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TEST REPORT N. **DA/0601E**

	Issued	on	07-07-2013
	Sample received	on	13-04-2013
Tested by :	Casati Francesco	on	03-07-2013
Title :	*P.I. Francesco Casati Lab. Engineer*		
Checked by :	Rivoltella Dario	on	07-07-2013
Title :	*Ing. Dario Rivoltella Laboratory Manager*		

THE TEST RESULTS PRESENTED IN THIS REPORT RELATE ONLY TO THE ITEMS TESTED

*sample not selected by **UL INTERNATIONAL ITALIA** – sample ID **799822***

Applicant:	SOTECO S.p.A. Via Enrico Fermi, 2 – 26022 Castelverde (CR) – Italy					
Product:	VACUUM CLEANER				Trade mark:	SOTECO
Type/Model:	Ecologico MAXI				Manufacturer:	SOTECO S.p.A.
Serial number:	---				Production date:	---
Rating:	230 V	50 Hz	1000 W	1650 W_{max}	EN 55014-2 category:	II

Tests and relevant methods and procedures were performed according to the following standards:

E M I S S I O N

• **EN 55014-1**	**(2006)**	Electromagnetic compatibility (EMC) Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission

D I S T U R B A N C E S I N P O W E R S U P P L Y S Y S T E M S

• **EN 61000-3-2**	**(2006)**	Electromagnetic compatibility (EMC) Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
• **EN 61000-3-3**	**(2008)**	Electromagnetic Compatibility (EMC) Part 3-3: Limits – 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 subjected to conditional connection

I M M U N I T Y

• **EN 55014-2** **+ A1** **+ A2**	**(1997)** **(2001)** **(2008)**	Electromagnetic compatibility (EMC) Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity – Product family standard
• **EN 61000-4-2** **+ A1** **+ A2**	**(1995)** **(1998)** **(2001)**	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test – Basic EMC pubblication
• **EN 61000-4-3** **+ A1**	**(2006)** **(2008)**	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test
• **EN 61000-4-4**	**(2004)**	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test – Basic EMC publication
• **EN 61000-4-5**	**(2006)**	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques – Section 5: Surge immunity test
• **EN 61000-4-6** **+ corr. August**	**(2007)** **(2007)**	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques – Section 6: Immunity to conducted disturbances, induced by radio-frequency fields
• **EN 61000-4-11**	**(2004)**	Electromagnetic compatibility (EMC) Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests

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Notified Body
D. Lgs. 194/07 G.U. 261 del 09/11/07
MINISTERO COMUNICAZIONI

DESCRIPTION

This product is a vacuum cleaner. It consists of one motor, one switch, one indicator lamp, one potentiometer for motor speed regulation and two electronic boards.

Ports:
Input AC power: unshielded, 2 wires (N+L)
Output AC power: 2 wires (N+L), for tools connection. This port is not subjected to tests because it is connected directly to the input AC power.

PHOTOS

Photo 1

Photo 2

EN 55014-1

For detailed measurement see **SEC. 3 Annex A**

CONTINUOUS DISTURBANCE			
	Frequency	**Limits**	**RESULT**
Mains terminals:	0,15 ÷ 0,5MHz	66 ÷ 56 $dB_{\mu V}$ (QP) decrease leanerly with the logarithm of the frequency 59 ÷ 46 $dB_{\mu V}$ (AV) decrease leanerly with the logarithm of the frequency	Conducted Emission ***COMPLIED***
	0,50 ÷ 5 MHz	56 $dB_{\mu V}$ (QP) 46 $dB_{\mu V}$ (AV)	
	5 ÷ 30 MHz	60 $dB_{\mu V}$ (QP) 50 $dB_{\mu V}$ (AV)	
	Frequency	**Limits**	**RESULT**
Mains leads:	30 ÷ 300 MHz	45 ÷ 55 dB_{pW} (QP) increase linearly with the frequency 35 ÷ 45 dB_{pW} (AV) increase linearly with the frequency	Disturbance power ***COMPLIED***

DISCONTINUOUS DISTURBANCE		
Frequency (MHz)	Upper quartile method LIMITS	RESULT
0,15 0,50 1,4 30	25 % click > Lq	***NOT APPLICABLE (*)***
(*) According with clause 4.2.3.1 "Individual switching operations"		

EN 61000-3-2

For detailed measurement see **SEC. 3 Annex B**

HARMONIC TYPE	LIMITS CLASS A		RESULT
Fluctuating	Harmonic order **n** (Odd armonics) 3 5 7 9 11 13 15≤n≤39	Maximum permissible harmonic current 2,30 1,14 0,77 0,40 0,33 0,21 0,15 (15/n)	***COMPLIED***
	Harmonic order **n** (Even armonics) 2 4 6 8≤n≤40	Maximum permissible harmonic current 1,08 0,43 0,30 0,23 (8/n)	
Measuring instrumentation according to EN 61000-4-7 (2002)			

EN 61000-3-3

For detailed measurement see **SEC. 3 Annex C**

TYPE OF VOLTAGE FLUCTUATIONS	LIMITS			RESULT
Manual switching	P_{st} 1		P_{lt} 0,65	***NOT APPLICABLE***
	d_c 3,3 %		d_{max} 7 %	***COMPLIED***
	d(t) 3,3 % for less than 500 ms			***COMPLIED***

TEST RESULTS SEC. 2

EN 61000-4-2

For detailed measurement see **SEC. 3 Annex D**

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Electrostatic discharge	8 kV Air discharge / 4 kV Contact discharge	*COMPLIED*

EN 61000-4-3

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Radio-frequency electromagnetic field 1 kHz, 80 % AM	80 ÷ 1000 MHz 3 V/m (rms) (unmodulated)	*NOT APPLICABLE (*)*
(*) The EUT contains electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz		

EN 61000-4-4

For detailed measurement see **SEC. 3 Annex F**

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Fast transients common mode	Input/output a.c. power 1 kV	*COMPLIED*

EN 61000-4-5

For detailed measurement see **SEC. 3 Annex G**

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Surge	1 kV (phase-phase) 2 kV (phase/neutral - earth)	*COMPLIED*

EN 61000-4-6

For detailed measurement see **SEC. 3 Annex H**

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Injected current 1 kHz, 80% AM	Input/output a.c. power 3 V (rms.) (unmodulated)	*COMPLIED*

EN 61000-4-11

For detailed measurement see **SEC. 3 Annex I**

ENVIRONMENTAL PHENOMENA	TEST SPECIFICATION	RESULT
Interruptions	0 % U_T for 0,5 T	*COMPLIED*
Voltage dips	40 % U_T for 10 T	*COMPLIED*
Voltage dips	70 % U_T for 25 T	*COMPLIED*

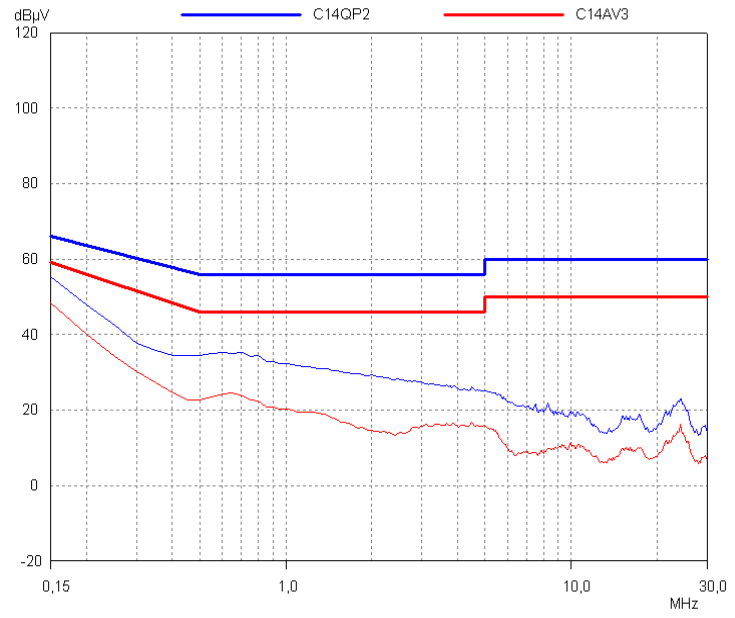
RADIO DISTURBANCE IN THE RANGE 150kHz - 300MHz

CONTINUOUS DISTURBANCE

Test set up	Ambient Conditions	
According to the standard	Ambient Temperature	27 °C
	Relative Humidity	52 %
	Baron Pressure	998 mbar

Rated Conditions		Supply Conditions (worst case)			
Rated Voltage	230 V	Voltage (*)	253 V	Frequency	50 Hz
Rated Frequency	50 Hz	(*) Voltage (over a range of 0,9 to 1,1 times rated voltage) which causes maximum disturbance in the frequency range 0,15-30MHz			
Rated Power	1000 W				

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at max power, without accessories and with an empty dustbag in place		
Test result:	*Complied*	**Tested on:**	03-07-2012



Legend:

C14QP2: QP limit
C14AV3: AV limit
Detector: QP
Detector: AV

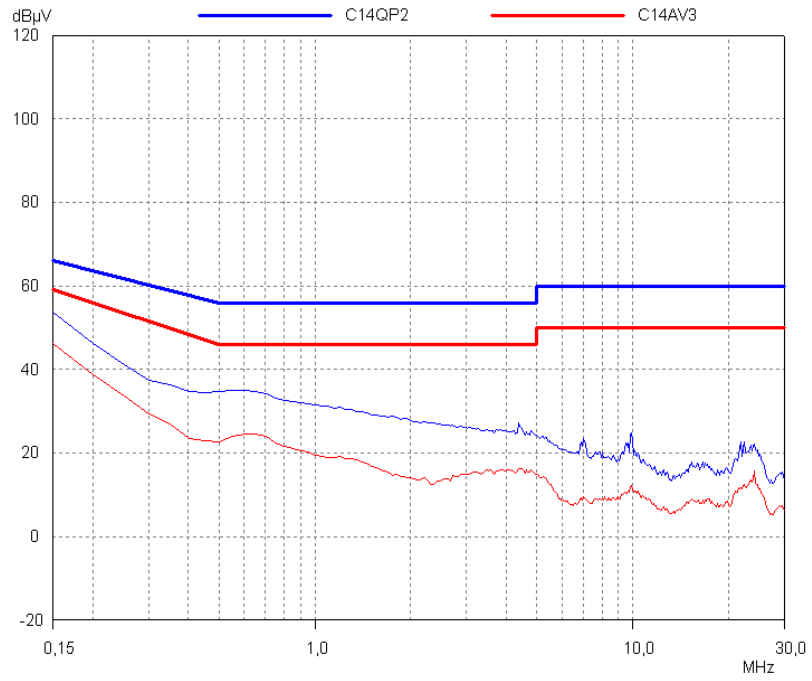
Port: AC Mains (N)
Frequency step: 50kHz

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
LINE IMPEDANCE STABILIZATION NETWORK	AFJ	LT32C	32030712115	9kHz÷30MHz; 50µH+5Ω//50Ω; 230/450Vac; 3 x 32A	05-2011 * 12
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESHS 10	844077/008	9kHz ÷ 30MHz	04-2011 * 12
PULSE LIMITER	ROHDE & SCHWARZ	ESH3Z2	20002384	9kHz ÷ 30MHz 10dB	04-2011 * 12

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,44 dB Ucispr = 3,60 dB The test is complied if the disturbance level is lower than 0,8 dB or more from the limit

MEASUREMENTS SEC. 3 ANNEX A1

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at max power, without accessories and with an empty dustbag in place		
Test result:	***Complied***	**Tested on:**	03-07-2012



Legend:

C14QP2: QP limit
C14AV3: AV limit
Detector: QP
Detector: AV

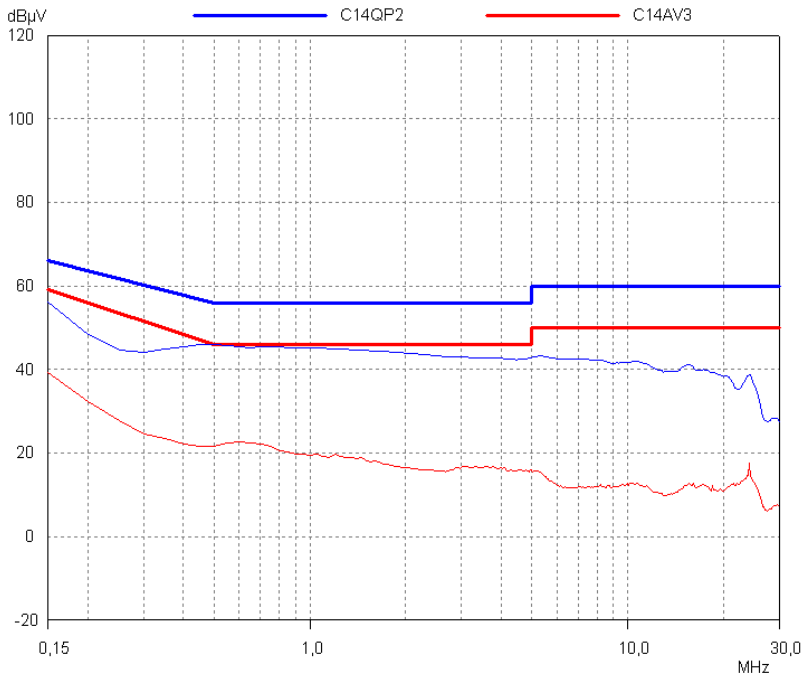
Port: AC Mains (L)
Frequency step: 50kHz

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
LINE IMPEDANCE STABILIZATION NETWORK	*AFJ*	*LT32C*	*32030712115*	*9kHz÷30MHz; 50µH+5Ω//50Ω; 230/450Vac; 3 x 32A*	*05-2011 * 12*
EMI TEST RECEIVER	*ROHDE & SCHWARZ*	*ESHS 10*	*844077/008*	*9kHz ÷ 30MHz*	*04-2011 * 12*
PULSE LIMITER	*ROHDE & SCHWARZ*	*ESH3Z2*	*20002384*	*9kHz ÷ 30MHz 10dB*	*04-2011 * 12*

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,44 dB Ucispr = 3,60 dB The test is complied if the disturbance level is lower than 0,8 dB or more from the limit

MEASUREMENTS SEC. 3 ANNEX A1

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at mean power (worst case), without accessories and with an empty dustbag in place		
Test result:	***Complied***	**Tested on:**	03-07-2010



Legend:

C14QP2: QP limit
C14AV3: AV limit
Detector: QP
Detector: AV

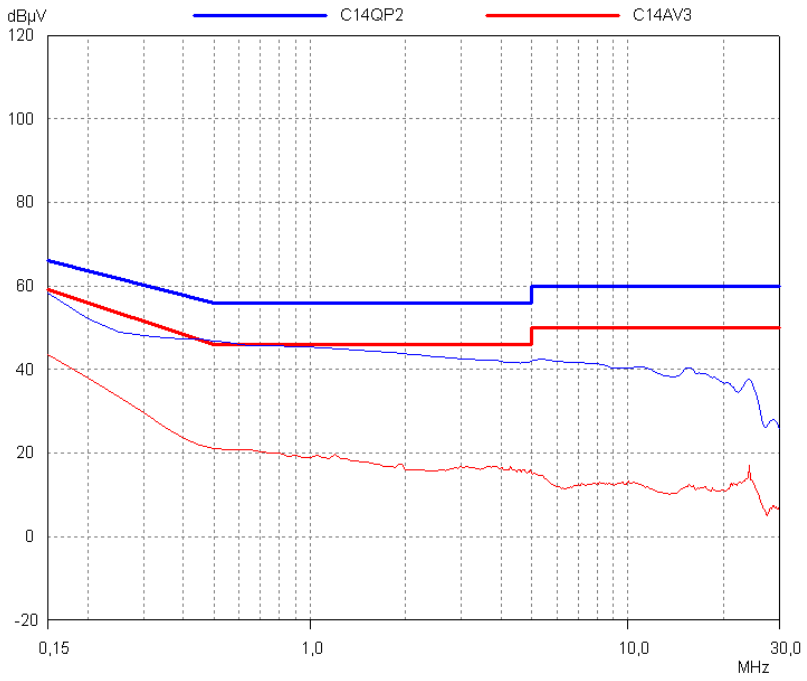
Port: AC Mains (N)
Frequency step: 50kHz

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
LINE IMPEDANCE STABILIZATION NETWORK	*AFJ*	*LT32C*	*32030712115*	*9kHz÷30MHz; 50µH+5Ω//50Ω; 230/450Vac; 3 x 32A*	*05-2011 * 12*
EMI TEST RECEIVER	*ROHDE & SCHWARZ*	*ESHS 10*	*844077/008*	*9kHz ÷ 30MHz*	*04-2011 * 12*
PULSE LIMITER	*ROHDE & SCHWARZ*	*ESH3Z2*	*20002384*	*9kHz ÷ 30MHz 10dB*	*04-2011 * 12*

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,44 dB Ucispr = 3,60 dB The test is complied if the disturbance level is lower than 0,8 dB or more from the limit

MEASUREMENTS SEC. 3 ANNEX A1

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at mean power (worst case), without accessories and with an empty dustbag in place		
Test result:	***Complied***	**Tested on:**	03-07-2012



Legend:

C14QP2: QP limit
C14AV3: AV limit
Detector: QP
Detector: AV

Port: AC Mains (L)
Frequency step: 50kHz

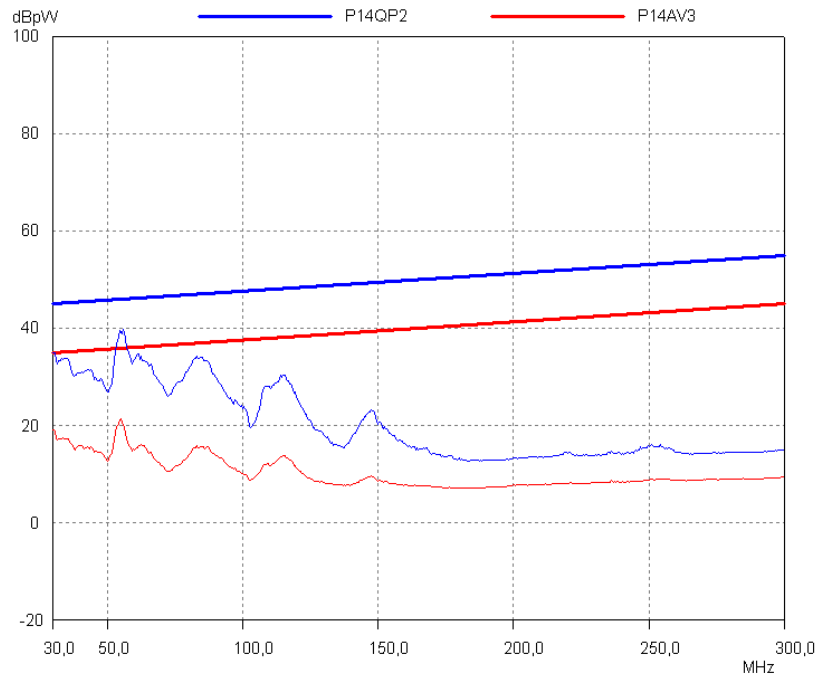
TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
LINE IMPEDANCE STABILIZATION NETWORK	*AFJ*	*LT32C*	*32030712115*	*9kHz÷30MHz; 50µH+5Ω//50Ω; 230/450Vac; 3 x 32A*	*05-2011 * 12*
EMI TEST RECEIVER	*ROHDE & SCHWARZ*	*ESHS 10*	*844077/008*	*9kHz ÷ 30MHz*	*04-2011 * 12*
PULSE LIMITER	*ROHDE & SCHWARZ*	*ESH3Z2*	*20002384*	*9kHz ÷ 30MHz 10dB*	*04-2011 * 12*

