Test Report No.:	**28220293 001**	**Page 1 of 33**
Client:	**AC TRUP Kft.** H-6000 Kecskemét, Budai Hegy 121/B., Hungary	
Manufacturer:	**AC TRUP Kft.** H-6000 Kecskemét, Budai Hegy 121/B., Hungary	
Test item:	**Heat pump**	
Identification:	**BES 5 VV, BES 12 VV,** **BES 18 VV, BES 25 VV,** **BES 35 VV** (see page 2.)	**Serial No.:** **16.10.12**
Receipt No.:	**93339889**	**Date of receipt:** **---**
Testing location:	**AC TRUP Kft.** H-6000 Kecskemét, Budai Hegy 121/B., Hungary	
Test specification:	**EN 61000-6-3:2007+A1:2011** **EN 61000-3-2:2006+A1:2009+A2:2009** **EN 61000-3-3:2008** **EN 61000-6-1:2007** **EN 61000-4-2:2009** **EN 61000-4-3:2006 + A1:2008 + A2:2010** **EN 61000-4-4:2012** **EN 61000-4-5:2006** **EN 61000-4-6:2009** **EN 61000-4-11:2004**	
Test result:	**The test item passed the test specification(s).**	
Testing laboratory	**TÜV Rheinland InterCert Kft.** H-1132 Budapest, Váci út 48/A-B., Hungary	

Tested by:			**Reviewed by:**		
2013-12-09	Imre **Király**		2013-12-09	János Horváth	
Date	**Name**	**Signature**	**Date**	**Name**	**Signature**

Other Aspects:

Rated data: 3N, 400 V, 50 Hz, 7.8 kW, heating capacity: 36 kW

Abbreviations:			
	P(ass)	=	**passed**
	F(ail)	=	**failed**
	N/A	=	**not applicable**
	N/T	=	**not tested**

Note(s):

The equipment under test uses the heat of the earth in order to make heating.
The product family includes five types such as BES 5 VV, BES 12 VV, BES 18 VV, BES 25 VV and BES 35 VV. The types are differing in heating power. The electronic parts are the same, the only difference is the power of the heat pump. The tests were carried out on the highest power type, BES 35VV.

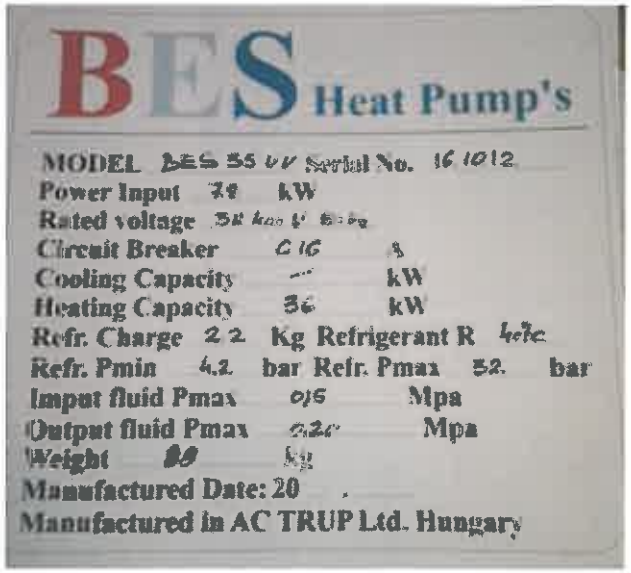
Test was not carried out according to standard **EN 61000-4-8:2010**, as the EUT does not contain any devices susceptible to magnetic fields.

The **EN 61000-3-3:2008** test was not carried out on the EUT as the standard tells that test shall not be made on equipment, which is unlikely to produce significant voltage fluctuations or flicker.
There is a warning in the manual of the EUT that the impedance of the power line should be less than 0,1 Ohm. Therefore the voltage fluctuations are considered to be under the limit.

