TEST REPORT CONCERNING THE COMPLIANCE OF A FLEXIBLE ANALYZER FOR MEASUREMENT OF HYDROCARBONS, BRAND SYNSPEC, MODEL GC955, IN ACCORDANCE WITH THE STANDARDS: EN 61000-6-2:2001, EN 61000-6-3:2001 AND EN 61326:1997 AND ALL RELEVANT AMENDMENTS (EMISSION AND IMMUNITY)

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VCCI registered	: R-1518, C-1598

TNO Electronic Products and Services (EPS) B.V.
P.O. Box 15
9822 ZG Niekerk (NL)
Smidshornerweg 18
9822 TL Niekerk (NL)

Telephone: +31 594 505005
Telefax: +31 594 504804

E-mail: info@tno-eps.nl

Description of test item

Test item	:	Flexible analyzer for measurement of hydrocarbons
Manufacturer	:	Synspec B.V.
Brand mark	:	Synspec
Model/Partnumber	:	GC955
Serial number(s)	:	--
Revision	:	--
Receipt number	:	1
Receipt date	:	November 11, 2006

Applicant information

Applicant's representative	:	Mr. H. Bakema
Company	:	Synspec B.V.
Address	:	De Deimten 1
Postal code	:	9747 AV
City	:	Groningen
PO-box	:	--
Postal code	:	--
City	:	--
Country	:	The Netherlands
Telephone number	:	+31 (0)50 526 6454
Telefax number	:	+31 (0)50 525 65 40

Test performed

Location	:	Niekerk
Test(s) started	:	November 11, 2006
Test(s) completed	:	February 28, 2007
Purpose of test(s)	:	Compliance with relevant standards
Test specification(s)	:	EN 61000-6-2: 2001; EN 61000-6-3:2001 and EN 61326:1997 and all relevant amendments (emission and immunity)
Test engineer	:	T.E.T. Koning
Projectleader	:	T.E.T. Koning
Report written by	:	T.E.T. Koning
Report approved by	:	H.J. Pieters
Report date	:	March 8, 2007

This report is in conformity with NEN-EN-ISO/IEC 17025: 2000.

The test results relate only to the item(s) tested.

Table of contents

1 General.

1.1 Applied standards.

The flexible analyzer for measurement of hydrocarbons, model/type GC955, has been tested in accordance with the standards EN 61000-6-2:2001, EN 61000-6-3: 2001 and 61326:1997 and all relevant amendments (emission and immunity).

1.2 Detailed description of test configuration, input and output ports.

The flexible analyzer for measurement of hydrocarbons, model/type GC955, in the configuration as described below, will be referred to as EUT for the purpose of this test report.

1.2.1 Description of test configuration.

Test item	:	Flexible analyzer for measurement of hydrocarbons
Manufacturer	:	Synspec B.V.
Brand	:	Synspec
Model/partnumber	:	Model GC955
Type	:	---
Serial number	:	---
Voltage input rating	:	230 V AC
Remarks	:	---

1.2.2 Description of tested input and output ports.

Number	Terminal	From	To	Remarks
1	AC power	Mains power supply	EUT	-
2	Controlling cable	EUT	Slave unit	< 3 m
3	Tstrip7 cable	Slave	Possible PC	< 3 m
4	Tstrip7 cable	Main GC955	Possible PC	< 3 m
5	Keyboard & Mouse	Main GC955	Keyboard & Mouse	< 3 m
6	USB cable	Main GC955	Possible PC	< 3 m
7	Ethernet	Main GC955	Possible LAN Network	< 3 m
8	VGA cable	Main GC955	Extra monitor	< 3 m