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,44 dB Ucispr = 3,60 dB The test is complied if the disturbance level is lower than 0,8 dB or more from the limit

MEASUREMENTS SEC. 3 ANNEX A2

Rated Conditions		Supply Conditions (worst case)			
Rated Voltage	230 V	Voltage (*)	253 V	Frequency	50 Hz
Rated Frequency	50 Hz	(*) Voltage (over a range of 0,9 to 1,1 times rated voltage) which causes maximum disturbance in the frequency range 0,15-30MHz			
Rated Power	1000 W				

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at max power, without accessories and with an empty dustbag in place		
Test result:	***Complied***	**Tested on:**	03-07-2010



Legend:

P14QP2: QP limit
P14AV3: AV limit
Detector: QP
Detector: AV

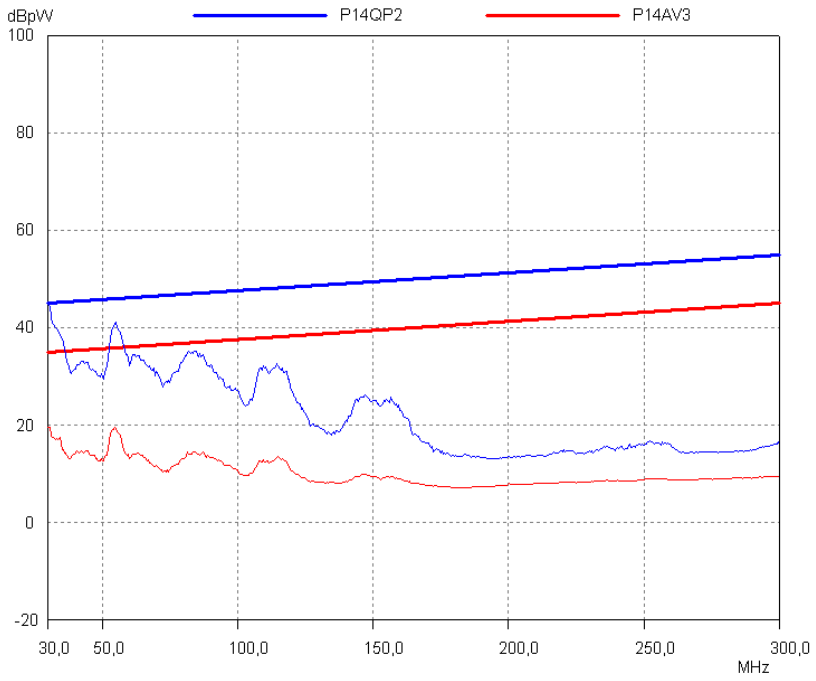
Leads: AC mains
Frequency step: 500kHz

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
SEMI-ANECHOIC CHAMBER	*EMERSON & CUMING*	*EAC54101*	*---*	*Dimensions: 9 x 6 x 6m* *Test volume: cylinder ϕ1,5m*	*12-2013 * 60*
EMI TEST RECEIVER	*ROHDE & SCHWARZ*	*ESVS 10*	*844106/010*	*20MHz ÷ 1000MHz*	*04-2011 * 12*
ABSORBING CLAMP	*FCC*	*F-201*	*187*	*30MHz ÷ 300MHz*	*05-2011 * 12*

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,17 dB Ucispr = 4,50 dB The test is complied if no measured disturbance exceeds the limit

MEASUREMENTS SEC. 3 ANNEX A2

Test Condition:	Standard operating condition according to §7.3.1.1.1. Continuous operated at mean power (worst case), without accessories and with an empty dustbag in place		
Test result:	***Complied***	**Tested on:**	03-07-2012



Legend:

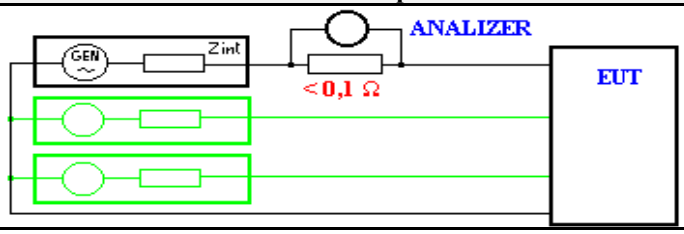
P14QP2: QP limit
P14AV3: AV limit
Detector: QP
Detector: AV

Leads: AC mains
Frequency step: 500kHz

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
SEMI-ANECHOIC CHAMBER	*EMERSON & CUMING*	*EAC54101*	*---*	*Dimensions: 9 x 6 x 6m* *Test volume: cylinder ϕ1,5m*	*12-2013 * 60*
EMI TEST RECEIVER	*ROHDE & SCHWARZ*	*ESVS 10*	*844106/010*	*20MHz ÷ 1000MHz*	*04-2011 * 12*
ABSORBING CLAMP	*FCC*	*F-201*	*187*	*30MHz ÷ 300MHz*	*05-2011 * 12*

Measurement uncertainties according to CISPR 16-4-2 (normal distribution and confidence level of 95% with coverage factor k=2)
U_{lab} = 4,17 dB Ucispr = 4,50 dB The test is complied if no measured disturbance exceeds the limit

HARMONICS

Test set up	Ambient Conditions	
	Ambient Temperature	27 °C
	Relative Humidity	52 %
	Baron Pressure	998 mbar

Rated Conditions		Section 6.1	
Rated Voltage	230 V	The appliance contain a power control mentioned in section 6.1 in the standard.	Yes
Rated Frequency	50 Hz	The requirements of capture 6.1 of this standard are checked and fulfilled.	Yes
Rated Power	1000 W	The manual must contain a requirement to ask the supply authority for permission to connect	No

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
DIGITAL LOW FREQUENCY EMISSION ANALYSER	BOCONSULT	B10	E60533	N= 2048 16 fundam. cycles Rectangular window	09-2010 * 12
TEST POWER SUPPLY	ELETTROTEST	TPS / T	---	20kW 300V_{LN} ~ 70A_{MAX} T.H.D. Voltage < 0,2%	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Current: **± 1,3%rdg;** | Voltage: **± 1,6%rdg**

Harmonic current measurement			
Test Condition:	Standard operating condition according to annex C.7. Suctioning at mean power (normal operation as defined in IEC 60335-2-2)		
Test result:	*Complied*	**Tested on:**	03-07-2010

Maximum RMS current and corresponding values in timewindow 186:

Voltage: 230.22 Vrms THD=0.05 % THV=0.106 V POHV=0.027 V PWHD=0.09 %
Current: 4.087 Arms THD=22.55 % THC=0.899 A POHC=0.024 A PWHD=4.72 %
Power: 903.8 W P1=903.9 W 940.8 VA
Powerfactor: 0.961 CosPhi1: 0.985

Testconditions: EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A
Time window cycles=10/12 (200ms), Grouping of harmonics=on

HARMONIC ANALYSIS: Test PASS
Tobs = entire measurement; POHC: avg=0.02 A, limits=0.25 A