Place of manufacture:

AC TRUP Kft. H-6000 Kecskemét, Budai Hegy 121/B., Hungary

Photo(s):



Contents:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Date of measurement: *2013-10-16*

Ambient conditions:

Ambient temperature: *18 °C*

Relative humidity: *60 %*

Air pressure *1006 hPa*

Test setup:

Laboratory test ☐ Post-installation test ☒

Classification of equipment: ---

Measuring method:	Tested:
Disturbance voltage Frequency range 150 kHz - 30 MHz (see measurement results on page 4-7)	☒
Radiated disturbance Frequency range 30 MHz - 1000 MHz (could not be measured, see on page 8)	☒

Calculated measurement uncertainty for
Disturbance voltage: ± 2.34 dB k= 1.744
Radiated disturbances (30 MHz – 200 MHz): ± 4.73 dB k= 2
Radiated disturbance (200 MHz – 1000 MHz): ± 4.86 dB k= 2

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):

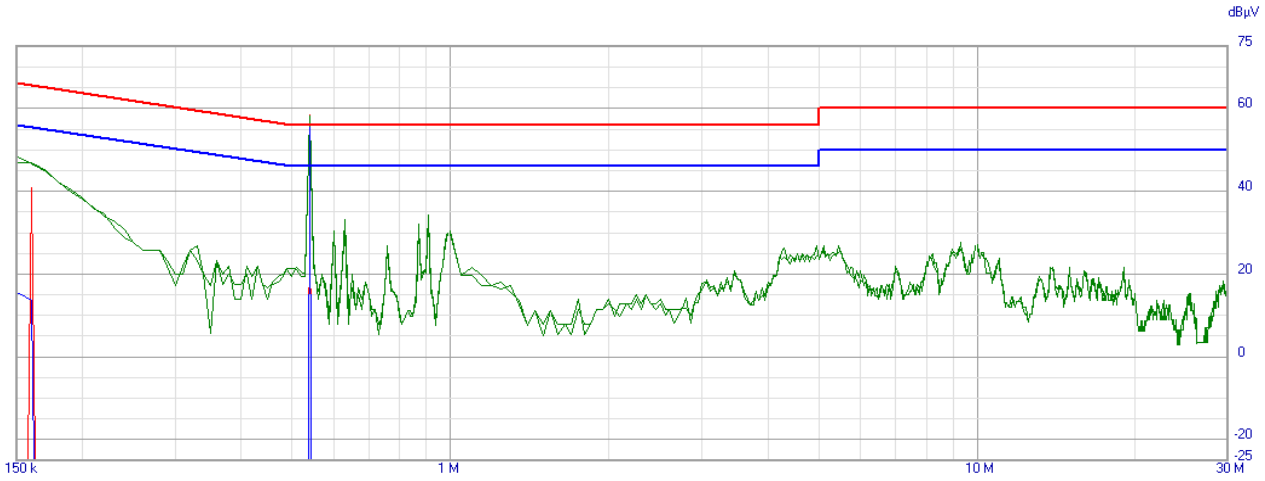
The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*
Test point:	*AC power port – Line L1*

Disturbance voltage diagram:



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	1	10 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
2	0.15	1	10 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
3	1	10	50 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
4	1	10	50 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
5	10	30	100 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
6	10	30	100 kHz	S P A 022av-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...

Ancillary = L3 PMM
Limits: 022qp-b 022av-b
Factors: ESH3Z2
Peak QPeak Avg

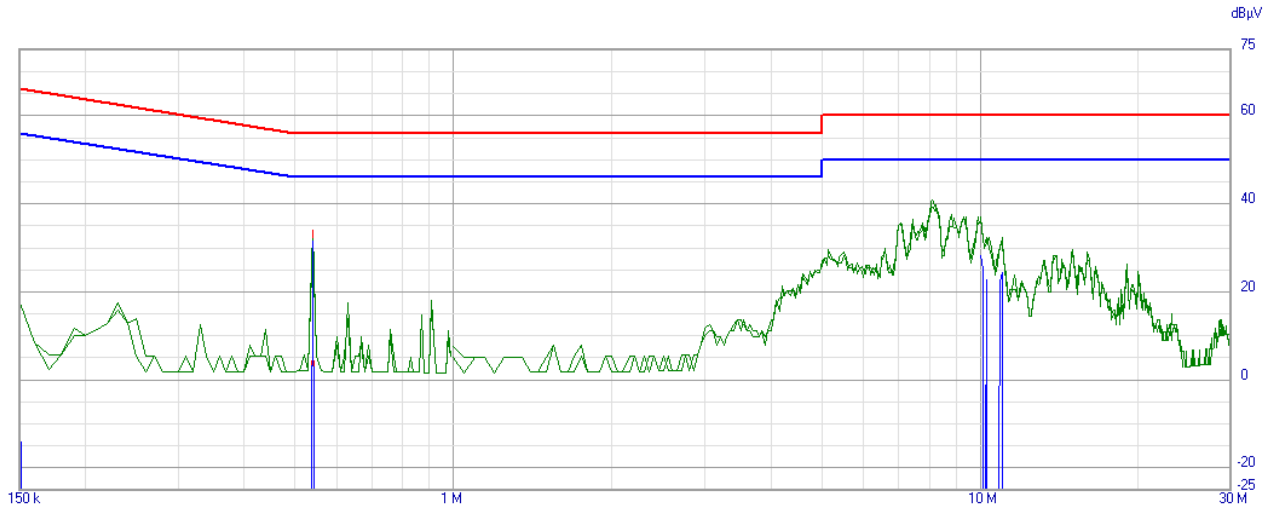
As the measurement was not performed in a shielded chamber, there are peaks shown on diagram, which derive not from EUT (which derive from external source). The peak on 540 kHz for example is a broadcasting radostation.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*
Test point:	*AC power port – Line L2*

