



PT9C-PROOF

UNDERWATER LOCATING DEVICE

Manual for initiation and maintenance No.350-14508-F5e



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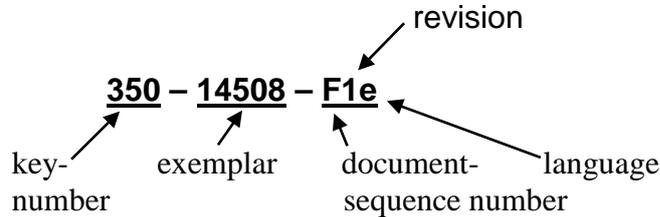
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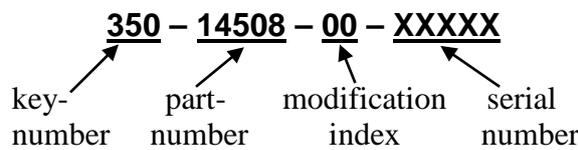
This manual is developed by Novega Produktionssysteme GmbH. Upon non-compliance with the data content, the operating licence will be retracted and there will be no acceptance of any guarantee for the device.

Advice: This manual must be read to its full extent prior to any initiation or operation, testing or maintenance of the Underwater Locating Device PT9 C-PROOF.

Annotation of the number of this manual



Annotation of the part- and serial number system of the PT9 C-PROOF:



Type plate:

Original battery install date / date of manufacture
month / year perforated

Battery replaced

PT9 C-PROOF
UNDERWATER LOCATING DEVICE

Battery status
Arrow indicates month of battery insertion or replacement.

Original battery inserted: ? STICKER

Battery durability after inserting: 3 years!

Battery replaced: Inspection Sticker Replacement

Avoiding Corrosion Safety measures must be carried out when mounting the PT9 and the beacon holder must be in good condition. Never use sharp objects or tools which apply force on the device. Do not drop the PT9. Minor damages on the surface coating must be repaired immediately to avoid corrosion and negative effects on the durability of the PT9. Use of a Novega accredited protective paint is recommended. Please contact us with queries or if major damages on the surface coating are visible. Improper handling causes guarantee loss.
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Battery Test

1. Activate 3 sec. with wire

min. 2.5V

2. Measure within 60 sec.

battery voltage

Data matrix code containing serial number and original battery install date

Warning! Do not open, disassemble; crush, penetrate, incinerate or expose the beacon to temperatures above 75°C (167°F). Observe operating instructions! Remove the beacon from service 6 years after installation at the latest. Patent pending SAE AS8045

Made in Germany Serial No. 14508-00-30210

serial number

- Necessary parts for the service:
- TAG 2550 Tester 17610
 - Battery replacement kit 17358
 - Torque 3.0 Torque_3.0
 - Pressure dispense clamp 17359

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1.0 Introduction

This manual contains the description, as well as the installation and maintenance directions for the PT9 C-PROOF Underwater Locating Device. These Underwater Locating Devices (ULD) have been type-examination tested by the BSH (Federal Office for maritime navigation and hydrography), and meet or exceed all requirements of SAE AS8045.

Advice: This manual must be read to its full extent prior to any initiation or operation, testing or maintenance of the Underwater Locating Device PT9 C-Proof.

1.1 Symbols und Abbreviations

PT9 C-PROOF	Pulse Transmitter for maritime navigation
ULD	Underwater Locating Device
BSH	Bundesamt für Seeschifffahrt und Hydrographie
FRM	Final Recording Medium
VDR	Voyage Data Recorder
°C	Grad Celsius
°F	Grad Fahrenheit
kg	Kilogram
m	Meter
ft	Foot
mm	Millimeter
min	Minute
h	Hour
s	Second
ms	Millisecond
dB	Decibel
kHz	Kilohertz
µPa	Micro Pascal
MPa	Mega Pascal

2.0 General

2.1 Technical characteristics

The PT9 C-PROOF Underwater Locating Device is battery-powered and primarily consists of an electronic module and a signal transmitter. Protected by a cylindrical, water- and weatherproof housing, the PT9 C-PROOF withstands extreme environmental conditions, high G-impact shock and deep sea - pressure up to 6096m. The PT9 C-PROOF is activated by immersion into fresh- or salt-water. The activation effects the emission of a defined ultrasonic signal. The battery capacity is dimensioned in such a way that the PT9 C-PROOF is able to send this ultrasonic signal with constant signal intensity for the duration of at least 30 days.



