



KONGSBERG

cNODE Maxi 31 Ex d
Transponder
Instruction Manual

390755/G

May 2022 © Kongsberg Maritime AS

Document information

- **Product:** Kongsberg cNODE Maxi 31 Ex d
- **Document:** Instruction Manual
- **Document part number:** 390755
- **Revision:** G
- **Date of issue:** 3 May 2022

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact Kongsberg Maritime's support organisation. You can also contact us using the following address: km.support.hpr@kongsberg.com. If you need information about our other products, visit <https://www.kongsberg.com/maritime>.

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About this manual

This manual includes all necessary documentation to safely install, operate and maintain the system.

Target audience

This manual is intended for all users of the system.

Online information

All end-user documentation can be downloaded from our website.

<https://www.kongsberg.com/maritime/>

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EX related document

No modification permitted without reference to the KM EX responsible.

cNODE Maxi 31 Ex d

Topics

[Important, page 7](#)

[System description, page 7](#)

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Important

Working in an explosive atmosphere, there are some things you must be aware of.

WARNING

Explosion proof cNODE transponders do not have the same batteries as other cNODE Maxi transponders and can not be interchanged.

The batteries must never be changed in an explosive environment.

Read the lithium batteries safety procedure before handling batteries.

System description

These transponders are designed to be used in an explosive atmosphere.

The transponders complies with the following directive:

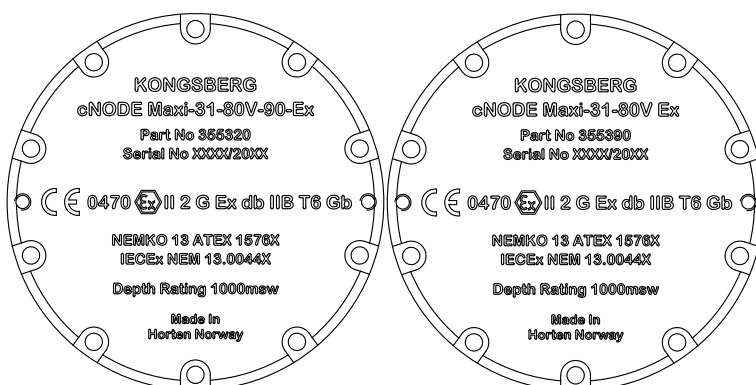
- ATEX Directive – 2014/34/EU

The transponders complies with the following standards:

- IEC 60079-0:2017, 7th Edition, EN IEC 60079-0:2018, Explosive atmospheres - Part 0: Equipment - General requirements
- IEC 60079-1:2014, 7th Edition, EN 60079-1:2014, Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
- IEC 60086-1:2015, Primary batteries - Part 1: General

The transducer and end cap are made of titanium. The tube and all fasteners are made of Super Duplex stainless steel.

The bottom end cap is engraved with information about the safety standards.

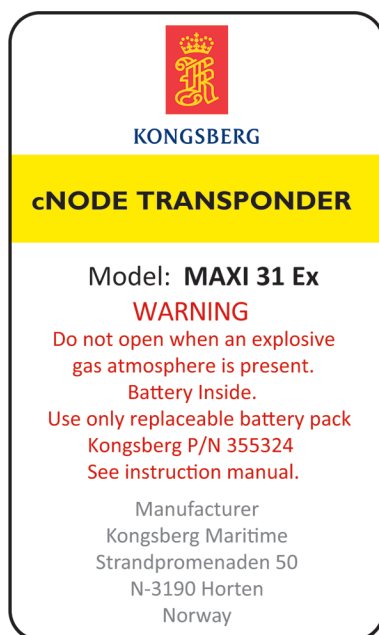


Special conditions of use

The transponder will be installed in an explosive atmosphere. It is very important to read and understand the instructions for the use of this transponder and its atmosphere.

Important conditions in explosive atmospheres

- Fit the transponder properly before operation as this will avoid the ignition hazard due to impact or friction.
- Ground the transponder according to local regulations for such conditions.
- Never open a transponder in an explosive atmosphere.



Note

Operational temperature is -5 to $+55$ °C.

Storage temperature is -30 to $+70$ °C

Maximum operational depth is 1000 m.

- 1 $-20 \leq T_{amb} \leq +55^{\circ}\text{C}$
- 2 Titanium content exceeded limit, more than 7.5%, avoid the ignition hazard due to impact or friction
- 3 Transponder must be earthed (by Installer). Fit the transponder to the brackets, at least one part of bracket must be metal in direct contact with transponder tube.

Keep the equipment connected to equipotential bonding facility when operate in hazardous area

- 4 Special fasteners used to fix together Main Tube, Bottom End Cap and Top End Cap with Housing TD80V are made from super-duplex stainless steel with minimum yield stress 550 MPa

General supply conditions

General supply conditions apply to this cNODE Maxi 31 Ex d delivery.

Receipt, unpacking and storage

Upon accepting shipment of the equipment, the shipyard and/or the dealer must ensure that the delivery is complete and inspect each shipping container for evidence of physical damage.

If the inspection reveals any indication of crushing, dropping, immersion in water or any other form of damage, the recipient should request that a representative from the company used to transport the equipment be present during unpacking.

