

TEST REPORT

Nº LRIC-IE24-99-2

DATE OF ISSUE: 25/11/2024
TESTING LABORATORY: Lightning Research Institute of Catalonia
APPLICANT'S NAME: Cirprotec, S.L.U.
C/ Lepanto, 49 · 08223 · Terrassa (Barcelona) · Spain

TEST SPECIFICATION

TEST: Immunity against disturbances
TEST METHODOLOGY: No standard

OBJECT UNDER TEST

TRADE MARK: SENSOCAR
MANUFACTURER: SENSOCAR, S.A.
C/ Géminis 77· 08228 · Terrassa (Barcelona) · Spain.
MODEL: Compression Load cell + Measurement terminal (complete description see page 2)

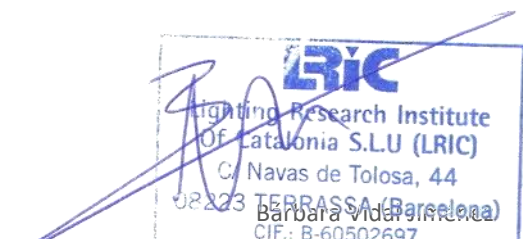
Tests results contained in this report refer exclusively to the objects under test. The tests have been performed to 1 new sample.

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CONCLUSIONS

The device has withstood the tests to which It has been submitted without showing damage, loss of functionality, or any type of perforation either in the voltage or current records. The maximum intensity during the test has been 100kA as declared by the manufacturer.


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TEST NUMBER: LRIC-IE24-99-2

1. Test item description

The object under test is a set of compression load cell + measurement terminal supplied by SENSOCAR S.A. on October 21st, 2024.

MODEL: Load cell + Measurement terminal (complete description see Table 1.1)

TEST DATA:
 U_n : 230V~
 U_{max} : 100kA
 L_{wire} : 15m

| Reference | Cell | Serial N. | Measurement terminal | Serial N. |
|----------------|-------|--------------|----------------------|---------------|
| LRIC-IE24-99/1 | CS-DC | 192300021024 | SC-A ver:SC-A1 | HB14060/03.24 |

Table 1.1. Traceability data for samples under test



Figure 1.1. Sample under test

2. Environmental conditions during testing

The testing was carried out on October 29th, 2024. The environmental conditions registered during test have been those that are shown in the Table 2.1.

| Date | Temperature (°C) | HR (%) | Pressure (hPA) |
|------------|------------------|-------------|----------------|
| 29/10/2024 | 20.7 - 21.0 | 65.5 - 66.7 | 996.7 - 996.6 |

Table 2.1. Environmental conditions

3. Employed equipment

| Reference | Description | Serial Number |
|-----------|--|----------------|
| EM11092 | CURRENT IMPULSE GENERATOR 8/20 UP TO 160KA | 061005004.20.1 |
| EM11080 | PEARSON PROBE 8561 UP TO 100kA | 127931 |
| EM23010 | WEATHER STATION 176P1GENERATOR | 41003366 |

Table 3.1. Employed equipment

4. Declaration of uncertainty

Decisions on conformity are purely qualitative and therefore do not depend on the uncertainty of the quantitative parameters measured during the test.

5. Deviations, additions or exclusions on the test method

Not applicable.

6. Results

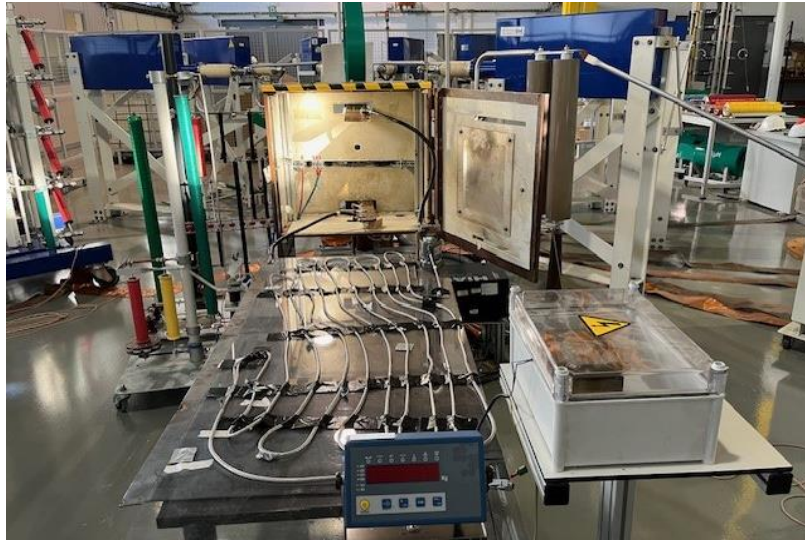


Figure 6.1. Test set-up

| N. | I _{peak} (kA) | I _{TEST} (kA) | Terminal measurements before shot | Terminal measurements after shot | RESULT |
|----|------------------------|------------------------|-----------------------------------|----------------------------------|--------|
| 1 | 5 | 5.10 | 9988 | 9988 | PASS |
| 2 | 10 | 10.04 | 9989 | 9989 | PASS |
| 3 | 20 | 19.93 | 9990 | 9990 | PASS |
| 4 | 40 | 40.00 | 9991 | 9991 | PASS |
| 5 | 60 | 60.45 | 9990 | 9990 | PASS |
| 7 | 80 | 80.89 | 9992 | 9992 | PASS |
| 8 | 100 | 97.51 | 9990 | 9990 | PASS |

