

Test Report

No: U142199E2

Designation of equipment under test: Sea Angel SA14

Test Laboratory

for

**"Safety of Electrical Equipment and
Industrial Low-Voltage Devices
as well as Environmental Tests"**

accredited by

DAkKS Deutsche Akkreditierungsstelle GmbH
in compliance with DIN EN ISO/IEC 17025
under

Reg. No. D-PL-17186-01-03

The copying of excerpts from this report is not permitted without written the consent of the testing body.
The test results indicated in this report refer exclusively to the equipment under test specified below. It
is not permitted to transfer the results to other systems or configurations.

Testing body: PHOENIX TESTLAB GmbH
Königswinkel 10

D-32825 Blomberg

Applicant: FT-TEC GmbH
Werner von Siemens Straße 5

A-7343 Neutal

Order number: 14-112199

Type of test: Environmental test:
- Thermal Shock
- IP X7

Test base: IEC 60945

Equipment
under test:

Sea Angel SA14

DUT-No. PTL	Typ	Note
142199_310608	310608	Thermal Shock
142199_310601	310601	IP X7

Manufacturer:

See applicant

Date equipment
was received:

20 October 20014

Test specifications:

IEC 60945

Customer represented
during the test by the
following person(s):

Place of testing:

PHOENIX TESTLAB GmbH, Blomberg

Date of testing:


21 October 2014 to 24 October 2014

Test result:

Test requirements and conditions are present in the following chapters.

The requirements made in the test documents were fulfilled by the equipment under test.

Blomberg, 10 November 2014



Testengineer: Jörg Jacob



Authorized-reviewer: Michael Jonca

Contents	Page
1 Test specifications and test conditions.....	6
1.1 Thermal Shock.....	6
1.2 IP X7	6
2 Test performance and test results	7
2.1 Test performance	7
2.2 Test results	7
2.2.1 Thermal Shock	7
2.2.2 IP X7	7
3 List of measurement equipment	8
4 Pictures	9
5 List of pictures	13

1 Test specifications and test conditions

1.1 Thermal Shock

The EUT shall be placed in an atmosphere of $+70\text{ °C} \pm 3\text{ °C}$ for 1 h. It shall then be immersed in water at $+25\text{ °C} \pm 3\text{ °C}$ to a depth of $100\text{ mm} \pm 5\text{ mm}$, measured from the highest point of the EUT to the surface of the water, for a period of 1 h. At the end of the test the EUT shall be subjected to a performance check, and shall then be examined for damage and for unwanted ingress of water. Following examination, the EUT shall be resealed in accordance with the manufacturer's instructions. Alternatively, if there are no external signs of unwanted ingress of water, an internal examination of the EUT, which involves disturbance to seals, may be carried out after all environmental tests have been completed.

1.2 IP X7

The EUT shall be subject to the test corresponding to IEC 60529, table 3, second characteristic numeral 7: protected against the effects of temporary immersion in water.

The test shall be carried out by completely immersing the EUT in water so that the following conditions are satisfied:

- the highest point of the EUT is located 1 m below the surface of the water;
- the duration of the test is 5 min;
- the water temperature does not differ from that of the equipment by more than 5 K.

At the end of the test the EUT shall be subjected to a performance check, and shall then be examined for damage and for unwanted ingress of water. Following examination, the EUT shall be resealed in accordance with the manufacturer's instructions. Alternatively, if there are no external signs of unwanted ingress of water, an internal examination which involves disturbance to seals may be carried out after all environmental tests have been completed.

2 Test performance and test results

2.1 Test performance

The tests are carried out as follows:

No.	DUT	Test	Axis
1	142199_310608	Thermal Shock	---
2	142199_310601	IP X7	---

Note: The final evaluation of the DUTs will be carried out by the applicant and not by the testing body, PHOENIX TESTLAB GmbH

2.2 Test results

2.2.1 Thermal Shock

DUT	Temp.	Test duration	Visual damages	Performance check during the test	Requirements fulfilled
142199_310608	+ 70 °C	1 h	No	No	Yes
	+ 25°C water	1 h	No	Yes	Yes

Note: The final evaluation of the EUTs will be carried out by the applicant and not by the testing body, PHOENIX TESTLAB GmbH

2.2.2 IP X7

DUT	Deep.	Test duration	Visual damages	Performance check during the test	Requirements fulfilled
142199_310601	1 m	5 min	No	No	Yes

Note: The final evaluation of the EUTs will be carried out by the applicant and not by the testing body, PHOENIX TESTLAB GmbH

3 List of measurement equipment

Measurement equipment	PM Nr.
IP Room	490021
AIS protocol tester MK II	481422
Temperature Chamber RS M58	480619
GPS SOURS	481520

Note: The QM-Manual of PHOENIX TESTLAB regulates the calibration of the measuring equipment. All listed measuring equipment is traceable calibrated according to national or international standards. Measurement uncertainty is calculated according to GUM.