Figure 1: Position of the water sensitive PT9 C-PROOF switch

2.2 ULD mounting

The ULD is to be mounted to a Final Recording Medium (FRM) by means of a suitable mounting kit.

2.3 Original battery inserted

The inspection sticker for the original battery records the install date of the original battery. The marked inspection sticker is positioned, so that the arrow points to the month in which the original battery has been inserted.

Meaning of Original Battery Install Date: The month in which the original battery was inserted into the PT9 (see Figure 2: Original battery inserted).



Figure 2: Original battery inserted

Advice: The battery is inserted just in time before the delivery to achieve maximum battery lifetime for our clients. Relevant for the evaluation of the ULD is in any case the “Original battery inserted” date only.

2.4 ULD-Signal

The ULD is certified to emit an ultrasonic signal of 42 kHz (+/- 1kHz) for a regulatory transmission time of at least 30 days.

2.4.1 Specification PT9 C-PROOF

Operating frequency	42 kHz +/- 1kHz
Operating depth	6096 m (~ 20.000 ft)
Pulse permanence	9 ms (Minimum)
Pulse repetition rate	0,9 pulses/s
Operating life	30 days (Minimum)
Battery durability	3 years (after insertion of the battery)
Life cycle ULD	6 years (after installation)
Acoustic output, initial	106 N/m ² rms pressure @ 1m (160,5 dB)
Acoustic output after 30 days	70 N/m ² rms pressure @ 1m (157,0 dB)

Operating temperature range	-2°C (28°F) to +38°C (100°F)
Storage temperature range	18°C ±5°C (65°F± 10°F)
Transport temperature	-55°C (-67°F) to +71°C (160°F)
Activation	Fresh- or Saltwater
Radiation pattern	80% of a sphere
Size	Length 100 mm (3,92 inches) Diameter 33 mm (1,3 inches)
Weight	173 grams (6.1 ounces)

3.0 Installation

This section describes the methodical installation and mounting of the Underwater Locating Device to the FRM.

3.1 Installation criteria of the ULD

The installation of the Underwater Locating Device is to be completed in accordance with the FRM or VDR manufacturer's approved procedures and his hardware.

3.2 Site selection of the ULD

The position of the FRM and subsequently of the ULD is to be selected according to the regulations of the standard IEC 61996.

In case of an incident, the possibility of demolition of the unit by crash is to be minimized. The environment, selected for mounting the ULD, has to exclude the possibility that the ULD can be struck by loosening, heavy weight components.

Advice: Honeycomb structures, tarpaulins and persennings, clothes, cargo, etc. are to be considered as sound absorbing materials. Do not surround the ULD with those materials.

Upon observing all mandatory aspects above mentioned, the mounting position of the FRM and subsequently of the ULD is to be selected thus, that there is enough space for maintenance works and a comfortable access to the ULD, same as the required space for demounting the ULD.

3.3 Appropriate exposure to the PT9 C-PROOF

3.3.1 General handling of the PT9 C-PROOF

The PT9 C-PROOF ULD must not be disassembled, crushed, penetrated, incinerated or exposed to temperatures above 75°C (167°F).

3.3.2 PT9 C-PROOF Shelf Life

The ULD is a battery-powered device. Store the ULD in a cool (18°C ± 5°; 65°F ± 10°), dry place. The shelf life can be affected by higher or lower

temperatures, as well as by moisture. If a long-term storage of the ULD is required, please follow the instructions in point 5.3.

3.3.3 Water switch pin cleaning

Even though the ULD is equipped with a protection against unintentional activation, both of the pins are to be kept clean and impurities are to be removed. Clean water switch pins allow the moisture to collect into droplets and so run off the switch (see 5.1).

