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**EMC Test report for Diamond Core Drill** 

# Models: TC20; TC201; TD20; TD201; TCD20; TCD201; TC40; TC401; TD40; TD401; TCD40; TCD401; TC402; TD402; TCD402

Shanghai, date of issue: 2015-08-11 Author : Richie Tang

By order of Lee Yeong Industrial Co., Ltd. at Yunlin County 64057, Taiwan

Rental Tom

sky zhong

author : Richie Tang B 26 pages 0 annexes (sec) DEKRA Testing and Certification (Shanghai) Ltd. Document reviewed : Sky Zhang

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# 1 CONCLUSION

The equipment under test (EUT) does meet the essential requirements of the EMC Directive 2004/108/EC.

The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA. As far as the tests were based on certain specifications, these are mentioned in the report.

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

# 1.1 **Model description**

The apparatus as supplied for the test is a diamond core drill, model TC402 intended for residential use. This product has electronic control circuit but no earth connection.

According to the declaration from manufacturer, all models have the same construction and components except the gear box and rated no-load speed are different.

Due to the similarity between them, model TC402 was selected for the full tests and the corresponding data is representative for other models as well.



Figure 1 Overview



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Figure 2 Internal view



Figure 3 Internal view



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# 1.2 Environment

The requirements and standards apply to equipment intended for use in:

✓	Residential (domestic) environment	
	Commercial and light-industrial environment	
	Industrial environment	
	Medical environment	

### 1.3 Classification

The standard EN 55014-2 is subdivided in four categories. For each category, the specific immunity requirements are formulated.

	Category 1	Apparatus containing no electronic control circuitry
~	Category 2	Apparatus containing electronic control circuitry with no internal clock or oscillator frequency higher than 15 MHz.
	Category 3 Battery powered apparatus containing electronic control circuitry with no internal clock higher than 15 MHz.	
	Category 4	All other apparatus.

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# 2 SUMMARY

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

# 2.1 Applied standards

Standard	Year	Title
EN 55014-1	2006	Emission – Electrical motor-operated and thermal
A1	2009	appliances for household and similar purposes, electrical
A2	2011	tools and similar electrical apparatus
EN 55014-2	1997	
A1	2001	Immunity - Household appliances, electric tools and similar
A2	2008	
EN 61000-3-2	2014	Limits for harmonic currents emissions
EN 61000-3-3	2013	Limitation of voltage fluctuations and flicker

# 2.2 **Overview of results**

Emission tests	Result
Mains conducted disturbance voltage	PASS
Disturbance Power	PASS
Harmonic current emission	PASS
Limitation of voltage fluctuations (flicker)	PASS

Immunity tests	Result
Electrostatic Discharges (ESD)	PASS
Electrical fast transient (EFT)	PASS
Surge transients	PASS
Conducted RF disturbances	PASS
Power supply voltage interruptions & dips	PASS



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# 3 GENERAL INFORMATION

# 3.1 **Product Information**

Equipment under test	Diamond Core Drill
Trade mark	AGP
Tested Type	TC402
Representative types	TC20; TC201; TD20; TD201; TCD20; TCD201; TC40; TC401; TD40; TD401; TCD40; TCD401; TD402; TCD402
	TC402; TD402; TCD402:
	110-120 Vac or 220-240 Vac; 50-60 Hz; 650 W;
	n <sub>0</sub> =4500/7500 min <sup>-1</sup> ; Class II
	TC40; TC401; TD40; TD401; TCD40; TCD401:
Ratings	110-120 Vac or 220-240 Vac; 50-60 Hz; 650 W;
	$n_0=4500 \text{ min}^{-1}$ ; Class II
	TC20; TC201; TD20; TD201; TCD20; TCD201:
	110-120 Vac or 220-240 Vac; 50-60 Hz; 650 W;
	$n_0=7500 \text{ min}^{-1}$ ; Class II

# 3.2 Customer Information

Applicant	Lee Yeong Industrial Co., Ltd.
Address	No.2, Kejia Road, Douliu City, Yunlin County 64057, Taiwan

Manufacturer	Lee Yeong Industrial Co., Ltd.
Address	No.2, Kejia Road, Douliu City, Yunlin County 64057, Taiwan