Table 1

Photo 1. Total EUT

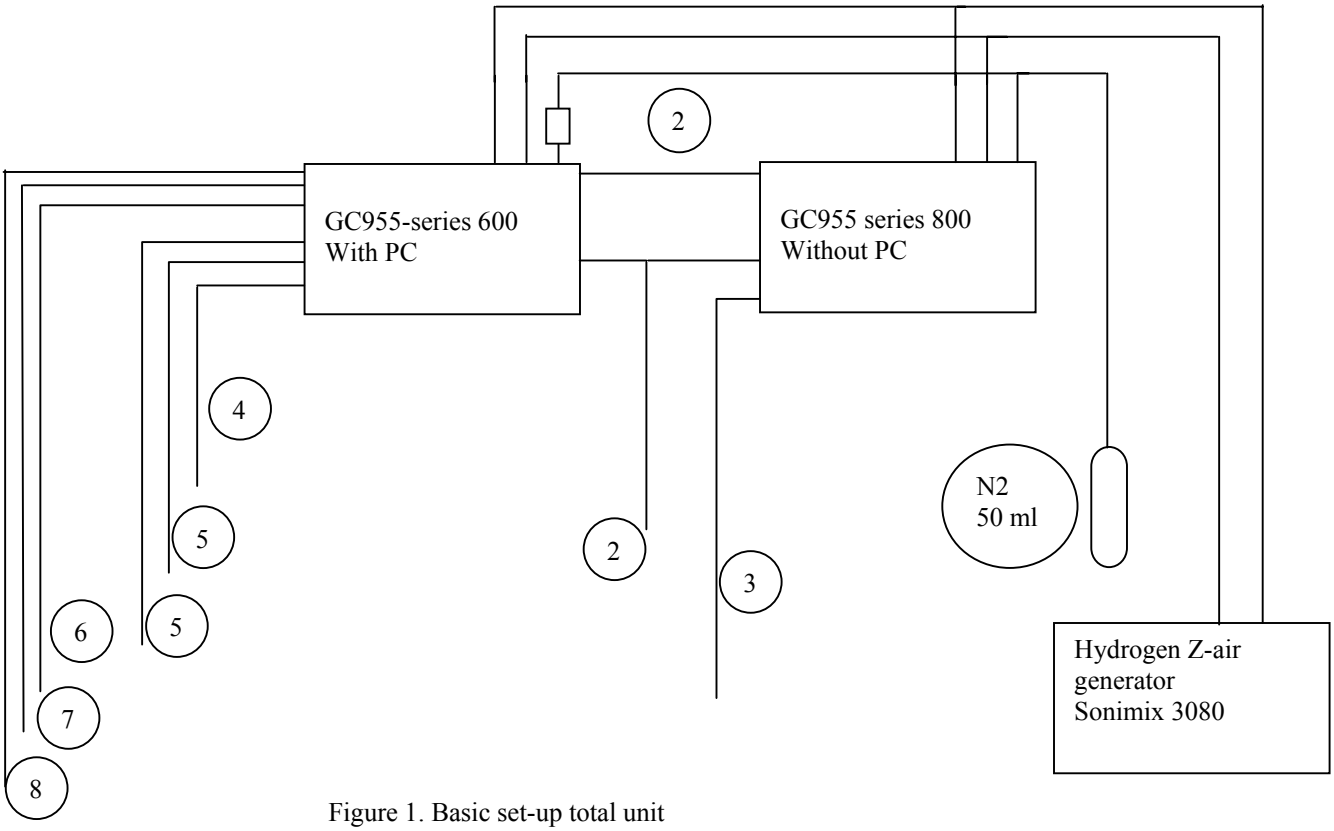


Figure 1. Basic set-up total unit

The numbers in circles refer to Table 1

1.3 Test conditions.

1.3.1 Environmental conditions.

During all tests the environmental conditions were the following:

Temperature	:	18 - 21 °C
Relative humidity	:	30 - 50 %
Air Pressure	:	86 – 106 kPa

1.3.2 Operation mode(s).

Operation mode 1: A gasmixture is generated by the Hydrogen Z-Air Generator and the N2 tube and the mixture is measured by the EUT. During all immunity tests the level indicated before tests shall be identical within the specified deviation limits as stated in the product manual.

2 Emission.

The EUT has been tested in conformity with (parts) the standard EN 61000-6-3:2001 and all relevant amendments (conducted and radiated field strength measurements concerning the emission of radiated and conducted electromagnetic disturbances).

