



# Electromagnetic Compatibility (EMC)

## TEST REPORT

TR\_2024772\_1

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# Test Report

## Electromagnetic Compatibility (EMC)

**Report Number** : TR\_2024772\_1

**Date of issue** : 08.10.2024

**Date of receipt of test item** : 14.08.2024

**Date (s) of performance of tests** : 15.08.2024-01.10.2024

**Total number of pages** : 40

**Test item description** : Minibar cooler

**Model/Type reference** : See page 5

**Trademark** : MN BAR, MN COOLING

**Manufacturer Address** : MN MINIBAR INOVASYON YATIRIM LTD ŞTİ.  
KAYSERİ OSB MAH 19.CAD. NO:8  
Kayseri/ Türkiye

**Applicant's name Address** : Same is manufacturer

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**Approved by  
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SGS Turkey



The report was signed electronically

1 DOCUMENTATION	4
1.1 Test Standards	4
1.2 Overview of Test Results	4
1.3 Testing Location/address	5
2 PRODUCT DESCRIPTION	5
2.1 Equipment Under Test (EUT) Information	5
3 TEST CONDITIONS	7
3.1 Performance Criteria A for Immunity Testing	7
3.2 Performance Criteria B for Immunity Testing	7
3.3 Performance Criteria C for Immunity Testing	7
3.4 EUT Test Conditions During EMC-Testing	7
3.5 Environmental Conditions	7
4 TEST RESULTS AND CONDITIONS	8
4.1 Emission Test Results	8
4.1.1 Conducted Emissions In The Frequency Range	8
4.1.2 Radiated Power In The Frequency Range	10
4.1.3 Discontinuous Interference (click)	12
4.1.4 Harmonic Currents Emissions	15
4.1.5 Voltage Fluctuation And Flicker Sensation	18
4.2 Immunity Test Results	20
4.2.1 Electrostatic Discharge Immunity (ESD)	20
4.2.2 Electrical Fast Transient Immunity (EFT)	22
4.2.3 Surge Immunity	24
4.2.4 RF-Electromagnetic Conducted Immunity	26
4.2.5 Voltage Dips And Short Interruptions Immunity	28
4.2.6 Radiated, Radio Frequency, Electromagnetic Field Immunity	30
5 PHOTOS OF EQUIPMENT UNDER TEST	31
6 LIST OF TEST EQUIPMENT USED	39
7 MEASUREMENT UNCERTAINTIES	39

## 1 DOCUMENTATION

### 1.1 Test Standards

The Equipment Under Test Complies with Following Standard(s)

Title of the standard	Reference standard	Publication Year	Amendment(s) of the standard
Emission-Product family standard -Household appliances, electric tools and similar apparatus	EN IEC 55014-1	2021	
	CISPR 14-1	2020	
Immunity-Product family standard -Household appliances, electric tools and similar apparatus	EN IEC 55014-2	2021	
	CISPR 14-2	2020	
Product family standard -Harmonic current emissions	EN IEC 61000-3-2	2019	A1:2021+A2:2024
	IEC 61000-3-2	2018	A1:2020+A2:2024
Product family standard -Voltage fluctuations and flicker sensation	EN 61000-3-3	2013	A1:2019+A2:2021
	IEC 61000-3-3	2013	A1:2017+A2:2021

### 1.2 Overview of Test Results

Emission tests	Result
Conducted Emissions In The Frequency Range	<b>Pass</b>
Radiated Power In The Frequency Range	<b>Pass</b>
Discontinuous Interference (click)	<b>Pass</b>
Harmonic Currents Emissions	<b>Pass</b>
Voltage Fluctuation And Flicker Sensation	<b>Pass</b>

Immunity tests	Result
Electrostatic Discharge Immunity (ESD)	<b>Pass</b>
Electrical Fast Transient Immunity (EFT)	<b>Pass</b>
Surge Immunity Test	<b>Pass</b>
RF-Electromagnetic Conducted Immunity	<b>Pass</b>
Voltage Dips And Short Interruptions Immunity	<b>Pass</b>
Radiated, Radio Frequency, Electromagnetic Field Immunity	<b>N/A</b>

Possible test case verdicts:	
- test case does not apply to the test object	: N/A
- test object does meet the requirement	: P (Pass)
- test object does not meet the requirement	: F (Fail)

### 1.3 Testing Location/address

**Note:** All tests have been performed Eldaş Test ve Kalibrasyon Elektrik Sanayi Ticaret A.Ş. under supervision of SGS Engineer. The address of test location as below;

Organize Sanayi Bölgesi Büyük

Selçuklu Blv. No:2 Sincan

06930 ANKARA / TURKEY

**Türkak Accreditation Number:** AB-1532-T

## 2 PRODUCT DESCRIPTION

### 2.1 Equipment Under Test (EUT) Information

**Test item description** : Minibar Cooler

**Model/Type reference** : See table

**Rated Voltage** : 220-240V

**Rated Frequency** : 50 Hz

**Rated Power/Current** : 63 W

The model MNK 40T has been tested. The appliance tests were carried out at a frequency of 50 Hz. The appliance is a minibar incorporated with electric circuit, compressor and led lighting. Appliance cannot be used for outdoor. All models shared similar construction except for appearance, rated power and volume. All models have the same electric circuit, same compressor and same led lighting. The applicant declares that the models given in the table below enclose similar electrical components with the tested model.

Models	Ref Gas	Mass of Ref Gas	Voltage Frequency	Rated Power	Volume
MNK 40T	R600a	39 g	220-240V 50 Hz	63 W	40 L
MNK 30T	R600a	39 g	220-240V 50 Hz	63 W	30 L

### Classification of EUT according to CISPR 14-2:

The EUT is classified as

Category I	<input type="checkbox"/>
Category II	<input checked="" type="checkbox"/>
Category III	<input type="checkbox"/>
Category IV	<input type="checkbox"/>
Category V	<input type="checkbox"/>

### 3 TEST CONDITIONS

#### 3.1 Performance Criteria A for Immunity Testing

During testing the EUT shall operate without any degradation of performance.

#### 3.2 Performance Criteria B for Immunity Testing

During testing temporary degradation of performance or loss of function, which is self-recovered are allowed.

#### 3.3 Performance Criteria C for Immunity Testing

Temporary loss of function is allowed if the function is self-recoverable or can be restored by the operation of controls.

#### 3.4 EUT Test Conditions During EMC-Testing

Configuration of the EUT will be made corresponding and actual assembling conditions as far as possible. During tests the thermostat will be set to middle position. Before the tests EUT will be pre-cooled until the steady state has been reached. Behaviour of the EUT will be monitored during the immunity tests.

