EMC TEST REPORT

According to

1) EN 55022: 1998+A1: 2000
2) EN 61000-3-2:2000
3) EN 61000-3-3: 1995+A1: 2001
4) EN 50130-4:1995+A1:1998
EN 61000-4-2: 1995+A2: 2001 / EN 61000-4-3: 1996+A2: 2001
EN 61000-4-4: 1995+A2: 2001 / EN61000-4-5: 1995+A1: 2001
EN 61000-4-6: 1996+A1: 2001 / EN 61000-4-11: 1994+A1: 2001
Main Supply Voltage Variations

EQUIPMENT : Barrier (Curtain) Sensor

MODEL NO. : BS-200, BS-400, BS-600, BS-800

APPLICANT : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

Test Engineer : SIMON LIU

Checked by : HADES HUANG

Issued Date : DEC. 12, 2003

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1. General

1.1 General Information :

Applicant : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

Manufacturer : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

Measurement Procedure : EN 55022 & EN 50130-4

1.2 Place of Measurement

PEP TESTING LABORATORY

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih, Taipei Hsien, Taiwan, R. O. C.
TEL : 8862-26922097 FAX : 8862-26956236

NVLAP LAB CODE 200097-0
FCC Registration No. : 90868
Nemko Aut. No. : ELA133
BSMI Aut. No. : SL2-IN-E-11,SL2-A1-E-11
VCCI Registration No. : C-493/R-477

1.3 Test standard

Tested for compliance with :

EN 55022:1998 +A1: 2000	- Information Technology Equipment – Radio disturbance characteristics - Limits and methods of measurement
EN 61000-3-2: 2000	- Electromagnetic compatibility (EMC) Part 3-2: Limits – Limits for harmonic current emissions (equipment input Current up to and including 16A per phase
EN 61000-3-3: 1995 +A1: 2001	- Electromagnetic compatibility (EMC) Part 3-2: Limits – Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to 16A

EN 50130-4:1995+A1: 1998	- Alarm systems – Part 4. Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-4-2: 1995 +A2: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 2: Electrostatic discharge immunity test Basic EMC Publication
EN 61000-4-3: 1996 +A2: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 3: Radiated, radio-Frequency, electromagnetic field immunity test
EN 61000-4-4: 1995 +A2: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 4: Electrical fast transient / Burst immunity test Basic EMC publication
EN 61000-4-5: 1995 +A1: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 5: Surge immunity test (includes corrigendum: 1995)
EN 61000-4-6: 1996 +A1: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 6: Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11: 1994 +A1: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 11: Voltage dips, short interruptions and voltage variations immunity tests

2. Product Information

a.	**EUT Name:**	Barrier (Curtain) Sensor
b.	**Model No.：**	BS-800
c.	**CPU Type：**	N/A
d.	**CPU Frequency：**	N/A
e.	**Crystal/Oscillator(s) ：**	4 MHz
f.	**Chassis Used：**	ABS
g.	**Port/Connector(s) ：**	N/A
h.	**Power Rating：**	DC 10~30V
i.	**Condition of the EUT :**	☐ Prototype Sample ☑ Engineering Sample ☐ Production Sample
j.	**Test Item Receipt Date :**	DEC. 08, 2003

2a. Product Technical Judgement

Based on the major electrical and mechanical constrictions of the EUT, We hereby declare that the subject product does fully comply with the following EMC requirements without additional test required :

1) EN 61000-3-2: 2000
2) EN 61000-3-3: 1995+A1: 2001
3) EN 61000-4-6: 1996+A1: 2001
4) EN 61000-4-11: 1994+A1: 2001

These test standards will be applicable to both of PEP EMC verification and declaration of conformity for technical reference.

3. EUT Description and Test Conclusion

The equipment under test (EUT) is Barrier (Curtain) Sensor model BS-800, BS-600, BS-400 and BS-200. These models have identical electrical designed and construction except the followings are different:

Model No.	BS-800	BS-600	BS-400	BS-200
Beams	8 beams	6 beams	4 beams	2 beams
Height (housing)	201 cm	153 cm	105 cm	57 cm

After verifying these models, we only took the worst-case model BS-800 for test. The EUT that consists of two parts is used for the application of indoor/outdoor security system. The maximum sensing range of EUT is 8 meters outdoor. DC 10V~30V from any DC power source is required to operate EUT. For more detail specification about the EUT, please refer to the user's manual.

Test method: According to the major function designed, the EUT configuration was set up by the following steps for test.

(A) Erect EUT and arrange its placement within sensing range.
(B) Feed EUT DC 12V from DC power supply.

The EUT configuration was set to proceed with test. The test was carried out on EUT operational condition and the worst-case test result was recorded and provided in this report.

Conducted emission test:
N/A

Radiated emission test:
The maximum readings were found by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.
The highest emissions were also analyzed in details by operating the spectrum analyzer in fixed tuned quasi-peak mode to determine the precise amplitude of the emissions.

In addition, the following test standards are applicable for related tests being carried out on the same EUT configuration and operational condition kept during radiated emission test :

EN 61000-4-2, EN 61000-4-3, EN 61000-4-4 and EN 61000-4-5, and Main Supply Voltage Variations.

4. Modification(s):

N/A

5. Test Software Used

N/A

6. Support Equipment Used

1. DC Power Supply	**Manufacturer**：ABM **Model Number**：9306D **Power Cord**：Non-Shielded, Detachable, 1m
2. DC Power Supply	**Manufacturer**：ESCORT **Model Number**：3030SD **Power Cord**：Non-Shielded, Detachable, 1m