All equipment must be inspected for physical damage, i.e. broken controls and indicators, dents, scratches etc. during unpacking. If any damage to the equipment is discovered, the recipient must notify both the transportation company and Kongsberg Maritime so that Kongsberg Maritime can arrange for replacement or repair of the damaged equipment.

Once unpacked, the equipment must be stored in a controlled environment with an atmosphere free of corrosive agents, excessive humidity or temperature extremes.

The equipment must be covered to protect it from dust and other forms of contamination when stored.

Equipment responsibility

Unless otherwise stated in the contract, the shipyard doing the installation and/or equipment dealer becomes fully responsible for the equipment upon receipt.

The duration of responsibility cover:

- The period of time the equipment is stored locally before installation
- The entire installation process
- Commissioning
- The period of time between commissioning and the final acceptance of the equipment by the end user or owner

Unless other arrangements have been made in the contract, the Kongsberg cNODE Maxi 31 Ex d warranty period (as specified in the contract) begins when the acceptance documents have been signed.

Support information

Should you need technical support for your cNODE Maxi 31 Ex d system you must contact a Kongsberg Maritime office. A list of all our offices is available on our website. You can also contact our main support office in Norway.

Manuals and technical information can be downloaded from our support website.

Company name	Kongsberg Maritime AS
Address	Strandpromenaden 50, 3183 Horten, Norway
Telephone	+47 33 03 41 00
Telephone 24h support	+47 33 03 24 07
Website	https://www.kongsberg.com/maritime/
Support website	Product support A to Z
Email address	km.support.hpr@kongsberg.com

General acoustic considerations

Take this information into consideration when deploying the transponders.

Acoustic range

The depth rating should not be confused with acoustic range. The acoustic range is dependent on many factors, and some of the factors are outside control of the user.

Vessel system

The directivity and coverage area for the vessel system is different, depending on which system you are using. Some systems have high directivity and omnidirectional coverage, while other systems has reduced coverage and less directivity. The transponder should always be within the coverage cone of the vessel system.

Transducer type

There are different types of transducers used on the transponders. An omnidirectional transducer, such as TD180, covers a large area, but has less acoustic power compared to a focused transducer, such as TD30V. A focused signal gives less footprint/coverage. The vessel should always be within the signal footprint of the transponder.

Tx Power

The ability to detect signals depends on the signal strength. The transmission power can be adjusted, both for the vessel system and for the transponder.

Acoustic noise

Acoustic noise is present at all vessels. At given conditions, the noise level can be excessive. Acoustic noise is caused by main propellers and thrusters, and in some instances also from machinery and/or pumps on board. Heavy propeller/thruster use or also waves can also generate air bubbles, which can get in front of the vessel transducer and block the acoustic signal.

Sound velocity and ray bending

Changes in sound velocity through the water column caused by changes in the water temperature and/or salinity can bend the acoustic signal and make it impossible to reach the vessel.

Getting started

Topics

[Turning on the transponder, page 14](#)

[Closing the transponder, page 15](#)

[Turning off the transponder, page 16](#)

[Pre-deployment checks, page 16](#)

Turning on the transponder

The transponder is designed for operation in water only. The transponder may be operated in air for test purposes over a short period of time.

Prerequisites

For safety reasons, the transponder is delivered with the battery separately. The battery must be inserted and connected before the transponder is deployed.

The following specific tool is required for this task:

- 5 mm Hex key

Procedure

- 1 Remove the bolts that fastens the transducer.
- 2 Remove the transducer by using the extractor holes.
- 3 Remove the transport plug.
- 4 Insert the new battery.

Note

Make sure you insert a battery labelled cNODE Ex battery.

Inserting the battery at an angle makes this easier. Press firmly to make sure the battery is properly inserted.



- 5 Switch the on/off switch inside the top to on.



Further requirements

Closing the transponder is the next step.

[Closing the transponder, page 15](#)

Closing the transponder

Closing the transponder requires special attention. It is very important that the transponder is properly closed and watertight before it is submerged.

Prerequisites**WARNING**

Do not open when an explosive atmosphere is present.

Make sure the battery is labelled cNODE Ex battery. Make sure the on/off switch is switched on.

The following specific tool is required for this task:

- 5 mm Hex key
- Torque wrench

Procedure

- 1 Replace the transducer.
- 2 Inspect the bolts.
If they have no damage they can be used again. New bolts must be of the same grade; Super-duplex with minimum yield stress 550 MPa.
- 3 Clean the bolts and the hole threads.
- 4 Spray Loctite activator 7649 on the bolt's threads.
- 5 Add a drop of Loctite 243, threadlock to the lower part of the threads in the tube.
- 6 Fasten the bolts with a torque of 9.4 Nm.

Turning off the transponder

This will leave you with the transponder turned off and not using up the battery.

Prerequisites

WARNING

Remove the battery when storing the transponder for a longer period (months).

[Opening the transponder, page 21](#)

The following specific tool is required for this task:

- 5 mm Hex key

Procedure

- 1 Remove the bolts that fastens the transducer.
- 2 Remove the transducer by using the extractor holes.
- 3 Switch the on/off switch inside the top to off.
- 4 Remove the battery.

