



TL24103A

European Safety Systems Limited

Ingress Protection

EN 60529: 1992 + A2: 2013 (IP67)

STExC1

**Combined Beacon &
Sounder Enclosure**

30th June 2024

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1 SCOPE OF WORK

Test requirements

This file contains the results of tests carried out to meet the requirements of EN 60529: 1992 + A2: 2013 (IP67).

2 EQUIPMENT UNDER TEST

The tests were performed only on the sample shown below

Description	The EUT is a combined beacon and sounder enclosure.
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Item	Model	Unique Identifier
Combined Beacon and Sounder Enclosure	STExC1	D199-05-621

All model numbers and unique identifiers were supplied by the client or taken from the supplied EUT. The sample tested was selected and provided by the client. The laboratory did not sample the selected EUT.

The client stated that the unit tested forms part of a range of products that share the same IP housing. It was decided that testing only one product from the range was necessary as the unit enclosures are identical and the only difference is the internal electronics. This report is only for the sample tested.

The following models are units within this range. Only the STExC1 was tested. – The STExS1, STExL1, STExS2 and STExL2 form the range of identical units.

Date of Receipt	14 th May 2024
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Date of Testing	25 th June 2024 – 27 th June 2024
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Test Results

The equipment under test complied with the requirements of the specification. This test report may not be reproduced in whole or part without the prior written approval of the laboratory. The test results in this report are facts and any opinions or interpretations derived from these facts shall be marked *

Signed



Mr. Stephen Lee
Laboratory Manager

3 TEST LABORATORY

The tests were carried out at MS Testing, located in Newton Aycliffe, Co. Durham, UK.

Laboratory accreditation:

MS Testing is UKAS Accredited Test Laboratory No. 4413.

Ambient conditions in the laboratory:

PARAMETER	Required (Lloyd's Specification 1)
Temperature °C	15 – 35
Humidity % RH	42 – 78
Barometric pressure mbar	860 - 1060

4 TEST SPECIFICATION, METHODS AND PROCEDURES

4.1 Test Details

The tests detailed in this file are –

	Test	Basic Standard
6.4	Ingress Protection 6X (IP6X)	EN 60529: 1992 + A2: 2013
6.5	Ingress Protection X7 (IPX7)	EN 60529: 1992 + A2: 2013

4.2 Test Procedures

IP6X

The 1.0mm test wire is pushed against the opening on the enclosure. A force gauge is used to measure the push on the probe. The force applied is 1N +/- 10%.

Dust

The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. The suction connection shall be made to a hole specially provided for this test. If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts. If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole. If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site. The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. In no event shall the depression exceed 2 kPa (20 mbar) on the manometer. If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 hours. If, with a maximum depression of 2kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 hours has elapsed.