2.1 Enclosure.

2.2 AC mains power input ports.

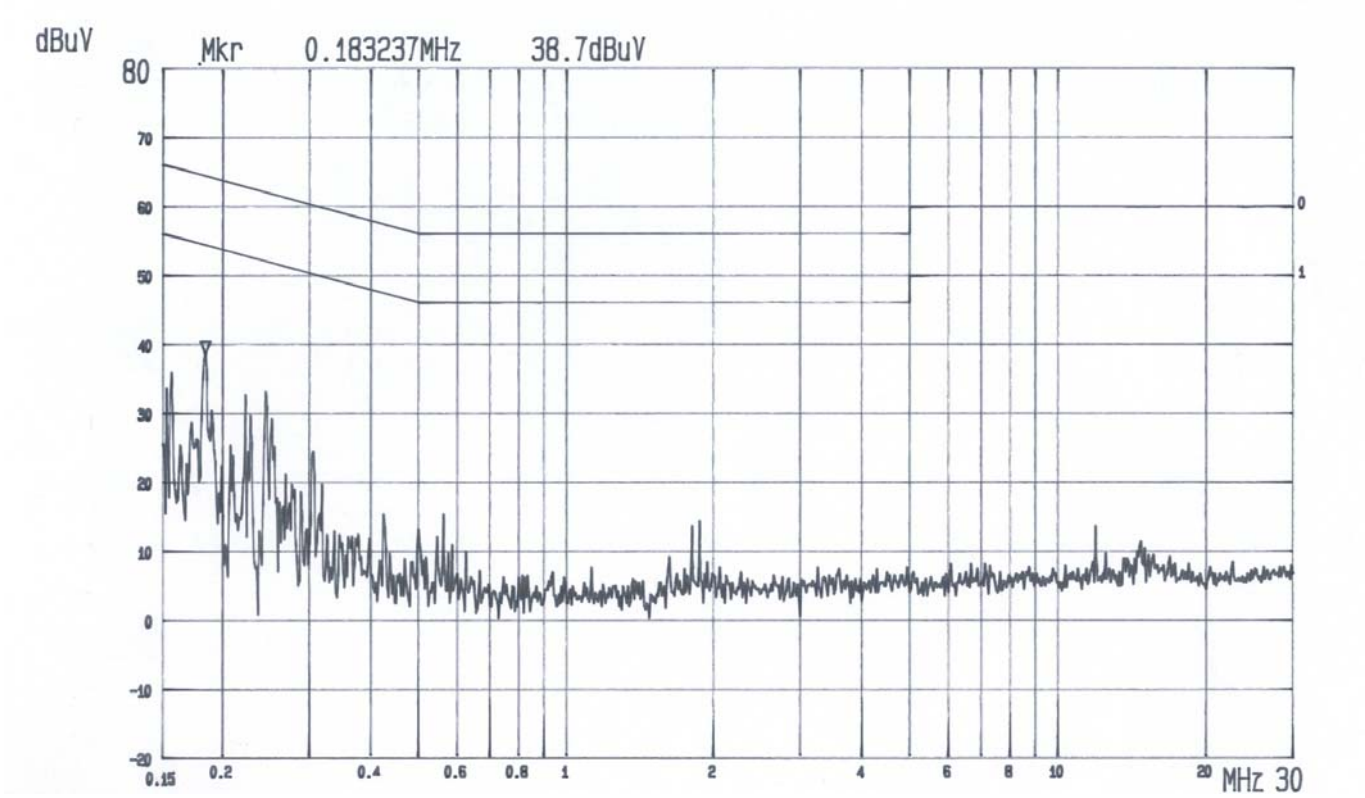
The disturbance voltage levels at the AC mains power input port of the EUT to be measured in conformity with- and according to the criteria as stated below. Tested in mode 1 and on port 1. The results are stated in Graphic 1.

