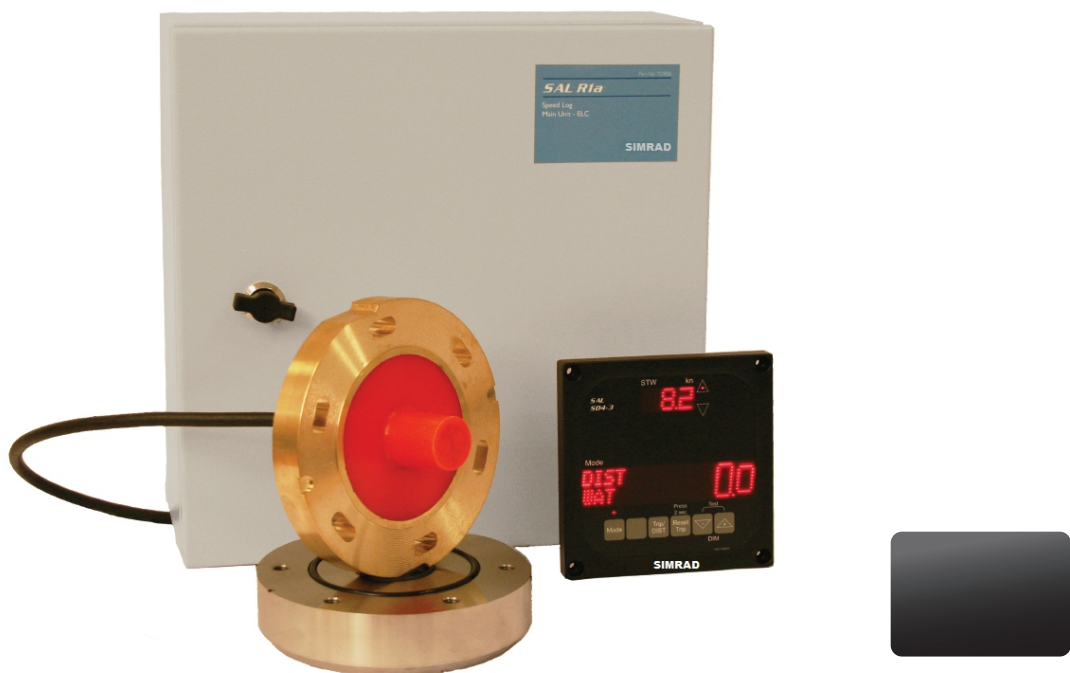


SIMRAD

SAL R1a Easy Tank System

Installation Manual

ENGLISH



Revisions:

Date	Version	Author	Comment
2016-12-29	01	TE	Simrad Version

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Section 3: INSTALLATION MANUAL

1 TRANSDUCER LOCATING PRINCIPLES

An optimized transducer unit (TRU) installation is of primary importance to achieve proper performance of the speed log system (See Basic System Information).

Following rules must then be considered:

- The TRU should, preferably, be installed in the foremost area of the vessel, in a perpendicular position in a flat, horizontal part of the bottom hull plating close to the keel line and not behind 1/3 of LOW (Length On Water-line).
- The TRU could be installed in a forepeak, or in a double bottom forepeak tank, or in the lower section of the bulb. It must be a dry space (cofferdam) accessible for maintenance and service also when the ship is afloat.
- The TRU transmitting surface must always remain under water, even in heavy seas, in order to provide speed measurements.
- The outer shape of the vessel, especially in the forward vicinity of the TRU installation position, must be free from sudden projections, steps and sharp edges, welding seams etc., which can cause turbulence in the water flow passing the TRU.
- The TRU shall be installed at least 2 m forward of water inlets and outlets.
- The TRU shall be installed at least 2 m from any echo sounder transmitters and similar acoustic devices.
- On tankers, the TRU shall not be installed within the Ex-area.
- Sufficient headroom must be available at the TRU position to allow for its fitting and removal (see relevant chapter for appropriate bottom parts).

Note: The TRU cable shall run directly to the ELC and **must never be cut off, shortened, extended or by any other mean pass a junction box**. The cable must be laid free and accessible for dismounting if exchange of TRU will be necessary.

2 BOTTOM PARTS / TRU INSTALLATION

The SAL R1a Easy Tank is very suitable for installation for small ships, which can be easily dry-docked or lifted out of the water, where a mounting location can be found directly in the bottom hull plating. It may also be used for ships where sufficient inboard space is not available for fitting with a seavalve. TRU exchange or maintenance is not recommended with the ship in water or at least not without diver assistance.

A complete SAL R1a Easy Tank is divided in two parts; SAL R1 TRU Easy Tank with a water tight cable of 10 meters and R1a Easy Tank Flange. Alternative Flange for aluminium ships is the R1a Easy Tank flange ALU 5083.

The transducer is designed to be fitted flush with the hull. The transducer measures speed through the water STW (relative speed) approximately 130 mm below the ship's hull.

Note!

The R1 Speed Log transducer is tested with the cable as one unit.

DO NOT CUT OR MODIFY THE TRANSDUCER CABLE.

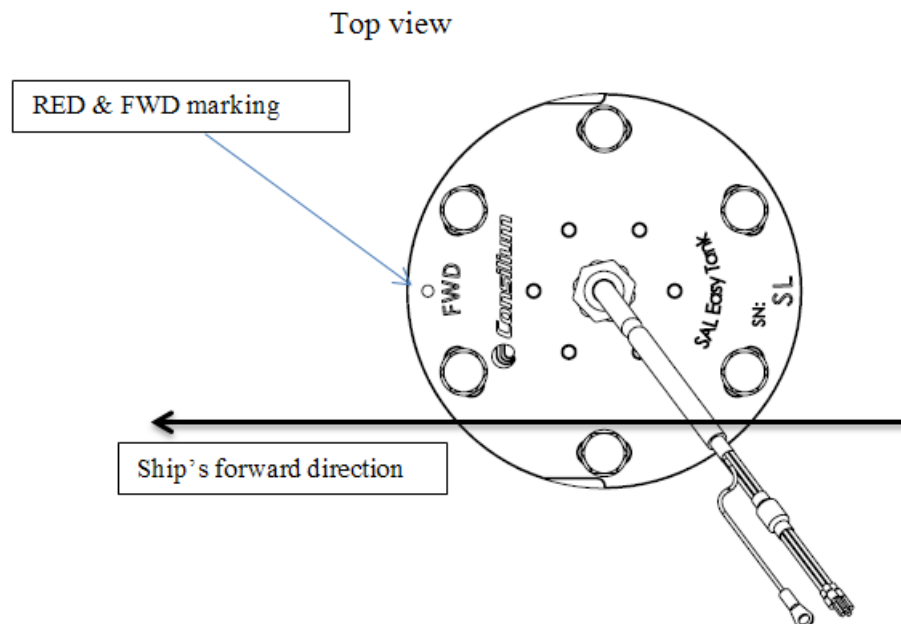
Because the relative speed measurement operates at a frequency where cable length affects performance and the Navico will take no responsibility if the cable is modified.

The bottom flange is welded into a cut-out in the ship's bottom hull plate.

The bottom flange holds the transducers flush with the underside of the hull.

IMPORTANT!

When welding the bottom flange to the hull the **Red markings** on the flange **must** be assured to point in the **ship's forward direction**.

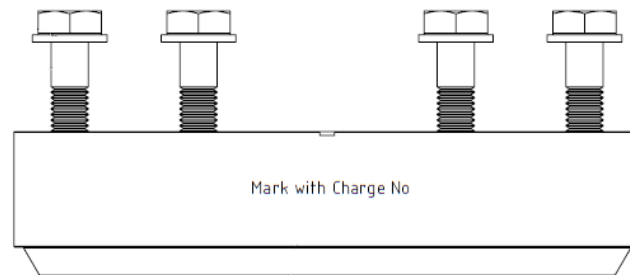


2.1 Parts

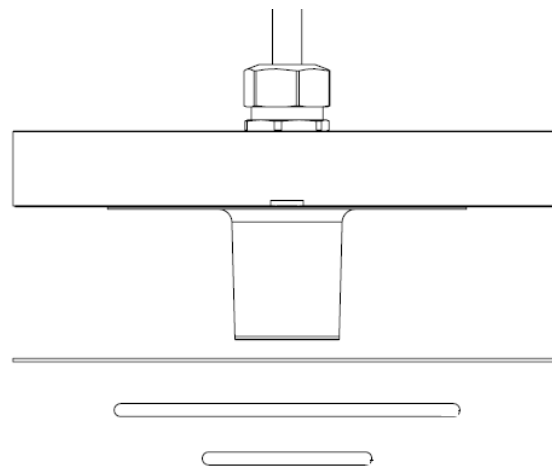
The components of the SAL R1a Easy Tank assembly are supplied in kit form for mounting in the ship. Before starting the work, check the contents of the kit against the packing list.

