Tron 40VDR AIS

Float-free EPIRB with storage module

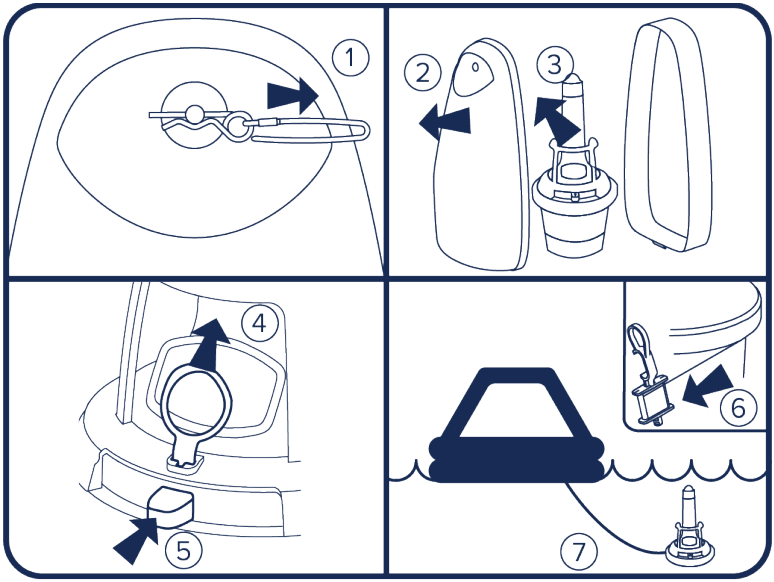
User manual

JOTRON

Performance for Life

1 Manual operation and activation

Use only in emergency!



It is not recommended to operate the EPIRB 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 from functioning if the ship sinks.

1. Remove the locking pin from the front cover.
2. Remove the front cover.
3. Take the EPIRB out of the bracket.
4. Pull the red tab.
5. Push the switch to activate the EPIRB.
6. Unclip and release the lanyard.
7. Tie the lanyard to yourself or to the life raft.

The strobe light will start flashing indicating that the EPIRB is operating.

If possible, keep the EPIRB in an open area, away from any metal objects (ship construction etc.) that may limit the satellite coverage. Transmissions can be stopped by taking the EPIRB out of water and turning the switch to mid position.

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2 General

Jotron manufactures safety products designed for search and rescue of human lives and property. For this product to be effective according to the design parameters, it is imperative that it is handled, maintained, serviced and stowed in accordance with this manual.

All information contained within this manual has been verified and is to Jotron's knowledge correct. Jotron reserves the right to make changes to any product(s) or module(s) described herein to improve design, function or reliability without further notice.

IMPORTANT	Jotron is not liable and cannot be held responsible for any injury or damages caused directly or indirectly by an error or omission of information, incorrect or misuse, breach of procedures or failure of any specific component or part of this product.

Jotron documentation can be downloaded from jotron.com.

3 Product description

The Tron 40VDR AIS is a combined Cospas-Sarsat and MED approved EPIRB, and a storage medium. It has been developed to meet the regulations and rules for use on vessels and life rafts in the maritime service.

See the Declaration of Conformity-document at jotron.com for information on applicable standards.

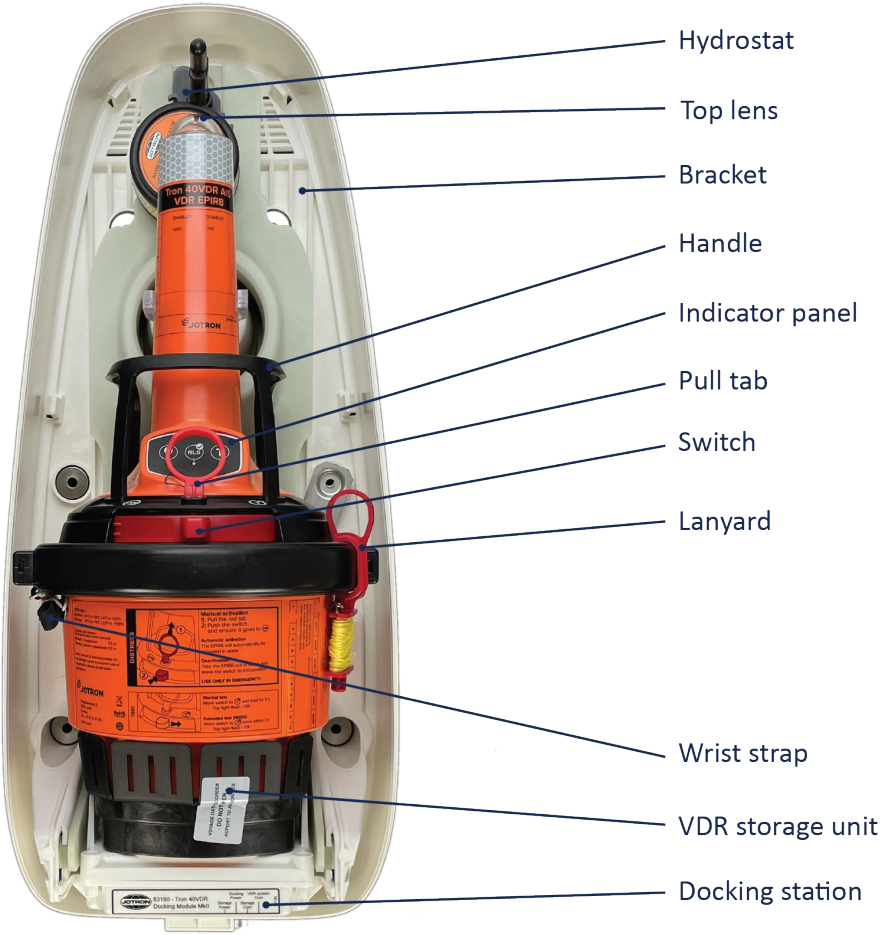
The main purpose of the EPIRB is to alarm the search and rescue authorities in a distress situation. When activated the EPIRB will transmit a signal, which includes the ID of the ship in distress and the position of the EPIRB. The top flash will start flashing in both visible and infra-red light.

The main parts of the Tron 40VDR AIS are:

- Tron 40VDR AIS EPIRB
- FB-40 or FBH-40 Float-free bracket
- VDR storage module

The EPIRB is buoyant and is equipped with a system that will activate the distress transmissions if it is deployed into water. The EPIRB will not be activated if it is exposed to sea spray or rain when mounted in its bracket.

3.1 Tron 40VDR AIS EPIRB



3.1.1 Switch

The switch has 3 positions. “ON” position to the left. “Auto / Ready” position in the middle, and “self-test” position to the right. The “ON” position is secured with a pull tab to prevent inadvertent activation.

The switch is spring loaded and will move to “ON” position when pushed if the pull tab is removed.

