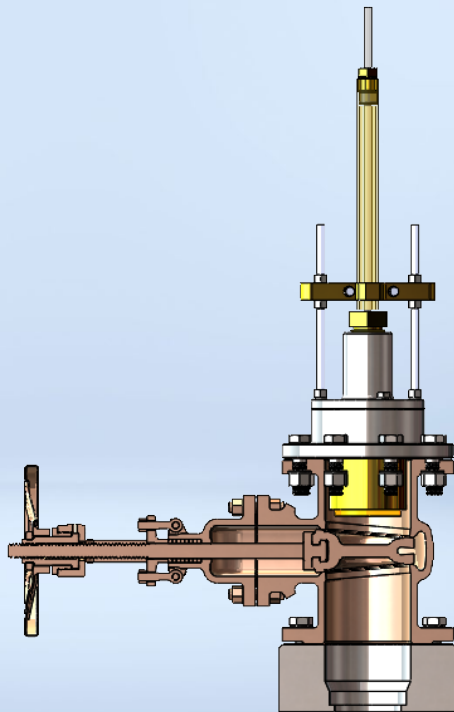


DL2SF-SA

Single Bottom Sea Valve Installation manual



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1 Document information

This manual covers the operation and installation of SKIPPER DL2SF-SA, which is a retrofit for replacing a Furuno DS-630 sensor with a Jotron SKIPPER DL2 sensor in the Furuno DS-661 valve.

2 Installation

2.1 Important



Caution! Be aware that the Sea Valve contains high precision parts and therefore proper handling when mounting is essential for the final result. 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 to avoid damaging and any kind of pollution of the Sea Valve.

The SKIPPER DL2SF-SA is delivered partly assembled for transport. The parts necessary for final assembly will be provided in the shipment.

The active surface of the transducer must be installed with front face a **maximum of +/-7 degree to the ships horizontal plane.** (Echo Sounder).

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



Important! Sensors for Speed Log and Echo Sounder are delivered with a fixed cable. Attention must be taken to allow easy replacement/pulling of new cable during maintenance.

2.2 Space considerations and dimensions

See measurements on the drawings below for space considerations. All dimensions are in mm.

