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Add value.

RAPPORTO DI PROVA

TEST REPORT

Titolo (Title):

EMC Immunity test and measure of the harmonic components and Flicker on SP40 plus

Richiedente (Customer):

- Ente/Società (Dept./Firm): Compuprint S.p.A.
- Sig.(Mr.): Daniele Zanino
- Indirizzo (Address): Via Lombardore 282 –10040 Leinì (TO)

Modulo Richiesta Prova n.: 165
Test Requesting Form no.:

Rapporto inviato a: Mr. Daniele Zanino
Report sent to:

Nome e Firma esecutore prova: (P. Fortis)
Name and Signature of the test engineer:

Nome e Firma Responsabile settore: (G. Mecchia)
Name and Signature of the Sector Manager

Data ricevimento campioni: 21 / 08 / 2012
Date of test samples receipt:

Data esecuzione prove: dal 21 / 08 / 2012
Date of test execution: al 23 / 08 / 2012

Località esecuzione prove (se diversa dal piè di pagina):
Site of test execution (if different from the address in the footer):

Presenti alle prove:
Witness to the test:

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.
The test results contained in this Test report relate to the tested samples only.

E' ammessa la riproduzione integrale del presente Rapporto di prova da parte del Richiedente; la riproduzione parziale dev'essere autorizzata per iscritto dal Laboratorio.

The integral reproduction of the present Test report is allowed; the partial reproduction must be authorized in writing by the Lab.

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no.: EMC 12/165A
Revision: 0
Page 1 of 17

Project manager:
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Issue date: 28/ 08/ 2012

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1. **SETUP DI PROVA** *TEST SETUP*

1.1. **IDENTIFICAZIONE CAMPIONE** (Vedere note pag. 18) *SAMPLE IDENTIFICATION (See remarks pag. 18)*

- Prodotto/materiale sottoposto a prova: **SP40 plus**
Product/material subjected to test:
- Descrizione: Dot matrix printer
Description:
- Livello (Prodotto di serie, prototipo, ecc.): Series product
Level (Series product, prototype, etc.):
- N° Matricola: RHS-S81-02973
Part number:
- Codice di identificazione: C1203461
Identification code:

1.2. **DISPOSITIVI AUSILIARI** *AUXILIARY DEVICES*

Desktop DELL

1.3. **CONFIGURAZIONE DI PROVA** *TEST CONFIGURATION*

SP40 plus connected through shielded
USB/serial/parallel cable to Desktop

1.4. **SISTEMA DIAGNOSTICO** *DIAGNOSTIC SYSTEM*

Printing through USB/serial and parallel port

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 2 of 17

Project manager:
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2. ELENCO DELLE PROVE

TEST LIST

- 2.1 Immunity against electrostatic discharges.
- 2.2 Immunity against fast transient (Burst) on AC line.
- 2.3 Immunity to conducted disturbance, induced by radio-frequency fields in the frequency range 150 kHz to 80 MHz AM 80% at 1 kHz on AC line.
- 2.4 Immunity against electromagnetic fields ranging from 80 ÷ 1000 MHz , 1400 ÷ 2700 MHz AM 80% at 1 kHz
- 2.5 Immunity against surge
- 2.6 Immunity against voltage dips and interruptions
- 2.7 Measure of the induced fluctuation on the AC line (Flicker)
- 2.8 Measure of harmonic components induced on the AC line

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 3 of 17

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3. **METODO DI PROVA** *TEST METHOD*

☒ Normalizzato - Norma di riferimento:
Standardized - Reference Standard:

Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003
Product standard CEI EN 61000-3-2:2007+A1/A2:2011
Product standard CEI EN 61000-3-3:2009

3.1 Immunity against electrostatic discharges Test procedure : CEI EN 61000-4-2 : 2010

Immunity level and test conditions :
Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003

3.2 Immunity against fast transient (Burst) on AC line Test procedure : CEI EN 61000-4-4:2006

Immunity level and test conditions :
Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003

3.3 Immunity to conducted disturbance, induced by radio-frequency fields in the frequency range 150 kHz to 80 MHz AM 80% at 1 kHz on AC line .

