DEKRA Testing and Certification (Suzhou) Co., Ltd.
No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China

Test report Number:
2480159R-EMC-CE-P01V01

TEST REPORT
Electromagnetic Compatibility (EMC)

Identification of item tested	RobStride 03
Trademark	robstride
Model and /or type reference	RSQDD-PG-20-60-01A
Features	N/A
Derived model(s)	N/A
Applicant´s name / address	RobStride Dynamics Co., Ltd Room 305, 3rd Floor, Building 15, Yard 3, Jinghai 5th Road, Beijing Economic-Technological Development Area (Tongzhou), Beijing
Test method requested, standard	EN IEC 61000-6-1:2019 EN IEC 61000-6-3:2021
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Caviare Yang/Project Engineer 
Approved by (name / position & signature)	Yilia Zhang/Technical Supervisor
Date of issue	August 30, 2024
Report template No.	Template_EN_IEC 61000-6-1-2-3-4-EMC-V2.0

INDEX

Page No.

Competences and Guarantees....4
General conditions....4
Uncertainty....4
Environmental conditions....4
Possible test case verdicts....5
Definition of symbols used in this test report....5
Abbreviations....5
Document History....6
Remarks and Comments....6
1 General Information....7
1.1 General Description of the Item(s)....7
1.2 The environment(s) in which the EUT is intended to be used....8
1.3 Test location and date....8
2 Description of Test Setup....8
2.1 Operating mode(s) used for tests....8
2.2 Port(s) of the EUT....8
2.3 Support / Auxiliary equipment / unit / software for the EUT....8
2.4 Test Configuration / Block diagram used for tests....9
3 Verdict summary section....10
3.1 Standards....10
3.2 Deviation(s) from the Standard(s) / Test Specification(s)....10
3.3 Overview of results....11
3.4 Test Matrix....12
4 Emission Test Results....13
4.1 Conducted disturbance voltage at AC mains port(s)....13
4.2 Discontinuous disturbance (clicks) at AC mains port(s)....15
4.3 Conducted disturbance voltage at DC power port(s)....18
4.4 Conducted disturbance at Wired network port or other wired port(s)....21
4.5 Radiated electromagnetic disturbances (30 – 1000 MHz)....24
4.6 Radiated electromagnetic disturbances (above 1 GHz)....29
4.7 Harmonic current emissions....31

4.8 Voltage changes, voltage fluctuations and flicker 34
5 Immunity Test Results 36
5.1 Performance (Compliance) criteria 36
5.1.1 Performance criteria related to immunity tests 36
5.1.2 Manufacturer defined performance criteria 36
5.2 Monitored – Checked Functions / Parameters 37
5.3 Electrostatic discharge immunity 38
5.4 Radio-frequency electromagnetic fields immunity 42
5.5 Electrical Fast Transients immunity 43
5.6 Surge transient immunity 44
5.7 Injected currents (RF common mode) immunity 45
5.8 Power frequency magnetic field immunity 46
5.9 Power supply interruptions and dips immunity 47
6 Identification of the Equipment Under Test 48
7 Annex 1 - Measurement Uncertainties 50
8 Annex 2 - Test Photos 51
9 Annex 3 - EUT Photos 54

COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
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UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document PROD-P-EMC-M22. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. Refer to the Annex 1 for furter information.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	25 % - 75 %;30 % - 60 %(ESD)
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.				
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.				
Decimal separator used in this report	☐	Comma (,)	☒	Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	:	Equipment Under Test
QP	:	Quasi-Peak
CAV	:	CISPR Average
AV	:	Average
CDN	:	Coupling Decoupling Network
SAC	:	Semi-Anechoic Chamber
OATS	:	Open Area Test Site
BW	:	Bandwidth
AM	:	Amplitude Modulation
PM	:	Pulse Modulation
HCP	:	Horizontal Coupling Plane
VCP	:	Vertical Coupling Plane
U_N	:	Nominal voltage
Tx	:	Transmitter
Rx	:	Receiver
N/A	:	Not Applicable
N/M	:	Not Measured

DOCUMENT HISTORY

Report Number	Date	Description
2480159R-EMC-CE-P01V01	August 30, 2024	First release

REMARKS AND COMMENTS

1.The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

2.These test results on a sample of the device are for the purpose of demonstrating Compliance with EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021, EN IEC 61000-3-2:2019+A1:2021, EN 61000-3-3:2013/A2:2021.

3. The test results presented in this report relate only to the object tested.
4. This report will not be used for social proof function in China market.
5. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
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1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item .....:	RobStride 03
Model / Type number .....:	RSQDD-PG-20-60-01A
Serial number .....:	N/A
Trademark .....:	robstride
Manufacturer .....:	RobStride Dynamics Co., Ltd
Address.....:	Room 305, 3rd Floor, Building 15, Yard 3, Jinghai 5th Road, Beijing Economic-Technological Development Area (Tongzhou), Beijing

Note 1: The EUT information is from customer declaration.

Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC: 100-240 Vac, 50/60 Hz	☐	☐	☐	☐	☐
	☐	AC: 100 – 240 V, 50/60 Hz	☐	☐	☐	☐	☐
	☒	DC: 48 Vdc					
Rated Power .....:	Not provided						
Clock frequencies :	1 kHz						
Other parameters.....:	Not provided						
Software version .....:	0.2						
Hardware version.....:	0.2						
Dimensions in cm (L x W x H) ....:	Not provided						
Mounting position.....:	☒	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					

Intended use of the Equipment Under Test (EUT)
The EUT is a commercial and light-industrial environment.

No	Module/parts of test item			Type	Manufacturer
---	---			---	---
No	Documents as provided by the applicant - Description			File name	Issue date
---	---			---	---
Modifications to the test item during testing .....:	☒	N/A	☐	Supplemental information:	

Copy of marking plate:
N/A

1.2 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

☐	Residential (domestic) environment.
☒	Commercial and light-industrial environment
☐	Industrial environment

1.3 Test location and date

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date (receive sample)	August 06, 2024
Date (start)	August 15, 2024
Date (finish)	August 20, 2024

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for testing	
		Emission	Immunity
1	Normal working (DC power 1+motor forward rotation)	☒	☒
2	Normal working (DC power 2+motor inversion rotation)	☒	☒
Supplemental information:			

2.2 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable		
		Length used during test [m]	Attached during test	Shielded
DC Power Port 1	DC Source	0.8	☒	☐
Signal Port	Notebook computer	0.9	☒	☐
Supplemental information: Note: DC Power cable and Signal cable are less than 3m in length.				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

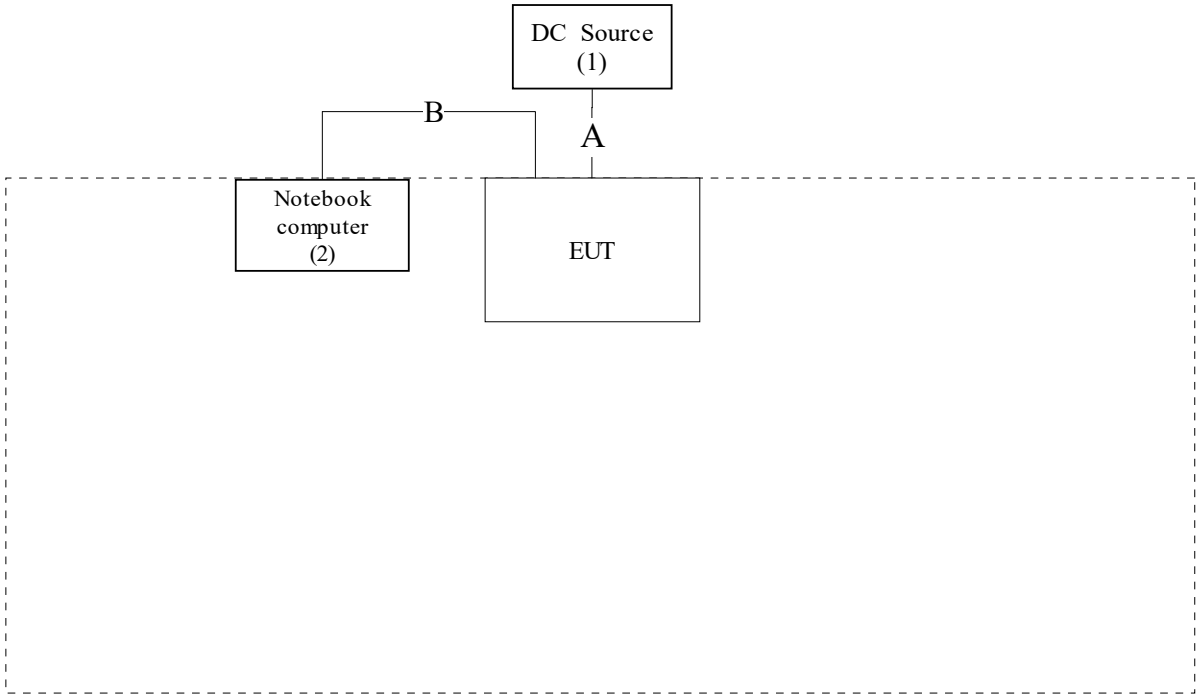
Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
DC Source	N/A	N/A	DEKRA
Notebook computer	ThinkPad X250	Lenovo	DEKRA
Supplemental information:			

2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:

Test Item		EMI / EMS			
Product		Manufacturer	Model No.	Serial No.	Power Cord
1	DC Source	N/A	N/A	990950	Non-Shielded, 1.8 m
2	Notebook computer	Lenovo	ThinkPad X250	SL10H14859	Non-Shielded, 1.2 m

Test Configuration / Block diagram



Signal Cable Type		Signal cable Description
A	DC Cable	Non-Shielded, 0.8 m
B	Signal Cable	Non-Shielded, 0.9 m

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
EN IEC 61000-6-3	2021	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments
EN IEC 61000-6-4	2019	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN IEC 61000-6-1	2019	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments
EN IEC 61000-6-2	2019	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
CISPR 16-2-1 +A1	2014 2017	Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements
CISPR 16-2-3	2016	Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements
CISPR 14-1	2016	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission
EN IEC 61000-3-2	2019	Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3 /A1	2013 2019	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.
EN 61000-3-12	2011	Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase.
EN IEC 61000-3-11	2019	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection.
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
IEC 61000-4-3 +A1 +A2	2006 2007 2010	Electromagnetic compatibility (EMC) – Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
IEC 61000-4-5	2014	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques - Surge immunity test
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-8	2009	Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
IEC 61000-4-11	2004	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests
IEC 61000-4-34 +A1	2005 2009	Electromagnetic compatibility (EMC) – Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

No deviation.

3.3 Overview of results

EMISSION TESTS –☒EN IEC 61000-6-3, ☐EN IEC 61000-6-4			
Requirement – Test case	**Basic standard(s)**	**Verdict**	**Remark**
Conducted disturbance voltage at AC power port(s)	CISPR 16-2-1	N/A	See 1)
Conducted disturbance voltage at DC power port(s)	CISPR 16-2-1	N/A	See 2)
Conducted disturbance voltage at Telecommunications / network port(s)	CISPR 32, CISPR 16-2-1	N/A	See 3)
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)	CISPR 16-2-3	Pass	---
Radiated electromagnetic disturbances (above 1 GHz)	CISPR 16-2-3	N/A	See 4)
Discontinuous disturbance (clicks)	CISPR 14-1	N/A	See 1)
Supplementary information: 1) The EUT does not have an AC mains power input / output port, so it needs not to perform this test item. 2) The test is not applicable to DC power input / output ports connected to cable(s)≤ 3m, so it needs not to perform this test item. 3) The test is not applicable to wired network ports connected to cable(s) ≤ 3 m, so it needs not to perform this test item. 4) The highest internal frequency of the EUT is less than 108 MHz, so it needs not to perform this test item.			

EMISSION TESTS –☐EN IEC 61000-3-2, ☐EN 61000-3-12, ☐EN 61000-3-3, ☐EN IEC 61000-3-11			
Requirement – Test case	**Basic standard(s)**	**Verdict**	**Remark**
Harmonic current emissions	EN IEC 61000-3-2	N/A	See 1)
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	N/A	See 1)
Supplementary information: 1) The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.			

IMMUNITY TESTS –☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2			
Requirement – Test case	**Basic standard(s)**	**Verdict**	**Remark**
Electrostatic discharge	EN 61000-4-2	Pass	---
Radio-frequency electromagnetic fields	EN 61000-4-3	Pass	---
Fast transients	EN 61000-4-4	N/A	See 1)
Surge transient	EN 61000-4-5	N/A	See 1)
Injected currents (radio-frequency common mode)	EN 61000-4-6	N/A	See 1)
Power frequency magnetic fields	EN 61000-4-8	Pass	---
Voltage dips and short interruptions	☐IEC 61000-4-11 ☐IEC 61000-4-34	N/A	See 2)
Supplementary information: 1) The test is not applicable to DC power input / output ports connected to cable(s)≤ 3m, so it needs not to perform this test item. 2) The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.			

