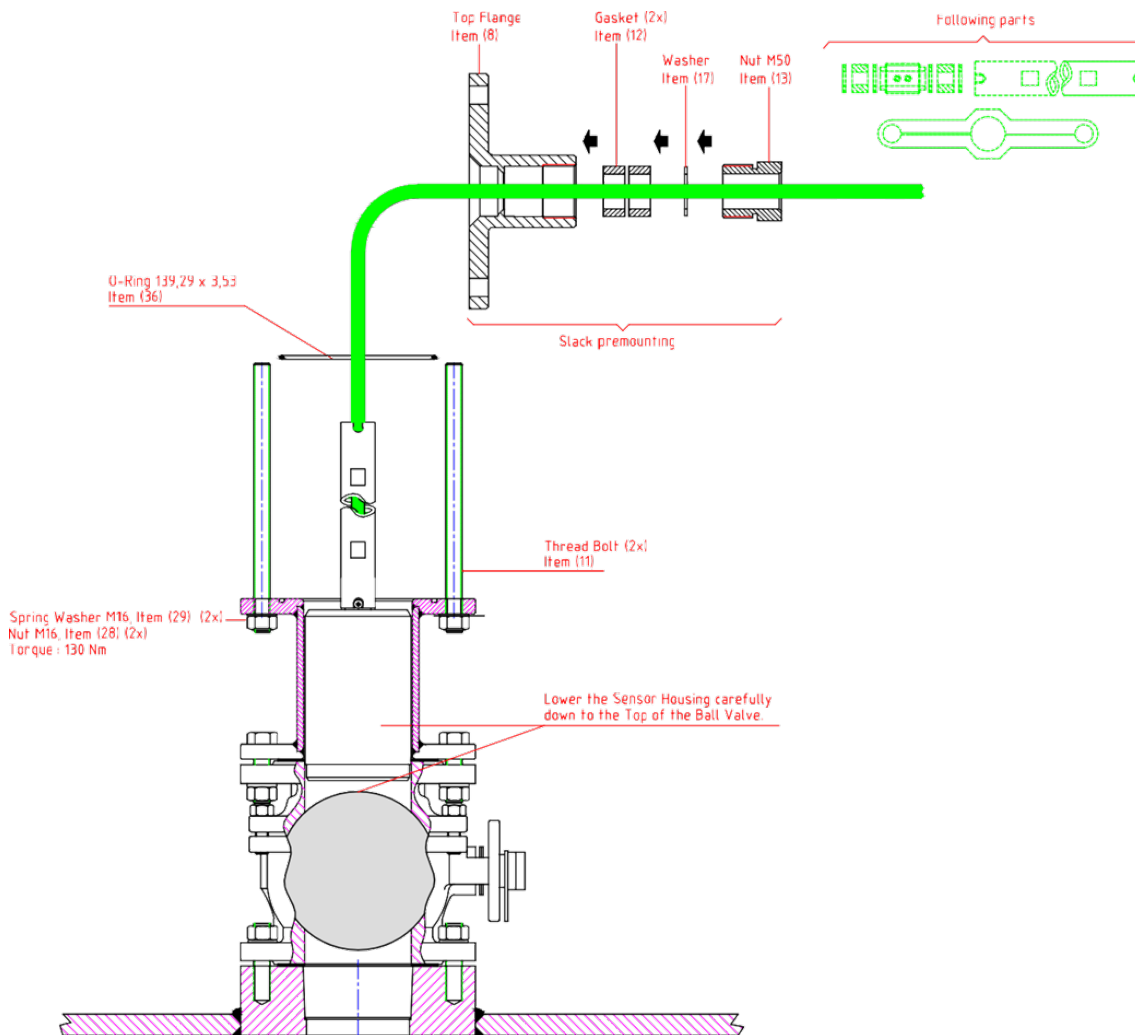
Pos. 1 and 2: O-ring and gaskets must be replaced with every sensor replacement.

Pos. 3 and 4: Washer and gasket used with 7mm.



