

SIMRAD

PRO
SERIES



EP70/EG70

User Guide

ENGLISH



Preface

As Navico is continuously improving this product, we retain the right 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.

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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.

Copyright

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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

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 education to test the operational functions of the beacon. Non-original maintenance and/or service parts may destroy the equipment function and performance.

Product Safety Data Sheet

PRODUCT NAME:	Energizer Battery
TYPE NO.:	L91 Volts: 1.5
TRADE NAMES:	ULTIMATE (L91)
APPROXIMATE WEIGHT:	14.5 g.
CHEMICAL SYSTEM:	Lithium Iron Disulfide
DESIGNED FOR RECHARGE:	No

Hazards Identification

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful.

Inhalation: Contents of an open battery can cause respiratory irritation.

Skin Contact: Contents of an open battery can cause skin irritation.

Eye Contact: Contents of an open battery can cause severe irritation.

First Aid Measures

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately. CALL NATIONAL BATTERY INGESTION HOTLINE for advice and follow-up (202-625-3333) collect day or night.

Inhalation: Provide fresh air and seek medical attention.

Skin Contact: Remove contaminated clothing and wash skin with soap and water.

Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Carbon black is listed as a possible carcinogen by International Agency for Research on Cancer (IARC).

Fire Fighting Measures

In case of fire where lithium batteries are present, flood area with water or smother with a Class D fire extinguishant appropriate for lithium metal, such as Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving lithium batteries can be controlled by flooding with water. However, the contents of the battery will react with water and form hydrogen gas. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended. A smothering agent will extinguish burning lithium batteries.

Emergency Responders should wear self-contained breathing apparatus. Burning lithium-iron disulfide batteries produce toxic and corrosive lithium hydroxide fumes and sulfur dioxide gas.

Handling And Storage

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.

- The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion. Crushed or damaged batteries may result in a fire.
- If soldering or welding to the battery is required, consult your

Energizer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Energizer label or package warnings are not visible, it is important to provide a package and/or device label stating:

WARNING

Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature. Where accidental ingestion of small batteries is possible, the label should include:

WARNING

(1) Keep away from small children. If swallowed, promptly see doctor. Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

TEST AND MAINTENANCE RECORD			
DATE	N/T/B	SIGN	INSP

N= New EPIRB installed, T= Test, B= New battery

Test Of Radio Equipment

Monthly:

Float-free and manual EPIRBs to be checked using the means provided for testing on the equipment. Check data for periodical maintenance requirement for float-free EPIRB.

False alerts transmitted by EPIRB

False alerts are a serious problem for the rescue service. Nearly 90% of EPIRB initiated distress alerts turn out to be false alarms.

If for any reason, your EPIRB should cause a false alarm, it is most important that you contact the nearest search and rescue authority and tell them it was a false alarm. They can then stand down any rescue service (coast radio station or appropriate CES or RCC). Use any means at your disposal to make contact. Switch off the distress alarm by de-activating your EPIRB, as soon as possible.

If your beacon is activated in a non-distress situation or a distress situation which has been resolved and you no longer require assistance, contact the nearest search and rescue authorities via the most expeditious means available with the following information:

- Beacon ID number (15 character UIN):
- Position (At time of activation):
- Date of Activation:
- Time of Activation (Time zone):
- Duration of Activation:
- Beacon make and model:
- Vessel Name/ID:
- Circumstances/cause (if known):

USA

The United States search and rescue authority is the U.S. Coast Guard. The primary points of contact are:

Pacific Ocean Area

USCG Pacific Area Command Centre
Tel: +1 (510)-437-3701

Atlantic Ocean / Gulf of Mexico Area

USCG Atlantic Area Command Centre
Tel: +1 (757)-398-6231

From Any Location

USCG Headquarters Command Centre
Tel: +1 (800)-323-7233

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General Description

The EP70/EG70 is emergency equipment consisting of:

- EP70/EG70 Cospas-Sarsat emergency EPIRB
- One of the following brackets:
- FB-70 - Automatic float free bracket.
- MB-70 - Manual bracket.

The EP70/EG70 EPIRB is developed to meet the regulations and rules for use on vessels and life rafts in the maritime service. EP70/EG70 meets the following specifications for 406 MHz EPIRBs for use in search and rescue operations at sea.