	Entire measurement (2.5 min = 750 time windows)							Worst 2.5 min		Average		PASS	FAIL
Ha	Maximum	Window	EN61000-3-2 Class A	Margin in MaxWin	100 to 150%	150 to 200%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0794 A	743	-.- - - -	- - - . -	0	0	0	n.e.	n.e.	0.0746 A	0	X	
1	3.9859 A	186	-.- - - -	- - - . -	0	0	0	n.e.	n.e.	3.9323 A	0	X	
2	0.0049 A	575	1.0800 A	-99.5 %	0	0	0	n.e.	n.e.	0.0023 A	0	X	
3	0.8973 A	3	2.3000 A	-61.0 %	0	0	0	n.e.	n.e.	0.8675 A	0	X	
4	0.0039 A	650	0.4300 A	-99.1 %	0	0	0	n.e.	n.e.	0.0019 A	0	X	
5	0.1688 A	2	1.1400 A	-85.2 %	0	0	0	n.e.	n.e.	0.1634 A	0	X	
6	0.0047 A	665	0.3000 A	-98.4 %	0	0	0	n.e.	n.e.	0.0018 A	0	X	
7	0.0329 A	23	0.7700 A	-95.7 %	0	0	0	n.e.	n.e.	0.0310 A	0	X	
8	0.0041 A	662	0.2300 A	-98.2 %	0	0	0	n.e.	n.e.	0.0017 A	0	X	
9	0.0242 A	473	0.4000 A	-93.9 %	0	0	0	n.e.	n.e.	0.0222 A	0	X	
10	0.0042 A	743	0.1840 A	-97.7 %	0	0	0	n.e.	n.e.	0.0018 A	0	X	
11	0.0234 A	650	0.3300 A	-92.9 %	0	0	0	n.e.	n.e.	0.0224 A	0	X	
12	0.0039 A	455	0.1533 A	-97.4 %	0	0	0	n.e.	n.e.	0.0017 A	0	X	
13	0.0212 A	95	0.2100 A	-89.9 %	0	0	0	n.e.	n.e.	0.0200 A	0	X	
14	0.0055 A	650	0.1314 A	-95.8 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
15	0.0243 A	50	0.1500 A	-83.8 %	0	0	0	n.e.	n.e.	0.0192 A	0	X	
16	0.0043 A	665	0.1150 A	-96.3 %	0	0	0	n.e.	n.e.	0.0021 A	0	X	
17	0.0207 A	77	0.1324 A	-84.4 %	0	0	0	n.e.	n.e.	0.0177 A	0	X	
18	0.0043 A	575	0.1022 A	-95.7 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
19	0.0157 A	536	0.1184 A	-86.8 %	0	0	0	n.e.	n.e.	0.0146 A	0	X	
20	0.0043 A	574	0.0920 A	-95.3 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
21	0.0133 A	650	0.1071 A	-87.6 %	0	0	0	n.e.	n.e.	0.0122 A	0	X	
22	0.0047 A	575	0.0836 A	-94.4 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
23	0.0113 A	1	0.0978 A	-88.5 %	0	0	0	n.e.	n.e.	0.0102 A	0	X	
24	0.0050 A	473	0.0767 A	-93.5 %	0	0	0	n.e.	n.e.	0.0022 A	0	X	
25	0.0109 A	575	0.0900 A	-87.9 %	0	0	0	n.e.	n.e.	0.0097 A	0	X	
26	0.0047 A	740	0.0708 A	-93.3 %	0	0	0	n.e.	n.e.	0.0022 A	0	X	
27	0.0091 A	596	0.0833 A	-89.1 %	0	0	0	n.e.	n.e.	0.0081 A	0	X	
28	0.0041 A	596	0.0657 A	-93.7 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
29	0.0087 A	596	0.0776 A	-88.8 %	0	0	0	n.e.	n.e.	0.0073 A	0	X	
30	0.0041 A	443	0.0613 A	-93.3 %	0	0	0	n.e.	n.e.	0.0023 A	0	X	
31	0.0081 A	227	0.0726 A	-88.9 %	0	0	0	n.e.	n.e.	0.0065 A	0	X	
32	0.0130 A	452	0.0575 A	-77.4 %	0	0	0	n.e.	n.e.	0.0084 A	0	X	
33	0.0069 A	665	0.0682 A	-89.8 %	0	0	0	n.e.	n.e.	0.0055 A	0	X	
34	0.0117 A	455	0.0541 A	-78.4 %	0	0	0	n.e.	n.e.	0.0057 A	0	X	
35	0.0063 A	650	0.0643 A	-90.1 %	0	0	0	n.e.	n.e.	0.0045 A	0	X	
36	0.0047 A	596	0.0511 A	-90.9 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
37	0.0059 A	596	0.0608 A	-90.4 %	0	0	0	n.e.	n.e.	0.0039 A	0	X	
38	0.0042 A	535	0.0484 A	-91.2 %	0	0	0	n.e.	n.e.	0.0022 A	0	X	
39	0.0051 A	665	0.0577 A	-91.2 %	0	0	0	n.e.	n.e.	0.0033 A	0	X	
40	0.0051 A	443	0.0460 A	-89.0 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	

Tested with EMC test software V2.4a / PAS2000 by Spitzenberger + Spies GmbH & Co. KG, Schmidstr 32-34, D-94234 Viechtach, 01.07.2010

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
DIGITAL LOW FREQUENCY EMISSION ANALYSER	*BOCONSULT*	*B10*	*E60533*	*N= 2048 16 fundam. cycles Rectangular window*	*09-2010 * 12*
TEST POWER SUPPLY	*ELETTROTEST*	*TPS / T*	---	*20kW 300V_{LN} ~ 70A_{MAX} T.H.D. Voltage < 0,2%*	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Current: **± 1,3%rdg;** Voltage: **± 1,6%rdg**

Harmonic ratios of the test voltage with the EUT connected (annex A.2)			
Test result:	*Complied*	**Tested on:**	03-07-2012

Maximum RMS current and corresponding values in timewindow 186:

Voltage: 230.22 Vrms THD=0.05 % THV=0.106 V POHV=0.027 V PWHD=0.09 %
Current: 4.087 Arms THD=22.55 % THC=0.899 A POHC=0.024 A PWHD=4.72 %
Power: 903.8 W P1=903.9 W 940.8 VA
Powerfactor: 0.961 CosPhi1: 0.985

Testconditions: EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A
Time window cycles=10/12 (200ms), Grouping of harmonics=on

HARMONIC ANALYSIS: Test PASS
Tobs = entire measurement; POHC: avg=0.03 V, limits=0.73 V

Ha	Entire measurement (2.5 min = 750 time windows)							Worst 2.5 min		Average		PASS	FAIL
	Maximum	Window	EN61000-3-2 Voltages	Margin in MaxWin	100 to 150%	150 to 200%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0156 V	346	-.- - - -	- - - . -	- - -	- - -	0	n.e.	n.e.	0.0025 V	0	X	
230	0.2434 V	548	-.- - - -	- - - . -	- - -	- - -	0	n.e.	n.e.	230.2247 V	0	X	
2	0.0523 V	473	fluctuating	-88.6 %	- - -	- - -	0	n.e.	n.e.	0.0450 V	0	X	
3	0.0439 V	544	fluctuating	-97.9 %	- - -	- - -	0	n.e.	n.e.	0.0348 V	0	X	
4	0.0369 V	648	fluctuating	-92.0 %	- - -	- - -	0	n.e.	n.e.	0.0343 V	0	X	
5	0.0613 V	489	fluctuating	-93.3 %	- - -	- - -	0	n.e.	n.e.	0.0581 V	0	X	
6	0.0061 V	648	fluctuating	-98.7 %	- - -	- - -	0	n.e.	n.e.	0.0040 V	0	X	
7	0.0216 V	120	fluctuating	-96.9 %	- - -	- - -	0	n.e.	n.e.	0.0199 V	0	X	
8	0.0069 V	346	fluctuating	-98.5 %	- - -	- - -	0	n.e.	n.e.	0.0058 V	0	X	
9	0.0096 V	96	fluctuating	-97.9 %	- - -	- - -	0	n.e.	n.e.	0.0086 V	0	X	
10	0.0049 V	136	fluctuating	-98.9 %	- - -	- - -	0	n.e.	n.e.	0.0043 V	0	X	
11	0.0090 V	473	fluctuating	-96.1 %	- - -	- - -	0	n.e.	n.e.	0.0075 V	0	X	
12	0.0115 V	473	fluctuating	-95.0 %	- - -	- - -	0	n.e.	n.e.	0.0108 V	0	X	
13	0.0173 V	470	fluctuating	-92.5 %	- - -	- - -	0	n.e.	n.e.	0.0163 V	0	X	
14	0.0178 V	346	fluctuating	-92.3 %	- - -	- - -	0	n.e.	n.e.	0.0170 V	0	X	
15	0.0226 V	89	fluctuating	-90.2 %	- - -	- - -	0	n.e.	n.e.	0.0214 V	0	X	
16	0.0108 V	244	fluctuating	-95.3 %	- - -	- - -	0	n.e.	n.e.	0.0101 V	0	X	
17	0.0068 V	473	fluctuating	-97.1 %	- - -	- - -	0	n.e.	n.e.	0.0058 V	0	X	
18	0.0024 V	49	fluctuating	-99.0 %	- - -	- - -	0	n.e.	n.e.	0.0016 V	0	X	
19	0.0062 V	473	fluctuating	-97.3 %	- - -	- - -	0	n.e.	n.e.	0.0053 V	0	X	
20	0.0075 V	253	fluctuating	-96.7 %	- - -	- - -	0	n.e.	n.e.	0.0068 V	0	X	
21	0.0183 V	661	fluctuating	-92.0 %	- - -	- - -	0	n.e.	n.e.	0.0175 V	0	X	
22	0.0047 V	48	fluctuating	-98.0 %	- - -	- - -	0	n.e.	n.e.	0.0042 V	0	X	
23	0.0109 V	77	fluctuating	-95.3 %	- - -	- - -	0	n.e.	n.e.	0.0101 V	0	X	
24	0.0056 V	109	fluctuating	-97.6 %	- - -	- - -	0	n.e.	n.e.	0.0051 V	0	X	
25	0.0098 V	270	fluctuating	-95.7 %	- - -	- - -	0	n.e.	n.e.	0.0092 V	0	X	
26	0.0052 V	55	fluctuating	-97.8 %	- - -	- - -	0	n.e.	n.e.	0.0046 V	0	X	
27	0.0056 V	557	fluctuating	-97.6 %	- - -	- - -	0	n.e.	n.e.	0.0051 V	0	X	
28	0.0036 V	39	fluctuating	-98.4 %	- - -	- - -	0	n.e.	n.e.	0.0032 V	0	X	
29	0.0085 V	96	fluctuating	-96.3 %	- - -	- - -	0	n.e.	n.e.	0.0076 V	0	X	
30	0.0045 V	421	fluctuating	-98.1 %	- - -	- - -	0	n.e.	n.e.	0.0038 V	0	X	
31	0.0059 V	473	fluctuating	-97.4 %	- - -	- - -	0	n.e.	n.e.	0.0048 V	0	X	
32	0.0042 V	494	fluctuating	-98.2 %	- - -	- - -	0	n.e.	n.e.	0.0037 V	0	X	
33	0.0084 V	106	fluctuating	-96.3 %	- - -	- - -	0	n.e.	n.e.	0.0080 V	0	X	
34	0.0061 V	400	fluctuating	-97.4 %	- - -	- - -	0	n.e.	n.e.	0.0053 V	0	X	
35	0.0062 V	86	fluctuating	-97.3 %	- - -	- - -	0	n.e.	n.e.	0.0053 V	0	X	
36	0.0032 V	420	fluctuating	-98.6 %	- - -	- - -	0	n.e.	n.e.	0.0025 V	0	X	
37	0.0017 V	472	fluctuating	-99.2 %	- - -	- - -	0	n.e.	n.e.	0.0008 V	0	X	
38	0.0047 V	444	fluctuating	-98.0 %	- - -	- - -	0	n.e.	n.e.	0.0040 V	0	X	
39	0.0054 V	712	fluctuating	-97.7 %	- - -	- - -	0	n.e.	n.e.	0.0047 V	0	X	
40	0.0065 V	475	fluctuating	-97.2 %	- - -	- - -	0	n.e.	n.e.	0.0054 V	0	X	