Test procedure : CEI EN 61000-4-6 :2009
Immunity level and test conditions :
Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003

3.4 Immunity against electromagnetic fields ranging from 80 ÷ 1000 MHz , 1400 ÷ 2000 MHz with AM 80% at 1 kHz

Test procedure : CEI EN 61000-4-3:2007
Immunity level and test conditions :
Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003



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3.5 Immunity against surge

Test procedure : CEI EN 61000-4-5 : 2007

Immunity level and test conditions :

Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003

3.6 Immunity against voltage dips and interruptions

Test procedure : CEI EN 61000-4-11 : 2006

Immunity level and test conditions :

Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003

3.7 Measure of the induced fluctuation on the AC line (Flicker)

Test procedure and emissions level CEI EN 61000-3-3:2009

3.8 Measure of harmonic components induced on the AC line

Test procedure / Emissions level CEI EN 61000-3-2:2007+A1/A2:2011

Eventuali scostamenti, aggiunte o limitazioni:

Possible differences, additions or limitations:

Nessuno

☐ Interno - Descrizione:

Internal - Description:

Nessuno



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4. APPARECCHIATURE UTILIZZATE

TEST EQUIPMENT USED

- 4.1 Immunity against electrostatic discharges
ESD Simulator SHAFFNER NSG438 s.n. 00248
- 4.2 Immunity against fast transient (Burst) on AC line
Fast transient / Burst simulator EM TEST Mod. EFT 500-M s.n. V0723102574
- 4.3 Immunity to conducted disturbance, induced by radio frequency fields on AC line .
Power Meter ROHDE & SCHWARZ mod.NRVS s.n. 841954/007
with measurement head NRV25 s.n. 841187/022
Signal generator Hewlett-Packard Mod. 8656B s.n. 2703U03718
Amplifier A/R Mod. 75A250 s.n. 24051
Directional coupler Amplifier Research Mod. DC3400 s.n. 303145
Coupling / Decoupling Network Fischer Custom Communication
(For the kind of CDN used see the table of results) .
- 4.4 Immunity against electromagnetic fields ranging from 80 ÷ 1000 MHz , 1400 ÷ 2000 MHz
with AM 80% at 1 kHz
Semianechoic Chamber SIEMENS 20 x 11 x 8m
Amplifier A/R Mod. 500W 80-1000MHz s.n. 304066
Amplifier A/R Mod. 50S1G4A 50W 0,8-4,2GHz s.n. 308271
Oscillator ROHDE & SCHWARZ SWM05 s.n. 863605/014
Power Meter ROHDE & SCHWARZ mod.NRVS s.n. 841954/007
with measurement head NRV25 s.n. 841187/022
Directional coupler AMPLIFIER RESEARCH mod. DC6180 s.n. 14108
Directional coupler AMPLIFIER RESEARCH mod. DC7144 s.n. 302459
Antenna EMCO 3145 s.n. 69598
Antenna EMCO 3109 s.n. 69597
Microwave Horn Antenna A/R Model AT4002A s.n. 307308
Isotropic sensor Holaday mod. HI4433 GRE s.n. 96710
- 4.5 Immunity against surge
Surge tester HAEFELY mod. PC6-288.1 s.n. 082 149-22
Coupling Filter HAEFELY mod. FP 20/3-3.2 s.n. 082 316-05
High Voltage Plug-in HAEFELY mod. PHV1.1 s.n. 082 266-04
Haefely Technology mod. IP6.2 s.n. 147980
Haefely Technology mod. DEC1A s.n. 148049

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 6 of 17

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4.6 Immunity against voltage dips and interruptions

Power System Analyzer ECAT - (Keytek)	s.n. 9605472
Power Source -EP61 (Keytek)	s.n. 9605473
Power Source -ER13 (Keytek)	s.n. 9706209
Power Source -EP94 (Keytek)	s.n. 9706211

4.7 Measure of the induced fluctuation on the AC line (Flicker)

Power System Analyzer ECAT - (Keytek)	s.n. 9605472
Power Source -EP61 (Keytek)	s.n. 9605473
Power Source -ER13 (Keytek)	s.n. 9706209
Power Source -EP94 (Keytek)	s.n. 9706211

4.8 Measure of harmonic components induced on the AC line

Power System Analyzer ECAT - (Keytek)	s.n. 9605472
Power Source -EP61 (Keytek)	s.n. 9605473
Power Source -ER13 (Keytek)	s.n. 9706209
Power Source -EP94 (Keytek)	s.n. 9706211