Pre-deployment checks

Before deploying the transponder, it is important to do the following checks to make sure the operation goes smoothly.

Prerequisites

Note

Do not open when an explosive atmosphere is present.

Procedure

- 1 Record the transponder serial number and channels.
- 2 Perform an acoustic test using a Transponder Test and Configuration (TTC) unit:
 - a Interrogate the transponder.
 - b Read battery status and confirm that it will last for the upcoming operation.
 - c Read the power setting and confirm it is correct for the upcoming operation.

Installing the cNODE Maxi 31 Ex d

Correct installation is essential for keeping the transponder safe in an explosive atmosphere.

Prerequisites

The pre-deployment checks must be completed before installation can begin.

Procedure

1 Mount the transponder with the transducer having a free line of sight.

2

Important _____

The transponder must be earthed.

Fit the transponder to the brackets.

At least one part of the bracket must be metal in direct contact with the transponder tube.

3 Fit the transponder in such a way that the transducer does not move.

The transducer must be at least 0.2 mm from any metal surface to avoid the ignition hazard due to impact or friction.

Operating procedures

The transponder is operated from the HiPAP operator station APOS.

- Refer to APOS online help for descriptions.

Maintenance

Topics

[Recovering the transponder, page 20](#)

[Cleaning the transponder, page 20](#)

[Opening the transponder, page 21](#)

[Changing the battery, page 21](#)

[Closing the transponder, page 15](#)

Recovering the transponder

Always read the emergency procedures before handling lithium batteries.

Context

Avoid slamming the transponder against solid objects as it is lifted out of the water.

Procedure

- 1 Check the transponder's temperature
If the transducer is overheated go directly to the emergency procedures.
- 2 Place the transponder in a safe place out on deck, shielded from people and vital equipment.
- 3 Control the transponder for minimum two hours.
Check for damages that could involve a water leakage and check the housing temperature for a possible temperature increase in the lithium battery.
For batteries with possible damages, go to the emergency procedures chapter.
- 4 Wash the unit thoroughly in warm fresh water to dissolve any salt deposits and clean off any sand or silt.
- 5 As an extra precaution, it is recommended that the unit is left to soak in fresh water to allow salt to dissolve and diffuse from hard-to-reach areas, such as crevices between mating parts.
- 6 Dry off, so no water can come inside when opening.
- 7 Turn the transponder off and store the batteries outside the housing if the transponder is not used for some time.

Cleaning the transponder

The transponder must be cleaned after use.

Procedure

- 1 Remove any growth and dirt with a stiff brush, or with a wooden scraper or with a plastic scraper.
Be careful not to damage the unit.
- 2 Clean the unit thoroughly with a lot of fresh water.
- 3 Dry off, so no water can come inside when opening.

Opening the transponder

Always read the emergency procedures before handling lithium batteries.

Prerequisites

WARNING

Do not open when an explosive atmosphere is present.

A battery malfunction may have caused high pressure to build up inside the transponder.

You must never stand in front of, or at the back of the unit, when you open it. Open the transponder in a safe place out on the deck, shielded from people and vital equipment.

Use a full face mask with minimum BE-filter, and protective equipment made of rubber or plastic.

The unit must be cleaned and dried before opening, so that no dirt or water seeps into it when it's opened.

The following specific tool is required for this task:

- 5 mm Hex key

Procedure

- 1 Remove the bolts that fastens the transducer.
- 2 Remove the transducer by using the extractor holes.
- 3 Inspect all visible O-rings for damage.
- 4 Replace the visible O-rings that are damaged or used for more than a year.

There are 2 O-rings 107.32 x 5.33 under the transducer.

There is 1 O-ring 112.0 x 4.0 over the chassis.

- 5 Make sure the mating surfaces and the O-rings are completely clean.
- 6 Wipe a thin film of silicone grease over the rings and mating surfaces.

Use Parker Super O-lube or similar grade grease.

Changing the battery

The battery is not rechargeable and needs to be replaced when empty.

Prerequisites

The transponder must be opened to change the battery.

Opening the transponder, page 21

Caution

Read the lithium batteries safety procedure before handling batteries.

Do not connect the + and – electrodes on the batteries with metal or wire.

Procedure

- 1 Remove the spent battery.
- 2 Insert the new battery.

Caution

Make sure you insert a battery labelled cNODE Ex battery.

Inserting the battery at an angle makes this easier. Press firmly to make sure the battery is properly inserted.



Result

Closing the transponder is the next step.

Closing the transponder

Closing the transponder requires special attention. It is very important that the transponder is properly closed and watertight before it is submerged.

Prerequisites

WARNING

Do not open when an explosive atmosphere is present.

Make sure the battery is labelled cNODE Ex battery. Make sure the on/off switch is switched on.

The following specific tool is required for this task:

- 5 mm Hex key
- Torque wrench

Procedure

- 1 Replace the transducer.
- 2 Inspect the bolts.
If they have no damage they can be used again. New bolts must be of the same grade; Super-duplex with minimum yield stress 550 MPa.
- 3 Clean the bolts and the hole threads.
- 4 Spray Loctite activator 7649 on the bolt's threads.
- 5 Add a drop of Loctite 243, threadlock to the lower part of the threads in the tube.
- 6 Fasten the bolts with a torque of 9.4 Nm.