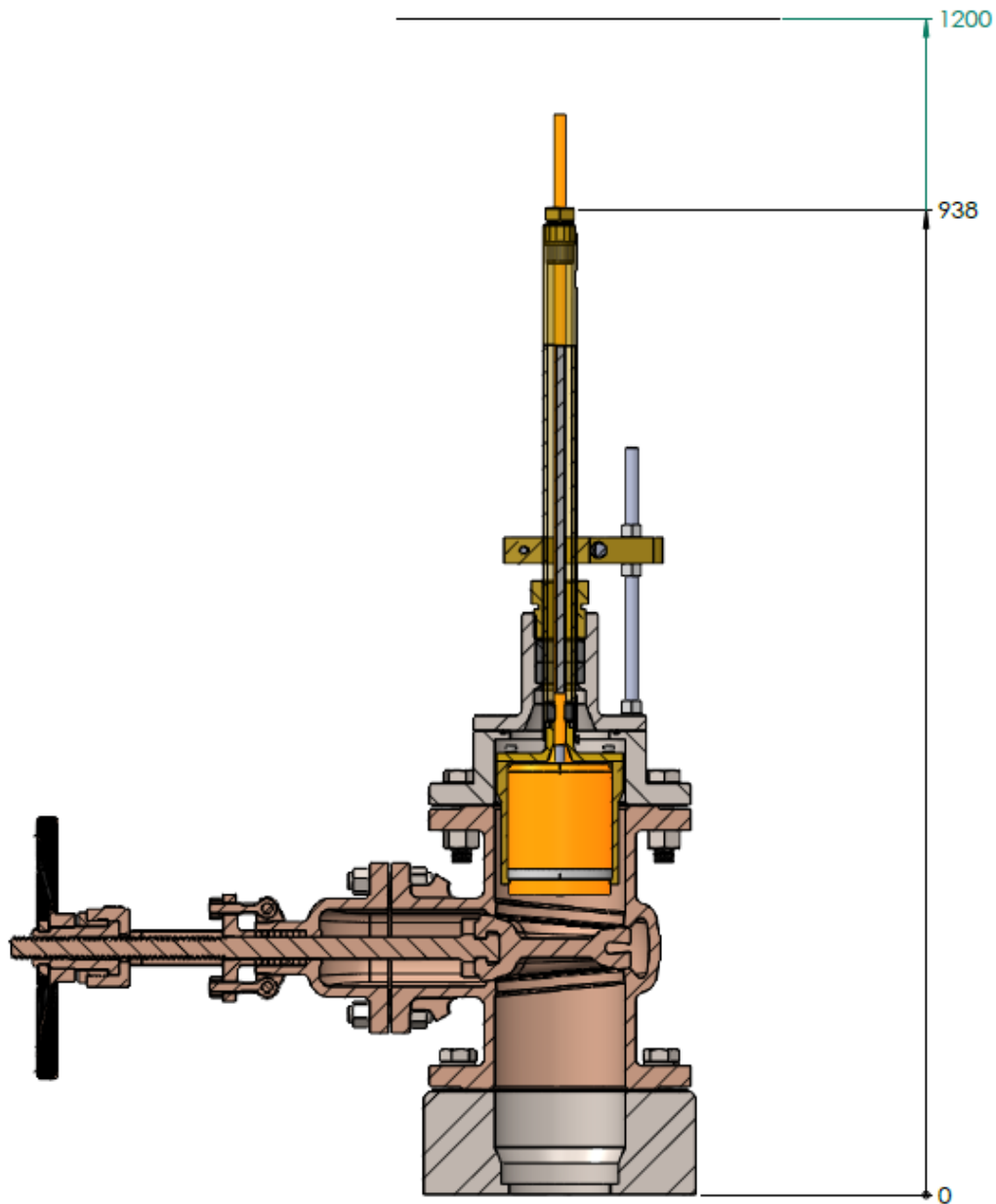
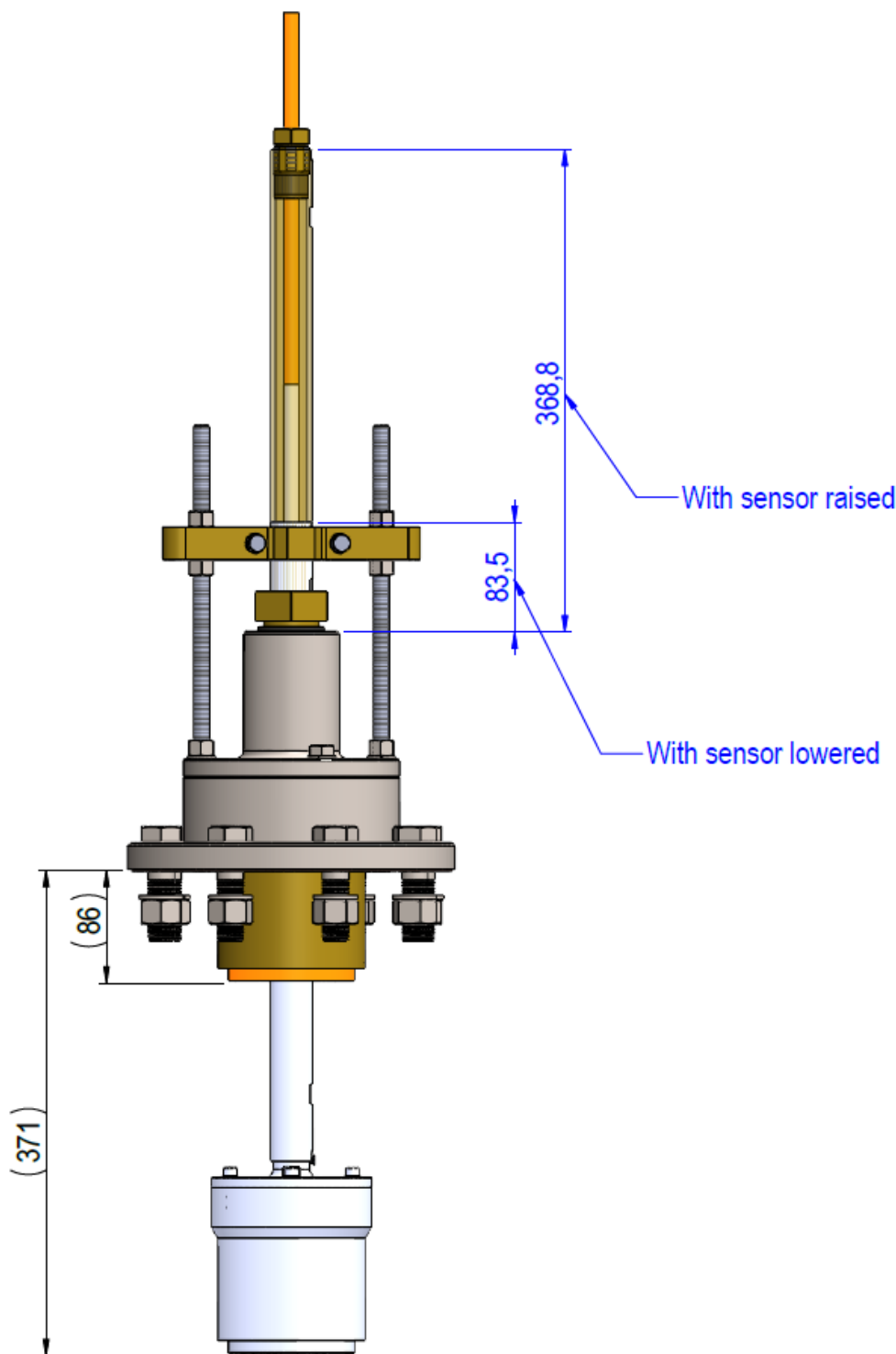


Figure 1 - Height considerations

The minimum installation height for the SKIPPER DL2SF-SA retrofit in the Furuno DS-661 valve is 1200 mm. When the sensor is raised, the total height of the assembly is 938 mm.