Switch position icons						
Icons		ON			T	
Description	ON			Normal and GNSS self-test		

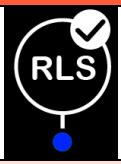
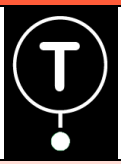
3.1.2 Pull tab

A pull tab is located above the switch and must be removed in order to move the switch to “ON” position. The pull tab does not prevent the switch to move to “self-test” position and must not be removed when performing normal and GNSS self-tests.

The pull tab can be removed by pulling firmly upwards.

3.1.3 Indicator panel

The indicator panel consist of 3 LED indicator lights with associated icons. See the tables below for descriptions and possible statuses

Indicator panel icons			
Icons			
Description	GNSS (green light)	RLS (blue light)	Test (white light)

NOTE

The blue RLS indicator will only be active if the EPIRB has enabled the RLS protocol.

Indicator light descriptions		
Off	The LED is off	●
On	The LED is on	○
Triple blink	The LED blinks fast in sequences of 3 fast blinks	○○○ ○○○ ○○○
Steady blinks	The LED blinks periodically with a long blink	○ ○ ○
Multiple dark periods	The LED is turned off for short periods, creating a blink effect. (Negative blink, occulting blink)	●●●
Blinks	The LED blinks multiple times	○○○

3.1.4 Lanyard

A lanyard is located on the right side of the EPIRB, clipped onto the equator belt.

The purpose of the lanyard is to secure the EPIRB to yourself or the life raft. For optimal performance in an emergency situation, the EPIRB should be floating in the water.

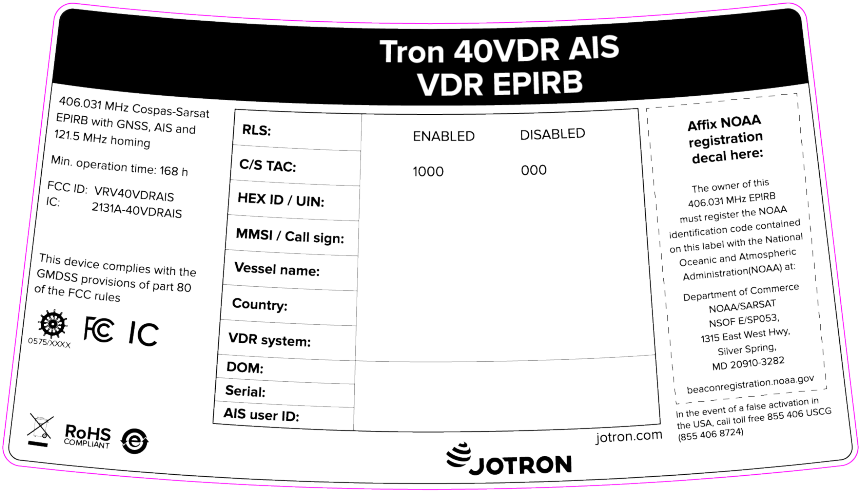
The end of the lanyard is secured to the EPIRB. To use the lanyard, unclip the lanyard coil from the equator belt and uncoil the line.

Do not secure the lanyard to the ship, as this will cause the EPIRB to follow the ship down if it is sinking.

3.1.5 Wrist strap

The provided wrist strap can be used to carry the EPIRB in situations where it is necessary to have both arms free, e.g. when climbing a ladder. The wrist strap can be pulled out of its pocket, and your arm can be placed through it. Note that it is not possible to put the wrist strap back into its pocket after usage.

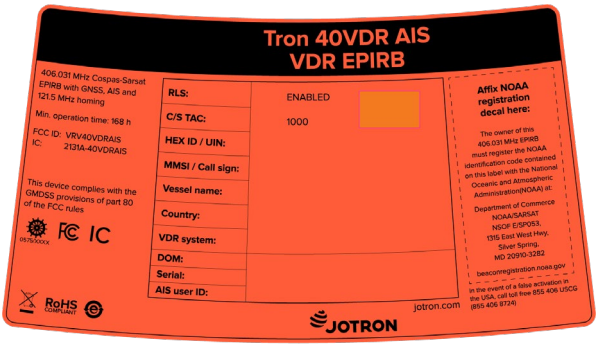
3.1.6 EPIRB ID information



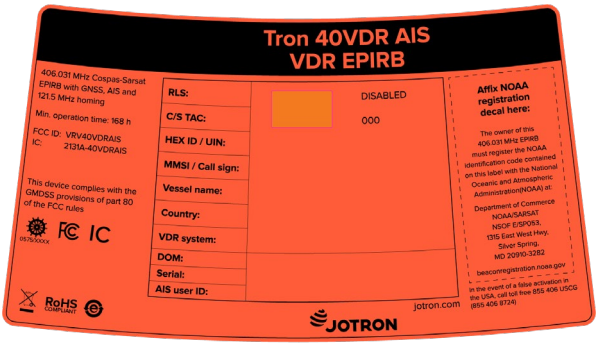
A table with all the ID information is located on the neck of the EPIRB, just below the top flash. From the factory this table contains information about the date of manufacture (DOM), EPIRB serial number and AIS User ID.

The section showing the TAC number and RLS information is filled out by the dealer or supplier depending on the chosen protocol. The TAC number will have the prefix 1 if the EPIRB is programmed with an RLS protocol.

The dealer or supplier shall use the orange rectangular label included in the box to cover the information that is not applicable



If the EPIRB has the RLS protocol enabled the label will appear as shown in this figure.



If the EPIRB do not have the RLS protocol enabled the label will appear as shown in this figure.

The remaining fields showing the ownership of the EPIRB shall be filled in and covered by the blank protection label included in the box.

3.2 FB-40 or FBH-40 Bracket

The float-free bracket (FB-40 or FBH-40) is a covered bracket with a hydrostatic release unit (HRU) which will release the EPIRB if the bracket is submerged to a water depth of above 2-4 meters.

The bracket includes a docking station with LAN and power connections for the VDR storage module. The connections are magnetic and capacitive, and transfers signals without radio transmissions or cables.

3.3 VDR storage module

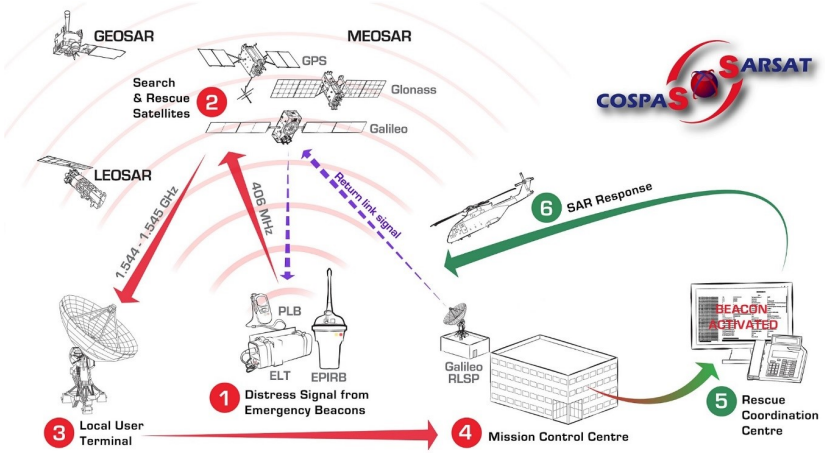
The VDR storage module is a sealed unit containing a storage unit that functions as a Final Recording Medium (FRM) in a VDR-system. The VDR storage module communicates with the vessels VDR system via a connector-less connection to the bracket, and it is attached to the EPIRB with a tamper proof connection.