Disturbance voltage diagram:



55022 B

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	1	10 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
2	0.15	1	10 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
3	1	10	50 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
4	1	10	50 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
5	10	30	100 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
6	10	30	100 kHz	S P A 022av-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...

Ancillary = L3 PMM
Limits: 022qp-b 022av-b
Factors: ESH3Z2
Peak
QPeak
Avg

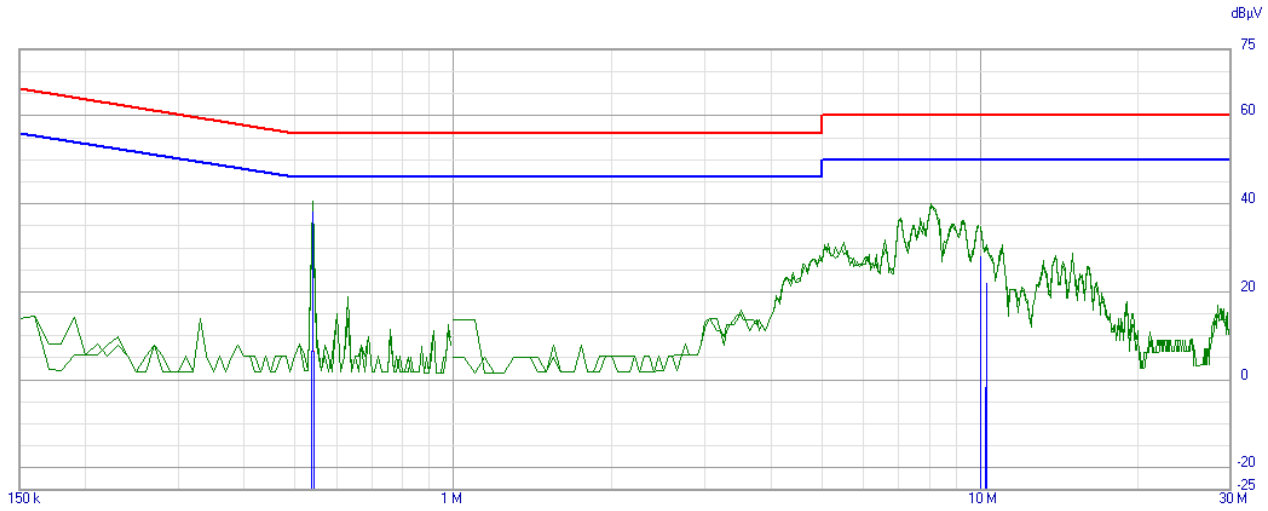
As the measurement was not performed in a shielded chamber, there are peaks shown on diagram, which derive not from EUT (which derive from external source). The peak on 540 kHz for example is a broadcasting radostation.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*
Test point:	*AC power port – Line L3*

Disturbance voltage diagram:



55022 B

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	1	10 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
2	0.15	1	10 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
3	1	10	50 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
4	1	10	50 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
5	10	30	100 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
6	10	30	100 kHz	S P A 022av-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...