Basic standard	:	EN 61000-6-3:2001 and Amd 11:2004;
Test set-up	:	EN 61000-6-3:2001 and Amd 11:2004
Frequency range 1	:	0.15 MHz – 0.5 MHz
Limit	:	66.0 – 56.0dB(µV) quasi peak, 56.0 – 46.0 dB(µV) average
Frequency range 2	:	0.5 – 5.0 MHz
Limit	:	56.0 dB(µV) quasi peak, 46.0 dB(µV) average
Frequency range 2	:	5.0 - 30 MHz
Limit	:	60.0 dB(µV) quasi peak, 50.0 dB(µV) average

Result of the measurements concerning the emission of disturbance voltage levels at the AC mains input port of the EUT	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE**	

Utilized test equipment:

Inventory number	Description	Brand	Type
12507	Artificial mains network 3-phase	Rohde & Schwarz	ESH2-Z5
13313	Impulse limiter	Rohde & Schwarz	ESH3Z2.357...
15667	EMI test receiver	Rohde & Schwarz	ESCS 30



Graphic 1.

Results of conducted measurements in accordance with EN 61000-6-3:2001 and Amd 11:2004 at the mains terminals of the EUT

2.3 Enclosure.

The radiated field strength levels (electric component) have been measured in conformity with- and according to the criteria as stated below. Tested in mode 1.

Basic standard	:	EN 61000-6-3:2001 and Amd 11:2004;
Test set-up	:	EN 61000-6-3:2001 and Amd 11:2004;
Measuring distance	:	10 meters
Frequency range 1	:	30 MHz - 230 MHz
Limits	:	30 dB(µV/m)
Frequency range 2	:	230 MHz - 1000 MHz
Limits	:	37 dB(µV/m)

Detailed results of the measurements concerning radiated field strength levels (electric component), emitted by the EUT, are depicted in table 4 on the next page of this test report.

Result of the measurements concerning radiated electromagnetic fields (electric component) emitted by the EUT (enclosure)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
12636	Plastic measurement room	Polyforce	-
13886	Open Area Test Site	Comtest	-
14277	Antennamast 4m	Heinrich Deisel	MA240
14278	Controller OATS	Heinrich Deisel	HD100
15633	Bsignilog antenna 30MHz – 1000MHz	Chase	CBL6111B
15667	EMI test receiver	Rohde & Schwarz	ESCS 30
99108	Turntable OATS	Heinrich Deisel	HD050

Frequency (MHz)	Measurement results dB(µV)/m @ 10 meters Quasi-peak		Limits dB(µV)/m @ 10 meters Quasi-peak (Class B)	Verdict (PASS/FAIL)
	Vertical	Horizontal		
30.0-230.0	< 20.0	< 20.0	30.0	PASS
Except for:				
37.56	23.3	<<	30.0	PASS
54.25	21.4	<<	30.0	PASS
56.0	21.2	<<	30.0	PASS
84.0	22.8	<<	30.0	PASS
104.0	22.9	<<	30.0	PASS
133.0	27.2	<<	30.0	PASS
144.0	23.1	<<	30.0	PASS
172.0	24.1	<<	30.0	PASS
180.0	24.6	<<	30.0	PASS
212.0	24.5	<<	30.0	PASS
220.0	25.9	<<	30.0	PASS
228.0	23.5	<<	30.0	PASS
230.0-1000.0	< 25.0	< 25.0	37.0	PASS
Except for:				
240.0	27.0	27.0	37.0	PASS

Table 4

The results of the measurements, carried out in conformity with the standard EN 61000-6-3:2001 and Amd 11:2004, concerning radiated field strength levels (electric component), emitted by the EUT in the configuration and operation mode(s) as stated in this test report, are depicted in Table 4.

3 Immunity.

The EUT has been tested in conformity with parts of the standard EN 61000-6-2: 2001, EN 61326:1997 and all relevant amendments (immunity) concerning the susceptibility to continuous and transient, conducted and radiated disturbances including electrostatic discharges.

3.1 Performance criteria.

The general principles (performance criteria) for the evaluation of the immunity test results are the following.

3.1.1 Performance criterion A.

During testing, normal performance, no change of settings after start-up shall occur during testing. The generated gaslevel shall be measured before testing and shall not change during testing as specified in paragraph 1.3.2.