3.4 RLS capability

This Beacon has the capability to use the RLS (Return Link Service) delivered on the Galileo navigation satellite system. To have RLS activated the Beacon also needs to be configured with a Cospas-Sarsat RLS protocol. You can check your 15 HEX code on this webpage http://www.cospas-sarsat.int/en/pro and look for the link "Beacon Message Decode Program" to check if you have an RLS protocol programed in your Beacon.

RLS is a service delivered, free of charge from the Galileo satellite system, to inform the people in distress that the signal is picked up by the ground station and forwarded into the SAR system.

To achieve this, the Beacon sends RLS status together with the distress signal on 406 MHz to the Cospas-Sarsat system. When this message is received by the ground station, an acknowledge is returned to the Beacon through the Galileo position system. The Beacon reads back this acknowledge thorough the GNSS module.



4 Registration, Installation and mounting

4.1 Registration of the beacon

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.

4.1.1 Registration in USA

For registration of the beacon in USA, 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:

SARSAT BEACON REGISTRATION

NOAA

NSOF, E/SPO53

1315 East West Hwy

Silver Spring, MD 20910 – 3282

4.1.2 Registration in the UK

For registration of the beacon in United Kingdom, use this link:

http://www.gov.uk/406beacon

4.1.3 Registration in other countries

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.

4.2 Change of ownership

If the ownership of the EPIRB is transferred or a change of vessel occurs, the EPIRB must be recoded and re-registered on the new owner in accordance with local rules.

4.3 Installation

The EPIRB should be installed in a location that meets the following requirements:

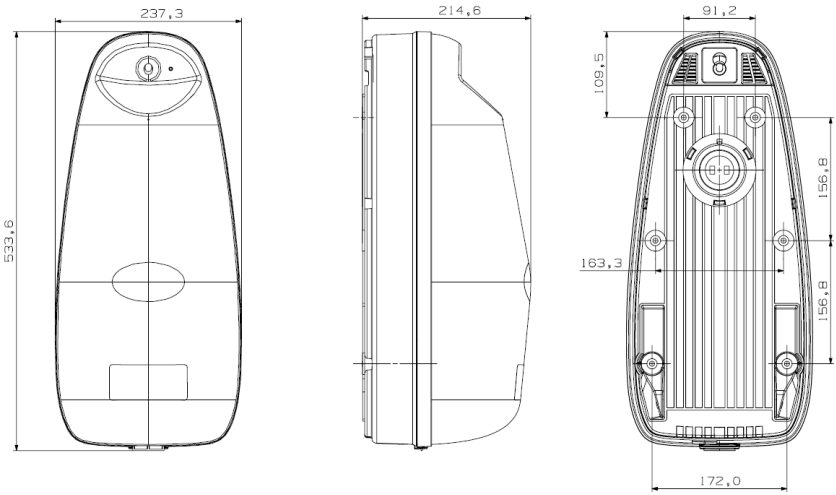
- The EPIRB should, with greatest possible probability, float-free and avoid being caught in railings, superstructure, etc., if the ship sinks.
- Do not install the bracket near strong magnetic fields that could activate the EPIRB.
- The EPIRB should be located so that it may be easily released manually 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 a vertical ladder.
- The bracket should, if possible, be installed in a position that will provide as clear a view of the sky as is practical, orientated to facilitate satellite reception.

- Do not install or operate the EPIRB in a location subject to high intensity RF fields. (e.g Radar or communications antennas).
- Be especially aware of interference from shipboard L band transceiver sources such as Inmarsat Fleet Broadband. The emitted signals from such sources are very strong and may influence the GNSS position reception.

The location should be well protected from environmental conditions such as direct sea-spray, chemicals, oil, exhaust and vibrations. - see more detailed information in COMSAR/Circ.32" regarding "Harmonization of GMDSS requirements for radio installations onboard SOLAS ships".

4.4 Bracket installation and mounting

The mounting footprint is the same for the brackets for Tron 40VDR AIS (FB-40 and FBH-40). Dimensions are shown in the figure below.



4.4.1 Installation screws

The bracket shall be installed on a flat metal surface with 6 pcs M6 screws with socket head with material quality of A4 (AISI 316). There shall not be used any washer under the screw heads. A washer can block the catapult from releasing. For the pre-mounted vibration dampers to work properly it

is important that they are not misshaped by the tightening of the screws. If they are misshaped, the dampers will not work as designed.

4.5 Mounting the EPIRB in the bracket

4.5.1 Tron 40VDR AIS

1 2 3

1. Make sure the bracket is not damaged.
2. Grab the EPIRB and match the bottom of the battery housing correct on the bracket base and gently press the EPIRB into the stability clip.
3. Place the cover by fitting it from the bottom first. Mount the locking pin to securely hold the cover in place. See chapter 4.6 for details.

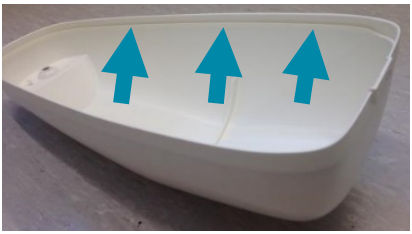
If the bracket is mounted correctly, on a flat surface, the EPIRB shall fit in the bracket without any gap in the stability clip.

If the bracket is mounted incorrect, or on an uneven surface, the bracket will be in tension. This may cause poor contact between the VDR storage module and the docking station, which again may lead to communication problems and in worst case complete loss of communication.

4.6 Fitting the front cover

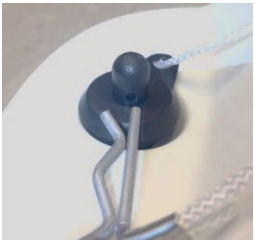
To place the front cover; the following steps should be followed:

1



2

3



4

5

1. Fit the groove on the front cover with the tab on the bracket.
2. There is a groove alongside the front cover that must be aligned and fit around the tongue in the bracket.
3. After aligning the tongue and the groove the front cover can be closed. If the tongue and groove does not align correctly, it can be helped by lightly pressing the front cover inwards on the long side.
4. Firmly press the front cover in place before fitting the locking pin through the hole in the hydrostatic release. If the hole is not visible, or you must use force to press down the front cover to see the hole, the tongue and groove is not aligned. Please take the front cover off and try again.
5. Make sure the locking pin is mounted the correct way.