Tested with EMC test software V2.4a / PAS2000 by Spitzenberger + Spies GmbH & Co. KG, Schmidstr 32-34, D-94234 Viechtach, 01.07.2010

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
DIGITAL LOW FREQUENCY EMISSION ANALYSER	*BOCONSULT*	*B10*	*E60533*	*N= 2048 16 fundam. cycles Rectangular window*	*09-2010 * 12*
TEST POWER SUPPLY	*ELETTROTEST*	*TPS / T*	---	*20kW 300V_{LN} ~ 70A_{MAX} T.H.D. Voltage < 0,2%*	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Current: **± 1,3%rdg;** Voltage: **± 1,6%rdg**

Harmonic current measurement			
Test Condition:	Standard operating condition according to annex C.7. Suctioning with control adjusted to max input power, to a firing-angle of 90° ± 5° and to minimum input power in sequence		
Test result:	***Complied***	**Tested on:**	03-07-2012

Maximum RMS current and corresponding values in timewindow 32:

Voltage: 230.15 Vrms THD=0.05 % THV=0.119 V POHV=0.024 V PWHD=0.09 %
Current: 4.776 Arms THD=25.30 % THC=1.171 A POHC=0.028 A PWHD=4.22 %
Power: 1041.7 W P1=1041.8 W 1099.3 VA
Powerfactor: 0.948 CosPhi1: 0.978

Testconditions:EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A
Time window cycles=10/12 (200ms), Grouping of harmonics=on

HARMONIC ANALYSIS: Test PASS
Tobs = entire measurement; POHC: avg=0.05 A, limits=0.25 A

Ha	Entire measurement (6.5 min = 1950 time windows)							Worst 2.5 min		Average		PASS	FAIL
	Maximum	Window	EN61000-3-2 Class A	Margin in MaxWin	100 to 150%	150 to 200%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0914 A	619	-.- - - -	- - - . -	0	0	0	n.e.	n.e.	0.0721 A	0	X	
1	4.6299 A	34	-.- - - -	- - - . -	0	0	0	n.e.	n.e.	2.9491 A	0	X	
2	0.0222 A	1213	1.0800 A	-97.9 %	0	0	0	n.e.	n.e.	0.0066 A	0	X	
3	1.8748 A	1134	2.3000 A	-18.5 %	0	0	0	n.e.	n.e.	1.3478 A	0	X	
4	0.0172 A	1213	0.4300 A	-96.0 %	0	0	0	n.e.	n.e.	0.0045 A	0	X	
5	0.6598 A	1194	1.1400 A	-42.1 %	0	0	0	n.e.	n.e.	0.4559 A	0	X	
6	0.0131 A	1213	0.3000 A	-95.6 %	0	0	0	n.e.	n.e.	0.0050 A	0	X	
7	0.1867 A	945	0.7700 A	-75.8 %	0	0	0	n.e.	n.e.	0.1186 A	0	X	
8	0.0110 A	1212	0.2300 A	-95.2 %	0	0	0	n.e.	n.e.	0.0053 A	0	X	
9	0.0499 A	1234	0.4000 A	-87.5 %	0	0	0	n.e.	n.e.	0.0222 A	0	X	
10	0.0112 A	1212	0.1840 A	-93.9 %	0	0	0	n.e.	n.e.	0.0060 A	0	X	
11	0.0536 A	640	0.3300 A	-83.8 %	0	0	0	n.e.	n.e.	0.0319 A	0	X	
12	0.0108 A	31	0.1533 A	-93.0 %	0	0	0	n.e.	n.e.	0.0065 A	0	X	
13	0.0704 A	1922	0.2100 A	-66.5 %	0	0	0	n.e.	n.e.	0.0507 A	0	X	
14	0.0209 A	569	0.1314 A	-84.1 %	0	0	0	n.e.	n.e.	0.0088 A	0	X	
15	0.0633 A	672	0.1500 A	-57.8 %	0	0	0	n.e.	n.e.	0.0410 A	0	X	
16	0.0185 A	2	0.1150 A	-83.9 %	0	0	0	n.e.	n.e.	0.0092 A	0	X	
17	0.0564 A	672	0.1324 A	-57.4 %	0	0	0	n.e.	n.e.	0.0357 A	0	X	
18	0.0093 A	31	0.1022 A	-90.9 %	0	0	0	n.e.	n.e.	0.0063 A	0	X	
19	0.0466 A	671	0.1184 A	-60.6 %	0	0	0	n.e.	n.e.	0.0325 A	0	X	
20	0.0067 A	1725	0.0920 A	-92.7 %	0	0	0	n.e.	n.e.	0.0049 A	0	X	
21	0.0422 A	698	0.1071 A	-60.6 %	0	0	0	n.e.	n.e.	0.0253 A	0	X	
22	0.0096 A	1936	0.0836 A	-88.5 %	0	0	0	n.e.	n.e.	0.0053 A	0	X	
23	0.0311 A	673	0.0978 A	-68.2 %	0	0	0	n.e.	n.e.	0.0215 A	0	X	
24	0.0082 A	1868	0.0767 A	-89.4 %	0	0	0	n.e.	n.e.	0.0047 A	0	X	
25	0.0310 A	701	0.0900 A	-65.5 %	0	0	0	n.e.	n.e.	0.0201 A	0	X	
26	0.0067 A	1580	0.0708 A	-90.6 %	0	0	0	n.e.	n.e.	0.0037 A	0	X	
27	0.0225 A	673	0.0833 A	-73.0 %	0	0	0	n.e.	n.e.	0.0145 A	0	X	
28	0.0114 A	1833	0.0657 A	-82.6 %	0	0	0	n.e.	n.e.	0.0053 A	0	X	
29	0.0239 A	708	0.0776 A	-69.2 %	0	0	0	n.e.	n.e.	0.0179 A	0	X	
30	0.0137 A	1871	0.0613 A	-77.7 %	0	0	0	n.e.	n.e.	0.0063 A	0	X	
31	0.0181 A	677	0.0726 A	-75.0 %	0	0	0	n.e.	n.e.	0.0126 A	0	X	
32	0.0116 A	1855	0.0575 A	-79.8 %	0	0	0	n.e.	n.e.	0.0055 A	0	X	
33	0.0190 A	676	0.0682 A	-72.1 %	0	0	0	n.e.	n.e.	0.0124 A	0	X	
34	0.0085 A	1284	0.0541 A	-84.3 %	0	0	0	n.e.	n.e.	0.0042 A	0	X	
35	0.0158 A	1238	0.0643 A	-75.5 %	0	0	0	n.e.	n.e.	0.0104 A	0	X	
36	0.0151 A	1414	0.0511 A	-70.5 %	0	0	0	n.e.	n.e.	0.0062 A	0	X	
37	0.0168 A	1253	0.0608 A	-72.3 %	0	0	0	n.e.	n.e.	0.0093 A	0	X	
38	0.0239 A	1410	0.0484 A	-50.7 %	0	0	0	n.e.	n.e.	0.0093 A	0	X	
39	0.0247 A	1253	0.0577 A	-57.1 %	0	0	0	n.e.	n.e.	0.0096 A	0	X	
40	0.0245 A	1721	0.0460 A	-46.6 %	0	0	0	n.e.	n.e.	0.0098 A	0	X	

Tested with EMC test software V2.4a / PAS2000 by Spitzenberger + Spies GmbH & Co. KG, Schmidstr 32-34, D-94234 Viechtach, 05.07.2010

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
DIGITAL LOW FREQUENCY EMISSION ANALYSER	*BOCONSULT*	*B10*	*E60533*	*N= 2048 16 fundam. cycles Rectangular window*	*09-2010 * 12*
TEST POWER SUPPLY	*ELETTROTEST*	*TPS / T*	---	*20kW 300V_{LN} ~ 70A_{MAX} T.H.D. Voltage < 0,2%*	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Current: **± 1,3%rdg;** Voltage: **± 1,6%rdg**

Harmonic ratios of the test voltage with the EUT connected (annex A.2)			
Test result:	*Complied*	**Tested on:**	03-07-2012

Maximum RMS current and corresponding values in timewindow 32:

Voltage: 230.15 Vrms THD=0.05 % THV=0.119 V POHV=0.024 V PWHD=0.09 %
Current: 4.776 Arms THD=25.30 % THC=1.171 A POHC=0.028 A PWHD=4.22 %
Power: 1041.7 W P1=1041.8 W 1099.3 VA
Powerfactor: 0.948 CosPhi1: 0.978