3.4 Test Matrix

EMISSION TESTS	Model / Type Mode 1&2
Conducted disturbance voltage at AC power port(s) (150 kHz – 30 MHz)	☐
Conducted disturbance voltage at DC power port(s) (150 kHz – 30 MHz)	☐
Conducted disturbance voltage at telecommunications/ network port (150 kHz – 30 MHz)	☐
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)	☒
Radiated electromagnetic disturbances (above 1 GHz)	☐
Discontinuous disturbance (clicks)	☐
Harmonic current emissions	☐
Voltage changes, voltage fluctuations and flicker	☐
Supplementary Information:	

IMMUNITY TESTS	Model / Type Mode 1&2
Electrostatic discharge	☒
Radio-frequency electromagnetic fields	☒
Fast transients	☐
Surges	☐
Injected currents (radio-frequency common mode)	☐
Power frequency magnetic field immunity	☒
Voltage dips and short interruptions	☐
Supplementary Information:	

4 EMISSION TEST RESULTS

4.1	Conducted disturbance voltage at AC mains port(s)	VERDICT:	N/A

Standard	☒**EN IEC 61000-6-3,** ☐**EN IEC 61000-6-4**
Basic standard(s)	CISPR 16-2-1

Limits for EN IEC 61000-6-3

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 – 0,50	66 – 56 [2)]	56 – 46 [2)]	9 kHz	QP, CAV
0,50 – 5,0	56	46	9 kHz	QP, CAV
5,0 – 30	60	50	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.

Limits for EN IEC 61000-6-4

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 – 0,50	79	66	9 kHz	QP, CAV
0,50 – 30	73	60	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.

Performed measurements

Port under test		Terminal							
☐	AC input port	☐	N	☐	L1	☐	L2	☐	L3
☐	Other:	☐	N	☐	L1	☐	L2	☐	L3

Voltage – Mains [V]	---			
Frequency – Mains [Hz]	---			
Test method applied	☐	Artificial mains network		
	☐	Voltage probe		
Test setup	☐	Table top	☐	Artificial hand applied
	☐	Floor standing	☐	Other:

Operating mode(s) used	---			
Remark	---			

See next page.

Measurement data	Port under test	AC Power Port
Operating mode / voltage / frequency used during the test		---

The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.

Remark	

4.2 Discontinuous disturbance (clicks) at AC mains port(s) — VERDICT: N/A

Standard	☒EN IEC 61000-6-3, ☐EN IEC 61000-6-4	
Basic standard(s)	CISPR 14-1	
Exlusions	☐	Test item only causes single switching events (CISPR 14-1 5.4.3.2)
	☐	Combination of disturbances in a time frame less than 600 ms (CISPR 14-1 5.4.3.3)
	☐	Instantaneous switching (CISPR 14-1 5.4.3.4)
	☐	Separation less than 200 ms (CISPR 14-1 5.4.3.5)
	☐	Thermostatically controlled three-phase switches (CISPR 14-1 5.4.3.6)
	☐	Superposition of clicks with continuous disturbance (CISPR 14-1 5.4.3.7)
	☐	Other:

Limits

Frequency [MHz]	Limit: QP [dB(µV)]	IF BW	Detector
0,15	66	9 kHz	QP
0,50	56	9 kHz	QP
1,40	56	9 kHz	QP
30,0	60	9 kHz	QP

Performed measurements

Voltage – Mains [V]	---			
Frequency – Mains [Hz]	---			
Test method applied	☐	Artificial mains network:V-AN		
	☐	Voltage probe		
Test setup	☐	Table top	☐	Floor standing
	☐	Other:		

Operating mode(s) used	---			
Remark	---			

Reason for not performing the test	☐	The amplitudes of the observed disturbances were all below the limit for continuous disturbance, these are not considered to be clicks.

Measurement results	☐	Neutral	☐	Line 1	☐	Line 2	☐	Line 3

Frequency (MHz)	First Measurement: Determination of the limit L_q – Quasi-peak							
	Limit L (dBµV)	Number of short clicks	Number of long clicks	Number of clicks – N_1	Time of meas. (min.)	Click rate N	Increased limit (dB)	Increased Limit L_q
0,15	66	---	---	---	---	---	---	---
0,5	56	---	---	---	---	---	---	---
1,4	56	---	---	---	---	---	---	---
30	60	---	---	---	---	---	---	---

☐	The calculated click rate N is not more than 5 times per minute and all the clicks are classified as short (t ≤ 10 ms). Thus, the EUT is deemed to comply with the limits without any further measurement at an increased limit.

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method):			
	Limit Lq (dBµV)	Number of clicks – N_2	Number of authorized clicks N2 ≤N1/4	Verdict
0,15	---	---	---	---
0,5	---	---	---	---
1,4	---	---	---	---
30	---	---	---	---
Supplementary information:				

See next page.

Measurement data	Port under test	AC power port
Operating mode / voltage	---	

The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.

Remark	

4.3 **Conducted disturbance voltage at DC power port(s)**	**VERDICT: N/A**

Standard	☒**EN IEC 61000-6-3,** ☐**EN IEC 61000-6-4**
Basic standard(s)	CISPR 16-2-1

The applicability to DC port(s)

No.	Description of DC power source connection[d]	Intended cable connection [d]	Specifics and additional requirements
1	Distribution network [a]	All types	---
2	Remote battery	Is longer than 3 m	Applicable in case of remote battery connected to only one piece of equipment
3	External AC/DC converter or battery charger	Is longer than 3 m [b]	
4	External DC/DC converter or battery charger	Is longer than 3 m [b]	The DC input port of the charger/converter [c] shall also be tested.
5	All other DC power sources not defined above	Is longer than 3 m	---

a. DC distribution networks include:
- those enclosed within a car, truck, train or similar vehicle (independent of length),
- those with an overall length greater than 3 m.

b. The length of the cable between the DC port and the convertor or charger.
c. Where possible, use a device specified in the user instructions, else use a typical device capable of developing the necessary DC voltage/current.
d. Based upon the intended use of the equipment as defined in the user instructions.

Limits for EN IEC 61000-6-3

Limits: V-AN

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 - 0,50	79	66	9 kHz	QP, CAV
0,50 - 30	73	60	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.

Limits: △-AN

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 - 0,50	84-74 [2)]	74-64 [2)]	9 kHz	QP, CAV
0,50 - 30	74	64	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.

The start frequency of test defined in table"The applicability to DC port(s)" No. 2 to 5 for EN IEC 61000-6-3

Cable length *l* m	Start frequency MHz f_{start}
3< *l* <30	$f_{start} = 60 / l$
l ⩾ 30	$f_{start} = 0,15$

Cable length *l* m	Start frequency MHz f_{start}
Not defined	
l = maximum supported cable length intended to be connected to the DC power port Measurement shall be performed across the range from f_{start} to 30 MHz.	

According to the cable length of DC power port

f_{start} =	☐ MHz	☐0.15MHz

Limits for EN IEC 61000-6-4

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 - 0,50	89	76	9 kHz	QP, CAV
0,50 - 30	83	70	9 kHz	QP, CAV
[1)] At the transition frequency, the lower limit applies.				

Performed measurements

Port under test		Terminal			
☐	DC power input port	☐	Positive (+)	☐	Negative (-)
☐	Other:	☐	Positive (+)	☐	Negative (-)

Voltage – Input [VDC]	---			
Voltage – Output [V_{DC}]	---			
Test method applied	☐	Artificial mains network:V-AN		
	☐	Voltage probe		
Test setup	☐	Table top	☐	Artificial hand applied
	☐	Floor standing	☐	Other:

Operating mode(s) used	---			
Remark	---			

See next page.

Measurement data	Port under test	DC power port
Operating mode / voltage		---
The test is not applicable to DC power input / output ports connected to cable(s)≤ 3m, so it needs not to perform this test item.		
Remark		

4.4	**Conducted disturbance at Wired network port or other wired port(s)**	**VERDICT: N/A**

Standard	☒**EN IEC 61000-6-3,** ☐**EN IEC 61000-6-4**
Basic standard(s)	CISPR 32, CISPR 16-2-1

Limits for EN IEC 61000-6-3

Applicable to
1. wired network ports
2. optical fibre ports with metallic shield or tension menbers
3. broadcast receiver tuner ports
4. antenna ports

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	Limit: QP [dB(µA)[1)]]	Limit: AV [dB(µA) [1)]]	IF BW	Detector(s)
0,15 - 0,50	84 – 74 [2)]	74 – 64 [2)]	40 – 30 [2)]	30 – 20 [2)]	9 kHz	QP, CAV
0,50 - 30	74	64	30	20	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.

Limits for EN IEC 61000-6-4

Applicable to
1. wired network ports
2. optical fibre ports with metallic shield or tension menbers
3. antenna ports

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	Limit: QP [dB(µA)[1)]]	Limit: AV [dB(µA) [1)]]	IF BW	Detector(s)
0,15 - 0,50	97 – 87 [2)]	84 – 74 [2)]	53 – 43 [2)]	40 – 30 [2)]	9 kHz	QP, CAV
0,50 - 30	87	74	43	30	9 kHz	QP, CAV

[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.

Performed measurements

Port under test			
☐	LAN / Ethernet	☐	Other:
☐	Other:	☐	Other:

Voltage – Mains [V]	---
Frequency – Mains [Hz]	---

Test method applied	☐	ISN – Impedance Stabilisation Network
	☐	Voltage probe
	☐	Current probe
	☐	Artificial mains network

	☐	Other:		
Test setup	☐	Table top	☐	Artificial hand applied
	☐	Floor standing	☐	Other:

Operating mode(s) used	---			
Remark	---			

See next page.

Measurement data	Port under test	Network Port
Operating mode / voltage / frequency used during the test		---

The test is not applicable to wired network ports connected to cable(s) ⩽ 3 m, so it needs not to perform this test item.

Remark	

4.5 Radiated electromagnetic disturbances (30 – 1000 MHz) | VERDICT: PASS

Standard	☒**EN IEC 61000-6-3,** ☐**EN IEC 61000-6-4**
Basic standard(s)	CISPR 16-2-3
Test method	Antenna method according to CISPR 16-2-3 standard.

Limits for EN IEC 61000-6-3

Frequency	Limit: QP [dB(µV/m)[1)]]		IF BW	Detector
[MHz]	@3 m.	@10 m.		
30 - 230	40	30	120 kHz	QP
230 - 1000	47	37	120 kHz	QP
[1)] At the transition frequency, the lower limit applies.				

Limits for EN IEC 61000-6-4

Frequency	Limit: QP [dB(µV/m)[1)]]		IF BW	Detector
[MHz]	@3 m.	@10 m.		
30 - 230	50	40	120 kHz	QP
230 - 1000	57	47	120 kHz	QP
[1)] At the transition frequency, the lower limit applies.				

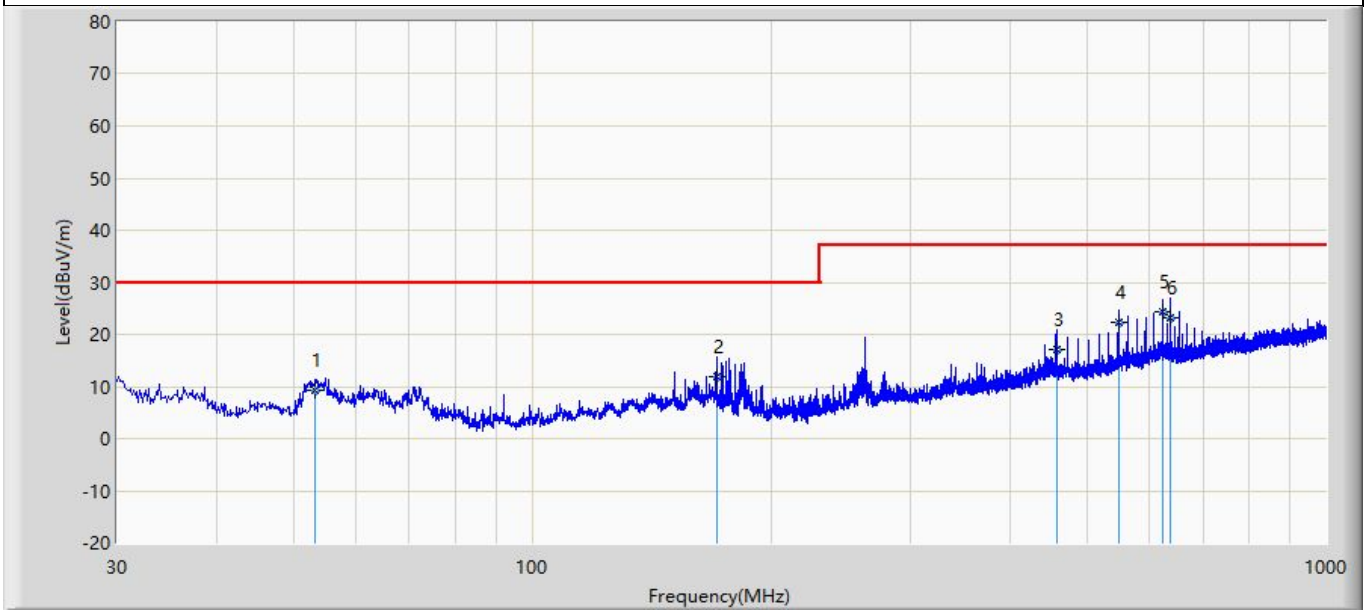
Performed measurements

Port under test	Enclosure Port	
Voltage – Mains [V]	48 Vdc	
Frequency – Mains [Hz]	---	
Test method applied	☐	OATS or SAC with measurement distance [m]: 3 m.
	☒	OATS or SAC with measurement distance [m]: 10 m.
Test setup	☒	Equipment on a table of 80 cm height
	☐	Equipment on the floor (insulated from ground plane)
	☐	Other:
	Refer to the Annex 2 for test setup photo(s).	
Operating mode(s) used	Mode 1&2	
Remark	---	

See next page.