5 Operating instructions

5.1 Manual activation

1

2

3

To activate the EPIRB follow these steps:

1. Remove pull tab
2. Push switch
3. Ensure that switch moves to “ON” position

WARNING

Use only in emergency!

5.2 Indicator descriptions

The following tables describes the status of the different indicator lights when the EPIRB is operating normally.

5.2.1 Top flash

	Top flash
EPIRB activated	○ ○ ○ Steady blinks
Cospas-Sarsat signal transmitted	○○○ Triple blinks
AIS signal transmitted	○○ Double blinks

- The first Cospas-Sarsat signal will be transmitted approximately 60 seconds after the EPIRB has been activated.
- The first AIS signal will be transmitted approximately 4.5 minutes after the EPIRB has been activated.
- The 121.5 MHz homing signal will start transmitting approximately 4.5 minutes after the EPIRB has been activated.

5.2.2 GNSS indicator

	GNSS indicator
Waiting for GNSS fix	Triple blinks
GNSS fix achieved	Steady blinks

5.2.3 RLS indicator

	RLS indicator
Waiting for RLS	Triple blinks
RLS acknowledged	Steady blinks
RLS disabled (EPIRB is not equipped with RLS protocol)	No light

5.2.4 Test indicator

The test indicator is not active during normal activation of the EPIRB.

5.3 Automatic activation

5.3.1 Float-free

If the ship is sinking, the EPIRB will be automatically released from the bracket when it has reached a depth of 2-4 meters (6-13 feet) and start transmitting when it has reached the surface.

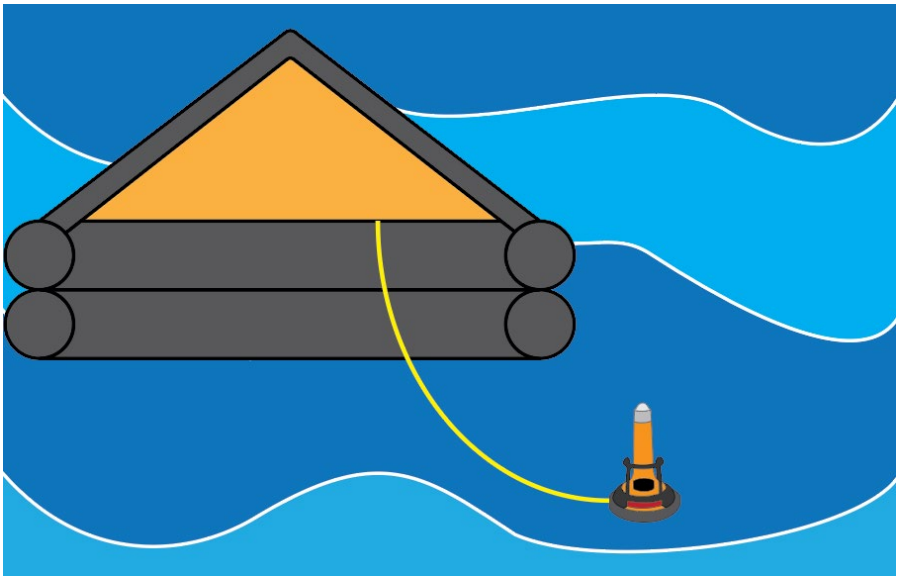
The transmission will continue until the EPIRB is lifted out of the water and dried off.

5.3.2 Water activation

The EPIRB is designed to automatically activate when deployed into water.

An internal safety function will prevent inadvertent activation caused by moisture, sea spray etc. when located in the bracket.

5.4 Operating scenarios



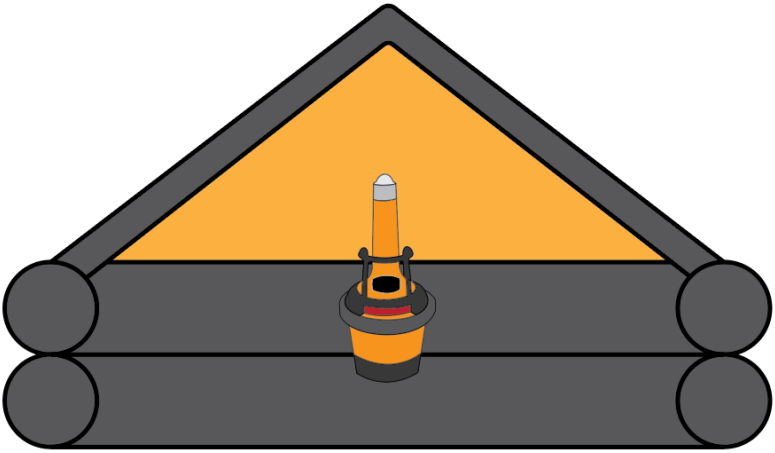
The EPIRB is designed to give the best distress signal performance when floating in the sea, but there may be situations where the EPIRB is activated

elsewhere. To optimize the performance in these situations please follow the following instructions.

WARNING

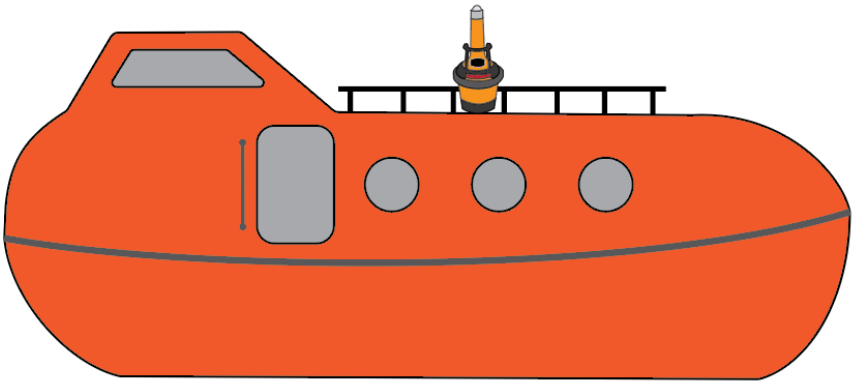
Do not obstruct the GNSS antennas view to the sky

5.4.1 In life raft



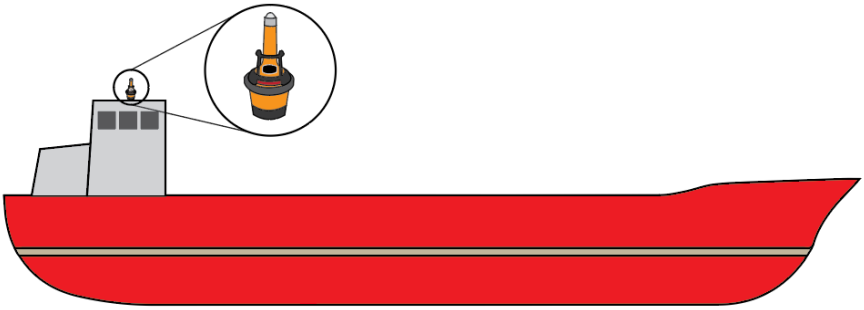
- Try to keep the EPIRBs view of the sky unobstructed.
- It is not recommended to operate the EPIRB under the life raft cover.
- Keep the antenna facing upwards.