#### 3.5 Environmental Conditions

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained with in the applicable ranges.

<b>Ambient temperature</b>	15 °C - 35 °C
<b>Relative Humidity</b>	30% - 60%

## 4 TEST RESULTS AND CONDITIONS

### 4.1 Emission Test Results

#### 4.1.1 Conducted Emissions In The Frequency Range

<b>Standard</b>	<b>EN IEC 55014-1 / CISPR 14-1</b>
-----------------	------------------------------------

<b>Frequency [MHz]</b>	<b>QP [dB(μV)]</b>	<b>AV [dB(μV)]</b>
0,15 – 0,50	66 – 56	59 – 46
0,50 – 5	56	46
5 – 30	60	50

#### Test Plan/Test Description

Conducted disturbance voltage will be measured with an artificial main network from 150 kHz to 30 MHz with 5 kHz steps and a resolution bandwidth of 10 kHz. Measurements will be carried out with Peak- and Average-detectors from Phase-line and Neutral-line.

If the Peak-values are more than 6 dB below the Quasi Peak-limit no final Quasi Peak-measurement will be made otherwise Quasi Peak-values and Average-values will be recorded from the worst points. Rest of the sub ranges will be measured by using the same procedure.

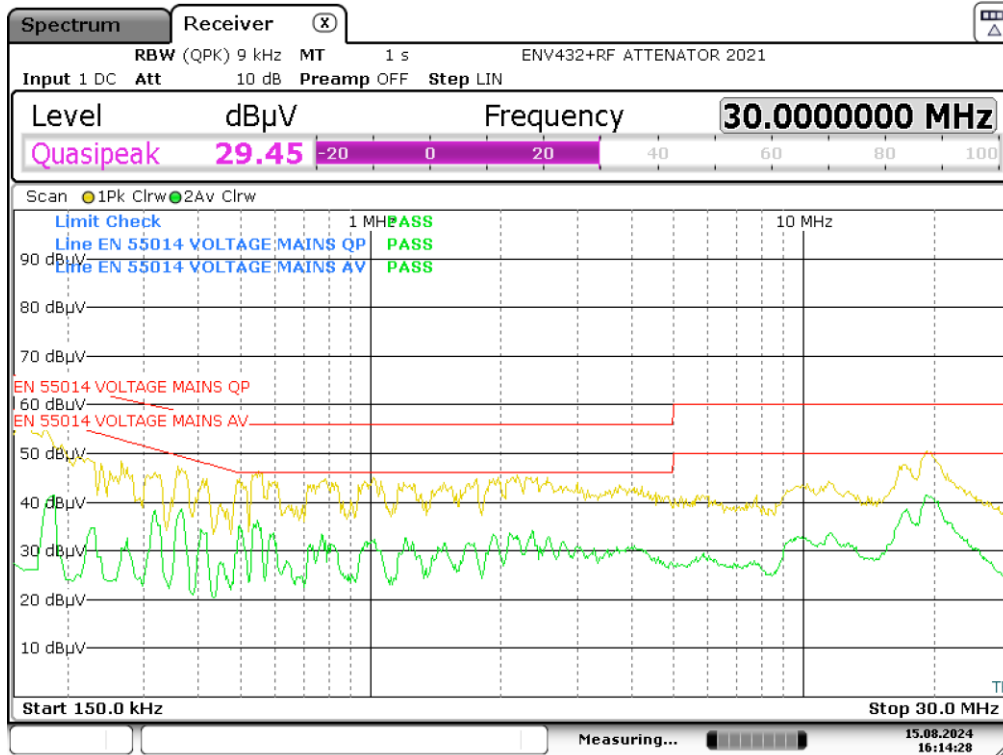
This measurement will be made from the AC-mains lines. The EUT is working as described in the section "EUT Test Conditions". Test results are presented at the next page.

#### Operating mode

Measurements were performed at thermostat middle position.

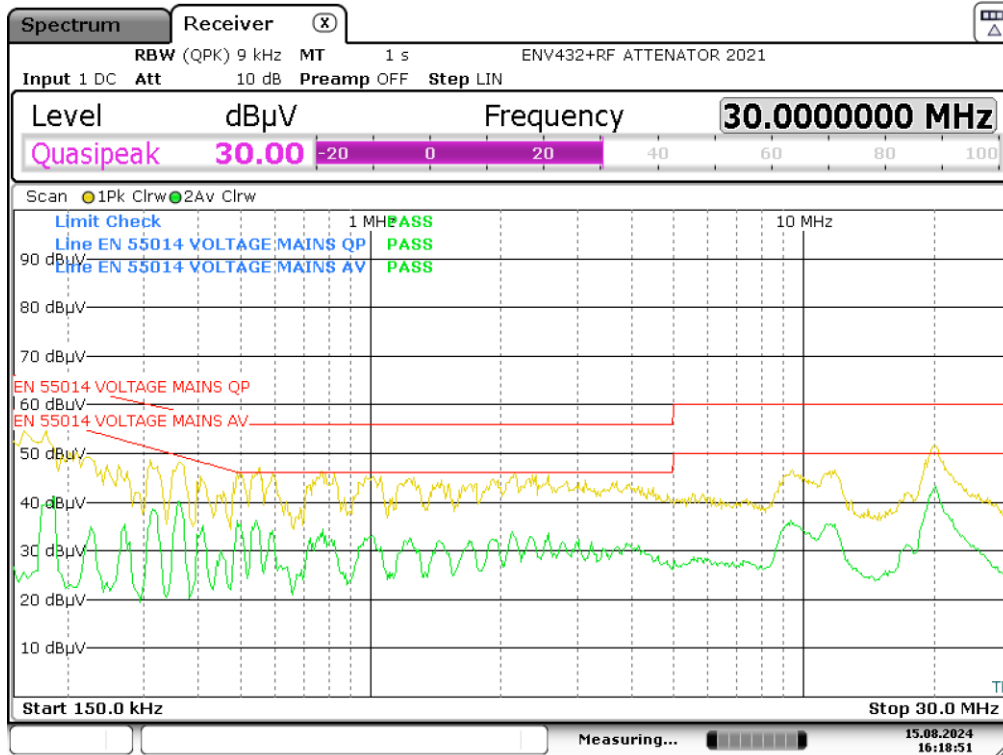
## Test Results

### Line port



Date: 15.AUG.2024 16:14:28

### Neutral port



Date: 15.AUG.2024 16:18:52



**Test setup : Conducted Emissions In The Frequency Range****TEST SUMMARY P**

The EUT fulfills the requirements of the EN IEC 55014-1 Conducted Emission part.