Measurement data	☒	Horizontal	☐	Vertical
Operating mode / voltage / frequency used during the test		Mode 1 /48 Vdc		

Engineer: Jim Fu	
Site: AC1	Time: 2024/08/15
Limit: EN IEC 61000-6-3_RE (10m)_Class B	Margin: 0
Probe: VULB9168_01100(30-1000MHz)-H	Polarity: Horizontal
EUT: RobStride 03	Power: 48 Vdc
Note: Mode 1	



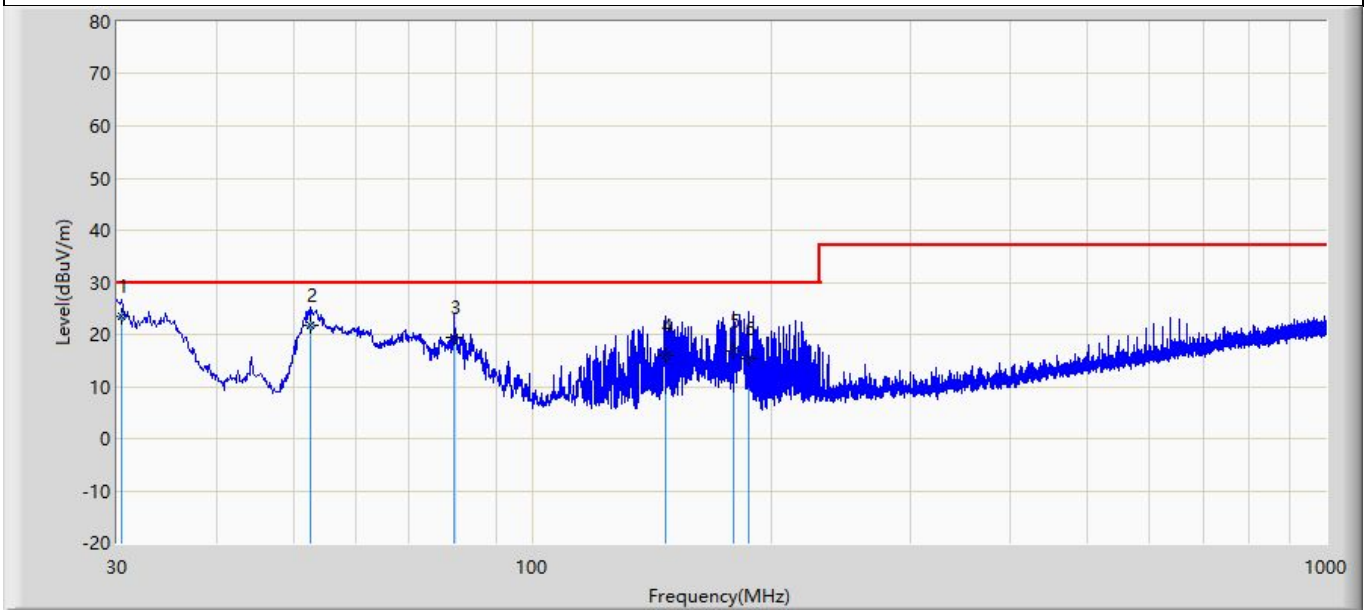
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		53.296	9.308	23.100	-20.692	30.000	13.725	1.326	28.843	331	84	QP
2		170.785	12.024	25.400	-17.976	30.000	12.851	2.500	28.727	292	262	QP
3		457.526	17.225	23.600	-19.775	37.000	17.263	4.408	28.046	134	19	QP
4		547.526	22.334	26.700	-14.666	37.000	18.815	4.907	28.088	139	204	QP
5	*	622.554	24.349	26.800	-12.651	37.000	20.486	5.305	28.243	182	161	QP
6		637.594	23.248	25.600	-13.752	37.000	20.584	5.382	28.318	116	42	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Measurement data	☐	Horizontal	☒	Vertical
Operating mode / voltage / frequency used during the test		Mode 1 / 48 Vdc		

Engineer: Jim Fu	
Site: AC1	Time: 2024/08/15
Limit: EN IEC 61000-6-3_RE (10m)_Class B	Margin: 0
Probe: VULB9168_01099(30-1000MHz)-V	Polarity: Vertical
EUT: RobStride 03	Power: 48 Vdc
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	30.381	23.466	43.300	-6.534	30.000	11.664	1.106	32.604	320	94	QP
2		52.684	21.715	39.500	-8.285	30.000	13.569	1.473	32.827	238	328	QP
3		79.842	19.453	41.200	-10.547	30.000	9.494	1.858	33.098	204	276	QP
4		147.526	15.946	33.700	-14.054	30.000	12.929	2.571	33.253	167	22	QP
5		179.756	16.710	35.100	-13.290	30.000	11.941	2.889	33.221	357	168	QP
6		187.532	15.467	34.600	-14.533	30.000	11.113	2.967	33.213	255	120	QP

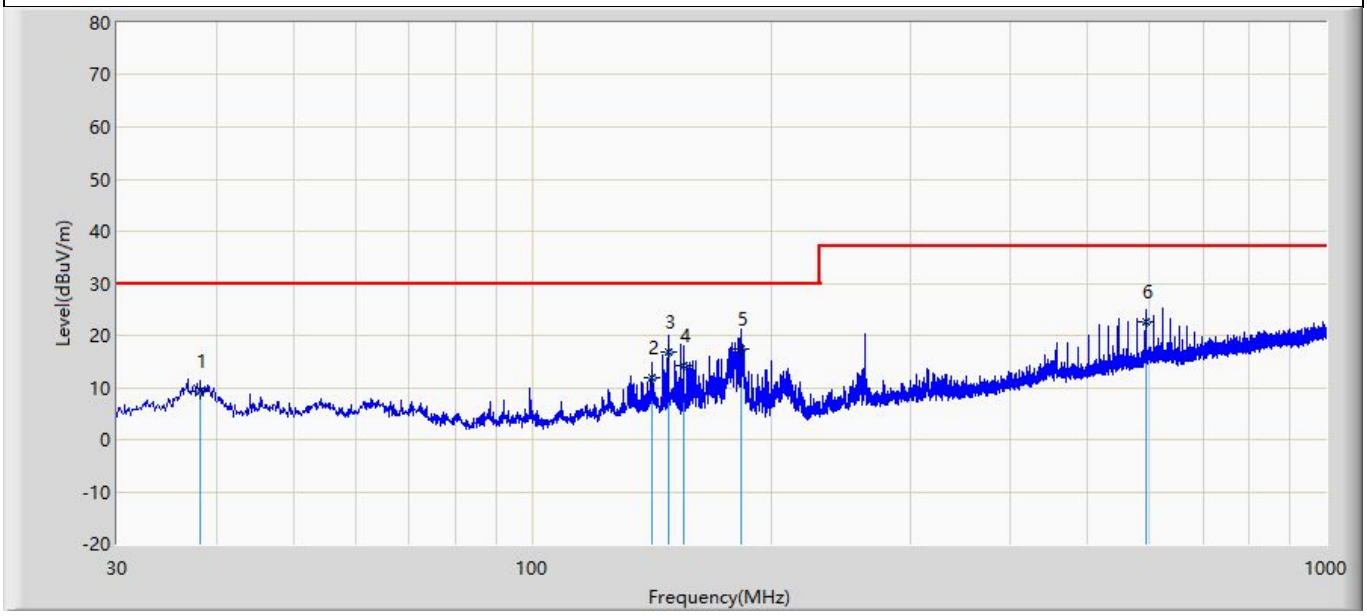
Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Remark	

Measurement data	☒	Horizontal	☐	Vertical
Operating mode / voltage / frequency used during the test		Mode 2 /48 Vdc		

Engineer: Jim Fu	
Site: AC1	Time: 2024/08/15
Limit: EN IEC 61000-6-3_RE (10m)_Class B	Margin: 0
Probe: VULB9168_01100(30-1000MHz)-H	Polarity: Horizontal
EUT: RobStride 03	Power: 48 Vdc
Note: Mode 2	



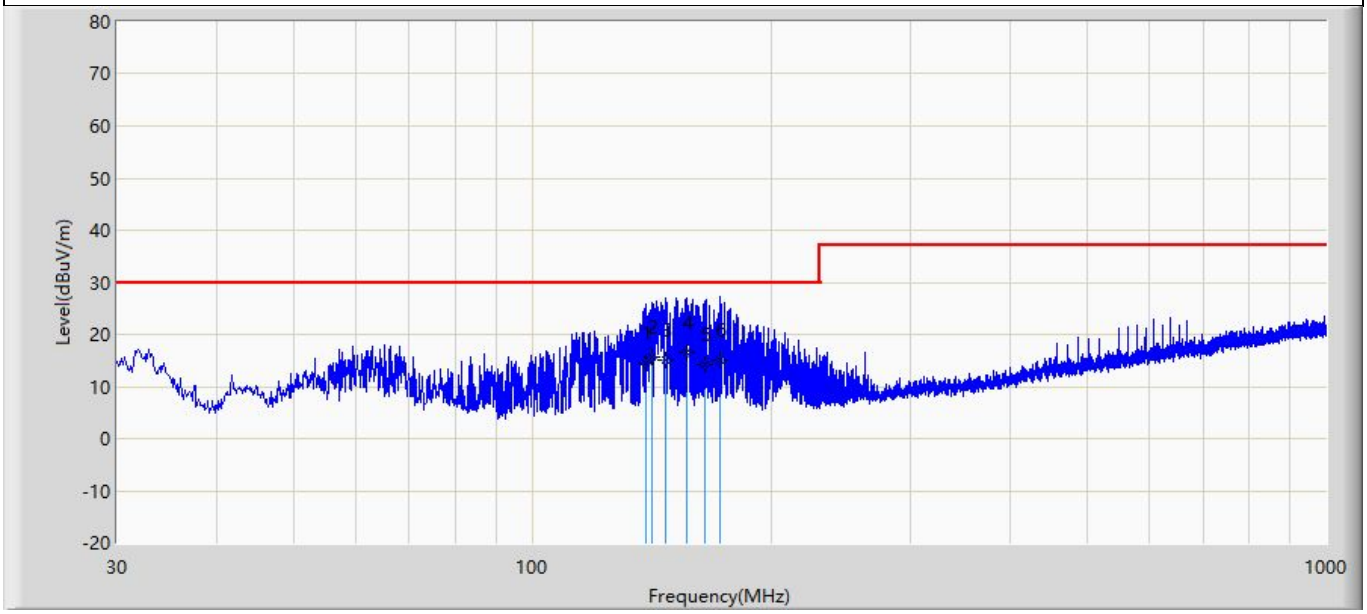
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		38.259	9.280	23.800	-20.720	30.000	13.156	1.096	28.772	293	334	QP
2		141.825	11.864	25.400	-18.136	30.000	13.044	2.242	28.822	326	219	QP
3		148.726	16.854	30.100	-13.146	30.000	13.249	2.304	28.799	354	351	QP
4		155.046	14.309	27.300	-15.691	30.000	13.427	2.360	28.778	375	39	QP
5	*	183.534	17.515	31.900	-12.485	30.000	11.685	2.614	28.684	245	332	QP
6		592.615	22.521	25.600	-14.479	37.000	19.895	5.150	28.124	294	80	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Measurement data	☐	Horizontal	☒	Vertical
Operating mode / voltage / frequency used during the test		Mode 2 / 48 Vdc		

Engineer: Jim Fu	
Site: AC1	Time: 2024/08/15
Limit: EN IEC 61000-6-3_RE (10m)_Class B	Margin: 0
Probe: VULB9168_01099(30-1000MHz)-V	Polarity: Vertical
EUT: RobStride 03	Power: 48 Vdc
Note: Mode 2	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		138.986	14.555	32.700	-15.445	30.000	12.629	2.486	33.261	280	91	QP
2		141.581	15.609	33.600	-14.391	30.000	12.756	2.511	33.258	206	101	QP
3		147.423	15.142	32.900	-14.858	30.000	12.926	2.570	33.253	204	85	QP
4	*	156.834	16.418	33.800	-13.582	30.000	13.198	2.663	33.243	260	245	QP
5		165.328	14.340	31.900	-15.660	30.000	12.928	2.747	33.234	218	60	QP
6		172.392	15.137	33.100	-14.863	30.000	12.447	2.817	33.227	100	5	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Remark	

4.6 Radiated electromagnetic disturbances (above 1 GHz) — VERDICT: N/A

Standard	☒EN IEC 61000-6-3, ☐EN IEC 61000-6-4	
Basic standard(s)	CISPR 16-2-3	
Test method	Antenna method according to CISPR 16-2-3 standard.	
Required highest frequency for radiated measurement		
Highest internal frequency [f_x]		Highest measured frequency
☒	$f_x \leq 108$ MHz	1 GHz
☐	108 MHz < $f_x \leq 500$ MHz	2 GHz
☐	500 MHz < $f_x \leq 1$ GHz	5 GHz
☐	$f_x \geq 1$ GHz	5x f_x or up to 6 GHz
☐	unknown	6GHz

Limits for EN IEC 61000-6-3

Frequency [GHz]	Limit: PK@3m.[dB(µV/m)[1)]]	Limit: AV@3m.[dB(µV/m)[1)]]	IF BW	Detector
1 - 3	70	50	1 MHz	PK, CAV
3 - 6	74	54	1 MHz	PK, CAV
[1)] At the transition frequency, the lower limit applies.				