IPX7

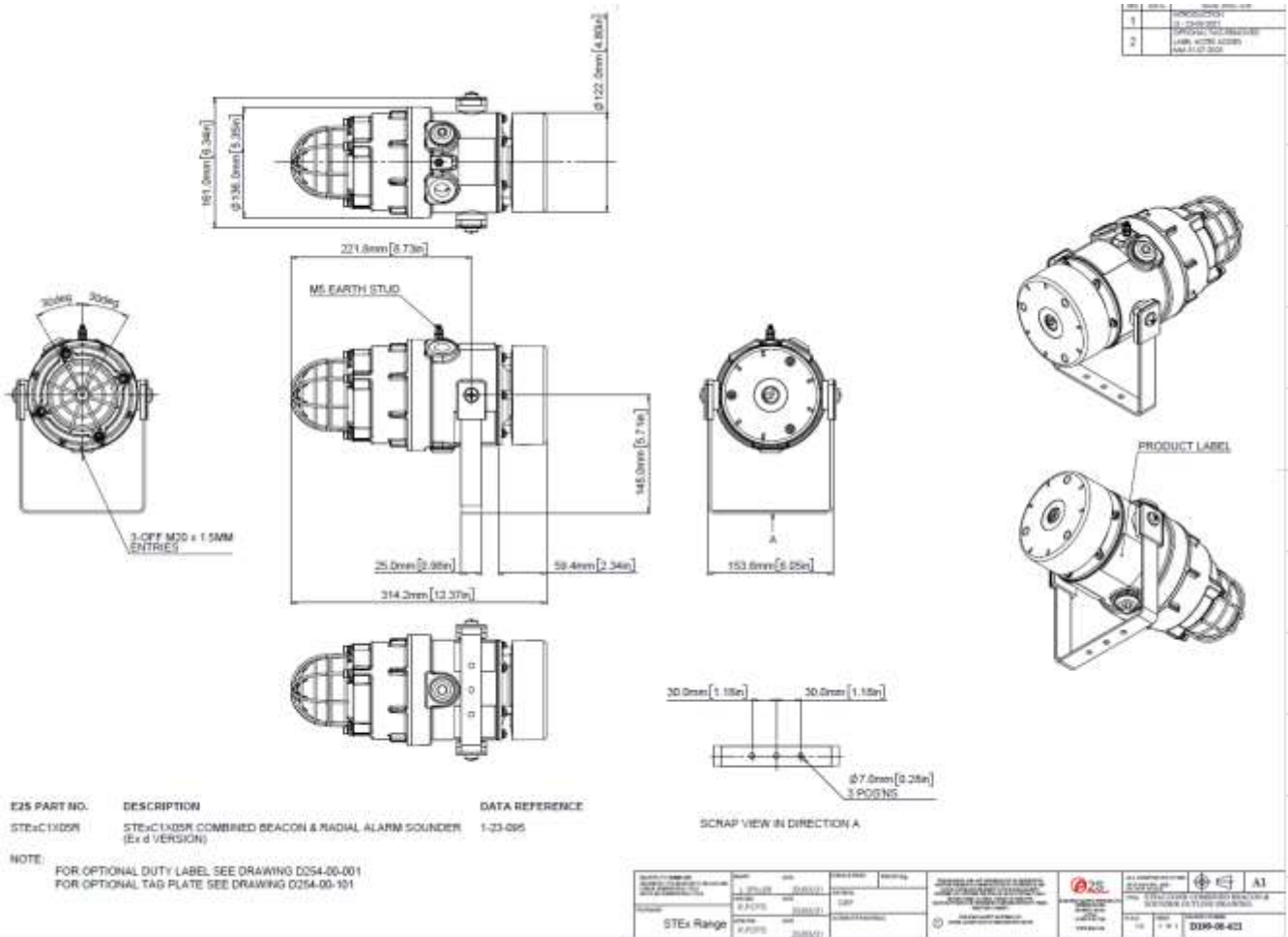
The enclosure under test is placed in its normal operating orientation into a tank filled with water to a depth of 1 metre for 30 minutes.

5 OPERATION OF THE EUT DURING TESTING

5.1 System Configuration

The equipment was not powered during any of the testing, the enclosure was checked after the test for ingress as applicable.

Only the main enclosure that housed the electronics was under test.



5.2 Acceptance Criteria

IP6X

The test wire of 1.0mm diameter shall not penetrate.

No dust shall enter the enclosure.

IPX7

No water shall enter the enclosure that will either impair safety or correct operation given in the acceptance criterion of the standard.

6 TEST RESULTS

6.1 Samples

Sample 1 – This was the original sample sent by the client, no modifications were made.

6.2 Summary of test results

Basic Standard	Test	Result	Sample
EN 60529	Ingress Protection IP6X	Complied	Sample 1
EN 60529	Ingress Protection IPX7	Complied	Sample 1

6.3 Equipment Performance

Specification

The conformance to drawings is checked and a functional performance test is demonstrated to ensure that the system operates in accordance with the customer's instructions where applicable.

Test Procedure

The equipment was checked to ensure it was sealed as the customer required it and to the correct torque.

6.4 IP6X

Basic Standard:	EN 60529: 1992 + A2: 2013
Applicability:	Enclosure

Test Result

The object probe, sphere of 1.0mm diameter did not penetrate.

The enclosure under test was supported inside the test chamber and the pressure inside the enclosure was maintained below the surrounding atmospheric pressure by a vacuum pump.

The extraction rate was less than 40 volumes per hour, so the test was continued until either 80 times the volume of the EUT was extracted or 8 hours had elapsed, whichever occurred first. The test time was 8 hours.

The enclosure was opened after the test and no dust was found to have entered the main enclosure where the electronics were housed. The dust visible in the below photos on the blue o ring/seal was external to the main enclosure, the o ring was doing its job and preventing the dust from managing to ingress any further.



