


TEST REPORT ENVIRONMENTAL TESTING Environmental testing	
Report Reference No.:	374381-1TRFEnvEx This test report replaces the one identified with number 374381TRFEnvEx issued by Nemko Spa dated on 2019-08-05 (see General remarks)
Tested by (name, function and signature):	O. Segantin (Project Handler) 
Approved by (name, function and signature):	Giulio Tassinari (Verifier)
Date of issue:	2019-09-23
Testing Laboratory:	Nemko Spa.
Address:	Via del Carroccio 4 I – 20853 Biassono (MB)
Testing location/ address:	Nemko Spa., Via del Carroccio 4 I - 20853 Biassono (MB)
Applicant's name:	Kria Srl
Address:	Via Laboratori Autobianchi, 1PTB Edificio, 23G 20832 Desio (MB) - Italy
Test specification:	
Standard:	IEC 60068-2-1:2007 IEC 60068-2-2:2007 IEC 60068-2-78:2012 OIML D11:2013 See par. 2 for details
Non-standard test method:	N/A
Test Report Form No.:	TRF EN 60068-2-ENV
TRF Originator:	Nemko S.p.A.
Master TRF:	2017-03
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Test item description:	Analysis and measurement camera system
Trade Mark:	Kria
Manufacturer:	Kria Srl
Model/Type reference:	T-EXSPEED
Ratings:	35 W 24 Vdc
Test Report distribution index.:	
Kria Srl	2019-09-23
Via Laboratori Autobianchi, 1PTB Edificio, 23G-20832 Desio (MB) - Italy	

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The test report merely corresponds to the test sample.

The phase of sampling / collection of equipment under test is carried out by the customer.

This Test Report, when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.

Test Report No. :
374381-1TRFEnvEx

Short description of the EuT	Copy of marking plate
The EuT is an analysis and measurement camera system composed by 3 cameras, IR LED and CPU.	Not Provided
Number of tested samples:	1
Serial number:	4410120
Brand	Kria
Manufacturer	Kria Srl
Model	T-EXSPEED
Manufacturer year	-
Ratings	35 W 24 Vdc
Accessories and detachable parts included/ Mounted tool:	The EuT is composed by a unit, accessories as supplied in the appliance (EuT tested in the configuration supplied by manufacturer).
Other options included:	None
Testing	
Date of receipt of test sample:	2019-07-15
Testing commenced on:	2019-07-15
Testing concluded on:	2019-07-17
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.	
Throughout this report, a comma is used as the decimal separator.	

Test Result according to the customer criteria of acceptance in § 4.4:	Pass
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PROJECT HISTORY		
Report number	Modification to the report / comments	Date
374381TRFEnvEx	First release	2019-08-05
374381-1TRFEnvEx	Second release	2019-09-23
REMARKS		

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1 TEST PERFORMED

The following tests are performed for qualification purpose.

The following clauses of IEC 60068 standard have been applied to the equipment under test in this sequence, as required by OIML D11 standard:

- Part 2-2: Tests - Test B: Dry heat (see §5.1 of this test report)
- Part 2-1: Tests: - Test A: Cold (see §5.2 of this test report)
- Part 2-78: Tests - Test Cab: Damp heat, steady state (see §5.3 of this test report)

The test not covered by ACCREDIA Accreditation have been indicated with a “**”.

2 TEST STANDARDS AND PROCEDURES

The following standard(s) are not covered by ACCREDIA accreditation:

- **NEMKO WM L0177:**
General routines for using instruments at Nemko
- **NEMKO WM L1002:**
Measurement Uncertainty - Policy and Statement
- **IEC 60068-2-38:2009**
Environmental testing - Part 2-38: Test - Composite temperature / humidity cycling test
- **OIML R91: 1990**
Radar equipment for the measurement of the speed of vehicles
- **OIML D11:2013**
Radar equipment for the measurement of the speed of vehicles – Environmental conditions

The following standard(s) are covered by ACCREDIA accreditation:

- **IEC 60068-2-2:2007**
Environmental testing - Part 2-2: Test - Test: Dry heat
- **IEC 60068-2-1:2007**
Environmental testing - Part 2-1: Test - Test: Cold
- **IEC 60068-2-78:2012**
Environmental testing - Part 2-78: Test - Damp heat, steady state

3 GENERAL REMARKS

3.1 Environmental conditions

Unless different values are declared in the test case, following ambient conditions apply for the tests:

Ambient Temperature:	18 ÷ 33° C
Relative Humidity:	30 ÷ 70 %
Atmospheric pressure:	980 ÷ 1060 hPa

This report replaces the previous having reference no. 374381TRFEnvEx

This version of test report is different due:

- **Correction of Report No.**
- **Correction of graphic §5.4.1 (typing error)**

3.2 Measurement uncertainty

The measurement uncertainty was calculated for all measurements listed in this test report according to Nemko Spa Technical Procedure WM L1002 and is documented in the quality system acc. to EN 17025. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Nemko Spa laboratory is reported:

Test	Range	Measurement Uncertainty	Note	
Environmental testing	Temperature -70 °C ÷ 180 °C	1.8 °C	(1)	
	Relative Humidity 10 % ÷ 98 %	6 %	(1)	
IP protection	Water flow 0.5 l/min ÷ 100 l/min	5 %	(1)	
	Air flow	5 %	(1)	
	Force 50 N, 30 N, 3 N, 1 N	10 %	(1)	
	Dimensions 50 mm, 12.5 mm, 2.5 mm, 1 mm	0.05 mm	(1)	
	AC/DC Voltage 10 mV ÷ 1000 V up to 5 kHz	1.5 %	(1)	
Construction verifications	AC/DC Voltage 10 mV ÷ 1000 V 5÷100 kHz	2.5 %	(1)	
	AC/DC Current 0.1 mA ÷ 5 A up to 1 kHz	1.5 %	(1)	
	AC/DC Current 5 A ÷ 400 A up to 1 kHz	2.5 %	(1)	
	Resistance 100 mΩ ÷ 10 MΩ	2.0 %	(1)	
	Active/Apparent Power 200 mW ÷ 1 W	20 mW	(1)	
	Active/Apparent Power 1 W ÷ 6 kW	3.0 %	(1)	
	Power factor	0.05	(1)	
	Frequency	0.2 %	(1)	
	Dimensions 0 ÷ 200 mm	0.05 mm	(1)	
	Dimensions 0.2 ÷ 200 m	0.5 %	(1)	
	Force 0.2 ÷ 2.5 kN	3 %	(1)	
	Torque 0.2 ÷ 200 Nm	5 %	(1)	
	Weight 1 g ÷ 2 kg	1.0 % or 0.1 g	(1)	
	Weight 2 kg ÷ 100 kg	2 %	(1)	
	Heating	Temperature 20 °C ÷ 400 °C	4.5 °C	(1)
	Pressure measurement	Pressure -0.5 bar ÷ 700 bar	1.0 %	(1)
	Temperature measurement	Temperature -40 °C ÷ 300 °C	2.0 °C	(1)
Protection against access to live parts	Dimensions 1 ÷ 1000 mm	0.08 mm or 0.3 %	(1)	
	Force 0.2 ÷ 1000 N	3 %	(1)	
Power input and current	Active/Apparent Power 0.2 W ÷ 6 kW	20 mW or 3 %	(1)	
	AC/DC Current 1 mA ÷ 5 A up to 1kHz	1.5 %	(1)	
Leakage current	AC Current 0.01 mA ÷ 200 mA up to 5kHz	3.0 %	(1)	
	AC Current 0.01 mA ÷ 200 mA 5kHz to 1MHz	10.0 %	(1)	
Earth impedance	Impedance 1 mΩ ÷ 10 kΩ	3 mΩ or 4 %	(1)	
Continuity resistance	AC 10 mΩ ÷ 2 Ω, 5A ÷ 32A	3 mΩ or 5 %	(1)	
	AC 2 Ω ÷ 100 Ω, 100 mA or 200 mA	5 %	(1)	
	DC 1 mΩ ÷ 1 kΩ, 0.01 A ÷ 10 A	5 %	(1)	
Insulation resistance	10 kΩ ÷ 200 GΩ, 10 V ÷ 1000 V	3.0 %	(1)	
	200 GΩ ÷ 1000 GΩ, 500 V ÷ 1000 V	10 %	(1)	
Dielectric strength	AC Voltage 0.1 kV ÷ 5 kV (50 Hz or 60 Hz)	3.0 %	(1)	
	DC Voltage 0.1 kV ÷ 6 kV	3.0 %	(1)	
	AC/DC Current 0.1 mA ÷ 200 mA up to 1 kHz	5 %	(1)	
Transients	Pulse voltage	10 %	(1)	
Tracking test	Voltage, Current	1.5 %	(1)	
	Drops - count	7	(1)	

NOTES:
 (1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$ which has been derived from the assumed normal probability distribution with infinite degrees of freedom and for a coverage probability of 95 %.