5.4.2 In lifeboat



- Try to keep the EPIRBs view of the sky unobstructed.
- It is not recommended to operate the EPIRB under the lifeboat canopy.
- Keep the antenna facing upwards.

5.4.3 Onboard ship



- Keep the EPIRB in an open space.
- Do not place the EPIRB inside, under a roof or other overhead obstructions.
- Do not tie the lanyard to the ship.
- Keep the antenna facing upwards.

5.5 Self-test

Self-tests shall be performed regularly to verify that the EPIRB is working correctly. A self-test will use battery power, so please follow the recommendations in Chapter 6 for self-test intervals.

5.5.1 Normal self-test

1

2

To start the self-test, move the switch to test position and hold until the test indicator light is on.

During the normal self-test, short test signals on 121.5 MHz, AIS and Cospas-Sarsat are transmitted. The test signals will not be recognized as distress signals. While transmitting the test signals the battery and the transmitted signals are tested.

The test indicator will give a short dark period every time a signal is transmitted.

If the RLS protocol is enabled the blue RLS indicator light will light up for approximately 1 second.

The top light will flash once if the self-test is successful.

If the self-test detects a fault in the EPIRB module, the test indicator light will start blinking at the end of the test. For fault codes see the table in section 5.5.3.

	GNSS indicator	RLS indicator	Test indicator	Top flash
Self-test started	-	-	On	-
Test signals are transmitted	-	-	Multiple short dark periods	-
RLS enabled *	-	On for 1 second	-	-
Self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure	-	-	Multiple blinks ** (See 5.5.3)	-
*For EPIRBs with RLS disabled the RLS indicator will remain dark				
**See table in section 5.5.3 for details on failure indications				

5.5.2 Extended self-test

The extended self-test includes a GNSS test in addition to the normal self-test. To perform the extended self-test, do the following 3 steps within a period of 3 seconds:

1 2 3

1. Move the switch to test position
2. Release to middle position
3. Move the switch to test position and release when the white test indicator lights up.

The white test indicator light will light up and the green GNSS indicator light will start blinking in sequences of 3 fast blinks. This indicates that the EPIRB is searching for a validated position.

When a valid position is found the green GNSS indicator light will remain lit for approximately 1 second and a normal self-test will continue.

The top light will flash once at the end of the text if the extended self-test is successful.

If the self-test detects a fault in the EPIRB module, the test indicator light will start blinking at the end of the test. For fault codes see the table in section 5.5.3.

Note that the extended self-test can only be performed 60 times. After that the self-test will indicate “Maximum number of extended self-tests exceeded”.

	GNSS indicator	RLS indicator	Test indicator	Top flash
Extended self-test started	-	-	On	-
Waiting for GNSS fix	Triple blinks	-	-	-
GNSS fix achieved	On for 1 second	-	-	-
Self-test started	-	-	On	-
Test signals are transmitted	-	-	Multiple short dark periods	-
RLS enabled *	-	On for 1 second	-	-
Extended self-test successful	-	-	-	One flash
If one of the above tests are unsuccessful, the remaining test sequences will not be performed, and the test indicator will indicate self-test failure.				
Self-test failure			Multiple blinks** (See 5.5.3)	
*For EPIRBs with RLS disabled the RLS indicator will remain dark				
**See table in section 5.5.3 for on failure indications				

5.5.3 Test failure indications

Number of blinks	Failure indication
2	Battery failure (PIE failure)
3	Transmitter failure
4	-
5	No GNSS fix
6	-
7	Maximum number of extended self-tests exceeded
8	-
9	-
10	Other faults

5.5.4 Test failure descriptions and corrective actions

5.5.4.1 Battery failure (PIE failure)

This indicates that there is something wrong with the battery, and correct operation can't be guaranteed anymore. Contact a service partner for replacing the battery immediately.

5.5.4.2 Transmitter failure

This indicates that the RF-signal transmitted from the Beacon is not good and is most probably because the antenna is too close to conductive material, like metal, or you are holding your hand around the antenna. Place the Beacon on a free space around (minimum 30 cm) and try again. If this does not help, please contact your service partner.

5.5.4.3 No GNSS fix

The GNSS needs free view of the sky to get a position within the timeout. Windows and canopies will also reduce the signals from the satellites. Place the Beacon on a place with free space around (minimum 30 cm) and with a free view of the sky and try again. IF this does not help, please contact your service partner.

5.5.4.4 Maximum number of extended self-tests exceeded

The extended self-test uses much current and is therefore limited in number. The Beacon will continue to operate as normal in emergency mode and you can still perform normal self-test.

However, verification of the GNSS is not possible until the battery is replaced. Contact a service partner for replacing of the battery.

5.5.4.5 Other faults

Something is wrong with the configuration of the Beacon. Contact a dealer or service partner immediately.

THE BEACON WILL NOT WORK PROPERLY UNTIL THIS ERROR IS FIXED

5.5.5 Testing of the AIS locating signal

During standard self-test mode, the EPIRB will transmit two text messages with the 15HEX ID in one message and the text EPIRB TEST in the other message.

When doing GNSS self-test the position messages are also output together with the text messages.

Normally AIS stations will suppress AIS SART test messages but can be placed in a mode that will display the test information. If an AIS installation is going to be used to verify AIS SART test messages, please consult the equipment manual of the AIS system for more information about this.

If an AIS station is used to verify the test mode, it must enter a special mandatory mode. Consult the instruction manual for the AIS installation for more information about this.

5.6 Deactivation of the EPIRB

If the EPIRB has been accidentally activated or to deactivate it after use, remove it from the water and move the switch back to its middle position. Note that it can take up to 15 seconds before the top flash stops blinking.

5.7 EPIRB control functions

Control position		EPIRB condition		EPIRB mounted IN / OUT of bracket		Transmitter status	
ON	READY	WET*	DRY	OUT	IN	ON	OFF
X		X		X		X	
X		X			X	X	
X			X	X		X	
X			X		X	X	
	X	X		X		X	
	X	X			X		X
	X		X	X			X
	X		X		X		X
*Floating or immersed in water.							

5.8 False alerts

False alerts are a serious problem for the rescue service. Nearly 90% of EPIRB initiated distress alerts turn out to be false alarms. Take the following precautions to prevent inadvertent activation:

- Make sure that the EPIRB is correctly mounted in the bracket.
- Keep the EPIRB dry when its not mounted in the bracket.
- Keep the EPIRB away from strong magnetic fields.