Factory	Lee Yeong Industrial Co., Ltd.
Address	No.2, Kejia Road, Douliu City, Yunlin County 64057, Taiwan



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### 3.3 Test data

Location	DEKRA Testing and Certification (Shanghai) Ltd.
Address	1 F., No. 250, Jiangchangsan Road, Shanghai City, China
Date of receipt of test item	2015-04 (samples provided by applicant)
Date (s) of performance of tests	2015-04
Supervised by	Richie Tang

# 3.4 Environmental conditions

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

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

# 3.5 Measurement Uncertainty

Conducted Emission Expanded Uncertainty: U = 3.22 dBDisturbance Power Expanded Uncertainty: U = 2.38 dB



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# 3.6 Equipment List

Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESCI	101351	2015.08.05
2-line V-network	R&S	ENV216	101620	2015.08.05
EMC Shielding room	Changzhou FeiTe	8 x 5 x 3 mm	Nil	2015.12.24
EMI absorbing clamp	SCHWARZBECK	MDS 21B	4183	2015.08.05
Harmonic currents and flick tester	California Instruments	СТЅ	1306A00135	2015.05.18
AC power source	California Instruments	5001iX-CTS-400	1306A00135	2015.05.18
ESD generator	TESEQ	NSG 435	6716	2015.08.05
EFT, Surge, DIPS all-in-one	TESEQ	NSG-3040-MF	2006/EFT:0535 /SURGE:1234 /DIPS:2062	2015.08.05
Compact immunity test system (RF)	TESEQ	NSG 4070-30	35895	2015.08.05
Coupling decoupling network (CDN)	TESEQ	CDN M016S	34640	2015.08.05
Attenuator	TESEQ	ANT 6050	34847	2015.08.05



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# 4 EMISSION TEST RESULTS

# 4.1 Mains conducted disturbance voltage

Standard		EN 55014-1	(Tools)				
Frequency [MHz	]	QP [dB(μV)]			AV [dB(μV)]		
0,15 –	0,35	66	_	59 *)	59	_	49 *)
0,35 –	5	59			49		
5 –	30	64			54		

\*) Limits decreasing linearly with the logarithm of the frequency

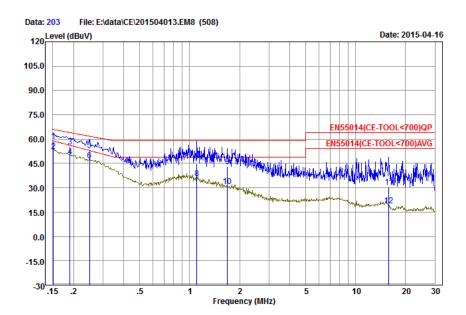
ſ	√	Rated power below 700 W	Limits as above
		Rated motor power above 700 and not exceeding 1000 W	Limits +4 dB
ŀ		Rated power above 1000 W	Limits +10 dB

Port	AC mains
Test method	LISN
Mode	On mode with artificial hand, no load



# Results with 110-120 Vac

#### Line

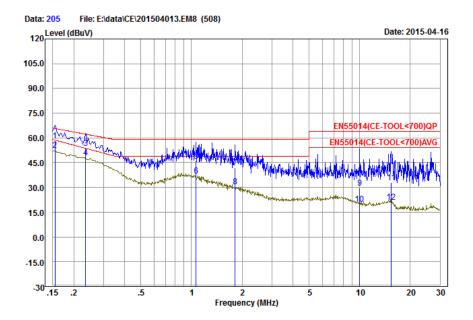


	Freq	Limit Line	Level	Read Level	Factor	Cable Loss	Over Limit	Remark
	MHz	dBuV	dBuV	dBuV	dB	dB	dB	
1 qp	0.15	65.95	58.78	47.90	10.88	1.18	-7.17	QP
2	0.15	58.92	52.72	41.84	10.88	1.18	-6.20	Average
3	0.19	64.03	55.35	44.66	10.69	1.11	-8.68	QP
4	0.19	56.19	49.21	38.52	10.69	1.11	-6.98	Average
5	0.25	61.80	53.23	42.56	10.67	1.10	-8.57	QP
6 pp	0.25	53.00	46.86	36.19	10.67	1.10	-6.14	Average
7	1.11	59.00	44.84	33.89	10.95	1.31	-14.16	QP
8	1.11	49.00	35.74	24.79	10.95	1.31	-13.26	Average
9	1.69	59.00	43.01	31.98	11.03	1.38	-15.99	QP
10	1.69	49.00	30.72	19.69	11.03	1.38	-18.28	Average
11	15.89	64.00	30.35	18.90	11.45	1.74	-33.65	QP
12	15.89	54.00	18.95	7.50	11.45	1.74	-35.05	Average



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#### Neutral

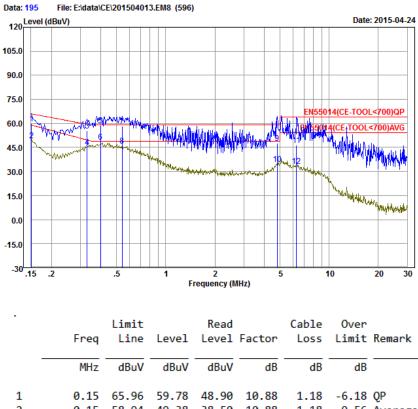


	Freq	Limit Line	Level	Read Level	Factor	Cable Loss	Over Limit	Remark
-	MHz	dBuV	dBuV	dBuV	dB	dB	dB	
1 qp 2 3 4 pp 5 6 7 8 9 10	0.15 0.24 0.24 1.07 1.07 1.82 1.82 10.02 10.02	65.74 58.62 62.28 53.68 59.00 49.00 59.00 49.00 64.00 54.00	58.28 52.58 53.66 48.26 46.14 37.04 41.82 30.62 29.62 19.72	47.40 41.70 42.90 37.50 35.20 26.10 30.80 19.60 18.50 8.60	10.88 10.88 10.76 10.94 10.94 11.02 11.02 11.12 11.12	1.31 1.38 1.38 1.40 1.40	-8.62 -5.42 -12.86 -11.96 -17.18 -18.38 -34.38 -34.28	Average QP Average QP Average QP Average QP Average
11 12	15.39 15.39	64.00 54.00	33.07 20.97	21.60 9.50	11.47 11.47		-30.93 -33.03	QP Average



# Results with 220-240 Vac

#### Line



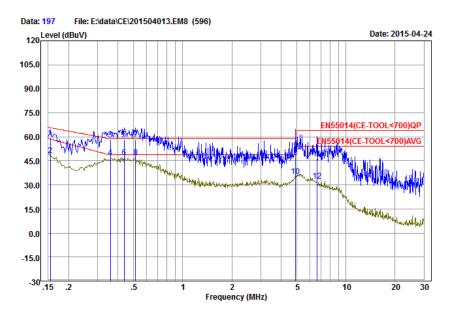
1	0.15	65.96	59.78	48.90	10.88	1.18	-6.18	QP
2	0.15	58.94	49.38	38.50	10.88	1.18	-9.56	Average
3	0.33	59.48	55.28	44.60	10.68	1.10	-4.20	QP
4	0.33	49.68	45.18	34.50	10.68	1.10	-4.50	Average
5 pp	0.40	59.00	58.49	47.80	10.69	1.10	-0.51	QP
6 av	0.40	49.00	48.49	37.80	10.69	1.10	-0.51	Average
7	0.54	59.00	58.45	47.70	10.75	1.14	-0.55	QP
8	0.54	49.00	45.95	35.20	10.75	1.14	-3.05	Average
9	4.80	59.00	47.86	36.90	10.96	1.30	-11.14	QP
10	4.80	49.00	34.56	23.60	10.96	1.30	-14.44	Average
11	6.32	64.00	46.60	35.60	11.00	1.33	-17.40	QP
12	6.32	54.00	33.50	22.50	11.00	1.33	-20.50	Average

Notice that the disturbance reaches the limits and at these frequencies precautions are advised.



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Neutral



	Freq	Limit Line	Level	Read Level	Factor	Cable Loss	Over Limit	Remark
	MHz	dBuV	dBuV	dBuV	dB	dB	dB	
1	0.15	65.74	59.47	48.59	10.88	1.17	-6.27	QP
2	0.15	58.62	48.57	37.69	10.88	1.17	-10.05	Average
3 рр	0.36	59.00	58.24	47.50	10.74	1.10	-0.76	QP
4 av	0.36	49.00	47.34	36.60	10.74	1.10	-1.66	Average
5	0.44	59.00	58.13	47.40	10.73	1.10	-0.87	QP
6	0.44	49.00	47.23	36.50	10.73	1.10	-1.77	Average
7	0.52	59.00	58.24	47.50	10.74	1.12	-0.76	QP -
8	0.52	49.00	47.24	36.50	10.74	1.12	-1.76	Average
9	4.93	59.00	51.57	40.60	10.97	1.30	-7.43	QP
10	4.93	49.00	35.57	24.60	10.97	1.30	-13.43	Average
11	6.63	64.00	46.41	35.40	11.01	1.34	-17.59	QP
12	6.63	54.00	32.61	21.60	11.01	1.34	-21.39	Average

Notice that the disturbance reaches the limits and at these frequencies precautions are advised.

Refer to chapter 6 for the test set-up.

Conclusion: **PASS** 



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### 4.2 **Disturbance Power**

Standard	EN 55014-1	
Frequency [MHz]	QP [dB(pW)]	AV [dB(pW)]
30 - 300	45 – 55 *)	35 – 45 *)

\*) Limits increasing linearly with the frequency

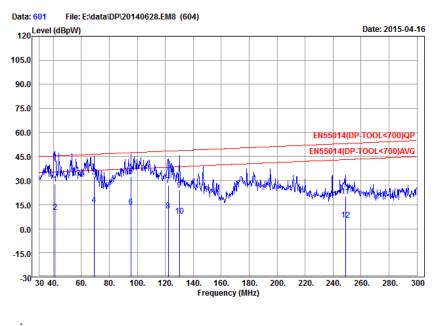
For tools the following limits apply to the AC Mains port:

$\checkmark$	Rated power below 700 W	Limits as above
	Rated motor power above 700 and not exceeding	Limits +4 dB
	1000 W	
	Rated power above 1000 W	Limits +10 dB

Port	AC Mains
Mode	On mode with no load



#### Results with 110-120 Vac



		Freq	Limit Line	Level	Read Level	Factor	Cable Loss	Over Limit	Remark
		MHz	dBpW	dBpW	dBpW	dB	dB	dB	
1		41.07	45.42	28.00	7.51	20.49	1.08	-17.42	QP
2		41.07	35.42	10.40	-10.09	20.49	1.08	-25.02	Average
3 p	р	69.15	46.46	32.58	14.11	18.47	1.15	-13.88	QP
4 a	av	69.15	36.46	14.98	-3.49	18.47	1.15	-21.48	Average
5		95.34	47.43	32.69	14.61	18.08	1.49	-14.74	QP
6		95.34	37.43	13.59	-4.49	18.08	1.49	-23.84	Average
7		122.07	48.42	27.05	8.91	18.14	1.61	-21.37	QP
8		122.07	38.42	11.25	-6.89	18.14	1.61	-27.17	Average
9		130.17	48.72	24.53	6.51	18.02	1.48	-24.19	QP
10		130.17	38.72	7.93	-10.09	18.02	1.48	-30.79	Average
11		248.97	53.12	20.36	1.51	18.85	2.36	-32.76	QP
12	:	248.97	43.12	5.46	-13.39	18.85	2.36	-37.66	Average



Date: 2015-04-16

# Results with 220-240 Vac Data: 598 File: E:\data\DP\20140628.EM8 (604) 120 Level (dBpW) 105.0 90.0 75.0 60.0 4

60.0										EN	55014(	DP-TO	OL<700)	QP
45.0									_	EN5	5014(D	P-TOC	DL<700)A	<b>WG</b>
30.0	M	MW	human N	lilling . I		hita ka ka ka ka	marchiller	ut lith	and a little a se		<b>h</b> adh	hille	uppary all	***
15.0			L. ANA	III IN WIGH	ihd. at i	AULA IA AFTAA ADIM.	antiver and in a	MUN 5	a AbdaAtu	MAT WHITE	1	0		12
0.0		2		4				6			8			
0.0														
-15.0														
-30	30 40	. 60	). 8	D. 10	0.	120. 140		180.	200.	220.	240.	260.	280.	300
							Frequency	(MHZ)						
				Li	mit		Read	t t		Cable	e 0	ver		
			Fred	l L:	ine	Level	Level	l Fac	tor	Loss	Li	mit	Remar	۰k
			MHz	z dl	BpW	dBpW	dBpl	N	dB	dB	3	dB		
	1 pp		51.00	5 45	.79	24.42	4.82	2 19	9.60	1.04	-21	.37	QP	
	2 av		51.06	5 35	.79	4.12	-15.48	3 19	9.60	1.04	-31	.67	Avera	age
	3	9	97.50	) 47	.51	11.43	-6.49	9 17	7.92	1.37	-36	.08	QP	
	4	9	97.50	37	.51	-0.67	-18.59	9 17	7.92	1.37	-38	.18	Avera	age
	5	18	87.41	L 50	.84	12.45	-6.41	1 18	3.86	2.27	-38	. 39	QP	
	6	18	87.41	40	.84	1.02	-17.84	4 18	3.86	2.27	-39	.82	Avera	age
	7	2	37.90	52	.71	17.92	-0.78	3 18	3.70	2.19	-34	.79	QP	
1	8	2	37.90	) 42	.71	3.82	-14.88	3 18	3.70	2.19	-38	.89	Avera	age
	9	2	53.56	53	.29	23.46	4.61	1 18	3.85	2.37	-29	.83	QP	
1	0	2	53.56	5 43	. 29	6.76	-12.09	9 18	8.85	2.37	-36	.53	Avera	age

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Refer to chapter 6 for the test set-up.

According to clause 4.1.2.3.2 (EN 55014-1):

Appliances are deemed to comply in the frequency range from 300 MHz to 1 000 MHz if both of the following conditions (1) and 2)) are fulfilled:

1) all emission readings from the equipment under test shall be lower than the applicable limits (Table 2a) reduced by the margin (Table 2b);

2) the maximum clock frequency shall be less than 30 MHz.

Conclusion: PASS



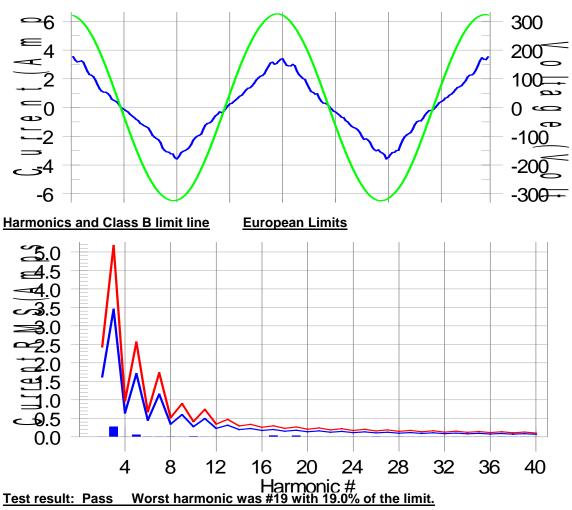
#### 4.3 Harmonic currents

Standard	EN 61000-3-2
Port	AC Mains supply
Rated power	650 W

	Class A	All apparatus not classified as Class B, C or D
$\checkmark$	Class B	Portable tools
	Class C	Lighting equipment
	Class D	Personal computers, television receivers

#### Results

#### Current & voltage waveforms





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Test Re	sult: Pass	Source qu	alification:	Normal			
THC(A) Highest	: 0.286 I-TI parameter va	HD(%): 15.0 alues during		A): 0.000 P(	OHC Limit(A	): 0.377	
-	V_RMS (Volts	s): 229.75		Frequency(Hz)			
	I_Peak (Amps			I_RMS (Amps)			
	I_Fund (Amps			Crest Factor:	1.866		
	Power (Watts	): 458.8		Power Factor:	0.987		
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.620	N/A	0.006	2.430	N/A	Pass
3	0.274	3.450	7.9	0.304	5.175	5.9	Pass
4	0.006	0.645	N/A	0.007	0.968	N/A	Pass
5	0.056	1.710	3.3	0.063	2.565	2.4	Pass
6	0.006	0.450	N/A	0.007	0.675	N/A	Pass
7	0.007	1.155	N/A	0.008	1.733	N/A	Pass
8	0.009	0.345	N/A	0.019	0.518	N/A	Pass
9	0.006	0.600	N/A	0.007	0.900	N/A	Pass
10	0.015	0.276	5.4	0.024	0.414	5.9	Pass
11	0.005	0.495	N/A	0.007	0.743	N/A	Pass
12	0.005	0.230	N/A	0.007	0.345	N/A	Pass
13	0.005	0.315	N/A	0.006	0.473	N/A	Pass
14	0.005	0.197	N/A	0.006	0.295	N/A	Pass
15	0.005	0.225	N/A	0.008	0.338	N/A	Pass
16	0.005	0.173	N/A	0.009	0.260	N/A	Pass
17	0.037	0.199	18.6	0.054	0.299	18.0	Pass
18	0.007	0.153	N/A	0.010	0.230	N/A	Pass
19	0.034	0.178	19.0	0.049	0.267	18.4	Pass
20	0.005	0.138	N/A	0.007	0.207	N/A	Pass
21	0.006	0.161	N/A	0.008	0.241	N/A	Pass
22	0.004	0.125	N/A	0.005	0.188	N/A	Pass
23	0.004	0.147	N/A	0.005	0.221	N/A	Pass
24	0.005	0.115	N/A	0.006	0.173	N/A	Pass
25	0.004	0.135	N/A	0.005	0.203	N/A	Pass
26	0.009	0.106	N/A	0.012	0.159	N/A	Pass
27	0.004	0.125	N/A	0.006	0.188	N/A	Pass
28	0.007	0.099	N/A	0.012	0.149	N/A	Pass
29	0.004	0.116	N/A	0.005	0.174	N/A	Pass
30	0.005	0.092	N/A	0.006	0.138	N/A	Pass
31	0.004	0.110	N/A	0.005	0.164	N/A	Pass
32	0.004	0.086	N/A	0.005	0.129	N/A	Pass
33	0.004	0.102	N/A	0.005	0.153	N/A	Pass
34	0.004	0.081	N/A	0.005	0.122	N/A	Pass
35	0.006	0.096	N/A	0.012	0.144	N/A	Pass
36	0.004	0.077	N/A	0.006	0.116	N/A	Pass
37	0.006	0.092	N/A	0.011	0.137	N/A	Pass
38	0.005	0.073	N/A	0.009	0.110	N/A	Pass
39	0.003	0.087	N/A	0.004	0.131	N/A	Pass
40	0.003	0.069	N/A	0.004	0.104	N/A	Pass

**Conclusion:** 





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# 4.4 Voltage fluctuations (Flicker)

Standard	EN 61000-3-3
Port	AC Mains supply
Voltage	230 V <sub>AC</sub>
Mode	On mode

Equipment intended to be connected to 230/400  $V_{AC}$  50 Hz supply systems may not produce voltage fluctuations in the supply systems due to variation of the input current above the limits as stated below.

P <sub>ST</sub>	Not applicable*
P <sub>LT</sub>	Not applicable*
Tmax (dt > 3,3%)	≤ 500 ms
d <sub>c</sub>	≤ <b>3</b> , <b>3%</b>
d <sub>MAX</sub>	≤ <b>7%</b>

#### Results

Tmax (dt > 3,3%)	0,0 ms
Maximum voltage change d <sub>MAX</sub>	3,455%
Relative Voltage change d <sub>C</sub>	0,410%
Short term flicker P <sub>ST</sub>	Not applicable*
Long term flicker P <sub>LT</sub>	Not applicable*

In addition, this test was conducted in accordance with Annex B of EN 61000-3-3.

