SIMRAD

PRO SERIES

SA70 AIS SART

User Guide

ENGLISH

Preface

As Navico is continuously improving this product, we retain theright to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your nearest distributor if you require any further assistance.

It is the owner's sole responsibility to install and use the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

NAVICO HOLDING AS AND ITS SUBSIDIARIES, BRANCHES AND AFFILIATES DISCLAIM ALL LIABILITY FOR ANY USE OF THIS PRODUCT IN A WAY THAT MAY CAUSE ACCIDENTS, DAMAGE OR THAT MAY VIOLATE THE LAW.

Governing Language: This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

The chapter covering battery replacement is added for information only. Simrad does not take any responsibility for improper disassembling/assembling of the beacon. We strongly recommend all service to be done by authorized Simrad agents. In addition to normal service, Simrad agents have the necessary equipment and knowledge to test the operational functions of the beacon. Non-original mainte-nance and/or service parts may destroy the equipment function and performance.

Copyright

Warranty

The warranty card is supplied as a separate document.
In case of any queries, refer to the brand web site of your display or system: pro.simrad-yachting.com, www.simrad-yachting.com

Battery Safety Data Sheet

(Form: EEC directive 91/155)

(2) Safety Advice

S2	Keep out of reach of children.
S8	Keep container dry.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S43	In case of fire, use D type extinguishers. Never use water.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

(3) First Aid Measures

In case of contact of cell contents with eyes, flush immediately with water for 15 min. With skin, wash with plenty of water and take off contaminated clothes. If inhaled, remove from exposure, give oxygen, and seek medical advice.

(4) Fire-Fighting Measures

Extinguishing media

Suitable:	Type D fire extinguishers
Not to be used:	Water - CO2 - Halon, dry chemical or foam extinguishers

Special exposure hazards

Generation of chlorine, sulphur dioxide, disulphur dichloride during thermal decomposition.

Special protective equipment

Use protective working boots, rubber apron and safety glasses with side shields.

Contents

1 GMDSS Requirements

Simrad GMDSS products are manufactured and approved to be compliant with relevant IMO/ SOLAS (Safety of Life at Sea) Regulations and requirements.

The SOLAS GMDSS regulations are structured such that all GMDSS ships are required to carry a minimum set of equipment, with (basically) more equipment being required the further the ship travels from land.

GMDSS requirement for SART (Search and Rescue Locating Device) according to SOLAS :

Chapter III, Regulation 6
2.2 Search and rescue locating devices

At least one search and rescue locating device shall be carried on each side of every passenger ship and of every cargo ship of 500 gross tonnage and upwards. At least one search and rescue locating device shall be carried on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage. Such search and rescue locating devices shall conform to the applicable performance standards not inferior to those adopted by the Organization*. The search and rescue locating devices** shall be stowed in such location that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 31.1.4. Alternatively one search and rescue locating device shall be stowed in each survival craft other than those required by regulation 31.1.4. On ships carrying at least two search and rescue locating devices and equipped with free-fall lifeboats one of the search and rescue locating devices shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilized on board and ready for transfer to any of the other survival craft.

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* Refer to the Recommendation on performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution MSC.247(83) (A.802(19)), as amended) and the Recommendation on performance standards for survival craft AIS Search and Rescue transmitter (AIS SART), adopted by the Organization by resolution MSC.246(83).

** One of these search and rescue locating devices may be the search and rescue locating device required by regulation IV/7.1.3.

Regulation 26
- Additional requirements for ro-ro passenger ships 2 Liferafts

2.5 Liferafts carried on ro-ro passenger ships shall be fitted with a search and rescue locating device in the ratio of one search and rescue locating device for every four liferafts. The search and rescue locating device shall be mounted inside the liferaft so its antenna is more than one metre above the sea level when the liferaft is deployed, except that for canopied reversible liferafts the search and rescue locating device shall be so arranged as to be readily accessed and erected by survivors. Each search and rescue locating device shall be arranged to be manually erected when the liferaft is deployed. Containers of liferafts fitted with search and rescue locating devices shall be clearly marked."

Chapter IV, Regulation 7- Radio Equipment- General

Every ship shall be provided with:

- .3 A search and rescue locating device capable of operating either in the 9 GHz band or on frequencies dedicated for AIS, which:
    - o .3.1 shall be so stowed that it can be easily utilized; and
    - o .3.2 may be one of those required by reg. III/6.2.2 for a survival craft

SA70 AIS SART is also compliant with relevant sections in these regulations/requirements:

- ¨European Marine Equipment Directive (MED) 96/98/EC as amended latest by 2011/75/EU (Annex A.1/4.55)
- SOLAS 74 as amended, Regulations: III/4, III/6, IV/7 , IV/14
- IMO Res. MSC.246 (83), MSC.247(83), MSC.256(84)
- ITU-R M. 1371-4 (2010)
- IEC 61097-14:2010, IEC 60945:2002 and IEC 60945 Corr.1 :2008, IEC 61108-1 Ed.2.0, 2003
- Other national certifications/requirements

General Description

SA70 AIS SART is a battery powered AIS emergency transmitter in a sealed waterproof enclosure consisting of:

- SA70 AIS SART unit
- Mounting rope for life rafts / life boats.

The SA70 AIS SART is developed by Simrad to meet the rules and regulations for use on vessels and life rafts in the maritime service.

SA70 AIS SART meets the specifications for use in search and rescue operations at sea.

The operating range of the SA70 AIS SART is 7 -10 nautical miles from vessel AIS Class-A, and more than 40 nautical miles from an airborne AIS receiver.

SA70 AIS SART is buoyant, however to obtain maximum performance, the unit should be placed in a vertical position and as high up as possible in order to achieve maximum coverage.

Several mounting brackets and mounting aids are available to ensure correct mounting and use of the radar unit.

The purpose of the SA70 AIS SART is to perform a secondary alarm when search and rescue units are searching for a life raft / lifeboat in distress. The SA70 AIS SART includes a built-in GPS, which will help the units to pinpoint exactly where the distressed boat is located in a larger area. This is done with the help of the AIS on the searching ship or helicopter. When started, the SA70 AIS SART sends its position data in an ordinary AIS message.

In addition the SA70 AIS SART sends a safety text message every forth minute, containing text: "AIS SART". This will be received by other AIS systems within the range.

The batteries of the SA70 AIS SART will last at least 96 hours when activated.

To save battery capacity in case of a situation where the unit is needed, the use should be limited to tests and emergency situations.

SA70 AIS SART Features

Watertight:
SA70 AIS SART is watertight to a depth of minimum 1 meter.

Buoyant:
SA70 AIS SART is buoyant in case the unit is accidentally dropped into the water. To increase coverage the SA70 AIS SART should always be held or mounted as high as possible.

Rugged design:
The SA70 AIS SART will withstand a drop from 20 meters into the water. It is resistant to seawater, oil and sunlight.

Handling:

SA70 AIS SART is designed for easy operation, with a brief operating instruction printed on the unit. It comes standard with a 10 meter rope and a shackle hook to be used for hanging the SA70 AIS SART on the inside of a life raft.

Indicators:

SA70 AIS SART is equipped with two colored LEDs, one green and one red. The LEDs will give visual status of operation and faults. In addition a built in buzzer beeps regularly to indicate operation.

FUNCTION	INDICATOR	BUZZER
GPS position fix OK	Green LED ON (15 sec)	15 sec beep
Searching for GPS fix	Red and Green LED flashes	Regularly beep
No GPS fix, count number of flashes	Red LED ON (15 sec)	15 sec beep beep

Battery Module

The Battery Module comprises of two C-size Lithium batteries, a battery housing, a connector and cables. The battery module is to be replaced every 5th year. A battery expiry label on the SA70 AIS SART housing displays the expiry date.

Only original Simrad batteries, partno 000-10733-001, are allowed to be used with this product

A new battery comes complete with cable and connector.

2 Functional Description

General

SA70 AIS SART consists of a housing sealed at the lower end with a bottom lid and may be split into the following main parts:

1 Bottom lid
2 Housing with SA70 AIS SART electronic assembly and battery module. The housing is made of polycarbonate
3 Base of antenna

See "Drawings" on page 24 onwards.

Transmitter Module

SA70 AIS SART transmitter module is inserted into the SA70 AIS SART housing.

It consists of the main board, antenna and two screen boxes which is mounted in the housing. It can be divided into the following sections:

1 Transmitter module
2 Antenna
3 Screen Boxes
4 Base of antenna

See illustrations in "Transmitter Module" on page 24 .

Battery Module

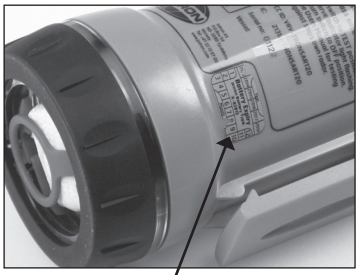
See "Replacing The Battery Module" on page 20.

The battery module is inserted into the SA70 AIS SART housing.

A battery expiry label on the SA70 AIS SART housing displays the battery expiry date.

A new battery module comes complete with cable and connector and can be changed by opening the bottom lid at of the SA70 AIS SART.

See illustrations in "Battery Module" on page 24 .



Battery expiry label

Bottom Lid

The Bottom lid includes four items:

1 The winder hook
2 The screw ring
3 The light tower
4 The O-ring

See illustrations in "Bottom Lid" on page 9.

3 Installation

SA70 AIS SART can be mounted several ways, near the vessels emergency exit, normally in the wheelhouse at the starboard or port exit (or both, depending of requirements) and inside liferaft or lifeboat. (See "GMDSS Requirements" on page 4.

If the SA70 AIS SART is used in an emergency, it should mounted as high as possible to increase line of sight to the search and rescue units. Since the SA70 AIS SART have integrated GPS receiver, it need clear view to the sky to obtain GPS position. Metal objects close to the transponder should be avoided, these will limit the performance in the directions they are located.

Brackets

There are two different mounting brackets available.

- Wall bracket
- Lifeboat bracket
- Pole bracket

Wall Bracket

A wall bracket is delivered with the SA70 AIS SART and should be used for storage of the unit. The bracket should preferably be mounted in a vertical position and in a place where the SA70 AIS SART is easily available in case of an emergency.

See illustrations in "Wall Bracket" on page 25.

The bracket should be mounted with four screws (Ø 4 mm).

Lifeboat Bracket

The outdoor lifeboat bracket should be mounted vertically on the roof of the lifeboat (as high as possible).

Activate the unit and put it into the bracket. Secure the transponder to the bracket. The bracket will fit a pipe with a maximum diameter of 50mm.

Item nr.	Title
1	Wall bracket
2	M-84163_Bracket_ Universal_Weldament D 1
3	Nut nylock M4 DIN 985
4	Screw, DIN 965 – Pozidrive M4x12
5	Screw, DIN 965 – Pozidrive M6x70
6	Screw, DIN 965 – Pozidrive M6x90
7	Pipe Clamp
13	Washer plate
14	Nu nylock M6 DIN 985
15	Washer, DIN9021 Ø6mm

See illustrations in "Life Boat Bracket" on page 26.

Installation Tips

How To Use The Bracket In Life Rafts

See illustrations in "How To Use The Bracket In Life Rafts" on page 27.

Mounting To A Pipe

See illustration in "Mounting To A Pipe" on page 28.

Using The Telescopic Pole

A telescopic pole can be used to extend the height of the SA70 AIS SART, inside or outside the life raft/boat. Simply extend the attached pole to the full length (app. 1,2m from the top of the SA70 AIS SART). Make sure that the rod is locked by pulling hard when it is fully extended. The rod can now be fastened or held by a person. Ensure the rod is held as vertical as possible when activating the SA70 AIS SART.

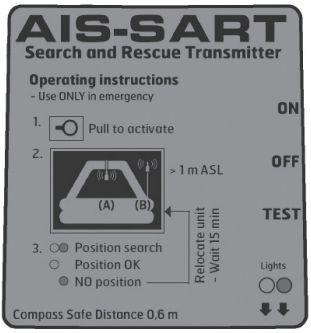
Using The 10 meter Rope

The 10 meter rope is meant to hang the SA70 AIS SART inside a life raft. Any objects that the rope can be attached to can be used. As long as the SA70 AIS SART is kept away from any metal objects, the performance will not be notable degraded because of the canvas of the life raft.

See "Using The 10 m Rope" on page 30.

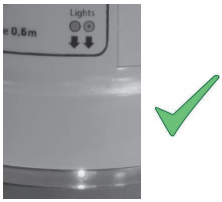
4 Operating Instructions

Activation

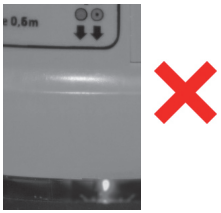


1. Break seal at switch
2. Pull "Activation ring" to activate (see label) and make sure that the switch enters the "ON" position. The indicator LEDs will start to flash and an audible "BEEP" will be heard regulary.

3. After lifeboat/liferaft is launched, remove SA70 AIS SART from bracket and mount it: using one of the mounting options described in "Installation" on page 10 onwards
With a clear view to the sky to maximize GPS location (Inside inflatable liferaft is also OK)



4. SA70 AIS SART will flash both LEDs (Green + Red) while it is searching for GPS position fix (max 15 minutes)
5. A BEEP will be heard every time a transmission is made (once a minute)



6. A successful GPS fix is indicated by Green LED flash
7. If no GPS fix is obtained, this is indicated with RED LED flash. Please relocate the unit and restart SA70 AIS SART.

If the Green LED is flashing as indicated in (6.) the AIS -SART will update its GPS position every minute and transmit it's new position to nearby ships (or rescue aircrafts).

Reception On Nearby Vessels Ais Transponders And Ecs/ Ecdis Or Chart Plotters

Today, most AIS transponders installed are not compliant with SA70 AIS SART, but will still receive them as another ship, both with ID code, Position, Range, Bearing, and Text message

Reception On A Non SA70 AIS SART Compliant Ais Transponder

- will be shown as a ship without name, with MMSI (here "ID code"), range, bearing and position:

```
                                1/2
  RNG    BRG   Name
> 0.01   222
  15     150   Havhesten
```

```
                                1/14
> MMSI: 970010001
  Call: ---
  ETA: --/-- 00:00n
```

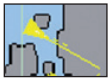
- Some AIS transponders will show MMSI (here "ID code") when no vessel name is received

- In addition, a text message will be received:

```
  Menu Message                  1/2
> 97001001:SART ACTIVE
```

Reception An A Non SA70 AIS SART Compliant Electronic Chart (Ecs/Ecdis)

- will be shown as a ship



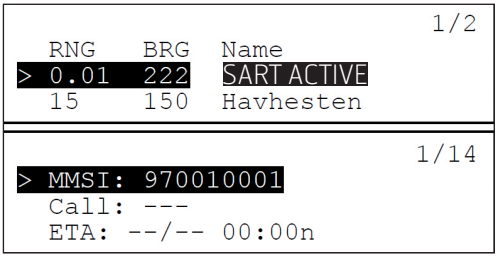
- with the same text message received: SART ACTIVE

Reception On An SA70 AIS SART Compliant Ais Transponder

The requirement to have a SA70 AIS SART compliant AIS transponder, is not ready yet, not when it will be implemented, nor what the final requirement will be. But there are drafts of new AIS specification, IEC 61993-2 (Ed.2) which states:

By default the target list is auto-sorted in ascending range except the nearest active AIS SART or, if supported, other target of interest shall be displayed at the top of the list.

• will be possibly be shown with the text "SART ACTIVE" as "vessel name" with range, bearing and position:



• In addition, a text message will be received:

Reception On An SA70 AIS SART Compliant Electronic Chart (Ecs/Ecdis)

Even though the AIS transponder is not SA70 AIS SART compliant, the electronic chart may show the correct symbol when receiving an SA70 AIS SART in "Test" or "Active" if it is updated to the latest revisions defined below:

- will be shown with this special symbol (red) as defined here: SN.1/Circ.243/Add.1 and in lates revision of IEC 62388:
  - an AIS Search And Rescue Transponder (SART) shall be presented as a circle with an "X" inscribed inside it. The circle shall be 5 millimetres in diameter. The symbol shall be drawn using a thick dashed line style with the colour red. The symbol shall flash until acknowledged by the user. Once acknowledged, the symbol shall cease flashing.
- with the same text message received: SART ACTIVE

Test

1 Test must be conducted outdoors with a clear view to the sky to maximize GPS location.

2. Move the switch to "TEST" position until the LEDs start flashing.
3. SA70 AIS SART will now run through a self test procedure. If a Red LED flashes, it is indication of critical faults. *See table below for error codes.

4. Release the switch when both LEDs start flashing. The unit will now search for GPS position for maximum 15 minutes.
5. A successful test is indicated by 15 second beep and Green LED . See next page for description of indication on a AIS transponder/ Electronic chart etc
6. An unsuccessful test is indicated by 15 second beep and Red LED. Please relocate the unit and restart test.
7. To cancel ongoing test, hold the switch on the SA70 AIS SART in the "TEST" position until the buzzer starts to beep.

Number of LED flash	Fault Indication
2	Transmit power failure
3	Low battery
4	Transmit frequency error
5	User ID not programmed
6	Undefined, contact Simrad
7	Internal communication error

*Error codes if RED flash in "2".

Reception On Nearby Vessels Ais Transponders And Ecs/ Ecdis Or Chart Plotters

To conduct a complete test of a SA70 AIS SART, reception on the ships AIS transponder should also be checked. Today, most AIS transponders installed are not compliant with SA70 AIS SART, but will still receive them as another ship, both with ID code, Position, Range, Bearing, and Text message

Reception An A Non SA70 AIS SART Compliant Ais Transponder

- will be shown as a ship without name, with MMSI (here "ID code"), range, bearing and position:

```
                                1/2
  RNG    BRG   Name
> 0.01   222
  15     150   Havhesten
```

```
                                1/14
> MMSI: 970010001
  Call: ---
  ETA: --/-- 00:00n
```

- Some AIS transponders will show MMSI (here "ID code") when no vessel name is received

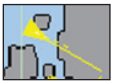
- In addition, a text message will be received:

```
 Menu Message                   1/2

> 97001001:SART TEST
```

Reception An A Non SA70 AIS SART Compliant Electronic Chart (Ecs/Ecdis)

- will be shown as a ship



- with the same text message received: SART TEST

Reception An A SA70 AIS SART Compliant Ais Transponder

The requirement of reception/ visibility on an SA70 AIS SART compliant AIS transponder:

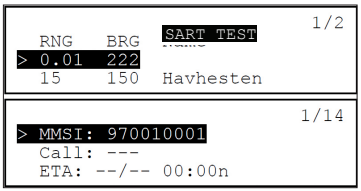
There shall be a separate menu item in the AIS to activate reception of SA70 AIS SART in "TEST":

- Jotron TR-8000:  -> Advanced -> VHF Link/Long Range ->
- Display SART in test mode
- Furuno FA-150 implementation: [USER SETTINGS] -> DISP SART TEST = ON

When this function is activated:

SA70 AIS SART will be shown on top of the list with vessel name SART TEST since this is an emergency product to show ships/people in Distress. (Normally this list is sorted on range, but SA70 AIS SART has higher priority than normal vessels)

SA70 AIS SART will be shown with ID, Range, Bearing and Position:



o In addition, a text message will be received:

Reception An A SA70 AIS SART Compliant Electronic Chart (Ecs/Ecdis)

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  - an AIS Search And Rescue Transponder (SART) shall be presented as a circle with an "X" inscribed inside it. The circle shall be 5 millimetres in diameter. The symbol shall be drawn using a thick dashed line style with the colour red. The symbol shall flash until acknowledged by the user.Once acknowledged, the symbol shall cease flashing.
- with the same text message received: SART TEST

5 Maintenance And Troubleshooting

Maintenance

SA70 AIS SART requires the following maintenance:

Every month.

The unit should be taken out of its bracket and tested using the procedure on page 17. (Short TEST, GPS and transmitter not tested).

Every 6. month.

The unit should be taken out of its bracket and tested using the procedure on pages 17 and 18.

Every 5. year.

The battery unit must be replaced every 5 year. Storage of batteries over a long period of time will reduce their capacity. To ensure long and reliable operation the battery unit must be replaced every 5 year. The battery replacement can be performed on board using the procedure on page 21.

Service

Warranty Service

All goods sold by the Company are warranted to be free from defect in workmanship and material for the period of five (5) years from the date of delivery (unless stated otherwise and confirmed in writings). For further information, see pos.6 "Guarantee" in our Terms and Conditions of Sale.

Provided that the unit(s) returned for repair is under warranty, man-hour cost and material cost will be covered by Simrad. This is not valid if the customer has tried to repair, modify or rebuild the unit, or if the unit has been exposed to environmental conditions outside the specifications for the unit.

If the unit is in need of repair, please return it carriage paid to the agent that you purchased it from.

Additional costs not related to repair/replacement of the unit will not be covered.

Replacing The Battery Module

Below is a description on how to change batteries on SA70 AIS SART

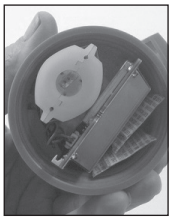
Dissasembly

Twist the rubber grip anti-clockwise to remove the lid

It might be difficult to remove the lid. If so, remove the rubber grip first

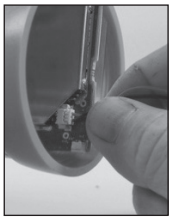
And then twist off the lid

Opened



Rubber holder below battery and electronics removed

Pull out the battery

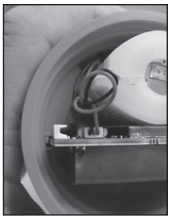


Pull out the cable from connector

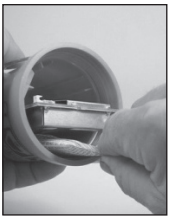
Remove old Silaca gel bags

Assembly

Install the new battery. Make sure the cable is within the guide



Connect cable to electronics, black= left, red= right



Add 2x5 g Silica gel bags

Mount rubber holder

Remove old O-ring using a Credit Card

Use acid-free Vaseline on the new O-ring

Fit the new O-ring

Reinstall lid- tighten without tools

Replace the rubber grip

Assembly completed

Battery Disposal

Dispose in accordance with applicable regulations, which vary from country to country.(In most countries, the disposal of used batteries is regulated and end-users are invited to dispose of them correctly, through non-profit organizations, mandated by local governments or organized on a voluntary basis by professionals). Lithium batteries should have their terminals insulated prior to disposal.

Incineration

Incineration should never be performed by battery users but by trained professionals in authorized facilities with proper gas and fumes treatment.

Land Filling

Leachability regulations (mg/l)

Component	Lachability	EC limit	EPA	Other*
Iron	100			5
Nickel	100	500	2	0,5

* Applicable to France

Recycling

Send to authorized recycling facilities, through a licensed waste carrier.

6 Technical Specifications

Electrical Specifications

Frequency:	161.975MHz and 162.025MHz
Temperature range:	Operating: -20°C to +55°C
Storage:	-30°C to +70°C
Radiated power (e.i.r.p):	1W (30dBm ± 3dB)
Antenna pattern:	Vertical polarization
Battery:	Two C-size SAFT LSH 14 light Lithium batteries, 5 years service life + 18 month storage (from date of manufacture)
Battery capacity:	96 hours operation when activated at -20°C.

Mechanical Specification

Materials used:

- Wall bracket: ASA
- Housing: PC GF10
- Lightcover: PC
- Impact Ring: TPE

Unit dimensions:

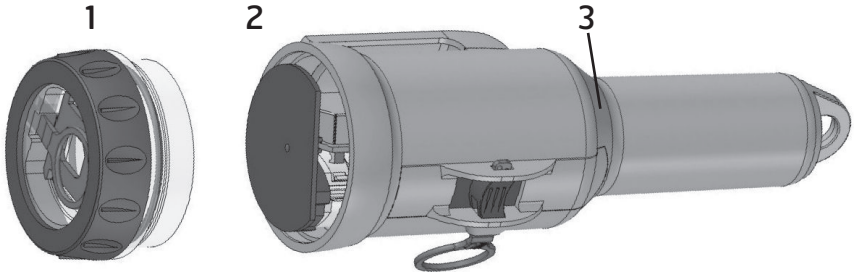
- Max diameter: 89 mm
- Length: 251 mm
- Weight: 450g

Unit with standard storage bracket:

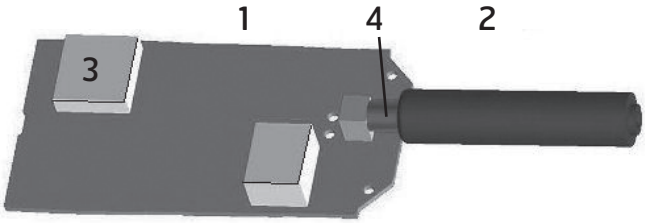
- Max diameter: 90 mm
- Length: 251 mm

7 Drawings

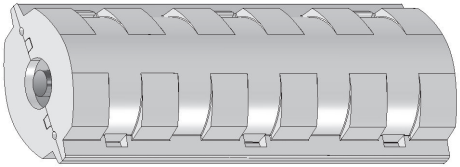
General - SA70 AIS SART Disassembled



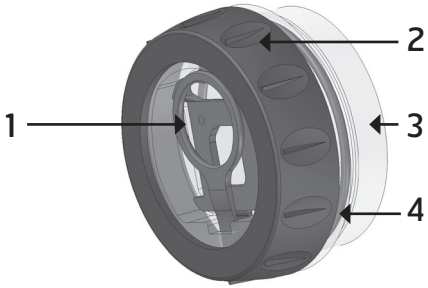
Transmitter Module



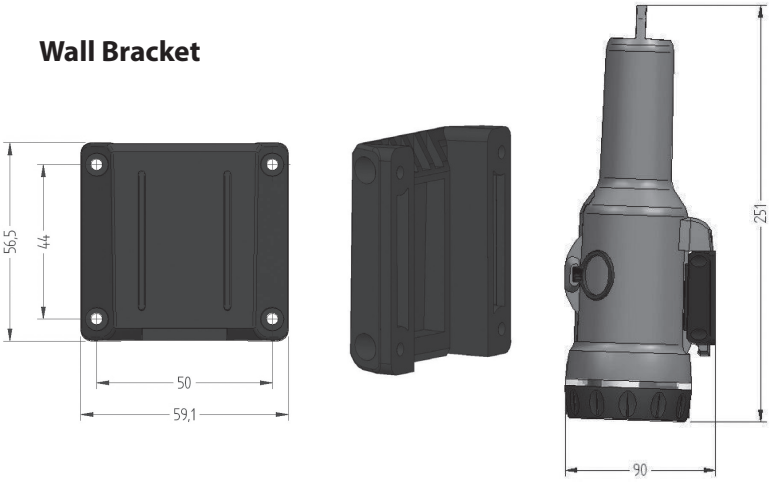
Battery Module



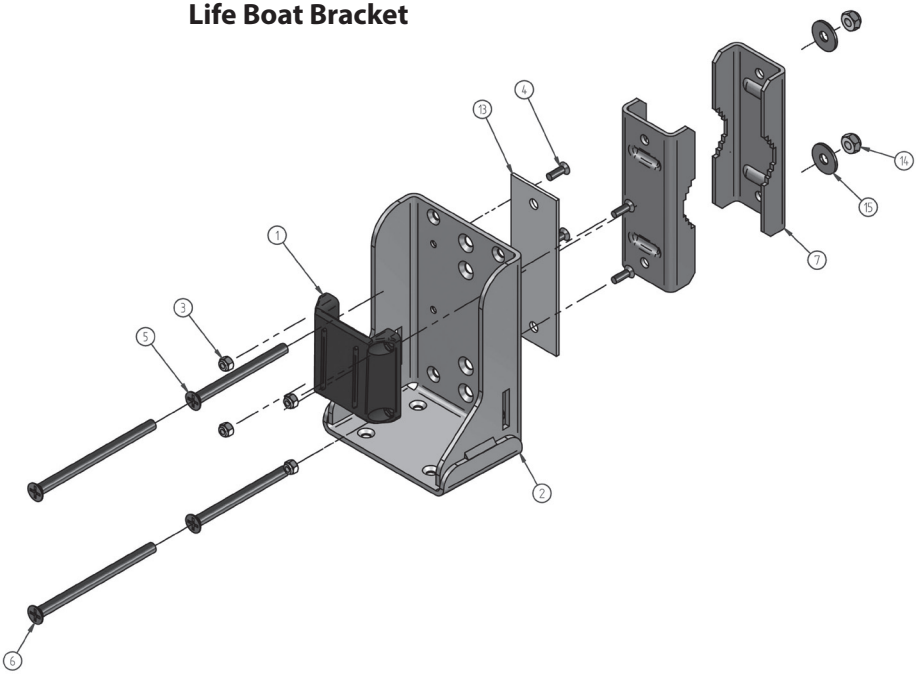