4.0 Test

4.1 General

After its installation into the beacon retainer bracket of the VDR or S-VDR Data Capsule, the PT9 C-Proof shall be tested. At least once a year the PT9 C-Proof is to be cleaned and tested by a qualified service technician. Performance testing and replacement of the battery shall be done by a qualified technician only.

4.2 Operational test

- For battery voltage measurement, use a high impedance multimeter (impedance 10MΩ).

Advice: Instructions for use of the multimeter are contained in the multimeter's manual and are not further specified in this manual.

- For functional testing use the tester TAG 2550 (No. 17610). The acoustic function is given when the yellow LED "Pulse" illuminates.

Advice: Specified information is to be taken from the TAG 2550 user manual. [TAG2550 User manual](#)

4.3 Battery test

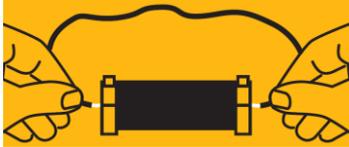
Please ensure that both water switch pins are clean and dry before starting the test (see 5.1).

Proceeding of battery voltage measurement:

Advice: The PT9 C-PROOF comes with a patent pending, intelligent activation, which avoids an unintentional activation, e.g. by rain, spray, ice or snow, whereby the durability of the battery could be impaired. On this account, observe the following procedure to set the PT9 C-PROOF into the service operation mode.

Starting the service operation mode (Activation):

Use a wire jumper and connect both of the water switch pins for approx. 3 seconds to the left and the right of the ULD, which puts the PT9 C-PROOF into the service operation mode.



1. Activate 3 sec. with wire

Figure 3: Start the service operation mode

Battery voltage measurement:

The PT9 C-PROOF is now in the service operation mode for 60 seconds. At this point the battery voltage is circulated to the water switch pins. After expiration of 60 seconds, the PT9 C-PROOF drops back into the sleep mode.

For battery voltage measurement, use a high impedance voltmeter (impedance 10M Ω). For voltage measurement, adjust the multimeter into a range of 20 V DC (direct current). During the 60 seconds, press both of the multimeter test prods on the ULD water switch pins to the left and the right, and read off the battery voltage.



2. Measure within 60 sec.

Figure 4: Battery voltage measurement

The water switch pin at the battery cap is the negative pole. The indication of the multimeter might balance in the decimal range. This is normal and shows, that the ULD is pulsing the ultrasonic signal, which causes a minor fall of voltage. The minimum read-out voltage value must not fall below 2,5 V. If minimum value is undercut, the battery is to be replaced. Use only the original replacement battery (No. 17350). The licence expires and the device can be damaged if batteries, other than the original replacement battery, are used.

5.0 Maintenance and cleaning of the PT9 C-PROOF

This paragraph contains instructions for the cleaning of the ULD as well as its long-term storage. Initially, the ULDs shall be tested with every installation and battery replacement, according to paragraph 4.0. When the ULD has been mounted on a Voyage Data Recorder and the Recorder has been installed in compliance with the manufacturer's specifications, the recurrent period for cleaning and testing of the ULD is 12 months. Otherwise the required maintenance period is 6 months. The battery replacement is to be performed within an interval of 3 years after the original battery was inserted (see 5.2) or if the battery voltage is not within its limits (see 4.3).

Replace the PT9 C-PROOF 6 years after the first installation and dispose it in accordance with all local, state and federal regulations. Please do not hesitate to contact us for assistance.

5.1 Cleaning of the ULD

Clean the water switch pins and the housing with a soft cloth and a mild detergent, and then dry them carefully with a clean cloth. Clean the white insulations around the water switch pin as well, to reach an optimum dripping performance of wetting fluids. The water switch pins are to be cleaned whenever dirt or dust accumulate.

5.2 Battery replacement

Warning: An incorrect installation of the battery might cause damage to the ULD's electronics!

Specified information is to be taken from [PT9 C-Proof Battery Replacement](#)

Battery safety data sheet: Further information is to be taken from the relevant [MSDS Data Sheet](#) on our website.

5.3 ULD long-term storage

When long-term storage of the ULD is required, the ULD should be stored in the original shipping container or adequate packaging. Ensure that the ULD is stored in a cool, dry environment. The ULD must be stored closed, but without battery. The maximum storage time for Underwater Locating Devices, with extracted battery, is 10 years. Please contact us for further instructions.