Limits for EN IEC 61000-6-4

Frequency [GHz]	Limit: PK@3m.[dB(µV/m)[1)]]	Limit: AV@3m.[dB(µV/m)[1)]]	IF BW	Detector
1 - 3	76	56	1 MHz	PK, CAV
3 - 6	80	60	1 MHz	PK, CAV
[1)] At the transition frequency, the lower limit applies.				

Performed measurements

Port under test	---	
Voltage – Mains [V]	---	
Frequency – Mains [Hz]	---	
Test method applied	☐	Absorber-lined OATS or SAC with measurement distance [m]: 3 m.
	☐	Absorber-lined OATS or SAC with measurement distance [m]: 1 m.
Test setup	☐	Equipment on a table of 80 cm height
	☐	Equipment on the floor (insulated from ground plane)
	☐	Other:

Operating mode(s) used	---	
Remark	---	

See next page.

Measurement data	☐	Horizontal	☐	Vertical
Operating mode / voltage / frequency used during the test		---		

The highest internal frequency of the EUT is less than 108 MHz, so it needs not to perform this test item.

Remark	

4.7 **Harmonic current emissions**	**VERDICT: N/A**

Standard	☐EN IEC 61000-3-2, ☐EN 61000-3-3, ☐EN 61000-3-12	
Basic standard	EN IEC 61000-3-2,EN 61000-3-12	
Exlusions (For these categories of equipment, limits are not specified in the EN 61000-3-2 standard)	☐	lighting equipment with a rated power less than but not equal to 5 W
	☐	equipment with a rated power of 75 W or less, other than lighting equipment
	☐	professional equipment with a total rated power greater than 1 kW
	☐	symmetrically controlled heating elements with a rated power less than or equal to 200 W
	☐	independent phase control dimmers - with a rated power less than or equal to 1 kW when operating incandescent lamps - with a rated power less than or equal to 200 W for trailing edge dimmers, and universal phase control dimmers with the default mode set to trailing edge, when operating lighting equipment other than incandescent lamps - with a rated power less than or equal to 100 W for leading edge dimmers, and universal phase control dimmers without default mode set to trailing edge, when operating lighting equipment other than incandescent lamps

Classification（I_{input}≤ 16A）				
☐	Class A	All apparatus not classified as Class B, C or D		
☐	Class B	Portable tools, arc welding equipment which is not professional equipment		
☐	Class C	☐	Lighting equipment with rated power > 25 W (Table 2)	
		☐	Lighting equipment with rated power≥ 5 W and ≤ 25 W (First requirement, Table 3 column 2)	
			☐	Table 3, column 2 (Power related limits)
			☐	3rd harmonic ⩽ 86 %, 5th harmonic ⩽ 61 % and waveform conditions
			☐	THD ⩽ 70 %, Harmonics: 3rd ⩽35 %, 5th ⩽ 25 %, 7th ⩽ 30 %, 9th and 11th ⩽ 20 %, 2nd ⩽ 5 %
			☐	Other:
☐	Class D	Equipment having a specified power according to EN IEC 61000-3-2 6.3.2, less than or equal to 600 W, of the following types: - personal computers and personal computer monitors - television receivers - refrigerators and freezers having one or more variable-speed drives to control compressor - motor(s)		

Classification（16A≤ I_{input}<75A）		
☐	Table 2	other than balanced three-phase equipment
☐	Table 3	balanced three-phase equipment
☐	Table 4	balanced three-phase equipment under specified conditions(a,b,c)
☐	Table 5	balanced three-phase equipment under specified conditions(d,e,f)

Performed measurements

Port under test	---					
Voltage – Mains [V]	---					
Frequency – Mains [Hz]	---					
Observation peroid	☐	6.5 min.	☐	2.5 min.	☐	Other:
Version of measurement instrument standard used EN / IEC61000-4-7 (Cl. 7)	☐	EN 61000-4-7:2002 + AM1:2009 (IEC 61000-4-7:2002+AM1:2008)				
	☐	EN 61000-4-7:1991				
Control principle used in the EUT	☐	Comply with the requirements of the Clause 6.2 (EN / IEC 61000-3-2).				
	☐	Comply with the requirements of the Clause 5.1 (EN / IEC 61000-3-12).				
	☐	Not comply with the requirements of the Clause 6.2 (EN / IEC 61000-3-2).				
	☐	Not comply with the requirements of the Clause 5.1 (EN / IEC 61000-3-12).				
Operating mode(s) used	---					
Remark	---					

See next page.

Measurement data	Port under test	AC Power Port
Operating mode / voltage / frequency used during the test		---

The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.

Remark	

4.8 **Voltage changes, voltage fluctuations and flicker**	**VERDICT: N/A**

Standard	☐EN IEC 61000-3-2, ☐ EN 61000-3-3, ☐EN IEC 61000-3-11
Basic standard	EN 61000-3-3,EN IEC 61000-3-11

apply for	☐	EN 61000-3-3		
	☐	EN IEC 61000-3-11	☐	Z_{test} = 0,25 + j 0,25 Ω
			☐	Z_{test} = 0,15 + j 0,15 Ω for line, 0,1 + j 0,1 Ω for neutral
			☐	Z_{test} =
Supplemental information:				

Limits

P_{ST} (Short term flicker)	☐	≤ 1	☐	Not Applicable
P_{LT} (Long term flicker)	☐	≤ 0,65	☐	Not Applicable
d_C (Relative Voltage change)	☐	≤ 3,3%	☐	Not Applicable
T_{max} (Maximum time duration)	☐	≤ 500ms	☐	Not Applicable
d_{MAX} (Max. voltage change)	☐	≤ 4%	☐	6%
	☐	7%	☐	Not Applicable
Supplemental information:				

Performed measurements

Reason for not performing the measurement(s)	☐	Tests are not necessary because the EUT is unlikely to produce significant voltage fluctuations or flicker (clause 6.1 of EN 61000-3-3).				
Port under test	---					
Voltage – Mains [V]	---					
Frequency – Mains [Hz]	---					
Test method	☐	Flickermeter according EN / IEC 61000-4-15:2011				
	☐	Simulation (Clause 4.2.3 of EN / IEC 61000-3-3)				
	☐	Analytical method (Clause 4.2.4 of EN / IEC 61000-3-3)				
	☐	Use of P_{st} = 1 curve (Clause 4.2.5 of EN / IEC 61000-3-3)				
Observation peroid	☐	10 min.	☐	120 min.	☐	Other:
	☐	24 times switching according to Annex B of the standard				
Operating mode(s) used	---					
Remark	---					

See next page.

Measurement data	Port under test	AC power port
Operating mode / voltage / frequency used during the test		---

The EUT does not have an AC mains power input / output port, so it needs not to perform this test item.

Remark	

5 IMMUNITY TEST RESULTS

5.1 Performance (Compliance) criteria

[Source: EN IEC 61000-6-1&EN IEC 61000-6-2]

Performance criterion A: The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion B: The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion C: Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

5.1.1 Performance criteria related to immunity tests

Immunity test	Performance criteria
Electrostatic discharge	B
Radio-frequency electromagnetic fields	A
Fast transients	B
Surge transient	B
Injected currents (radio-frequency common mode)	A
Power frequency magnetic field immunity	A
Voltage dips and short interruptions	B, C

5.1.2 Manufacturer defined performance criteria

Not provided.

5.2 Monitored – Checked Functions / Parameters

During the immunity tests the following functions of the EUT has/have been monitored/checked.

☒	Motor speed	☐	Display data
☐	Switching	☐	Data storage
☐	Standby mode	☐	Sensor functions
☐	Temperature	☐	Audible signals
☐	Power consumption	☒	Others: Connect the notebook computer to monitor the motor speed parameters through the software
☐	AC mains input current	☐	Others:
☐	Timing	☐	Others:
☐	Illumination	☐	Others:
Supplementary information:			

Immunity test	Monitored - Checked function(s)/parameter(s) during / after the test	Method
Electrostatic discharge	PASS	Visual
Radio-frequency electromagnetic fields	PASS	Camera
Fast transients	N/A	N/A
Surge transient	N/A	N/A
Injected currents (radio-frequency common mode)	N/A	N/A
Power frequency magnetic field immunity	PASS	Visual
Voltage dips and short interruptions	N/A	N/A
Supplementary information:		

5.3 Electrostatic discharge immunity — VERDICT: PASS

Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

Requirements

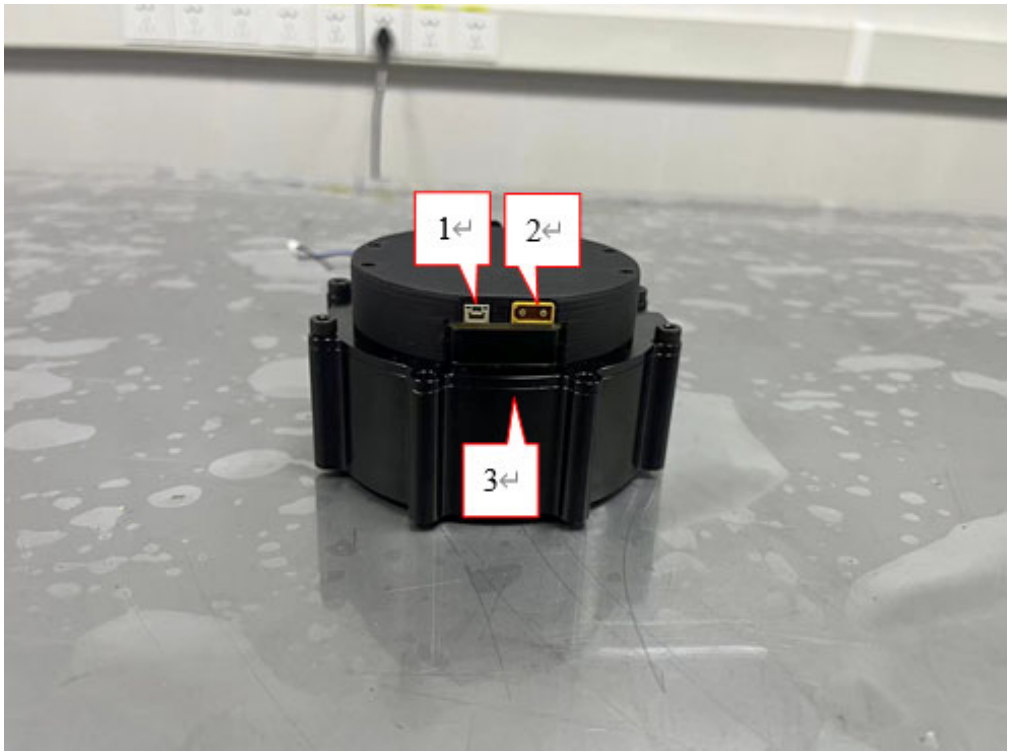
Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2							
Basic standard	IEC 61000-4-2							
Port under test	Enclosure							
Air discharges	☒	±2 kV	☒	±4 kV	☒	±8 kV	☐	kV
Contact discharges	☐	±2 kV	☒	±4 kV	☐	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval.							
Performance criterion	B; During the test degradation is allowed. No change of operating state or stored data is allowed. Refer to the chapter 5.1 for details.							