\* The EUT belongs to hand-held tools (portable tools without heating elements), according to EN 61000-3-3, clause A.9,  $P_{ST}$  and  $P_{LT}$  shall not be evaluated.







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# 5 IMMUNITY TEST RESULTS

# 5.1 **Electrostatic discharge immunity**

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

#### Requirements

Standard	EN 55014-2
Basic standard	EN 61000-4-2
Port	Enclosure
Performance criterion	B; During the test degradation is allowed.
	No change of operating state or stored data is allowed.
Air discharges	8 kV
Contact discharges	4 kV
Mode	On mode

### Performed tests

Air discharges	✓	4 kV	~	8 kV		15 kV		
Contact discharges	✓	2 kV	~	4 kV		8 kV		
Via coupling planes		Horizontal			$\checkmark$	Vertical		
Polarity	√	Positive			$\checkmark$	Negative		
Set-up	√	Table-to	р			Floor st	andin	g
Ambient temperature		21 °C						
Relative Humidity air		48%						

#### Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

Conclusion:





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# 5.2 Electrical Fast Transient immunity

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

#### Requirements

Standard	EN 5	EN 55014-2					
Basic standard	EN 6	EN 61000-4-4					
Performance criterion	B; Dı	B; During the test degradation is allowed.					
	No cl	No change of operating state or stored data is allowed.					
Pulse characteristics	5/50	5/50 ns					
Peak Voltage; Port	1 kV;	1 kV; AC input power port					
Repetition frequency	~	✓ 5 kHz 2,5 kHz					

### **Performed tests**

Tested Voltage; Port	1 kV	1 kV; AC input power port				
Mode		On mode				
Injection method	✓	CDN		Capacitive clamp		
Polarity	√	Positive	~	Negative		
Set-up	√	Table-top		Floor standing		

### Observations





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### 5.3 Surge transient immunity

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

#### Requirements

Standard	EN 55014-2
Basic standard	EN 61000-4-5
Performance criterion	B; During the test degradation is allowed.
	No change of operating state or stored data is allowed.
Pulse characteristics	1,2/50 µs
Peak Voltage; Port	1 kV; AC input power port (Line to line)

#### Performed tests

Tested Voltage; Port	1 kV; AC input power port (Line to line)			
Mode	On mode			
Polarity	$\checkmark$	Positive	$\checkmark$	Negative

#### Observations





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# 5.4 **RF Conducted immunity**

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

#### Requirements

Standard	EN 55014-2
Basic standard	EN 61000-4-6
Performance criterion	A; Operation as intended
Frequency range	0,15 – 230 MHz
Modulation	1 kHz – 80% AM
Test level; Port	3 V; AC input power port

#### **Performed tests**

Tested level; Port	3 V; AC input power port		
Mode	On mode		
Frequency range	0,15 – 230 MHz		
Dwell time	3 seconds		
Injection method	✓ CDN-M2 EM clamp		

#### Observations





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# 5.5 **Power supply interruptions and dips**

#### Requirements

Basic standard	EN 61000-4-11	
Performance criterion	B; During the test degradation is allowed.	
	No change of operating state or stored data is allowed.	
	C; Temporary, self-recoverable loss of function is	
	allowed.	

Standard	EN 55014-2			
			50 Hz	60 Hz
AC input power port	С	U <sub>NOM</sub> – 30%	(25 periods)	(30 periods)
	С	U <sub>NOM</sub> – 60%	(10 periods)	(12 periods)
	С	U <sub>NOM</sub> – 100%	(0,5 period)	(0,5 period)

# Performed tests

Tested voltage	AC input power port		
Mode	On mode		
AC input power port	50 Hz	60 Hz	
	U <sub>NOM</sub> – 30% (25 periods)	U <sub>NOM</sub> – 30% (30 periods)	
	U <sub>NOM</sub> – 60% (10 periods)	U <sub>NOM</sub> – 60% (12 periods)	
	U <sub>NOM</sub> – 100% (0,5 period)	U <sub>NOM</sub> – 100% (0,5 period)	

### Observations





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# 6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photograph shows the tested device.



Figure 4 Conducted Emission test setup



Figure 5 Disturbance power test setup

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