### 4.1.2 Radiated Power In The Frequency Range

<b>Standard</b>	<b>EN IEC 55014-1 / CISPR 14-1</b>	
<b>Frequency [MHz]</b>	<b>QP [dB(pW)]</b>	<b>AV [dB(pW)]</b>
30 – 300	45 – 55	35 – 45
<b>Margin</b>		
200 - 300	0 – 10	-

#### Test plan/Test Description

Radiated absorbing power will be measured with an absorbing clamp from 30 MHz to 300 MHz with 100 kHz steps using the resolution bandwidth of 120 kHz. The maximum interference level will be found by moving the clamp along the cable. Final measurements will be made from the worst peaks only with QuasiPeak-detector and Average-detector. No QuasiPeak- or Average-measurements will be made if the Peak-values are more than 10 dB below the QP-limit.

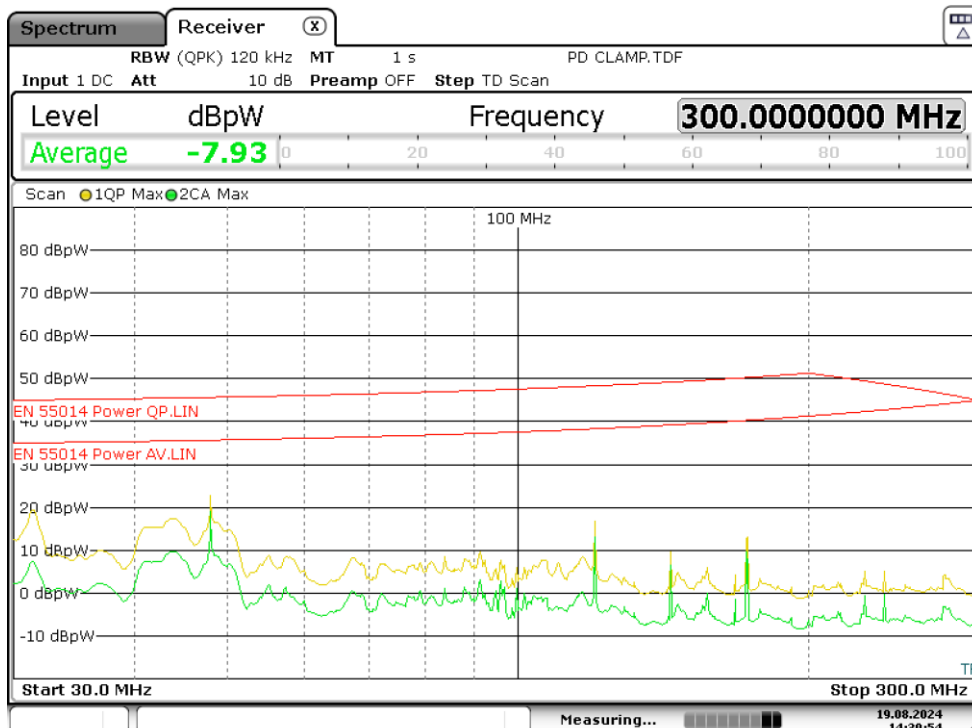
This measurement will be made from the AC-mains.

The EUT is working as described in the section “EUT Test Conditions”.

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test Result



Date: 19.AUG.2024 14:30:54

According to clause 4.3.4.2 procedure (a) of the EN IEC 55014-1 standard the EUT is deemed to comply in the frequency range from **300 MHz to 1000 MHz** without further measurements.

**Test setup : Radiated Power In The Frequency Range****TEST SUMMARY P**

The EUT fulfills the requirements of the EN IEC 55014-1 Radiated Power part.

**4.1.3 Discontinuous Interference (Click)**

<b>Standard</b>	<b>EN IEC 55014-1 / CISPR 14-1</b>
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<b>Frequency [MHz]</b>	<b>QP [dB(μV)]</b>
0,15	66
0,50	56
1,40	56
30,00	60

**Test plan/Test Description**

The EUT will be exercised as intended for. The click rate analysis will be made with four frequencies and with different continuous interference limits (e.g. sensitivity (dBμV)). Measured frequencies will be 0.15 MHz, 0.55 MHz, 1.40 MHz and 30 MHz. The limits are 66 dBμV for 0.15 MHz, 56 dBμV for both 0.55 MHz and 1.40 MHz and 60 dBμV for 30 MHz at the first test run (Run A).

The test time (T) is 120 min. If the total number of switching operations ( $n_2$ ) is measured to be 40 before the time of 120 min is passed, the test shall be interrupted and the test time will be recorded. After that the test will be repeated with the new sensitivity limits. If the click rate  $N \leq 5$ , all click durations are  $\leq 20$  ms and 90 % of the click durations are  $\leq 10$  ms, repeating the test is not necessary.

The sensitivity of the second test run will be calculated from the following formula:

Sensitivity (Run B) = Run A + 20 \* log (30/(Run A switching operations \* 0.5)).

The time for second test run will be the same as the time taken for the first test run.

If the total number of the counted clicks (run B) will be  $\leq 0.25 \times n_1$  and the click duration will not exceed 200 ms during the test, EUT fulfils the requirements of the standard.

Test will be made with all the operations of the EUT, which are controlled by either the thermostat or the energy regulators. Different operations will be tested separately. Both lines (neutral and phase L) will be tested separately.

The click rate N is half of the number of switching operations per minute for duty cycle  $50 \pm 10\%$  of the control devices.

The test results are shown on the following pages.

**Operating mode**

Measurements were performed at thermostat middle position.

**Test results**

**Test results, measured phase L**

**Table 3.** Run A

Used frequencies [MHz]:	0,15	0,5	1,4	30
Sensitivity [dB( $\mu$ V)]:	66	56	56	60
Number of counted clicks, (short):	0	0	0	0
Number of counted clicks, (long):	0	0	0	0
Total number of clicks ( $n_1$ ):	0	0	0	0

Duration over 200 ms [ s ]	0	0	0	0
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Switching operations rate                    0  
 Total time of run (T):                        120 minutes

**Table 4.** Run B

Sensitivity dB( $\mu$ V) (L+L <sub>q</sub> )	-	-	-	-
Number of clicks allowed above permitted limits:	-	-	-	-
Number of counted clicks, (short):	-	-	-	-
Number of counted clicks, (long):	-	-	-	-
Total number of clicks ( $n_1$ ):	-	-	-	-

Click rate used:                                -  
 Total time of run (T):                        -

**Test result: PASS**

**Remarks: No click emission detected.**

**Test results, measured phase N**

**Table 5.** Run A

Used frequencies [MHz]:	0,15	0,5	1,4	30
Sensitivity [dB( $\mu$ V)]:	66	56	56	60
Number of counted clicks, (short):	0	0	0	0
Number of counted clicks, (long):	0	0	0	0
Total number of clicks ( $n_1$ ):	0	0	0	0

Duration over 200 ms [ s ]	0	0	0	0
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Switching operations rate                    0  
 Total time of run (T):                        120 minutes

**Table 6. Run B**

Sensitivity dB( $\mu$ V) (L+L <sub>q</sub> )	-	-	-	-
Number of clicks allowed above permitted limits:	-	-	-	-
Number of counted clicks, (short):	-	-	-	-
Number of counted clicks, (long):	-	-	-	-
Total number of clicks ( <b>n</b> <sub>1</sub> ):	-	-	-	-

Click rate used: -

Total time of run (T): -

**Test result: PASS**

**Remarks: No click emission detected.**

**TEST SUMMARY**

**P**

The EUT fulfills the requirements of the EN IEC 55014-1 Discontinuous Interference part.