Spare parts

Topics

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[Spare part kit, page 25](#)

[Transport plug spare part, page 25](#)

[TTC 30 spare part, page 25](#)

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Battery

- **Part name:** Battery cNODE Maxi Ex
- **Part number:** 355324



Spare part kit

- **Part name:** Spare part kit Maxi 31 Exd
- **Part number:** 480555

The spare part kit consists of:

- 4 x O-rings, 107.32 x 5.33 mm
- 2 x O-rings, 112.0 x 4.0 mm
- 20 x M6x16 DIN912 Super Duplex Bolts

Transport plug spare part

- **Part name:** Transport plug spare part
- **Part number:** 346211



TTC 30 spare part

- **Part name:** TTC 30 (Transponder Test and Configuration unit)
- **Part number:** 345775



Maxi 31–80V-Exd

- **Part name:** Maxi 31–80V-Exd
- **Part number:** 355390



Maxi 31-80V-90-Exd

- **Part name:** Maxi 31-80V-90-Exd
Part name: 355320



Technical specifications

Topics

[Materials, page 28](#)

[Performance specifications, page 28](#)

[Weights and outline dimensions, page 28](#)

[Power requirements, page 29](#)

[Environmental requirements, page 30](#)

Materials

This transponder is designed for use in an explosive atmosphere and the following materials are used:

Bolts and tube

Super Duplex stainless steel

Transducer, top end cap and bottom end cap

Titanium grade 5

Performance specifications

These performance specifications summarize the main functional and operational characteristics of the system.

Maxi 31 Exd

- **Depth range:** 1000 m
- **Operating frequency:** MF 21 – 31 kHz
- **Transducer beam:** 80 degrees
- **Source level:** 198 dB
- **Receiver sensitivity:** 85 dB

Weights and outline dimensions

These weights and outline dimension characteristics summarize the physical properties of the system.

Model	Height	Diameter	Weight in air	Weight in water
Maxi 31-80V-90-Exd	874 mm	164 mm	35.5 kg	25 kg
Maxi 31-80V-Exd	880 mm	139 mm	35.5 kg	25 kg

Power requirements

These power characteristics summarize the supply power requirements for the system.

Battery

- **Battery type:** Non-rechargeable Lithium, (Li/SOCl₂)
- **Battery voltage:** 14.4 VDC
- **Battery capacity:** 128 Ah
- **Cells per battery:** 48

Transponder

- **Input voltage:** 10–14.4 VDC
- **Power consumption:** 250 W, Maximum

Maxi 31 Exd Operating battery lifetime

Note

The lifetime ranges should be treated as approximations only. Calculations made should allow for standard deviation in battery manufacture.

- Quiescent battery lifetime: 913 days

Cymbal

Update rate	1 Seconds	2 Seconds	3 Seconds	4 Seconds	5 Seconds	10 Seconds
TX power level						
Minimum	95 days	101 days	102 days	103 days	104 days	105 days
Low	59 days	76 days	84 days	89 days	92 days	99 days
High	23 days	38 days	48 days	56 days	62 days	78 days
Maximum	6 days	11 days	16 days	21 days	25 days	40 days

FSK

Update rate	1 Seconds	2 Seconds	3 Seconds	4 Seconds	5 Seconds	10 Seconds
TX power level						
Minimum	167 days	172 days	174 days	175 days	175 days	176 days
Low	125 days	147 days	156 days	161 days	164 days	170 days
High	61 days	91 days	109 days	121 days	129 days	149 days
Maximum	18 days	34 days	46 days	57 days	66 days	96 days

Environmental requirements

These environmental specifications summarize the temperature and humidity specifications for the system.