4 Pictures

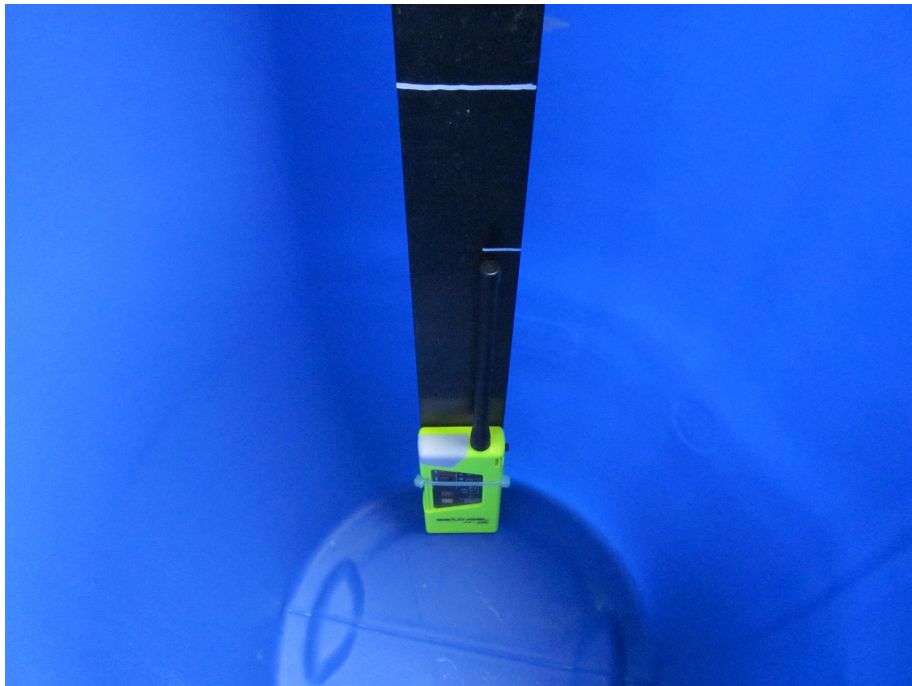
Picture 1: Test set-up Thermal Shock



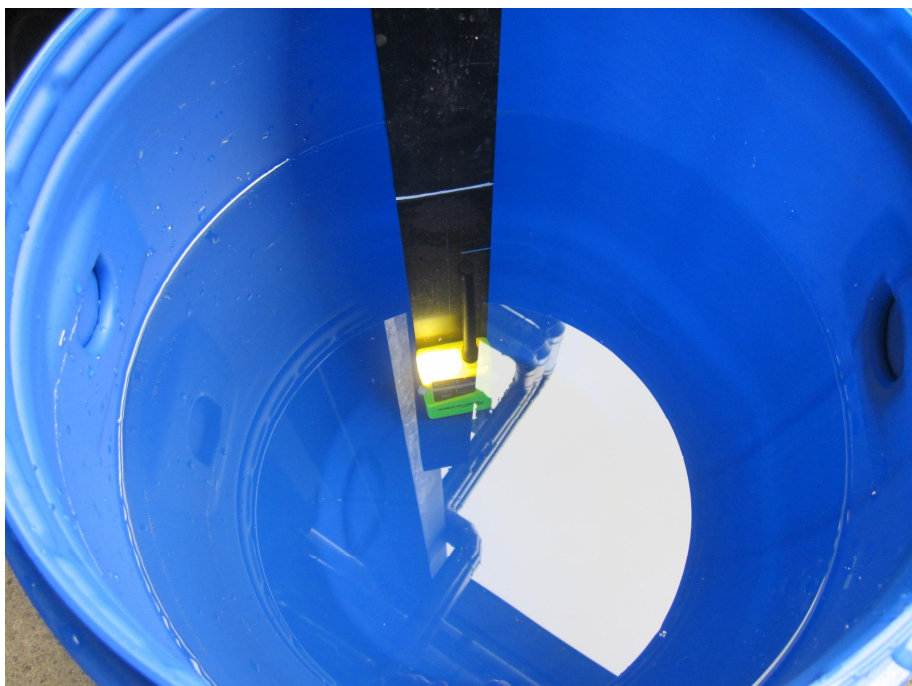
Picture 2: Test set-up Thermal Shock



Picture 3: Test set-up Thermal Shock



Picture 4: Thermal Shock



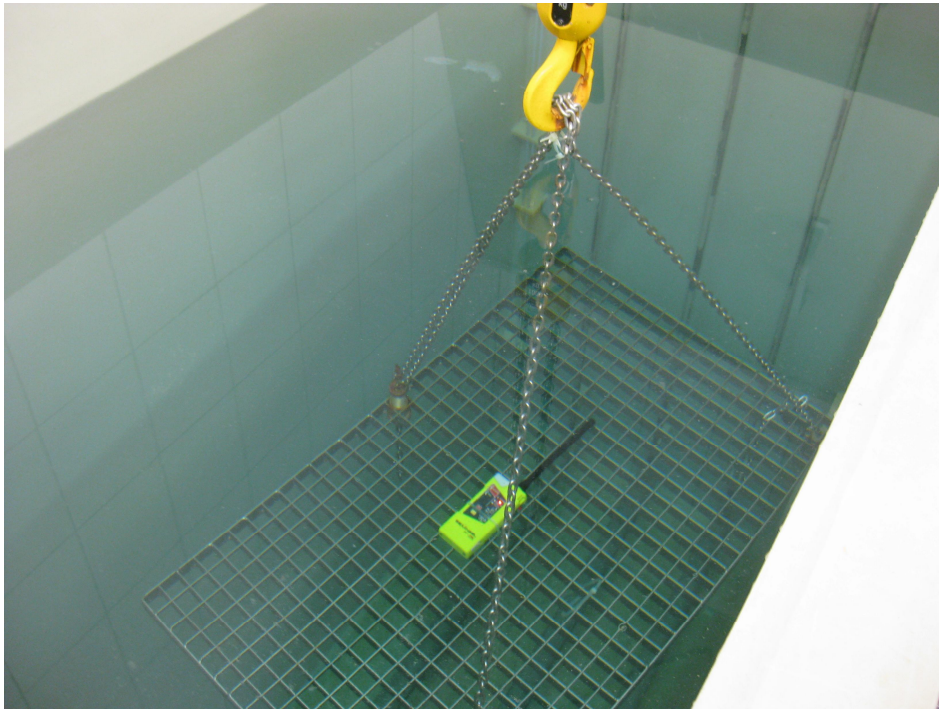
Picture 5: After Thermal Shock



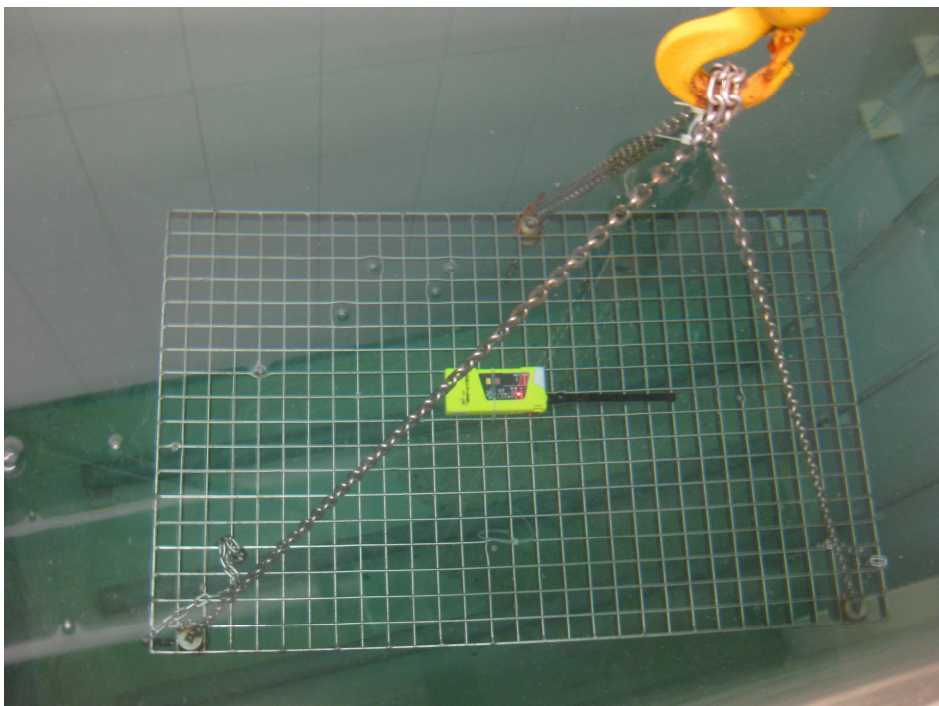
Picture 6: After Thermal Shock



Picture 7: IP X7



Picture 8: IP X7



5 List of pictures

Picture 1:	Test set-up Thermal Shock	9
Picture 2:	Test set-up Thermal Shock	9
Picture 3:	Test set-up Thermal Shock	10
Picture 4:	Thermal Shock	10
Picture 5:	After Thermal Shock.....	11
Picture 6:	After Thermal Shock.....	11
Picture 7:	IP X7	12
Picture 8:	IP X7	12