#### 4.1.4 Harmonic Currents Emissions

<b>Standard</b>	<b>EN IEC 61000-3-2 / IEC 61000-3-2</b>
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#### Test Plan/Test Description

Depending on the type of EUT, the test class will be determined by the test engineer.

Concerning all products the maximum peak current A (pk), the fundamental current and power factor (PF) will be measured prior to measurement. These values are used in order to set the limits in actual test depending on the class.

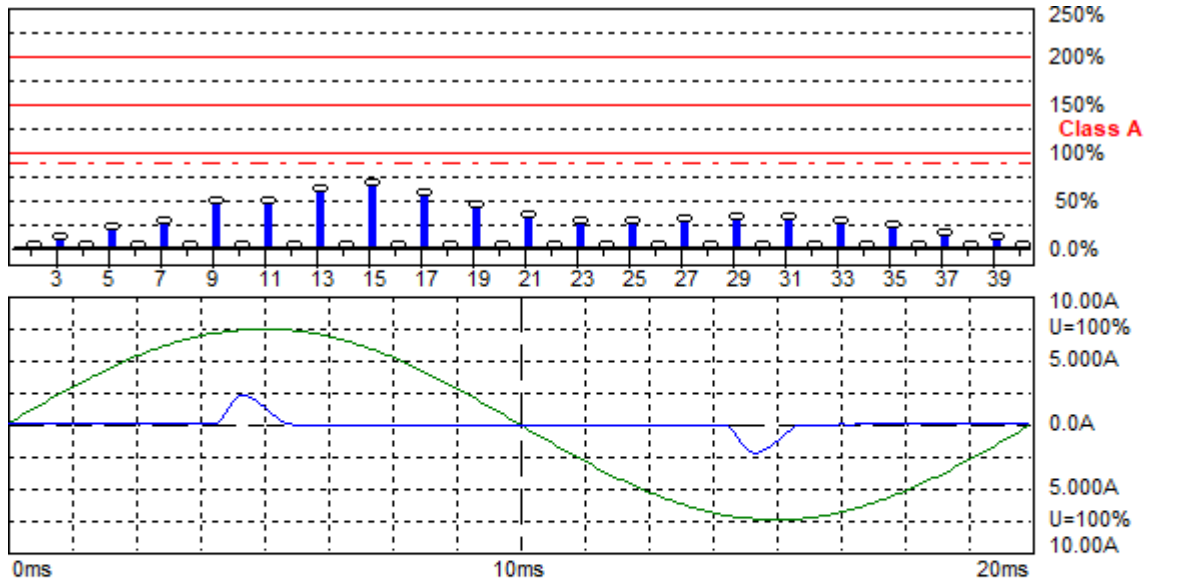
Preliminary measurements will be made in order to find out the state, which produces the maximum amount of harmonics. Harmonics up to 40 will be measured.

**Test time** 5 Minutes  
**Equipment Class** A

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test Result



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

15.08.2024 17:32:13

Urms = 230.1 V    P = 57.67 W    THC = 0.502 A  
 Irms = 0.552 A    pf = 0.454

Range: 10 A  
 V-nom: 230 V  
 TestTime: 5 min (100%)

MNK 40 T

**Test completed, Result: PASSED**

HAR-1000 EMC-Partner

**Measurement**

rms = 230.1V    Freq = 50.000    Range: 10 A  
 Irms = 0.552A    Ipk = 2.285A    cf = 4.142  
 P = 57.67W    S = 127.0VA    pf = 0.454  
 THDi = 196 %    THDu = 0.20 %    Class A

Test - Time : 5min ( 100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Irms [A]	I <sub>max</sub> [A]	Limit [A]	Status
1	50	0.2562	0.2563	0.2740		
2	100	0.0000	0.0006	0.0006	1.0800	
3	150	0.2424	0.2423	0.2429	2.3000	
4	200	0.0000	0.0006	0.0012	0.4300	
5	250	0.2290	0.2289	0.2295	1.1400	
6	300	0.0000	0.0012	0.0012	0.3000	
7	350	0.2092	0.2094	0.2094	0.7700	
8	400	0.0000	0.0018	0.0018	0.2300	
9	450	0.1847	0.1849	0.1849	0.4000	
10	500	0.0000	0.0018	0.0024	0.1840	
11	550	0.1568	0.1569	0.1569	0.3300	
12	600	0.0000	0.0024	0.0024	0.1533	
13	650	0.1278	0.1282	0.1282	0.2100	
14	700	0.0000	0.0024	0.0024	0.1314	
15	750	0.0992	0.0995	0.0995	0.1500	
16	800	0.0000	0.0024	0.0024	0.1150	
17	850	0.0723	0.0726	0.0732	0.1324	
18	900	0.0000	0.0024	0.0024	0.1022	
19	950	0.0499	0.0507	0.0507	0.1184	
20	1000	0.0000	0.0018	0.0018	0.0920	
21	1050	0.0333	0.0336	0.0336	0.1071	
22	1100	0.0000	0.0018	0.0018	0.0836	
23	1150	0.0244	0.0244	0.0244	0.0978	
24	1200	0.0000	0.0018	0.0018	0.0767	
25	1250	0.0227	0.0226	0.0232	0.0900	
26	1300	0.0000	0.0012	0.0018	0.0708	
27	1350	0.0232	0.0232	0.0238	0.0833	
28	1400	0.0000	0.0012	0.0012	0.0657	
29	1450	0.0233	0.0232	0.0238	0.0776	
30	1500	0.0000	0.0012	0.0018	0.0613	
31	1550	0.0213	0.0214	0.0214	0.0726	
32	1600	0.0000	0.0012	0.0018	0.0575	
33	1650	0.0177	0.0177	0.0183	0.0682	
34	1700	0.0000	0.0012	0.0018	0.0541	
35	1750	0.0133	0.0134	0.0134	0.0643	
36	1800	0.0000	0.0012	0.0018	0.0511	
37	1850	0.0088	0.0092	0.0092	0.0608	
38	1900	0.0000	0.0012	0.0012	0.0484	
39	1950	0.0057	0.0061	0.0061	0.0577	
40	2000	0.0000	0.0012	0.0012	0.0460	



**Test setup : Harmonic Current Emissions****TEST SUMMARY P**

The EUT fulfills the requirements of the EN IEC 61000-3-2 for Class A.