Test Result



Test Result



Test Result



Test Result



Test Result



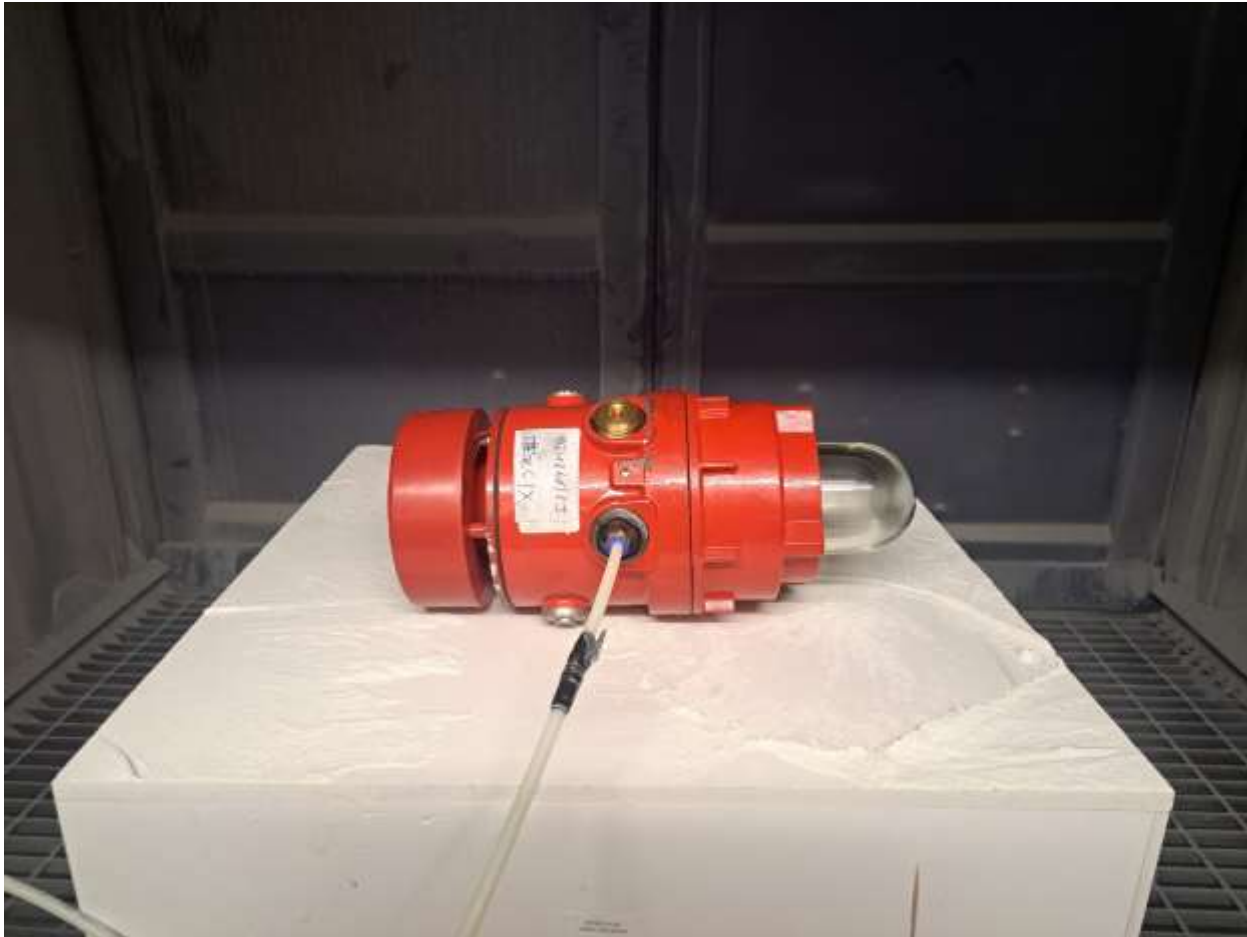
Test Result



Test Result



Test Setup



Test Equipment

Equipment	Model	Serial
IP4X Access Probe	TRP-02	L06430609
Dust Chamber	-	-
Dust	UKAS calibrated particles	-
Three-phase Compressor	Clarke	3695230050
Manson Power Supply	EP-603	460424750
Digital manometer	RS8890	211016862
Sundely 12V DC Negative Pressure Pump	6W	Z512-604-3000N
Flow meter	Key Instruments (max 0.5l/min)	-
Flow meter	Dwyer Instruments (max 5l/min)	-