5.4 Avoiding surface damages avoids corrosion

For assembly of the PT9 C-PROOF do not use sharp-edged tools or tools which apply a force on the device! These could damage the surface coating, and consequently will cause corrosions!

5.4.1 Corrosion safety measures when mounting

- The packaging of PT9 C-PROOF can be opened by turning the box cases counterclockwise. On no account open the packaging by using a knife or other sharp objects, as the surface coating could become scratched or damaged.
- Before you take the PT9 C-PROOF out of the packaging, ensure that the contact surfaces of the ULD holder (see figure 5) are free of impurities and rust. The ULD holder must not have any blank or sharp-edged areas, as these could damage the surface coating of the PT9 C-PROOF and thus cause corrosions. If applicable, repair the affected spots by abrasion and varnishing.



Figure 5: ULD holder

- Always be sure to do the mounting of the device on an adequate and level surface to avoid eventual falling from the work bench. As a result, small pieces of the coating could chip off the edges of the PT9 C-PROOF and corrosions could be the consequence.
- Pay attention not to cant or deform the PT9 C-PROOF while mounting it into the ULD holder.

5.4.2 Damaged ULD coating

If there are visible damages on the surface coating (see figure 6), they must be repaired immediately, because they could cause corrosions at the damaged spot. This could have negative effects on the durability of PT9 C-PROOF.



Figure 6: Small damages

5.4.3 Repair of small damages

The PT9 C-Proof is provided with an extremely resistant surface coating. It is subject to a quality inspection and is only delivered without damages. Possible small damages, caused by transport or handling on site, can be corrected by applying a protective paint. For this purpose, use the paint as listed in paragraph 5.4.4. Apply it, after having degreased the surface at and around the damaged area with an adequate detergent (Please see the varnish producers' manual, concerning specified information: e.g. the curing time).

5.4.4 Varnish information

These small damages can be repaired with a protective coating. For this, we recommend a "Single-coat lacquer". Apply it after having degreased the surface at and around the damaged area with an adequate detergent.

Coating repair kit order number: 20543

5.4.5 Procedure in case of major damages

In case of doubt, or if the PT9 C-PROOF should show major damages, please contact us.

6.0 Warranty PT9 C-PROOF

The warranty period of the PT9 C-ROOF is 3 years from the date of delivery from Novega.

Specified information is to be taken from [PT9 Warranty](#)

7.0 Returns

Please contact us for clearing the details and planning before returning the Beacon.

Assure yourself of the use of a clean protective packaging for the ULD, i.e. protection against unintended crash, scratches or abrasion.

Required Documentation:

- Reason for reshipment
- Serial number of the Acoustic Beacon
- Order (if required) for replacement of the Acoustic Beacon

Service_address:

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7.1 Reshipment for factory overhaul

The Acoustic Beacon can be returned to Novega for battery replacement and for a factory overhaul at or close to the specific date for battery replacement.

- Performance of all functional tests for controlling the power of the Acoustic Beacon according to its specifications (SAE AS 8045)
- Battery- and O-ring replacement
- Guarantee extension for two years

Every consignment of overhauled Acoustic Beacons includes the required documentation to prove, that the returned product complies with its known specifications.

7.2 ULD return – defective

- In case of a failure, which is determined to be within the warranty terms (see 6.0), the ULD will be replaced free of charge by Novega.
- Upon return after a warranty service, the customer will receive a new original guarantee.

7.3 ULD return – no defect

If an acoustic ULD is returned to Novega and it is found to be functional, the ULD will be returned to the customer, corresponding shipment costs will be charged. In addition, the customer will be informed that an analysis fee is required. Please note that differences of the housing and the cover in terms of colour are production process specific and do not demonstrate damage.

7.4 Return ULD – out of warranty

If the ULD is returned to Novega out of warranty, the customer will receive an estimate of costs of repair.

8.0 Declaration of Conformity

Specified information is to be taken from [PT9 C-Proof Declaration of Conformity](#)

9.0 Disclaimer and copyright

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