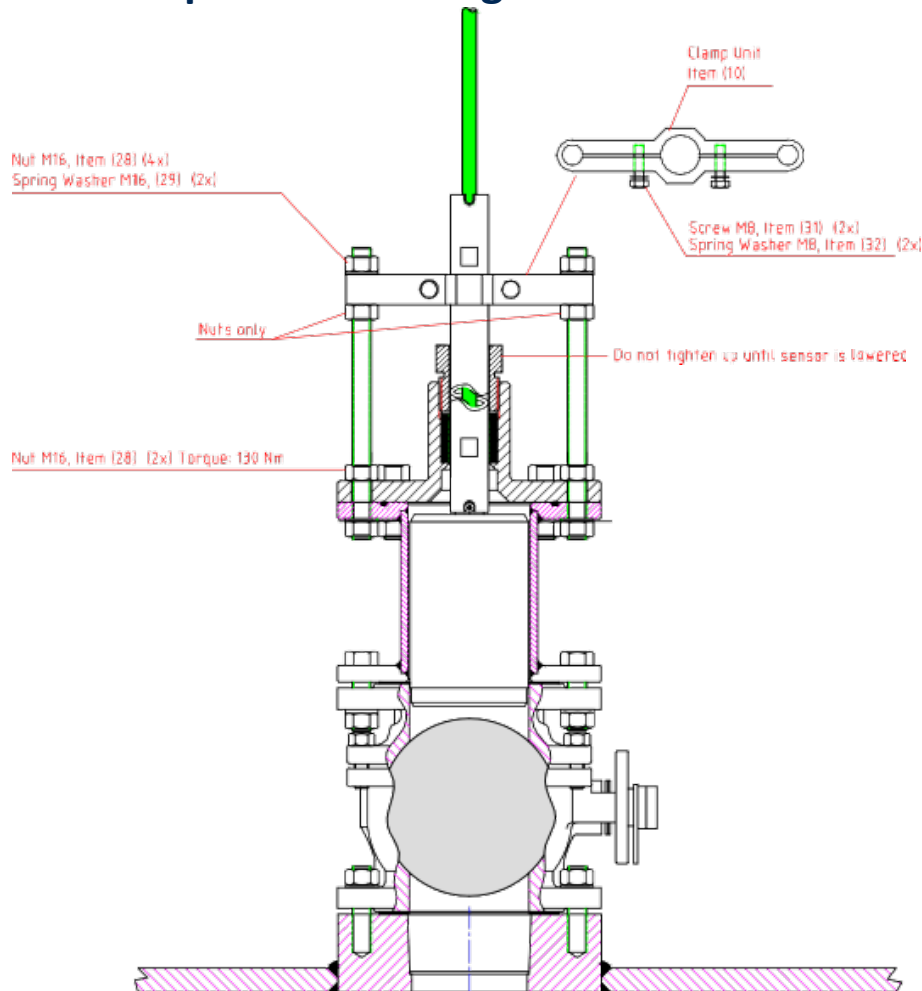
POS.	PART NUMBER	DESCRIPTION	QTY.
1	ZOA-01024	Nitril O-Ring Ø3,53x139,30mm	1
2	DB-2035	Gasket Ø47/32,5 X 20mm	2
3	DB-2019	Washer Ø25,9/Ø8 x 2,5mm	4
4	DB-2020	Gasket Ø25,9/8 x 15mm	2
5	ZOA-01069	Screw M4x8 mm DIN7991 A4	1

6.3 Sensor installation



1. Place the O-ring, Item (36), in the groove on top of the intermediate element, Item (7).
2. Apply grease to the O-ring.
3. Insert the 2 thread bolts, Item (11), through the flange and secure with 2 x M16 counter nuts, Item (28). Torque 130 Nm.
4. Lower the sensor housing carefully down to the top of the valve piston.

6.4 Clamp unit mounting



Mount top flange Item (8). Secure with 8 each washers, Item (29) and nuts, Item (28). Torque: 130 Nm.

Mount in the following order:

1. 2 x gasket, Item (12)
2. Washer, Item (17)
3. Nut M50, Item (13)
4. 2 x M16 nuts, Item (28)
5. Clamp unit, Item (10)
6. 2 x M16 nuts, Item (28) with spring washer, Item (29)

6.5 Lower the sensor

- To ensure the sensor is properly inserted, completely into the bottom flange, make a distance mark to indicate when the sensor is at the bottom.
 - SB-100-SB/SB-100-LB distance from top of ball to bottom: 234mm
 - SB-100-SA/SB-100-LA distance from top of gate to bottom: 180mm
- Before opening the sea valve, lift the sensor a few cm to avoid scratches when the valve opens.
- Open the sea valve, lower the sensor unit and the extension tube.

Figure 4. Lowering sensor in SB-100-SB

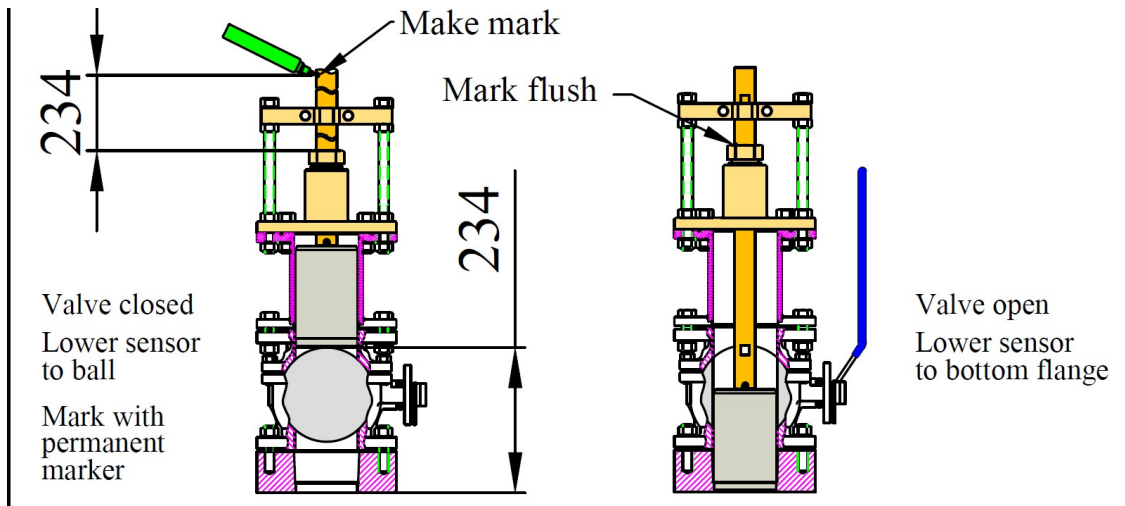
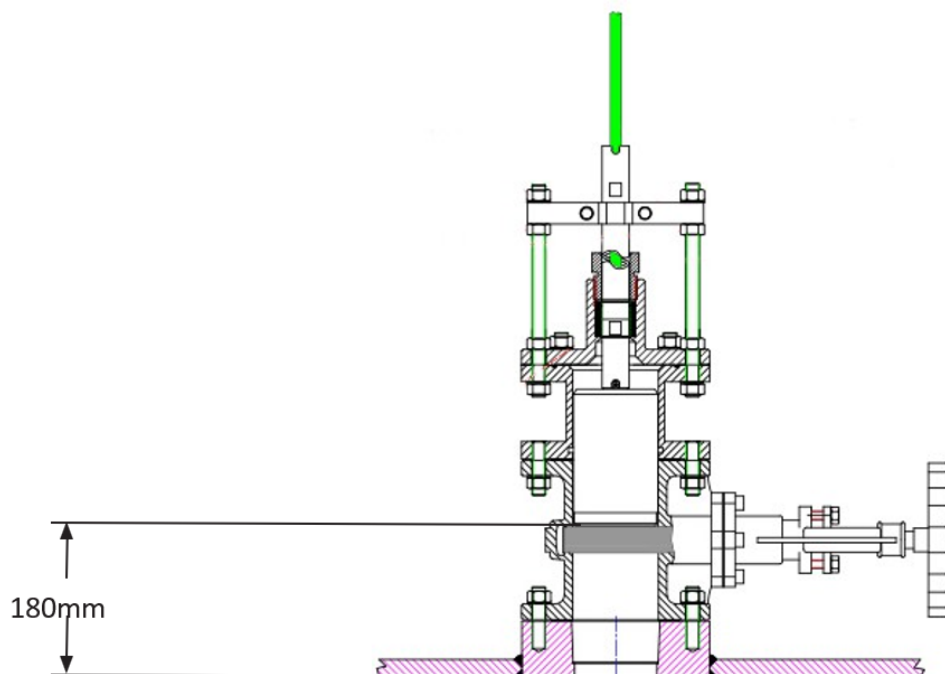


