Test Report

Prepared for: Johnson Outdoors

Models Covered:

SOLIX 12
SOLIX 12 SI

In Accordance with:
EN 60950-1:2006
Clauses:
4.5.4 – Touch Temperatures
5.1 – Touch Current
5.2 – Electric Strength

ACS Report No.: 16-0526.S11.1A
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Tested by:

Rylan London

Reviewed by:

Terje Gronas

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This report contains 10 pages

REVISION HISTORY			
DATE	REVISION	DESCRIPTION	APPROVED BY
2016-12-14	A	Initial release.	Terje Gronas

GENERAL INFORMATION

1.0 Introduction

This report documents the results of testing performed on December 13, 2016 on the Johnson Outdoors model SOLIX 12 SI recreational fish finder. The SOLIX 12 SI was tested as it was determined to be the worst configuration model.

Testing was performed to evaluate the EUT with regard to the requirements of the specific clauses of standard EN 60950-1:2006. Only these clauses were tested, at the request of the client.

4.5.4	Touch Temperature Limits
5.1	Touch Current
5.2	Electric Strength

This report should not be considered to fulfill all requirements of standard EN 60950-1:2006. A complete evaluation and test program was not conducted.

2.0 Test Facilities & Environment

2.1 Test Facilities

All testing was performed at the following address:

Advanced Compliance Solutions, Inc.
5015 B.U. Bowman Drive
Buford GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598
www.acstestlab.com

The laboratory is fully equipped to carry out the tests outlined in this report.

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the ANSI-ASQ National Accreditation Board under their National Voluntary Laboratory Accreditation Program (ANAB).

2.3 Test Equipment Calibration Statement

Test equipment used for each test is specified in the relevant sections of this test report. Unless expressly given, all test equipment is calibrated on an annual basis, where applicable. All test equipment is operated within the climatic specifications as defined by the equipment manufacturer.

3.0 Equipment Under Test (EUT) Information

Manufacturer:
Johnson Outdoors
1220 Old Alpharetta Road
Suite 340
Alpharetta, GA 30005

Representative Model Tested: SOLIX 12 SI

Description: Recreational fish finder

Rated input voltage: 10-20Vdc

Maximum rated ambient operating temperature: 60°C

TEST RESULTS *per clause:*

4.5.4 Touch temperature limits

Accessible surfaces of the EUT shall not exceed 95 °C for plastic surfaces, 80 °C for glass surfaces, or 70 °C for metal surfaces, when the EUT is operated at the maximum rated ambient operating temperature. The limits are taken from EN 60950-1 Table 4C.

Test Equipment Used

Asset ID	Manufacturer	Model	Description	Last cal date	Cal due date
276	Agilent	34970A	Datalogger	2016-07-11	2017-07-11
279	Hewlett Packard	34901A	Datalogger module, 20 channel	2016-07-12	2017-07-12
715	Hewlett Packard	6023A	DC Power Supply	NCR	NCR
171	Greenlee	DM110	DMM	2016-07-11	2018-07-11
426	Thermotron	S-8 Mini Max	Environmental test chamber	2016-07-14	2017-07-14

NCR = No Calibration Required

Test Site Description

The EUT was tested in an environmental test chamber which controlled the ambient temperature.

Test Methodology

The EUT was configured and connected to satisfy its functional requirements. The EUT was powered by a DC source whose output voltage was monitored by a DMM. Temperatures on operator accessible surfaces of the EUT were monitored using 30 AWG Type T thermocouples and recorded using a datalogger. The EUT was operated in the required ambient until thermal stabilization was reached.

The input voltage to the EUT was set to 10.5 Vdc to simulate a drained battery.

Test Justification

☒ **No justification - The EUT was tested per the appropriate test methods and test plan.**
☐ **The test method, standard, and/or test plan was deviated from for the following reason:**

Test Results: See following pages

THERMOCOUPLE LOCATIONS

Channel	Location
1	Ambient
2	Front, Screen bottom center
3	Front, D-pad
4	Back left, near mount
5	Back top, left of center
6	Back top center near logo
7	Bottom left of center
8	Back right, near mount
9	Top right of center
10	Back near power inlet