Testconditions: EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A
Time window cycles=10/12 (200ms), Grouping of harmonics=on

HARMONIC ANALYSIS: Test PASS
Tobs = entire measurement; POHC: avg=0.03 V, limits=0.73 V

	Entire measurement (6.5 min = 1950 time windows)							Worst 2.5 min		Average		PASS	FAIL
Ha	Maximum	Window	EN61000-3-2 Voltages	Margin in MaxWin	100 to 150%	150 to 200%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0189 V	1755	-.- - - -	- - - . -	- - -	- - -	0	n.e.	n.e.	0.0026 V	0	X	
1	230.4897 V	1214	-.- - - -	- - - . -	- - -	- - -	0	n.e.	n.e.	230.3270 V	0	X	
2	0.0521 V	1891	fluctuating	-88.7 %	- - -	- - -	0	n.e.	n.e.	0.0436 V	0	X	
3	0.2174 V	1187	fluctuating	-89.5 %	- - -	- - -	0	n.e.	n.e.	0.1473 V	0	X	
4	0.0381 V	1212	fluctuating	-91.7 %	- - -	- - -	0	n.e.	n.e.	0.0342 V	0	X	
5	0.0985 V	1468	fluctuating	-89.3 %	- - -	- - -	0	n.e.	n.e.	0.0634 V	0	X	
6	0.0064 V	1212	fluctuating	-98.6 %	- - -	- - -	0	n.e.	n.e.	0.0038 V	0	X	
7	0.0454 V	1021	fluctuating	-93.4 %	- - -	- - -	0	n.e.	n.e.	0.0226 V	0	X	
8	0.0079 V	1447	fluctuating	-98.3 %	- - -	- - -	0	n.e.	n.e.	0.0057 V	0	X	
9	0.0196 V	1212	fluctuating	-95.7 %	- - -	- - -	0	n.e.	n.e.	0.0132 V	0	X	
10	0.0071 V	1424	fluctuating	-98.5 %	- - -	- - -	0	n.e.	n.e.	0.0054 V	0	X	
11	0.0129 V	619	fluctuating	-94.4 %	- - -	- - -	0	n.e.	n.e.	0.0060 V	0	X	
12	0.0131 V	1454	fluctuating	-94.3 %	- - -	- - -	0	n.e.	n.e.	0.0093 V	0	X	
13	0.0238 V	1448	fluctuating	-89.7 %	- - -	- - -	0	n.e.	n.e.	0.0182 V	0	X	
14	0.0182 V	477	fluctuating	-92.1 %	- - -	- - -	0	n.e.	n.e.	0.0149 V	0	X	
15	0.0324 V	621	fluctuating	-85.9 %	- - -	- - -	0	n.e.	n.e.	0.0227 V	0	X	
16	0.0128 V	622	fluctuating	-94.4 %	- - -	- - -	0	n.e.	n.e.	0.0104 V	0	X	
17	0.0285 V	626	fluctuating	-87.6 %	- - -	- - -	0	n.e.	n.e.	0.0161 V	0	X	
18	0.0080 V	987	fluctuating	-96.5 %	- - -	- - -	0	n.e.	n.e.	0.0047 V	0	X	
19	0.0223 V	1234	fluctuating	-90.3 %	- - -	- - -	0	n.e.	n.e.	0.0134 V	0	X	
20	0.0084 V	470	fluctuating	-96.4 %	- - -	- - -	0	n.e.	n.e.	0.0049 V	0	X	
21	0.0288 V	1214	fluctuating	-87.5 %	- - -	- - -	0	n.e.	n.e.	0.0124 V	0	X	
22	0.0057 V	1455	fluctuating	-97.5 %	- - -	- - -	0	n.e.	n.e.	0.0035 V	0	X	
23	0.0243 V	620	fluctuating	-89.4 %	- - -	- - -	0	n.e.	n.e.	0.0122 V	0	X	
24	0.0068 V	620	fluctuating	-97.0 %	- - -	- - -	0	n.e.	n.e.	0.0037 V	0	X	
25	0.0243 V	1216	fluctuating	-89.4 %	- - -	- - -	0	n.e.	n.e.	0.0142 V	0	X	
26	0.0084 V	1493	fluctuating	-96.3 %	- - -	- - -	0	n.e.	n.e.	0.0052 V	0	X	
27	0.0230 V	1214	fluctuating	-90.0 %	- - -	- - -	0	n.e.	n.e.	0.0114 V	0	X	
28	0.0088 V	1455	fluctuating	-96.2 %	- - -	- - -	0	n.e.	n.e.	0.0045 V	0	X	
29	0.0222 V	1312	fluctuating	-90.3 %	- - -	- - -	0	n.e.	n.e.	0.0122 V	0	X	
30	0.0091 V	1437	fluctuating	-96.1 %	- - -	- - -	0	n.e.	n.e.	0.0042 V	0	X	
31	0.0212 V	1216	fluctuating	-90.8 %	- - -	- - -	0	n.e.	n.e.	0.0119 V	0	X	
32	0.0083 V	1436	fluctuating	-96.4 %	- - -	- - -	0	n.e.	n.e.	0.0041 V	0	X	
33	0.0143 V	1214	fluctuating	-93.8 %	- - -	- - -	0	n.e.	n.e.	0.0061 V	0	X	
34	0.0078 V	1230	fluctuating	-96.6 %	- - -	- - -	0	n.e.	n.e.	0.0046 V	0	X	
35	0.0173 V	1223	fluctuating	-92.5 %	- - -	- - -	0	n.e.	n.e.	0.0076 V	0	X	
36	0.0071 V	1230	fluctuating	-96.9 %	- - -	- - -	0	n.e.	n.e.	0.0037 V	0	X	
37	0.0167 V	1223	fluctuating	-92.8 %	- - -	- - -	0	n.e.	n.e.	0.0087 V	0	X	
38	0.0088 V	625	fluctuating	-96.2 %	- - -	- - -	0	n.e.	n.e.	0.0036 V	0	X	
39	0.0124 V	632	fluctuating	-94.6 %	- - -	- - -	0	n.e.	n.e.	0.0062 V	0	X	
40	0.0112 V	1454	fluctuating	-95.1 %	- - -	- - -	0	n.e.	n.e.	0.0047 V	0	X	

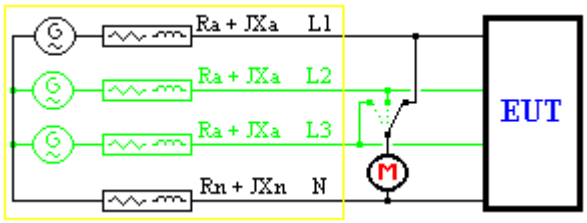
Tested with EMC test software V2.4a / PAS2000 by Spitzenberger + Spies GmbH & Co. KG, Schmidstr 32-34, D-94234 Viechtach, 05.07.2010

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
DIGITAL LOW FREQUENCY EMISSION ANALYSER	*BOCONSULT*	*B10*	*E60533*	*N= 2048 16 fundam. cycles Rectangular window*	*09-2010 * 12*
TEST POWER SUPPLY	*ELETTROTEST*	*TPS / T*	---	*20kW 300V_{LN} ~ 70A_{MAX} T.H.D. Voltage < 0,2%*	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Current: **± 1,3%rdg;** Voltage: **± 1,6%rdg**

MEASUREMENTS SEC. 3 ANNEX C

VOLTAGE FLUCTUATIONS

Test set up	Ambient Conditions
	Ambient Temperature 27 °C Relative Humidity 52 % Baron Pressure 998 mbar Datum impedance Z_{test} $R_N + jX_N =$ 0,16 + j 0,10 Ω $R_A + jX_A =$ 0,24 + j 0,15Ω

Rated Conditions		Supply Conditions			
Rated Voltage	230 V	Voltage	230 V	Frequency	50 Hz
Rated Frequency	50 Hz				
Rated Power	1000 W				

Limits on the test supply voltage	d_{max} limits on EUT
(*) Test voltage within ± 2% of the nominal value	4%: without additional conditions
d_{MAX} measured at the supply terminals < 1/5 d_{MAX} measured on EUT	6%: manual switching or automatic switching with N>2/g and with delay on restart or manual restart after supply interruption
Pst of the test supply voltage < 0,4	7%: equipment attended whilst use or switched automatically with N<2/g and delay on restart or manual restart after supply interruption
Percentage total harmonic distortion of the supply voltage << 3%	

Test Condition:	Standard operating condition according to annexes A.7 and B. Starts of motor at max power (worst case)		
Test result:	*Complied*	**Tested on:**	03-07-2010

MEASURING d_{max} VOLTAGE CHANGES CAUSED BY MANUAL SWITCHING											
1	2	3	4	5	6	7	8	9	10	11	12
4,440	4,428	4,698	4,556	4,673	4,655	4,415	4,411	4,415	4,635	4,416	4,597
13	14	15	16	17	18	19	20	21	22	23	24
4,603	4,514	4,459	4,405	4,507	4,511	4,621	4,404	4,498	4,500	4,647	4,553

Highest d_{max}	Average d_{max}	Lowest d_{max}
4,698	**4,521**	4,404

Parameter		Limit	EUT Test	Source Test	RESULT
Relative voltage change characteristic (mean value)	$d(t)_{test}$	3,3 % for more 500 ms	74 ms	0 ms	*Complied*
Maximum relative voltage change (mean value)	$d_{max\ test}$	7 %	4,521 %	0,590 %	*Complied*
Relative steady-state voltage change (mean value)	$d_{c\ test}$	3,3 %	0,975 %	0,045 %	*Complied*