The contents can be divided into two groups as shown in figures below:

1. SAL R1a Easy Tank Flange with Screws and Washers for welding in the hull, steel version.



2. SAL R1 TRU Easy Tank (Transducer unit) with cable, O-Ring (s) and Gasket.



2.1.1 Note!

The surfaces of transducer must never be painted!

2.1.2 Wight Specifications

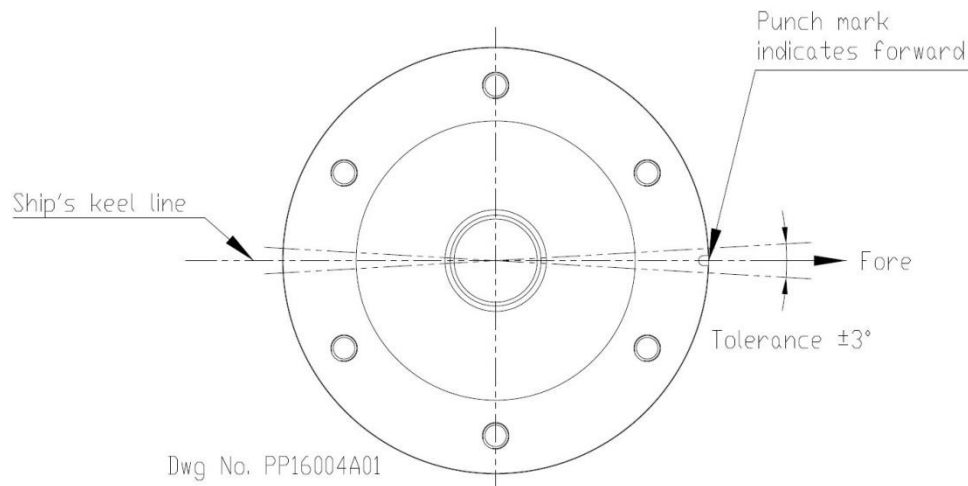
SAL R1 TRU Easy Tank 10m WTC	5.5 kg
SAL R1a Easy Tank Bottom Flange "Steel"	6.2 kg
SAL R1a Easy Tank Bottom Flange ALU 5083	2.1 kg

2.2 4. *Easy Tank mounting procedures*

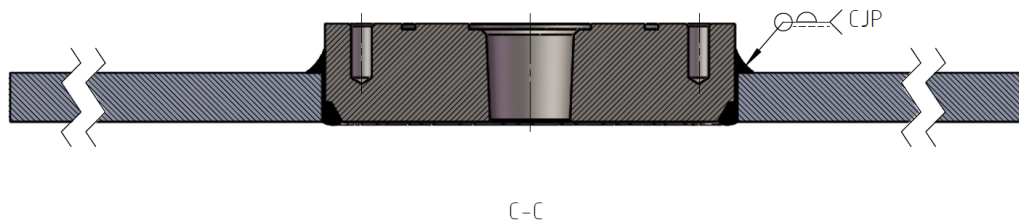
The Easy Tank bottom Flange must first be welded into a hole cut in the ship bottom. Cut a circular hole, diameter 170 mm (+10 / -0 mm) at the selected Easy Tank transducer position.

Note!

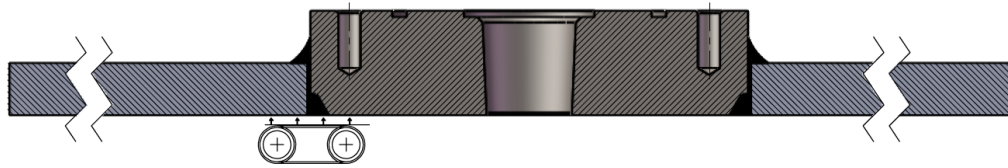
A licensed welder, approved by the appropriate classification society, should carry out the welding work.



- Red markings aiming strictly ($\pm 3^\circ$) forward.
- Ensure that the bottom flange is **flush** with the outside of the hull.



2.2.1 Welded joint grinding

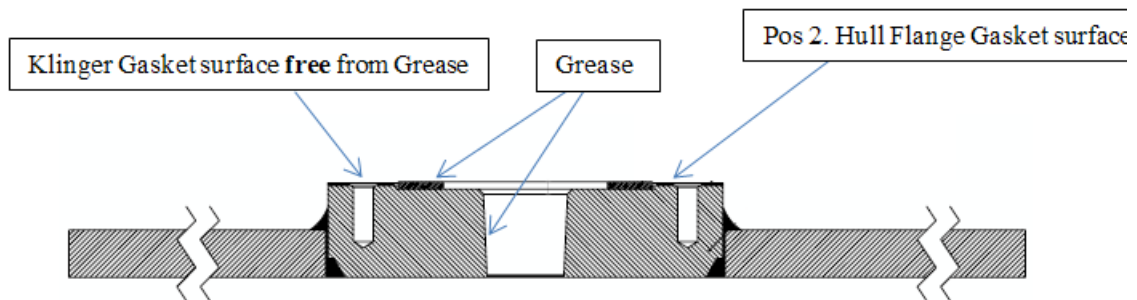


The welded joint must be ground smooth and flush with the hull. There must be no sharp edges that can cause turbulence in the water flow passing the SAL R1 Easy Tank transducer.

2.2.2 Preparation of flange

- Assure that the hull Flange (Position 2) is clean.
- Apply a thin layer of Silicone based grease on the O-Rings and the surfaces inside the outer Klinger Gasket. Keep the outer Klinger Gasket area on the flange free from any grease.

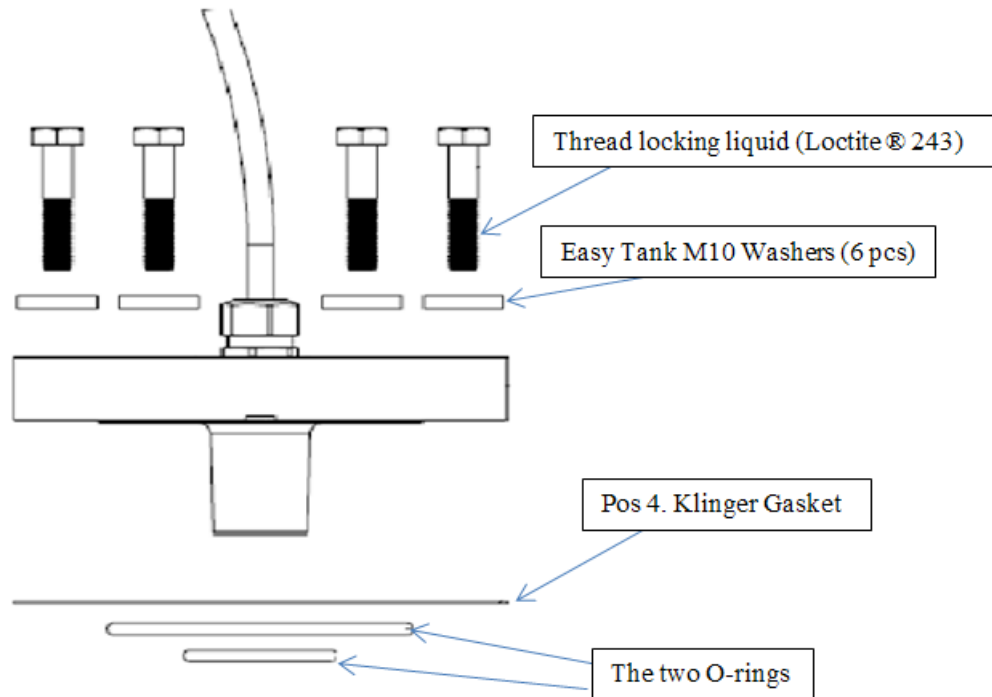
Note! Do not use grease containing any sulphur.