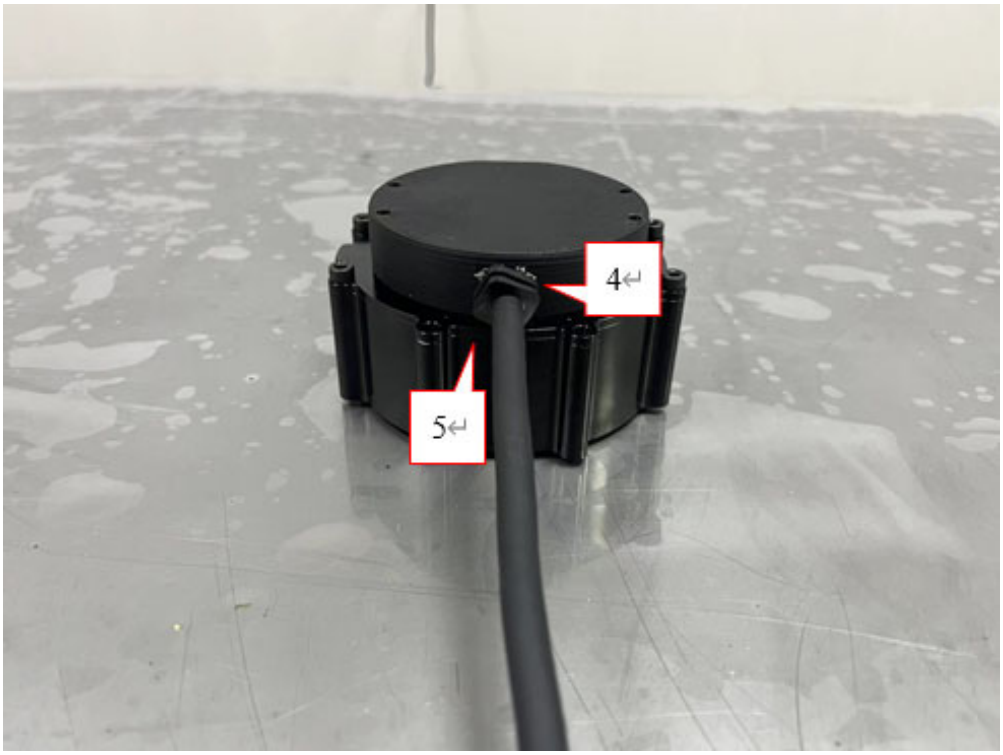
Performed tests

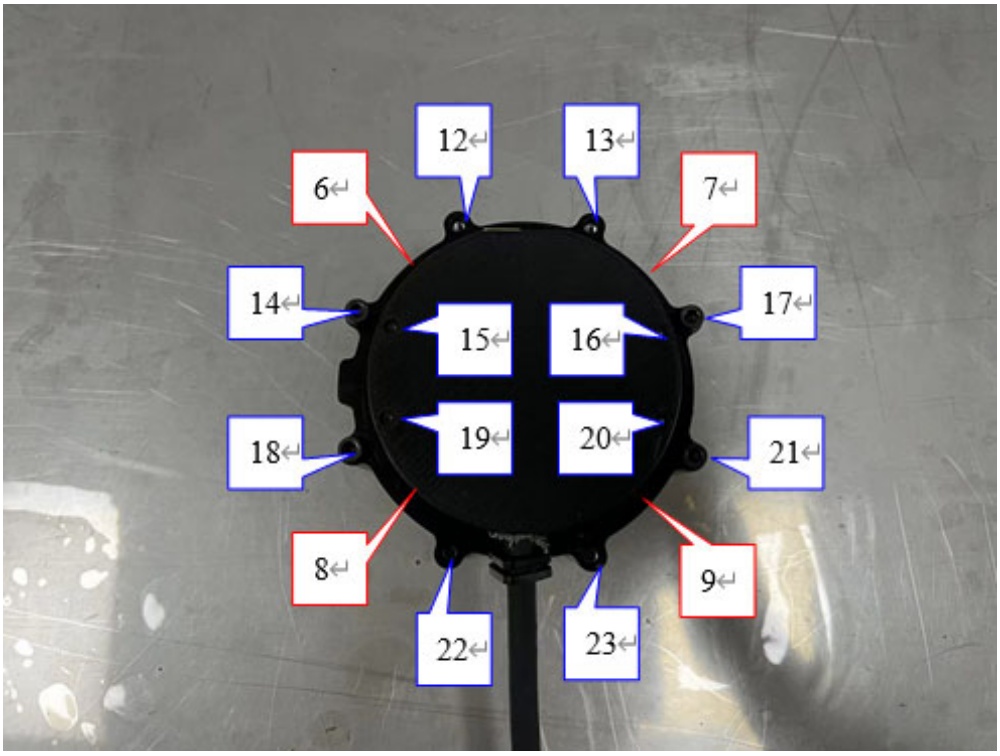
Set-up	☒	Table-top	☐	Floor standing
Ambient temperature [°C]	22		Relative Humidity air [%]	42
Voltage – Mains [V]	48 Vdc			
Frequency – Mains [Hz]	---			
Operating mode(s) used	Mode 1&2			

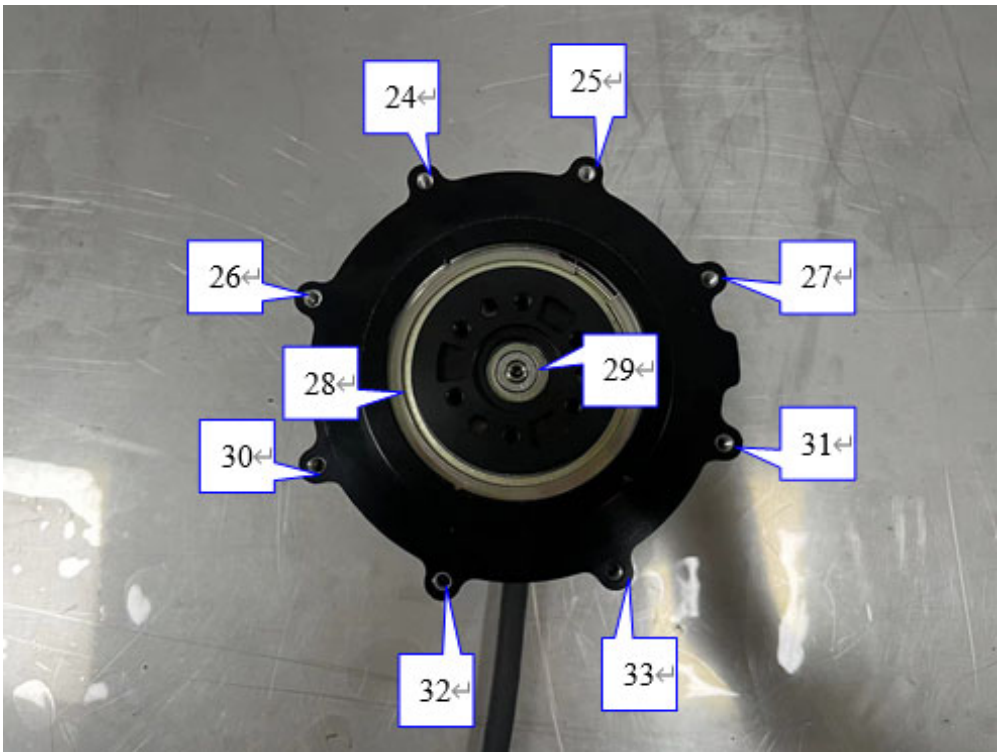
	Test Point (Location of discharge, see also photo)	Test Voltage [kV] & Polarity	Coupling type	# of applied discharges / polarity	Discharge interval [s]
☒	Points on conductive surface as indicated in the picture below.	±4[1)]	Contact	10	1
☒	Points on non-conductive surface as indicated in the picture below.	±2[1)], ±4[1)], ±8[1)]	Air	10	1
☒	HCP top side.	±4[1)], ±6[1)]	Contact	10	1
☒	HCP bottom side.	±4[1)], ±6[1)]	Contact	10	1
☒	VCP right side.	±4[1)], ±6[1)]	Contact	10	1
☒	VCP left side.	±4[1)], ±6[1)]	Contact	10	1
☒	VCP front side.	±4[1)], ±6[1)]	Contact	10	1
☒	VCP rear side.	±4[1)], ±6[1)]	Contact	10	1
Observation(s)	1) There was no change operated with initial operating during the test.				
Supplementary information:					

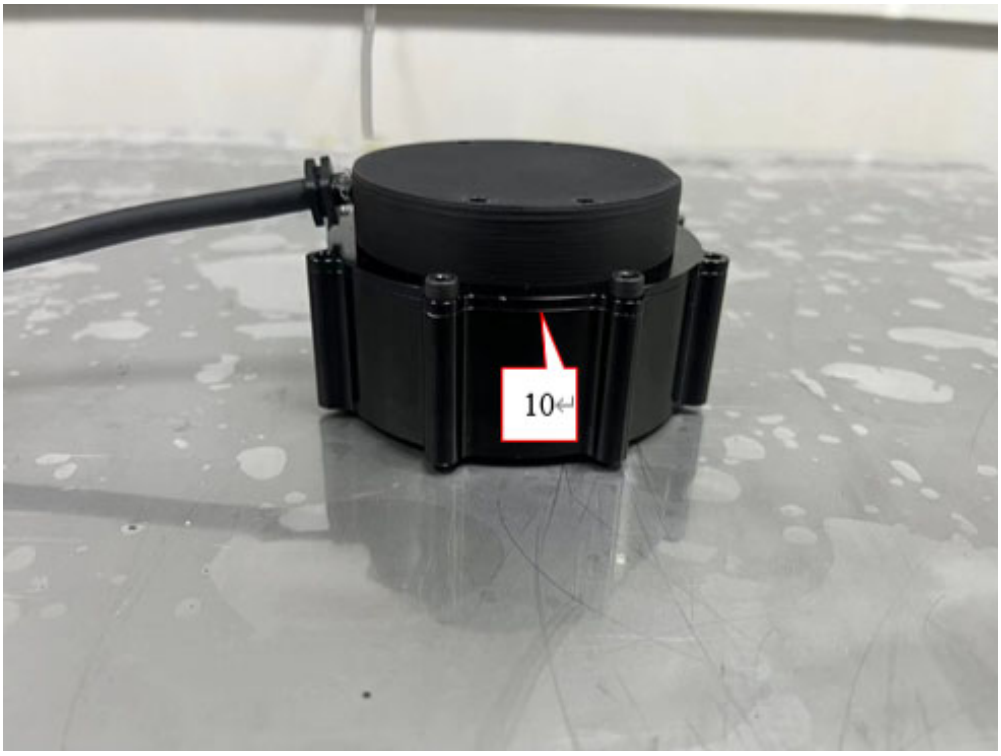
Photo of selected test points

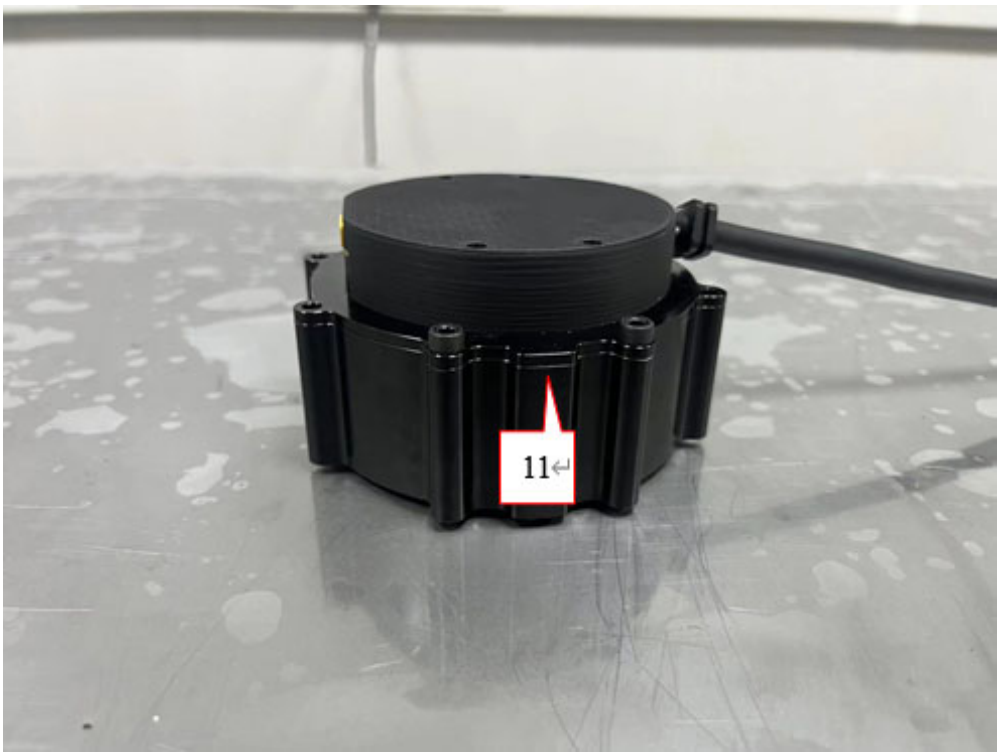





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Red: Air discharge
Blue: Contact discharge

5.4 Radio-frequency electromagnetic fields immunity — VERDICT: PASS

During the test it is verified if the equipment under test (EUT) has sufficient immunity against radiated electromagnetic fields. Industrial electromagnetic sources, walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices can generate these fields.