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5. **CONDIZIONI AMBIENTALI** Temperature 24°C - 42 % R.H. – Pressure 1002mb
ENVIRONMENTAL CONDITIONS

6. **INCERTEZZA DI MISURA**
MEASUREMENT UNCERTAINTY

<u>EXPANDED UNCERTAINTY,</u> <u>IN REFERENCE TO THE ELECTROMAGNETIC IMMUNITY TEST</u> The declared uncertainty is based on a standard uncertainty (k=2) providing a level of confidence of approximately 95%			
<u>Kind of test</u>	<u>Parameters</u>	<u>Expanded Uncertainty</u>	<u>Variance</u>
ESD	Output open circuit voltage	± 1,48%	≥50 (K=2)
	First peak value	± 1,6%	≥50 (K=2)
	Value 30ns	± 1,61%	≥50 (K=2)
	Value 60ns	± 1,61%	≥50 (K=2)
	Rise time of the first peak value	± 0,3%	≥50 (K=2)
BURST	Open circuit impulse duration	± 1,65%	≥50 (K=2)
	Rise time loaded at 50Ω	± 3,52%	≥50 (K=2)
	Pulse duration loaded at 50Ω	± 4,46%	≥50 (K=2)
	Output voltage	± 1,08%	≥50 (K=2)
	Repetition frequency	± 4,56%	≥50 (K=2)
	Duration of burst	± 1,66%	≥50 (K=2)
	Repetition time	± 1,97%	≥50 (K=2)
SURGE	Voltage value	± 1,08%	≥50 (K=2)
	Measured value of current	± 2,19%	≥50 (K=2)
	Time scale (1,2-50μs)	± 3,11%	≥50 (K=2)
CONDUCTED RF	Voltage value	± 6,2%	≥50 (K=2)
RADIATED RF	Electric field value	± 18.8%	≥50 (K=2)
VOLTAGE DIPS	Value of voltage fluctuations	± 10%	≥50 (K=2)
HARMONICS		± 0.068%	≥50 (K=2)
FLICKER		± 2.025%	≥50 (K=2)

7. **PIANO DI CAMPIONAMENTO** Campionamento effettuato dal richiedente
SAMPLING PLAN (sample selected by the customer)

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 8 of 17

Project manager:
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8. RISULTATI DELLE PROVE E/O MISURE

TEST AND / OR MEASUREMENT RESULTS

8.1 Immunity against electrostatic discharges

Ref. CEI EN 61000-4-2 : 2010 Immunity level required : $\pm 4\text{kV}$ contact discharge , $\pm 8\text{kV}$ air discharge Ref. Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003		
Discharges Procedures	Test level	Test result
Contact discharge Direct+Indirect	$\pm 4 \text{ kV}$	No degradation during and after the test (Passed)
Air discharge Direct	$\pm 8 \text{ kV}$	No degradation during and after the test (Passed)

Tab. 1

8.2 Immunity against fast transient (burst) on AC line .

Ref. CEI EN61000-4-4:2006 Immunity level required : $\pm 1\text{kV}$ Ref. Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003		
AC input power line	Test level	Test result
L1,L2,PE – GND	$\pm 1\text{kV}$	No degradation during and after the test (Passed)

Tab. 2

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 9 of 17

Project manager:
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8.3 Immunity to conducted disturbance, induced by radio frequency fields ranging from 150 kHz÷80 MHz AM 80% at 1 kHz on AC line .

Ref. CEI EN 61000-4-6 :2009 Immunity level required : 3V (rms ,unmodulated) with performance criterion A Ref. Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003			
AC input power line	Used C.D.N.	Test level	Test result
From GND and L1 - L2 - PE	FCC 801 M3 - 25	3V	No degradation during and after the test (Passed)

Tab. 3

8.4 Immunity against electromagnetic fields ranging from 80 ÷ 1000 MHz , 1400 ÷ 2000 MHz with AM 80% at 1 kHz

Ref. CEI EN 61000-4-3:2007 Immunity level required :3 V/m (unmodulated , rms) with performance criterion A Ref. Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003			
Polarization	Frequency	V/m	Test result
Horizontal	80MHz ÷ 1GHz	3	No degradation during and after the test (Passed)
Vertical	80MHz ÷ 1GHz	3	No degradation during and after the test (Passed)
Horizontal	1.4GHz ÷ 2GHz	3	No degradation during and after the test (Passed)
Vertical	1.4GHz ÷ 2GHz	3	No degradation during and after the test (Passed)