Transponder

- **Operating temperature:** -5 to 55 °C
- **Storage temperature:** -30 to 70 °C

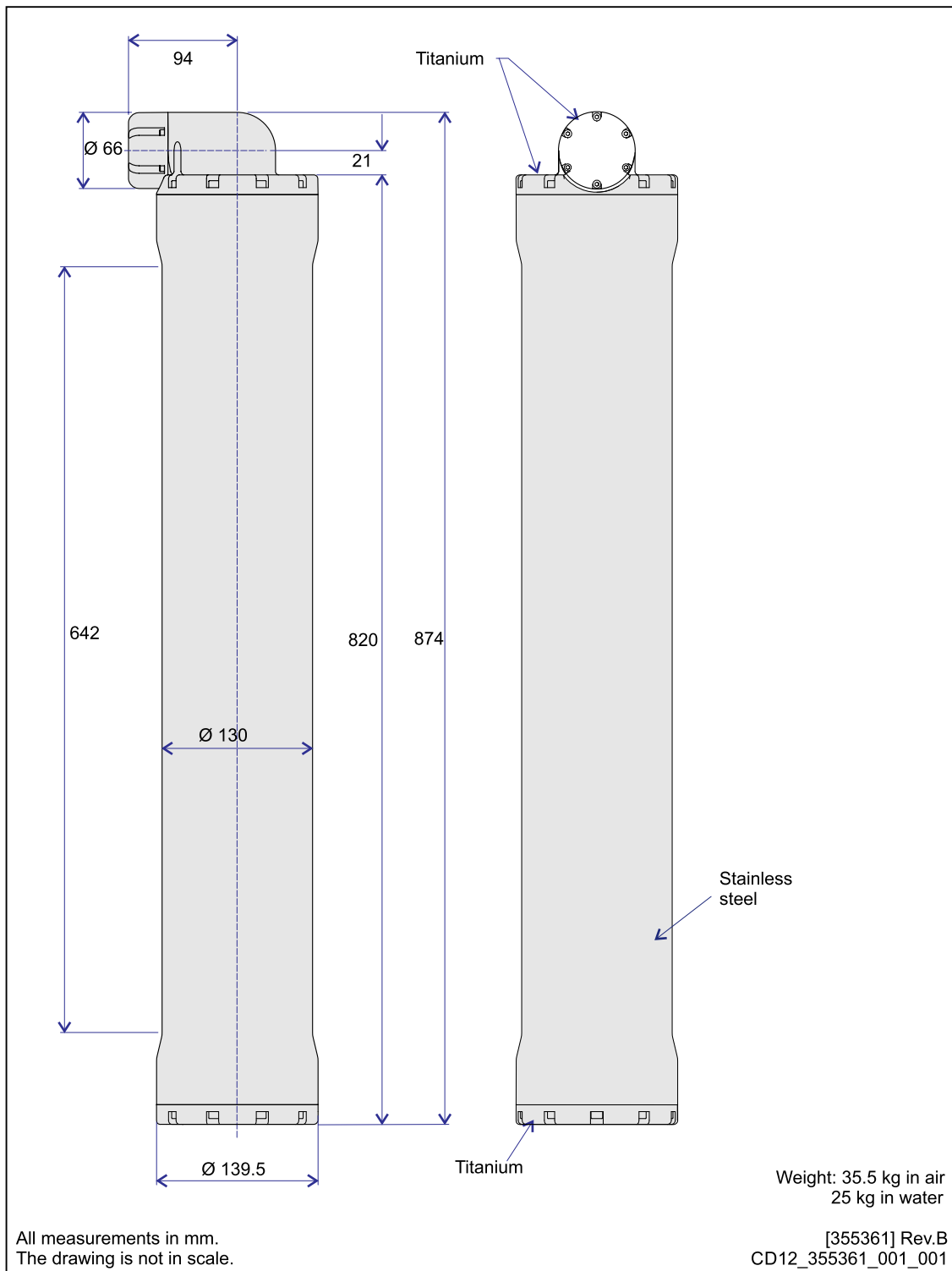
Drawings

Topics

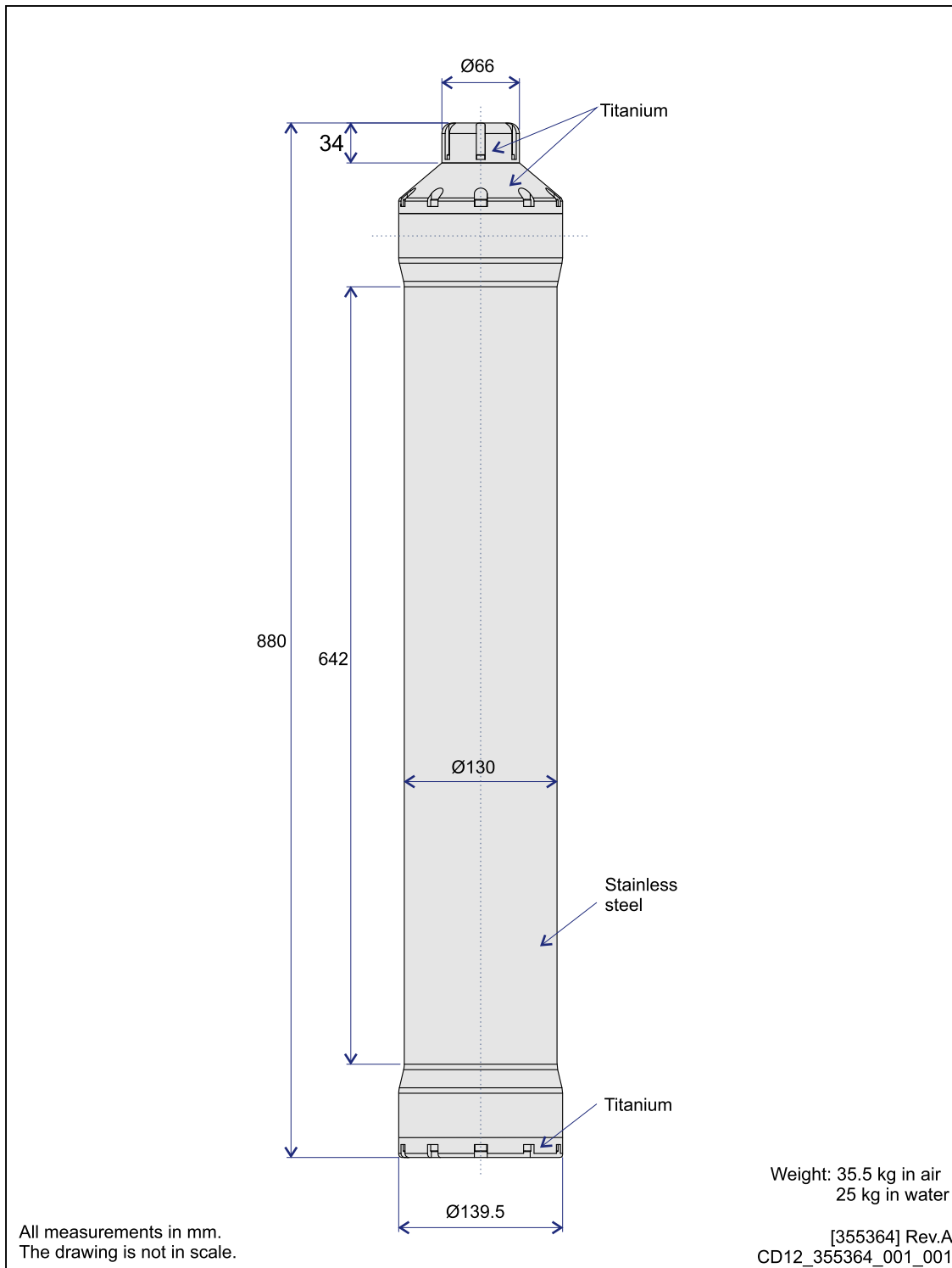
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cNODE Maxi 31-80V-90-Exd Outline dimensions