7. EN 55022 Conducted Disturbance Test

Test Standard	Model No.	Result
EN 55022	BS-800	N/A

8. EN 55022 Radiated Disturbance Test

Test Standard	Model No.	Result
EN 55022	BS-800	Passed

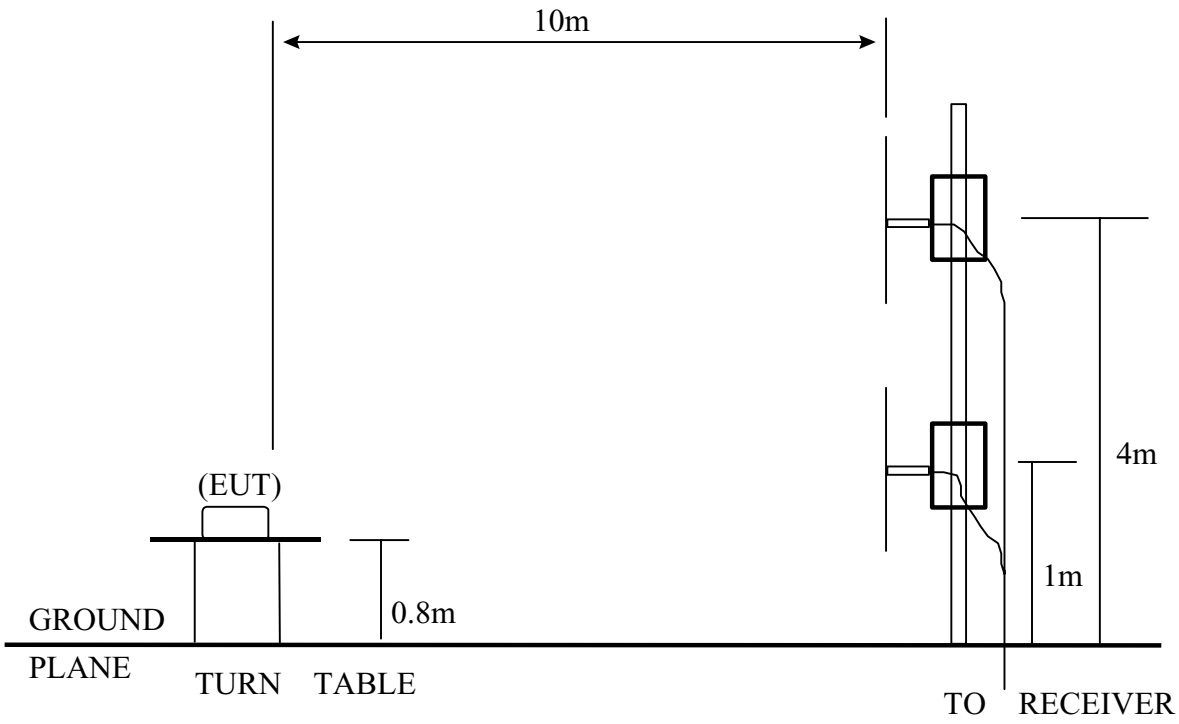
8.1 Radiated Disturbance Test Description

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna were used.

Final measurements were made outdoors at 10-meter test range using biconical, dipole antenna or horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.

8.2 Radiated Disturbance Test Setup



EUT = Equipment Under Test

8.3 Radiated Disturbance Test Limits

Limits for radiated disturbance of Class A ITE at
a measuring distance of 10 m

Frequency MHz	Field Strength dB(μ V/m)
30 to 230	40
230 to 1 000	47
NOTES 1 The lower limit shall apply at the transition frequency. 2 Additional provisions may be required for cases where interference occurs.	

Limits for radiated disturbance of Class B ITE at
a measuring distance of 10 m

Frequency MHz	Field Strength dB(μ V/m)
30 to 230	30
230 to 1 000	37
NOTES 1 The lower limit shall apply at the transition frequency. 2 Additional provisions may be required for cases where interference occurs.	

8.4 Radiated Disturbance Test Setup Photos

< FRONT VIEW >

< REAR VIEW >

8.5 Radiated Disturbance Test Data

Model No. : BS-800
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 27° C Humidity : 56 %

Antenna polarization : HORIZONTAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
30.089	24.83	- 5.17	30.00	25.96	18.47	0.40	20.00	121.0	4.0
44.358	20.19	- 9.81	30.00	27.61	11.96	0.61	19.99	179.0	4.0
120.519	19.37	-10.63	30.00	32.07	6.26	0.92	19.88	256.0	4.0
229.332	18.79	-11.21	30.00	27.44	9.37	1.52	19.54	308.0	4.0
743.704	28.28	- 8.72	37.00	20.67	24.00	2.79	19.18	213.0	3.5
970.658	30.71	- 6.29	37.00	20.96	25.28	3.37	18.90	106.0	3.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : BS-800
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 27 ° C Humidity : 56 %

Antenna polarization : VERTICAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
31.810	27.81	- 2.19	30.00	29.88	17.57	0.40	20.04	254.0	1.0
52.210	26.83	- 3.17	30.00	36.57	9.64	0.55	19.93	165.0	1.0
60.037	28.72	- 1.28	30.00	38.49	9.23	0.70	19.70	97.0	1.0
120.496	23.64	- 6.36	30.00	36.34	6.26	0.92	19.88	132.0	1.0
817.333	26.64	-10.36	37.00	19.88	22.69	3.16	19.09	269.0	1.5
970.657	28.77	- 8.23	37.00	19.02	25.28	3.37	18.90	312.0	1.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

9. EN 61000-4-2 Electrostatic Discharge Test

Test standard	Model No.	Result
EN 61000-4-2	BS-800	Passed

Criteria for Compliance:

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs.

9.1 Electrostatic Discharge Test Description

This standard relates to equipment, systems, sub-systems and peripherals which may be involved in static electricity discharges owing to environmental and installation conditions. such as low relative humidity, use of low-conductivity (artificial-fibre) carpets, vinyl garments, etc., which may exist in allocations classified in standards relevant to electrical and electronic equipment.

The test set-up shall consist of a wooden able, 0.8 m high standing on the ground reference plane. A horizontal coupling plane(HCP), 1.6 m x 0.8 m, shall be placed on the table. The EUT and cables shall be isolated from the coupling plane by an insulating support 0.5 mm thick .
A ground reference plane shall be provided on floor of the laboratory. It shall be metallic sheet of 0.25 mm minimum thickness. The minimum size of the reference plane is 1 m, the exact size depending on the dimensions of the EUT .

It shall project beyond the EUT or coupling plane by at least 0.5 m on all sides. and shall be connected to the protective grounding system.
In order to minimize the impact of environmental parameters on test results, the tests shall be carried out in climatic and electromagnetic reference conditions.