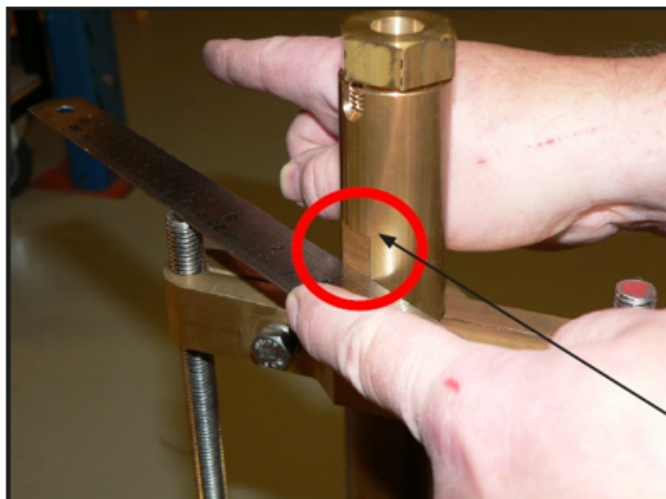
Figure 5. Lowering sensor in SB-100-SA



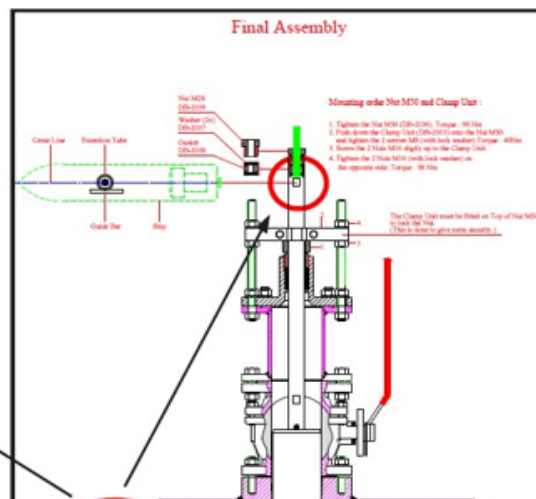
6.6 Orientation of sensor forward

Sensor forward orientation is only required for speed logs. Echo sounder transducers require no forward orientation.

Rotate the Extension Tube to align the sensor to point forward (ahead). Use the flattened area on the Extension Tube to find correct direction.