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 MCC 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 characters UIN).
- Position at time of activation.
- Date and time of activation (Time zone).
- Date and time of deactivation (Time zone).
- Position at time of deactivation.
- Beacon make and model.
- Vessel Name/ID.
- Circumstances/cause of activation (if known).

5.8.1 In the 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

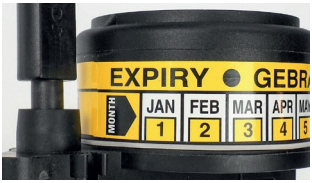
6 Testing and maintenance

To ensure reliability and to minimize the risk of false distress alerting it is important that the EPIRB must undergo testing and maintenance as described in this chapter.

6.1 Every month

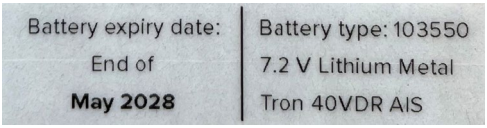
- Perform self-test (see chapter 5.5)
- Visual inspection:
  - Make sure that nothing prevents the release function of the EPIRB.

- Check for defects on the EPIRB and its bracket
- Make sure that the bracket is not covered by paint or any other chemicals.
- Check that the lanyard is firmly attached to the EPIRB, and not tied to the vessel or any other objects.
- Check the expiry dates of the battery and the HRU. The hydraulic release unit expires at the end of the indicated month.



Expiry month location

Expiry year location



6.2 Every 3 months

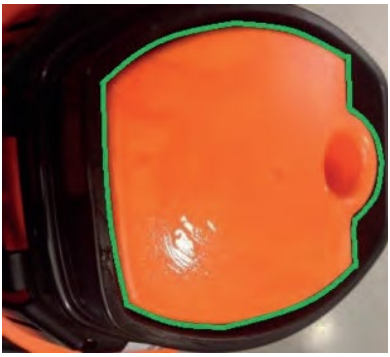
- Perform an extended self-test. See chapter 5.5.2

6.3 Every 12 months

The Tron 40VDR AIS is under the regulation of the IMO MSC.1/Circ 1040 rev 1, which requires annual testing performed by authorized radio-surveyor or authorized personnel trained and certified by Jotron.

Additional requirement for testing (IMO MSC.1/Cir. 1222):

- Remove and clean old grease from both the docking and the storage module.
- Apply a thin layer of grease evenly in the areas inside the green borders marked in the figure below. Use Jotron silicon grease (P/N: 100946 or 88237)



WARNING

Too much grease may have a negative effect on the VDR performance

6.4 Every 2nd year

- Replace the HRU including the plastic bolt. See chapter 6.7 for description
- Mark a new expiry date on the HRU label

6.5 Every 4 or 5 years

Perform complete SBM service or replace the complete EPIRB. See chapter 6.8

The interval is 4- or 5-years dependent on the flag-state administration.

6.6 Every 10 years

Jotron strongly recommends replacing the EPIRB, the VDR storage unit, the float-free bracket and the docking station after 10 years.

6.7 Hydrostatic release unit replacement

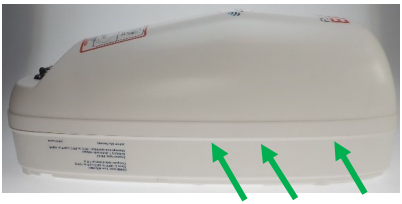
1

2

3

4

5



6

1. Release and remove the bracket front cover.
2. Remove the EPIRB from the bracket.
3. Press down and hold in place the spring-loaded bracket plate and remove the hydrostatic unit by sliding it out of its locking slot.
4. Install the new hydrostatic unit while continuing holding down the spring-loaded bracket plate and sliding the unit into its locking slot.
5. Mount the EPIRB in the bracket. See chapter 4.5 for instructions.
6. Verify that there is no gap between the bracket and cover.

WARNING

Only Jotron HRU kit is acceptable for use. Any use of counterfeit spare parts will invalidate the product type approval certificates, and warranty will not apply.

6.8 Shore based maintenance (SBM)

Shore-based maintenance of EPIRBs should be carried out in accordance with IMO guidelines as set out in MSC/Circ.1039 as amended.

Satellite EPIRBs may have mandatory requirement of Shore Based Maintenance (SBM) either by IMO SOLAS or national requirements at intervals specified by flag administration, not exceeding 5 years.

SBM shall be performed latest by the date indicated on the SBM label on the EPIRB, by Jotron SBM approved Partner.

The SBM label is located at the battery housing, and is shown in the figure below:

2026	2027	2028	2029	2030	2031	2032
Service or SBM shall be performed at the end of the indicated month, and within battery expiry date.			Serviced by:			

1	2	3	4	5	6	7	8	9	10	11	12

Only trained personnel certified and authorized by Jotron can perform battery replacement and SBM on the Tron 40VDR AIS. In addition, an approval is needed from the VDR manufacturer.

7 Technical information

7.1 General

Tron 40VDR AIS:	
EPIRB Class:	Class 2
- Operating temperature:	-20° C to 55° C (-4° F to 131° F)
- Stowage temperature:	-30° C to 70° C (-22° F to 158° F)
EPIRB Category:	Category 1 - Float-free automatically activated EPIRB
EPIRB Group:	Group 3 - Includes AIS transmitter and 121.5 homing transmitter
Housing material:	Glass reinforced polycarbonate
Height:	397 mm
Width:	200 mm
Weight:	1.9 kg
Standard compass safe distance:	0.8 m
Steering compass safe distance:	0.6 m
Battery operating time:	More than 168 hours at -20° C
Lanyard length:	5 to 8 m
Lanyard tensile strength:	More than 25 kg

7.2 Cospas-Sarsat transmitter

Cospas-Sarsat transmitter	
Frequency:	406.031 MHz ±2 ppm
Output power:	5W ±2 dB
Protocols:	Maritime, Serialized, Radio Call Sign
Modulation	Phase modulation 1.1 ± 0.1 rad
Data encoding	Bi Phase L
Short term stability	Less than 2x10^-9
Medium term stability	Less than 10^-9
Residual noise:	Less than 3x10^-9
Bit rate:	400 b/s
Antenna:	Omni directional

7.3 GNSS receiver

Navigation device	
Supported GNSS constellations:	GPS, GLONASS, Galileo
Antenna polarization:	RHCP

7.4 Homing transmitter

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

7.5 AIS transmitter

AIS transmitter	
Frequency:	161.975 MHz (AIS 1) 162.025 MHz (AIS 2)
Output power:	1 W (30 dB ±3 dB)
Modulation:	GMSK
Stability:	±1 KHz
Antenna:	Omni directional