4 EQUIPMENT UNDER TEST

4.1 Power supply system utilised

EuT has been supplied by external DC power source (not under test) at 24 Vdc, except when has been required the EuT state OFF.

For those tests refer to list of test equipment in §5.

4.2 EuT operation mode:

EuT operation is described in the doc.: "Attachment1 Test Report 374381-1TRFEnvEx", provided from customer and saved inside company archive.

4.3 EuT configuration:

EuT has been connected to laptop by LAN cable to check functional status; functional check has been made by a software provided from customer to be able to acquire an image every 60 s for each camera.

4.4 Acceptance Criteria

Acceptance criteria considered are according to customer and are not covered by ACCREDIA accreditation:

The test results shall be defined by standard:

- From start test to end of operation Dry cold the EuT must operate as intended during the test . No degradation of performance or loss of function is allowed.
- From the end of operation Dry cold to end of the test the EuT shall operate as intended during the test. Degradation of performance is however allowed, but no registration of erroneous data is accepted. No change of actual operating state or stored data is allowed.

The performance level and acceptance criteria defined by standard are described in the doc: "Attachment2 Test Report 374381-1TRFEnvEx", provided from customer and saved inside company archive.

Functional test described in section §4.3 has been made for all state ON period of the EuT. Results have been saved inside the folder " 374381-1TRFEnvEx_Functional test" and saved inside company archive.

5 TEST CONDITIONS AND RESULTS

5.1 *Test according to OIML D11:2013 and IEC 60068-2-2 - Test Bd: Dry Heat

Instruments used: see section 5.

5.1.1 Description of the test location

Test location: Nemko Spa

5.1.1 Photo documentation of the test set-up

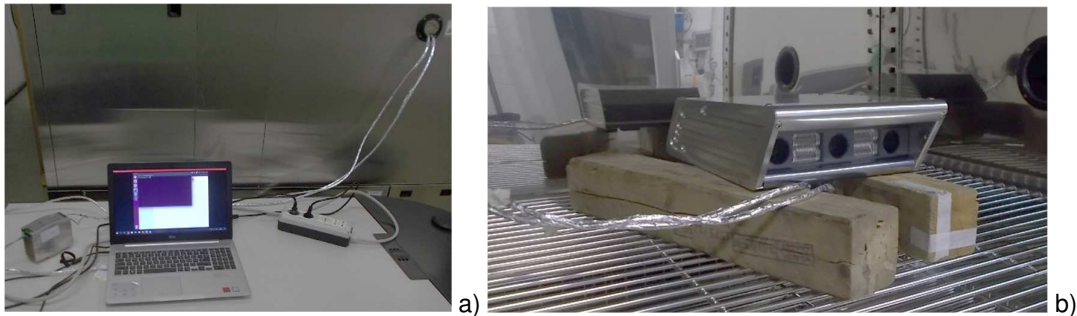


Fig.1 a) Test setup outside climatic chamber; b) EuT inside climatic chamber

5.1.2 Checks and inspections

Initial verification: functional test with positive results (see §4.4)

5.1.3 Test according to IEC 60068-2-2 Test Bd: Dry Heat

Parameter	Value
Initial adjustment	20 °C 50 % R.H./ 60 min
Temperature T1	50 °C
Duration @ T1	4 hours
Temperature T2	70 °C
Duration @ T2	2 hours
Gradient up/down	1 hour
Temperature S	20 °C 50 % R.H.
EuT condition during test	Operating from initial adjustment temperature to end of temperature T1 period

5.1.3.1 Checks and inspections

Intermediate verification: functional test (ON STATE) has been made during all period when EuT has been operated with positive results (see §4.4)

5.2 *Test according to OIML D11:2013 and IEC 60068-2-1 - Test Ab: Cold

Instruments used: see section 5.