See “Declaration of Conformity” document at www.pro.simrad-yachting.com for information of required standards.

EP70/EG70

The EP70/EG70 is buoyant, and is designed to automatically release and activate in case of an emergency where the EPIRB and its bracket is submerged into the sea. The EP70/EG70 can also be operated as a manual EPIRB, by manually releasing it from its bracket and then activating it.

Two different brackets are currently available for the EP70/EG70. MB-70 is the manual bracket and FB-70 is the automatic bracket with cover. The manual bracket comes without the hydrostatic release mechanism and is used to store the beacon inside the wheelhouse or other protected places. The automatic bracket is mounted in a free space outside where the beacon can be released automatically.

The purpose of the EP70/EG70 is to give a primary alarm to the search and rescue authorities. The EPIRB gives an immediate alarm when activated, transmitting the ID of the ship in distress. Care must be taken not to activate the EPIRB unless in an emergency situation, in such cases the user will be held responsible. For periodic testing a test function is implemented. During the test cycle the EPIRB does a self-test on the transmitters and on the battery status. No emergency signal is transmitted during the self-test.

The battery of the EPIRB will last for at least 48 hours from activation of the EPIRB.

System Description

The Cospas-Sarsat system was introduced in 1982 as a worldwide search and rescue system with the help of satellites covering the earth's surface. Since the introduction of the system more than 28000 persons have been rescued by the Cospas-Sarsat system (2009). Currently the system consists of 5 functional satellites in a polar orbit constellation, these satellites cover the entire earth's surface and receive the emergency signal from the 406 MHz transmitter within the EP70/EG70, more polar orbiting satellites will be available in the future, giving a faster location and rescue time.

In addition several geostationary satellites are equipped with a 406 MHz transponder, these satellites are not able to locate the EP70/EG70 but will give an early warning to the rescue forces, minimising the time from an emergency occurs till the rescue forces are at the site.

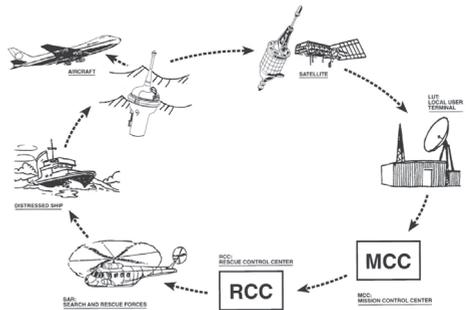
Each emergency EPIRB in the system is programmed with its own unique code, therefore it is vital that the ships data that is given to the dealer you obtained your EP70/EG70, is correct. It is also important that your EPIRB is registered in the database for each country. This database is normally located in the same country that the ship is registered.

Signal Detection

When the EP70/EG70 is activated (manually or automatically) it transmits on the frequencies 121.5 MHz and 406.037 MHz. An analogue signal is emitted on 121.5 MHz and a

digital signal is transmitted on 406.037 MHz. After the EP70/EG70 is activated, the next passing satellite will detect the transmitted signal and relay it to an antenna at a ground station, called LUT.

The International Cospas-Sarsat System has ceased satellite processing of 121.5/243 MHz beacons from 1 February 2009.





Distress Location Determination

The location of the distress signal is determined by taking measurements of the doppler shift of the EPIRB frequency when the satellite first approach and then pass the EPIRB.

The actual frequency is heard at the time of closest approach (TCA). Knowing the position of the satellite and using the received doppler signal information, it is possible to determine the location of the EP70/EG70 from the satellite at the TCA. At the LUT, actually two positions are calculated. One is the actual position (A) and the other is the mirror image (B) position. A second satellite pass confirms the correct location (A). Doppler-only accuracy is within 5 km (3 mi) (3.1 statute miles or 2.6 nautical miles)— that is, the position is sufficiently accurate for SAR purposes even after only one pass. What's more, the most likely of the two 'mirror' positions can be determined valid with 98.5% accuracy after only one satellite pass. This accuracy can be increased to 99.3% using so-called "combined Leo-Geo processing," and this technique also enables accurate positions to be generated with as little as two or three bursts from the beacon (i.e. less than 4 minutes of transmission) and thus greatly increases the chances of being found even if the beacon is ultimately consumed by fire or is otherwise destroyed

EPIRB Registration

Normally the MCC will contact the vessel or the contact person registered in a shipping register and/or an EPIRB register (Ships owner, family member etc.) before alerting the RCC. This is to determine if the alarm from the EPIRB for some reason is a false alarm, and an expensive rescue operation can be avoided. Because of this it is important that the ships data is correct in the shipping register or in the EPIRB database.