Ancillary = L3 PMM
Limits: 022qp-b 022av-b
Factors: ESH3Z2
Peak
QPeak
Avg

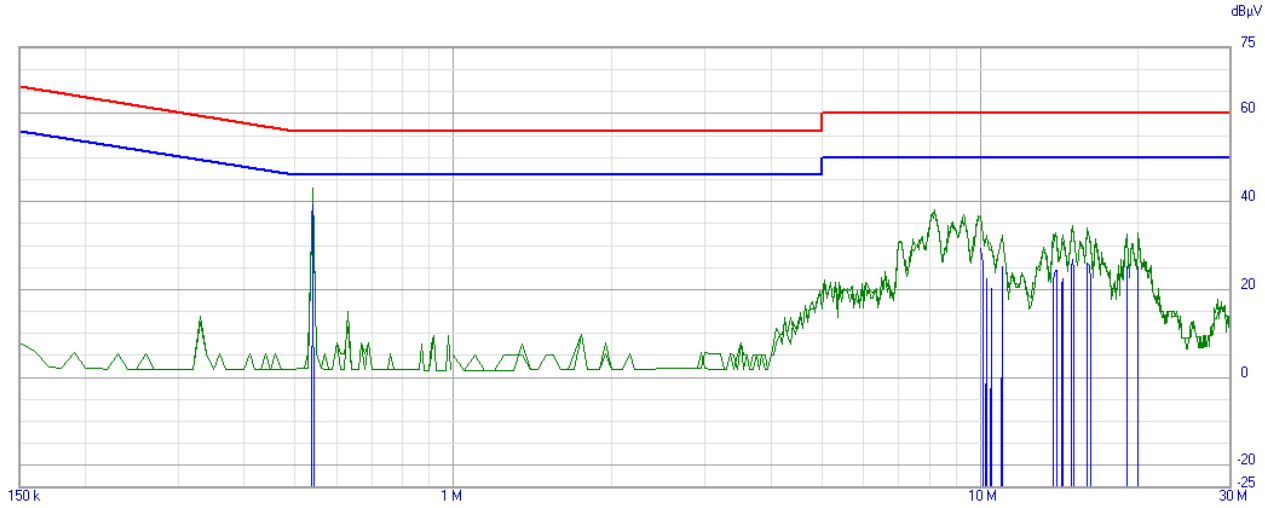
As the measurement was not performed in a shielded chamber, there are peaks shown on diagram, which derive not from EUT (which derive from external source). The peak on 540 kHz for example is a broadcasting radostation.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*
Test point:	*AC power port – Neutral*

Disturbance voltage diagram:



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	1	10 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
2	0.15	1	10 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
3	1	10	50 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
4	1	10	50 kHz	S P A 022av-b Margin 9 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
5	10	30	100 kHz	S P Q 022qp-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...
6	10	30	100 kHz	S P A 022av-b Margin 19 dB	Scan 20 ms Peak 20 ms	9 kHz	0	ON	ON	...	...

Ancillary = L3 PMM
Limits: 022qp-b 022av-b
Factors: ESH3Z2
Peak
QPeak
Avg

As the measurement was not performed in a shielded chamber, there are peaks shown on diagram, which derive not from EUT (which derive from external source). The peak on 540 kHz for example is a broadcasting radostation.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Measurement of radiated disturbances in the frequency range between 30 MHz and 1 GHz:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*
Test point:	*Enclosure port.*
Description of measurement area:	*The measurement was carried out on site, at the place of manufacturer*
Measurement distance:	*10 m*
Height of antenna:	*1-4 m*
Polarisation of antenna	*Vertical, horizontal.*
Description of cables:	*Power supply cable, 5x6 mm^2, 8 m long*
Measurement results:	*Valuable disturbance field strength could not be measured.*

Frequency MHz	Measured value dBµV	Ambient noise dBµV/m	**Actual disturbance level dBµV/m**	**Limit value (for 10 m) dBµV/m**	Polarisation of the antenna v / h
-	-	-	**-**	**-**	-

Note(s): ---

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-6-3:2007+A1:2011** Electromagnetic compatibility – Emission standard for residential, commercial and light-industrial environments

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	Next calibration	Applied
Measuring receiver	R & S	ESCS30	836858/003	*2014-07*	☐
Measuring receiver	NARDA	9010 – 9060	495WX10801+ 001WX00809	*2014-03*	☒
Artificial mains network	R & S	ESH3-Z5	827729/018	*2016-02*	☐
Artificial mains network	Schwarzbeck	NNLK 8129	8129-201	*2016-05*	☒
Pulse limiter	R & S	ESH3-Z2	-	*2016-03*	☒
Biconical antenna	Emco	3104	4672	*2014-06*	☐
Log.-per. antenna	Emco	3146	3902	*2014-06*	☐
Biconilog antenna	ETS-Lindgren	3142 c	00035886	*2015-10*	☒

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Date of measurement: *2013-10-17*

Ambient conditions:

Ambient temperature: *21 °C*

Relative humidity: *53 %*

Air pressure: *1013 hPa*

Test setup:

Laboratory test: ☐ Post-installation test: ☒

Calculated measurement uncertainty for harmonic current: ± 0.25 % k= 2

Evaluation based on the test results:

Passed ☒ Failed ☐

Note:

The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The test sample was continuously operated*

Allowed max. values of harmonic current of class „A" equipment:

Harmonic No.	Limit for harmonic current
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	0.15 x (15 / n)
Even harmonics	
2	1.08
4	0.43
6	0.3
$8 \leq n \leq 40$	0.23 x (8 / n)

Test point: *mains connection*

Note(s): ---

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Measuring on main terminal Neutral

```
Voltage  =  234.761 V     Voltage Distortion =    2.69 %
Current  =   15.356 A     Current Distortion =    5.37 %
Power    =-2724.793 W     Apparent Power     = 3604.917 VA
CosPhi(1)=   -0.757       Power Factor       =   -0.756
Phase    =  L1
```

Hn	I rms	Percentage	Phase	Limits	FAIL
DC	-0.068 A	-0.45 %	--------	no limit	
1	15.330 A	100.00 %	+139.22°	no limit	
2	0.162 A	1.06 %	+123.24°	1.080 A	
3	0.258 A	1.68 %	+6.31°	2.300 A	
4	0.024 A	0.16 %	+62.87°	0.430 A	
5	0.643 A	4.19 %	-58.31°	1.140 A	
6	0.017 A	0.11 %	+44.64°	0.300 A	
7	0.396 A	2.59 %	+125.73°	0.770 A	
8	0.017 A	0.11 %	+29.47°	0.230 A	
9	0.015 A	0.10 %	-142.02°	0.400 A	
10	0.020 A	0.13 %	+7.35°	0.184 A	
11	0.012 A	0.08 %	+90.16°	0.330 A	
12	0.017 A	0.11 %	-13.29°	0.153 A	
13	0.067 A	0.44 %	+117.63°	0.210 A	
14	0.017 A	0.11 %	-31.20°	0.131 A	
15	0.014 A	0.09 %	+156.79°	0.150 A	
16	0.017 A	0.11 %	-50.34°	0.115 A	
17	0.038 A	0.25 %	+95.87°	0.132 A	
18	0.017 A	0.11 %	-66.38°	0.102 A	
19	0.024 A	0.15 %	+107.22°	0.118 A	
20	0.017 A	0.11 %	-84.26°	0.092 A	
21	0.009 A	0.06 %	+71.51°	0.107 A	
22	0.015 A	0.10 %	-90.38°	0.084 A	
23	0.025 A	0.16 %	+69.38°	0.098 A	
24	0.022 A	0.15 %	-99.85°	0.077 A	
25	0.015 A	0.10 %	+52.08°	0.090 A	
26	0.014 A	0.09 %	-148.47°	0.071 A	
27	0.013 A	0.08 %	+20.62°	0.083 A	
28	0.012 A	0.08 %	+114.12°	0.066 A	
29	0.012 A	0.08 %	+26.08°	0.078 A	
30	0.015 A	0.10 %	-173.47°	0.061 A	
31	0.006 A	0.04 %	-19.54°	0.073 A	
32	0.010 A	0.07 %	+165.23°	0.058 A	
33	0.011 A	0.07 %	-38.70°	0.068 A	
34	0.011 A	0.07 %	+145.22°	0.054 A	
35	0.008 A	0.05 %	-51.22°	0.064 A	
36	0.009 A	0.06 %	+119.78°	0.051 A	
37	0.007 A	0.04 %	-56.42°	0.061 A	
38	0.008 A	0.05 %	+96.21°	0.048 A	
39	0.006 A	0.04 %	-97.84°	0.058 A	
40	0.008 A	0.05 %	+77.00°	0.046 A	
41	0.007 A	0.05 %	-124.82°	no limit	
42	0.008 A	0.05 %	+52.86°	no limit	
43	0.008 A	0.05 %	-123.63°	no limit	
44	0.007 A	0.05 %	+30.03°	no limit	
45	0.005 A	0.03 %	-158.42°	no limit	
46	0.006 A	0.04 %	+9.04°	no limit	
47	0.006 A	0.04 %	-178.09°	no limit	
48	0.006 A	0.04 %	-14.60°	no limit	
49	0.006 A	0.04 %	+156.92°	no limit	
50	0.005 A	0.03 %	-35.84°	no limit	

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	Next calibration	Applied
Digital flickermeter-Real time harmonic analyser	PMM	PMM 1000	H90598	*2014-05*	☒
Power supply	Kikusui	PCR 2000L	A0000233	*2014-06*	☐
Power supply	Kikusui	PCR 2000L	A0000448	*2014-06*	☐
Power supply	Kikusui	PCR 2000L	A0000449	*2014-06*	☐
Digital multimeter	Norma	MP 14	X529116C	*2014-08*	☒
Clamp on probe	HIOKI	9018	040435909	*2014-05*	☐

Additional information:

* The power supplies are not calibrated instruments. Their output parameters are checked during each measurement.