7.6 Brackets

7.6.1 FB-40 Float-free bracket

FB-40	
Material:	Glass reinforced ASA
Dimensions:	215 x 553 x 236 mm
Weight:	2.9 kg
Release mechanism:	Jotron HRU kit (part no. 86218)
Storage and operation temperatures:	-30° C to +65°C (-22° F to +149° F)

7.6.2 FBH-40 Float-free bracket with heating

FBH-40	
Material:	Glass reinforced ASA
Dimensions:	215 x 553 x 236 mm
Weight:	3.6 kg
Release mechanism:	Jotron HRU kit
Storage and operation temperatures:	-30° C to +65°C (-22° F to +149° F)

7.7 Battery information

Capacity:	7.2 V / 18 Ah. 5 years service life
Lithium metal content:	Below 1 gram per cell
Approximate weight:	51 g per cell
Chemical system:	Lithium metal

7.7.1 Hazard identification

Due to risk of fire or explosion the batteries shall not be short-circuited, recharged, punctured, incinerated, crushed, immersed, forcibly discharged or exposed to temperatures above the declared operating temperature range of the product. The Lithium-Thionyl Chloride batteries in this EPIRB are sealed units which are not hazardous when used according to the recommendations of the manufacturer. Under normal conditions of use, the batteries are hermetically sealed.

7.7.2 First aid measures

Ingestion:	Do not induce vomiting or give food or drink. Seek medical attention immediately: In the USA: Call National Battery Ingestion Hotline (202-625-3333)
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.

7.7.3 Fire fighting measures

In case of fire where lithium batteries are present, flood area with water or smother it with a Class D fire extinguishant appropriate for lithium metal. For example, Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of the fire. Burning batteries will burn themselves out. Almost 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 a self-contained berating apparatus. Burning lithium-iron disulfide batteries produce toxic and corrosive lithium hydroxide fumes and sulfur dioxide gasses.

7.7.4 Handling and storage

Store in a cool, well ventilated area.

WARNING	If this Beacon is kept above room temperature for prolonged periods of time then the battery capacity will be degraded and either the battery should be replaced earlier than the date stated on the beacon, or the quoted 48 hour operating life of the beacon may be reduced. The effect is more pronounced as the temperature increases

In locations that handle large quantities of lithium batteries, such as a warehouse, lithium batteries should be isolated from unnecessary combustibles.

WARNING	The battery can explode or leak and cause burns if it is disassembled, charged, installed with reversed polarity, or exposed to water, fire or high temperatures.

7.8 Cospas-Sarsat system

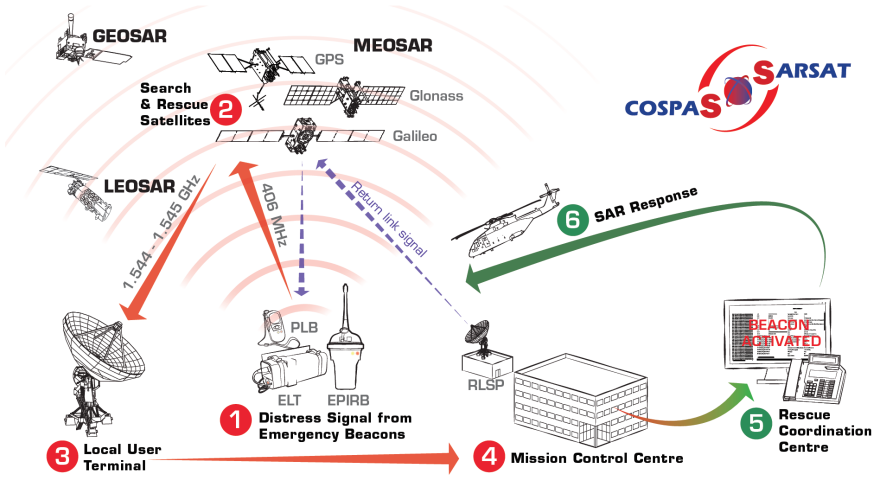
Cospas-Sarsat is a system that is created to detect and locate emergency beacons activated by aircrafts, ships and people in remote areas.

The 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 tens of thousands persons have been rescued.

The system consists of:

- Satellites in low-altitude earth orbit (LEOSAR), geostationary orbit (GEOSAR) and medium latitude earth orbit (MEOSAR), that process and/or relay signals transmitted by beacons.
- Local user terminals (LUT) that receives and processes the signals from the satellites.
- Mission control centers (MCC) that distributes the signals to the appropriate search and rescue authorities.

Each EPIRB is programmed with its own unique code in the system. Therefore, it is important that the ships data that was given to the dealer where the EPIRB was obtained is correct. It is also important that your EPIRB is registered in the database for the applicable country. This database is normally located in the same country as the ship is registered.



When the Tron 40VDR AIS is activated (1), the next passing satellite (2) will detect the transmitted signal and relay it to an antenna at a LUT (3). The signal will be routed from the LUT to an MCC (4). The MCC will then relay the signal to the appropriate rescue coordination center (5) that will organize the rescue operation (6).

7.9 AIS system

The EPIRB is capable of transmitting alert messages compatible with the Automatic Identification Systems (AIS) found onboard all SOLAS vessels and many other vessels. The transmission of these signals starts automatically after activation of the EPIRB. A burst consisting of eight messages are transmitted each minute with position velocity and course. These messages are received and plotted on AIS systems. They are distinguished from other vessels and are given special priority and alarm status. Once every 4 minutes a special text message containing the 15 HEX ID of the EPIRB and the text “AIS SART ACTIVE” is transmitted. These messages will be displayed immediately when received by an AIS installation.

7.10 121.5 MHz homing signal

The EPIRB transmits a sweep tone homing signal on 121.5 MHz that can be detected by overflying airplanes and the SAR vessels.

7.11 GNSS

The EPIRB has a built in GNSS receiver capable of receiving signals from GPS, GLONASS and Galileo GNSS satellite systems. The position fix is normally accurate to a few meters and is encoded by the message generator of the EPIRB and transmitted to the Cospas-Sarsat satellites. The resolution of the transferred fix is somewhat limited compared to the original GNSS fix. The uncertainty is about 500m. The GNSS position fix and the position calculated by the Cospas-Sarsat system itself will together give a precise indication of the actual position.

When it comes to AIS homing the position format will reflect the GNSS position fix without any performance degradation. The accuracy will typically be approximately 2.5m. The position fix is updated each 5 minutes for both Cospas-Sarsat messages and AIS messages and reflected in the next transmission.

7.12 RLS system

This beacon has the Return Link Service (RLS) feature. The RLS feature is an indication on the beacon (see beacon user's manual) that confirms to the beacon user that the distress signal from an activated beacon has been localised by the Cospas-Sarsat system and is being sent to the responsible search-and-rescue (SAR) authorities. It does NOT mean that a search and rescue has yet been organized/launched, only the fact that the distress alert has been received and is being routed to the appropriate SAR agencies.