Climatic conditions

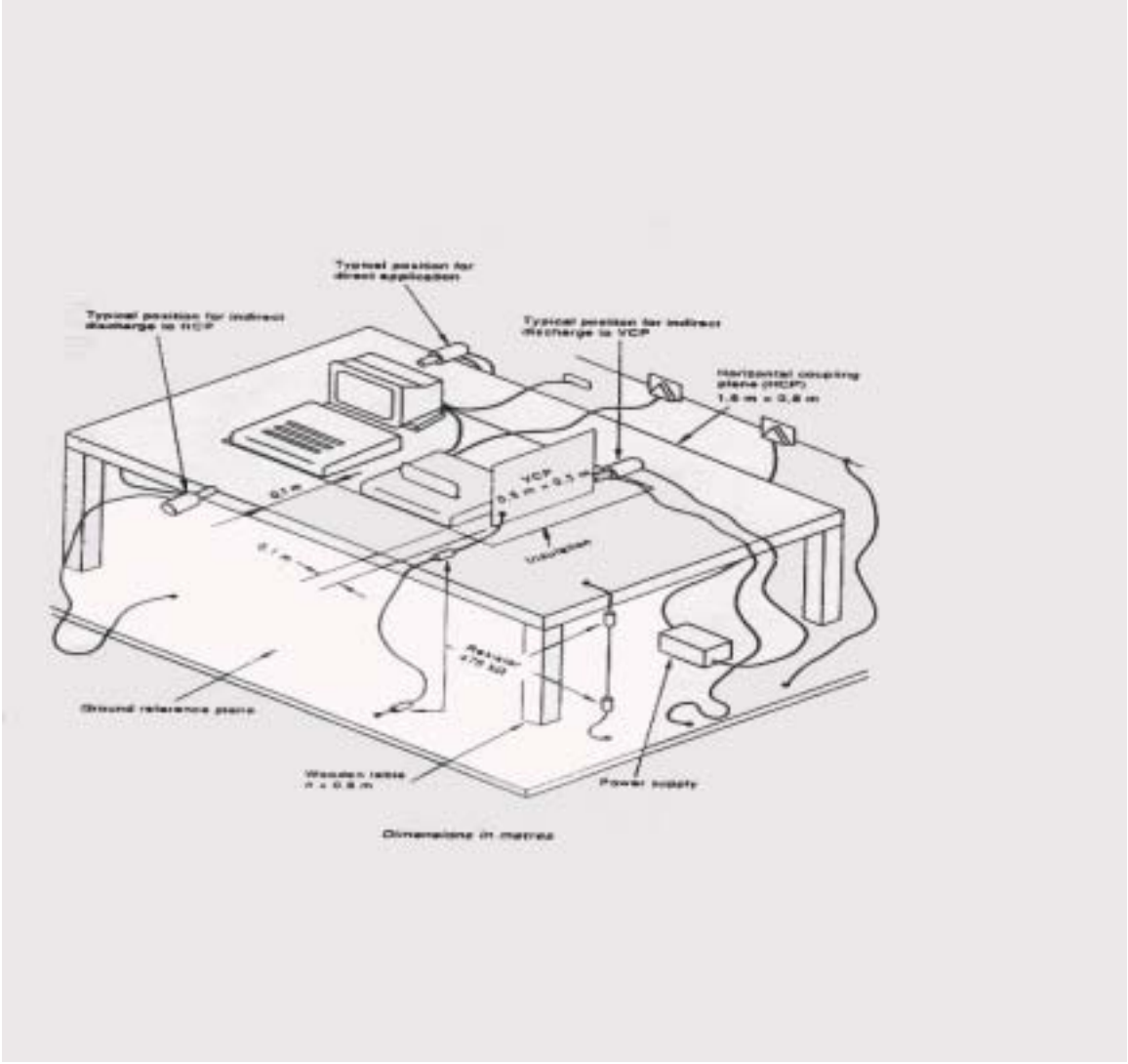
- ambient temperature: 15 ℃ to 35℃;
- relative humidity: 30 % to 60%
- atmospheric pressure: 86 KPa (860 mbar) to 106 KPa (1 060 mbar).

NOTE – Any other values are specified in the product specification.

Electromagnetic conditions

The electromagnetic environment of the laboratory shall not influence the test results.

9.2 Electrostatic Discharge Test Setup



- Example of test set-up for table-top equipment, laboratory tests

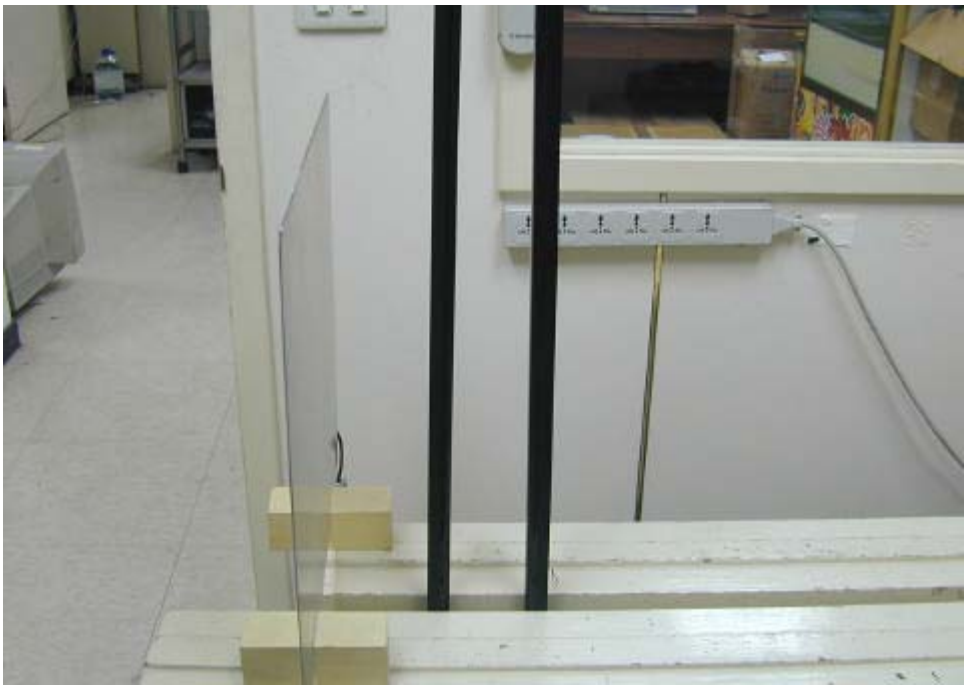
9.3 Electrostatic Discharge Test Limits

Test voltages[1]:		
Air discharges	(kV)	2; 4 & 8
Contact discharges	(kV)	2; 4 & 6
Polarity		+ & -
Number of discharges per point for each voltage and polarity		10
Interval between discharges	(s)	=1

[1]The test voltages specified are the open-circuit voltages.
The test voltages for the lower severity levels are included because all the lower severity levels must also be satisfied.

9.4 Direct Discharge Test Drawing

Indirect Discharge Test Drawing



9.5 Electrostatic Discharge Test Data(Direct Discharge)

Model No. : BS-800

Test Item : **Direct Discharge** Instrument : NoiseKen ESS-100L

Temperature : 27 ℃ Relative Humidity : 43 %RH

Storage Capacitor : 150 pf Discharge Resistor : 330 Ohm

Discharge Rate : < 1 / Sec

	Contact Discharge								**Air Discharge**							
	2 KV		4 KV		6 KV		8 KV		2 KV		4 KV		6 KV		8 KV	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
2	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
3	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
4	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
5	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
6	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
7	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
8	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
9	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P
10	P	P	P	P	P	P	/	/	P	P	P	P	P	P	P	P

1. 〃 P 〃- - - - means the EUT function is correct during the test .

2. 〃 / 〃- - - - no test.

Electrostatic Discharge Test Data(Indirect Discharge)

Model No. : BS-800

Test Item : **Indirect Discharge** Instrument : NoiseKen ESS-100L

Temperature : 27 ℃ Relative Humidity : 43 %RH

Storage Capacitor : 150 pf Discharge Resistor : 330 Ohm

Discharge Rate : < 1 / Sec

	Contact Discharge								**Air Discharge**							
	2 KV		4 KV		6 KV		8 KV		2 KV		4 KV		8 KV		15 KV	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1	P	P	P	P	P	P	/	/	/	/	/	/	/	/	/	/
2	P	P	P	P	P	P	/	/	/	/	/	/	/	/	/	/
3	P	P	P	P	P	P	/	/	/	/	/	/	/	/	/	/
4	P	P	P	P	P	P	/	/	/	/	/	/	/	/	/	/
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8	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

1. " P " - - - - means the EUT function is correct during the test .

2. " / " - - - - no test.

10. EN 61000-4-3 Radio-Frequency Electromagnetic Field Test

Test standard	Model No.	Result
EN 61000-4-3	BS-800	Passed

Field Strength : 10 V/M ,

Modulation : AM 80 % , 1KHz . ON (YES) . OFF (____)

Start : 80 MHz , Stop : 1000 MHz . DC Power : 12 Vdc

Pulse modulation: 1 Hz ON (YES) . OFF (____)

Start : 80 MHz , Stop : 1000 MHz . DC Power : 12 Vdc

Criteria for Compliance:

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs.

10.1 Radio-Frequency Electromagnetic Field Test Description

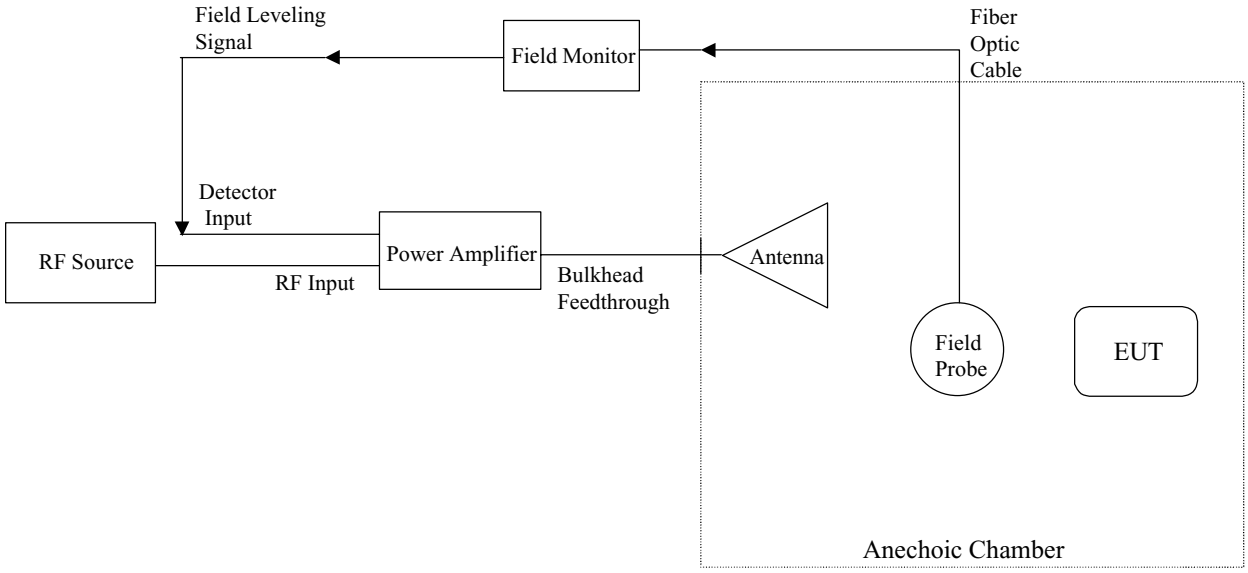
Most electronic equipment is, in some manner, affected by electromagnetic radiation.
This radiation is frequently generated by such sources as the small hand-held radio transceivers that are used by operating, maintenance and security personnel, fixed-station radio and television transmitters, vehicle radio transmitters, and various industrial electromagnetic sources.

In addition to electromagnetic energy deliberately generated, there is also spurious radiation caused by devices such as welders, thyristors, fluorescent lights, switches operating inductive loads, etc. For the most part, this interference manifests itself as conducted electrical interference and, as such, is dealt with in other parts of this standard. Methods employed to prevent effects from electromagnetic fields will normally also reduce the effects from these sources.
The electromagnetic environment is determined by the strength of the electromagnetic field (field strength in volts per metre). The field strength is not easily measured without sophisticated instrumentation nor is it easily calculated by classical equations and formulae because of the effect of surrounding structures or the proximity of other equipment that will distort and/or reflect the electromagnetic waves.

All testing of equipment shall be performed in a configuration as close as possible to the installed case. Wiring shall be consistent with the manufacturer's recommended procedures, and the equipment shall be in its housing with all covers and access panels in place, unless otherwise stated.

If the equipment is designed to be mounted in a panel, rack or cabinet, it shall be tested in this configuration.