Tab. 4

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name:EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 10 of 17

Project manager:
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8.5 Immunity against surge

Ref. CEI EN 61000-4-5 : 2007		
Immunity level : Ref. Product Standard CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003		
AC input power line	Test level	Test result
L1 - L2	± 1 kV	No degradation during and after the test (Passed)
L1 - PE	± 2 kV	No degradation during and after the test (Passed)
L2 - PE	± 2 kV	No degradation during and after the test (Passed)

Tab. 5

8.6 Immunity against voltage dips and interruptions

Ref. CEI EN 61000-4-11 : 2006				
Immunity level and test conditions Ref. CEI EN 55024 : 1998 + A1 : 2001 + A2 : 2003				
PHENOMENA	Voltage Dip in % Vac	Duration (periods)	Performance Criteria	Test result
Voltage dips	>95 %	0.5	B	No degradation during and after the test (Passed)
Voltage dips	30 %	25	C	No degradation during and after the test (Passed)
Interruption	> 95 %	250	C	See remark 1 (Passed)

Tab. 6

Remark 1 : During the voltage interruption the equipments under test turn-off , at the restored power supply self turn-on with expulsion of the printed paper made up to before the power interruption , ready for printing again.

In reference to the acceptance criterion required (C) the test is passed.

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 11 of 17

Project manager:
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8.7 Measure of the induced fluctuation on the AC line (Flicker)

Rif. CEI EN 61000-3-3: 2009					
VAC : 230V Frequency : 50 Hz					
	Pst	Plt	dc(%)	dmax	dt(%)
Limite (Limit)	1	0.65	3.3 %	4 %	500ms
Valore misurato (Actual Value)	0.133	0.058	0	0	0

Tab. 7

Legend

Pst - The Highest Short Term Flicker Value

Plt - The Highest Long Term Flicker Value

dc% - The Highest Relative Steady State Voltage Change (1s)

dmax - The Highest Maximum Relative Voltage Change 4%

dt(%)-The Highest Instantaneous Voltage Change (10ms)

TEST RESULT : Passed



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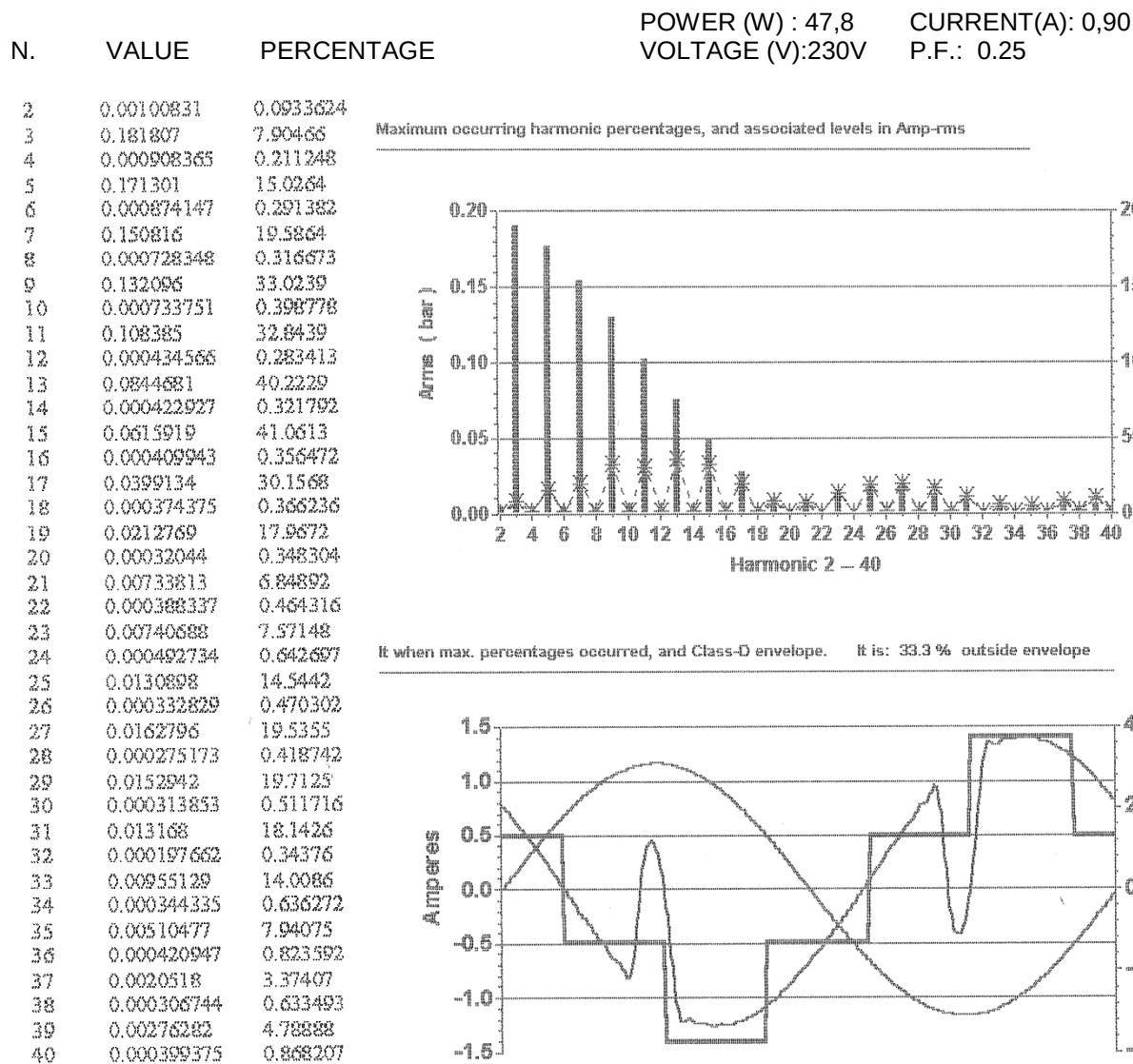
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8.8 Measure of harmonic components induced on the AC line