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2				
Basic standard	IEC 61000-4-3				
Port under test	Enclosure				
Frequency range	Test level		Modulation	Dwell time	Step size
	EN IEC 61000-6-1	EN IEC 61000-6-2			
80 – 1000 MHz	3 V/m	10 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
1400 – 6000 MHz	3 V/m	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
Supplementary information:					

Performed tests

Test method	☒	EN 61000-4-3					
Test set-up	☒	Equipment on the table (0,8 m height)					
(see annex 2 for photo)	☐	Equipment standing on floor (0,05 – 0,15 m height)					
Voltage – Mains [V]	48 Vdc			Frequency – Mains [Hz]	---		
Operating mode(s) used	Mode 1&2						
Frequency range (applied)	Antenna Polarization	Test level (applied)		Modulation (applied)	Dwell time (applied)	Remark	
80 – 1000 MHz	H	3 V/m		80% AM (1kHz)	3 s	---	
(step size 1%)	V	3 V/m		80% AM (1kHz)	3 s	---	
1400 – 6000 MHz (step size 1%)	H	3 V/m		80% AM (1kHz)	3 s	---	
	V	3 V/m		80% AM (1kHz)	3 s	---	
Exposed side of the EUT	☒	Front (0°)	☒	Right (90°)	☐	Top	
	☒	Rear (180°)	☒	Left (270°)	☐	Bottom	
Observation(s)	There was no change operated with initial operating during the test.						
Supplementary information:							

5.5 Electrical Fast Transients immunity — VERDICT: N/A

The EFT immunity test simulates disturbances by bursts of very short transients caused for example by switching off loads such as an AC motor or bouncing relay contacts. The transients are likely to disturb electronics but less likely to cause damage.

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2			
Basic standard	IEC 61000-4-4			
Pulse characteristics	5/50 ns			
Port	Test level		Repetition frequency[3)]	Duration
	EN IEC 61000-6-1	EN IEC 61000-6-2		
AC input-output power ports	± 1000 V	± 2000 V	5 or 100 kHz	≥1 min. / polarity
DC input-output power ports[2)]	± 500 V	± 1000 V		
Signal/control ports [1)]	± 500 V	± 1000 V		

[1)] Only applicable to ports interfacing with cables whose total length may exceed 3 m.

[2)] Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC–DC power adaptor shall be tested on the AC power input of the AC- DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC–DC power adaptor. The test is applicable to DC power input ports intended to be connected permanently to cables longer than 3 m.

[3)] The test may be performed at one or at both repetition frequencies. The use of 5 kHz repetition frequency is traditional; however, 100 kHz is closer to reality

Performed tests

Voltage – Mains [V]	---			
Frequency – Mains [Hz]	---			
Operating mode(s) used	---			
Test Set-up (see annex 2 for photo)	☐	Equipment standing on floor at (0,1 ± 0,01) m above ground plane		
	☐	Equipment on the table (0,1 ± 0,01) m above ground plane		
	☐	Artificial hand applied. Location refer to chapter 8.		
Coupling	☐	Common mode	☐	Other:

Port under test	Test Voltage &Polarity	Repetition Frequency	Test duration / polarity	Injection method			
---	---	---	---	☐	CDN	☐	Clamp
---	---	---	---	☐	CDN	☐	Clamp
Observation(s)	---						
Supplementary information:							

5.6	**Surge transient immunity**	**VERDICT: N/A**

The surge transient immunity test simulates the surges that are caused by over-voltages due to indirect (induced) lightning transients. The pulse is a slow transient with high-energy contents and due to its long duration may cause damage to an unprotected EUT.

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2				
Basic standard	IEC 61000-4-5				
Pulse characteristics	1,2/50μs Voltage; 8/20μs Current				
Repetition rate	≤ 60 secs. (for each test level and phase angle)				
Number of pulses	5 pulses (at each polarity and phase angle)				
Port	Test level & Polarity & Coupling				Phase angle [°]
	EN IEC 61000-6-1		EN IEC 61000-6-2		
	Line to Line[1)]	Line to Earth[1)]	Line to Line[1)]	Line to Earth[1)]	
AC input-output power ports	± 1 kV	± 2 kV	± 1 kV	± 2 kV	0, 90, 180, 270
DC input-output power ports[2)]	± 0.5 kV	± 1 kV	± 0.5 kV	± 1 kV	---
Signal/control ports[3)]	N/A	± 1 kV	N/A	± 1 kV	

[1)] In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.

[2)] Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC–DC power adaptor shall be tested on the AC power input of the AC–DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC–DC power adaptor. DC ports, which are not intended to be connected to a DC distribution network are treated as signal ports.

[3)]Applicable only to ports interfacing with long distance lines.

Performed tests

Voltage – Mains [V]	---
Frequency – Mains [Hz]	---
Operating mode(s) used	---
Repetition rate	60 secs. (for each test level and phase angle)
Number of pulses	5 pulses (at each polarity and phase angle)

Port under test	Coupling	Test level & Polarity	Phase angle [°]	Remark
---	---	---	---	---
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Observation(s)	---			
Supplementary information:				

5.7	**Injected currents (RF common mode) immunity**	**VERDICT:**	**N/A**

During this test the immunity of the equipment for induced or conducted electromagnetic fields is checked. Fields generated by radio and other transmitters cause RF voltages in long cables like the mains network. This test reproduces these induced disturbing voltages by injecting them to the EUT via the cabling.

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2				
Basic standard	IEC 61000-4-6				
Frequency range	0,15 – 80 MHz				
Port	Test level, *Uo*		Modulation	Step size	Dwell time
	EN IEC 61000-6-1	EN IEC 61000-6-2			
AC input-output power	3 V	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
DC input-output power ports [1)]	3 V	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Signal/control port [1)]	3 V	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
[1)] Only applicable to ports interfacing with cables whose total length, may exceed 3 m.					

Performed tests

Test method (applied)	Frequency range (applied)	Modulation (applied)	Step size (applied)
IEC 61000-4-6	0.15 – 80 MHz	80% AM (1kHz)	1%
Voltage – Mains [V]	---	Frequency – Mains [Hz]	---
Operating mode(s) used	---		

Test set-up (see annex 2 for photo)		
	☐	Equipment standing on floor at (0,1 ± 0,01) m above ground plane.
	☐	Equipment on the table (0,1 ± 0,01) m above ground plane.
	☐	Artificial hand applied. Location refer to Annex 2.

Port under test	Test Level (applied)	Injection method	Dwell time (applied)	Remark
---	---	---	---	---
---	---	---	---	---

Observation(s)	---
Supplementary information:	

5.8	**Power frequency magnetic field immunity**	**VERDICT: PASS**

Magnetic fields caused by for example nearby mains frequency transformers may disturb equipment with sensitivity for these type of disturbances such as CRT monitors.

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2	
Basic standard	IEC 61000-4-8	
Port under test	Enclosure	
Field strength	EN IEC 61000-6-1	EN IEC 61000-6-2
	3 A/m	30 A/m
Test Frequency	50, 60 Hz	
Notes: Applicable only to apparatus containing devices susceptible to magnetic fields. The test shall be carried out at the frequencies appropriate to the power supply frequency. Equipment intended for use in areas supplied only at one of these frequencies need only be tested at that frequency.		

Performed tests

Reason for not performing the test	☐	The test is not applicable as the apparatus does not contain any components susceptible to this low-frequency magnetic fields.
Voltage – Mains [V]	48 Vdc	
Frequency – Mains [Hz]	---	
Operating mode(s) used	Mode 1&2	
Test set-up (see annex 2 for photo)	☒	Single Coil. Dimensions: 1 m x 1 m
	☐	Single Coil. Dimensions: 2 m x 2 m
	☐	Homogeneous field (Helmholtz coil). Dimensions: 1 m x 1 m
	☐	0,1 m above metal surface

Axis under test		Tested Field strength	Test Frequency	Test Duration	Remark
☒	X-axis	3 A/m	50 Hz	60 s	---
☒	Y-axis	3 A/m	50 Hz	60 s	---
☒	Z-axis	3 A/m	50 Hz	60 s	---
Observation(s)		There was no change operated with initial operating during the test.			
Supplementary information:					

5.9 Power supply interruptions and dips immunity — VERDICT: N/A

The purpose of the test is to verify the immunity of the equipment against voltage dips and voltage interruptions. It helps to ensure that the equipment functions properly (as expected and safely) with power supply fluctuations. Voltage dips and interruptions are caused by faults in the LV, MV, HV networks (short-circuit or ground faults).

Requirements

Standard	☒EN IEC 61000-6-1, ☐EN IEC 61000-6-2			
Basic standard	IEC 61000-4-11, EN 61000-4-34			
# of dips & interruptions	3 dips / interruptions for each test level and phase angle			
Interval between events	≥ 10 seconds			
EN IEC 61000-6-1				
Port under test	Test level [1]	Period (Cycles)		Performance Criterion [2]
		50 Hz	60 Hz	
AC input power port	U_{NOM} –100%	0,5	0,5	B; Refer to the chapter 5.1 for details.
	U_{NOM} – 100%	1	1	B; Refer to the chapter 5.1 for details.
	U_{NOM} – 30%	25	30	C; Refer to the chapter 5.1 for details.
	U_{NOM} –100%	250	300	C; Refer to the chapter 5.1 for details.
EN IEC 61000-6-2				
Port under test	Test level [1]	Period (Cycles)		Performance Criterion [2]
		50 Hz	60 Hz	
AC input power port	U_{NOM} –100%	1	1	B; Refer to the chapter 5.1 for details.
	U_{NOM} – 60%	10	12	C; Refer to the chapter 5.1 for details.
	U_{NOM} – 30%	25	30	C; Refer to the chapter 5.1 for details.
	U_{NOM} –100%	250	300	C; Refer to the chapter 5.1 for details.

1) Changes to the voltage level shall occur at a zero crossing point in the a.c. voltage waveform.

2) For electronic power converters, the operation of protective devices (e.g. undervoltage protection) and the performance criterion C are allowed.

NOTE: Where the equipment has a rated voltage range the following shall apply:
- If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range. A single voltage within that range may be selected for testing.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.

Performed tests

U_{NOM} [V_{AC}]	Terminal	Test level [% U_{NOM}]	Duration [cycles]		Repetion rate [s]	Number of dips per test	Phase angle [°]
			50 Hz	60 Hz			
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Operating mode(s) used	---						
Observation(s)	---						
Supplementary information:							

6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

Radiated Emission / AC1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2024.05.12	2025.05.11
EMI Test Receiver	R&S	ESCI	100726	2024.07.06	2025.07.05
Preamplifier	Quietek	AP-025C	CHM-0511006	2024.04.20	2025.04.19
Preamplifier	R&S	SCU-01F	100452	2024.06.14	2025.06.13
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9168	01099	2024.03.16	2025.03.15
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9168	01100	2024.06.16	2025.06.15
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-L	2024.04.27	2025.04.26
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-R	2024.04.27	2025.04.26
Temperature/Humidity Meter	RTS	RTS-1909	THM-011	2024.05.17	2025.05.16
Software	Quietek	EMI_V3	V3.0.0	N/A	N/A

Electrostatic discharge / TR21

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
ESD Simulator	EM TEST	NSG 438A	237	2024.04.16	2025.04.15
Barometer	Boji	DYM3	02251	2024.01.24	2025.01.23
Temperature/Humidity Meter	RTS	RTS-1909	THM-015	2024.05.17	2025.05.16

Radio-frequency electromagnetic field / AC4

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Signal Generator	R&S	SMB100A	114728	2024.05.12	2025.05.11
Power Meter	R&S	NRP2	106362	2024.05.12	2025.05.11
Power Sensor	R&S	NRP6A	101411	2024.04.20	2025.04.19
Power Sensor	R&S	NRP6B	101412	2024.04.20	2025.04.19
RF Switch	R&S	OPS120	101944	N/A	N/A
Power Amplifier	R&S	BBA150 BC500	102912	N/A	N/A
Power Amplifier	R&S	BBA150 D200	102889	N/A	N/A
Power Amplifier	R&S	BBA150 E200	102890	N/A	N/A
LOG Antenna	R&S	HL046E	100257	N/A	N/A
Stacked Double Log-Periodic Antenna	SCHWARZBECK	STLP 9128E	01182	N/A	N/A
Filed Probe	AR	FL7006/KIT	350261	2024.03.15	2025.03.14
Audio Analyzer	R&S	UPV	101198	2024.01.20	2025.01.19
Amplifier	MegaSig	PM0043	11403040020	2024.07.09	2025.07.08