### 4.1.5 Voltage Fluctuation And Flicker Sensation

<b>Standard</b>	<b>EN 61000-3-3 / IEC 61000-3-3</b>
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#### Test plan/Test Description

The EUT will be exercised as intended for. Relative steady-state voltage change  $d_c$ , maximum relative change  $d_{max}$  and the value of  $d(t)$  shall be measured with a flicker meter.

#### Limits

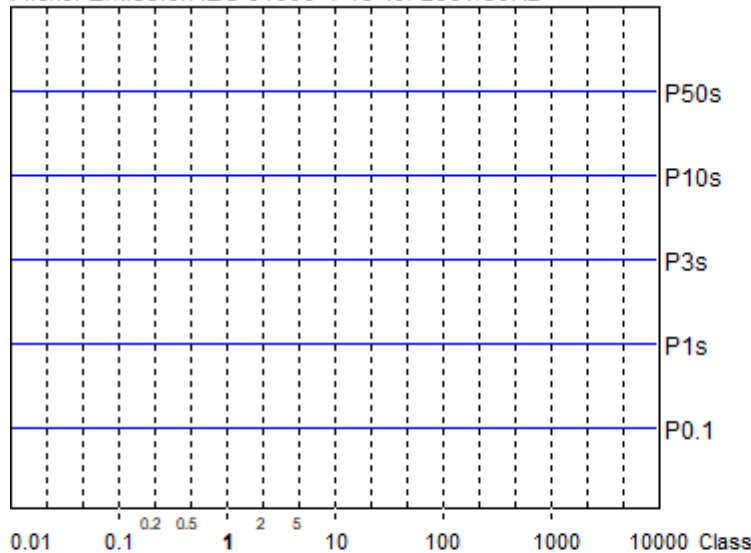
<b>P<sub>ST</sub></b>	N/A
<b>P<sub>LT</sub></b>	N/A
<b>d<sub>C</sub></b>	≤ 3,3 %
<b>d<sub>MAX</sub></b>	≤ 4 %

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test Result

Flicker Emission IEC 61000-4-15 for 230V/50Hz



<b>Actual Flicker (Fli):</b>	<b>0.00</b>
<b>Short-term Flicker (Pst):</b>	<b>0.07</b>
Limit (Pst):	1.00
<b>Long-term Flicker (Plt):</b>	<b>0.07</b>
Limit (Plt):	0.00
<b>Maximum Relative Volt. Change (dmax):</b>	<b>0.00%</b>
Limit (dmax):	4.00%
<b>Relative Steady-state Voltage Change (dc):</b>	<b>0.02%</b>
Limit (dc):	3.30%
<b>Tmax 3.30% (dt):</b>	<b>0.00ms</b>
Limit (dt>Lim):	500ms

**Flicker Emission - IEC 61000-3-3, EN 61000-3-3**

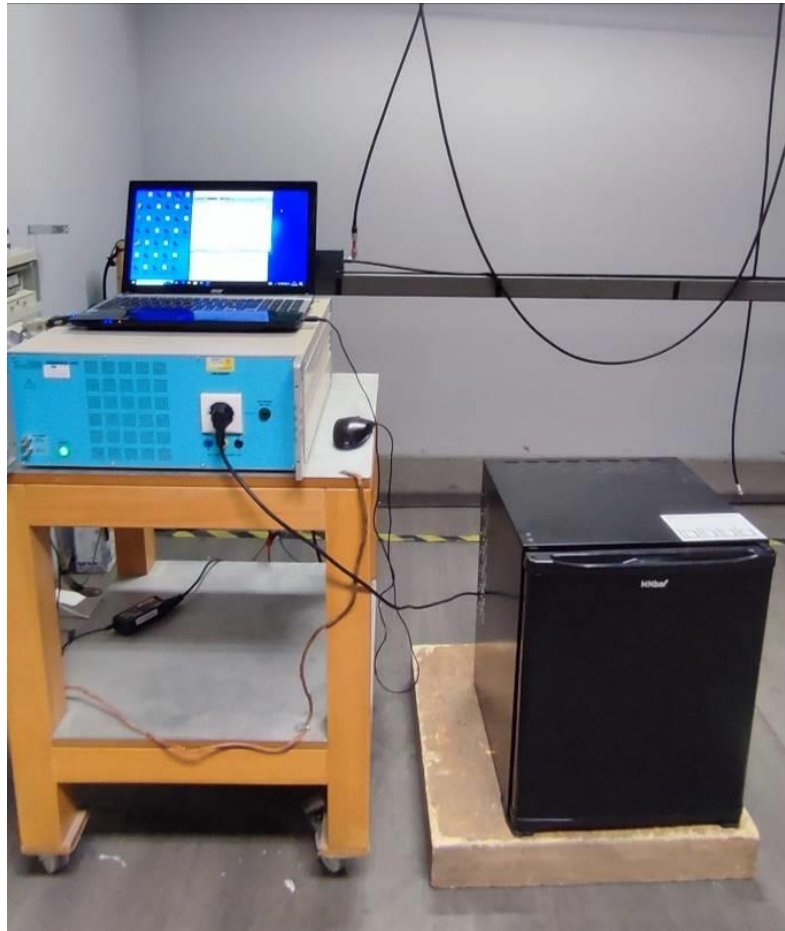
Urms = 230.1 V P = 58.17 W  
 Irms = 0.527 A pf = 0.479

MNK 40 T

**Test completed, Result: PASSED**

15.08.2024 17:26:26

Range: 10 A  
 V-nom: 230 V  
 TestTime: 10 min (100%)

**Test setup : Voltage Fluctuation And Flicker Sensation****TEST SUMMARY P**

The EUT fulfill the requirements of the EN 61000-3-3.

## 4.2 Immunity Test Results

### 4.2.1 Electrostatic Discharge Immunity (ESD)

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN 61000-4-2</b>

#### Test plan/Test Description

Tests will be done using the air discharge on non-conductive parts of the EUT. The contact discharge will be given to all conductive parts of the EUT. Also the indirect contact discharges will be given to vertical coupling planes in order to simulate the objects placed near the EUT. All four sides and the top of the EUT will be tested with both polarities.