3.1.2 Performance criterion B.

During testing, temporary degradation, or loss of function or change of settings after start-up may occur during testing which is self recovering after finishing testing. The generated gaslevel shall be measured before testing and may change during testing as specified in paragraph 1.3.2. but shall be as before testing after the tests have been carried out.

3.1.3 Performance criterion C.

During testing, temporary degradation, or loss of function or change of settings after start-up may occur during testing which requires operator intervention or system reset after testing. The generated gaslevel shall be measured before testing and may change during testing as specified in paragraph 1.3.2. but shall be as before testing after the tests have been carried out and all relevant settings have been restored by an operator.

3.2 Enclosure port.

3.2.1 Radio-frequency electromagnetic field. Amplitude modulated.

The susceptibility of the EUT to radio-frequency electromagnetic fields has been tested in conformity with-and according to the criteria as stated below. Tested in mode 1.

Basic standard	:	EN 61000-4-3: 2006
Test set-up	:	EN 61000-4-3: 2006
Frequency range	:	80 MHz - 2000 MHz
Field strength level	:	10 V_{rms}/m (selected without modulation, applied with modulation)
Modulation	:	1 kHz, modulation depth 80%
Performance criterion	:	A

Result of the tests concerning the susceptibility of the EUT to radio-frequency electromagnetic fields (amplitude modulated, enclosure port)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE**	

Utilized test equipment:

Inventory number	Description	Brand	Type
12441	Tripod	EMCO	TR3
12520	Function generator	Tabor Electronics	8241
14051	Compact anechoic room	Euroshield/ Comtest	RFSD-F-100
14298	Amplifier 0.01 MHz-220 MHz	SPS/Comtech	SPS7010
14307	Amplifier 200 MHz-1000 MHz	SPS/Comtech	SPS8030
14351	Bconilog antenna 20 MHz–1100 MHz	EMCO	3143
15392	Signalgenerator 0.1 MHz-2048 MHz	Rohde & Schwarz	SMY02
99107	Turntable anechoïc room + controller	Heinrich Deisel	HD050
13826	Amplifier 1-2 GHz/30W	MilMega	--
12484	Gainhorn	EMCO	3115

3.2.2 Electrostatic discharge.

The susceptibility of the EUT to electrostatic discharges has been tested in conformity with- and according to the criteria as stated below. Tested in mode 1.

Basic standard	:	EN 61000-4-2: 1995 and Amd A2: 2001
Test set-up	:	EN 61000-4-2: 1995 and Amd A2: 2001
Test levels	:	±2 kV, ±4 kV and ±8 kV air discharge ±2 kV and ±4 kV contact discharge
Performance criterion	:	B

Result of the tests concerning the susceptibility of the EUT to electrostatic discharges (enclosure port)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
99002	ESD simulator system	Schaffner	NSG 435-01

3.3 Signal ports including telecommunication ports.

3.3.1 Radio-frequency (common mode). Amplitude modulated.

The susceptibility of the EUT to radio-frequency (common mode)[1)], amplitude modulated, to be tested in conformity with- and according to the criteria as stated below.

Basic standard	:	EN 61000-4-6: 2006
Test set-up	:	EN 61000-4-6: 2006
Frequency range	:	0.15 MHz - 80 MHz
Test level	:	10 V_{rms} (selected without modulation, applied with modulation)
Modulation	:	1 kHz, modulation depth 80%
Source impedance	:	150 Ohms
Performance criterion	:	A
Note[1)]	:	Conducted only on ports interfacing with cables whose total length, according to the manufacturer's functional specification, may exceed 3 meters

Result of the tests concerning the susceptibility of the EUT to radio-frequency (common mode, amplitude modulated, ports for signal lines including telecommunication ports)	~~**PASS / FAIL /**~~ **NOT APPLICABLE**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **ALL CABLING < 3 M**	

3.3.2 Fast transients.

The susceptibility of the EUT to fast transients to be tested in conformity with- and according to the criteria as stated below.