The RLS is designed to send an acknowledgment to the EPIRB user in less than 30 minutes from beacon activation. Because this RLS performance still is under development, prior to around 2021 the acknowledgment to the beacon user may take somewhat longer than 30 minutes in certain parts of the world. Alerting of the distress to SAR authorities is independent of (and likely will occur before) the RLS acknowledgment indication on the beacon. This specification is described in the Galileo SAR Service Definition Document:

(https://www.gsceuropa.eu/sites/default/files/sites/all/files/Galileo-SAR-SDD.pdf).

You may visit the web page Countries Allowing RLS Beacons (https://cospassarsat.int/en/beacon-ownership/rls-enabled-beacon-purchase) to learn the most recent information about regional/global support for RLS.

8 Spare parts, warranty and disposal

8.1 Accessories and spare parts

For an overview of the available spare parts for this product, refer to the product information page on jotron.com or contact your sales partner.

8.2 Counterfeit spare parts

Jotron is aware of extended counterfeit spare parts being marketed and sold to fit GMDSS safety products. It is of extreme importance that any spare parts being fitted to this product are original spare parts, manufactured or approved by Jotron. Any use of counterfeit spare parts will invalidate the product type-approval certificates and warranty will not apply.

8.3 Warranty and service

All Jotron products are warranted against factory defects in materials and / or workmanship during the warranty period, unless otherwise is stated in writing. Please refer to the terms and conditions of your sales agreement for additional information.

The warranty period for a new Tron 40VDR AIS is 5 years from the date the product is shipped from Jotron. If you have questions about your product's warranty period, please contact your sales partner.

During this warranty period Jotron will repair or, when necessary, replace the product at no cost, including the costs of labor, materials and return transportation from Jotron or a Jotron subsidiary (according to delivery terms: DAP Incoterms 2010 by regular freight to "place" (airport)).

Jotron reserves the right to decide whether a defective product falls within the terms and conditions of the warranty.

The warranty is only valid if service and battery replacement have been carried out by an authorized Jotron agent or distributor. In addition, the warranty will not apply in the instance that the product has been accidentally damaged, misused, tampered with and/or is dysfunctional as a result of services or modifications performed by and unauthorized person or in an unauthorized facility.

Jotron is not liable for consequential or special damages and cannot be held responsible for any damages caused due to incorrect usage of the equipment, breach of procedures, or the failure of any specific component or other part of the equipment.

WARNING

Use of any counterfeit spare parts will invalidate your warranty.

For updated warranty and service details, please see jotron.com

For product support contact: support@jotron.com

NOTE

Keep the original packing material as it is required if the EPIRB is shipped for service. Special hazardous goods requirements apply for packaging and labelling when shipping batteries.

8.3.1 Transportation

The Tron 40VDR AIS contains Lithium batteries that are subject to transport regulations. Please see the documents listed under “dangerous goods” in the download section on the description of Tron 40VDR AIS on jotron.com for updated instructions on rules for transportation of the EPIRB.

8.4 Disposal

In order to prevent false alarms, it is important that the battery is removed from the EPIRB when it has reached the end of its life.

All parts of the EPIRB should be disposed of in a way that is not harmful for the environment. It should not be disposed as normal waste and must be handled in accordance with the applicable federal, state and local waste disposal regulations in the country where the equipment is used.

See jotron.com for updated instructions on disposal.

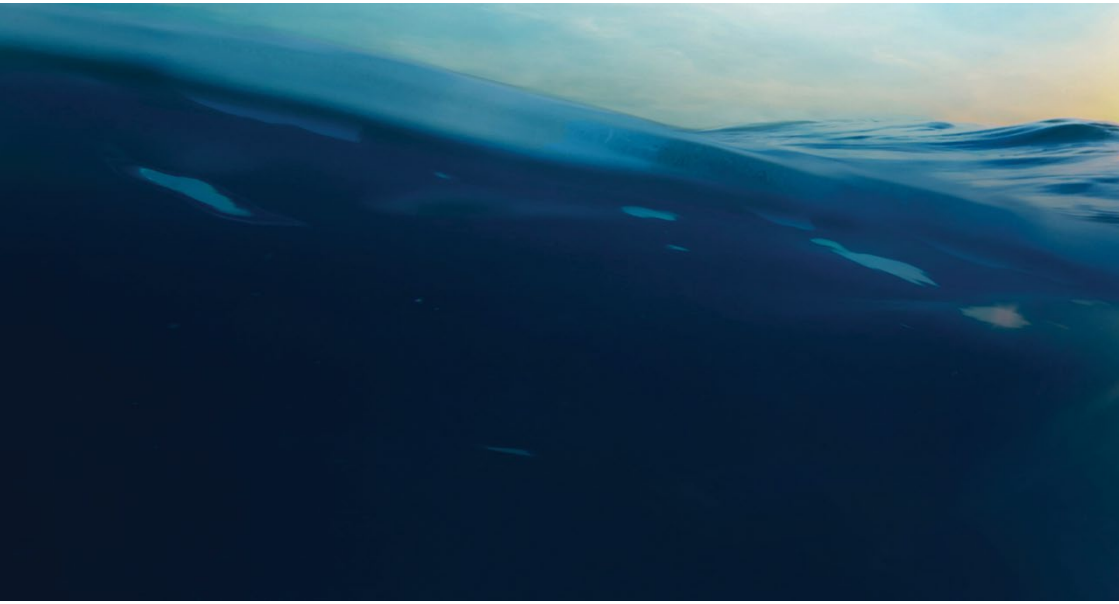
9 Abbrevations and definitions

Abbreviatons	
AIS	Automatic Idendification System
COMSAR	Committee on Radiocommunications and Search and Rescue
COSPAS	COsmichskaya Sistyema Poiska Avariynich Sudov (Space System for the Search of Vessels in Distress)
EPIRB	Emergency Position Indicating Radio Beacon
GEOSAR	Geostationary Search And Rescue
GMDSS	Global Maritime Distress and Safety System
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
LED	Light Emitting Diode
LEOSAR	Low Earth Orbiting Search And Rescue
LUT	Local User Terminal (Ground Station)
MCC	Mission Control Centre
MEOSAR	Medium Earth Orbiting Search And Rescue
MHz	Megahertz
NOAA	National Oceanic and Atmospheric Administration (USA)
PIE	Potentially Insufficient Energy
RCC	Rescue Coordination Centre
RLS	Return Link Service
SAR	Search And Rescue
SARSAT	Search And Rescue Satellite Aided Tracking System

SBM	Shore Based Maintenance
SOLAS	Safety of Life at Sea (An international maritime safety treaty)
VDR	Voyage Data Recorder

10 Ammendment records

Rev	Date	Reason for Issue	Author
A	10.06.21	First release	EJ
B	15.09.21	Updated chapter 3.1.6 and tables in 5.5.1 and 5.5.2	EJ
C	27.09.21	Corrected wrong reference	EJ



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