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
DIGITAL LOW FREQUENCY EMISSION ANALYSER	BOCONSULT	B10	E60533	Input chan. 2, 40÷504V_{rms} V_{rms} every half cycle	05-2011 * 12
SINGLE PHASE IMPEDENCE	BYTE LINE	Z 1+1	---	Z = 0,4 + J0,25Ω (50Hz)	02-2011 * 12
TEST POWER SUPPLY	ELETTROTEST	TPS/T/18K 54S	002/01	250V_{max}; 40÷80Hz; THD<0,1%; 18kW_{rated}; 54$kW_{peak\ (1,5s)}$	---

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
d_C: **< ± 8% (< 5,1% with resistive load)**; d_t: **2,9ms**

Notified Body
D. Lgs. 194/07 G.U. 261 del 09/11/07
MINISTERO COMUNICAZIONI

ELECTROSTATIC DISCHARGE

Test set up	Ambient Conditions		
• Floor-standing equipment (According Subclause 7.1.2 or 7.1.3.2) • Direct application of discharge (According Subclause 8.3.1) • Indirect application of discharge (According Subclause 8.3.2)	Ambient Temperature (15 ÷ 35 °C)	27	°C
	Relative Humidity (30 ÷ 60 %)	52	%
	Baron Pressure (860 ÷ 1060)	998	mbar

Rated conditions of EUT	
Rated Voltage	230 V
Rated Frequency	50 Hz
Rated Power	1000 W

Representative operating conditions of EUT	
OPERATING mode. Checking of motor speed and reed function	
Tested on:	03-07-2010

Direct discharges

Test Point (see test point at page 2)	Discharge Voltage	Contact/Air	Single discharge	Remarks	Perform. Criteria	Result
P1,P2,P3,P4,P5,P6	8 kV	Air	10 + and 10 -	A1	B	*Complied*
Screws and other accessible metallic parts	4 kV	Contact	10 + and 10 -	A1	B	*Complied*

Indirect discharges

Coupling plane	Discharge Voltage	Contact/Air	Single discharge	Remarks	Perform. Criteria	Result
Horizontal (2,0 x 3,0m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*
Horizontal (0,5 x 0,5m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*
Vertical (0,5 x 0,5m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*
Vertical (0,5 x 0,5m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*
Vertical (0,5 x 0,5m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*
Vertical (0,5 x 0,5m)	4 kV	Contact	10 + and 10 -	A1	B	*Complied*

A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Remarks
A1: The appliance continues to operate as intended during the test

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
ESD SIMULATOR	SCHAFFNER	NSG 435	1159	V_{Air} = 0,2÷16,5kV $V_{Contact}$ = 0,2÷9kV t_r =0,7ns	04-2011 * 12

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)

DC output voltage: **± 3,4% rdg**	Curve decay points at 30ns: **± 12,0% rdg**	Risetime: **± 10,8% rdg**
Peak current: **± 14,5% rdg**	Curve decay points at 60ns: **± 24,5% rdg**	

ELECTRICAL FAST TRANSIENT

Test set up	Ambient Conditions		
• Floor-standing equipment (According Subclause 7.2.1 Figure 7)	Ambient Temperature (15 ÷ 35 °C)	27	°C
	Relative Humidity (25 ÷ 75 %)	52	%
	Baron Pressure (860 ÷ 1060)	998	mbar

Rated conditions of EUT	
Rated Voltage	230 V
Rated Frequency	50 Hz
Rated Power	1000 W

Representative operating conditions of EUT	
OPERATING mode. Checking of motor speed and reed function	
Tested on:	03-07-2010

Waveshape of a single pulse into a 50Ω load
Front time: 5 ns ± 30 %
Time to half value: 50 ns ± 30 %
Maximum energy: 4 mJ/pulse at 2kV into 50Ω load

Test Conditions	
Burst duration	15 ms
Burst period	300 ms
Spike frequency	5 kHz

Port tested: Input AC power	**Test level:** 1000V	**Perform. Criteria:** B

Coupling mode	Test duration	Pol.	Inject.	Remarks	Result	Test duration	Pol.	Inject.	Remarks	Result
N	2min	+	direct	A1	*Complied*	2min	-	direct	A1	*Complied*
L	2min	+	direct	A1	*Complied*	2min	-	direct	A1	*Complied*
N-L	2min	+	direct	A1	*Complied*	2min	-	direct	A1	*Complied*

A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Remarks
A1: The appliance continues to operate as intended during the test

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
FAST TRANSIENT / BURST GENERATOR	SCHAFFNER	NSG 2025-4	1075	Tr/Th = 5/50 ns 400V 30A Max. Burst Freq.: 1MHz Max. Burst Amp.: 4,4kV	01-2012 * 24

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)

Peak output voltage into 50Ω: **± 9,1% rdg**	Peak output voltage into 1kΩ: **± 11,0% rdg**	Peak output voltage to CDN: **± 4,7% rdg**	Burst frequency: **± 0,3% rdg**
Risetime into 50Ω: **± 22,7% rdg**	Risetime into 1kΩ: **± 23,1% rdg**	Risetime to CDN: **± 5,2% rdg**	Burst duration: **± 1,3% rdg**
Pulsewidth into 50Ω: **± 20,3% rdg**	Pulsewidth into 1kΩ: **+ 20,6% rdg**	Pulsewidth to CDN: **± 23,7% rdg**	Burst period: **± 3,0% rdg**

SURGE

Test set up	Ambient Conditions
• Floor-standing equipment • Surge applied via capacitive coupling network (According Subclause 7.2. Figure 7, 8, 9, 10) • Generator source impedance: 2Ω • Generator trigger: internal • Actual installation conditions: AC: neutral not earthed; DC: earthed to simulate actual earthing conditions	Ambient Temperature (15 ÷ 35 °C) 27 °C Relative Humidity (10 ÷ 75 %) 52 % Baron Pressure (860 ÷ 1060) 998 mbar

Rated conditions of EUT	
Rated Voltage	230 V
Rated Frequency	50 Hz
Rated Power	1000 W

Representative operating conditions of EUT	
OPERATING mode. Checking of motor speed and reed function	
Tested on:	03-07-2010

Waveform parameters 1,2 / 50 µs	
Open-circuit voltage / Short-circuit current	
Front time: 1,2 / 8 µs	Rise time: 1 / 6,4 µs
Time to half value: 50 / 20 µs	Duration time: 50 / 16 µs

Capacitive coupling	
Differential/Common Mode	18/9 µF
Impedance out	2/12 Ω
Repetition rate	1 min^{-1}

Symmetrical mode (DM)	**Port tested:** Input AC power	**Test level:** 1000V	**Perform. Criteria:** B

Coupling mode	N° Imp.	Pol.	Phase	Remarks	Result	N° Imp.	Pol.	Phase	Remarks	Result
N-L	5	+	90°	B1	*Complied*	5	-	270°	B1	*Complied*

A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Remarks
B1: Temporary motor speed variation during the impulse. Normal working after the test

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
HIGH ENERGY PULSE GENERATOR	*SCHAFFNER*	*NSG 650*	*1075*	*0,2÷6,6kV; 3,3kA (at 6,6kV) 1,2/50µs; 8/20µs*	*01-2012 * 24*
COUPLING NETWORK	*SCHAFFNER*	*CDN 113*	*128*	*24-440V_{rms}; 50/60Hz; 3 x 16A_{rms} (3 x 25A_{rms} for 90 min)*	*01-2012 * 24*

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)

Open-circuit peak output voltage: **± 4,9% rdg**	Voltage rise time: **± 16,5% rdg**	Voltage duration time: **- 36,9% rdg**
Short-circuit peak output current: **± 5,5% rdg**	Current rise time: **± 14,4% rdg**	Current duration time: **± 24,2% rdg**

INJECTED CURRENTS

Test set up	Ambient Conditions
• Floor-standing equipment • Single unit (According Subclause 7.6 Figure 9) • Size of EUT: 36 x 38 x 46 cm	Ambient Temperature (15 ÷ 35 °C) 27 °C Relative Humidity (25 ÷ 75 %) 52 % Baron Pressure (860 ÷ 1060) 998 mbar

Rated conditions of EUT	
Rated Voltage	230 V
Rated Frequency	50 Hz
Rated Power	1000 W

Representative operating conditions of EUT	
OPERATING mode. Checking of motor speed and reed function	
Tested on:	03-07-2010

Type of modulation
Signal 80 % amplitude modulated with a 1kHz sinewave

Test Conditions	
Dwell time	3s
Frequency steps	1% fundament.