Basic standard	:	EN 61000-4-4:2005,
Test set-up	:	EN 61000-4-4:2005 (capacitive clamp)
Test level	:	± 1 kV and 2 kV
Tr/Th	:	5/50 ns
Repetition frequency	:	5 kHz
Performance criterion	:	B
Note[1)]	:	Conducted only on ports interfacing with cables whose total length, according to the manufacturer's functional specification, may exceed 3 meters

Result of the tests concerning the susceptibility of the EUT to fast transients	~~**PASS / FAIL**~~ **/ NOT APPLICABLE**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **ALL CABLING < 3 M**	

3.4 DC input and DC output ports.

3.4.1 Radio-frequency (common mode). Amplitude modulated.

The susceptibility of the EUT to radio-frequency (common mode)[1)], amplitude modulated, to be tested in conformity with- and according to the criteria as stated below.

Basic standard	:	EN 61000-4-6: 2006
Test set-up	:	EN 61000-4-6: 2006
Frequency range	:	0.15 MHz - 80 MHz
Test level	:	3 V_{rms} (selected without modulation, applied with modulation)
Modulation	:	1 kHz, modulation depth 80%
Source impedance	:	150 Ohms
Performance criterion	:	not applicable
Note[1)]	:	Conducted only on ports interfacing with cables whose total length, according to the manufacturer's functional specification, may exceed 3 meters

Result of the tests concerning the susceptibility of the EUT to radio-frequency (common mode, amplitude modulated, DC input and DC output ports)	~~**PASS**~~ **/** ~~**FAIL**~~ **/ NOT APPLICABLE**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NO DC PORTS**	

3.4.2 Fast transients (common mode).

The susceptibility of the EUT to fast transients (common mode) to be tested in conformity with-and according to the criteria as stated below.

Basic standard	:	EN 61000-4-4: 2005
Test set-up	:	EN 61000-4-4: 2005 (capacitive clamp)
Test level	:	±1 kV
Tr/Th	:	5/50 ns
Repetition frequency	:	5 kHz
Performance criterion	:	Not applicable

Result of the tests concerning the susceptibility of the EUT to fast transients (common mode, DC input and DC output power ports)	~~**PASS**~~ **/** ~~**FAIL**~~ **/ NOT APPLICABLE**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE.**	

3.5 AC input and AC output power ports.

3.5.1 Radio-frequency (common mode). Amplitude modulated.

The susceptibility of the EUT to radio-frequency (common mode), amplitude modulated, has been tested in conformity with- and according to the criteria as stated below. Tested in mode 1 and on port 1.

Basic standard	:	EN 61000-4-6: 2006
Test set-up	:	EN 61000-4-6: 2006
Frequency range	:	0.15 MHz - 80 MHz
Test level	:	10 V_{rms} (selected without modulation, applied with modulation)
Modulation	:	1 kHz, modulation depth 80%
Source impedance	:	150 Ohms
Performance criterion	:	A

Result of the tests concerning the susceptibility of the EUT to radio-frequency (common mode, amplitude modulated, AC input and AC output power ports)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut February 28, 2007
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
15690	Signal generator 0.1 MHz - 1000 MHz	Rohde & Schwarz	SMG
15627	Amplifier 10 kHz - 250 MHz, 75 Watts	Amplifier Research	75A250
99039	Attenuator 6 dB	Trilithic	HFP-560/6-NM/NF
99138	RF injection clamp	Lüthi	EM101
99393	Power meter	Rohde & Schwarz	NRVD
99395	Power sensor, 2 mV - 100 V	Rohde & Schwarz	URV5-Z4
59601/x	CDN coupling devices	Air Parts	Mx
-	Test software conducted immunity	Rohde & Schwarz	ES-K1
-	Personal computer + monitor	Hewlett-Packard	HP Vectra VE 5/75

3.5.2 Surges.

The susceptibility of the EUT to surges[1)] has been tested in conformity with- and according to the criteria as stated below. Tested in mode 1 and on port 1.