You should register your beacon with the national authority associated with the country code in the hexadecimal identification (15 Hex ID) of your beacon. You can register your beacon online with the Cospas-Sarsat IBRD if your country does not provide a registration facility and your country has allowed direct registration in the IBRD: www.406registration.com

If your country operates a national beacon registry, consult the document C/S S.007 "Cospas-Sarsat Handbook of Beacon Regulations" available at www.cospas-sarsat.org to obtain the point of contact.

Some EPIRB registration links:

USA: <http://www.beaconregistration.noaa.gov>

UK: <http://www.mcga.gov.uk> (search for "EPIRB registration")

USA

USA REGISTRATION CARD

For registration of the beacon, use this link:

<http://www.beaconregistration.noaa.gov>

Follow instructions you see on your screen.

Other registrations methods are mail or fax. Forms are ready with correct information and it may be downloaded from the above web site.

The Emergency Contact information has to be accurate, especially regarding the telephone number, as this will be used to validate an alert. Only if the beacon registration and approximate location details can be confirmed will USCG (United States Coast Guard) launch an immediate rescue, otherwise there will be a delay whilst further alerts from the same source are received and verified.

Registration address:

NOAA/SARSAT Beacon Registration

E/SP3

Federal Building 4, Room 3320

5200 Auth Road, Suitland

MD 20746-4304

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EPIRB Description

General

The EP70/EG70 consists of upper and lower house mounted together with an equator ring with gasket. EP70/EG70 consists of the following main parts:

- Main module with antenna
- Battery module

Main Module With Antenna

The EPIRB module consists of:

- The main board including all electronic circuitry and the main switch
- Antenna with flash LED

Battery Module

The Battery module supplies the EPIRB module with 12 V power to keep the EPIRB transmitters active for 48 hours when activated, and for test sequences. The battery pack is attached inside the lower house.

The seawater contacts are mounted in the battery module. The batteries are mounted in a plastic battery holder.

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Installation

Brackets

Two different brackets are currently available for the EP70/EG70.

Float Free Bracket FB-70

WARNING:

**DO NOT INSTALL THE EPIRB NEAR STRONG
MAGNETIC FIELDS THAT COULD ACTIVATE THE BEACON**

When the EP70/EG70 is mounted in the float-free bracket, FB-70, it will operate as an automatic float free unit. The satellite float-free EPIRB should be located/installed so that the following requirements are fulfilled:

- The EPIRB should, with greatest possible probability, float-free and avoid being caught in railings, superstructure, etc., if the ship sinks.
- The EPIRB should be located so that it may be easily released manually and brought to the survival craft by one person. It should therefore not be located in a radar mast or any other places which can only be reached by vertical ladder.

The location should be well protected from environmental conditions such as direct sea-spray, chemicals, oil, exhaust and vibrations.

See drawing on page 23

Manual Bracket MB-70

When the EP70/EG70 is mounted in the MB-70 bracket, it will operate as a manual unit. This bracket is typically used to store the EPIRB inside the wheelhouse or other protected areas of the ship. When the EP70/EG70 is mounted in the MB-70 bracket, the EPIRB can be activated as described in 5.1.1, but the sea water contacts are deactivated in the bracket. The bracket should be mounted in an easily accessible place where it can be removed in a hurry in case of an emergency.

See drawing on page 24.

Mounting The FB-70/MB-70 Brackets

The bracket is mounted with 5mm bolts according to the drawing. Use the bolts supplied with the bracket. The bracket could be mounted in either a vertical or horizontal position, whichever is the best regarding maintenance and operation. A vertical position is recommended.

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Operation Instructions

Warning

- USE ONLY DURING SITUATIONS OF GRAVE AND IMMINENT DANGER
- REPLACE THE BATTERY AFTER THE SATELLITE EPIRB IS OPERATED FOR ANY PURPOSE OTHER THAN A TEST

The EP70/EG70 is designed to be operated either manually or automatically. The EPIRB is always armed, that is the EPIRB will automatically start to transmit when the EPIRB is out of the bracket and deployed into water. In the EPIRB there is an automatic safety switch. This switch prevents the seawater contacts from operating the EPIRB (caused by ice, sea-spray etc.) as long as the EPIRB is placed in its bracket.

Manual Operation

Out Of Bracket

See drawing on page 24 and follow instructions from 4-5 on page 18.

Float Free Bracket FB-70

See drawing on page 25. For operation of the beacon in the bracket please follow instructions 1 to 7.

It is not recommended to operate the beacon inside a life raft or under a cover or canopy. Do NOT tie the lanyard to the ship in distress, as this will prevent the unit to functioning if the ship sinks.

1. Remove the locking pin from the bracket (FB-70)
2. Remove the FB-70 cover
3. Take out the EPIRB from the bracket
4. Pull the locking pin holding the main switch.
5. Move main switch to the left, to ON position. The LED indicator, located at the top of the antenna, will start to flash, indicating that the EPIRB is operating.
6. Tie the beacon lanyard to you or to the survival craft
7. If possible keep the EPIRB in an open area, away from any metal objects (ship construction etc.) that may limit the satellite coverage. This is especially important for EP70/EG70, since it needs good reception to obtain a GPS position.

NOTE:

To stop transmission, move the main switch to READY position.

AUTOMATIC OPERATION - FLOAT FREE BRACKET FB-70

See drawing on page 25.

1. The EP70/EG70 will automatically release from the bracket, float to the surface and start to transmit when the EPIRB, in its bracket is deployed into water at a depth of app. 2-4 meters (6 - 13 feet).
2. Transmission will continue until the EPIRB is lifted out of the water, and dried off. The transmission can also be stopped by placing the EPIRB in the bracket.

Test

To perform the self-test, the EPIRB has to be removed from the bracket. FB-70 bracket: Release FB-70 top cover by removing the locking pin.

See drawing on page 26.

1. Push and hold switch in TEST position for 15 seconds. Keep hands and other objects away from the antenna.
2. Test passed after one single flash only!
3. Release the switch and put the EPIRB back into the bracket

Warning

The EPIRB can drop out of the FB-70 bracket when releasing top cover

GPS Test:**NOTE:**

Limit this test to max. once/month as this test will reduce lifetime of EPIRB battery! The EP70/EG70 has maximum 60 GPS TESTs that can be performed during battery lifetime.

1. Move Switch to TEST twice within 3 seconds and release
2. EPIRB will BEEP shortly every 3 seconds until GPS position acquired
3. OK = 2 BEEPS (see below description if Not OK)
4. Normal SELFTTEST is performed after GPS TEST and position transmitted on 406.037 MHz. GPS position may be received on an EPIRB Tester for verification

There are two possible error conditions during this test:

- a) 5 BEEPS = Did not acquire GPS position
- b) 10 "-" = Number of GPS TEST above limit (>60)

EPIRB Error Messages

If the self test detects a fault in the EPIRB module, one or more of the following indications are shown:

Number of flashes:	Fault indication:
1	NONE
2	Low power on 406 MHz transmitter
3	Low battery voltage
4	Low power on 121.5 MHz transmitter
5	PLL on 406 MHz transmitter out of lock
6	PLL on 121.5 MHz transmitter out of lock
7	EPIRB module not programmed or programming not complete

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Periodical Control

Every Month:

Perform EPIRB self-test.

What the self-test actually does is to send out a short test signal on 121,5 and 406,037MHz, testing the output of the transmitter. While transmitting the test signal, the battery voltage, output power and phase lock is tested.

During the test of the 406MHz transmitter a test message is transmitted, this test message is coded with a special synchronization code and will not be recognized as real alert by the Cospas-Sarsat satellites. Carry out visual inspection for defects on both the EP70/EG70 and Bracket. The EP70/EG70 should be easily removed and replaced in the Bracket. Make sure that the EP70/EG70 and Bracket is not painted or otherwise covered with chemicals, oil, etc.

Check the expiry date of the EPIRB Battery and the Hydrostatic Release Mechanism. Check the presence of a firmly attached lanyard in good condition and that it is neatly stowed and is not tied to the vessel or the mounting bracket. If the EP70/EG70 is the main EPIRB on board, these rules must be followed:

Every 12th month:

If the EP70/EG70 is the main EPIRB on board and the ship falls under national regulation and/or the SOLAS regulations of SBM, these rules must be followed: Perform extended annual test according to IMO's MSC/Circ.1040 (Annual testing of 406 MHz satellite EPIRBs) as required by SOLAS IV/15.9. This test can be carried out by one of Navico's authorized representatives or any other service provider in possession of a Cospas/Sarsat EPIRB tester/decoder.

Every 2ndYear:

Hydrostatic Release Mechanism including Plastic Bolt on the Float Free Brackets must be replaced. (Check expiry date on label).

Every 5thYear:

- Battery change
- SBM (see page 19)

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Maintenance

Epirb Module / Battery Module

If the EPIRB is fitted on a vessel which requires GMDSS compliant equipment, the EPIRB shall be tested and approved as required by SOLAS regulation IV/15.9.2 of SOLAS 1974 as amended with, in accordance with MSC/Circ.1039 guidelines for shore-based maintenance of Satellite EPIRBs within 5 years, or by the date of battery expiry, whichever comes first.

Change Of Battery

The EP70/EG70 battery must be changed at Simrad SBM authorized workshop to be GMDSS compliant. If your EP70/EG70 is not under any international or national regulations, battery can be change by authorized Simrad representatives/partners/dealers.

Hydrostatic Release Replacement

Warning

Only Simrad approved hydrostatic release is acceptable for use

Replacing The Release Mechanism In FB-70 Bracket

See drawing on page 26.

1. Release and remove FB-70 top cover by removing the locking split pin (1). WARNING! The EPIRB can drop out of the FB-70 bracket when releasing the top cover. Remove the EPIRB from the bracket.
2. Press down the spring-loaded bracket plate and remove the hydrostatic unit by sliding it out of its locking slot. See arrow for direction.(2).
3. Check the expiry date of the new hydrostatic release mechanism (3). The date should be approximately two years from the date of purchase.
4. Install a new hydrostatic unit by pressing down the spring loaded bracket plate and sliding the unit into its locking slot (4).
5. Refit the EPIRB and the FB-70 top cover. Be sure that the top cover is locked at the bottom end and that the top end are fixed at hydrostatic release mechanism rod. Replace The locking split pin (1)

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Technical Specifications

GENERAL

Battery:	Lithium/iron disulfide, 12V/2900 mAh, 5 years service life
Housing:	Glass reinforced Polycarbonate
Dimensions:	
• Height:	340 mm
• Max diameter:	128mm
• Weight:	680 gram
Materials:	Polycarbonate
Compass safe dist.:	0,85 m
Temp. operating:	-20°C to + 55°C
Temp. storage:	-40°C to + 65°C
Operating life:	Minimum 48 hours at -20°C

COSPAS-SARSAT TRANSMITTER

Frequency:	406.037 MHz ± 2 ppm
Output power:	5W ± 2 dB
Protocols:	EP70/EG70: Maritime, Serialized, Radio Call sign, Location protocols
Modulation:	Phase modulation 1.1 ± 0.1 rad
Data encoding:	Bi Phase L
Stability:	Short term: $\leq 2 \times 10^{-9}$ Medium term: $\leq 10^{-9}$ Residual noise: $\leq 3 \times 10^{-9}$ Bit rate: 400 b/s Antenna: Omni directional
Type Approval Cert.:	TAC-222

NAVIGATION DEVICE

Type:	22 Channel GPS Receiver
Antenna:	Chip type

HOMING TRANSMITTER

Frequency:	121.500 MHz
Output power:	Up to 100 mW
Modulation:	A9, AM sweep tone between 300Hz and 1600Hz Sweep range: 700 Hz Sweep rate: 2.5 Hz
Stability:	10 ppm over temperature range
Antenna:	Omni directional

BRACKETS

Float Free Bracket FB-70

See drawing on page 27.