Port tested	Test Level	Range frequency	Remarks	Perform. criteria	Result
Input AC power	3 V (unmodulated) Z_{SOURCE} = 150Ω	0,15÷230 MHz	A1	A	*Complied*

A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Remarks
A1: The appliance continues to operate as intended during the test

TEST EQUIPMENT	*Manufacturer*	*Mod./Type*	*Serial N°*	*Characteristics*	*Next calib.*
SWITCHING UNIT	*NOVOTRONIK*	*GTS4440*	*1504*	*0 ÷ 12,4 GHz*	*---*
SIGNAL GENERATOR	*ROHDE & SCHWARZ*	*SMT 06*	*100979*	*5kHz ÷ 6GHz; 30dBm$_{max}$*	*05-2011 * 12*
RF-POWER AMPLIFIER	*KALMUS*	*115LC*	*102395-2*	*1kHz ÷ 100MHz; 15W*	*07-2010 * 12*
RF-POWER AMPLIFIER	*FRANKONIA*	*FLH-200B*	*1045*	*20 ÷ 1000 MHz; 200W*	*07-2010 * 12*
DIRECTIONAL COUPLER	*WERLATONE*	*C5982-SP*	*38973*	*80 ÷ 1000 MHz; 500W; 40dB*	*07-2010 * 12*
POWER METER	*ROHDE & SCHWARZ*	*NRVD*	*101770*	*0 ÷ 40 GHz*	*05-2011 * 12*
THERMAL POWER SENSOR	*ROHDE & SCHWARZ*	*NRV-Z51*	*101326*	*0 ÷ 18 GHz; 1μW ÷ 100mW; 50Ω*	*05-2011 * 12*
THERMAL POWER SENSOR	*ROHDE & SCHWARZ*	*NRV-Z51*	*101327*	*0 ÷ 18 GHz; 1μW ÷ 100mW; 50Ω*	*05-2011 * 12*
ATTENUATOR	*JFW*	*50FH-006-20*	*---*	*6dB; 30W*	*07-2010 * 12*
COUP./DECOUP. NETWORK	*SCHAFFNER*	*CDN 801-6 M3*	*132*	*0,15÷230MHz; 250Vac; 16A*	*07-2010 * 12*

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Output level at EUT port: *CDN and EM clamp*: **1,05V ± 5,8% ; 3,1V ± 4,0%;** *CDN*: **10,25V ± 3,0%;** *EM clamp*: **9,25V ± 3,3%**

VOLTAGE DIPS AND INTERRUPTIONS

Test set up	Ambient Conditions
• Floor-standing equipment • EUT connected to the test generator with the shortest power supply cable (According Subclause 7) • Generator trigger: internal • Actual installation conditions: AC: neutral not earthed; DC: earthed to simulate actual earthing conditions	Ambient Temperature (15 ÷ 35 °C) 27 °C Relative Humidity (25 ÷ 75 %) 52 % Baron Pressure (860 ÷ 1060) 998 mbar

Rated conditions of EUT	
Rated Voltage	230 V
Rated Frequency	50 Hz
Rated Power	1000 W

Representative operating conditions of EUT	
OPERATING mode. Checking of motor speed and reed function	
Tested on:	03-07-2010

Environmental phenomena	Voltage dips	Test level	Duration	Number sequence	Phase	Remarks	Perform. criteria	Result
Voltage dips 1	100 % U_T	0 % U_T	0,5 $T_{fond.}$	3 with interval of 10 s	0°	A1	C	*Complied*
Voltage dips 2	60 % U_T	40 % U_T	10 $T_{fond.}$	3 with interval of 10 s	0°	B1	C	*Complied*
Voltage dips 3	30 % U_T	70 % U_T	25 $T_{fond.}$	3 with interval of 10 s	0°	B1	C	*Complied*

A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Remarks
A1: The appliance continues to operate as intended during the test
B1: Temporary motor speed reduction. Normal working after the test

TEST EQUIPMENT	Manufacturer	Mod./Type	Serial N°	Characteristics	Next calib.
PROGRAMMABLE WAVEFORM GENERATOR	SPITZENBERGER +SPIES	SYCORE	A3768 12/0 0706	3,53V_{rms}÷10V_{pp}; 0÷359°; ≈ 40kHz_{max} (1 phase); 50Ω	---
4-QUADRANT AMPLIFIER	SPITZENBERGER +SPIES	PAS 2000	A3768 01/0 0706	135÷270V_{rms}; ±191÷382V_{dc}; 0÷5kHz (-3dB); 2kVA_{ac}; 3kW_{dc}	---
POWER SUPPLY	SPITZENBERGER +SPIES	NT 2000	A3768 02/0 0706	230/400V; 50/60Hz; 3x16A	---
DIGITIZING OSCILLOSCOPE	TEKTRONIX	TDS 430A	---	2 Channels 300V 400MHz 100MS/s	07-2010 * 12
VOLTAGE PROBE	TEKTRONIX	P6138A	OSA003	400MHz; 300V 10x	07-2010 * 12
MULTIMETER	FLUKE	45	6879005	0÷750Vac; 0÷1000Vdc	06-2011 * 12

Measurement uncertainties (normal distribution and confidence level of 95% with coverage factor k=2)
Dip duration: **< 0,5% rdg** | Voltage change with load: **< 5%** | Voltage rise and fall time: **1µs÷ 5µs**

COMPONENTS SOURCE OF INTERFERENCE

	Manufacturer	Type/Mod. Technical data	Location	Approval Marks
Motor	AMETEK	061200360 220-240V; 50/60Hz	Inside	---
Power board	LEGNANI	4122-1	Inside	---
Reed board	LEGNANI	4122-2	Inside	---
Potentiometer	LEGNANI	4122-3	Inside	---

SUPPRESSION COMPONENTS

Manufacturer	Type/Mod. Technical data	Location	Approval Marks
Suppression components are included on the electronic circuit printed boards			

PHOTOS

Photo 3

Photo 4

Photo 5

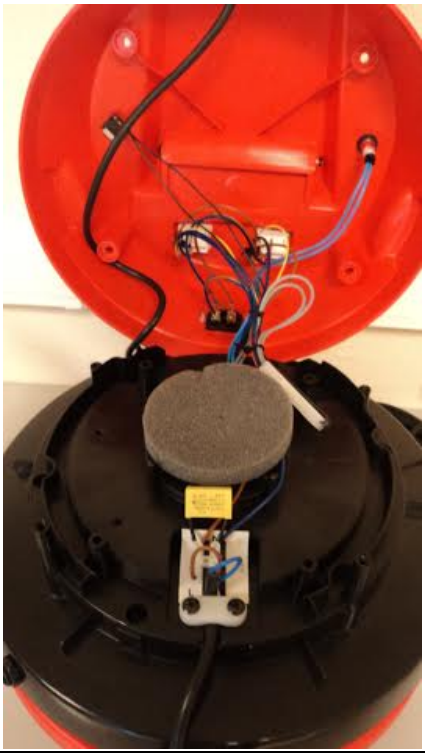
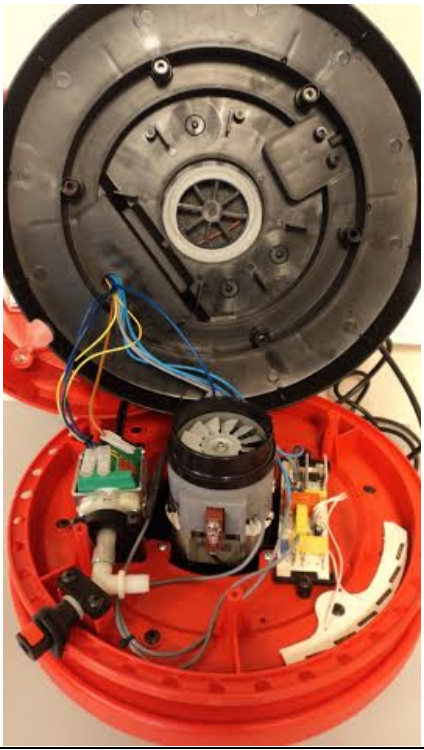


Photo 6



PHOTOS

Photo 7

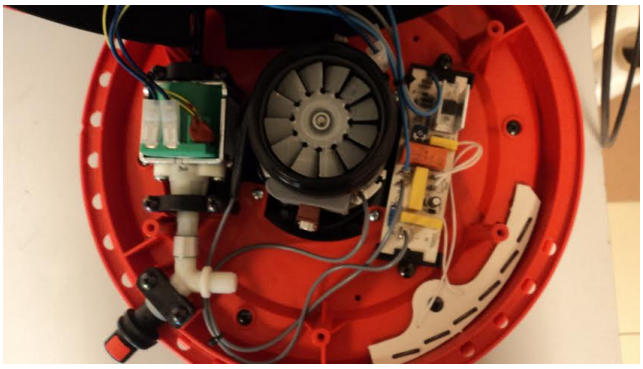


Photo 8

Photo 9

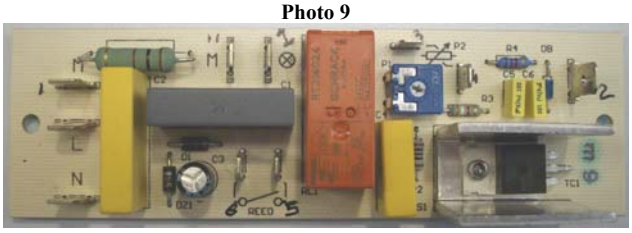


Photo 10

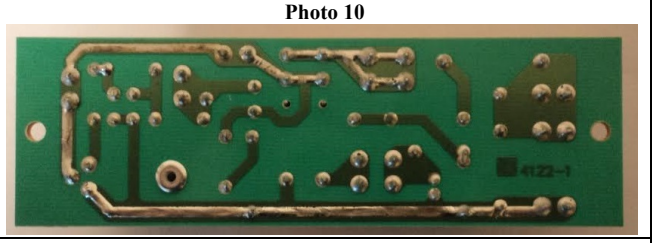


Photo 11

Photo 12

DOCUMENTATION

☐	**Instruction manual:**	
☒	**Electrical Scheme:**	WET ORKY (25/11/2009)
☒	**Electronic Scheme:**	4122-1, 4122-2
☒	**Electronic Component List:**	4122-1, 4122-2
☒	**Electronic Lay-Out:**	4122-1, 4122-2

-- END OF TEST REPORT --