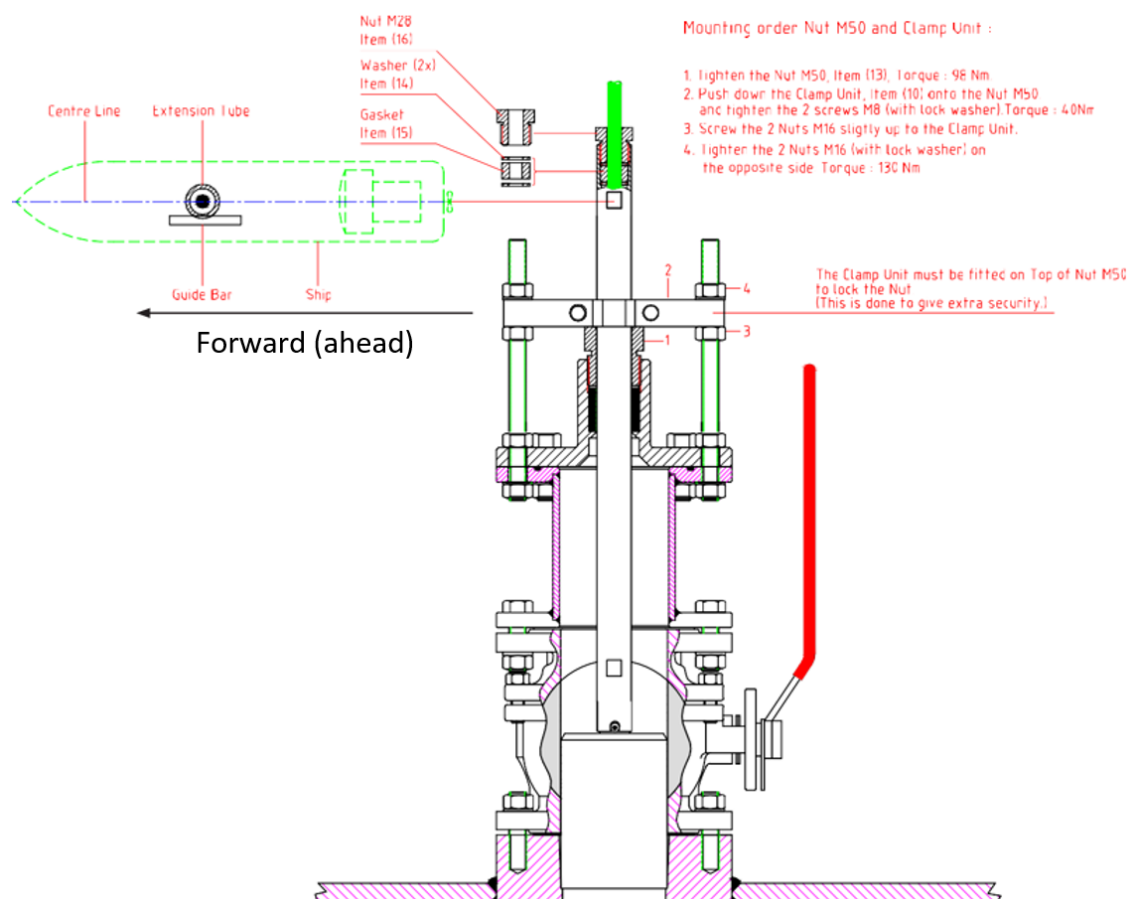
A flat object points fore/aft.



The flat side should be on the port side.

6.7 Final assembly

1. Tighten the M50 nut
2. Push down clamp unit on to the M50 nut
3. Tighten the 2 M8 screws on the clamp unit
4. Tighten the M16 nuts

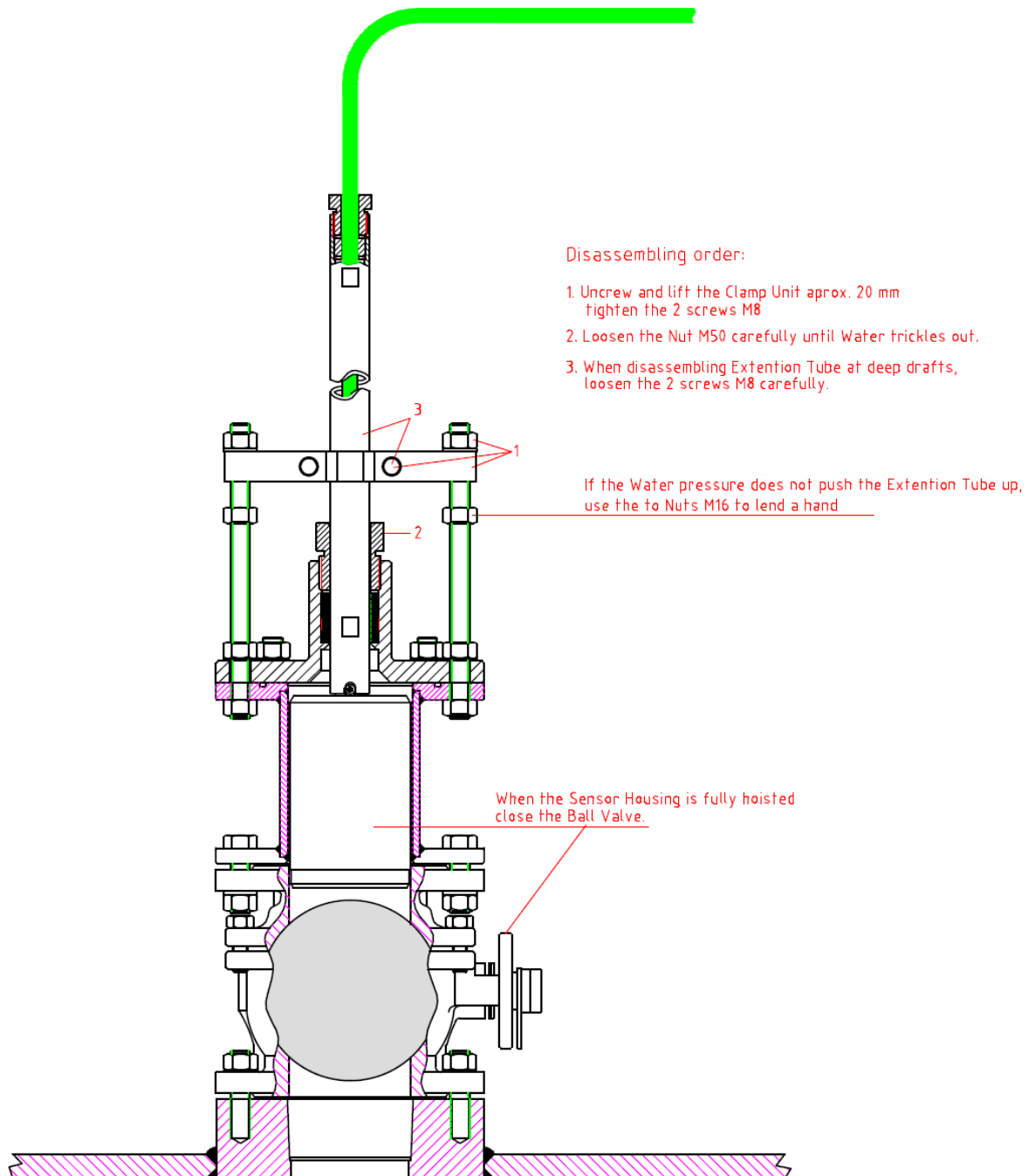


Protect sensor!