At least ten discharges will be given with both polarities to the selected points.

The air discharge will be given with  $\pm 8$  kV test levels.

The contact and the indirect contact discharge will be given with  $\pm 4$  kV test levels.

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test results

**Discharge method:** Air Discharge  
**Test levels:**  $\pm 8$  kV  
**EUT test point:** At insulating surfaces  
**Test remarks:** No degradation in the performance of the EUT was observed

**Discharge method:** Contact Discharge  
**Test levels:**  $\pm 4$  kV  
**EUT test point:** At conductive surfaces  
**Test remarks:** No degradation in the performance of the EUT was observed

**Discharge method:** Indirect contact discharge  
**Test level:**  $\pm 4$  kV  
**EUT test side:** At conductive surfaces  
**Test remarks:** No degradation in the performance of the EUT was observed

**Test setup : Electrostatic Discharge Immunity (ESD)**



**TEST SUMMARY P**

The EUT fulfills the requirements of the EN 61000-4-2 with Criteria B.

**4.2.2 Electrical Fast Transient Immunity (EFT)**

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN 61000-4-4</b>

**Test plan/Test Description**

Tests will be done to the AC-power supply port with the voltage level of  $\pm 1$  kV and 5 kHz. First the level will be tested with both polarities. After both polarities have been tested, the coupling path will be changed. Phase line, neutral will be tested separately. Both polarities will be tested with 60 seconds duration time and with 5 seconds recovery time between the tests.

**Operating mode**

Measurements were performed at thermostat middle position.

**Test results**

**Test cable:** AC power supply  
**Coupling path:** L, N, PE, L-N, N-PE, L-PE, L-N-PE  
**Test level:**  $\pm 1$  kV  
**Test remarks:** No loss of function was observed.

**Test setup : Electrical Fast Transient Immunity (EFT)****TEST SUMMARY P**

The EUT fulfills the requirements of the EN 61000-4-4 with Criteria B.

### 4.2.3 Surge Immunity Test

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN 61000-4-5</b>

#### Test plan/Test Description

Test will be done to the AC power supply port with step by step voltage levels starting at:

- ± 1 kV between phase and phase, Output impedance: 2ohm
- ± 1 kV between phase and neutral, Output impedance: 2ohm
- ± 2 kV between phase and protective earth, Output impedance: 12ohm
- ± 2 kV between neutral and protective earth, Output impedance: 12ohm

Positive and negative pulses will be given with 90° and 270° phase angles. Each pulse will be given five times with 60 seconds repetition rate. First the positive and the negative pulse will be given to the selected coupling path, then the phase angle will be changed and after that the voltage level will be increased to the next test level.

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test results

**Test cable:** AC-power supply  
**Coupling mode:** Differential mode  
**Test level:** ± 1 kV, Line to line  
 ± 2 kV, Line to ground  
**Phase angle:** 90° and 270°  
**Test remarks:** No loss of function was observed



**Test setup : Surge Immunity****TEST SUMMARY P**

The EUT fulfills the requirements of the EN 61000-4-5 with Criteria B.

#### 4.2.4 RF-Electromagnetic Conducted Immunity

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN 61000-4-6</b>

#### Test plan/Test Description

Test will be done from 150 kHz to 230 MHz. The calibration is done with 1 % logarithmic step size with an unmodulated signal. In the calibration setup the signal is fed to coupling network. The required power levels are recorded over the whole frequency range.

The EUT is placed 10 cm above the reference ground plane.

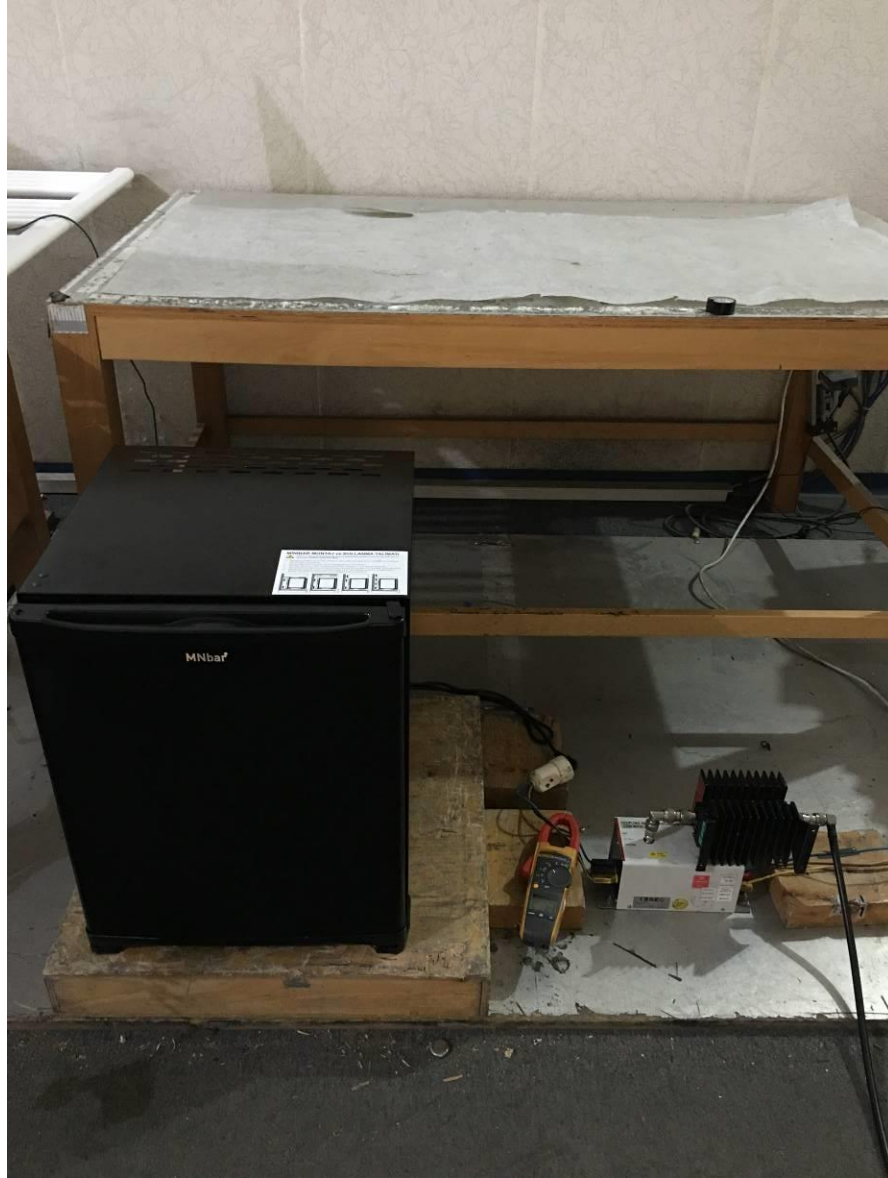
Test will be carried out with a voltage level of 3 V<sub>rms</sub> (80% AM-unmodulated, 1 kHz sine signal). Test will be performed to AC-power supply port.