			20009		
Microphone	MegaSig	MA802L	200512010	2024.01.23	2025.01.22
Temperature/Humidity Meter	RTS	RTS-1909	THM-018	2024.05.17	2025.05.16
Software	R&S	EMC 32	V10.40.10	N/A	N/A

Power-frequency magnetic field / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Immunity Test System	EMC PARTNER	IMU-MGE	109937-1582	2024.01.20	2025.01.19
Power frequency magnetic field test system	EMC PARTNER	MF1000-1	103480-1652	2024.01.21	2025.01. 20
Temperature/Humidity Meter	RTS	RTS-1909	THM-013	2024.05.17	2025.05.16

7 ANNEX 1 - MEASUREMENT UNCERTAINTIES

The table(s) below show(s) measurment uncertainties of the EMC test set-ups. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

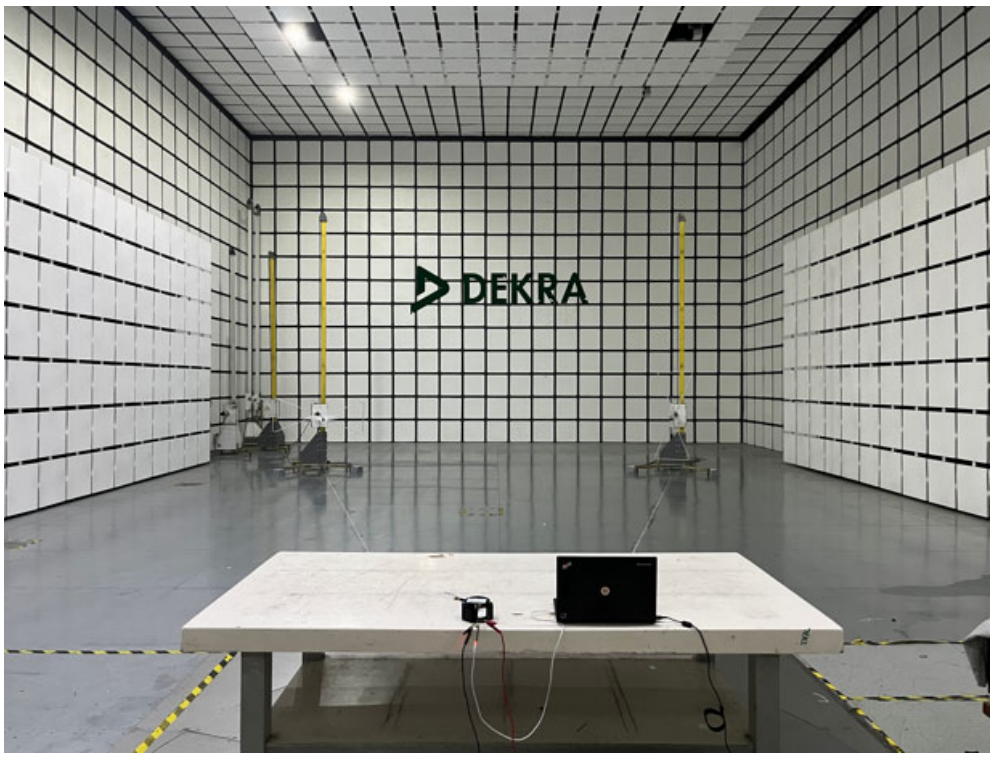
Radiated emission / AC1
The maximum measurement uncertainty is evaluated as: Horizontal: 30 MHz~200 MHz: 4.82 dB 200 MHz~1 GHz: 4.38 dB Vertical: 30 MHz~200 MHz: 5.14 dB 200 MHz~1 GHz: 4.38 dB
Electrostatic discharge / TR21
The maximum measurement uncertainty is evaluated as Rise Time: 6.4 %, Peak Current: 6 %, Current at 30 ns: 6 %, Current at 60 ns: 6 %.
Radio frequency electromagnetic field / AC4
The maximum measurement uncertainty is evaluated as 80 MHz-6 GHz:1.48 dB.
Power frequency magnetic field/ TR2
The maximum measurement uncertainty is evaluated as Current:10 %.

8 ANNEX 2 - TEST PHOTOS

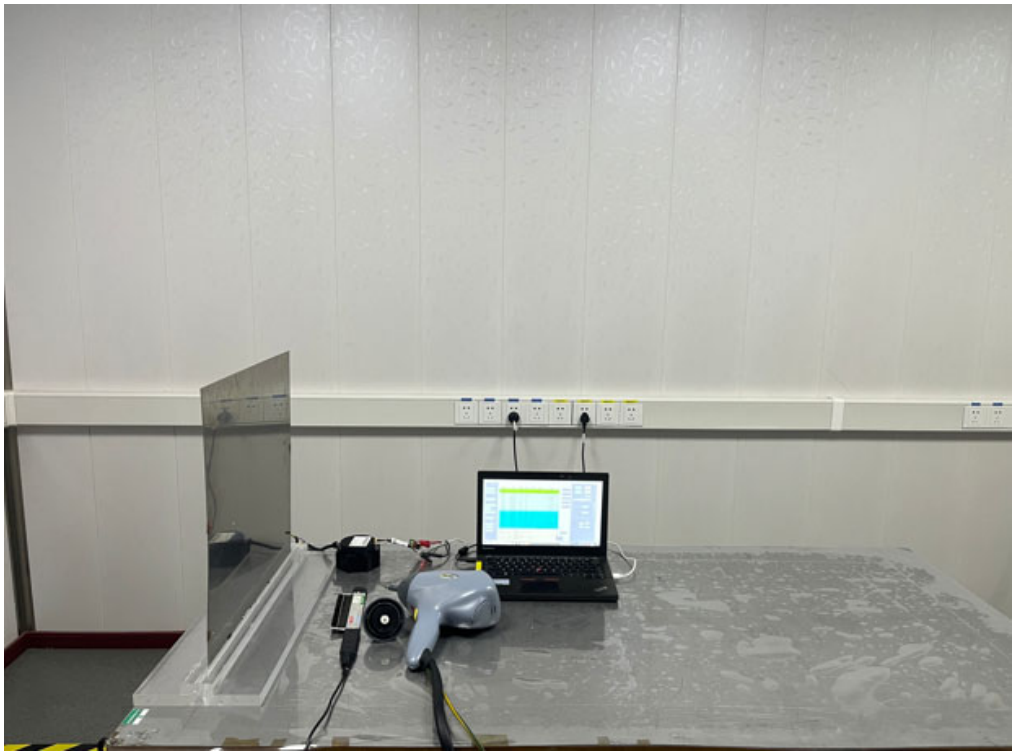
Radiated emissions (30 MHz to 1000 MHz): Front View



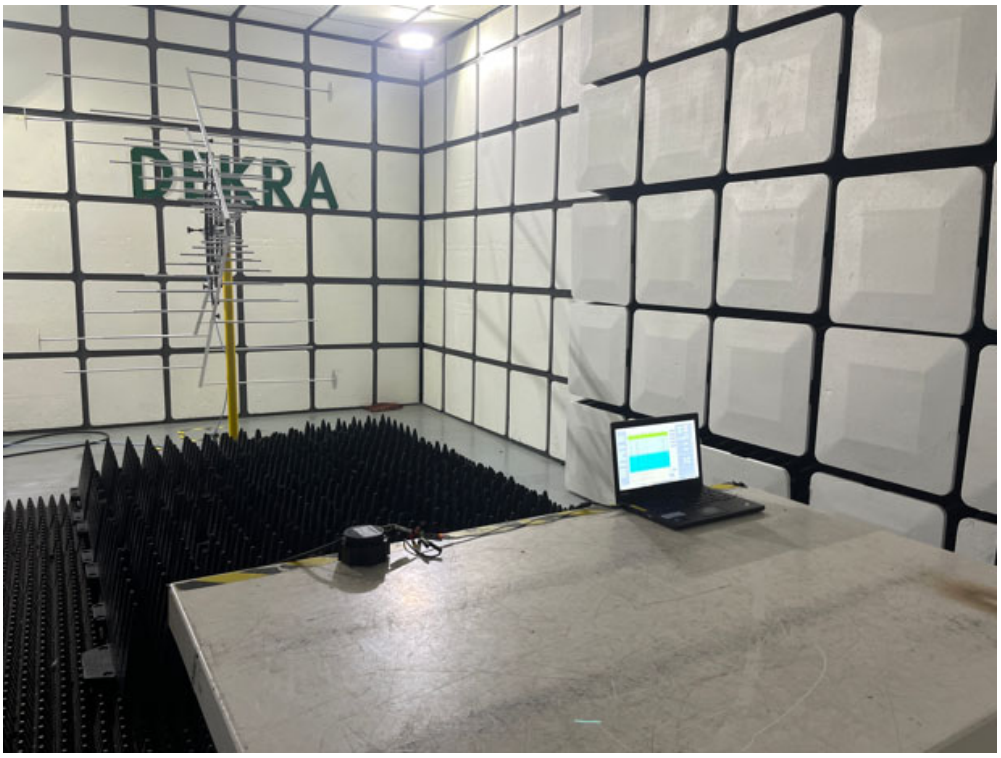
Radiated emissions (30 MHz to 1000 MHz): Back View



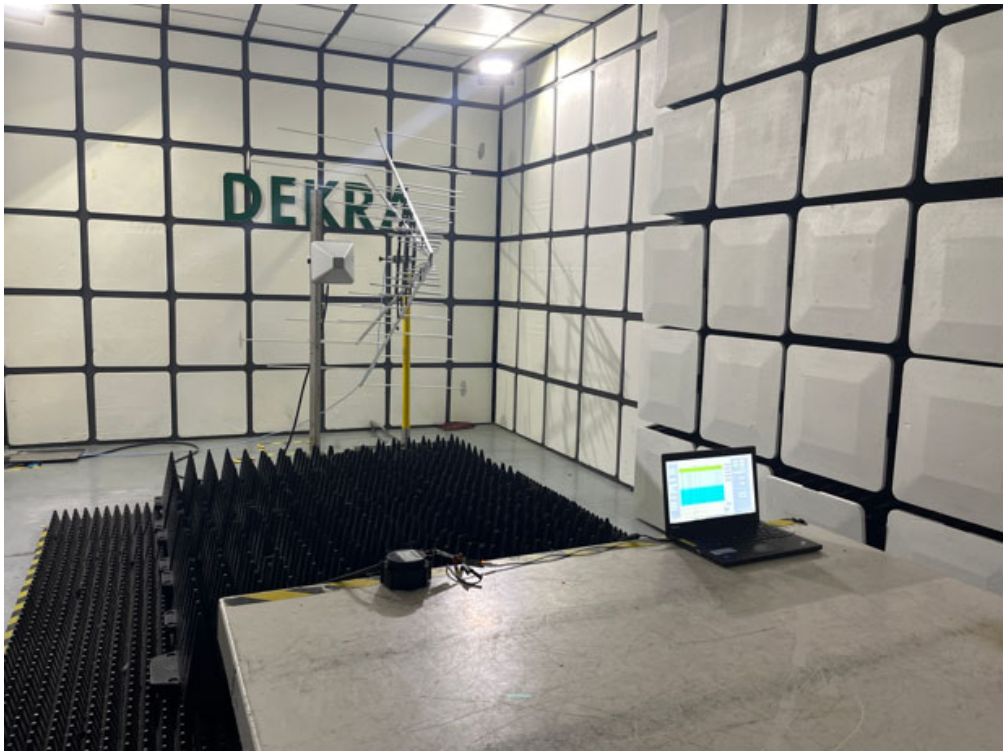
Electrostatic discharge immunity



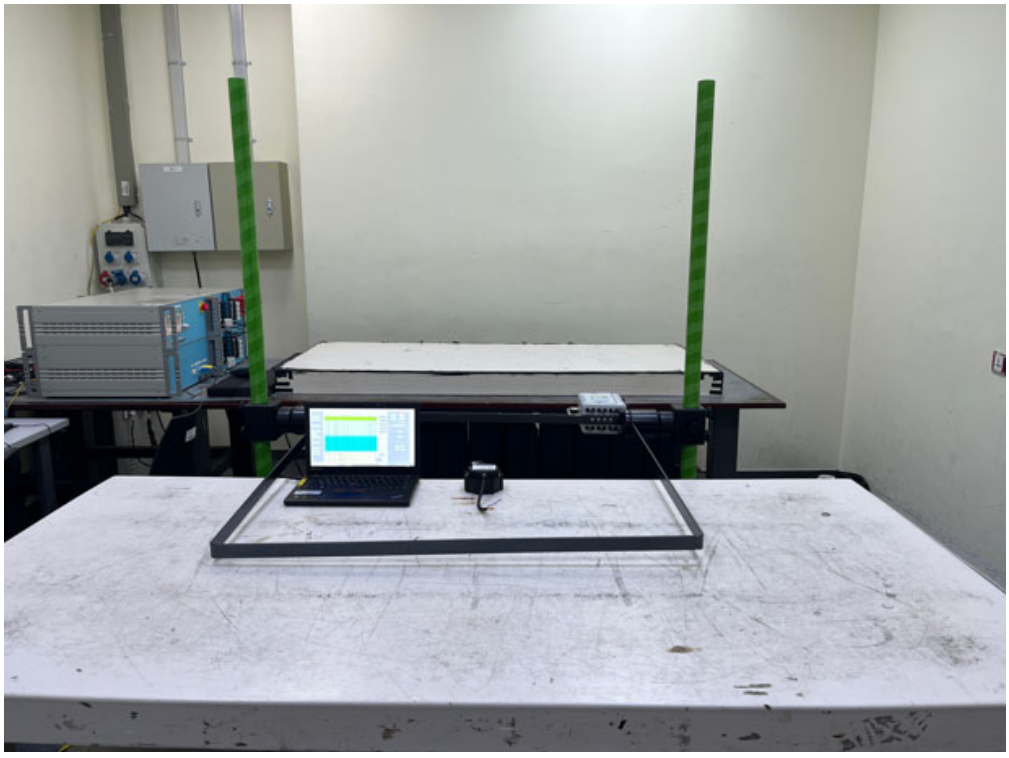
Radio-frequency electromagnetic field immunity (Below 1GHz)