- When launching the ship, lift sensor 50 mm.
- When dry docking the ship, lift sensor 50 mm.

Check that the transducer/sensor housing, when fully inserted, is flush with the lower surface of the bottom flange.

7 Sensor removal

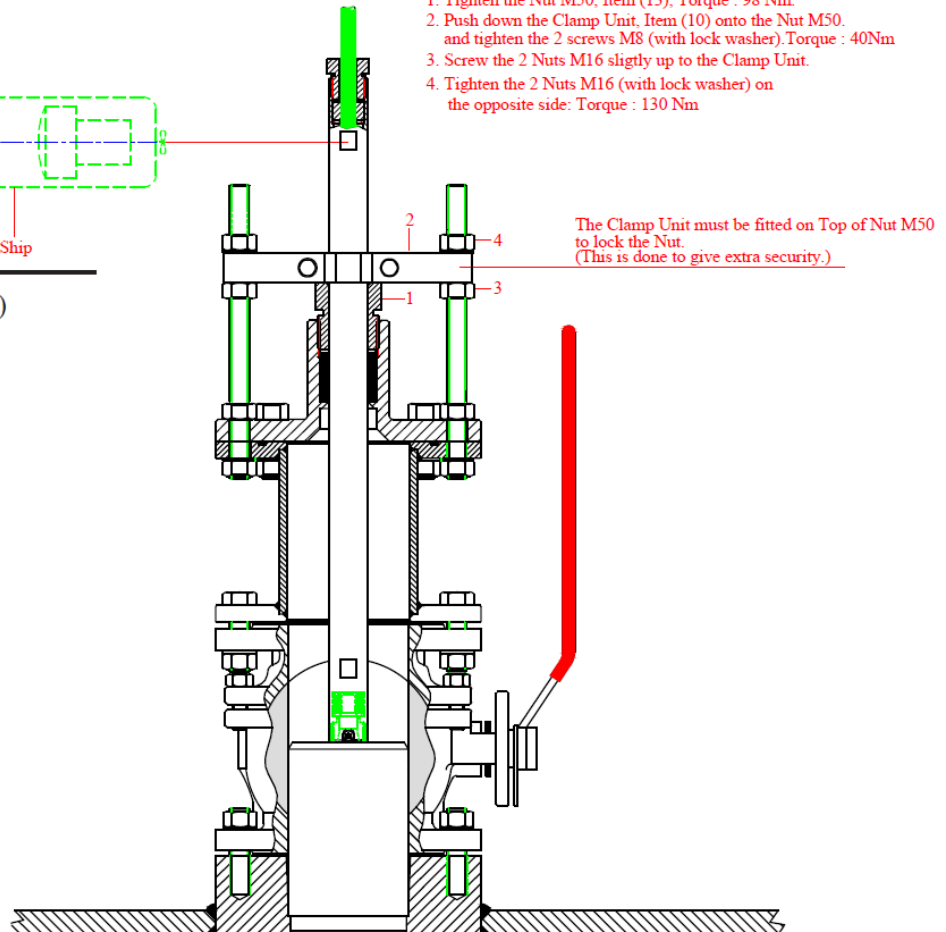
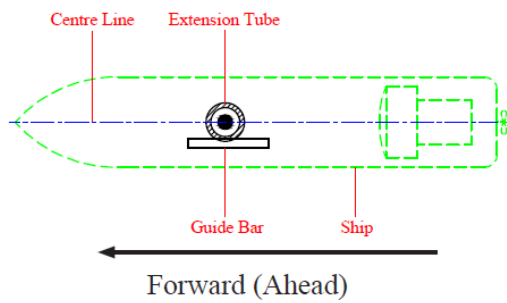


8 Re-installation

Same procedure as first-time mounting.

Mounting order Nut M50 and Clamp Unit :

1. Tighten the Nut M50, Item (13), Torque : 98 Nm.
2. Push down the Clamp Unit, Item (10) onto the Nut M50. and tighten the 2 screws M8 (with lock washer). Torque : 40Nm
3. Screw the 2 Nuts M16 slightly up to the Clamp Unit.
4. Tighten the 2 Nuts M16 (with lock washer) on the opposite side: Torque : 130 Nm



9 Maintenance

1. Speed log performance may be affected by growth, shell, etc on the sensor head.
Sensors may need to be carefully cleaned for growth to regain performance.
2. Sea valves consist of moving mechanical parts.
Consider greasing mechanical parts to ensure operation and avoid corrosion. Sea valves installed in wet areas (ballast tank etc) should be regularly inspected and greased.
3. Dry docking.
Consider replacing gaskets and O-rings during dry docking period.
Consider inspection of sea valve operation before a dry-docking period to have any spare parts available at dry docking.
4. O-rings are included with sensors and should be replaced when/if sensor is replaced.

9.1 Maintenance tasks for inactive sensors

The following instructions are applicable if the system is to be off / and the vessel is static for over 6 months in cold water or 3 months warm water.

9.1.1 When closing the vessel

- Turn off unit at power, both the display and transceiver.
- Mark the alignment of the sensor on the gate valve and sensor flange/pole.
- Lift the sensor into the gate valve and close the valve.
- Grease the valve's external moving parts

9.1.2 When restarting the vessel

- Heat the areas containing display, to allow condensation to evaporate.
- Lift and inspect the sensor head (or send diver). Carefully clean away growth.
- Redeploy the sensor taking care with alignment.
- Start the system.
- On first test, check alignment (Head Err in the calibration screen).

9.1.3 Dry docking in temperatures below freezing point

If the vessel is to be dry docked in temperatures below freezing point, water remaining inside the sea valve may cause damage to sea valve or sensor/transducer.

10 Part list

10.1 Illustrated part list - shipment

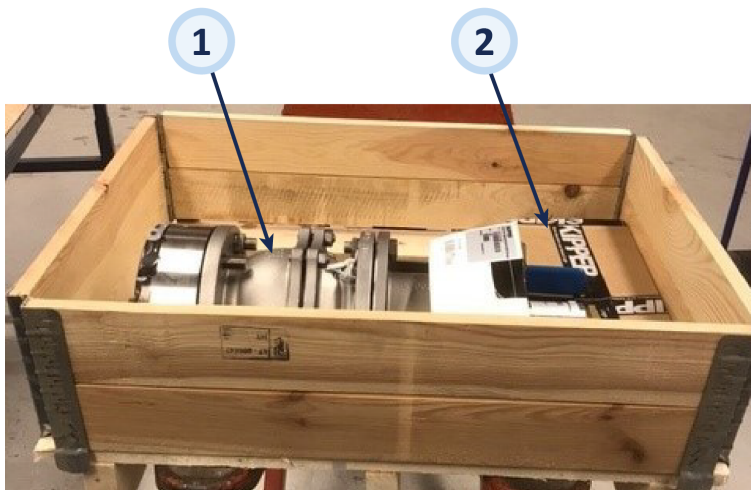
The SB-100-SA and SB-100-SB sea valves are packed in a wooden pallet.

Dimensions: 60 x 80 x 52 cm

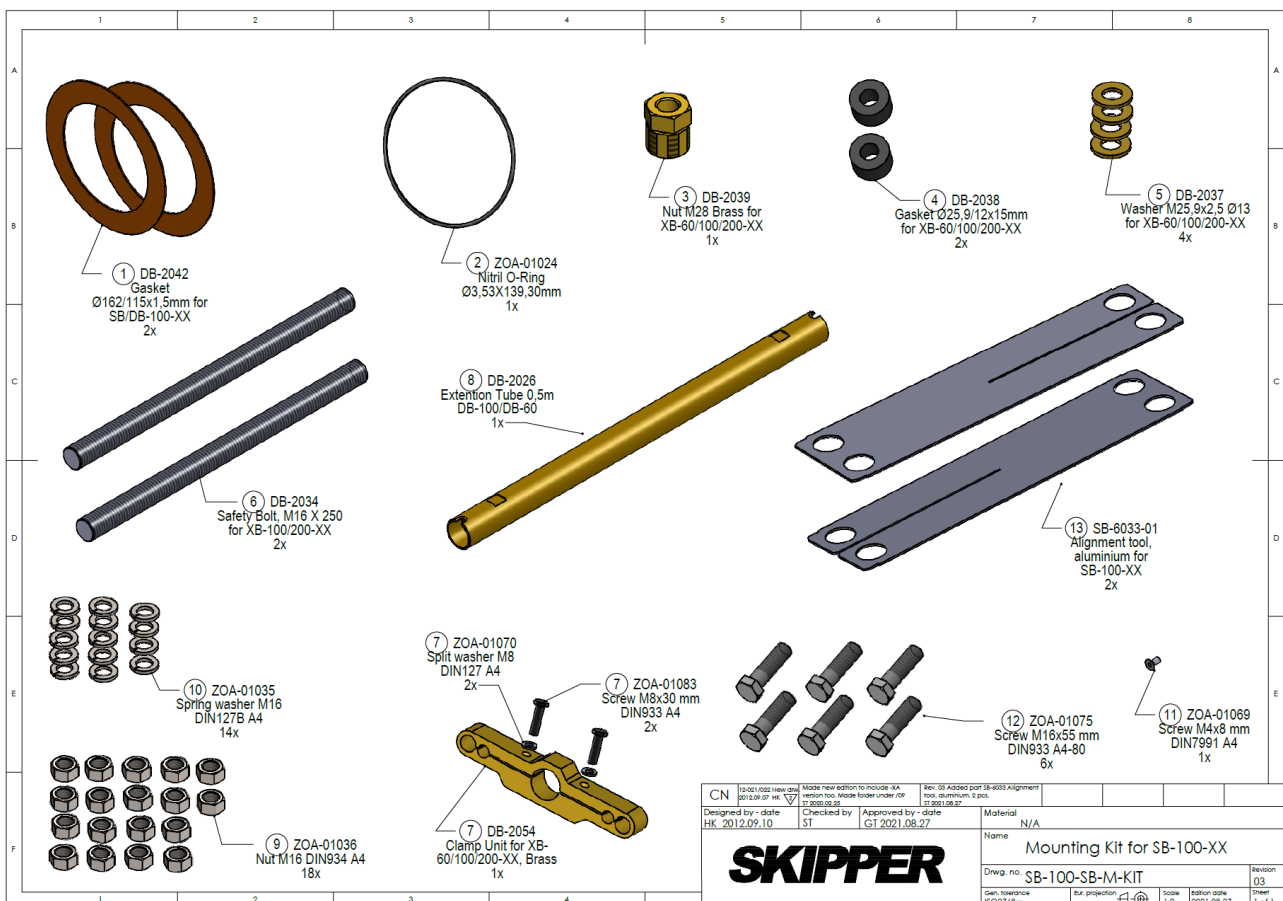
Ball valve SB-100-SB: 86 kg

Gate valve SB-100-SA: 78 kg

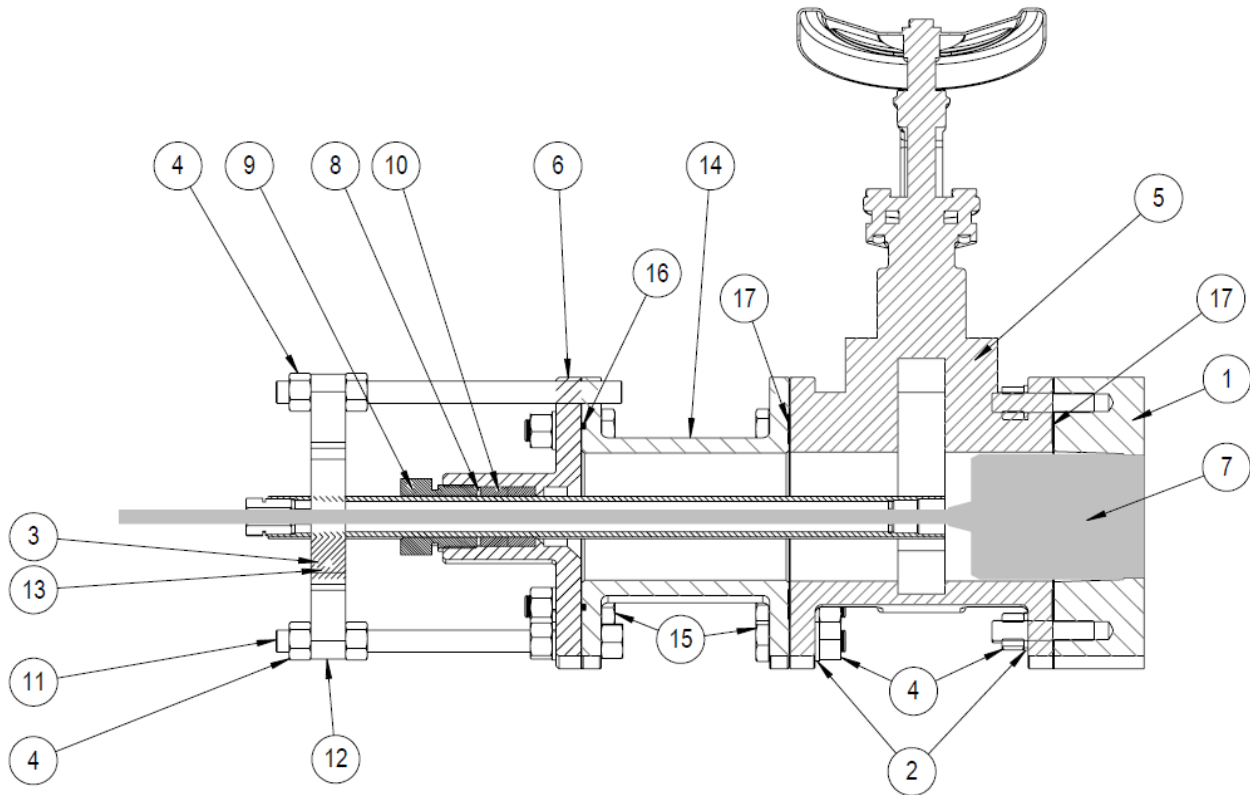
Figure 6. SB-100-XX shipment



1. Sea valve partly assembled.
 - Ball valve: SB-100-PB
 - Gate valve SB-100-PA
2. SB-100 mounting kit: SB-100-SB-M-KIT
 - This kit is the same for gate valve and ball valve.



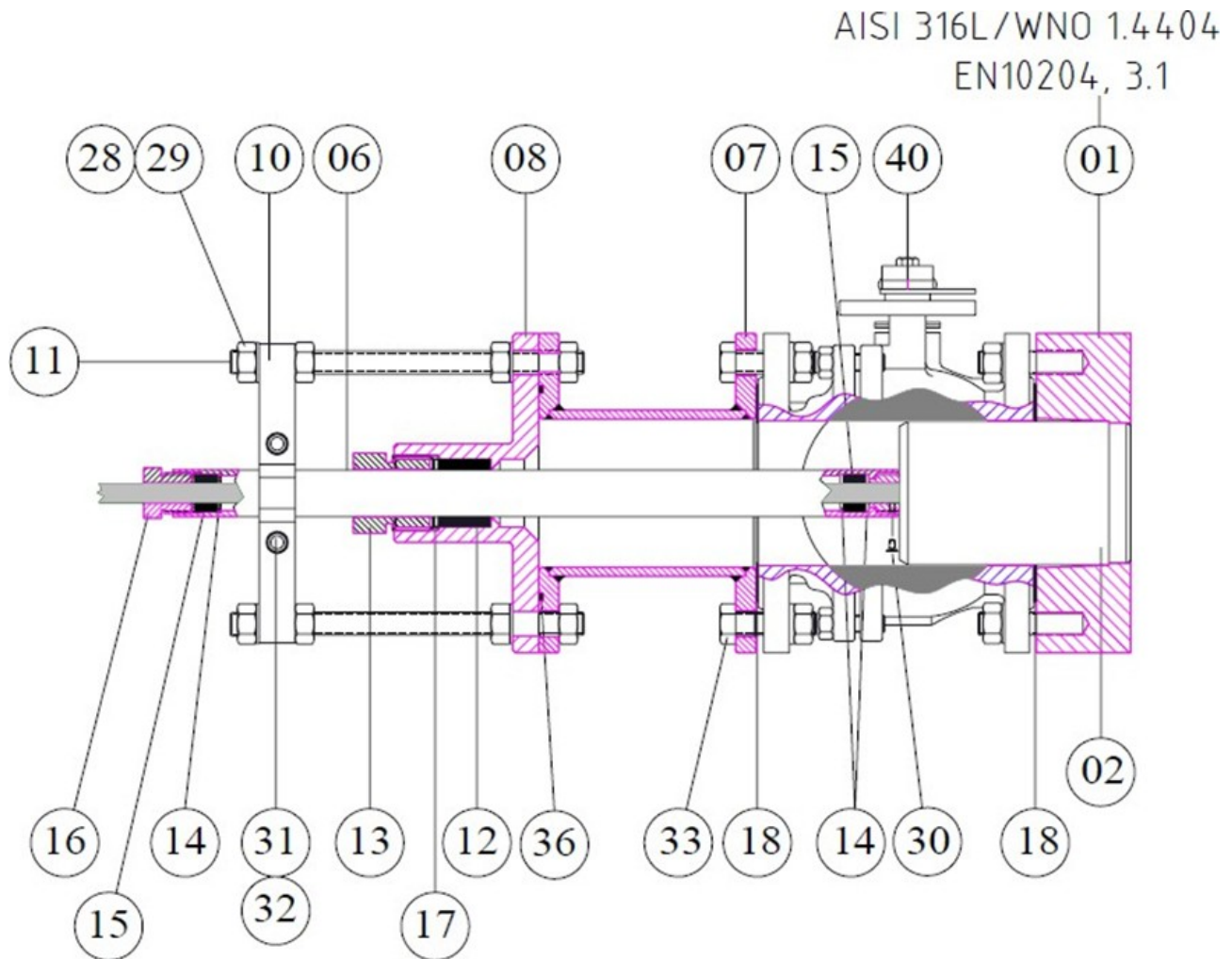
10.2 Part list for SB-100-SA



POS.	PART NR.	DESCRIPTION	MATERIAL	QTY
1	SB-2019	Bottom flange for SB-100-XX	AISI 316	1
2	ZOA-01035	Spring washer M16 DIN 127B	A4 St. Steel	24
3	ZOA-01070	Split washer M8 DIN127 A4	A4 St. Steel	2
4	ZOA-01036	Nut M16 DIN934	A4 St. Steel	30
5	ZCC-01011	DN100 PN16/3.1.B	Bronze	1
6	DB-2031	Top Flange	AISI 316	1
7	SENSOR	DL2SG / DL21SG / DL850S27G	N/A	1
8	DB-2040	Washer $\varnothing 46 \times 2.5 \varnothing 32.5$	Brass	1
9	DB-2036	Nut M50	Brass	1
10	DB-2035	Gasket $\varnothing 47/32.5 \times 20$	Nitril	2
11	DB-2034	Safety Bolt, M16 X 250	A4 St. Steel	2
12	DB-2054	Clamp Unit	Brass	1
13	ZOA-01083	Screw M8x30 mm DIN933 A4	A4 St. Steel	2

14	DB-2051	Intermediate Element	CF8M	1
15	ZOA-01075	Screw M16x50 DIN933	A4 St. Steel	14
16	ZOA-01024	O-ring 139,29 x 3,53	Nitril	1
17	DB-2042	Gasket $\varnothing 162/115 \times 1,5$ mm	Nitril	2

10.3 Part list for SB-100-SB



POS.	PART NR.	DESCRIPTION	MATERIAL	QTY
1	SB-2019	Bottom flange	AISI 316	1
2	DL21SG / DL2SG / DL850S27G	DB-100-Sensors	N/A	1
6*	DB-2026	Extension Tube, 0.5m	Brass	1
7	DB-2051	Intermediate Element	CF8M	1

8	DB-2031	Top Flange	AISI 316	1
10*	DB-2054	Clamp Unit	Brass	1
11	DB-2034	Thread Bolt	A4 St. Steel	2
12~	DB-2035	Gasket	Nitril	2
13	DB-2036	Nut M50	Brass	1
14*~	DB-2037	Washer Ø25,9/13 x 2,5	Brass	4
15*~	DB-2038	Gasket Ø25/12 x 15	Nitril	2
16*	DB-2039	Nut M28	Brass	1
17	DB-2040	Washer	Brass	1
18*~	DB-2042	Gasket Ø162/115 x 1,5	Nitril	2
28*~	ZOA-01036	Nut M16 DIN934	A4 St. Steel	30
29*~	ZOA-01035	Spring Washer M16 DIN 127B	A4 St. Steel	28
30*~	ZOA-01069	Screw M4 x 8 DIN 7991	A4 St. Steel	2
31*	ZOA-01083	Screw M8 x 30 DIN 933	A4 St. Steel	2
32*	ZOA-01070	Spring Washer M8 DIN 127B	A4 St. Steel	2
33*~	ZOA-01075	Screw M16x50 DIN933	A4 St. Steel	14
36*~	ZOA-01024	O-ring 139,29 x 3,53	Nitril	1
40	ZCC-01015	Ball Valve Element	A4 St. Steel	1

*) Part of mounting kit: SB-100-XB-M-KIT

~) Part of service kit: Module-SB-DB-S-KIT.1042A

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