10.2 Radio-Frequency Electromagnetic Field Test Block Diagram



10.3 Radio-Frequency Electromagnetic Field Test Limits

Frequency range	(MHz)	80 to 1000
Field strength[1)]	(V/m)	10
Modulation: Amplitude modulation Pulse modulation		 80%, 1 kHz, sinusoidal 1 Hz (0.5 s ON: 0.5 s OFF)

[1)] The field strength quoted is the RMS value for the continuous wave, before modulation.

10.4 Radio-Frequency Electromagnetic Field Test Setup Photo

< FRONT VIEW >

11. EN 61000-4-4 Fast Transient Burst Test

Test standard	Model No.	Result
EN 61000-4-4	BS-800	Passed

Criteria for Compliance:

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the bursts is permissible, providing that there is no residual change in the EUT or any change in outputs.

11.1 Fast Transient Bursts Test Description

The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled into power supply, control and signal ports of electrical and electronic equipment. Significant for the test are the short rise time, the repetition rate and the low energy of the transients.

The test shall be carried out on the basis of a test plan including verification of the performances of the EUT as defined in the technical specification.

Climatic conditions

The tests shall be carried out in standard climatic conditions in accordance with IEC 68-1:

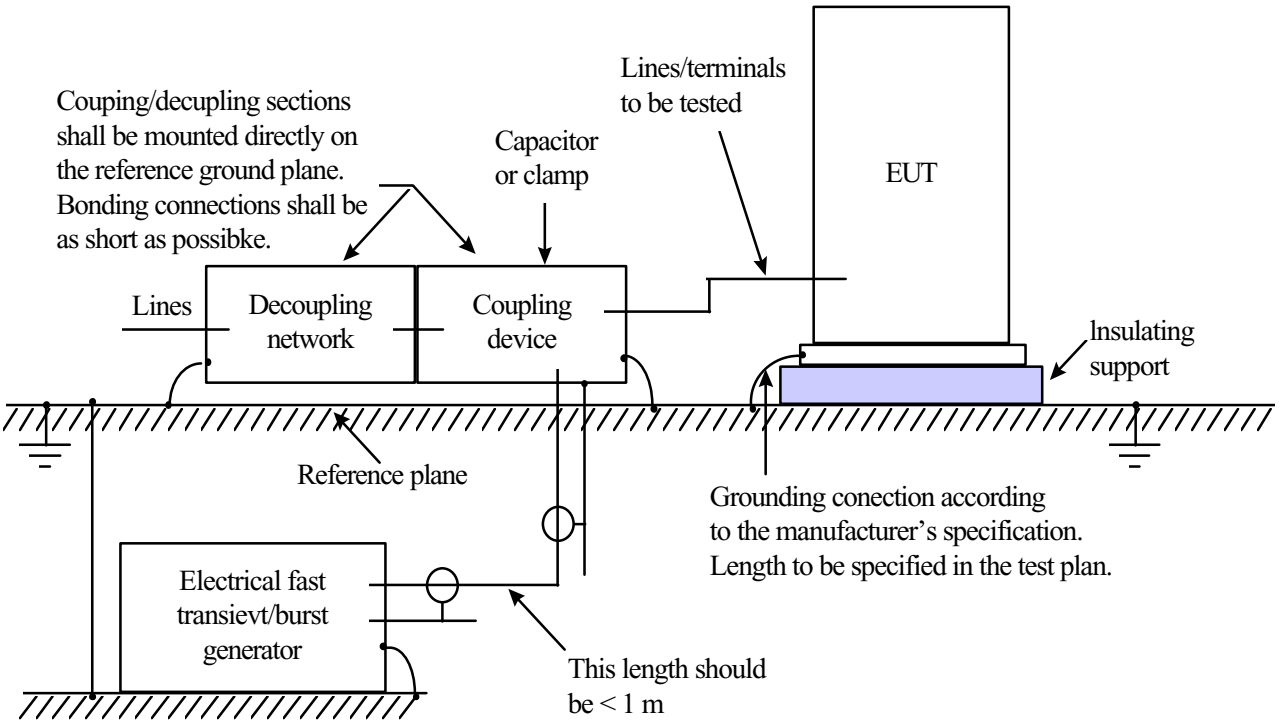
- ambient temperature: 15℃ to 35℃
- relative humidity: 25% to 75%
- atmospheric pressure: 86kPa (860 mbar) to 106Kpa (1 060 mbar)

NOTE – Any other values are specified in the product specification.

Electromagnetic conditions

The electromagnetic conditions of the laboratory shall be such to guarantee the correct operation of the EUT in order not to influence the test results.

11.2 Fast Transient Burst Test Setup



Block-diagram for electrical fast transient/burst immunity test

11.3 Fast Transient Burst Test Limits

Test voltages:[1)]		0.5; 1 & 2
a. c. mains supply lines	(kV)	
other supply/signal lines	(kV)	0.25; 0.5 & 1
Polarity		+ & -
Number of applications for each voltage and polarity		1
Duration per application	(min)	$1^{+0.2}_{-0}$

[1)] The test voltages specified are the open-circuit voltages. The test voltages for the lower severity levels are included because all the lower severity levels must also be satisfied.

11.4 Fast Transient Burst Test Setup Photo

< FRONT VIEW >

11.5 Fast Transient Burst Test Data

MODEL NO. : BS-800

REGULATION : **According to EN 61000-4-4 (1995+A2: 2001) Spec .**

TEST RESULT

Temperature : 27 degree .	Duration of tests : 1 min .
Relative Humidity : 43 % RH .	Time between test : 60 second .
Pulse : 5 / 50 ns .	AC Power : N/A Vac .
Burst : 15 ms / 300 ms .	DC Power : 12 Vdc .

Voltage \ Polarity \ Test Point \ Mode \ Result		0.5 **KV**		1 **KV**		**2KV**	
		+	-	+	-	+	-
Power Line	L	P[1)]	P	P	P	/	/
	N	P	P	P	P	/	/
	G	/[3)]	/	/	/	/	/
Signal Lines[4)] Clamp Test		0.25 **KV**		0.5 **KV**		1 **KV**	
		+	-	+	-	+	-
		/	/	/	/	/	/

Note : 1. " P " mean the EUT function is correct during the test .
2. " F " - - - - Fail
3. " / " - - - - no test
4. Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3m.

12. EN 61000-4-5 Surge Immunity Test

Test standard	Model No.	Result
EN 61000-4-5	BS-800	Passed

Criteria for Compliance:

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the surge is permissible, providing that there is no residual change in the EUT or any change in outputs.

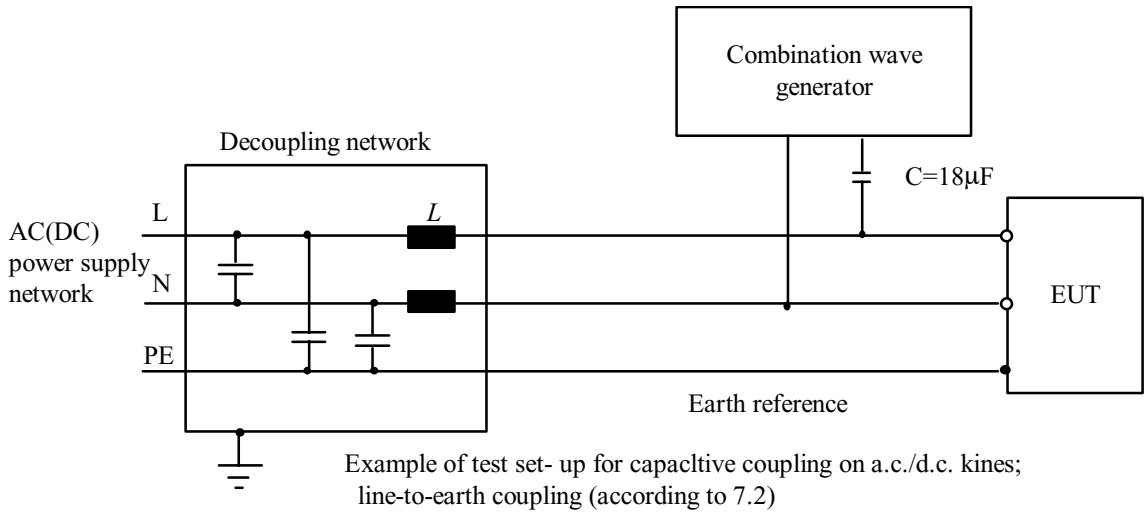
12.1 Surge Immunity Test Description

The task of the described laboratory test is to find the reaction of the EUT under specified operational conditions caused by surge voltages from switching and lightning effects at certain threat levels.

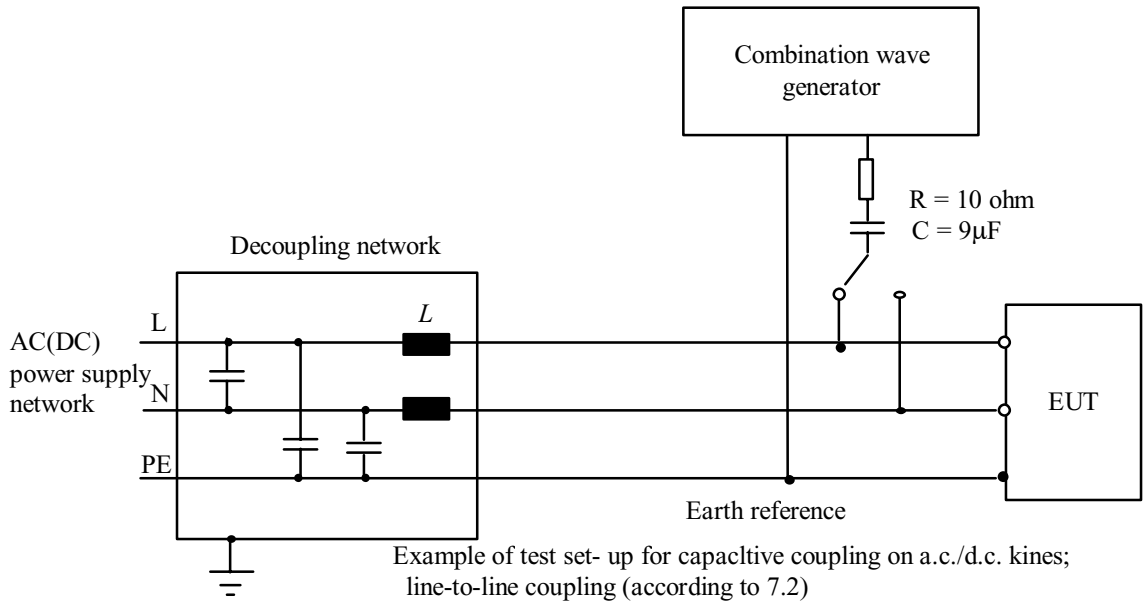
The following equipment is part of the test set-up :
- equipment under test (EUT);
- auxiliary equipment (AE);
- cables (of specified type and length);
- coupling device (capacitive or arrestors);
- test generator (combination wave generator, 1.2/50 μs generator);
- decoupling network/protection devices;
- additional resistors, 10 ohm and 40 ohm

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be developed on the lines under test .

12.2 Surge Immunity Test Setup



Example of test set- up for capacltive coupling on a.c./d.c. kines; line-to-earth coupling (according to 7.2)



Example of test set- up for capacltive coupling on a.c./d.c. kines; line-to-line coupling (according to 7.2)

12.3 Surge Immunity Test Limits

Test voltages[1] :		
a. c. mains supply lines:		
- line-to-line	(kV)	0.5 & 1
- line-to-ground[2]	(kV)	0.5; 1& 2
other supply/signal lines:		
- line-to-ground[3]	(kV)	0.5 & 1
Polarity		+ & -
Minimum number of surges at each polarity, voltage, coupling mode and line:		
- a. c. mains supply lines		20[4]
- other supply/signal lines		5

[1] The test voltages specified are the open-circuit voltages. The test voltages for the lower severity levels are included, because all the lower severity levels must also be satisfied.

[2] via a 10 O series resistor.

[3] via a 10 O series resistor.

[4] 5 at each zero-crossing point and at the maximum and minimum points on he mains voltage wave.

12.4 Surge Immunity Test Setup Photo

< FRONT VIEW >

12.5 Surge Immunity Test Data

MODEL NO : BS-800

TEST SETUP : According to EN 61000-4-5 (1995+A1: 2001)

Temperature : 27 ℃ Relative Humidity 43 %RH

Waveform : 1,2 x 50 μs Test rate : 15 sec

Times 20 times / each condition DC power 12 VDC

\Phase \Voltage\Mode\Polarity\Result			0	45	90	135	180	215	270	315
a.c. mains supply 0.5KV	Line Neutral	+	/	/	/	/	/	/	/	/
		-	/	/	/	/	/	/	/	/
a.c. mains supply 1KV	Line Neutral	+	/	/	/	/	/	/	/	/
		-	/	/	/	/	/	/	/	/
a.c. mains supply 0.5KV 1KV 2KV	Line Ground	+	/	/	/	/	/	/	/	/
		-	/	/	/	/	/	/	/	/
	Neutral Ground	+	/	/	/	/	/	/	/	/
		-	/	/	/	/	/	/	/	/
Signal line 0.5KV 1KV	Line Ground	+	P	P	P	P	P	P	P	P
		-	P	P	P	P	P	P	P	P
	Neutral Ground	+	/	/	/	/	/	/	/	/
		-	/	/	/	/	/	/	/	/

Note : 1. " P " means the EUT function is correct during the test

2. " / " no test

13. EN 50130-4 Clause 7 Mains Supply Voltage Variations Test

Test standard	Model No.	Result
EN 50130-4 Clause 7	BS-800	Passed

Criteria for Compliance:

There shall be no damage, malfunction or change of status due to the different supply voltage conditions. The EUT shall meet the acceptance criteria for the functional test, during the conditioning.

13.1 EN 50130-4 Clause 7 Mains Supply Voltage Variations Tests Description

To demonstrate the ability of the equipment to function correctly over the anticipated range of mains supply voltage conditions.

Subject the specimen to each of the power supply conditions, indicated in table 1, until temperature stability is reached:

Table 1	
Supply voltage max (Umax)	**Unom + 10%**
Supply voltage min (Umin)	**Unom – 15%**
Unom = Nominal mains voltage. Where provision is made to Adapt the equipment to suit a number of nominal supply voltages (e.g. by transformer tap changing), the above conditioning severity shall be applied for each nominal voltage, with the equipment suitably adapted. For equipment which is claimed to be suitable for a range of nominal mains voltages(e.g.220/240 V) without adaptation, Umax = (Maximum Unom) + 10%,and Umin = (Minimum Unom) – 15%. In any case the range of Unom must include the European nominal mains voltage of 230 V.	

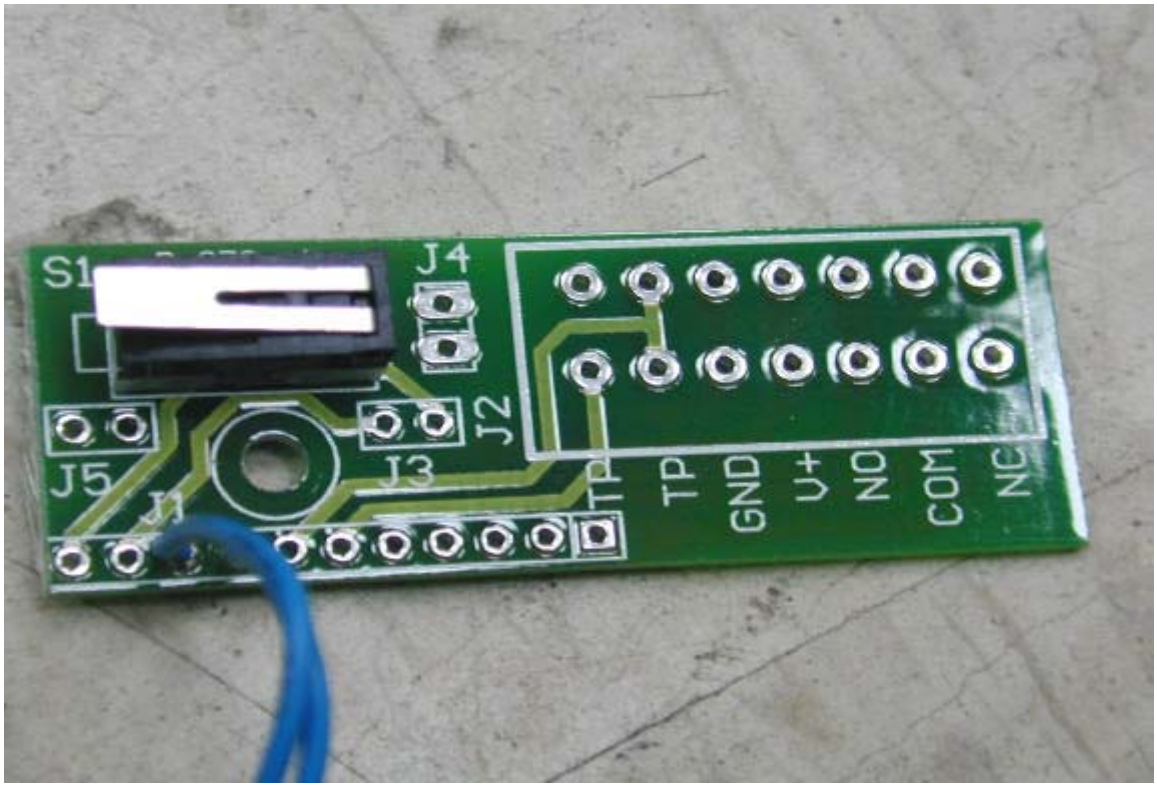
14. The List of Test Instruments

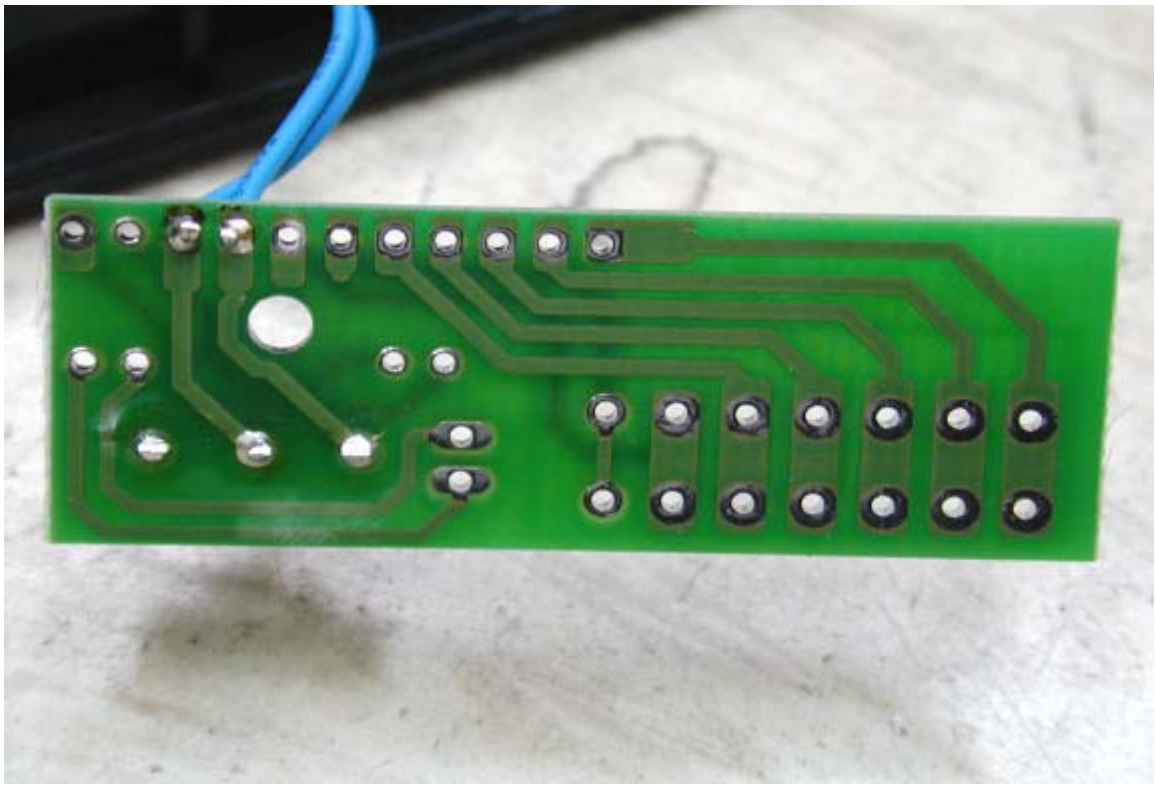
Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Conduction (No.1)	R & S Receiver	ESHS10	830223/008	May 22, 2004	1Year
	Rolf Heine LISN	NNB-4/63TL	98008	May 01, 2004	1Year
	R & S LISN	ESH3-Z5	844982/039	Aug. 06, 2004	1Year
	Spectrum Analyzer	R3261A	91720076	June 08, 2004	1Year
	RF Cable	Rg400	N/A	May 12, 2004	1Year
	Schaffner ISN	T411	N/A	June 29, 2004	1Year
Radiation (OP No.1)	R & S Receiver	ESVS30	863342/012	May 22, 2004	1Year
	Schaffner Pre-amplifier	CPA9232	1028	May 20, 2004	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 21, 2004	2Year
	Schwarzbeck Precision Dipole Ant	VHAP (30MHz~1GHz)	970 + 971 953 + 954	June 26, 2006	3Year
	R &S Signal Generator	SMY01	841104/037	Apr. 29, 2004	2Year
	RF Cable	No. 1	N/A	May 11, 2004	1Year
	EMCO Antenna	3142B (26MHz~2GHz)	9904-1370	Aug. 24, 2004	1Year

Test Mode	Test item	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
EMS (NO.1)	4-2	ESD Test System	ESS-100L (A)TC-815D	4099C01970	July 14, 2004	1Year
	4-3	Comtest G-Strip	G-320	CC112-0008	Oct. 01, 2005	2Year
	4-4	KeyTek EFT Noise Generator	CE-40	9508266	Jan. 27, 2005	2Year
	4-5	HAEFELY Surge Tester	PSURGE 4	083665-17	Dec. 18, 2004	2Year
	4-3 4-6	HP Signal Generator	8648A	3619U00426	Sep. 14, 2004	1Year

15. EUT Photographs

MODEL NO. : BS-800


S1
J4
J2
J3
J5
J1
TP
TP
GND
V+
NO
COM
NC



VERIFICATION

of conformity with European EMC Directive

No. E920735

Document holder: **YUAN HSUN ELECTRIC CO., LTD.**

Type of equipment: **Barrier (Curtain) Sensor**

Type designation: **BS-200, BS-400, BS-600, BS-800**

A sample of the equipment has been tested for CE-marking according to the EMC Directive, 89/336/EEC. & 92/31/EEC & 93/68/EEC *Standard(s) used for showing compliance with the essential requirements of the directive:*

Standard(s):

EN 55022 : 1998 + A1: 2000 — Class B
EN 61000-3-2:2000
EN 61000-3-3:1995 + A1: 2001

Performance Criterion

EN 50130-4 :1995 + A1:1998

EN 61000-4-2: 1995 + A2: 2001
EN 61000-4-3: 1996 + A2: 2001
EN 61000-4-4: 1995 + A2: 2001
EN 61000-4-5: 1995 + A1: 2001
EN 61000-4-6: 1996 + A1: 2001
EN 61000-4-11: 1994 + A1: 2001
Main Supply Voltage Variations

The referred test report(s) show that the product fulfills the requirements in the EMC Directive for CE marking. On this basis, together with the manufacturer's own documented production control, the manufacturer (or his European authorized representative) can in his EC Declaration of Conformity verify compliance with the EMC Directive.

Signed for and on behalf of
PEP Testing Laboratory

PEP Testing Laboratory

M. Y. Tsui

Date: DEC. 12, 2003

M. Y. Tsui / President

Declaration of Conformity

The following

Applicant : **YUAN HSUN ELECTRIC CO., LTD.**

Equipment : **Barrier (Curtain) Sensor**

Model No. : **BS-200, BS-400, BS-600, BS-800**

Report No. : **E920735**

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility(89/336/EEC) and the amendments in the Council Directive 92/31/EEC, 93/68/EEC.

For the evaluation of above mentioned Directives, the following standards were applied:

1) EN 55022: 1998+A1 : 2000 Class B
2) EN 61000-3-2 : 2000
3) EN 61000-3-3 : 1995+A1: 2001
4) EN 50130-4:1995 +A1:1998
   EN 61000-4-2 : 1995+A2: 2001
   EN 61000-4-3 : 1996+A2: 2001
   EN 61000-4-4 : 1995+A2: 2001
   EN 61000-4-5 : 1995+A1: 2001
   EN 61000-4-6 : 1996+A1: 2001
   EN 61000-4-11 : 1994+A1: 2001
   Main Supply Voltage Variations

The following manufacturer is responsible for this declaration:

YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813,
TAIWAN, R. O. C.

TAIWAN / DEC. 12, 2003

Place and Date

Signature of responsible Person