HARMONIC COMPONENTS INDUCED ON THE AC LINE
Ref. CEI EN 61000-3-2:2007+A1/A2:2011 – Class A – Steady state



Tab. 8

TEST RESULT : Passed

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name:EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 13 of 17

Project manager:
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9. **NOTE**
REMARKS

La configurazione e' stata fornita dal cliente

The configuration has been supplied by the customer.

Il cliente e' responsabile per i dati riportati al paragrafo 1.1 (Identificazione campione) e per la configurazione dell'EUT testato

The customer is responsible for the paragraph 1.1 reported data and for the configuration of the tested EUT.

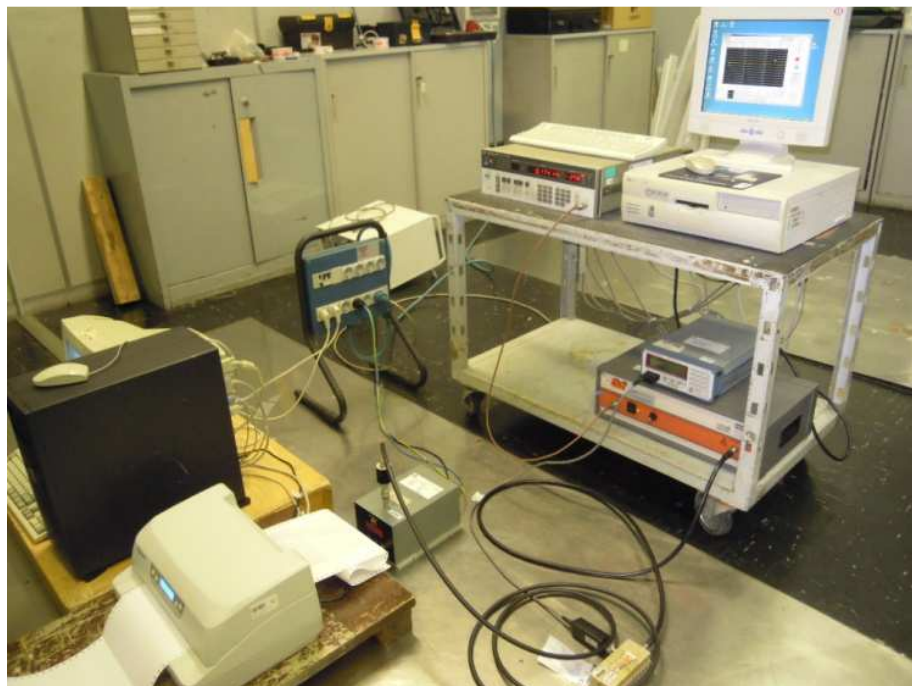
Il campione testato e' stato restituito al cliente

The sample under test was returned to the customer.