Bottom Lid

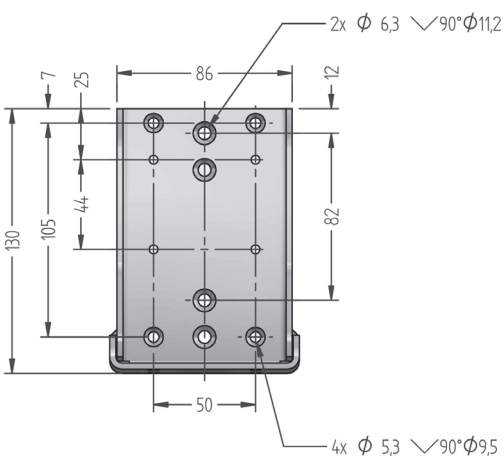


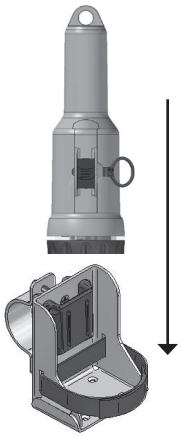
Wall Bracket

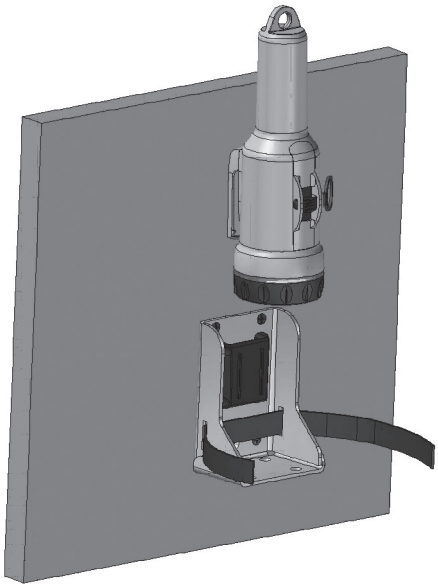


Life Boat Bracket

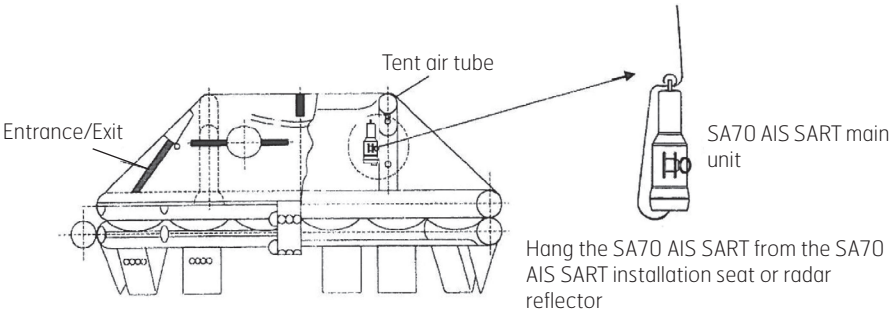




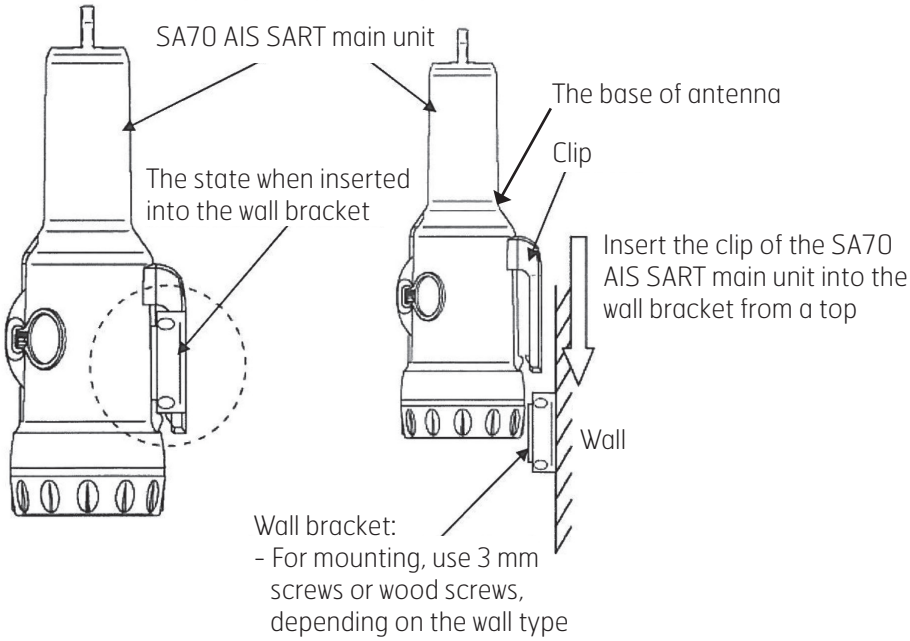




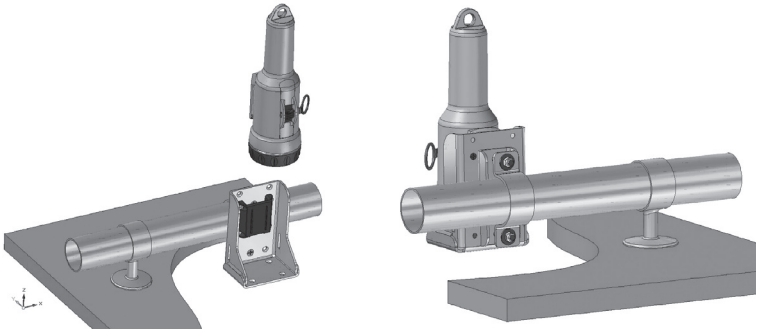
How To Use The Bracket In Life Rafts

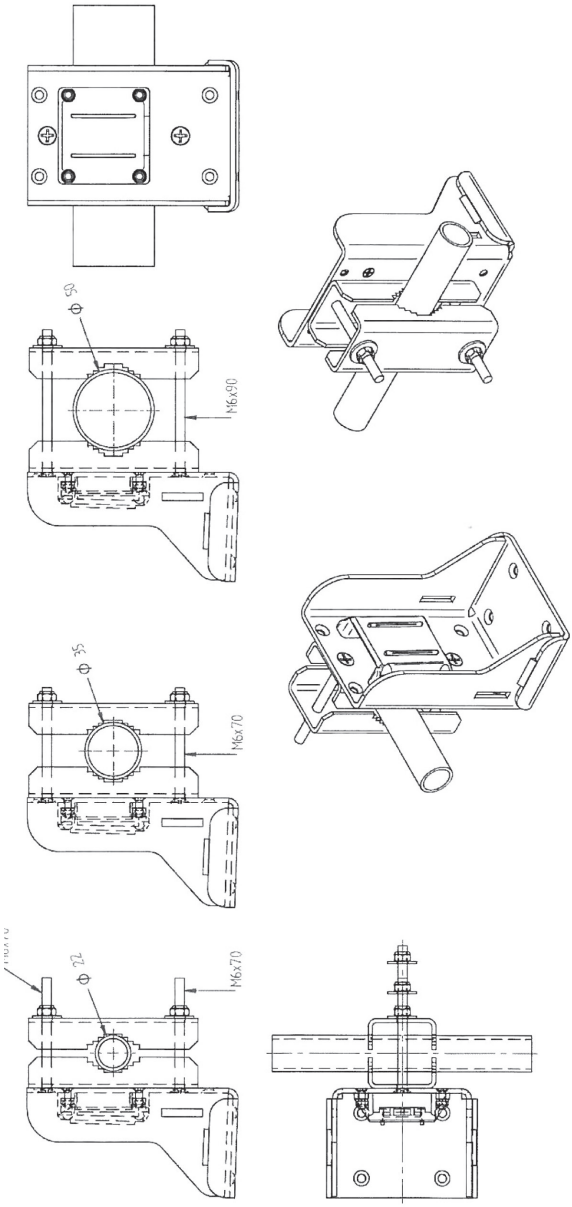


Installation Diagram

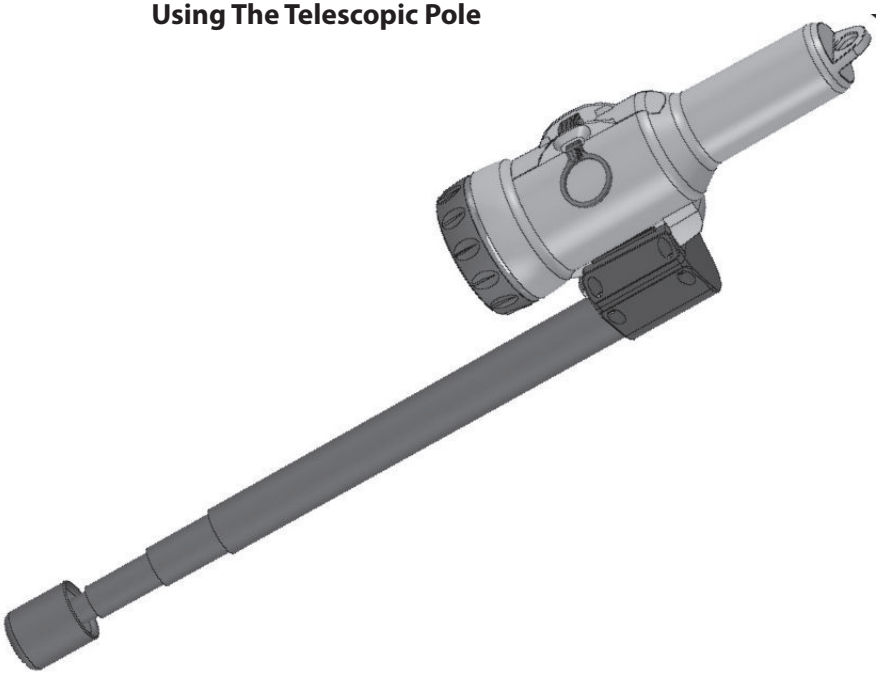


Mounting To A Pipe

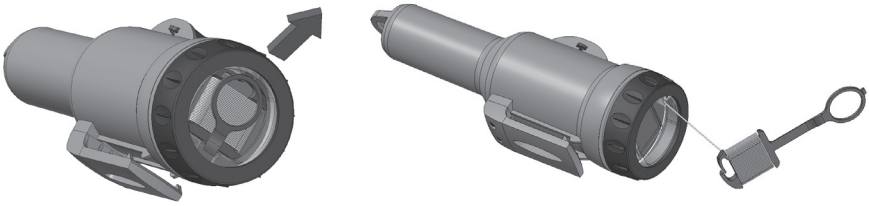



Ø5
M6x90
Ø5
M6x70
Ø2
M6x70

Using The Telescopic Pole



Using The 10 m Rope



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