2.3 Component overview

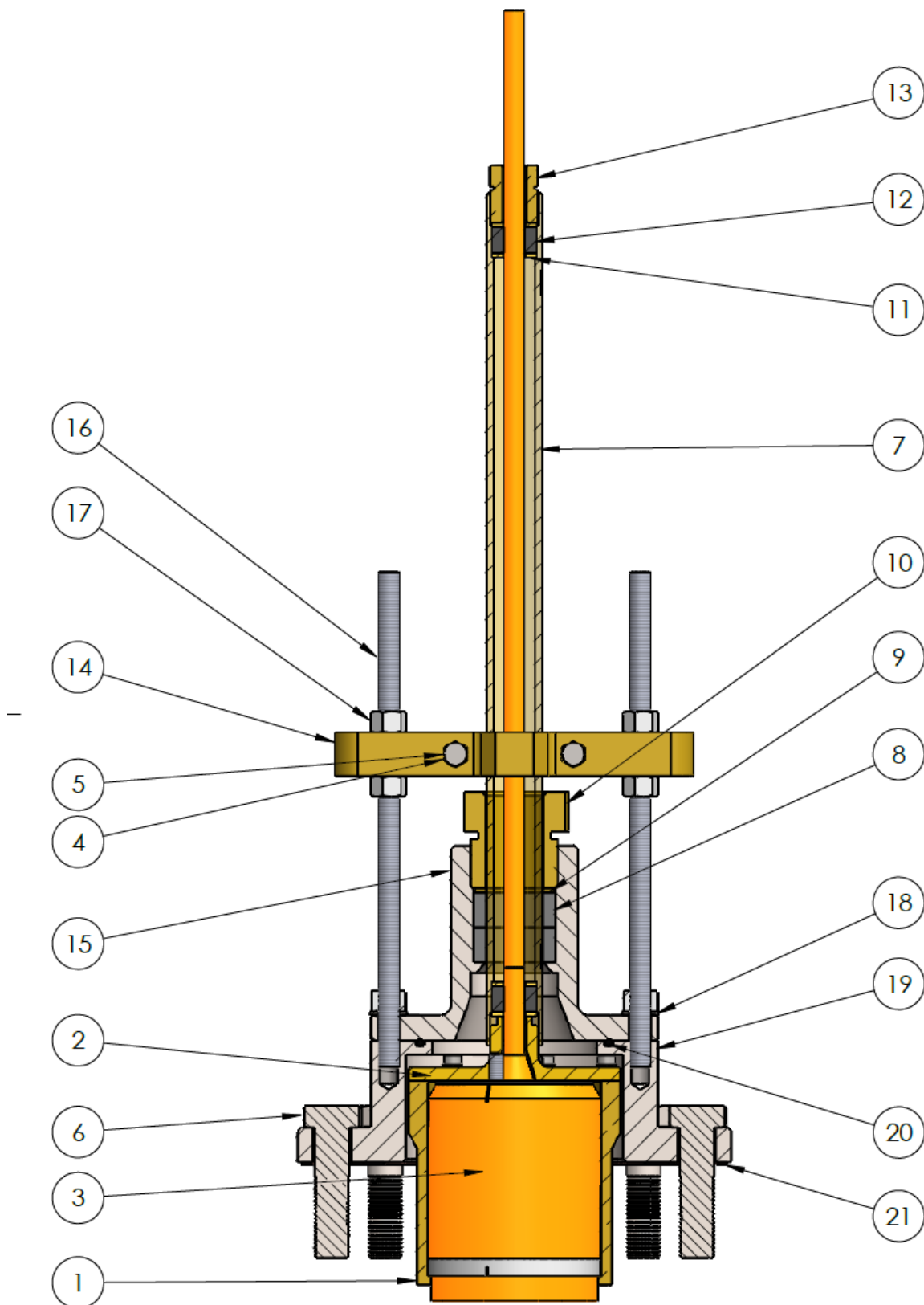


Figure 2 – Overview of DL2SF-SA

Pos.	Part number	Description	Qty.
1	DB-3053	Adaptor Housing for DS-60	1
2	DB-2016	Cover Brass for DS-60	1
3	DL2S-277-ZA	DL2 Sensor Molded 40m cable	1
4	ZOA-01083	Bolt, M8x30 mm DIN933 A4	2
5	ZOA-01070	Split washer M8 DIN127 A4	2
6	ZOA-01063	Bolt, M20x75 mm DIN931 A4	8
7	DB-2026	Extension Tube 0,5m	1
8	DB-2035	Gasket Ø47 Ø32,5 x 20mm	2
9	DB-2040	Washer Ø46 x 2,5 Ø32,5	1
10	DB-2036	Nut M50 Brass	1
11	DB-2037	Washer Ø25,9 x 2,5 Ø13	4
12	DB-2038	Gasket Ø25,9/12 x 15mm	2
13	DB-2039	Nut M28 Brass	1
14	DB-2054	Clamp Unit	1
15	DB-1031	Top Flange	1
16	SB-6027	Safety Bolt M12x285	2
17	ZOA-01023	Nut M12 DIN934 A4	6
18	ZOA-01066	Spring Washer M12,2 DIN 127B A4	4
19	DB-3051	Intermediate element for DS-60	1
20	ZOA-01029	Nitril O-Ring Ø4 x 105 mm	1
21	DB-2012	Gasket Ø222 x 140 for DS60	1

2.3.1 Overview of the mounting kit

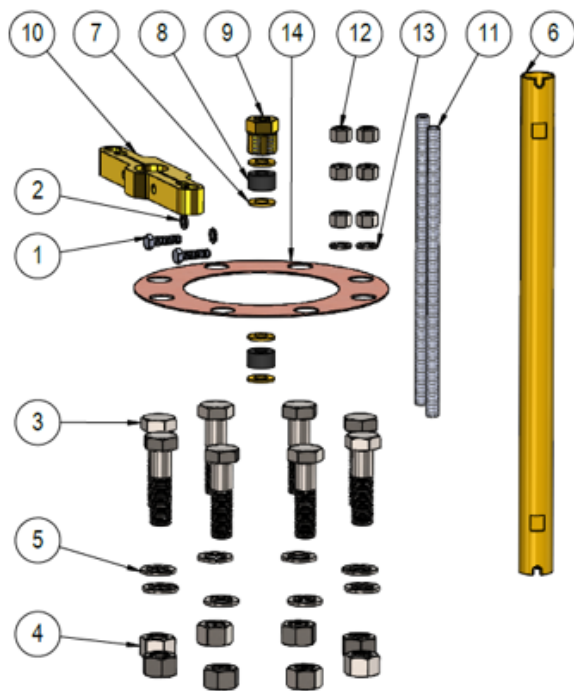


Figure 3 - Mounting kit - Exploded view

Pos.	Part number	Description	Qty.
1	ZOA-01083	Screw M8x30 mm DIN933 A4	2
2	ZOA-01070	Split washer M8 DIN127 A4	2
3	ZOA-01063	Screw M20x75 mm DIN931 A4	8
4	ZOA-01062	Nut M20 DIN934 A4	8
5	ZOA-01061	Spring Washer M20 DIN 127B A4	8
6	DB-2026	Extension Tube 0,5m	1
7	DB-2037	Washer Ø25,9x2,5 Ø13	4
8	DB-2038	Gasket Ø25,9/12 x 15mm	2
9	DB-2039	Nut M28 Brass	1
10	DB-2054	Clamp Unit, Brass	1
11	SB-6027	Threaded Bolt M12x285	2
12	ZOA-01023	Nut M12 DIN934 A4	6
13	ZOA-01066	Spring Washer M12,2 DIN 127B A4	2
14	DB-2012	Gasket Ø222x140 for DS-60	1

2.3.2 Overview of the top assembly

All items in Figure 4 are delivered preassembled.

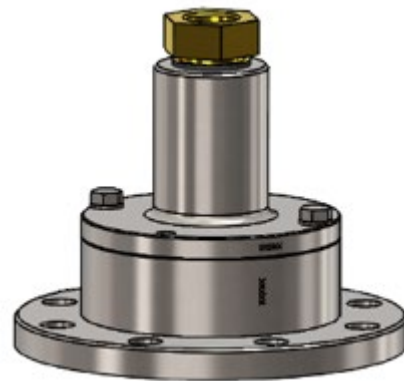
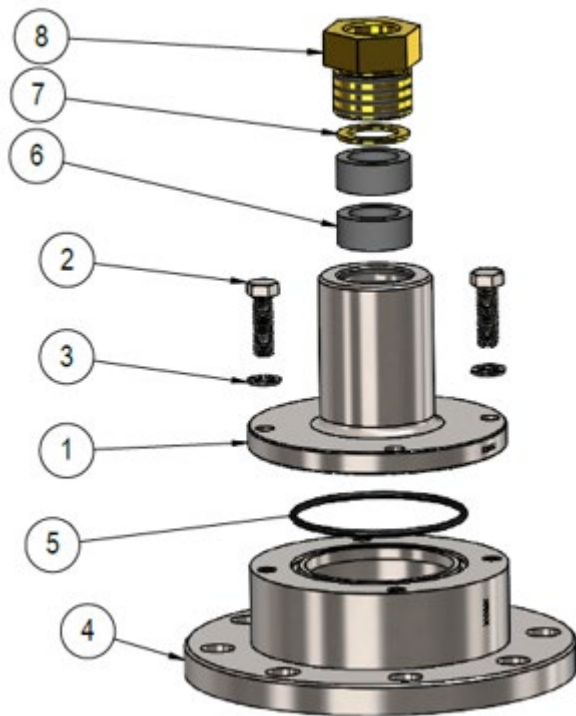


Figure 4 - Exploded view of the top assembly

Figure 5 - Assembled view

Pos.	Part number	Description	Qty.
1	DB-1031	Top Flange	1
2	ZOA-01065	Screw M12x40 mm DIN933 A4-80	2
3	ZOA-01066	Spring Washer M12,2 DIN 127B A4	2
4	DB-3051	Intermediate element for DS-60 Valve	1
5	ZOA-01029	Nitril O-Ring Ø 4x105 mm	1
6	DB-2035	Gasket Ø47 Ø32,5 x 20mm	2
7	DB-2040	Washer Ø46x2,5 Ø32,5	1
8	DB-2036	Nut M50 Brass	1

2.4 Assemble the extension tube and sensor

When delivered, the sensor is pre-assembled in the housing (item 1 in Figure 6). To assemble the extension tube, follow the instructions below:

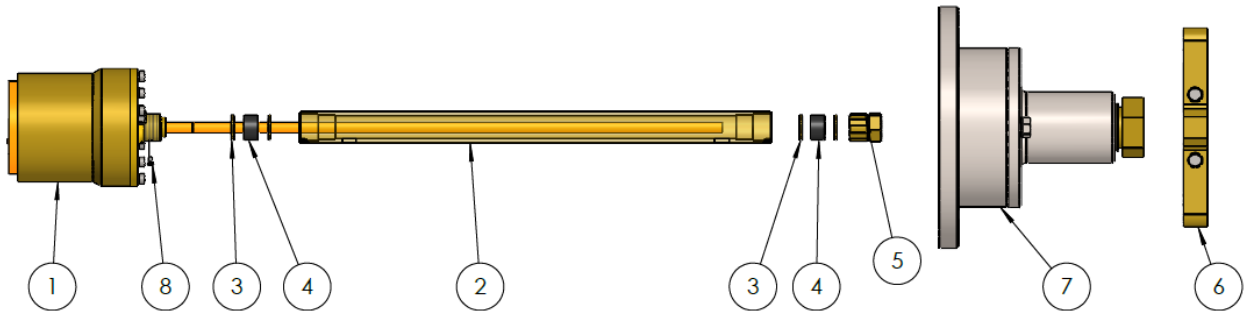


Figure 6 - Assemble the extension tube and sensor

Pos.	Part number	Description	Qty.
1	Sensor	Pre-mounted sensor assembly	1
2	DB-2026	Extension Tube 0,5m	1
3	DB-2037	Washer Ø25,9x2,5 Ø13	4
4	DB-2038	Gasket Ø25,9/12 x 15mm	2
5	DB-2039	Nut M28	1
6	DB-2054	Clamp Unit for XB-60/100/200-XX, Brass	1
7	Top part	Pre-mounted Top part	1
8*	ZOA-01069	CS Allen screw M4x8 DIN7991 A4 *Part of DB-3053	1

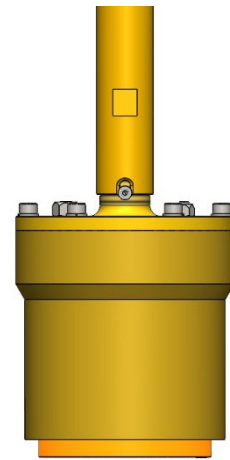


Figure 7 - Retaining slot and countersunk M4 screw interface

1. Thread a washer, gasket, and another washer on the sensor cable (item 3 and 4 in Figure 6).
2. Thread the extension tube on the cable (item 2 in Figure 6).
3. Thread a washer, gasket, and another washer on the cable (item 3 and 4 in Figure 6).
4. Unscrew the countersunk M4 screw (item 8 in Figure 6).
5. Tighten the extension tube until the hole for the countersunk M4 screw aligns with the retaining slot, see Figure 7. Ensure the heading mark on the bottom of the transducer aligns with the flattened area on the extension tube.
6. Apply threadlocker (Loctite® 222 or similar; user-supplied) to the threads of the countersunk M4 screw. Insert and tighten the screw.
7. Mount the M28 nut (item 5 in Figure 6) on the extension tube. Tighten until the gasket compresses around the cable.
8. Thread the sensor assembly through the top assembly (item 7 in Figure 6).
9. Thread the clamp unit on the sensor cable (item 6 in Figure 6).

2.5 Assemble the sea valve

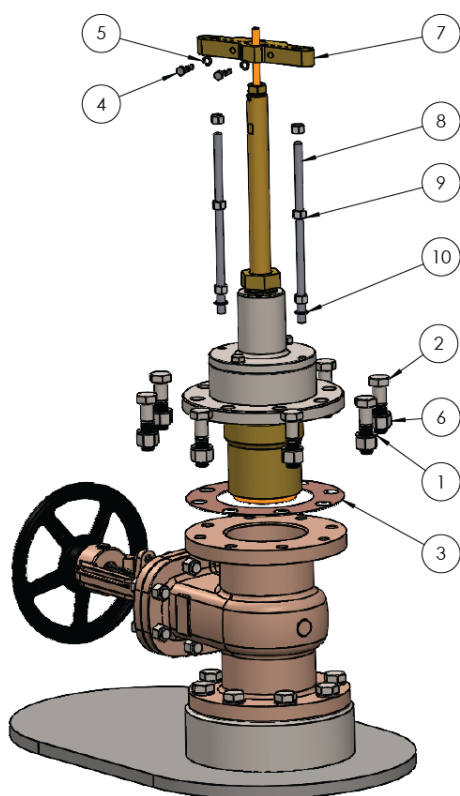


Figure 8 – Exploded view of the sea valve assembly

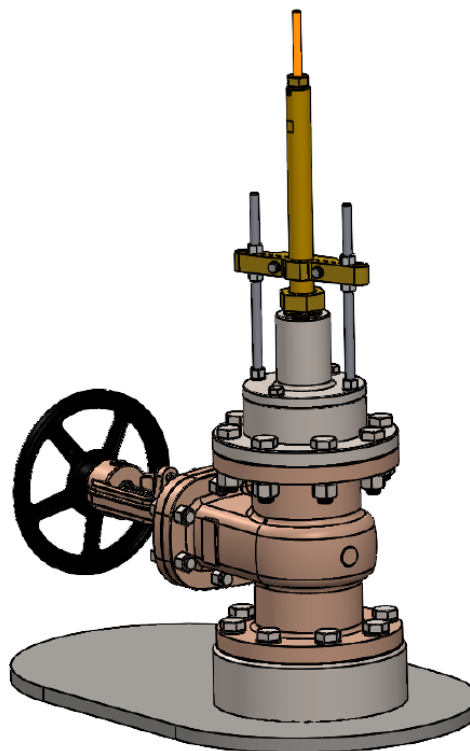


Figure 9 - Assembled view

Pos.	Part number	Description	Qty.
1	ZOA-01061	Spring Washer M20 DIN 127B A4	8
2	ZOA-01063	Screw M20x75 mm DIN931 A4	8
3	DB-2012	Gasket Ø222x140 for DS60	1
4	ZOA-01083	Screw M8x30 mm DIN933	2
5	ZOA-01070	Split washer M8 DIN127 A4	2
6	ZOA-01062	Nut M20 DIN934 A4	8
7	DB-2054	Clamp Unit for XB-60/100/200-XX, Brass	1
8	SB-6027	Safety Bolt M12x285	2
9	ZOA-01023	Nut M12 DIN934 A4	6
10	ZOA-01066	Spring Washer M12,2 DIN 127B A4	4

1. Place the 1.5 mm gasket on top of the gate valve element, positioned between the gate valve and the top assembly, see item 3 in Figure 8.
2. Secure the top assembly with 8 bolts, washers, and nuts (item 1, 2, and 6 in Figure 8).
Torque: 130 Nm.
3. Mount the safety bolts, M12 nuts, and clamp unit, see Figure 8.
4. When all items are aligned, tighten all screws and bolts.

2.6 Lower the sensor

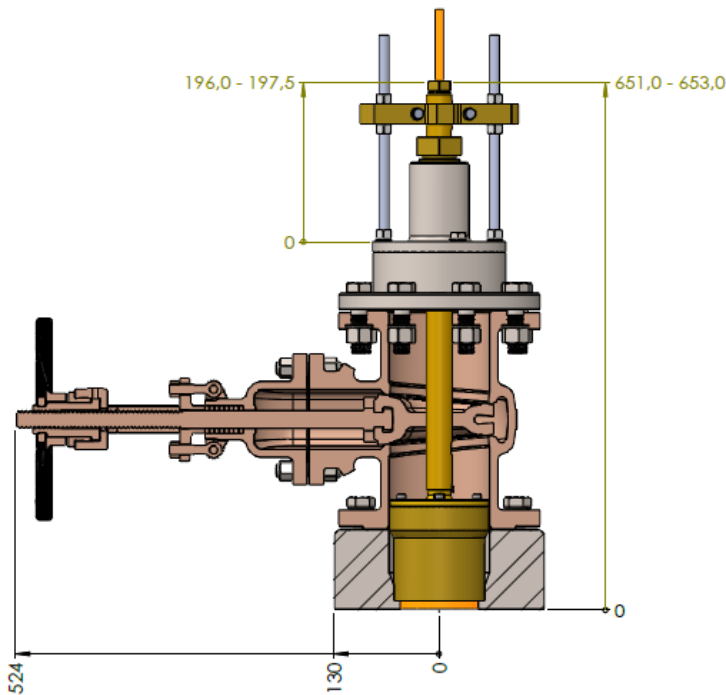
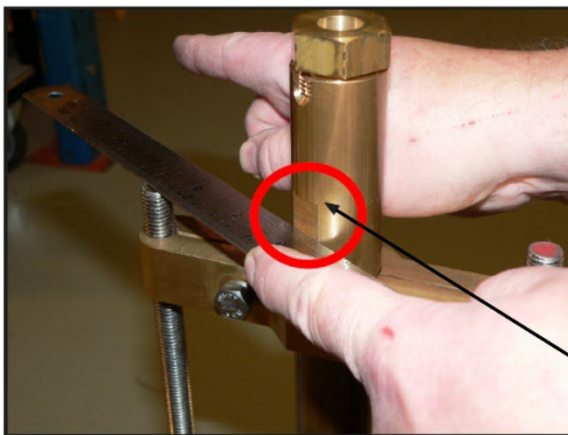
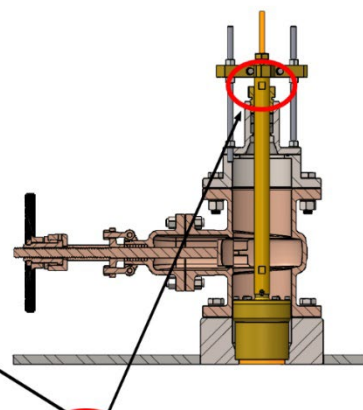


Figure 10 - Distance for lowering the sensor

1. Ensure the countersunk M4 screw on the sensor is in contact with the retraining slot on the extension tube. See instructions in section 2.4 for details.
2. Open the sea valve, lower the sensor unit and extension tube. See Figure 11 for lowering height information. Dimensions are shown as a range because gasket compression varies during installation.
3. Rotate the extension tube to align the sensor to point forward (ahead). Ensure that the flattened area on the extension tube is aligned with the vessel's centerline, see images below. The flat side should be on the port side of the vessel.



A flat object points fore/aft.



The flat side should be on the port side.



Note! Sensor forward orientation is only required for Speed Logs. Echo sounder transducers require no forward orientation.

4. Tighten the two M8 screws on the clamp unit and the M12 nuts.

2.7 Final assembly

The list and figure below show the mounting order for the M50 nut and the clamp unit:

1. Tighten the M50 nut. Torque: 98 Nm.
2. Push down the clamp unit, onto the M50 nut and tighten the two M8 screws (with lock washer). Torque: 40 Nm.



Important! The clamp unit must be fitted on top of the M50 nut to lock the nut. This is done to give extra security.

3. Screw the two M16 nuts slightly up to the clamp unit.
4. Tighten the two M16 nuts (with lock washer) on the opposite side. Torque: 130 Nm.

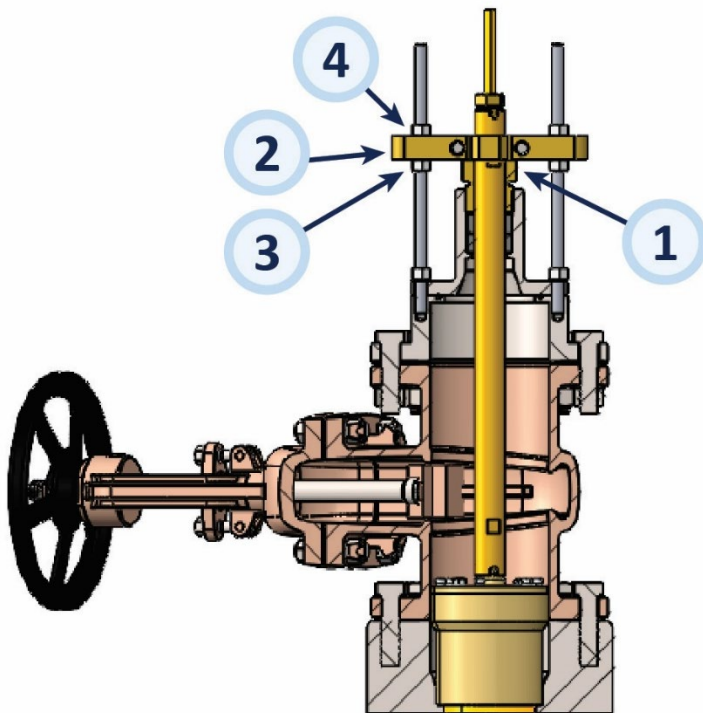


Figure 11 - Final assembly

Protect sensor!

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

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

3 Airing

After the ship is launched, it is necessary to let the compressed air out of the sea valve.

1. Lift the clamp unit approximately 10 mm and tighten the two M8 screws to hold it in position.
2. Screw the two M16 nuts slightly down to the clamp unit.
3. Unscrew the M50 nut until it reaches the clamp unit to vent the air.
When water begins to trickle out, tighten the M50 nut properly.