Materials:	Luran S/ ABS
Dimensions (hwd):	(385 x 151 x 148) cm
Weight:	850 g
Release mechanism:	HRU kit

Manual Bracket MB-70

See drawing on page 27.

Materials:	PA6 + 30% fibre glas (Polyamide)
Dimensions (hwd):	(156x 134 x 98.5) cm
Weight:	150 g

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Spare Parts

Battery kit, EP70/EG70/EP70/EG70	- part no. 000-10736-001
Hydrostat kit	- part no. 000-10737-001
FB-70	- part no. 000-10734-001
MB-70	- part no. 000-10735-001

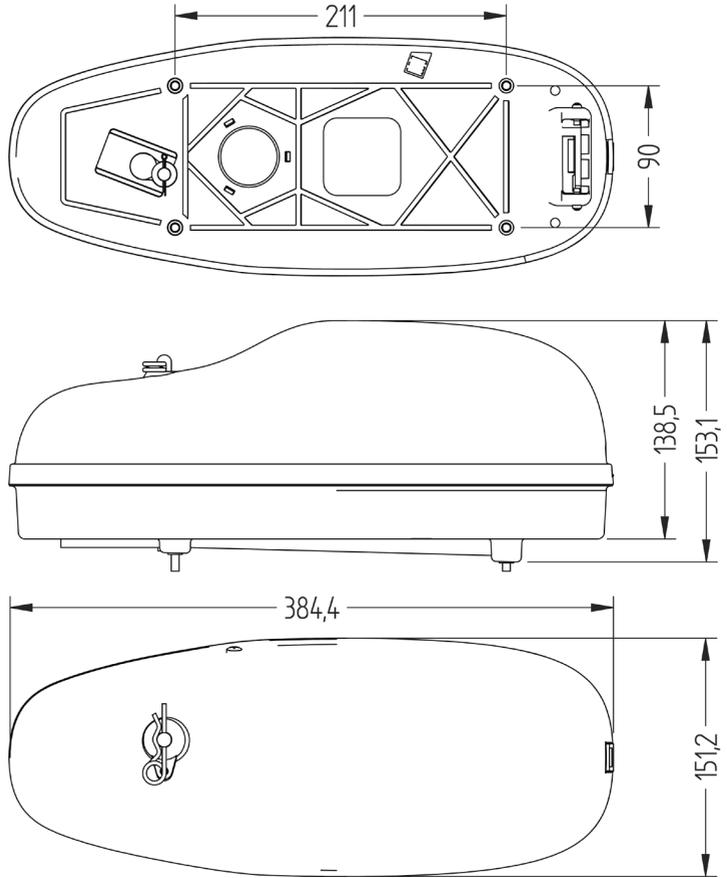
NOTE:

Keep the original satellite EPIRB packaging, since it may be needed if the EPIRB has to be shipped for servicing. UN requirements for shipping some batteries as hazardous goods require certain packaging standards and labelling