5.2.1 Description of the test location

Test location: Nemko Spa

5.2.2 Photo documentation of the test set-up

See §5.1.1

5.2.3 Test according to OIML D11:2013 and IEC 60068-2-1 - Test Ab: Cold

Parameter	Value
Initial adjustment	20 °C
Temperature T3	-25 °C
Duration @ T3	2 hours
Temperature T4	-20 °C
Duration @ T4	5 hours
Gradient down	2 hours
Gradient up	1 hour
EuT condition during test	Operating during period on temperature T4

5.2.3.1 Checks and inspections

Intermediate verification: functional test (ON STATE) has been made during all period when EuT has been operated with positive results (see §4.4)

5.3 *Test according to OIML D11:2013 and IEC 60068-2-78 – Test: Damp heat, steady state

Instruments used: see section 5.

5.3.1 Description of the test location

Test location: Nemko Spa

5.3.2 Photo documentation of the test set-up

See 5.1.1

5.3.3 Checks and inspections

Initial verification: functional test with positive results (see §4.4)

5.3.4 Test according to OIML D11:2013 and IEC 60068-2-78 – Test: Damp heat, steady state

Parameter	Value
Initial adjustment	20 °C 80 % R.H
Temperature T5	40 °C
Humidity @ T5	95 % R.H.
Duration @ T5	2 hours
Gradient up/down	1 hour
Stabilization @ S	1 hour
EuT condition during test	Operating from initial adjustment temperature to end of temperature T5

5.3.4.1 Checks and inspections

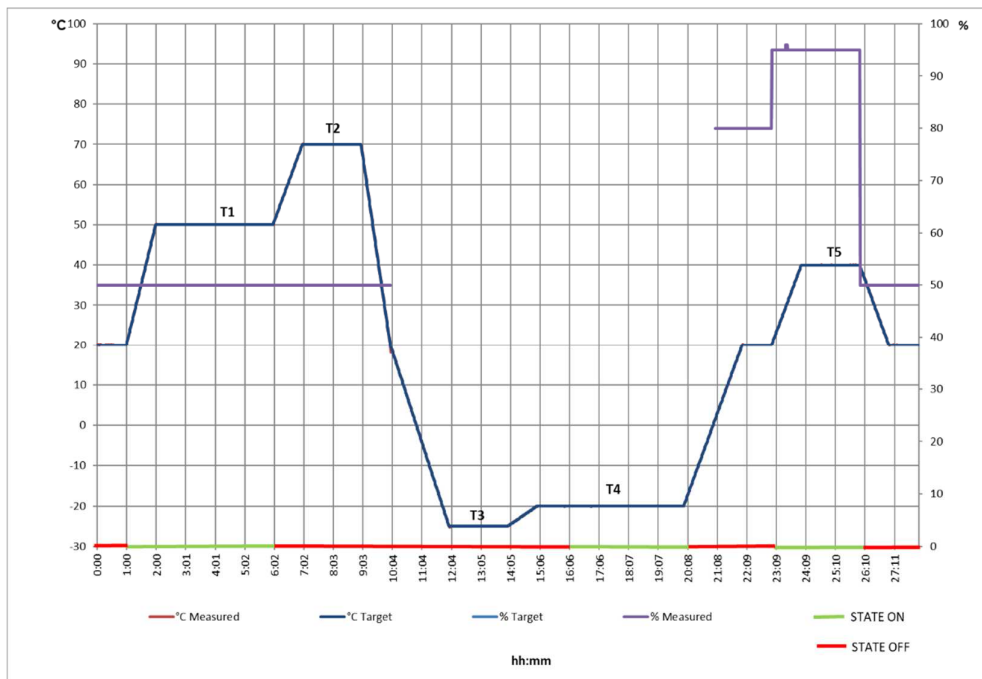
Intermediate verification: functional test (ON STATE) has been made during all period when EuT has been operated with positive results (see §4.4)

5.4 *Test result

The requirements are: **Fulfilled**

Remarks and/or Deviations: None.

5.4.1 Graphic



5 TEST EQUIPMENT

Description	Manufacturer	Model	Serial number
Climatic chamber	Espec	ARS 1100	4100000067
Thermo hygrometer data Logger	Testo	175 -H2	20012247/305
Barometer	MSR Electronic	MSR145B	330080

Description	Manufacturer	Model
Power supply **	Meanwell	DR-120-24
Laptop **	DELL	-

**Auxiliary equipment

For all other equipment auxiliary see the doc: "Attachment1 Test Report 374381-1TRFEnvEx", provided from customer and saved inside company archive.

6 PHOTO DOCUMENTATION



a)



b)

Figure 2: General views

- END OF TEST REPORT -