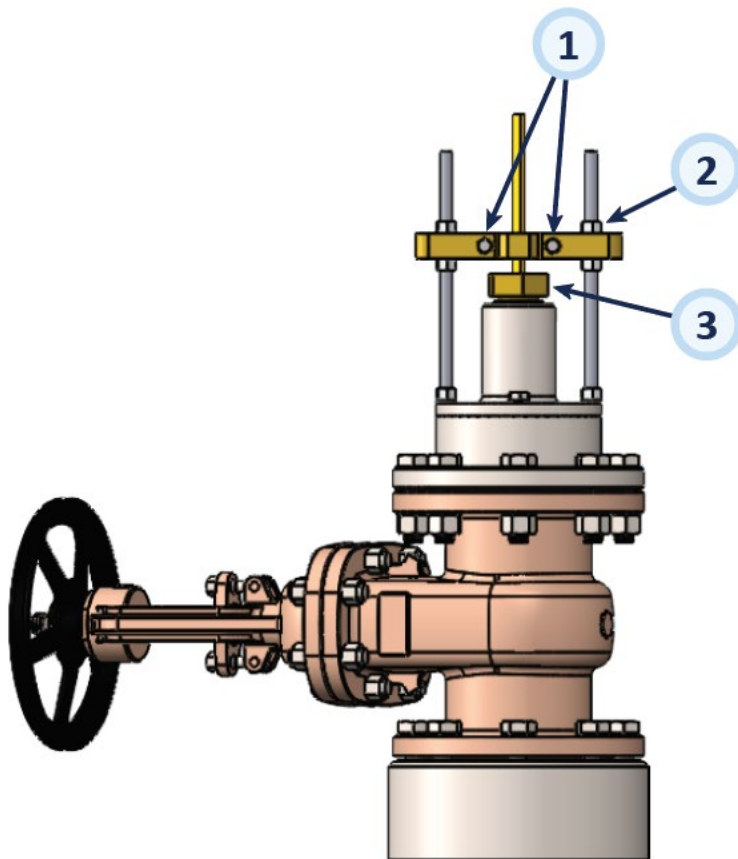


Figure 12 - Airing

4 Sensor removal

To disassemble the sensor, follow the steps and figure below:

1. Unscrew and lift the clamp unit approximately 20 mm, then tighten the two M8 screws to hold it in place.
2. Loosen the M50 nut carefully until water begins to trickle out.
3. When disassembling the extension tube at deep drafts, loosen the two M8 screws carefully.
4. If water pressure does not raise the extension tube by itself, use the two M12 nuts to lift it upward.
5. When the sensor housing reaches its mechanical upper position, close the gate valve.

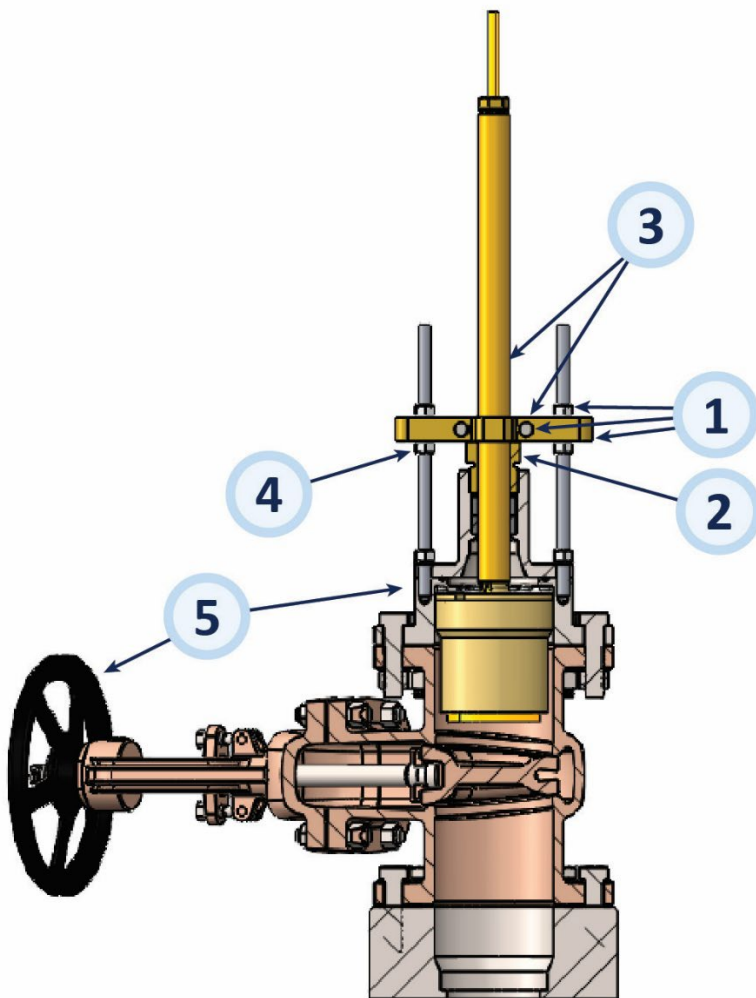


Figure 13 - Sensor removal

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