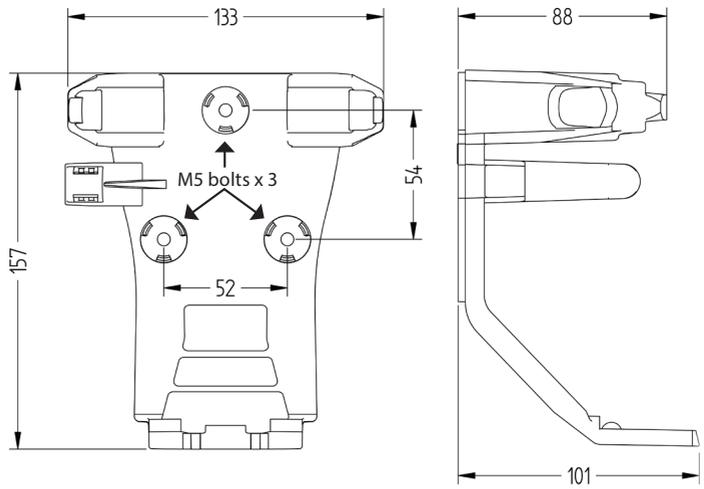
9

Drawings

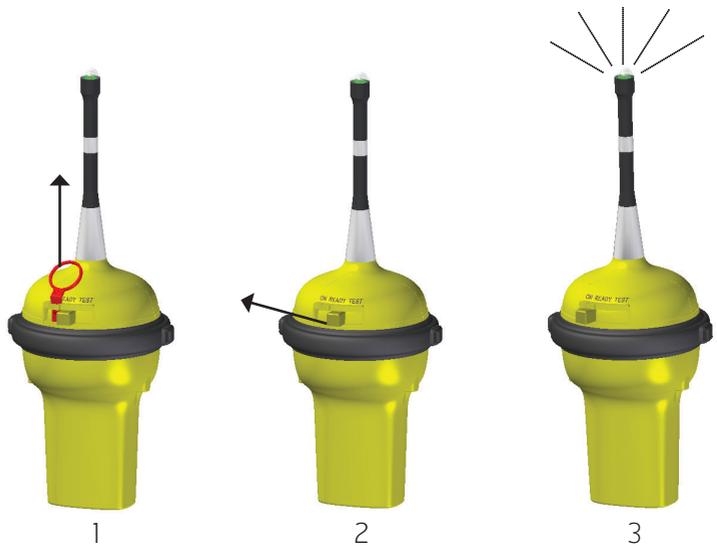
Float free bracket FB-70



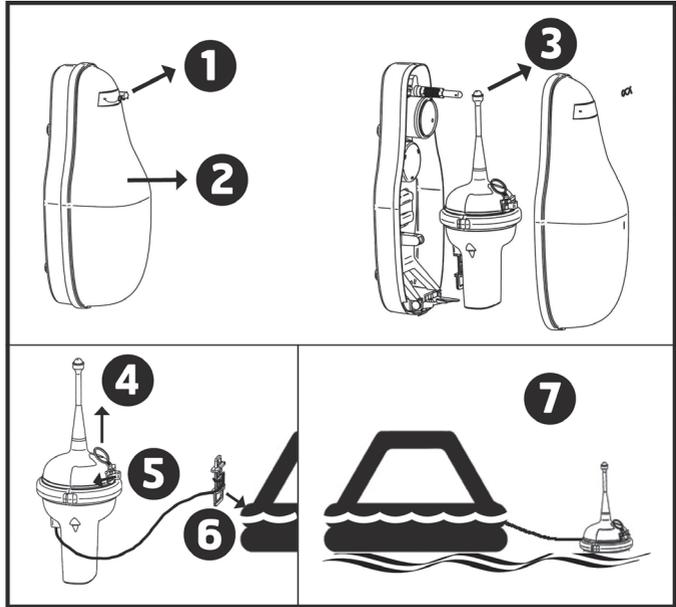
Manual Bracket MB-70



Manual Operation - Out Of Bracket



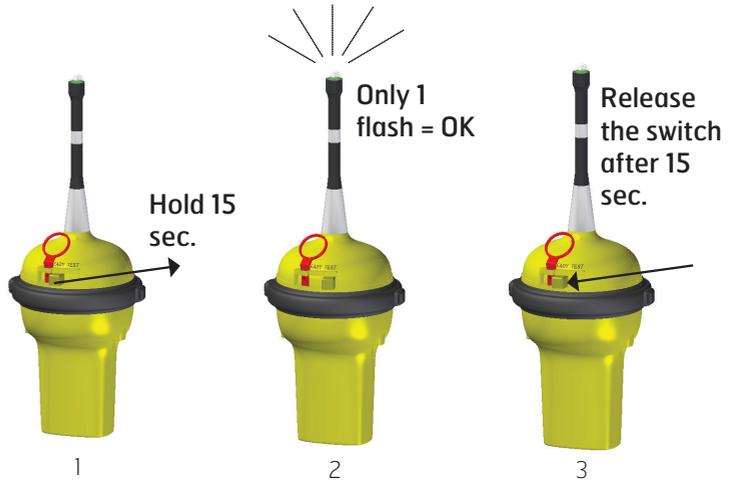
Float Free Bracket FB-70



Automatic operation - Float free Bracket FB-70



Test



Replacing The Release Mechanism In FB-70 Bracket



Float Free Bracket FB-70



Manual Bracket MB-70