Basic standard	:	EN 61000-4-5: 2007
Test set-up	:	EN 61000-4-5: 2007
Test level 1	:	±1 kV, ±2.0 kV
Test level 2	:	±1 kV
Tr/Th	:	1.2/50 (8/20) µs
Number of pulses	:	5
Performance criterion	:	B

Note[1)] : Applicable only to input ports

Result of the tests concerning the susceptibility of the EUT to surges (AC input and AC output power ports)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2006
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
15108	Surge simulator syst. mainframe 25A	Schaffner	NSG 2050
15111	Pulse network 1.2/50 µs 6.6 kV 3.3 kA	Schaffner	PNW 2050
99004	3-phase coupling network 25A	Schaffner	CDN 133
99006	1-phase Schuko coupling adapter 16A	Schaffner	INA 252
99008	Blind cover	Schaffner	-
99010	3-phase IEC 309 coupling adapter 32A	Schaffner	INA 250
99029	Software control package	Schaffner	WIN 2050

3.5.3 Fast transients (common mode).

The susceptibility of the EUT to fast transients (common mode) has been tested in conformity with- and according to the criteria as stated below. Tested in mode 1 and on port 1.

Basic standard	:	EN 61000-4-4:2006
Test set-up	:	EN 61000-4-4:2006 (capacitive clamp)
Test level	:	±1 kV, 2 kV
Tr/Th	:	5/50 ns
Repetition frequency	:	5 kHz
Performance criterion	:	B

Result of the tests concerning the susceptibility of the EUT to fast transients (common mode, AC input and AC output power ports)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut  February 28, 2007
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
15110	Three phase burst simulator system	Schaffner	NSG 2025-4
99001	IEC 1000-4-4 capacitive coupling clamp	Schaffner	CDN 126
99005	3-phase IEC 309 coupling adapter 32A	Schaffner	INA 250
99006	1-phase Schuko coupling adapter 16A	Schaffner	INA 252
99007	Blind cover	Schaffner	-
99014	Attenuator 30 dB for burst verification	Schaffner	INA 265
99015	Software control package	Schaffner	WIN 2025

3.5.4 Voltage dips and interruptions.

The susceptibility of the EUT to voltage dips and interruptions[1)] has been tested in conformity with- and according to the criteria as stated below.

Basic standard	:	EN 61000-4-11: 2004
Test set-up	:	EN 61000-4-11: 2004
Test level (a)	:	Reduction of the supply voltage of > 95% for 0.5 period [2)]
Performance criterion	:	B
Test level (b)	:	Reduction of the supply voltage of 30% for 25 periods [2)]
Performance criterion	:	B
Test level (c)	:	Reduction of the supply voltage of > 95% for 250 periods [2)]
Performance criterion	:	C

Note[1)] : Applicable only to input ports

Note [2)] : Voltage shift at zero crossing

Result of the tests concerning the susceptibility of the EUT to voltage dips and interruptions (AC input and AC output power ports)	**PASS / ~~FAIL~~ / ~~NOT APPLICABLE~~**
Name of test engineer: Signature: Date:	A.J.K. Hut February 28, 2007
REMARKS: **NONE.**	

Utilized test equipment:

Inventory number	Description	Brand	Type
15354	Profline interface	Schaffner	CCN2000-3P/5
99009	Blind cover	Schaffner	-
99030	Universal power analyzer/flicker meter	Voltech	PM 3000A
99031	Profline AC switching unit	Schaffner	888-0165-V2.30
99032	AC power source	Schaffner	3120-AMX
99033	AC power source	Schaffner	3120-AMX
99034	Magnetic module	Schaffner	134350
99035	Magnetic module	Schaffner	134350
99036	Personal computer	Dell	Dimension 133
99037	System cabinet	Schaffner	30U/He
99038	System cabinet	Schaffner	30U/He

4 Conclusion.

The flexible analyzer for measurement of hydrocarbons, model/type GC955, complies with the standards EN 61000-6-2:2001, EN 61000-6-3: 2001 and EN 61326:1997 and all relevant amendments (emission and immunity) in the configuration and operation mode(s) as stated and tested in this test report.