- Place the two O-Rings in the O-Ring slots
- Place the Klinger Gasket (Position 4) on the cleaned Flange surface.

2.2.3 Mounting Easy Tank TRU on Steel flange

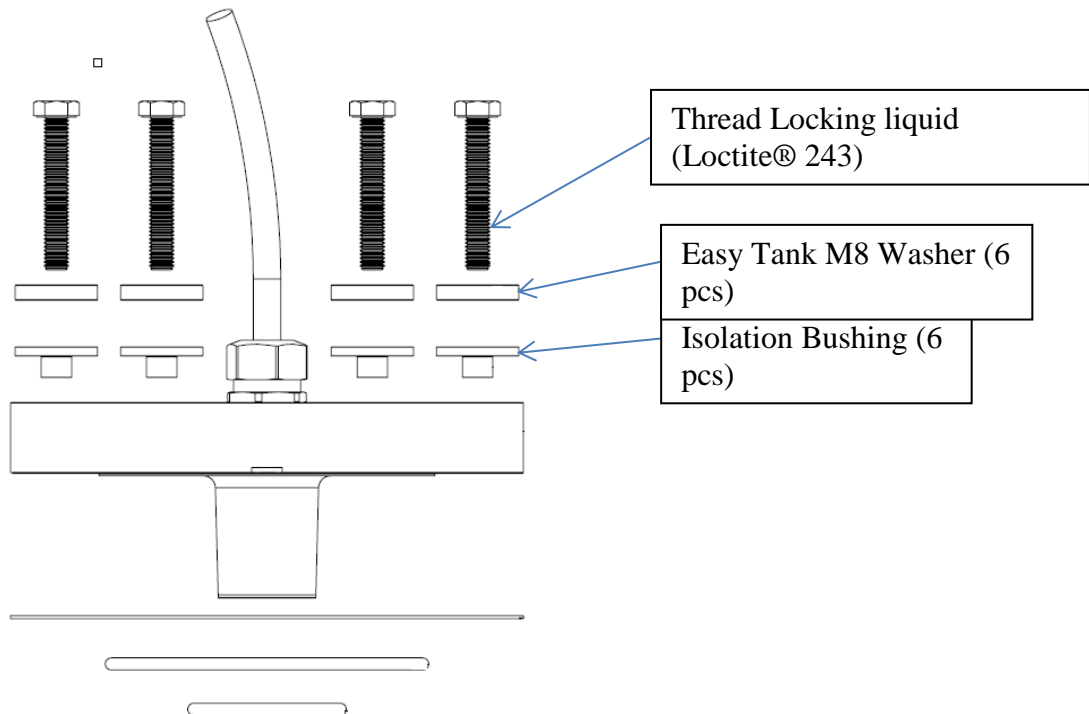
The SAL R1 TRU Easy Tank shall be mounted with the **Red and FWD markings** pointing in the ship's forward direction in line with Red markings on the bottom flange.



- Place the Washers onto the Screws and use universal thread locking liquid e.g. Loctite® 243 or equal on the Screw treads and mount the Washers and Screws.
- Adjust the angle aiming strictly ($\pm 3^\circ$) forward and tighten the six M10 screws.

2.2.4 Mounting Easy Tank TRU on Aluminium flange

The SAL R1 TRU Easy Tank shall be mounted with the **Red and FWD markings** pointing in the ship's forward direction in line with Red markings on the bottom flange.



- Place the Washers and Isolation Buchings onto the Screws and use universal thread locking liquid e.g. Loctite® 243 or equal on the Screw treads and mount the Washers and Screws.
- Adjust the angle aiming strictly (+/-3°) forward and tighten the six M8 screws.

2.2.5 General recommendations

Use universal thread locking liquid e.g. Loctite® 243, Loctite 2400® or equal, when mounting the screws into the flange.

Use Silicone grease when mounting the O-rings.

Recommended torque:

For Steel Flange	M10 Screws: 35 Nm.
For Aluminum Flange	M8 Screws: 25 Nm.

Do **not** overtightening the screws.

Note!

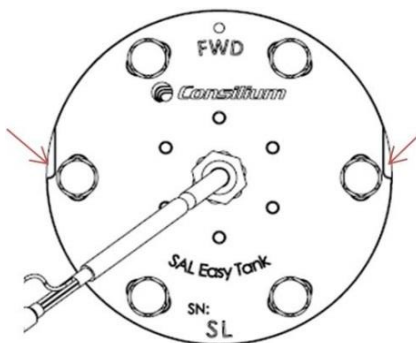
Bolt should be tightening in a cross-wise sequence.

2.2.6 FWD and RED marking pointing in ships forward direction



To be absolutely sure that the transducers are correctly seated and **FLUSH WITH THE HULL**, this must be **verified from outside the ship**. If necessary, this must be readjusted also after the above alignment procedure.

2.2.7 For adjusting to the alignment



For rotate the SAL R1 TRU Easy Tank you can use the two gouges "Red arrows" when the bolts are **not** tightened.

If the steel version of the SAL R1a Easy Tank is to be installed submerged it is recommended to protect the **side part of the flange with corrosion protective treatment, but never paint the top part who are made of bronze**.

Note! The aluminium version of Easy Tank shall **not** be installed submerged.

2.2.8 Running the Transducer unit (TRU) cable

After the TRU has been mechanically mounted, the cable should be securely fastened to the bulkhead all the way to the mounting place for the ELC. Leave a coil of sufficient length of TRU cable close to the TRU, to allow for retraction. The cable coil must be strapped and may not hang down and swing freely.

Note!

The TRU cable shall run directly to the ELC and **shall not be cut off, shortened, extended** or by any other mean pass a junction box. To make sure that the SAL R1a Easy Tank performance is not affected the cable shall not be laid close to other high

voltage cables (440 VAC or more) or other high power or high frequency cables (e.g. sonar, echo sounder, etc.).

Any excess cable length shall be coiled and strapped outside the ELC cabinet.

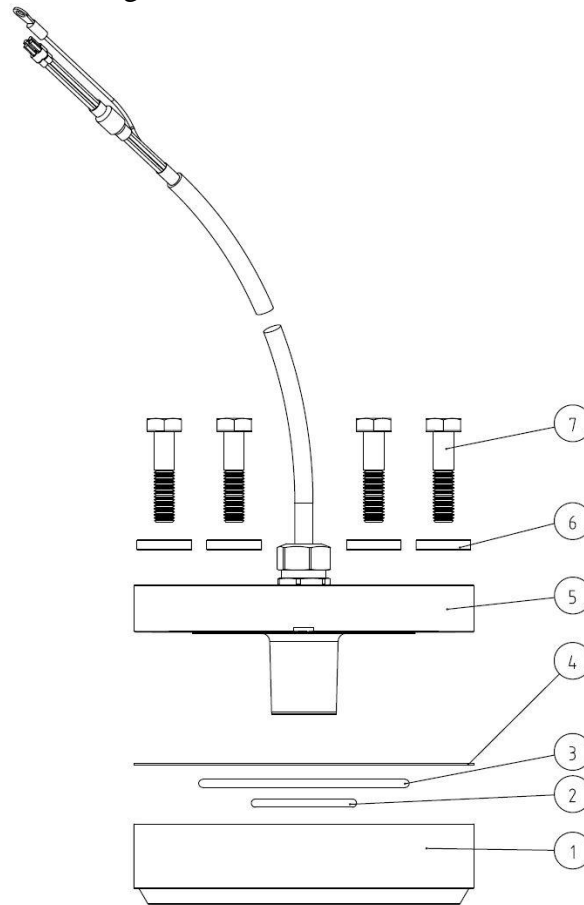
Do not store any excess cable length inside the ELC.

Any excess cable length inside will act as an antenna and may affect the electronics.