6.5 IPX7

Basic Standard:	EN 60529: 1992 + A2: 2013
Applicable:	Enclosure

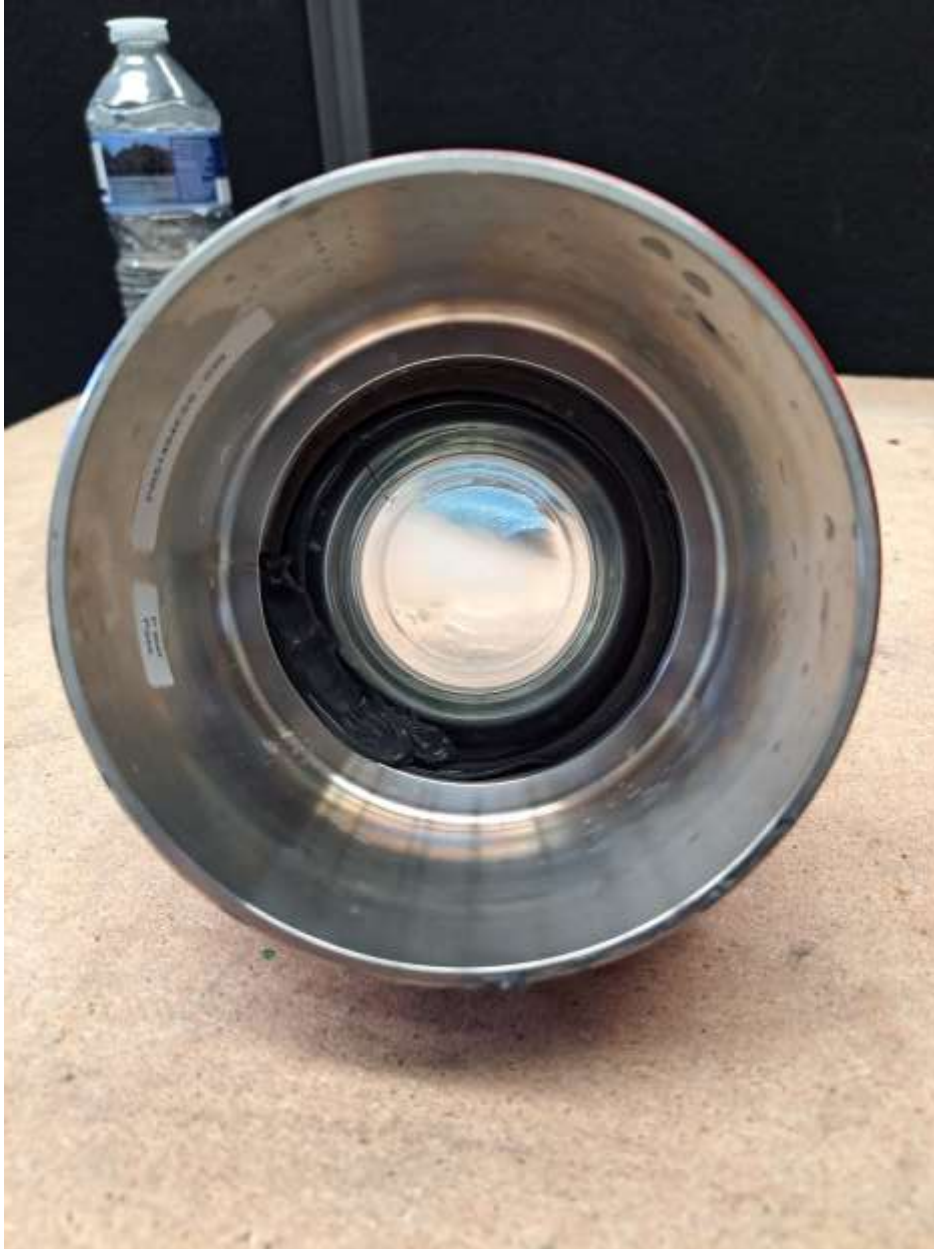
Test Result

The enclosure under test was placed in its normal operating orientation into a tank filled with water to a depth of 1 metre for 30 minutes.

The enclosure was opened after the test and there was no ingress of water in the main enclosure where the electronics were housed. The water ingress visible in the below photos on the base and on the 8Ω filter cone had occurred prior to the seal provided by blue o ring, therefore the blue o ring was doing its job and preventing any water from managing to ingress any further.



Test Result



Test Result



Test Result



Test Result



Test Result



Test Result



Test Setup



Test Equipment

Equipment	Model	Serial
1000mm Depth Water Tank	-	-
Thermocouple	Fluke 52	6209074
Tape Measure	RS Pro	-

END OF REPORT

1	Original Issue	S Lee	30 th June 2024
ISSUE	MODIFICATION	ISSUED BY	DATE

This test report relates only to the actual item(s) tested, details of which can be found in Section 2 of this report

The test results in this report are facts and any opinions or interpretations derived from the results of these tests shall be marked *

Any testing not presently covered by the scope of our UKAS Schedule of Accreditation shall be marked †

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