#### Operating mode

Measurements were performed at thermostat middle position.

#### Test results

**Tested cable:** AC-power supply  
**Frequency range:** 150 kHz – 230 MHz  
**Modulation:** 80% AM with 1 kHz unmodulated frequency  
**Test level:** 3 V<sub>rms</sub>  
**Test remark:** No loss of performance was observed

**Test setup : RF-Electromagnetic Conducted Immunity****TEST SUMMARY P**

The EUT fulfills the requirements of the EN 61000-4-6 with Criteria A.

#### 4.2.5 Voltage Dips And Short Interruptions Immunity

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN IEC 61000-4-11</b>

#### Test plan/Test Description

Test will be done to the AC-power supply port with the following voltage percentage dips of the rated voltage: 30% and 60%. Test will be also done with 100% voltage interruptions of the rated voltage.

#### Operating mode

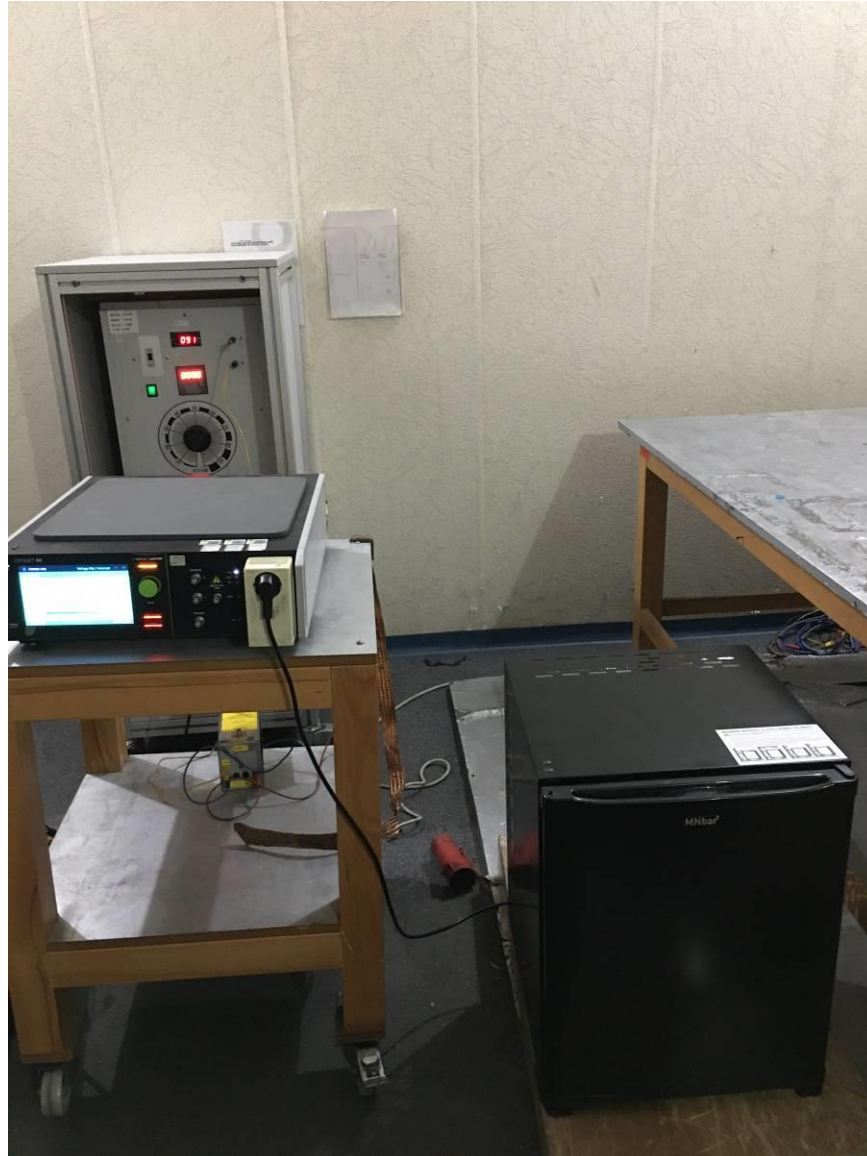
Measurements were performed at thermostat middle position.

#### Test results

**Test cable:** AC-power supply  
**Test level:** Interruption (% 0 of rated voltage)  
**Duration:** 0,5 periods of the rated frequency  
**Performance criteria:** C

**Test cable:** AC-power supply  
**Test level:** 60% dips of the rated voltage (%40 of rated voltage)  
**Duration:** 10 periods of the rated frequency  
**Performance criteria** C

**Test cable:** AC-power supply  
**Test level:** 30% dips of the rated voltage (%70 of rated voltage)  
**Duration:** 25 periods of the rated frequency  
**Performance criteria** C

**Test setup : Voltage Dips And Short Interruptions Immunity****TEST SUMMARY P**

The EUT fulfills the requirements of the EN 61000-4-11 with Criteria C.

**4.2.6 Radiated, Radio Frequency, Electromagnetic Field Immunity**

<b>Standard</b>	<b>EN IEC 55014-2 / CISPR 14-2</b>
<b>Basic standard</b>	<b>EN IEC 61000-4-3</b>

**Test plan/Test Description**

The EUT has been supplied with 230 Vac in Full-Anechoic Chamber on a wooden table that was above 10 cm height from floor. The test has been made by turning EUT four dimensions on vertical and horizontal polarizations of the antenna.