10. **APPENDICE (documentazione fotografica del setup di prova / allegati)**

APPENDIX (photographic report test setup / attachments)

This report has not attachments



Picture A : Immunity to conducted disturbance, induced by radio frequency fields, test set-up

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 14 of 17

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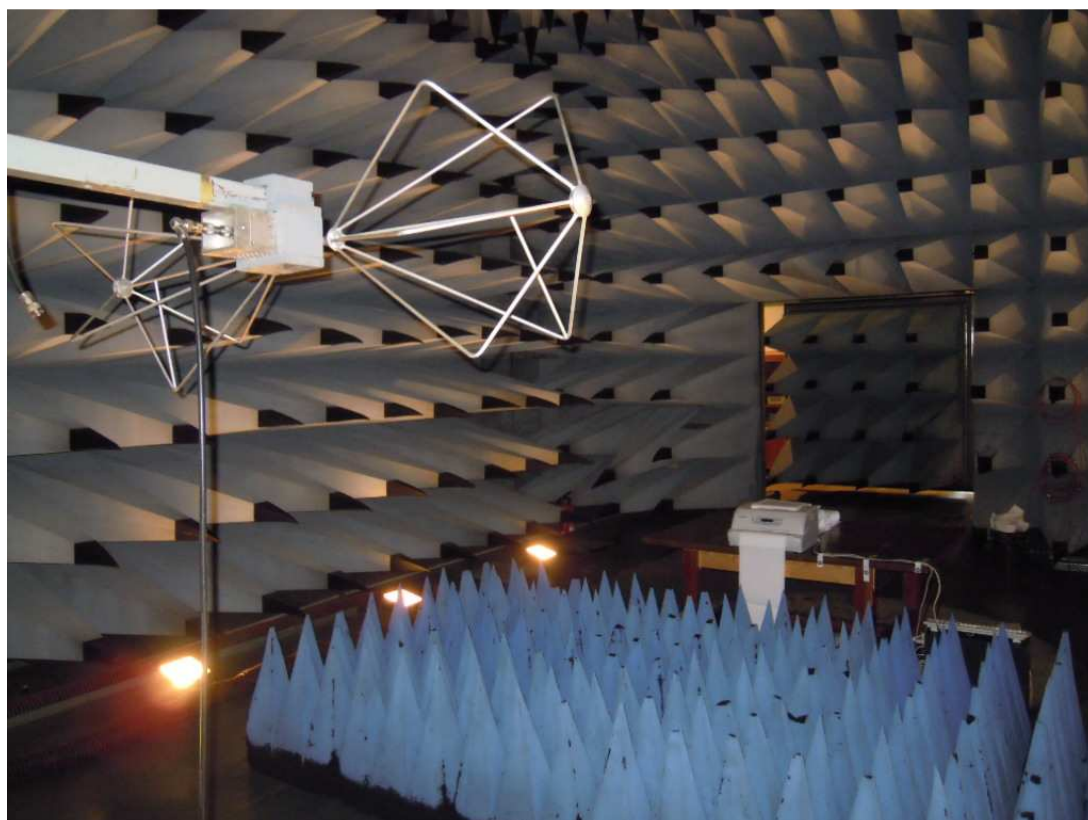


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**Picture B : Radiated radio – frequency electromagnetic field immunity
(EUT Detail), test set-up**

Form: ITA_F_09.01 (Rev.13 March 12, 2012)

Document name: EMC 12/165A
Test report no. : EMC 12/165A
Revision: 0
Page 15 of 17

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Choose certainty.
Add value.



Picture C : Immunity against voltage dips and interruption , Measure of the induced fluctuation (Flicker), and measure of harmonic components induced on the AC line, test set-up

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Test report no. : EMC 12/165A
Revision: 0
Page 16 of 17

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Choose certainty.
Add value.



Picture D : Immunity against surge

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Page 17 of 17

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