cNODE Maxi 31-80V-Exd Outline dimensions



Battery safety

Topics

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SECTION 1: Identification

The specification describes the technical parameters for the battery.

The battery is used in the following products:

- Maxi 31–80V-90–Exd
- Maxi 31–80V-Exd
- **Battery name:** L14.4 (48) Maxi Exd
- **Part number:** 355324
- **Battery weight:** 5.9 kg
- **Lithium weight:** 183 g
- **Manufacturer:** Kongsberg Maritime AS
- **Address:** Strandpromenaden 50, 3190 Horten, Norway
- **Telephone:** +47 33 03 24 07 (24 h)
- **Email address:** km.support.hpr@kongsberg.com
- **Website :** <https://www.kongsberg.com/maritime>

Note

The battery is a solid and sealed unit. The battery cannot be opened to reveal the individual cells.

SECTION 2: Hazards identification

The battery is not provided with any hazards identification. It is not classified as dangerous or hazardous with normal use.

Do not open, disassemble, crush or burn the battery. The battery contains dangerous ingredients. Exposure to the ingredients contained within the battery cells could be harmful. The battery cells include a barrier, preventing exposure to the user and environment. The battery cells are not classified as hazardous according to Regulation (EC) No. 1272/2008.

The chemicals in the battery cells are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact. The electrolyte solution can be corrosive and may cause irritation and burns.

Other hazards

- **External fire:** Internal pressure and thermal runaway may be the consequences if the cells inside the battery are exposed to temperatures above 85 °C.

- **Internal short circuit:** Internal short circuit in a cell. Destruction of the separator can cause a short circuit between the anode and cathode. Thermal runaway and fire is possible.
- **Water ingress:** Internal pressure, thermal runaway and chemical reactions may be the consequence.

SECTION 3: Composition

The battery is solid with a hard surface.

A battery pack consists of several individual cells that are electrically connected, both in series and parallel.

The battery packs have different number of cells, output voltages and power capacity. All transponder batteries include protection against short circuits (circuit breakers) and reverse current (diodes).

The lithium metal cells have the following chemical formula:

Lithium thionyl chloride — Li/SOCl₂

- **Negative electrode:** Lithium
- **Positive electrode:** Carbon
- **Electrolyte:** A solution of lithium tetrachloroaluminate (LiAlCl₄) in thionyl chloride
- **Battery weight:** 5.9 kg
- **Lithium weight:** 183 g

In case of hazardous events, the noxious gases are:

- Thionyl chloride (SOCl₂)
- Sulphur dioxide (SO₂)
- Hydrogen sulphide (H₂S)
- Hydrogen chloride (HCl)
- Chlorine (Cl₂)

For additional information about the cells inside the sealed battery pack, see the safety data sheet provided by the cell manufacturer.

- **Manufacturer:** Saft
- **Cell type:** LSH 20
- **Manufacturer's website:** <https://www.saftbatteries.com/>

SECTION 4: First aid measures

The battery will release toxic fumes if burned or exposed to fire.

If subjected to gas from a burning battery, remove the source of contamination or move yourself and any victims to fresh air. Seek medical advice.

- **Inhalation:** The chemicals are lung irritant. Avoid inhaling any vented gases. Remove the victim and yourself from exposure. Rest and keep warm. If breathing is difficult, seek emergency medical attention.
- **Skin contact:** The chemicals are skin irritant. Rinse immediately with a lot of water and soap for at least 15 minutes. Wipe immediately away excess material with waterless hand cleaner. Remove contaminated clothing and wash it thoroughly before reuse.
- **Eye contact:** The chemicals are eye irritant. Flush immediately with a lot of clear tepid water for at least 15 minutes.
- **Ingestion:** Exposure to the chemicals may cause tissue damage to throat and gastro/respiratory tract if swallowed. If ingested, rinse mouth and surrounding area with tepid water. Dilute by drinking plenty of water. Seek medical advice.