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-2:2009** Immunity against electrostatic discharges

Date of measurement:	*2013-10-16*
Ambient conditions:	
Ambient temperature:	*18 °C*
Relative humidity:	*60 %*
Air pressure	*1006 hPa*

Test setup:

Laboratory test ☐ Post-installation test ☒

Calculated measurement uncertainty
measurement uncertainty of current measurement: 2,5 %, k= 2
measurement uncertainty of time measurement: ± 110ps, k= 2

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):
The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-2:2009** Immunity against electrostatic discharges

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*

Performance criterion			
	☐	A	Normal operation within the prescribed limits.
	☒	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

Test voltage:	*4 kV*
Number of discharges:	*10 positive + 10 negative, each of tested points.*
Method of discharges:	*Direct and indirect contact discharge.*
Place of discharges (tested points):	*Metallic parts of EUT, vertical and horisontal coupling plane.*
Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-2:2009** Immunity against electrostatic discharges

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated*

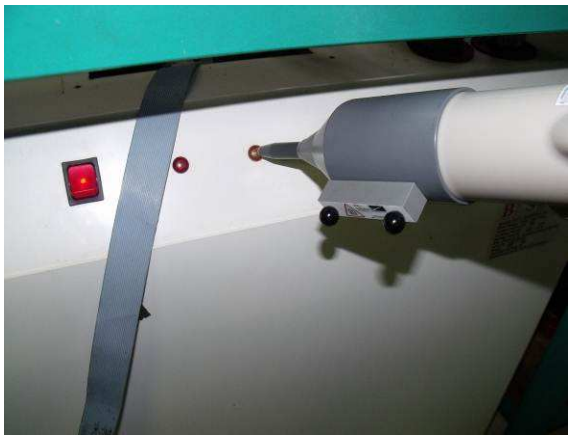
Performance criterion			
	☐	A	Normal operation within the prescribed limits.
	☒	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

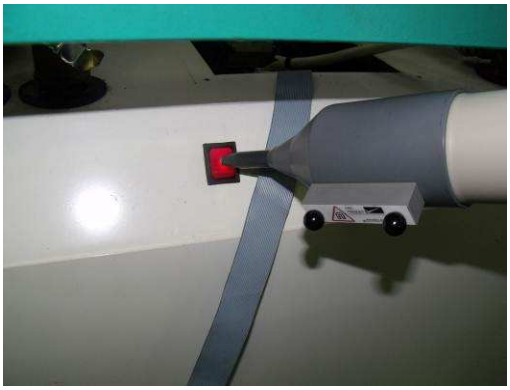
Test voltage:	*8 kV*
Number of discharges:	*10 positive + 10 negative, each of tested points.*
Method of discharges:	*Air discharge.*
Place of discharges (tested points):	*Display and the plastic enclosure of the appliance.*
Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Photo(s) on the measuring arrangement:





Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-2:2009** Immunity against electrostatic discharges

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
ESD generator	EMC-Partner	ESD3000	497	*2014-05*	☒

Note(s): ---

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-3:2006 + A1:2008 + A2:2010** Radiated, radio-frequency, electromagnetic field immunity test

Date of measurement: *2013-10-16*

Ambient conditions:

Ambient temperature: *18 °C*

Relative humidity: *59 %*

Air pressure *1006 hPa*

Test setup:

Laboratory test ☐ Post-installation test ☒

Calculated measurement uncertainty
for radiated, radio-frequency electromagnetic fields: ±1.52 dBm k=1.64

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):
The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-3:2006 + A1:2008 + A2:2010** Radiated, radio-frequency, electromagnetic field immunity test

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The test sample was continuously operated*

Performance criterion			
	☒	A	Normal operation within the prescribed limits.
	☐	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