Radio-frequency electromagnetic field immunity (Above 1GHz)

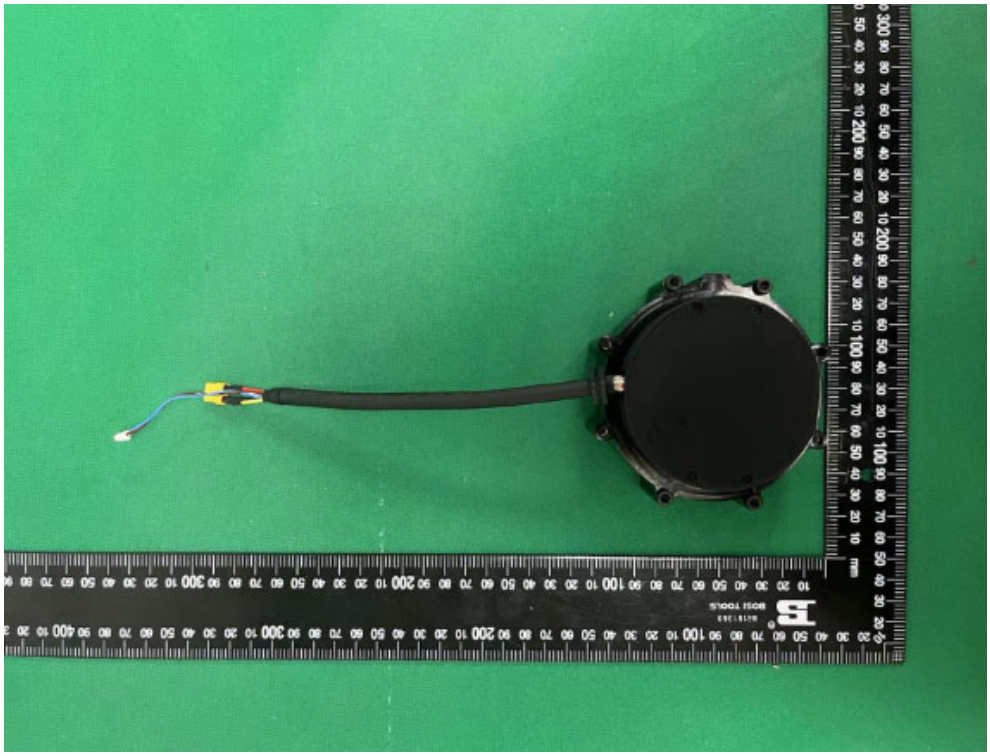


Power frequency magnetic field

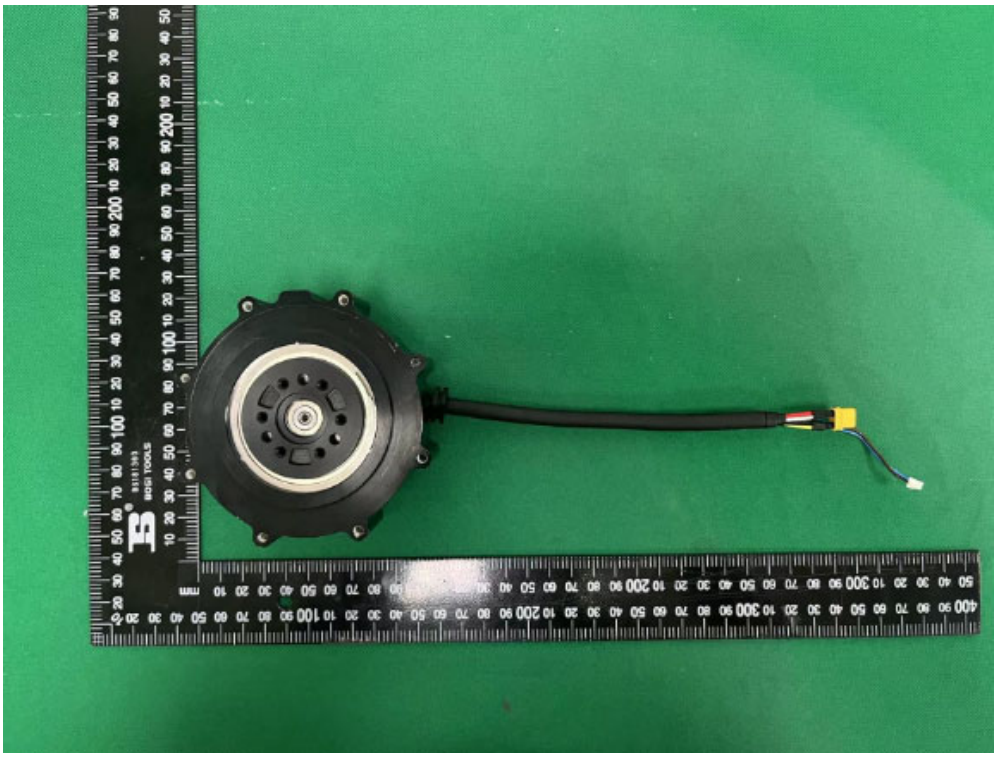


9 ANNEX 3 - EUT PHOTOS

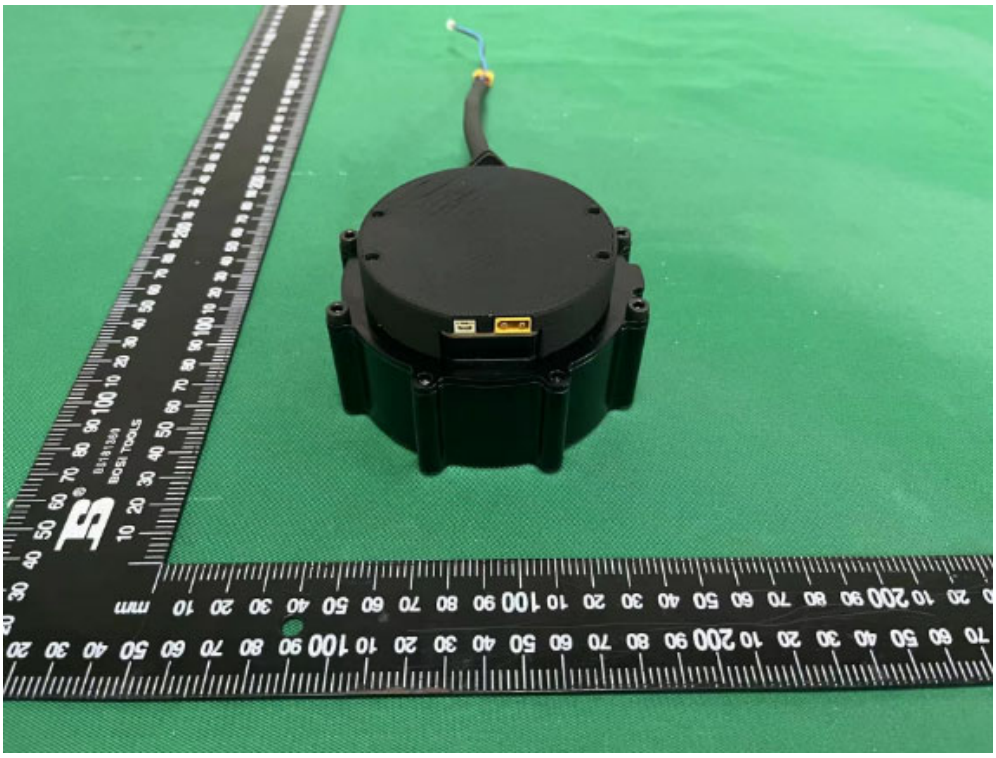
EUT PHOTOS (1)



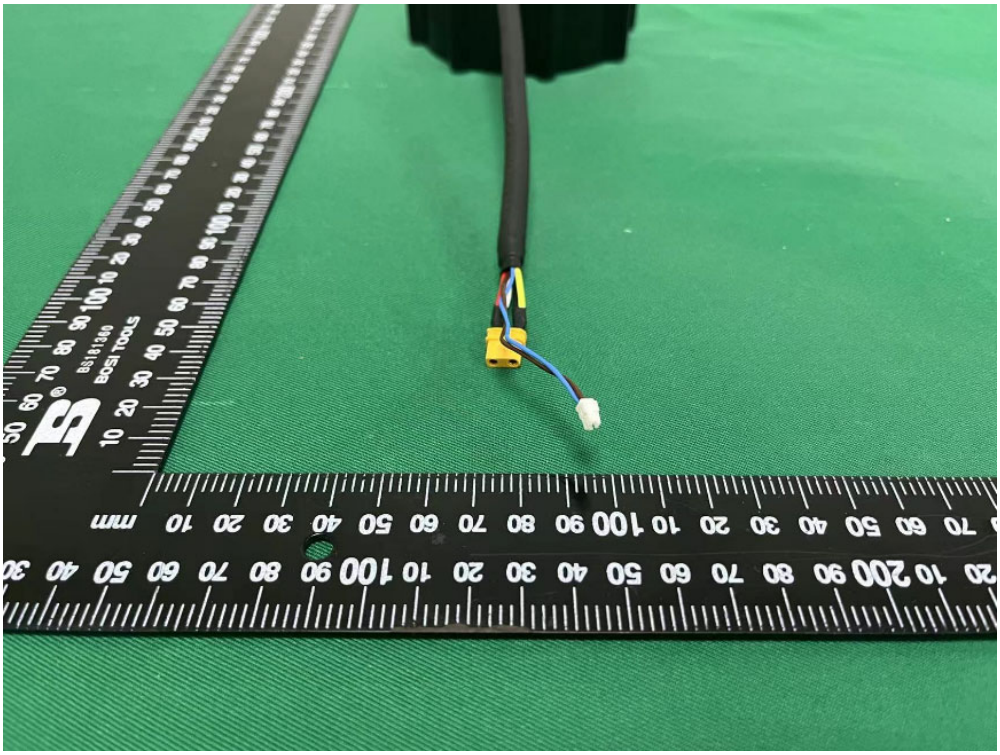
EUT PHOTOS (2)



EUT PHOTOS (3)



EUT PHOTOS (4)



End of the report

Date: 07/2/2025

Statement of Conformity

This statement is to certify that the designated product below.

Product	:	RobStride 03
Trade name	:	robstride
Model Number	:	RSQDD-PG-20-60-01A
Company Name	:	RobStride Dynamics Co., Ltd
Company Address	:	Room 305, 3rd Floor, Building 15, Yard 3, Jinghai 5th Road, Beijing Economic-Technological Development Area (Tongzhou), Beijing

This Statement implies that the examined types are in accordance with the standards designated under the Electromagnetic Compatibility Directive (2014/30/EU):

EN IEC 61000-6-1:2019

EN IEC 61000-6-3:2021

The Statement has been carried out on one single specimen or several specimens of the product submitted by the manufacturer. The Statement does not include an assessment of the manufacturer's production. The CE marking may be affixed on the product if all relevant and effective EC directives are complied with.

The issued test report(s) show(s) it in detail.

Report Number :

2480159R-EMC-CE-P01V01

TEST LABORATORY

oscar shi

TE name/ Manager