SECTION 5: Firefighting measures

The transponder is designed to withstand damage to the internal battery pack. Non-flammable materials are used. In case of fire, move the battery away from the fire area if you can do it without compromising your own safety. Extreme mechanical abuse to the battery may result in a ruptured seal and exposure.

- 1 If possible, move the battery and/or the transponder away from the fire.
- 2 Cool it down using lots of cold water.
 - a Immerse the battery and/or the transponder in the sea for minimum 24 hours.
 - b If this method is impossible, it can be cooled down with a fire hose.

Cooling down the battery with a large amount of cold water is the only way to reduce or stop the internal chemical reactions, or to limit the fire/explosions to as few battery cells as possible. The chemical reactions/fire will continue without additional supply of oxygen, so an extinguisher such as Lith-X will not work properly.

Applying water directly onto a battery may develop hydrogen gas, due to the possible electrolysis if the battery terminals are exposed to water. Mixed with air, this gas is very inflammable/explosive. However, if the water cooling takes place on deck or in a storage room with good ventilation, there will never be enough hydrogen gas to exceed the lower explosive limit of hydrogen in air (about 4 %).

Note

In case of an external fire, always remove transponder units and lithium batteries.

SECTION 6: Accidental release measures

During normal operation, accidental release measures are not applicable. Extreme mechanical abuse to the battery may result in a ruptured seal and exposure.

As an immediate precautionary measure, isolate the spill or leak area at least 25 metres (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind, and keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment.

Prevent material from contaminating soil and from entering sewers or waterways. Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up the spills immediately.

Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of it according to relevant regulations. Scrub the area with detergent and water; collect all contaminated water for proper disposal.

SECTION 7: Handling and storage

Do not open, disassemble, crush or burn the battery.

- 1 Do not expose the battery to water, sea water or other high-conductivity liquids.
- 2 Avoid mechanical or electrical abuse.
- 3 Do not expose the battery to temperatures outside the range of -40 °C to +80 °C.
- 4 Store in a dry location.

Recommended relative air humidity is 40 to 70 %. To minimize any adverse affects on the battery performance it is recommended that it is kept at room temperature (25 °C ± 5 °C). Higher temperatures can result in shortened life.

- 5 Do not store the battery in direct sunlight.
- 6 Keep the battery out of reach of children.

The storage room must be properly ventilated. It must be provided with sturdy racks with dedicated cradles for the batteries, and allow for easy removal of batteries in case of fire. The room must be designated and clearly identified as a storage area, and entrance should be restricted. The room must not be used as a general rest or work area.

Note

The storage room must have a sprinkler system or a fire station. A suitable fire hose (with water) must be placed outside or in the proximity of the room.

SECTION 8: Exposure control and personal protection

Airborne exposures to hazardous substances are not expected when the battery is undamaged and used as intended. Personal protective equipment (PPE) is not required when the battery is undamaged and used as intended. Don personal protective equipment if the battery is damaged and you are at risk for exposure to the chemicals inside.

In the event of fire or physical damage to the battery, follow the mandatory rules for personal protection.

- **Fire or explosion:** Don a self-contained breathing apparatus (SCBA).
- **Exposure to noxious gas:** Use a full-face mask with minimum BE filter and protective equipment of rubber or plastic. (*B* refers to protection against inorganic gases and *E* refers to protection against sulphur dioxide.)

SECTION 9: Physical and chemical properties

The battery is solid with a hard surface. There is no risk for exposure to the chemicals inside an undamaged battery during normal operation and transportation.

The battery is a solid and sealed unit. The battery cannot be opened to reveal the individual cells.

For additional information about the cells inside the sealed battery pack, see the safety data sheet provided by the cell manufacturer.

Cell manufacturer

- **Manufacturer:** Saft
- **Manufacturer's website:** <https://www.saftbatteries.com/>

SECTION 10: Stability and reactivity

The battery is stable. No specific handling requirements apply.

In normal use, the battery pack is placed inside the sealed transponder.

Water ingress into the transponder can cause dangerous situations.

Short-circuiting, overheating, mechanical damage and exposure to water can start chemical reactions and cause high currents inside the lithium battery. This can generate noxious gases and/or cause danger of explosion. The chemical reactions will continue without additional supply of oxygen, as the battery cells contain the necessary ingredients for maintaining the chemical reactions.

- 1 Do not open, disassemble, crush or burn the battery.
- 2 Do not expose the battery to water, sea water or other high-conductivity liquids.
- 3 Avoid mechanical or electrical abuse.
- 4 Do not expose the battery to temperatures outside the range of -40 °C to +80 °C.
- 5 Store in a dry location.

Recommended relative air humidity is 40 to 70 %. To minimize any adverse effects on the battery performance it is recommended that it is kept at room temperature (25 °C ± 5 °C). Higher temperatures can result in shortened life.

- 6 Do not store the battery in direct sunlight.
- 7 Keep the battery out of reach of children.

SECTION 11: Toxicological information

Acute oral, dermal and inhalation toxicity data are not available for this battery.

Risk of irritation occurs only if the battery is abused to the point of breaking the container and opening it to reveal the individual cells. If this occurs, irritation to the skin, eyes and respiratory tract may occur.