	1.	2.	3.
Frequency range:	*80-1000 MHz*	*1.4 - 2 GHz*	*2 – 2.7 GHz*
Field strength:	*3 V/m*	*3 V/m*	*1 V/m*
Modulation:	*80 % AM; 1kHz*	*80 % AM; 1kHz*	*80 % AM; 1kHz*
Frequency step:	*0.25 %*	*0.25 %*	*0.25 %*
Dwell time	*1 s*	*1 s*	*1 s*

Operation of the EUT during the test: *No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-3:2006 + A1:2008 + A2:2010** Radiated, radio-frequency, electromagnetic field immunity test

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	Next calibration	Applied
Semi anechoic chamber	T-Network	3, 10 m	---	*2015-01*	☐
Signal generator	R&S	SMT 06	100634	*2014-05*	☒
Signal generator	R&S	SMY 02	838219/008	*2014-02*	☐
Power amplifier	AR	25A250A	18727	*2014-05*	☐
Power amplifier	Ophir	5127F	1029	*2014-05*	☒
Power amplifier	Bonn	BSA0122-10	943848B	*2014-03*	☐
Power amplifier	Bonn	BLWA2010-10	943848B	*2014-03*	☐
Power amplifier	Bonn	BLMA1020-50	004781	*2014-05*	☒
Power Amplifier	Bonn	BLMA2040-60	045731	*2014-05*	☒
Portable field strength meter	PMM	8051	0110J70307	*2014-06*	☒
Antenna for measurement of field strength	PMM	BA 01	02010J70303	*2014-06*	☒
Optic repeater (for BA01)	PMM	OR 01	0210K70306	*2014-06*	☒
Biconical antenna	Emco	3104	4672	*2014-06*	☐
Log.-per. antenna	Emco	3146	3902	*2014-06*	☐
Biconilog antenna	ETS-Lindgren	3142 c	00035886	*2015-10*	☒

Note(s): ---

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-4:2012** Electrical fast transient/burst immunity test
Date of measurement:	*2013-10-16*
Ambient conditions:	
Ambient temperature:	*22 °C*
Relative humidity:	*46 %*
Air pressure	*1013 hPa*
Test setup:	
Laboratory test ☐	Post-installation test ☒
Evaluation based on the test results:	
Passed ☒	Failed ☐

Note(s):
The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-4:2012** Electrical fast transient/burst immunity test

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated. The test was carried out on the mains wires of the control electronics only.*		
Performance criterion	☐	A	Normal operation within the prescribed limits.
	☒	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.
Test voltage:	*1 kV*		
Test pulse (T_r/T_h):	*5 / 50 ns*		
Repetition frequency:	*5 kHz*		
Burst duration:	*15 ms*		
Burst period:	*300 ms*		
Polarity:	*Positive, then negative.*		
Duration of test:	*120 s (positive) + 120 s (negative).*		
Coupling method:	*CDN (built in)*		
Place of coupling:	*AC power port – mains connection*		
Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*		

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Photo on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-4:2012** Electrical fast transient/burst immunity test

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
Combined generator	EM test	UCS 500	0596-55	*2014-05*	☒
3-phase CDN	Schaffner	CDN 300	189	*2016-05*	☐
3-phase CDN	Haefely	FP 16/3-1	082632-019	*2014-06*	☐
Capacitive coupler	Haefely	093506.1	082963-25	*2016-05*	☐

Note(s): ---

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-5:2006** Immunity against surges

Date of measurement: *2013-10-16*

Ambient conditions:

Ambient temperature: *22 °C*

Relative humidity: *46 %*

Air pressure *1013 hPa*

Test setup:

Laboratory test ☐ Post-installation test ☒

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):

The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-5:2006** Immunity against surges

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated. The test was carried out on the mains wires of the control electronics only.*

Performance criterion	☐	A	Normal operation within the prescribed limits.
	☒	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

Test voltage:	*1 kV*
Test pulse (open circuit, T_r/T_h):	*1.2 / 50 µs*
Test pulse (short circuit, T_r/T_h):	*8 / 20 µs*
Number of pulses:	*10 positive + 10 negative each at 0°, 90°, 180°, 27 0°.*
Time between impulses	*60 s*

Coupling method:	*CDN (built in).*
Place of coupling:	*AC power port – mains connection: L ↔ N (differential mode).*

Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-5:2006** Immunity against surges