Note! The minimum coiling diameter 90 mm ” WTC cable”

2.2.9 SAL R1a Easy Tank / Part Numbers / Assembly Diagram

Version with Steel Flange

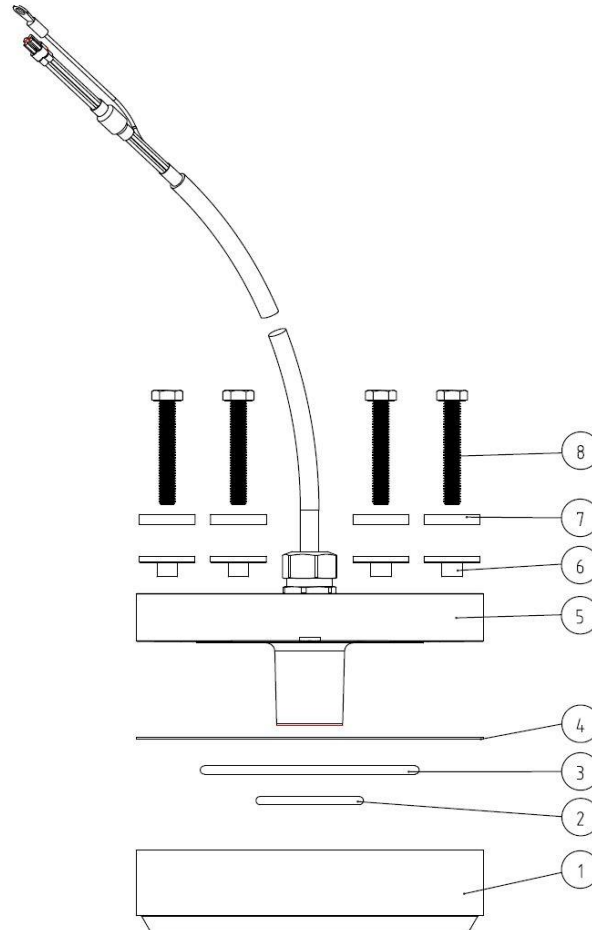


Drawing No: 5414109A01

Pos.	Qty.	Part no.	Description
1	1	5493382	R1a Easy Tank Flange “kit”
6	6	- 5493389	Easy Tank M10 Washer <i>Included in 5493382</i>
7	6	- 5494226	Screw M6S M10x45 SS <i>Included in 5493382</i>
5	1	5492300	SAL R1 TRU Easy Tank 10m
2	1	- 5493387	O-Ring 42x4 <i>Included in 5492300</i>
3	1	- 5493388	O-Ring 96x4 <i>Included in 5492300</i>
4	1	- 5493386	Easy Tank Klinger Gasket <i>Included in 5492300</i>

2.2.10 SAL R1a Easy Tank / Part Numbers / Assembly Diagram

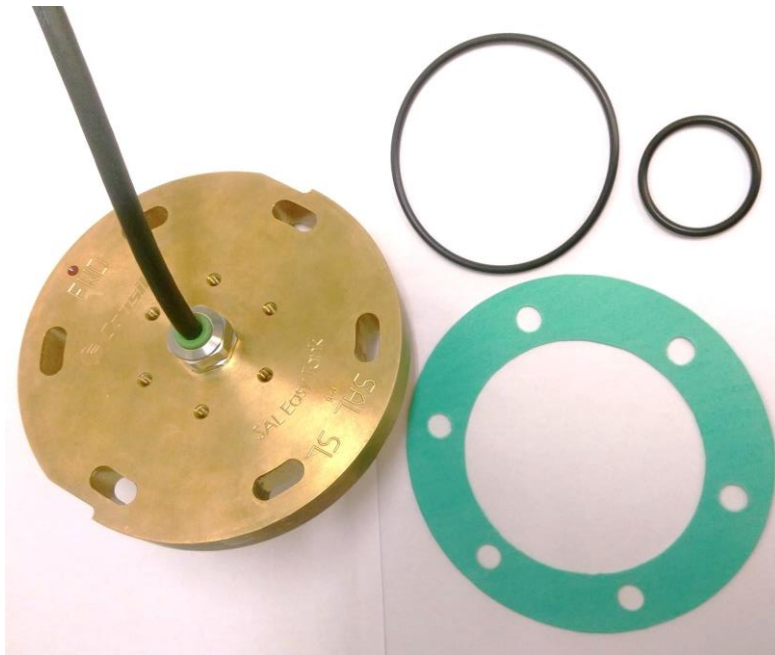
Version with Aluminium alloy Flange



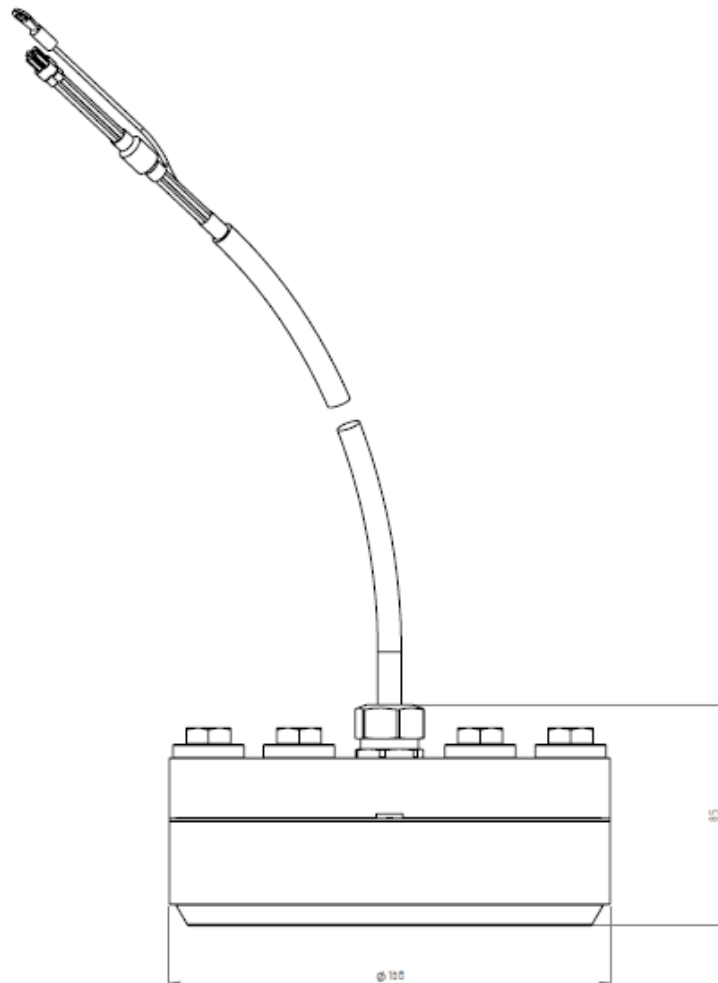
Drawing No: 5414113A01

Pos.	Qty.	Part no.	Description
1	1	5493384	R1a Easy Tank Flange "kit"
7	6	- 5494221	Easy Tank M8 Washer <i>Included in 5493384</i>
6	6	- 5494227	Aluminium Isolation Bushing <i>Included in 5493384</i>
8	6	- 5494222	Screw M6S M8x50 SS <i>Included in 5493384</i>
5	1	5492300	SAL R1 TRU Easy Tank 10m
2	1	- 5493387	O-Ring 42x4 <i>Included in 5492300</i>
3	1	- 5493388	O-Ring 96x4 <i>Included in 5492300</i>
4	1	- 5493386	Easy Tank Klinger Gasket <i>Included in 5492300</i>

Picture of **5492300 SAL R1 TRU Easy Tank** with included O-Rings and Gasket



2.2.11 SAL R1a Easy Tank / Main dimensions



2.3 6. *Maintenance*

2.3.1 Transducer replacement:

Parts below are needed whenever a TRU is replaced and/or partly used when maintenance/service work is carried out.

1 pcs	P/No: 5492300	SAL R1 Easy Tank TRU 10m WTC <i>Including O-rings and Klinger Gasket</i>
1 pcs	P/No: 5493383	Easy Tank Service kit, <i>that consist of O-Rings, Gasket and 6 pcs M10 screws/Washers for the steel version of SAL R1a Easy Tank</i>
	Alternative for Aluminum hull	
1 pcs	P/No: 5494228	Easy Tank Service kit ALU <i>that consist of O-Rings, Gasket and 6 pcs M8 screws, Washers, Isolation Bushing for the aluminium version of SAL R1a Easy Tank</i>

Note!

The SAL R1 Easy Tank Transducer is made with two gouges on each sides, to make it easier for removal of the transducer.

2.3.2 General dry-docking and maintenance routines:

At dry-docking it is recommended to inspect/clean the TRU surface.

Care and caution should be carefully considered in order to protect the TRU sensor surface during outside hull works, e.g. sand blasting, hull grinding, welding work, painting, etc., thus also any temporary protecting cover of the TRU should be properly removed/cleaned off before undocking as well as any marine growth should be carefully removed.

Use no sharp-edged metallic tools!

Wooden/Plastic or cloth/rag based tools are normally enough for marine growth removal.

Certain not too aggressive solvents may also be used with care.

Longer periods of slow steaming at low speed and/or extended periods of idling/berthing/anchoring (weeks/months), specifically in tropical waters, tend to result in rapid build-up of marine growth in the TRU vicinity as well as on the sensor surface, thus the TRU should be inspected/cleaning and/or diver assisted under hull cleaning.

Generally, also under normal sea-going operations, it is recommended to inspect the TRU as necessary each 3 to 6 months in order to prevent marine growth which may affect the speed log functionality and accuracy/reliability.

3 ELC, ELECTRONICS UNIT INSTALLATION

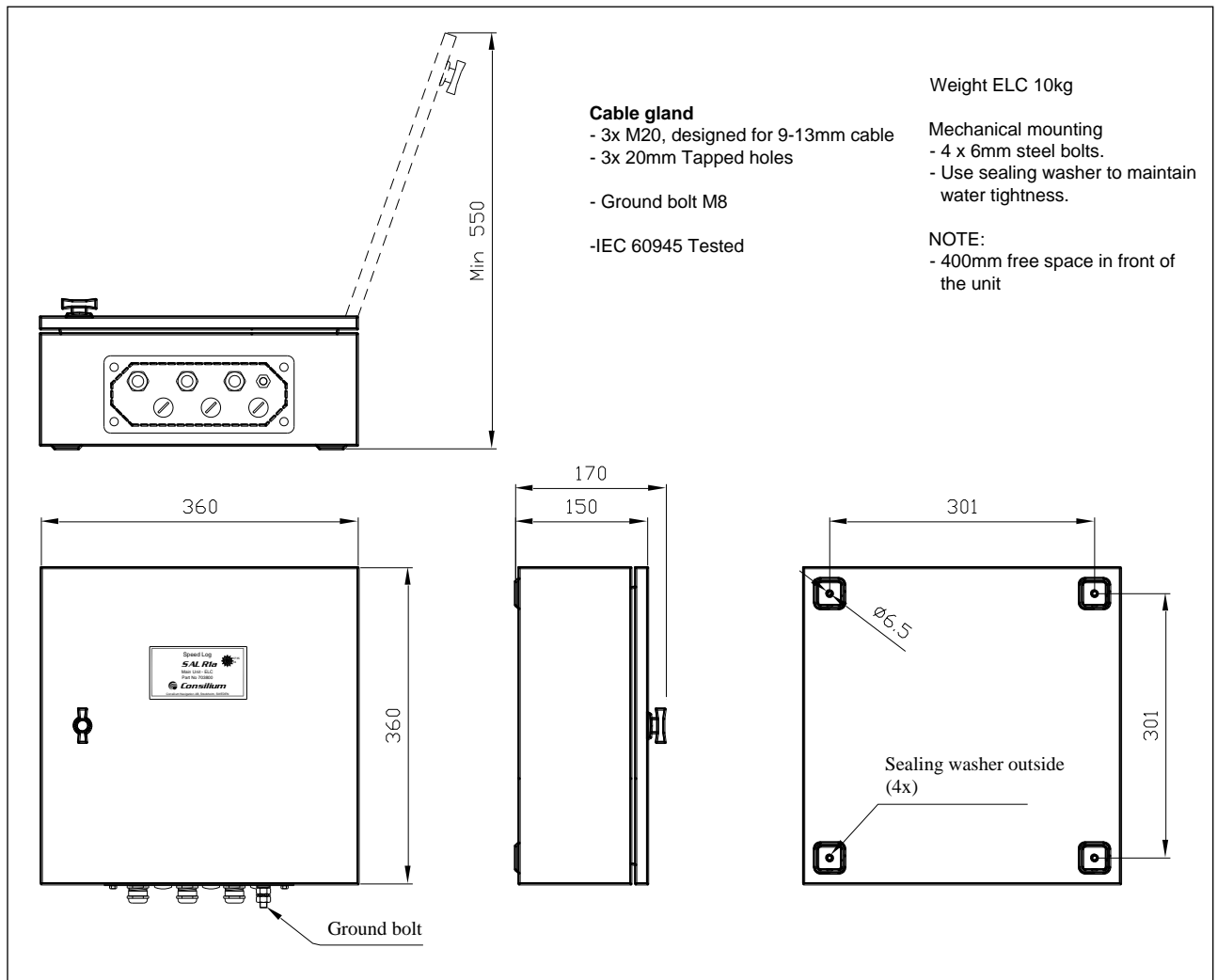
3.1 Mechanical installation

Selecting location

- It must be possible to lay the 10 m cable from the TRU in such a way that it can be dismantled in case of a TRU replacement.
Note: *The cable must not be cut or extended.*
- The location shall be easily accessible for installation and service. There must be minimum 350 mm free space in front of the unit for opening the door to access the electronics inside and there must be proper space for cables below the cabinet.
- The location shall be protected from weather and should offer a stable temperature not outside the range 0 - 40°C.
- The location shall not expose the ELC for excessive vibration levels.
- The location shall not be permanently exposed to water.
- The location shall not be under open floor plates (gratings) or grating ladders.
- The location shall be far from electrical installations giving excessive electric and/or magnetic fields, such as powerful electrical motors for ventilation, bow thrusters etc.
- There must be a flat surface for mounting and to hold the four mounting screws/bolts.

The overall dimensions and mounting details for the ELC are given in the figure below.

Dimensions:



4 pcs 6 mm steel screws shall be used for mounting. Use plastic sealing washers supplied to maintain water tightness.

3.2 Electrical Installation

Consider the ship's specific wiring diagram, depending on which units are included in the order that may be delivered with this manual.

Wiring principles:

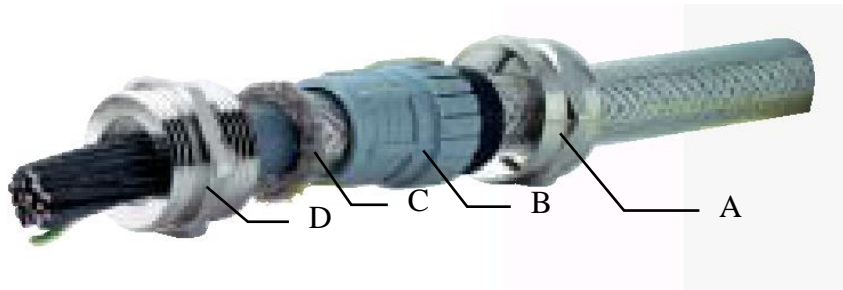
- The ELC shall be firmly grounded to the ship's metal hull structure.
- All wires shall be electrically shielded and all signal wiring shall be twisted pairs. The mains supply will require a separate cable.
- For transmission of IEC 61162-1 Ed. 4/NMEA 0183 Ver. 4.00, analogue or pulse signals, a cross-section of 0.5 mm² or more is required
- **All connections to the ELC shall be made with screened cables!**
- At least five connections shall always be used:

1. A solid connection shall be made between the ship's metal hull structure and the ground bolt at the bottom of the ELC cabinet. The cable area of this connection shall be at least 10 mm², preferably using copper braid.
 2. The AC power intake cable shall be brought to the 230 VAC terminals. Connect to L1, L2 and GND. If the ELC power supply is set for 115 VAC the same terminals may also be used for this voltage, see Mains Power options below.
 3. The TRU cable cores with terminal pins marked 1-2 and 4-5 shall be connected to terminal 1-2, 4-5.
Note! Leave the terminal number 3 open/not connected on the R1a ELC. Connect the ring cable shoe on the yellow-green ground core to the grounding bar at the bottom of the cabinet.
 4. Connect the TRU cable screen braid to the ELC cable gland as described below.
Note! *Do not cut or alter the cable properties. If the cable is cut or violated the warranty will not be valid.*
 5. The NMEA output cable and any other signal outputs should be brought through appropriate cable glands to other users. NMEA output is found on terminals 50 (A) and 51 (B). NMEA input is found on terminals 40 (A) and 41 (B). If an LPU2 (or other extension or distribution device) is used in the installation, the cable shields should be connected firmly there and not in the ELC. If cables are brought directly to users, displays, etc., grounding shall be done firmly in the ELC.
- All supplied cable glands are designed to terminate the cable screen braid directly to the ELC cabinet through the cable gland. This is a precaution to maintain proper EMC protection. If more cable glands than those supplied are needed, other EMC types maybe used.

Terminal	Signal name	Function
1	TRU ch1	Transducer connection
2	TRU ch1	Transducer connection
3	TRU gnd	Not to be connected
4	TRU ch2	Transducer connection
5	TRU ch2	Transducer connection
7	0VDC	Signal ground
8-9	200 p/NM relay1	Speed information (200 contact closures / NM)
10-11	200 p/NM relay2	Speed information (200 contact closures / NM)
18	Analog out	Speed information (0.1V / knots)
19	0VDC	Signal ground (for analog out)
24-25-26	LFA (NO-C-NC)	Log Fail Alarm
40	NMEA A in	NMEA in for Speed Log Master Display
41	NMEA B in	NMEA in for Speed Log Master Display
50	NMEA A out	NMEA out
51	NMEA B out	NMEA out
52	+ VDC for SD indicators	Power for SD4
53	0 VDC for SD indicators	Power for SD4
54	+12VDC in (optional supply)	Not to be connected
55	0VDC in (optional supply)	Not to be connected
L1	230/115VAC	Mains Power supply
L2	230/115VAC	Mains Power supply
GND	PE	Protective Earth/Ground

Table 2 Connections for R1a

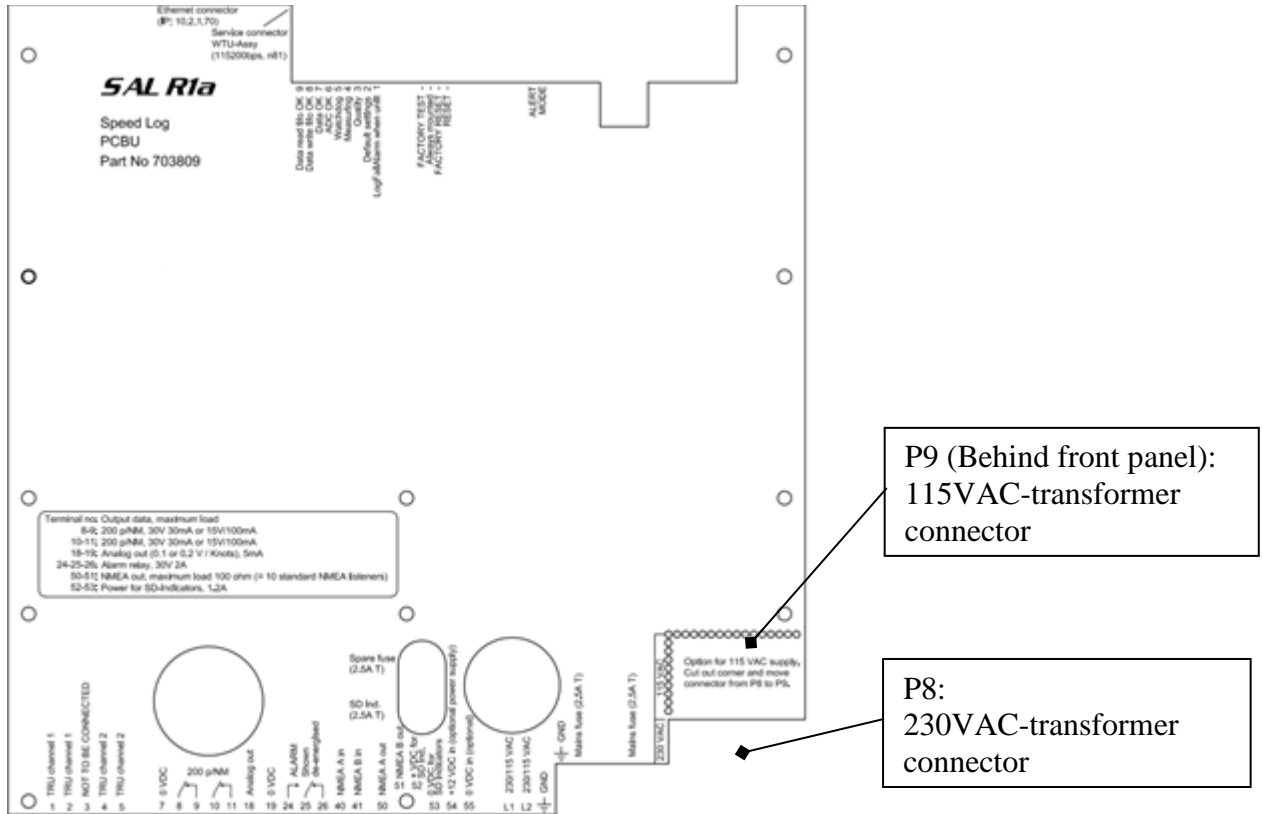
Correct mounting of EMC-type cable gland on TRU cable and on other cables:



1. Remove the protecting cover/strap on the cable, to expose and free the prepared screen braid for proper ground termination.
2. Push the parts “A” and “B” (with rubber packing) over the cable outer insulation sheath in the order shown.
3. “Push/Fold” down the screen braid “C” over the top of part “B”.
4. Push cable with “B” part firmly into the fixed part “D” of the cable gland ensuring that the screen braid makes contact inside “D”.
5. Firmly tighten cap nut “A”.

Mains Power options

At delivery the ELC is adapted to a nominal voltage of 230VAC. It is however possible to change the nominal voltage to 115VAC. When this is done precaution must be taken to prevent the ELC from being connected to 230VAC, as this would damage the unit.



To change to a nominal voltage of 115VAC, cut out the lower right corner of the front panel using a side cutter and move the transformer connector from position P8 to P9.

4 SET-UP GUIDE

The Set-Up procedure includes all steps after the mechanical and electrical installations have been performed and up to the calibration of the speed log. (For calibration details refer to User Guide.)

The Set-Up Guide is limited to short instructions and it is therefore recommended to use it as a check list. For errors or disruptions during the Set-Up procedure, please refer to Trouble-Shooting Guide and/or re-check installation details.

4.1 Pre-Set-Up procedure

This paragraph provides information concerning the preparative checks and procedures to be done as a completion of the electrical installation **before** supplying the ELC unit with power and **before** performing the system Set-Up procedure:

Note: Powering the Speed Log System is not included in the Pre-Set-Up procedure.

Each electrical installation needs to be completed by below Pre-Set-up procedure. Therefore it is recommended to double check the below points before connecting power to the unit:

- Clean out and remove any possible foreign particles and installation work residues from the cabinet(s).
- Carry out a visual inspection of the installed components and cables referring to the layout of the unit and to the interconnection drawings.
- Check that the connection terminals have a firm grip on the cable wires.
- Check that cable glands have a firm grip and tightened around the cables.
- Check that the Transducer/TRU cable screen braid is firmly grounded inside the cable gland of the Electronics unit/ELC.
- Check that the TRU cable is connected to intended terminals and that the yellow-green ground wire is connected to the ground bar.
- Any excess length of the TRU cable shall be neatly coiled and strapped near the ELC. NEVER CUT THE CABLE or alter/violate its properties!
- At the Sea Valve/TRU site the cable shall have a sling/coil allowing retraction of TRU for service/maintenance.
- Check for proper cable bends to assure not being stress bended.
- Check that ground connections to ship's hull are duly tightened.
- Before power-up carefully verify the Mains power voltage and the integrity of the fuses.
- Also verify that the transducer is correctly installed fully down in working position/seated and longitudinally aligned. Refer to TRU mounting procedures.

4.2 Set-up and testing

See section 2, Setting-up guide.

5 SD4-3 DISPLAY INSTALLATION

5.1 Mechanical installation

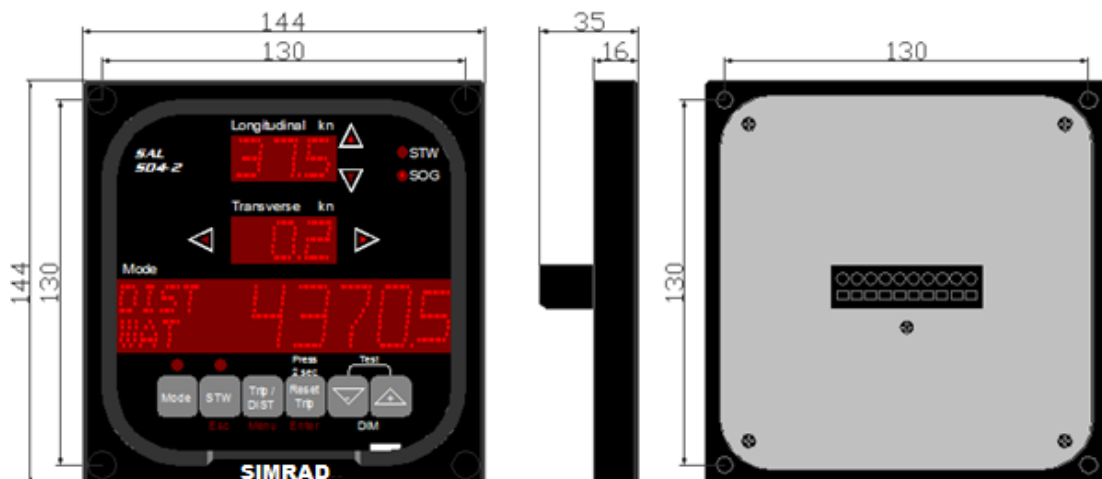
The display can be mounted on any flat panel or surface. The four mounting holes enable mounting of the display with four supplied M5 screws from the front using supplied M5 nuts on the backside or alternatively M5 threaded holes in the panel. A panel cut-out, shown below, must be made for the 10-pole cable connector.

The SD4 unit itself is watertight when mounted into and sealed with the supplied gasket, and the Teflon washers for the screw caps, against a flat panel/console with dry internal atmosphere.

Alternative mounting accessories:

- SD4 BMB Bulkhead Mounting Box for bulkhead surface installation.

The overall dimensions and mounting details for the SD4 display are given in the figure below:



The picture shows an SD4-2, but the dimensions for the SD4-3 are the same.

5.2 Electrical Installation

Consider the ship's specific wiring diagram, depending on which units are included in the complete scope of supply.

List of connections

The list of terminal Nos. and connections is labelled on backside of the unit.

Term#	
1	NMEA A in
2	NMEA B in
3	NMEA A out
4	NMEA B out
5	Pulse output (Menu setting: LP6)
6	
7	Ext Dim –
8	Ext Dim +
9	0 VDC
10	10 - 32 VDC (12 or 24 VDC nominal)

A ground screw is located below the detachable connector on the backside of the SD4. Connect a grounding wire from this screw to ship's ground.

Before powering the display:

- Carry out a visual inspection of the installed cables referring to the layouts of the unit and to the interconnection drawings.
- Check that cable terminations have a firm grip of the cable wires.

5.3 Speed Log Master Display

To remotely control the Menu system in speed logs and possible other equipment in the speed log system one SD4 display positioned on the bridge is used as a remote control. This SD4 display is named **Speed Log Master Display** and has to be marked in such a way that it is clearly distinguishable from all other displays connected to the log system.

The **Speed Log Master Display** can also be used to remotely control the dimming function in other SD4 displays connected to the system. In installations where more than one SD4 display are connected as **Speed Log Master Display**, those additional displays are primarily connected with remote control functionality to be able to control the dimming function in other SD4 displays but can also be used to control the Menu system in speed logs and other equipment. Those additional remote displays do not have to be labelled but the remote control function shall be clearly indicated in installation drawings and other documentation.

5.3.1 Positioning of the Speed Log Master Display

The **Speed Log Master Display** is preferably positioned on the bridge where it can be accessed without interfering with the normal operation of the ship, for example at the chart table.

5.3.2 Electrical connection

The **Speed Log Master Display** is connected with two-way communication to the Speed Log system. This means that it has to be connected with one pair of wires sending data to the display and one pair of wires sending data back to the Speed Log system. Other displays without remote control functionality only have one pair of wires sending data to the display.

Speed Log Master Display:

4 wires for the serial communication

2 wires for DC power supply

Other slave displays:

2 wires for the serial communication

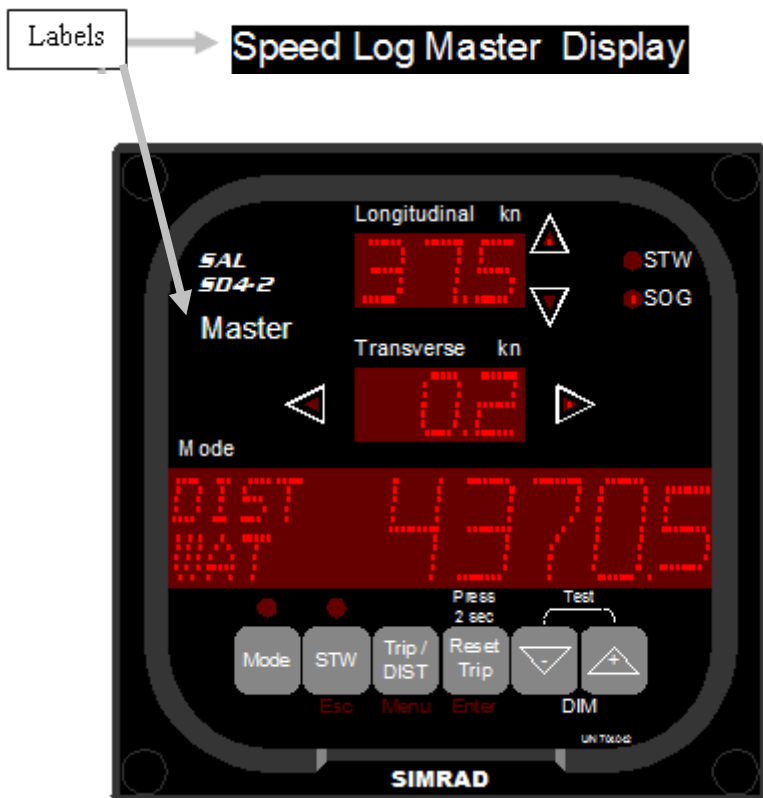
2 wires for DC power supply

5.3.3 Positioning of the labels

In every shipment of a SAL speed log a set of two labels are included inside the Speed Log Main Unit – ELC. The installation company shall place these labels on and/or adjacent to the dedicated **Speed Log Master Display**.

One label, with the text "**Master**", is intended for placing on the front foil surface of the display.

The other label, with the text "**Speed Log Master Display**", is intended for placing on the bridge console surface adjacent to or on the frame of the display itself.



The picture shows an SD4-2, but labelling should be the same for the SD4-3.

For set-up of desired local properties as well as intended functions, depending on actual optional equipment and/or accessories installed, the below table and “Menu mode” description provide adequate information.

5.4 Menu Mode

The Mode window of the SD4-3 Display can also be set to Menu mode. The Menu mode is used for internal settings of the display and when SD4-3 is used as a remote display for other units e.g. the R1a/WTU menu structure or for remotely dimming of other SD-displays.

The Menu mode is reached by pressing the Mode button for minimum 5 sec. The Mode window will switch to show the text "PRESS ENTER FOR MENU". Then press the Enter button (Reset Trip) within 5 seconds. The Mode window will now show the current menu and the upper window will maintain the speed presentation sent out from the WTU.

Three buttons under the Mode window have now changed to alternative functions. These are lit in red text below relevant button. From left to right the buttons now have the following functions:

Mode: Will inform which remote device that is connected.

Esc: "Blank". When in "Remote Device menu" Esc is used to leave the "Remote Device menu" (i.e. the WTU menu). When not in "Remote Device menu" Esc has the same function as Menu and Enter pressed simultaneously (see Menu-button below).

Menu: "Trip/DIST". Is used alone, or together with Arrow down (-), or together with Enter, to move/navigate in the menus as described below.
Menu alone, will display next menu, i.e. step forward on same menu level.
Menu and Arrow down (-) pressed simultaneously will display previous menu, i.e. step backwards on same menu level.
Menu and Enter pressed simultaneously will move up one menu level, except when leaving the "Remote Device menu". For this instead use Esc.

Enter: "Reset Trip" is used to save changed values/settings or to move to sub-menus.



"Arrow down" and "Arrow up" are used to change status, e.g. Write Access OFF/ON, and /or to change set values.

Note: When being in the Menu System and no button is pressed for 3 minutes, the Mode window will return to previous information displayed before the Menu System was entered.

5.5 SD4-3 in Menu Mode

The Menu mode has three “Local Menus” and one “Remote Device menu” on the first set-up level:

- SD4-3 LOCAL. This is the start menu when entering the Menu mode. If one or more other displays are remotely dimmed from the display, this menu shows a second text line and can easily be used to turn the remote dimming function ON/OFF.
- LP0 PROPERTIES. This menu contains sub-menus for local setting-up of the display.
NB! Do not change to Write Access ON without special training.
- LS0 REMOTE SETUP. This menu contains sub-menus for setting-up when the display is used as a Speed Log Master Display.
NB! Do not change to Write Access ON without special training.
- R0 REMOTE DEV. On a designated Speed Log Master Display this menu provides access to a Remote Device, e.g. SAL R1a/ WTU menu structure.
NB! Verify the setting in menu LS7, normally ON is default.

5.6 Write and read only access

Default for sub-menus when entering the menu system is read only access, i.e. the Mode window shows WRITE ACCESS OFF.

When changing to Write Access ON (“+” and confirmed by Enter) then sub-menus are accessible for changes. Be careful to change intended parameters only. When leaving sub-menus the write access is automatically set to OFF.

5.7 Menu functions

The complete list for fast indexing of the Menu System, available for the daily user, is included below under headline “Menu function summary”.

A Menu Structure chart for the SD4-3/WTU is found under Section E Appendix.

Special menus for testing can be found under Trouble-shooting.

5.8 Standby STW

This function can be used to temporarily deactivate the STW speed log. When using the standby function the SD4 has to be connected with two-way NMEA communication to the Speed Log system such as the **Speed Log Master Display**.

Set the local menu LP2.23, STANDBY STW, to ON.

WARNING! The standby mode is not valid/intended for normal operation. The standby mode must only be used for special purposes and under special circumstances to avoid or limit interfering and repeated alarm conditions from user systems disturbing bridge personnel.

Procedure for the user:

Press Mode to toggle the Mode window to show:

```
STW ACTIVE
[-+] FOR STANDBY
```

Press and release both DIM buttons, (- and +) simultaneously to deactivate the STW Speed Log.

When deactivated the Mode window will show:

```
STW DEACTIVATED
ANY KEY TO START
```

To start/activate the STW Speed Log, press **any** key.

If the SD4 Mode window shows:

```
STW UNIT STANDBY
NOT POSSIBLE
```

the SD4 did not establish contact with the STW Speed Log due to older software in the WTU and/or that the SD4 is not connected with two-way NMEA communication to the SAL Speed Log system.

5.9 Menu function summary

Note! Only the most commonly used menus for a SAL R1a are listed below.

Menu no.	Menu name	Default setting		Function
		SD4-3	SD4-4	
BASIC MENU	SD4- LOCAL			
LP0	PROPERTIES			Select properties menu
LP1	SD4 TYPE SD4- [X]	3	4	X = defines type of display, e.g. SD4-1..SD4-4 (factory setting)
LP2	MODE WINDOW			Lists user selected information to be shown in the MODE window ON = shown OFF = not shown
LP2.01	DIST WATER	ON	OFF	Total distance counter of STW (resulting)
LP2.04	TRIP WATER	ON	OFF	Trip distance counter of STW (resulting)
LP2.09	DIST+TRP WAT	OFF	OFF	DIST WAT and TRIP WAT are displayed simultaneously
LP2.15	SPEED STW-L	OFF	ON	STW longitudinal
LP2.21	ALERT	ON	OFF	Display Alert messages (PSALW..)
LP2.23	STANDBY STW	OFF	OFF	Deactivates valid STW NMEA to invalid STW NMEA
LP3	STARTUP DIM [50%]	50%	50%	Default brightness after a reset.
LP4	NEG SPD USE [OFF]	OFF	OFF	Longitudinal distance counters and pulse output off at negative/astern speed.
LP5	LP5 EXT INPUT [DIM]	DIM	DIM	Sets functions of external inputs: DIM or SDR2
LP6	LP6 EXT OUTPUT [200 P/NM STW-L]	STW-L	STW-L	200 P/NM STW-L 200 P/NM SOG-L Enables function of external output.
LP7	NMEA GATE THROUGH [OFF]	OFF	OFF	CAUTION! Always OFF when connected back to the Speed Log system. (Only used if more displays are connected in series)
LP8	NMEABAUDRATE [4800]	4800	4800	4800/(38400 not to be used!) CAUTION. Do not change!
LP9	SW REVISION 704021xx			xx = current Software revision.

Menu no.	Menu name	Default setting		Function
LPB	SPEED VALUES 2 DECIMALS [OFF]	OFF	OFF	Displays speed values with two decimals, when enough space
LPD	RESET TOTAL			
LPD.01	RESET TOT CONFIRM [NO]	NO	NO	YES = resets internal total distance counter(s) of the SD4 to zero.
LPE	SET DEFAULT MENU PARAMETERS			
LPE.01	RESET MEN CONFIRM [NO]	NO	NO	YES = resets all menu parameters in the SD4 to default values. (Depending on type of SD4)
LS0	REMOTE SETUP			Select Remote setup menu
LS1	SD4 ID [4]	4	4	ID number between 0-26. Other SD4 displays that have entered this ID in menu LS3 can remotely DIM this display.
LS2	DIM OFFSET [0 %]	0	0	Offset from remote DIM command
LS3	REMOTE DIM ID			SD4 displays that have corresponding ID numbers will be remotely dimmed from this SD4. Maximum 4 IDs can be entered.
LS3.01	REMOTE DIM ID []			The first SD4 ID to be entered.
LS3.02	REMOTE DIM ID []			The second SD4 ID to be entered.
LS3.03	REMOTE DIM ID []			The third SD4 ID to be entered.
LS3.04	REMOTE DIM ID []			The fourth SD4 ID to be entered.
LS4	HEARTBEAT TIMEOUT [30]S	30	30	Time between heartbeats are sent to the remote device.
LS5	MENU ACKN. TIMEOUT [X]S	2	3	Maximum time for acknowledge signal from the remote device.
LS6	SD2 REMOTE DIM [OFF]	OFF	OFF	On = makes it possible to remotely DIM old SD1/SD2 displays.
LS7	R0 REMOTE ENABLED [ON]	ON	ON	Enables menu R0 to allow remote connection to other device(s). OFF = disables menu R0.

Menu no.	Menu name	Default setting		Function
R0	REMOTE DEV CONNECT			Access to menu system in remote device(s). (LS7 defines if this menu shall be enabled)
R1	DEVICE 1 OF X <NAME> (<ID>)			X: number of available remote device(s). NAME: name of the remote device. ID: remote device identity.
R2	DEVICE 2 OF X <NAME> (<ID>)			X: number of available remote device(s). NAME: name of the remote device. ID: remote device identity.
R3	..., etc.			There will be as many R menus as there are remote devices connected and identified.