SECTION 12: Ecological information

Provided that the battery pack is disposed of according to local regulations and/or law, it will not have any environmental impact.

SECTION 13: Disposal considerations

Dispose of the batteries in accordance with local, state and federal laws and regulations for batteries.

A lithium thionyl chloride battery does not contain any heavy metals, and is therefore not regarded as special waste (contains only biodegradable parts).

A used lithium battery can contain a significant amount of residual energy. It is the danger of explosion that presents a problem when disposing a battery. Used batteries must therefore be handled with the same care as new ones.

Note

For safe disposal, contact the nearest local company that has been approved to collect and dispose of lithium batteries.

SECTION 14: Transport information

Transportation must be performed in accordance with rules and regulations stated for transportation of dangerous goods in the applicable countries.

Certification: UN 38.3

Transport identification codes:

- **Aircraft:** IATA DGR
- **Sea transport:** IMDG
- **Railway:** RID
- **Road transport:** ADR

Original shipping boxes must be used for all transport.

Air transport of all units with new lithium batteries, and new separate lithium batteries, is only permitted on board cargo aircraft. The goods must be clearly labelled: CARGO AIRCRAFT ONLY.

The transponders with batteries or batteries must be shipped in accordance with the prevailing national regulations.

- Separate lithium batteries
 - UN 3090 PI 968, Section IA
- Lithium batteries contained in equipment
 - UN 3091 PI 970, Section I

Note

During transport a lithium battery must always be disconnected from the electronics.

SECTION 15: Regulatory information

Not applicable.

SECTION 16: Other information

The battery manufacturer's safety datasheet is available on their website.

Saft: <http://www.saftbatteries.com/>

Emergency procedures

Follow these procedures for transponders with lithium batteries with unknown or failing status. Always read these procedures before handling any lithium batteries.

Topics

[Recovering a failing transponder, page 43](#)

[Handling a heated or self-heated transponder, page 43](#)

[Opening a transponder with defect/possibly defect battery, page 44](#)

[Handling heated or warm batteries, page 44](#)

[Handling transponder and separate transponder batteries in case of an external fire, page 45](#)

Recovering a failing transponder

Always read the emergency procedures before handling lithium batteries.

Prerequisites

Handle a failing transponder as a possible water ingression.

Procedure

- 1 Evacuate all unnecessary people.
- 2 Recover the transponder with great caution using a crane.
No people should be near the transponder when it is lifted up on deck.
- 3 Place the transponder in a safe place out on deck, shielded from people and vital equipment.
- 4 Fasten the transponder in a crane, ready to lower it into the sea again.
- 5 Control the transponder for minimum two hours.
- 6 Check for damages that could involve a water leakage and check the housing temperature for a possible temperature increase in the lithium battery.
- 7 For batteries with normal temperature: Take out the battery, see the emergency procedure for opening a transponder with a possible defect battery.
[Opening a transponder with defect/possibly defect battery, page 44](#)
- 8 For batteries with increasing temperature: See the emergency procedure for handling a heated or self-heated transponder.
[Handling a heated or self-heated transponder, page 43](#)

Handling a heated or self-heated transponder

Always read the emergency procedures before handling lithium batteries.

Procedure

- 1 Evacuate all unnecessary people.
- 2 Fasten the transponder to a rope or a crane and immerse in the sea for 24 hours or permanent. If this method is impossible, the unit can be cooled with copious amounts of cold water using a fire hose.
- 3 Recover the transponder and control the temperature.
- 4 Repeat this until the temperature is low and stable.
- 5 Take out the battery, see the emergency procedure for opening a transponder with a possible defect battery.
[Opening a transponder with defect/possibly defect battery, page 44](#)

Opening a transponder with defect/possibly defect battery

Always read the emergency procedures before handling lithium batteries.

Procedure

- 1 Evacuate all unnecessary people.
- 2 Use a full face mask with minimum BE-filter, and protective equipment made of rubber or plastic.

WARNING

You must never stand in front of, or at the back of the unit, when you open it.

- 3 Open the transponder in a safe place out on the deck, shielded from people and vital equipment.
- 4 If there has been water ingress and the battery is still warm, disconnect the battery from the transponder electronics and study the procedure for handling a heated or warm separate battery.
- 5 Wash out the residues from the chemical reaction with water.

Handling heated or warm batteries

Always read the emergency procedures before handling lithium batteries.

Procedure

- 1 Evacuate all unnecessary people.
- 2 Fasten the battery to a rope or a crane and immerse in the sea for 24 hours or permanent. If this method is impossible, the unit can be cooled with copious amounts of cold water using a fire hose.
- 3 Wash out the residues from the chemical reaction with water.

Handling transponder and separate transponder batteries in case of an external fire

Always read the emergency procedures before handling lithium batteries.

Procedure

- 1 If possible, move the battery and/or the transceiver away from the fire.
- 2 Cool it down using lots of cold water.

Cooling down the battery with a large amount of cold water is the only way to reduce or stop the internal chemical reactions, or to limit the fire/explosions to as few battery cells as possible. The chemical reactions/fire will continue without additional supply of oxygen, so an extinguisher such as Lith-X will not work properly.

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