HUMMINBIRD
SOLIX 12

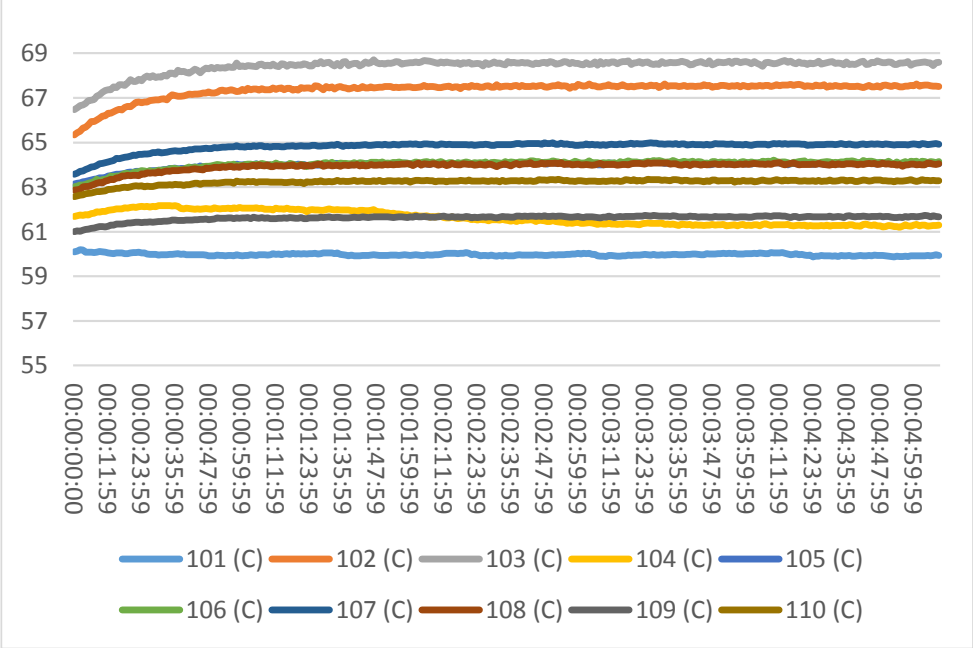

HUMMINBIRD
No Epoxy
X4-7 EUT
PLD X2-15


No Epoxy
PLD X2-15


No Epoxy
X4-7 EUT
PLD X4-15

Test Results at 60˚C Ambient
Input Voltage: 10.5 Vdc
Test Duration: 4 Hrs 59 min

Channel	Location	Measured	Adjusted	Limit
1	Ambient	59.9	60.0	—
2	Front, Screen bottom center	67.5	67.6	80
3	Front, D-pad	68.6	68.7	95
4	Back left, near mount	61.3	61.4	95
5	Back top, left of center	64.0	64.1	95
6	Back top center near logo	64.1	64.2	95
7	Bottom left of center	64.9	65.0	95
8	Back right, near mount	64.0	64.1	95
9	Top right of center	61.7	61.8	95
10	Back near power inlet	63.3	63.4	95



5.1 Touch current

Touch current was measured using a touch current meter complying with EN 60950-1:2006 Annex D, Figure D1.

Test Equipment Used

Asset ID	Manufacturer	Model	Description	Last cal date	Cal due date
439	DC Source	EZ Digital Co. LTD	GP-4303DU/TP	NCR	NCR
171	Greenlee	DM110	DMM	2016-07-11	2018-07-11
231	Simpson	228	Touch current meter	2016-06-15	2017-06-15

NCR = No Calibration Required

Test Site Description

The EUT was tested on the bench in normal laboratory ambient conditions.

Test Methodology

The EUT was configured and connected to satisfy its functional requirements. The EUT was powered by a DC source whose output voltage was monitored by a DMM. The input voltage to the EUT was 10-20 Vdc.

Touch current between the +12 Vdc input and the enclosure, covered in foil, was measured.

Test Justification

☐ **No justification - The EUT was tested per the appropriate test methods and test plan.**
☒ **The test method, standard, and/or test plan was deviated from for the following reason:**

Test performed at client request. EN 60950-1:2006 clause 5.1 states that touch current limits do not apply to DC powered equipment having no connection to wired telecommunication networks.

Test Result:

Measured touch current: 0 mA_{RMS}

5.2 Electric strength

Functional insulation between internal circuits and accessible parts was stressed by the application of a 500 V_{RMS} 60Hz test voltage between the +12 Vdc input pin and the non-conductive surface of the enclosure, covered by metal foil measuring 100mm x 200mm, in close contact with the enclosure.

The test voltage was raised gradually, and applied for one minute.

The EUT is not powered on during the test. Functional insulation between internal circuits, such as between +12 Vdc and DC Return were not tested, and not evaluated according to clause 5.3.4.

Test Equipment Used

Asset ID	Manufacturer	Model	Description	Last cal date	Cal due date
160	Associated Research	3665	Hi-pot tester	2016-07-14	2017-07-14

NCR = No Calibration Required

Test Site Description

The EUT was tested on the bench in normal laboratory ambient conditions.

Test Methodology

Per EN 60950-1:2006, clause 5.2, for Functional Insulation.

Test Justification

☒ **No justification - The EUT was tested per the appropriate test methods and test plan.**
☐ **The test method, standard, and/or test plan was deviated from for the following reason:**

Test Result: PASS

No breakdown of insulation

END OF TEST REPORT