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated. The test was carried out on the mains wires of the control electronics only.*		
Performance criterion	☐	A	Normal operation within the prescribed limits.
	☒	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.
Test voltage:	*2 kV*		
Test pulse (open circuit, T_r/T_h):	*1.2 / 50 µs*		
Test pulse (short circuit, T_r/T_h):	*8 / 20 µs*		
Number of pulses:	*10 positive + 10 negative each at 0°, 90°, 180°, 27 0°.*		
Time between impulses	*60 s*		
Coupling method:	*CDN (built in).*		
Place of coupling:	*AC power port – mains connection: L+N ↔ PE (common mode).*		
Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*		

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-5:2006** Immunity against surges

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
Combined generator	EM test	UCS 500	0596-55	*2014-05*	☒

Note(s): ---

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-6:2009** Immunity to conducted disturbances, induced by radio-frequency fields
Date of measurement:	*2013-10-17*
Ambient conditions:	
Ambient temperature:	*18 °C*
Relative humidity:	*56 %*
Air pressure	*1013 hPa*
Test setup:	
Laboratory test ☐	Post-installation test ☒
Evaluation based on the test results:	
Passed ☒	Failed ☐

Note(s):
The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-6:2009** Immunity to conducted disturbances, induced by radio-frequency fields

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The test sample was continuously operated. The test was carried out on the mains wires of the control electronics only.*

Performance criterion			
	☒	A	Normal operation within the prescribed limits.
	☐	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	☐	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

	1.	2.	3.
Frequency range:	*0.15 – 80 MHz*		
RF voltage:	*3 V*		
Step size:	*0.25 %*		
Dwell time:	*1 s*		
Modulation:	*80 % AM; 1 kHz*		

Coupling method:	*CDN type M3*
Place of coupling:	*AC power port – mains connection.*
Operation of the EUT during the test:	*No change was observed in the operation of the equipment. Performance criterion is complied with 'A'.*

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-6:2009** Immunity to conducted disturbances, induced by radio-frequency fields

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
Signal generator	Rhode & Schwarz	SMY 01	844146 / 052	*2014-02*	☒
Amplifier	Amplifier Research	25A250A	18727	*2014-05*	☒
RF millivoltmeter	Rhode & Schwarz	URV 5	894296/004	*2014-05*	☒
CDN	MEB	AF2	12516	*2016-06*	☐
CDN	MEB	M2	12114	*2016-06*	☐
CDN	MEB	M3	13225	*2016-06*	☒

Note(s): ---

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-11:2004** Immunity against voltage dips, short interruptions and voltage variations

Date of measurement:	*2013-10-17*
Ambient conditions:	
Ambient temperature:	*21 °C*
Relative humidity:	*47 %*
Air pressure	*1013 hPa*

Test setup:

Laboratory test ☐ Post-installation test ☒

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):

The measurement was performed on the place of applicant.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-11:2004** Immunity against voltage dips, short interruptions and voltage variations

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The test sample was continuously operated. The test was carried out on the mains wires of the control electronics only.*

Performance criteria		
	A	Normal operation within the prescribed limits.
	B	After a temporary degradation or failure of function the normal operation is restored automatically.
	C	After a temporary degradation or failure of function the normal operation is restored by the operator's action.

Immunity to voltage dips				
Test voltage (U_T):	*230V*	*230V*	*230V*	*230V*
Method of supply:				
Voltage dip (ΔU):	*100%*	*60%*	*30%*	*100%*
Reduced voltage:	*0V*	*0V*	*161V*	*0V*
Duration of voltage dip:	*10ms*	*20ms*	*500ms*	*5s*
Number of voltage dip:	*4*	*4*	*4*	*4*
Performance criterion:	*B*	*B*	*C*	*C*
Operation of the EUT during the test:	A No change was observed	A No change was observed	A No change was observed	B Automatically restarted

Note(s):

Test level and performance criterion are specified in EN 61000-6-1:2007 standard.

Measurement ref. No.: 28220293 001	Standard applied: **EN 61000-4-11:2004** Immunity against voltage dips, short interruptions and voltage variations

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
Combined generator	EM Test	UCS 500	0596-55	*2014-05*	☒
Power supply	Kikusui	PCR 2000L	A0000233	*2014-06*	☐
Power supply	Kikusui	PCR 2000L	A0000448	*2014-06*	☐
Power supply	Kikusui	PCR 2000L	A0000449	*2014-06*	☐
Multimeter	Hioki	3257-50	040418901	*2014-05*	☒
Multimeter	Norma	MP 14	X324871C	*2014-08*	☐

Note(s): ---

Photo(s) on the measuring arrangement: