



Test Report

Manufacturer: TTS A/S
Product: Nordic-Vision 1000
Standards: Environment test according to
HD 638 S1
Report No: B2006042

Date and Signature:

19/9 2006 *Ole Bøll*

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Test object: Nordic-Vision 1000 traffic signal controller

Manufacturer: TTS A/S
Slotsherrensvej 215
DK-2610 Rødovre, Denmark

Test dates: 5 – 15 September 2006

Standards: HD 638 S1 § 6.3 environmental test according to:

- Dry heat test EN 60068-2-2. 40 °C.
- Cold test EN 60068-2-1. -25 °C.
- Damp heat test EN 60068-2-30. 25 – 40 °C, 95% humidity.

Test engineer: Michael Baun Christensen

Test laboratory: All tests made in the test laboratories of Danfoss, Nordborg, Denmark

Conclusion: The product has been tested according to the above mentioned standard and has been found to fulfill the requirements.

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1. Introduction

The following test according to HD 638 S1 § 6.3.5, § 6.3.6 and § 6.3.7 was conducted;

1. Dry heat test EN 60068-2-2. 40 °C for 16 hours. After test; Measure the insulation resistance, and make a function test.
2. Cold test EN 60068-2-1. -25 °C for 16 hours. The last hour under heating to 25 °C, the traffic signal controller is turn on. After test; Measure the insulation resistance, and make a function test.
3. Damp heat test EN 60068-2-30. 25 – 40 °C, 95% humidity. After test; Measure the insulation resistance, and make a function test.

Function test: Turn on the traffic signal controller and wait about 1 minute, observe if the controller light is on and observe the program running for at least 1 cycle.

Insulation resistance is measured at at least 500 Vdc and resistance shall be greater that 1 M Ω

2. Test:

After each test as specified in "1. Introduction" the equipment performed normally and was observe for program running at least 1 cycle.

Hereafter the insulation resistance was measured:

Results:

- | | | |
|---|--------------|------|
| 1. Insulation resistance after dry heat test
The function test works. | 5G Ω | Pass |
| 2. Insulation resistance after cold test
The function test works. | 20G Ω | Pass |
| 3. Insulation resistance after damp heat test
The function test works. | 2G Ω | Pass |

Requirement:

HD 638 S1 § 8.6 Class R1; greater than 1 M Ω

3. Pictures:



Picture from the cold/heat camber.



Picture from the cold/heat camber.



Picture from the damp head camber.



Picture from the damp head camber.

4. **List of instruments:**

Insulation resistance:

Unilap ISO insulation tester qk. nr. 59190