Table 6.1. Impulses in 8/20µs waveform at the maximum current value (I_{max}) scaling applied on the sample

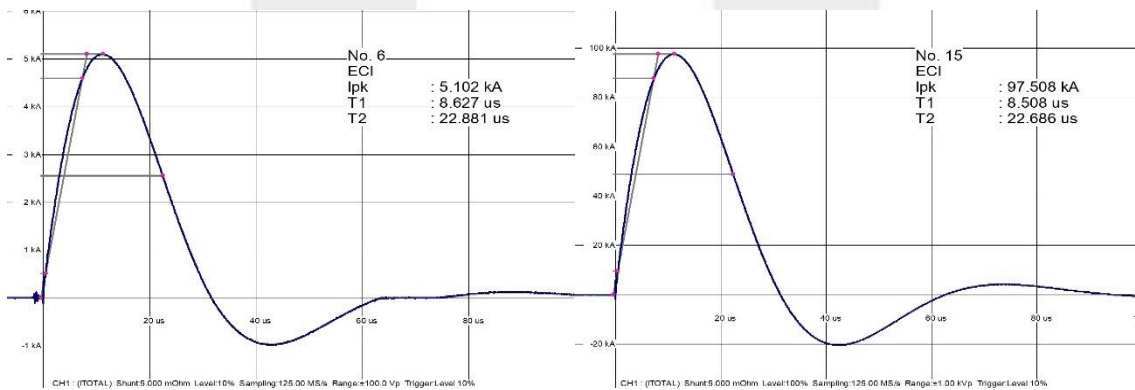


Figure 6.2. First and eighth impulse in 8/20µs waveform applied on the sample LRIC-IE24-99/1

| PASS CRITERIA | RESULT |
|---|--------|
| Voltage and current records and visual inspection shall show no indication of puncture or flashover. | PASS |
| There is no loss of functionality of the equipment after the test. The measurements before and after the test must be the same. | PASS |
| No visible damage shall occur during the test. | PASS |
| There shall be no explosion or other hazard to either personnel or the facility. | PASS |

Table 6.2. Pass criteria in the test Immunity against disturbances

7. Test description

The disturbance is applied to the load cell. The connecting cable between the cell and the measurement terminal must have the maximum length specified by the manufacturer L_{wire} and is placed on a non-conductive surface with a horizontal coupling plane (HCP) connected to PE.

The measurement terminal is powered at its nominal operating voltage U_n through a galvanically separated voltage source referenced to the same PE of the test.

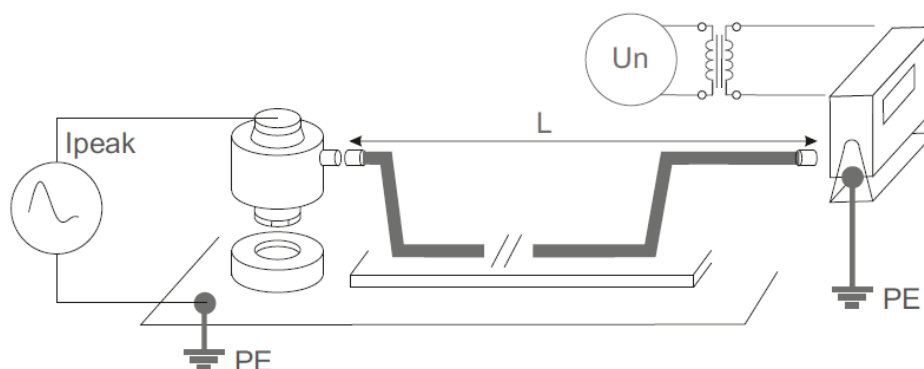


Figure 7.1. Sample setup in the test Immunity against disturbances

The test consists of applying a scaling of current impulses in the form of an 8/20 μ s wave in positive polarity with peak values I_{peak} . Up to the maximum value (I_{max}) value specified by the manufacturer is reached.

Pass criteria:

- Voltage and current records and visual inspection shall show no indication of puncture or flashover.
- There is no loss of functionality of the equipment after the test. The measurements before and after the test must be the same.
- No visible damage shall occur during the test.
- There shall be no explosion or other hazard to either personnel or the facility.

8. Opinions and interpretations

Not applicable.

9. General conditions

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9.2. Validity of the results

This document states the results exclusively for the tested samples described in this report and which correspond to the ones originally received. Such samples may have been altered during the course of the tests result thereof, such as for example destructive tests.

The results are subject to measurement uncertainty, described in the report.

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