- Test Level : 3V/m (80MHz to 1GHz)
- Modulation : 80% amplitude at 1kHz
- Dwell Times : 2 seconds for each step

**Operating mode**

**Test result**

<b>Test setup : Radiated, Radio Frequency, Electromagnetic Field Immunity</b>

<b>TEST SUMMARY</b>	<b>N/A</b>
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**5 PHOTOS OF EQUIPMENT UNDER TEST**



Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside







Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



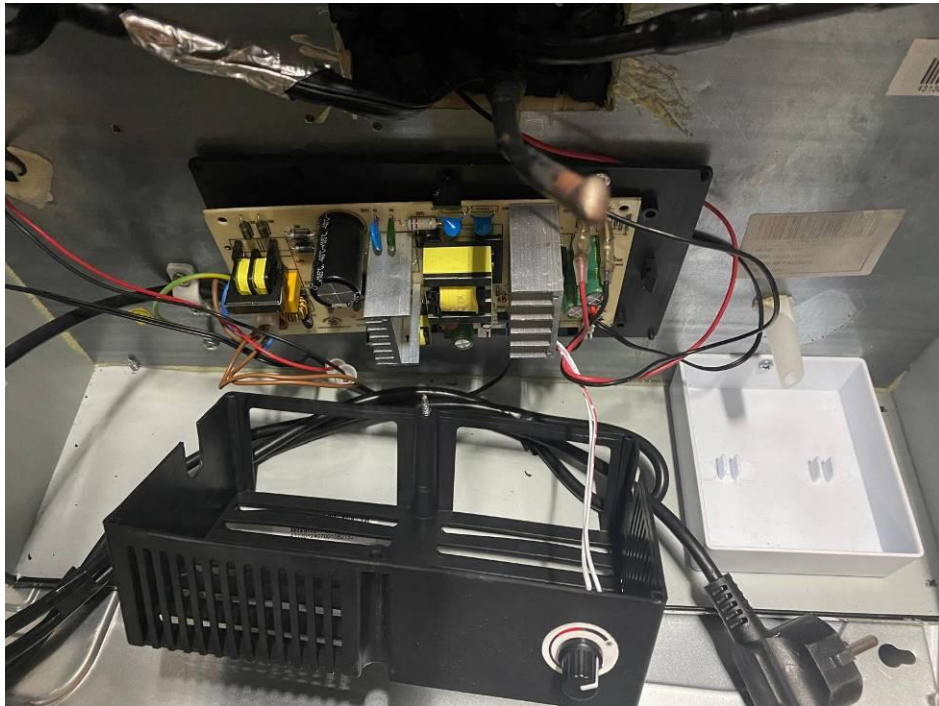
Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



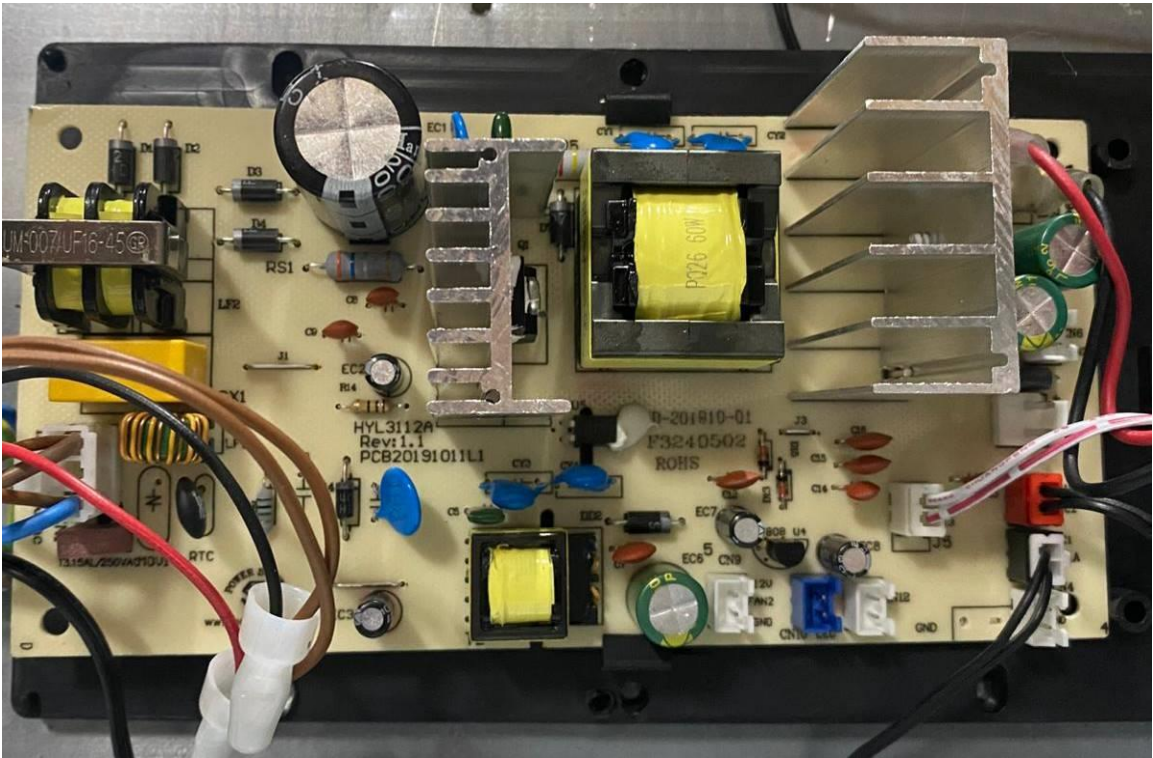
Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



Details of view :  general  front  rear  right  inside



## 6 LIST OF TEST EQUIPMENT USED

Equipment Name	Brand	Model	Serial No	Calibration Due Date
EMI Test Receiver	Rohde&Schwarz	ESR7	101817	08.2025
Solid State Power Amplifier 15 W	Bonn Elektronik	BSA012515	035357A	N/A
Signal Generator	Rohde&Schwarz	SMB100B	101649	11.2024
ESD Simulator	TESEQ	NSG 437	1152	02.2025
Harmonics 1000	EMC PARTNER	HAR1000-1P	HAR1000-1P 230V-0232	02.2025
LISN	Rohde&Schwarz	ENV432	101489	11.2024
Coupling Decoupling	TESEQ	CDN M316	43158	02.2025
Transient Limiter	EMC Elektronik	TL10K30M	121404	11.2024
RF Attenuator	BIRD ELEKTRONIC	8341-200	2382	11.2024
AMETEK SURGE-BURST	EM TEST	Compact NX5 bsp-1-300-16	P1602169864	02.2025
Em Measurement P.D Clamp	EMC Elektronik	EL1000M	1024040602	12.2024

Validation is done on all devices, per six month

## 7 MEASUREMENT UNCERTAINTIES

Equipment	Uncertainty
Harmonic current emission	± 5,42 %
Voltage fluctuation	± 7,31 %
Mains conducted disturbance voltage	± 3,28 dB 9kHz-150 kHz ± 2,52 dB 150kHz-30 MHz
Discontinuous Interference (clicks)	± 3,93 dB
Disturbance Power	± 3,11 dB
Radiated Emission	± 3,43 dB 30MHz-1000MHz
Electrostatic Discharges (ESD)	Interference generator fulfils basic requirements
Electrical fast transient (EFT)	Interference generator fulfils basic requirements
Surge transients	Interference generator fulfils basic requirements
Power supply voltage interruptions & dips	Interference generator fulfils basic requirements



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End of the Report