

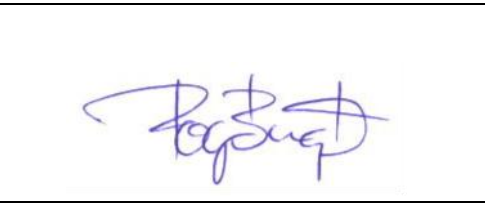

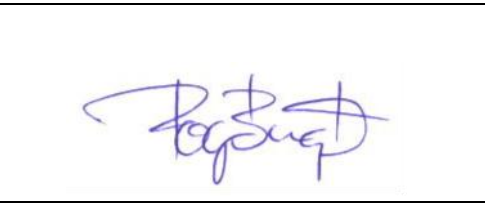

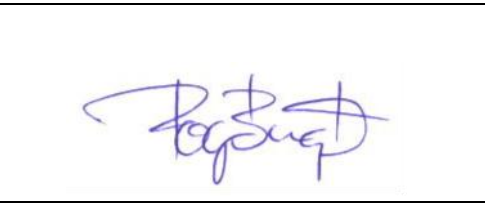


## EMC File

Product	Hobs for building-in			
Name and address of the applicant	Tecnowind SpA Piani di Marischio, 19 I-60044 Fabriano (AN) ITALY			
Name and address of the manufacturer	Tecnowind SpA Piani di Marischio, 19 I-60044 Fabriano (AN) ITALY			
Model	Type P29.. ...Family			
Rating	1500/2900/3000W 220-240V AC 50/60Hz			
Brand name	Tecnowind			
Serial number	-			
Additional information	Cl. I			
Tested according to	EN 55014-1 (2006) + A1 (2009) + A2 (2011) EN 61000-3-2 (2006) + A1 (2009) + A2 (2009) EN 61000-3-3 (2008) EN 55014-2 (1997) + A1 (2001) + A2 (2008)			
Order number	247715			
Tested in period	2005-03-30 to -31, 2005-12-29 to -30 , 2007-10-02 to -03, 2013 Nov.			
Issue date	2013-12-18			
Name and address of the testing laboratory	 P.O. Box 73 Blindern, N-0314 Oslo, Norway	Telephone (+47) 22 96 03 30 Fax (+47) 22 96 05 50		
<table border="1" style="width: 100%; height: 80px; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: middle;">             Prepared by [Lam Anh Dung]         </td> <td style="width: 50%; text-align: center; vertical-align: middle;">             Approved by [Roger Berget]         </td> </tr> </table>			 Prepared by [Lam Anh Dung]	 Approved by [Roger Berget]
 Prepared by [Lam Anh Dung]	 Approved by [Roger Berget]			
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## REVISIONS

Revision #	Date	Order #	Description
00	2005-03-30	43558	Individual Nemko Italy file
01	2005-12-29	57988	Individual Nemko Italy file
02	2007-10-02	94011	Individual Nemko Norway file
03	2008-11-10	116102	First issue of this file based on previous work of the above files
04	2010-12-01	160839	Update to latest standard versions. No additional test needed.
05	2012-12-05	226181	Update to latest standard versions. No additional test needed.
06	2013-12-18	247715	Additional tests to include new touch control units

## GENERAL REMARKS

This file applies only to the sample(s) tested. It is the manufacturer's responsibility to assure the additional production units of this product are manufactured with identical electrical and mechanical components. The manufacturer is responsible to the Competent Authorities in Europe for any modifications made to the product, which result in non-compliance to the relevant regulations.

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Opinions expressed within this file regarding general assessments and qualifications for **PASS** or **FAIL** to the standards limits and requirements, are not part of the current accreditation. Neither is opinions expressed regarding model variants covered by the testing of this file.

## CALIBRATION

All instruments used in the tests given in this test file are calibrated and traceable to national or international standards. Between calibrations all test set-ups are controlled and verified on a regular basis.

The instruments specified in immunity testing are subject to periodic calibration. Monthly controls ensure, with 95% confidence that the instruments remain within the calibrated levels.

## MEASUREMENT UNCERTAINTY

Measurement uncertainties are calculated or considered for all instruments and instrument set-ups used during these tests. Uncertainty figures are found in an appendix to this file.

Further information about measurement uncertainties is provided on request.

## EVALUATION OF RESULTS

If not explicitly stated otherwise in the standard, the test is passed if the measurement value is equal to or below the limit line, regardless of the uncertainty of the measurement. If the measurement value is above the limit line, the test is not passed - ref. IECEE/CTL (Sec) 056/94 (CTL = Committee of Testing Laboratories).

The instrumentation accuracy is within limits agreed by the IECEE/CTL (ref. Nemko proc. P227).

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## EQUIPMENT UNDER TEST (EUT)

### SYSTEM DESCRIPTION

Family of hobs for building-in, with timer and safety lock functions.

### MODEL VARIATIONS

This report also covers the following model/types:

VA no.	Type	Model	Rated power input	Rated voltage	Investigated
1	P29.....	EO3000	3,0kW	220-240V AC	Yes
2	P29.....	EO2900	2,9kW	220-240V AC	No
3	P29.....	RO3000	3,0kW	220-240V AC	No
4	P29.....	RO2900	2,9kW	220-240V AC	No
5	P29.....	CO3000	3,0kW	220-240V AC	No
6	P29.....	CO2900	2,9kW	220-240V AC	No
7	P29.....	MO3000	3,0kW	220-240V AC	No
8	P29.....	MO2900	2,9kW	220-240V AC	No
9	P29.....	EO1500	1,5kW	220-240V AC	Yes

Notes:

### Explanation of the type and reference:

P: hob for build-in (Piano)

29: width of the appliances in centimetre

E: Electronic touch control

R: Energy regulator

C: Commutator (rotary switch)

M: Mixed: Commutators and energy regulators

O. Horizontal position of the controls

2900: Total power input (1200 + 1700W)

3000: Total power input (1200 + 1800W)

1500: Total power input (1500W)

### PORTS AVAILABLE

This equipment is fitted with the following electrical ports.

PO no.	Port Name	Type	Count	Comment
1	AC Input Port	230V AC	1	-

Notes:

### AVAILABLE OPERATING MODES

The following functional operating modes are available and are considered applicable under intended use.

FU no.	Operating mode	Comment	Investigated
1	Heating	-	Yes
2	Standby	-	No

Notes:

### **ADDITIONAL INFORMATION RELATED TO TESTING**

This file is built from different individual EMC test reports, which were issued based on tests previously performed on several models in this family, to cover the critical components expected to interfere with its EMC properties. This file serves as a full test file for all components qualified through the years, and collects all these test data into one single report. The first part of the test section contains descriptions of the testing levels and results obtained generally for the family, while the Annex contains individual measurement chapters for each test session performed to one or more of the family members.

## GENERAL TEST CONDITIONS

### TEST LABORATORY

The following Nemko test sites have been utilized for the tests documented in this report:

	Site	Address
X	GAUSTAD	Gaustadalleen 30, N-0314 Oslo, Norway
	SKAR	Maridalsveien 621, N-0890 Oslo, Norway
	KJELLER	Instituttveien 6, N-2007 Kjeller, Norway
X	ITALY	Via Trento e Trieste, 116 I-20046 Biassono MI (Italy)

### POWER SUPPLIED TO EUT

Filtered electrical power was available for operation of EuT in all the test sites.

Voltage type: 230V AC 50Hz

Grounding: Grounded through its power connection.

### AMBIENT CONDITIONS

All tests and measurements were performed in a shielded enclosure or a controlled environment suitable for the tests conducted.

The climatic condition in the laboratory environment was according to EN 60068-1 (1988) + A1 (1992):

Ambient temperature	23°C (EN 60068-1: 15 - 35°C)
Relative humidity	45%RH (EN 60068-1: 25 - 75%RH)
Atmospheric pressure	100kPa (EN 60068-1: 86 – 106kPa)

Note: The climatic conditions in the test areas are automatically controlled and recorded continuously.

## EVALUATION OF PERFORMANCE

### FUNCTIONS MONITORED DURING IMMUNITY TESTS

In order to verify acceptable performance by the EuT during the applied tests, the following functions were monitored:

#	Function	Monitoring method
1	Heating	Visual
2	Timer	Visual
Notes:		

### FUNCTIONAL CHECKS

A verification of correct function was performed before, during and after each test, by the following tests:

#	Functional tests
1	Heating, timer and safety lock function was tested before and after each tests to verify normal behavior.
Notes:	

### PERFORMANCE CRITERIA

In order to pass each test, the EuT shall meet the following criteria:

Criteria	General description	Criteria modified by manufacturer
A	The device shall continue to operate as intended both during and after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device	-
B	The device shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device	-
C	Temporary loss of function during test is allowed, provided the function is self-recoverable or can be restored by the operation of the controls	-
Notes:		



## SUMMARY OF TESTING

### APPLIED STANDARDS

- » **EN 55014-1 (2006)**  
+ A1 (2009)  
+ A2 (2011) *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus -- Part 1: Emission*
  
- » **EN 61000-3-2 (2006)**  
+ A1 (2009)  
+ A2 (2009) *Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 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 subject to conditional connection*
  
- » **EN 55014-2 (1997)**  
+ A1 (2001)  
+ A2 (2008) *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus -- Part 2: Immunity - Product family standard*

### APPLIED TESTS

Test items	Test methods	Result
Mains Port Disturbance Voltage	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	PASS
Loads Port Disturbance Voltage	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	NA
Discontinuous Disturbance Voltage	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	PASS
Disturbance Power	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	PASS
Radiated Electromagnetic Field (3-loop)	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	NA
Radiated Disturbance (30MHz-1000MHz)	EN 55014-1 (2006) + A1 (2009) + A2 (2011)	NA
Harmonics	EN 61000-3-2 (2006) + A1 (2009) + A2 (2009)	PASS
Flicker	EN 61000-3-3 (2008)	PASS
Electrostatic Discharges	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-2 (2001), Ed.1.2	PASS
Radiated RF Field	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-3 (2001), Ed.1.2	NA
Electric Fast Transients	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-4 (2004), Ed.2.0	PASS
Surge	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-5 (2006), Ed.2.0	PASS
Conducted RF Disturbance	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-6 (2007), Ed.2.0	PASS
Dips/Interruptions	EN 55014-2 (1997) + A1 (2001) + A1 (2008) EN 61000-4-11 (2004), Ed.2.0	PASS

- PASS : Tested and complied with the requirements  
 FAIL : Tested and failed the requirements  
 NA : Test not relevant to this specimen (evaluated by the test laboratory)  
 - : Test not performed (instructed by the applicant)  
 \* : An asterisk (\*) placed after the verdict in the Result column indicates test items that are not within Nemko's scope of accreditation

# : A grid (#) placed after the verdict in the Result column indicates test items that are only partly covered by Nemko's scope of accreditation. Further information is detailed in the test section

## **DEVIATIONS AND EVALUATIONS**

Nemko has not recorded any deviations to the applied standards.  
Nemko has made no general evaluations.

# Test Results

## EMISSION – MAINS PORT DISTURBANCE VOLTAGE

### TEST DESCRIPTION

#### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

#### Set-up

The measurements were performed in a shielded enclosure. EuT was connected to an Artificial Mains Network (AMN) and placed on a wooden table 10cm (floor-standing) or 80cm (tabletop) above the grounded floor and 40cm from the reference ground plane (wall). EuT was connected to the AMN by its power cable, which was adjusted to 100cm length by folding.

#### Procedure

A screening test was first performed to decide the most disturbing operating mode of the EuT, maximizing the cable layout and deciding the proper dwell time for the measurements.

Then measurements were run between each of the current carrying wires of the power cord, and ground.

The frequency was swept in the range specified under Severity.

A comparison of the results obtained from the different wires was then performed to find the highest level at each frequency. This worst-case sweep with peak detector is presented below.

At the frequencies where the peak level of the emission was exceeding the applicable [limit - offset], the emission was also measured with the quasi-peak detector and, if required, with the average detector.

#### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

#### Comments

No recorded comments.

#### Severity

Port:	AC Input Port
Frequency range:	0.15 - 30 MHz
Frequency step:	5 kHz
Dwell time:	20 mSec
Bandwidth:	10 kHz

#### Conformity

Verdict:	Pass
Test engineer:	Jørn Gustavsen

### CONCLUSION

The EuT complied with the limits specified in the reference standard. Measurement data is presented in the Annex to this report

# EMISSION – DISCONTINUOUS DISTURBANCE VOLTAGE

## TEST DESCRIPTION

### Method

CISPR 16-2-1 Ed.1.1 (2005)  
Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements.  
CISPR 14-1 (2000) + A1 (2001) + A2 (2002)  
Electromagnetic compatibility – Requirements for household appliances, electric tools, and similar apparatus – Part 1: Emission.

### Set-up

The measurements were performed in a shielded enclosure. EuT was connected to an Artificial Mains Network (AMN) and placed on a wooden table 10 cm (floor standing) / 80 cm (tabletop) above the grounded floor and 40 cm from the reference ground plane (wall). EuT was connected to the AMN via a 100 cm mains cable.

### Procedure

Initially an observation of 40 detected clicks was made (or a maximum of 2 hours), measuring at 150 kHz and 500 kHz with a quasi-peak detector. Each click exceeding the quasi-peak limit was counted and then analysed to decide whether it should be classified as Short Click ( $T < 20$  ms), Long Click ( $20$  ms  $< T < 200$  ms) or Continuous ( $T > 200$  ms).

(Continuous noise lasting for more than 600 ms, accumulated during the whole observation period makes the EuT fail this test.)

Based on the counted value(s) from the observation period, an offset was added to the initial limit values. The calculated CLICK RATE was used to calculate the size of the offset (ref. CISPR 14-1, §7.4.2).

A final measurement was then initiated (with a measurement time of the same length as the observation); measuring clicks at 150 kHz, 500 kHz, 1.4 MHz and 30 MHz with a quasi-peak detector. The final CLICK RATE at each frequency was not allowed to exceed  $\frac{1}{4}$  of the CLICK RATE found during the observation period, when using the new limit values.

Measurements were made between each of the current carrying wires of the power port, and ground.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port: AC Input Port

### Conformity

Verdict: Pass

Test engineer: Jørn Gustavsen

## CONCLUSION

The EuT complied with the limits specified in the reference standard. Measurement data is presented in the Annex to this report

## EMISSION – DISTURBANCE POWER

### TEST DESCRIPTION

#### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

#### Set-up

The measurements were performed in a shielded enclosure. EuT was connected to the end of an automatic "absorbing clamp" slideway. EuT was placed on a wooden table 10 cm (floor standing) / 80 cm (tabletop) above the floor and at least 80 cm from any conductive structure. EuT was placed as close as possible to the absorbing clamp's zero-point (start of slideway) and the mains cable was extended to at least 6 meter length. The mains cable was then lead thru the "absorbing clamp" (which is a current probe followed by 50 cm of highly absorptive ferrite) and along the clamp slideway path.

#### Procedure

A screening test was first performed to decide the most disturbing operating mode of the EuT and deciding the proper dwell time for the measurements.

A measurement was then run at the clamps zero-point.

The frequency was swept in the range specified under Severity.

At the frequencies where the peak values of the emission were exceeding the applicable [limit - offset], a "maximum search" was performed to find the maximum emitting point along the cable. This was done by moving the clamp along the cable (from 0 to 5 meter) and constantly measures the emission. The clamp was then moved back to the maximum point where the emission was also measured with the quasi-peak detector and, if required, with the average detector.

#### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

#### Comments

No recorded comments.

#### Severity

Port:	AC Input Port
Frequency range:	30 MHz – 300 MHz
Frequency step:	80 kHz
Dwell time:	100 mSec
Bandwidth:	120 kHz

#### Conformity

Verdict:	Pass
Test engineer:	Jørn Gustavsen

### CONCLUSION

The EuT complied with the limits specified in the reference standard. Measurement data is presented in the Annex to this report

## POWER QUALITY – HARMONIC DISTORTION

### TEST DESCRIPTION

#### Method

EN 61000-3-2 (2006)

Electro-magnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase).

#### Set-up

EuT is connected to the Power Analyser system. A steady and undistorted AC mains is supplied to the EuT from a power supply matrix.

#### Procedure

10 seconds after the energizing of the EuT, the current harmonics is monitored for the time specified below.

Measurements are run on all active phases, searching for current harmonics 1<sup>st</sup> to 40<sup>th</sup> of the mains frequency (50 Hz or 60 Hz).

An overview of the harmonic emission is presented as numeric and as graphics below.

#### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

#### Comments

No recorded comments.

#### Severity

Port: AC Input Port  
Class identifier: A  
Duration: 2,5Min

#### Conformity

Verdict: Pass  
Test engineer: Jørn Gustavsen

### CONCLUSION

The EuT complied with the limits specified in the reference standard. Measurement data is presented in the Annex to this report

## POWER QUALITY – FLICKER

### TEST DESCRIPTION

#### Method

EN 61000-3-3 (1995) + A1 (2001) + A2 (2005)

Electro-magnetic 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  $\leq 16$  A per phase and not subject to conditional connection.

#### Set-up

EuT was connected to the Power Analyser system. A steady and undistorted AC mains was supplied to the EuT from an ideal power supply matrix. The power supply provided standardized mains impedance by means of synthetic programmable impedances.

#### Procedure

Measurements were performed to monitor the required flicker parameters. The measuring time depends on which parameters are measured:

- 2 hours when Long Time Flicker assessment (Plt) is to be made.
- 10 minutes when Short Time Flicker assessment (Pst) is to be made
- 1 or 10 minutes when only Dmax, Dc and Dt is to be assessed (depending on EuT switch-rate)

A measurement table and a graphic presentation of the probability function of Short Time Flicker during this session. (if measured) are presented in the report.

#### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

#### Comments

No recorded comments.

#### Severity

Port: AC Input Port

Duration: 10min

#### Conformity

Verdict: Pass

Test engineer: Jørn Gustavsen

### CONCLUSION

The EuT complied with the limits specified in the reference standard. Measurement data is presented in the Annex to this report



# IMMUNITY – ELECTROSTATIC DISCHARGES

## TEST DESCRIPTION

### Method

EN 61000-4-2 (1995) + A1 (1998) + A2 (2001)

Electromagnetic compatibility (EMC) -- Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test.

### Set-up

A ground reference plane is located on the floor, and connected to earth via a low impedance connection. The return cable of the EFT generator is connected to the reference plane.

EuT is placed on a wooden table 10 cm (floor standing) / 80 cm (tabletop) above the reference plane, and all cables attached to the EuT is isolated the same way.

A vertical coupling plane (VCP) of 50x50 cm is placed 10 cm from the EuT's exterior. This VCP is connected to the reference plane via a cable with two 470kΩ resistors located one in each end of the cable.

In case of tabletop equipment, a horizontal coupling plane (HCP) of 160x80 cm is located on the table, and connected to the reference plane the same way as the VCP. EuT is separated from the HCP by a 0.5mm insulating support.

### Procedure

Direct contact and air discharges are applied to the EuT enclosure. Indirect contact discharges are applied to the mid edge of the HCP and VCP.

Contact discharges are applied to various selected test points of the EuT at conductive surfaces, and to the HCP and VCP. Air discharges are applied to various selected test points of the EuT at non-conductive surfaces.

Discharges are applied at increasing levels to each test point.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port: Enclosure Port

### Conformity

Verdict: Pass

Test engineer: Jørn Gustavsen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance (clause 6.2).

Test Point	Applied Level [kV]	Discharge Type	Discharges per test level	Required Criteria	Complied Criteria	Result
Top Plate	±4, ±8	Air	10	B	A	PASS
Buttons	±4, ±8	Air	10	B	A	PASS
Display	±4, ±8	Air	10	B	A	PASS
HCP	±2, ±4	Contact	10	B	A	PASS
VCP	±2, ±4	Contact	10	B	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# IMMUNITY – ELECTRIC FAST TRANSIENTS

## TEST DESCRIPTION

### Method

EN 61000-4-4 (1995) + A1 (2001) + A2 (2001)  
 Electromagnetic compatibility (EMC) -- Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test.

### Set-up

A ground reference plane is located on the floor, and connected to earth via a low impedance connection. The EFT/B generator's reference ground is connected to the reference plane.

EuT is placed on a wooden table 10 cm (floor standing) / 80 cm (tabletop) above the reference plane, and all cables attached to the EuT is isolated the same way.

### Procedure

Transients are applied at increasing levels to each single line at the AC or DC mains port using a coupling network, and other remaining ports using a capacitive coupling clamp.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port: AC Input Port  
 Duration: 2min

### Conformity

Verdict: Pass  
 Test engineer: Jørn Gustavsen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance (clause 6.2).

Port	Applied Level [kV]	Injection Method	Required Criteria	Complied Criteria	Result
AC Input Port (N)	±0.5, ±1	CDN	B	A	PASS
AC Input Port (L1)	±0.5, ±1	CDN	B	A	PASS
AC Input Port (PE)	±0.5, ±1	CDN	B	A	PASS
AC Input Port (All at once)	±0.5, ±1	CDN	B	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# IMMUNITY – SURGE

## TEST DESCRIPTION

### Method

EN 61000-4-5 (1995) + A1 (2001)

Electromagnetic compatibility (EMC) -- Part 4-5: Testing and measurement techniques - Surge immunity test.

### Set-up

The surge generator is connected to earth via a low impedance connection. No presence of an earth/reference plane is necessary. The surge test is only applicable to AC mains.

### Procedure

For each test level and for each wire tested, the surges are applied at different phase angles, usually with 90° steps.

Differential mode surges are applied live-to-neutral and live-to-live, with a source impedance of 2Ω.  
Common mode surges are applied line-to-ground and neutral-to-ground, with a source impedance of 12Ω.

The surges are applied with time intervals of 60 seconds.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port: AC Input Port  
Intervals: 60sec

### Conformity

Verdict: Pass  
Test engineer: Jørn Gustavsen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance (clause 6.2).

Wire	Phase angle [deg]	Applied Level [kV]	Tests per level	Required Criteria	Complied Criteria	Result
AC Input Port (N to PE)	0°, 90°, 180°, 270°	±0.5, ±1, ±2	5	B	A	PASS
AC Input Port (L1 to PE)	0°, 90°, 180°, 270°	±0.5, ±1, ±2	5	B	A	PASS
AC Input Port (N to L1)	0°, 90°, 180°, 270°	±0.5, ±1, ±2	5	B	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# IMMUNITY – CONDUCTED RF DISTURBANCE

## TEST DESCRIPTION

### Method

EN 61000-4-6 (1996) + A1 (2001)

Electromagnetic compatibility (EMC) -- Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields.

### Set-up

The test is performed on a 2 x 2 meter ground reference plane.

EuT is placed on a wooden table 10 cm above the reference plane. Cables for AC mains and cables going to and from support equipment plus interconnecting cables are isolated from the ground plane by a 5 cm isolating support.

### Procedure

Disturbance is applied via a coupling/decoupling network (CDN) or a capacitive coupling clamp (EM Clamp) to each port separately.

All ports on EuT not subject to testing are furnished with decoupling networks to achieve 150  $\Omega$  termination of the EuT during test. As decoupling networks Nemko use the CDNs normally used to apply the disturbance, the CDNs input port is terminated with a 50  $\Omega$  termination to make them act as true decoupling networks.

For AC ports, DC ports, coax lines and 2- or 4-lines balanced communication lines a CDN is used to apply the disturbance. On other multiple signal cables an EM Clamp is used to apply the disturbance. A signal level/type as specified below is applied in the defined frequency range. The frequency is swept through the range with a step width and a dwell time per frequency as specified below.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port:	AC Input Port
Frequency range:	0.15 - 230MHz
Step size:	1 %
Dwell time:	3 Sec
Modulation:	80% AM @ 1 kHz

### Conformity

Verdict:	Pass
Test engineer:	Jørn Gustavsen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance (clause 6.2).

Port	Frequency range [MHz]	Applied Level [Vrms]	Injection Method	Required Criteria	Complied Criteria	Result
AC Power Port	0.15 – 230	3	CDN-M3	A	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# IMMUNITY – DIPS AND INTERRUPTIONS

## TEST DESCRIPTION

### Method

EN 61000-4-11 (1994) + A1 (2001)

Electromagnetic compatibility (EMC) -- Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests.

### Set-up

Only the general laboratory conditions apply. No special requirements are defined for the configuration of the EuT. The AC power input of the EuT is connected to the power simulator system that generates the dips and interruptions.

### Procedure

The dips and interruptions were applied at different phase angles, 0°, 90° and 270°. The duration of each dip and interruption is specified below. EuT was given at least 10 seconds periods to recover between each test. The number of tests applied at each phase angle is specified below.

### Instruments used during measurement

Instrument lists are found in the Annex for each test session.

### Comments

No recorded comments.

### Severity

Port: AC Input Port  
 Intervals: 20sec  
 Repetitions: 3

### Conformity

Verdict: Pass  
 Test engineer: Jørn Gustavsen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance (clause 6.2).

Voltage Reduction	Voltage Level		Periods	Phase Angle [deg]	Required Criteria	Complied Criteria	Result
	Nominal	Test					
30% Dip	230	161	50	0	C	A	PASS
60% Dip	230	92	10	0	C	A	PASS
100% Interruption	230	0	0.5	0	C	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# Annexes



## UNCERTAINTY FIGURES

	Nemko Norway	Nemko Italy
Mains Port Disturbance Voltage	± 3.8 dB (9 kHz – 150 kHz) ± 3.5 dB (150 kHz – 30 MHz)	± 2.8 dB (9 kHz – 30 MHz)
Discontinuous Disturbance Voltage	± 4.3 dB (150 kHz – 30 MHz)	± 2.8 dB (150 kHz – 30 MHz)
Disturbance Power	± 3.4 dB (30 MHz – 300 MHz)	± 4.0 dB (30 MHz – 300 MHz)
Radiated Disturbance (3 meter)	± 4.8 dB (150 kHz – 30 MHz) ± 4.8 dB (30 MHz – 200 MHz) ± 4.4 dB (200 MHz – 1000 MHz)	± 5.2 dB (30 MHz – 200 MHz) ± 4.9 dB (200 MHz – 1000 MHz)
Radiated Disturbance (10 meter)	± 4.1 dB (30 MHz – 200 MHz) ± 4.2 dB (200 MHz – 1000 MHz)	± 5.0 dB (30 MHz – 200 MHz) ± 4.8 dB (200 MHz – 1000 MHz)
Harmonic Current Emissions	± 2.1mA	± 2%
Flicker	± 0.64 V (Dc and Dmax) ± 5 % (Pst and Plt)	± 2%
Electrostatic Discharges	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Radiated RF Field	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Electric Fast Transients	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Surge	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Conducted RF Disturbance	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Power Frequency Magnetic Field	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	
Dips/Interruptions	The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels	

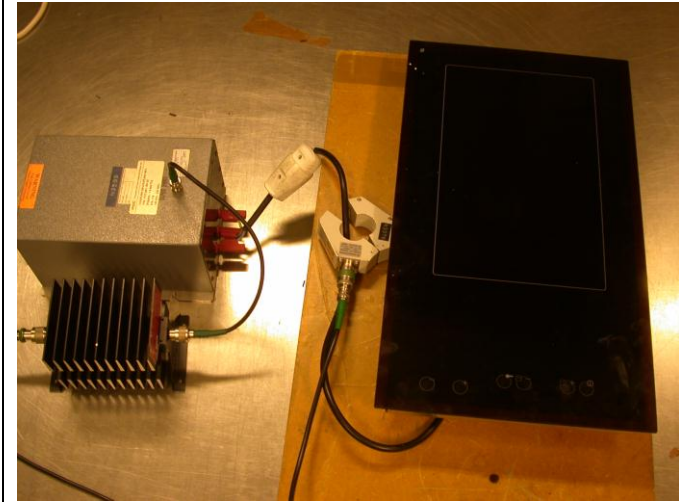
**PHOTOS**



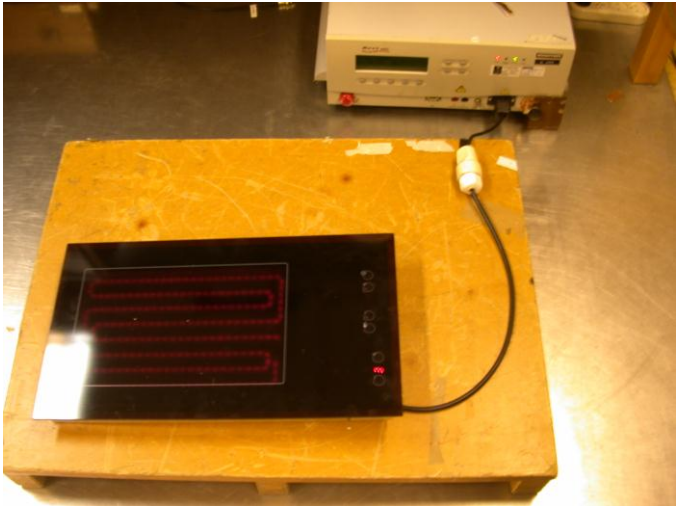
Notes: Mains Port Disturbance Voltage



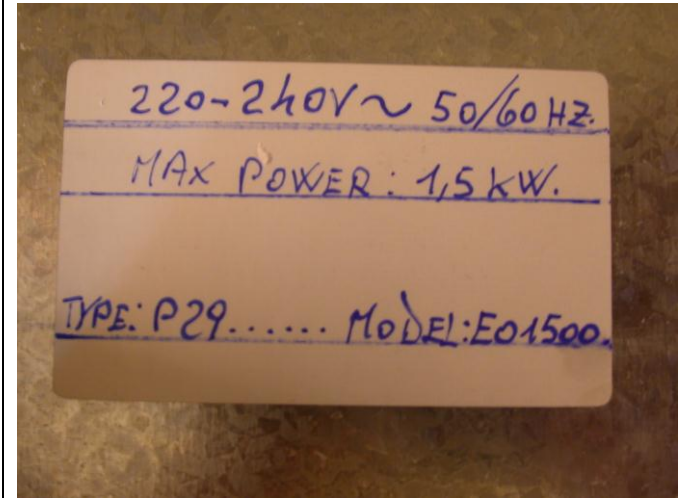
Notes: Disturbance Power



Notes: Conducted RF Disturbance



Notes: Electric Fast Transients, Surge and Dips/Interruptions



Notes: Marking Label



Notes: Model E01500

## MEASUREMENTS – ORDER NUMBER 43558

### SCOPE OF WORK

Initial tests performed on the P29 family, to qualify all models RO3000, CO3000, MO3000, RE3000, CE3000 and ME3000.

Testing was performed on the P29 EO3000 model

Components qualified this time:

Component	Manufacturer	Model	Conformity
Thermostat	Electrovac	Z98	Tested
Thermostat	EGO	60.25171.003	Tested
Thermostat	Electrovac	Z95	Considered a variant to Z98
Power PCB	Cherry GmbH	YS7-1104I07IE	Tested
Power PCB	DIEHL	TC 13703 - x TC4 13704-x	Tested
Energy Regulator	EGO	50.57021.010	Tested
Energy Regulator	Invensis Siebe	MSA	Tested
Energy Regulator	Invensis Siebe	MSA V03	Tested
Energy Regulator	Invensis Siebe	M(D)P(A)	Tested
Energy Regulator	Invensis Siebe	M(D)S(A)	Tested
Energy Regulator	EGO	50.55021.104	Tested
Energy Regulator	EGO	50.75021.000	Tested
Energy Regulator	EGO	50.77021.000	Tested
Energy Regulator	EGO	50.57071.041	Tested
Energy Regulator	EGO	50.57079.050	Tested
Commutator	EGO	46.27266.500	Tested
Commutator	EGO	41.41723.005	Tested
Commutator	EGO	Type E/010508	Tested

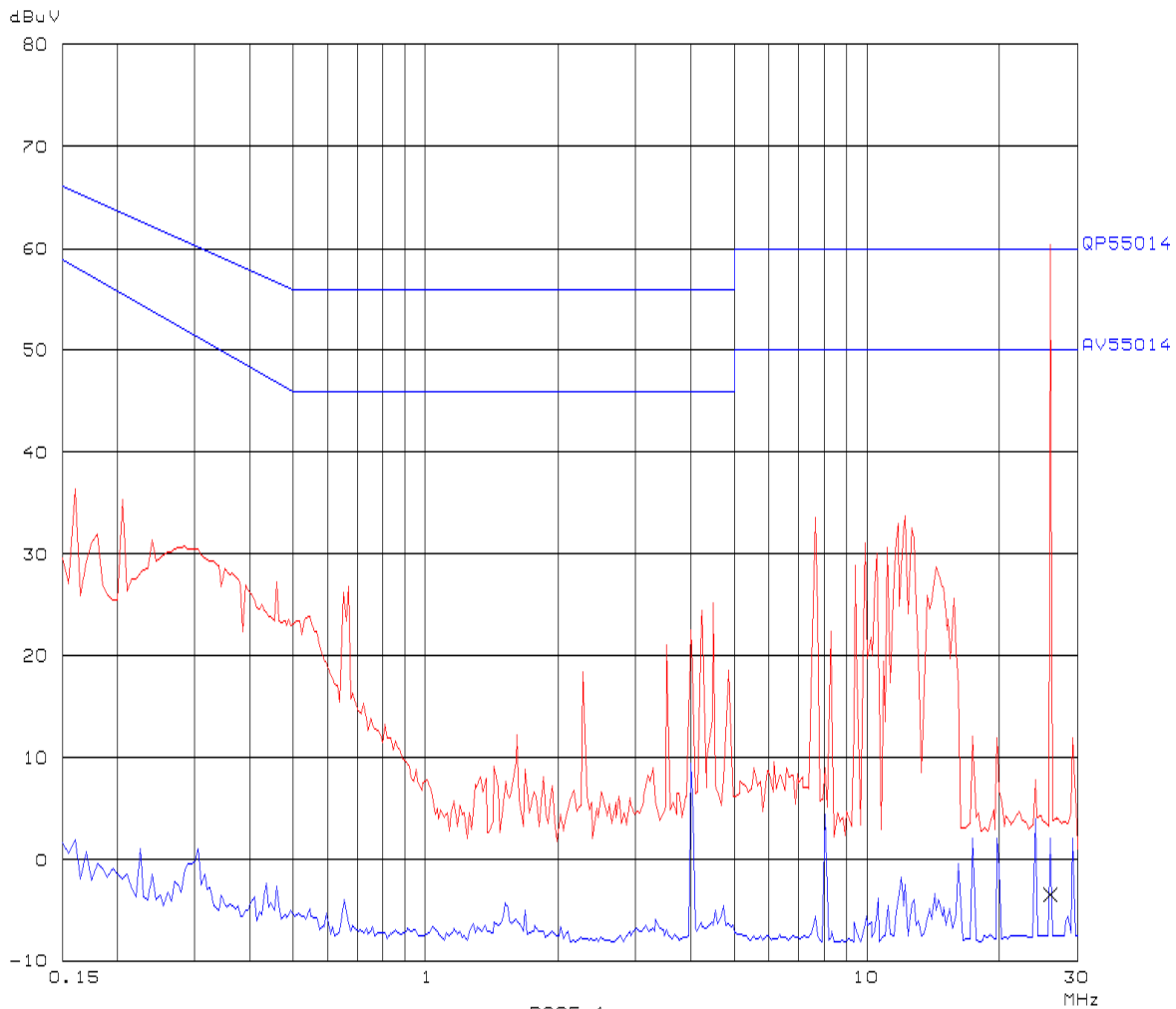
## USED TEST EQUIPMENT

Equipment	Manufacturer	Model	Serial N°	Calibration
RF receiver 9 kHz ÷ 30 MHz	R&S	ESHS 30	828765/012	-
LISN 9 kHz ÷ 30 MHz	R&S	ESH2-Z5	881 362/006	-
Shielded room	Siemens	--	009	-
ESD generator	Schaffner	NSG 435	000310	-
RF receiver 20 ÷ 1000 MHz	R&S	ESVS 10	825 475/001	-
Shielded room	Siemens	--	005	-
Clamp controller	Emi Tech	950	1190	-
Absorbing clamp 30 ÷ 1000 MHz	R&S	MDS 21	893 169/001	-
Interference analyzer	Chase	DIA 1512	5039	-
Digital oscilloscope	Yokogawa	DL1540	25WY1600L	-
LISN 9 kHz ÷ 30 MHz	Chase	MN 2050	1524	-
Mains analyzer	EMC Partner	Harmonics 1000	HAR1000-16	-
Transient generator	EMC Partner	Transient 1000	TRA 1000-124	-
AC Power source	HP	6834	3432A-00125	-
RF generator 0.1 ÷ 1000 MHz	R&S	SMG	883717/020	-
Wideband RF amplifier 150 kHz ÷ 300 MHz	Kalmus	210LC	060793-2	-
Coupling/decoupling network	Rohrbacher	CDN 801-M3	60116	-
Mainframe	Schaffner	NSG 200E	00861	-
Burst generator	Schaffner	NSG 225A	1484 9222	-
Pulse generator	Schaffner	NSG 651	172	-
Coupling network	Schaffner	CDN 110	255	-
Thermohygrometer data logger	Testo	175 -H2	20012380	-

**MAINS DISTURBANCE VOLTAGE**

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION ON AC MAINS

EUT: PE29  
Manuf: TECNOWIND  
Op Cond: See relevant paragraph of test report  
Operator: G. Romano  
Test Spec: EN 55014  
Comment: Phase line  
//





NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION ON AC MAINS

EUT: PE20  
Manuf: TECNOWIND  
Op Cond: See relevant paragraph of test report  
Operator: G. Romano  
Test Spec: EN 55014  
Comment: Phase line  
//

Final Measurement Results:

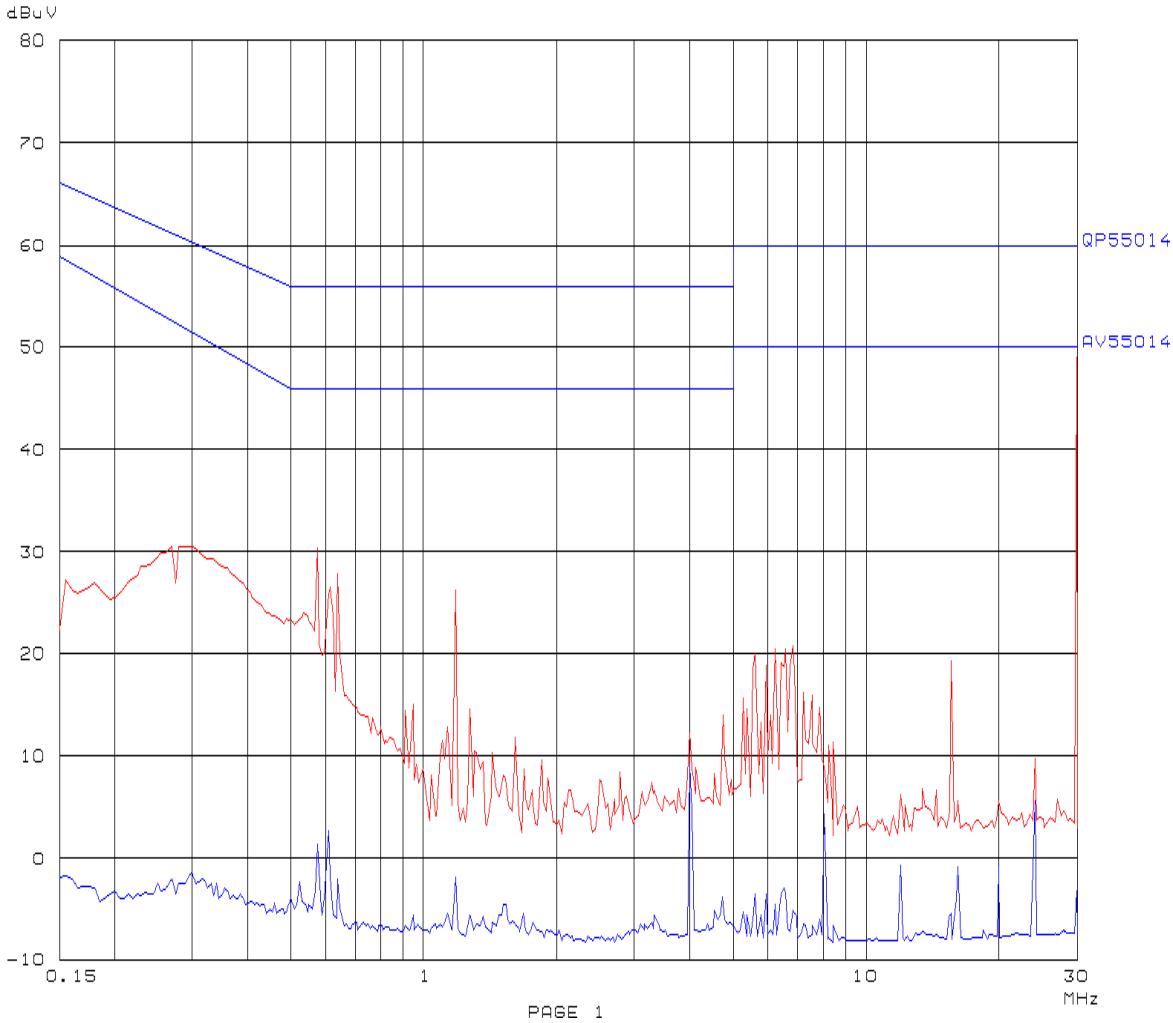
Frequency MHz	QP Level dBuV	QP Limit dBuV
26.04000	-3.4	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
no Results		

\* limit exceeded

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION ON AC MAINS

EUT: PE29  
Manuf: TECNOWIND  
Op Cond: See relevant paragraph of test report  
Operator: G. Romano  
Test Spec: EN 55014  
Comment: Neutral line  
//



NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION ON AC MAINS

EUT: PE20  
Manuf: TECNOWIND  
Op Cond: See relevant paragraph of test report  
Operator: G. Romano  
Test Spec: EN 55014  
Comment: Neutral line  
//

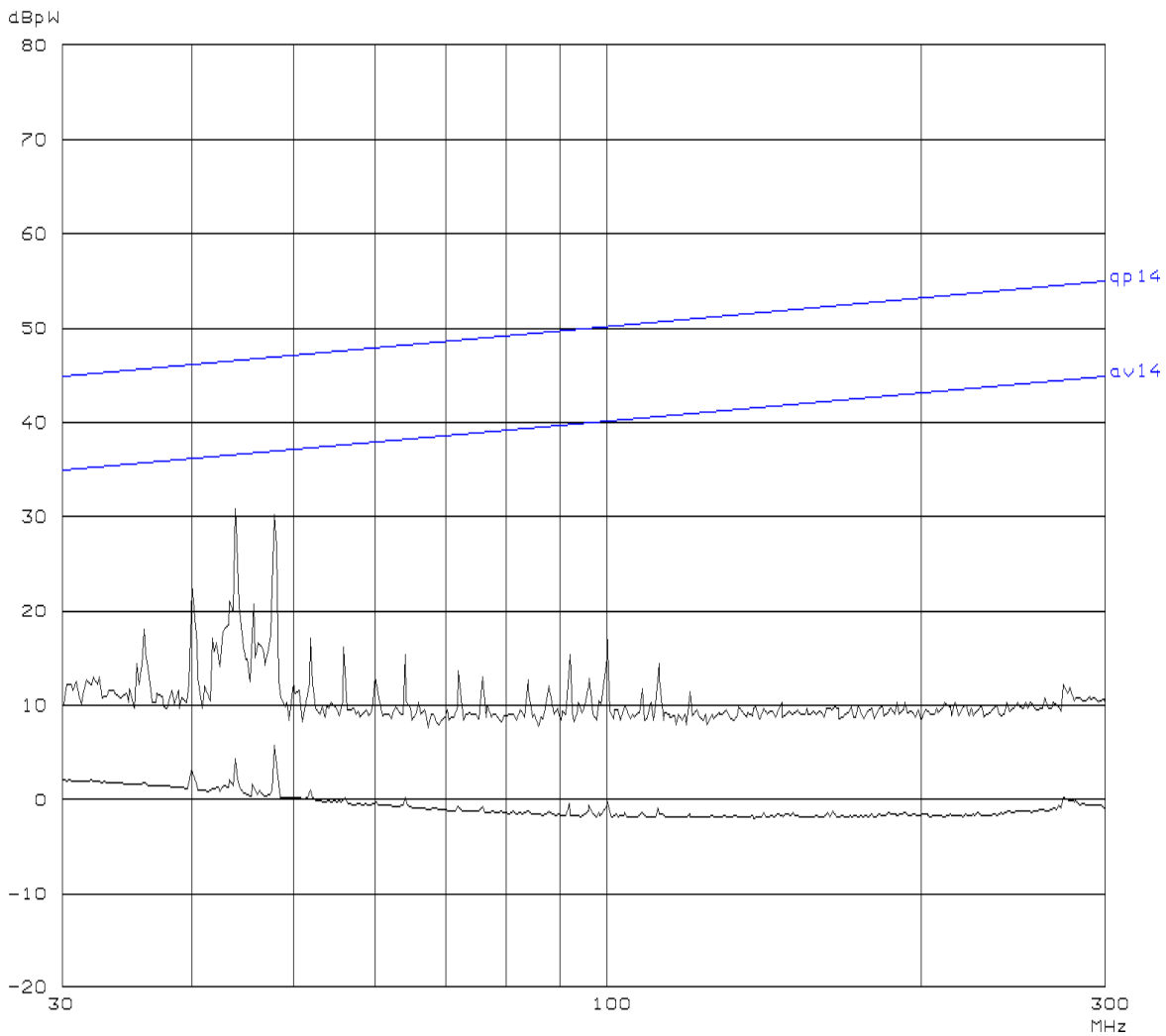
Final Measurement Results:  
no Results



### DISTURBANCE POWER

NEMKO SPA PT Dpt.  
INTERFERENCE RADIATED POWER

EUT: P29  
Manuf: TECNOWIND  
Op Cond: SEE RELEVANT PARAGRAPH OF TEST REPORT  
Operator: G. ROMANO  
Test Spec: EN 55014-1  
Comment: Prescan with clamp at 0cm



NEMKO SPA PT Dpt.  
INTERFERENCE RADIATED POWER

EUT: P29  
Manuf: TECNOWIND  
Op Cond: SEE RELEVANT PARAGRAPH OF TEST REPORT  
Operator: G. ROMANO  
Test Spec: EN 55014-1  
Comment: Pres cap with clamp at Ocm

## Final Measurement Results:

no Results

**DISCONTINUOUS DISTURBANCE VOLTAGE**

Frequency (MHz)	Clicks < 10 ms (n°)	10ms< Clicks <20 ms (n°)	Clicks > 20 ms (n°)	Switching operations (n°)	Time (min)	Click rate (n°/min)
0.15	39	0	0	40	15.2	1.31
0.5	40	0	0	40	15.2	1.31
1.40	26	0	0	40	15.2	1.31
30.0	0	0	0	40	15.2	1.31

*Appliance which has a click rate N less than 5 clicks per minute, and which has instantaneous switching (90% clicks shorter than 10 ms and none >20 ms) shall be deemed to comply with the limits, regardless of the click's amplitude.*

**HARMONIC DISTORTION**

Urms = 229.1V      Freq = 50.031      Range: 25 A  
 Irms = 12.92A      Ipk = 18.30A      cf = 1.417  
 P = 2959W      S = 2959VA      pf = 1.000  
 THDi = 0.20 %      THDu = 0.20 %      Class A

Test - Time : 5min ( 100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms% [%]	Irms%L [%]	Imax [A]	Imax%L [%]	Limit [A]	Status	Vrms [V]
1	50	12.483		12.820	99.267		12.943				229.18
2	100	0.0000	0.0000	0.0122	0.0945	1.1303	0.0183	1.6954	1.0800		0.0982
3	150	0.0000	0.0000	0.0046	0.0354	0.1990	0.0092	0.3981	2.3000		0.0245
4	200	0.0000	0.0000	0.0015	0.0118	0.3549	0.0031	0.7097	0.4300		0.0000
5	250	0.0000	0.0000	0.0168	0.1300	1.4723	0.0183	1.6062	1.1400		0.2209
6	300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.5086	0.3000		0.0000
7	350	0.0000	0.0000	0.0031	0.0236	0.3963	0.0046	0.5945	0.7700		0.0491
8	400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.6634	0.2300		0.0000
9	450	0.0000	0.0000	0.0031	0.0236	0.7629	0.0046	1.1444	0.4000		0.0736
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1840		0.0000
11	550	0.0000	0.0000	0.0092	0.0709	2.7743	0.0107	3.2367	0.3300		0.1718
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1533		0.0000
13	650	0.0000	0.0000	0.0031	0.0236	1.4532	0.0031	1.4532	0.2100		0.0491
14	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1314		0.0000
15	750	0.0000	0.0000	0.0015	0.0118	1.0173	0.0015	1.0173	0.1500		0.0245
16	800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1150		0.0000
17	850	0.0000	0.0000	0.0015	0.0118	1.1529	0.0015	1.1529	0.1324		0.0245
18	900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1022		0.0000
19	950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.2885	0.1184		0.0000
20	1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0920		0.0000
21	1050	0.0000	0.0000	0.0015	0.0118	1.4242	0.0015	1.4242	0.1071		0.0245
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0836		0.0000
23	1150	0.0000	0.0000	0.0031	0.0236	3.1196	0.0031	3.1196	0.0978		0.0491
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767		0.0000
25	1250	0.0000	0.0000	0.0015	0.0118	1.6954	0.0015	1.6954	0.0900		0.0245
26	1300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0708		0.0000
27	1350	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833		0.0000
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657		0.0000
29	1450	0.0000	0.0000	0.0015	0.0118	1.9667	0.0015	1.9667	0.0776		0.0245
30	1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0613		0.0000
31	1550	0.0000	0.0000	0.0015	0.0118	2.1023	0.0015	2.1023	0.0726		0.0245
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575		0.0000
33	1650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0682		0.0000
34	1700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0541		0.0000
35	1750	0.0000	0.0000	0.0015	0.0118	2.3736	0.0015	2.3736	0.0643		0.0245
36	1800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0511		0.0000
37	1850	0.0000	0.0000	0.0015	0.0118	2.5092	0.0015	2.5092	0.0608		0.0245
38	1900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484		0.0000
39	1950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	2.6449	0.0577		0.0000
40	2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460		0.0000

## VOLTAGE FLUCTUATIONS

### Big hot plate

Urms = 225.6V      Freq = 49.984      Range: 25 A  
Irms = 7.678A      Ipk = 10.90A      cf = 1.420  
P = 1732W      S = 1732VA      pf = 1.000

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits :      Plt : 0.65      Pst : 1.00  
              dmax : 4.00 %      dc : 3.30 %  
              dtLim: 3.30 %      dt>Lim: 500ms

Test completed, Result: PASSED

Pst	dmax	dc	dt>Lim
	[%]	[%]	[ms]
0.072	0.000	0.000	0.000

### Small hot plate

Urms = 227.0V      Freq = 49.984      Range: 10 A  
Irms = 5.166A      Ipk = 7.339A      cf = 1.421  
P = 1171W      S = 1173VA      pf = 0.999

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits :      Plt : 0.65      Pst : 1.00  
              dmax : 4.00 %      dc : 3.30 %  
              dtLim: 3.30 %      dt>Lim: 500ms

Test completed, Result: PASSED

Pst	dmax	dc	dt>Lim
	[%]	[%]	[ms]
0.076	0.000	0.000	0.000

## MEASUREMENTS – ORDER NUMBER 57988

### SCOPE OF WORK

Some new electronic controls have been introduced in the family, and are qualified with these tests.

Testing was performed on the PI29 EO3000 model

Components qualified this time:

Component	Manufacturer	Model	Conformity
Power PCB	Cherry GmbH	YS7-1163	Tested
Control PCBs	PGA	9922, 9920, 9901 and 991R2.1	Tested

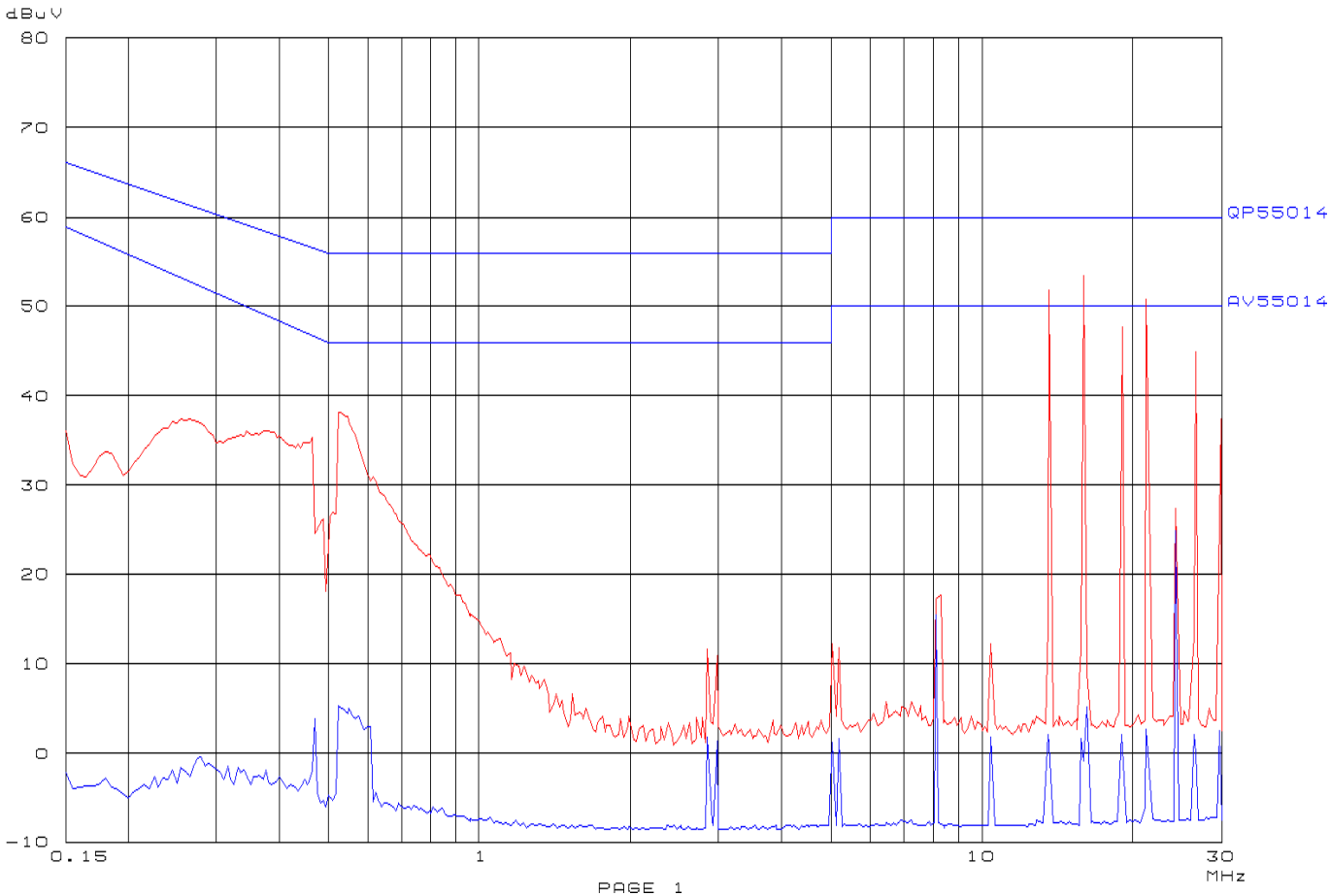
### USED TEST EQUIPMENT

Equipment	Manufacturer	Model	Serial N°	Calibration
RF receiver 9 kHz ÷ 30 MHz	R&S	ESHS 30	828765/012	-
LISN 9 kHz ÷ 30 MHz	R&S	ESH2-Z5	872 460/041	-
Shielded room	Siemens	--	009	-
ESD generator	Schaffner	NSG 435	000310	-
RF receiver 20 ÷ 1000 MHz	R&S	ESVS 10	827455/008	-
Shielded room	Siemens	--	005	-
Clamp controller	Emi Tech	950	1190	-
Absorbing clamp 30 ÷ 1000 MHz	R&S	MDS 21	893 169/001	-
Interference analyzer	Chase	DIA 1512	5039	-
Digital oscilloscope	Yocogawa	DL1540	25WY1600L	-
LISN 9 kHz ÷ 30 MHz	Chase	MN 2050	1524	-
Mains analyzer	EMC Partner	Harmonics 1000	HAR1000-16	-
AC Power source	HP	6834	3432A-00125	-
RF generator 0.1 ÷ 1000 MHz	R&S	SMG	883717/020	-
Wideband RF amplifier 150 kHz ÷ 300 MHz	411LA	EIN	629	-
Coupling/decoupling network	Rohrbacher	CDN 801-M3	60116	-
Mainframe	Schaffner	NSG 200E	00861	-
Burst generator	Schaffner	NSG 225A	1484 9222	-
Pulse generator	Schaffner	NSG 651	172	-
Coupling network	Schaffner	CDN 110	255	-
Thermohygrometer data logger	Testo	175 -H2	20012380	-

### MAINS DISTURBANCE VOLTAGE

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 E0  
Manuf: tecnowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Spec: EN 55014  
Comment: neutral line



NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 EO  
Manuf: teonwind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Spec: EN 55014  
Comment: neutral line

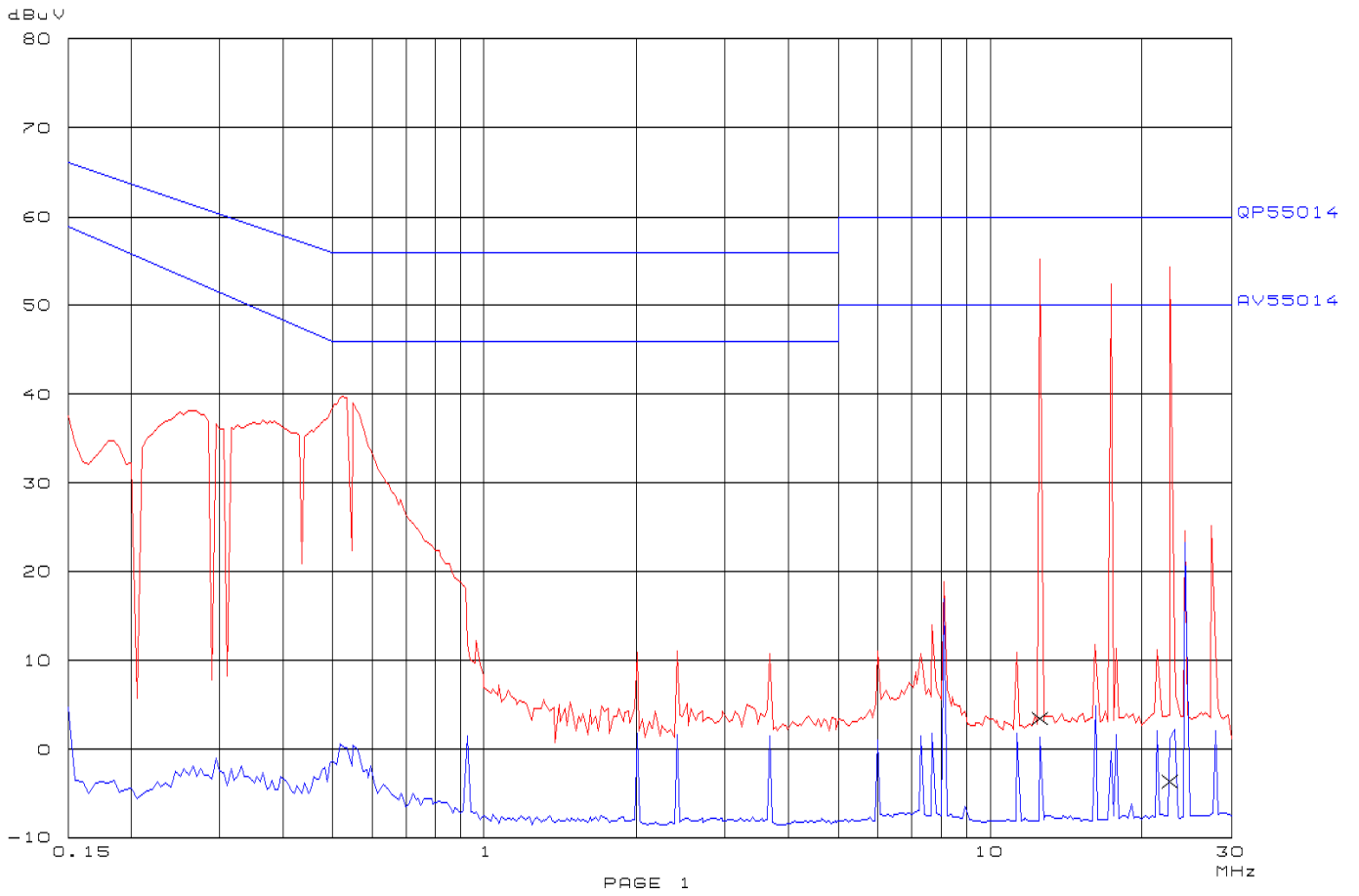
Final Measurement Results:

no Results



NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 EO  
Manuf: teonowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Specs: EN 55014  
Comment: neutral line





NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 EO  
Manuf: teonwind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D. Angelo  
Test Spec: EN 55014  
Comment: neutral line

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
12.57000	3.4	60.0
22.72000	-3.6	60.0

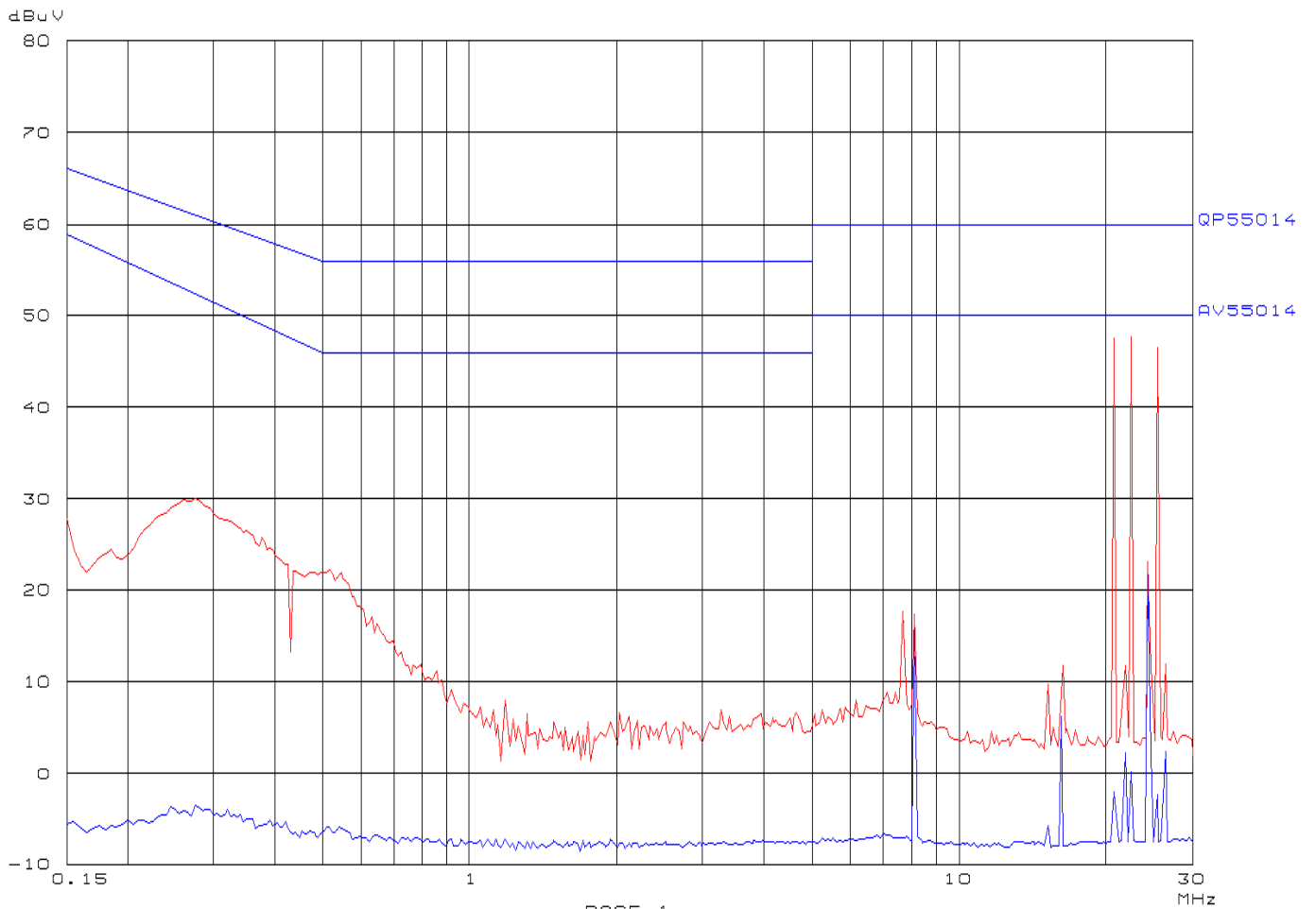
Frequency MHz	AV Level dBuV	AV Limit dBuV
------------------	------------------	------------------

no Results

\* limit exceeded

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 E0  
Manuf: teonowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Specs: EN 55014  
Comment: NEUTRAL line



NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

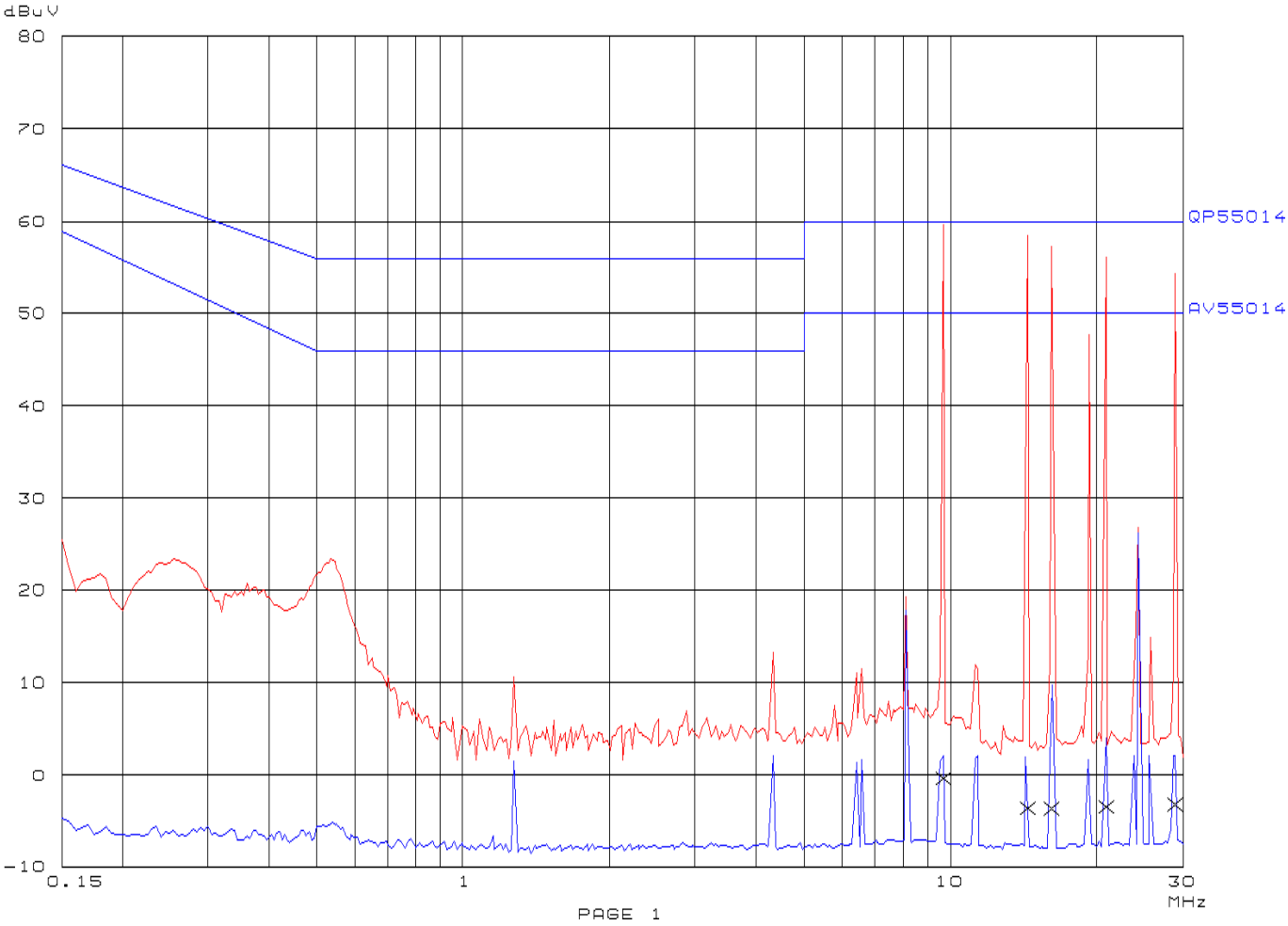
EUT: P29 EO  
Manuf: tecnwind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Spec: EN 55014  
Comment: NEUTRAL line

Final Measurement Results:

no Results

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 E0  
Manuf: teonowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Spec: EN 55014  
Comment: phase line





NEMKO S.p.A. PT Dpt.
CONDUCTED EMISSION AC MAINS

EUT: P29 EO
Manuf: teonwind SPA
Op Cond: See relevant paragraph of test report
Operator: G. D Angelo
Test Spec: EN 55014
Comment: please line

Final Measurement Results:

Table with 3 columns: Frequency MHz, QP Level dBuV, QP Limit dBuV. Rows include frequencies like 9.670000, 14.430000, 16.110000, 20.930000, 28.900000.

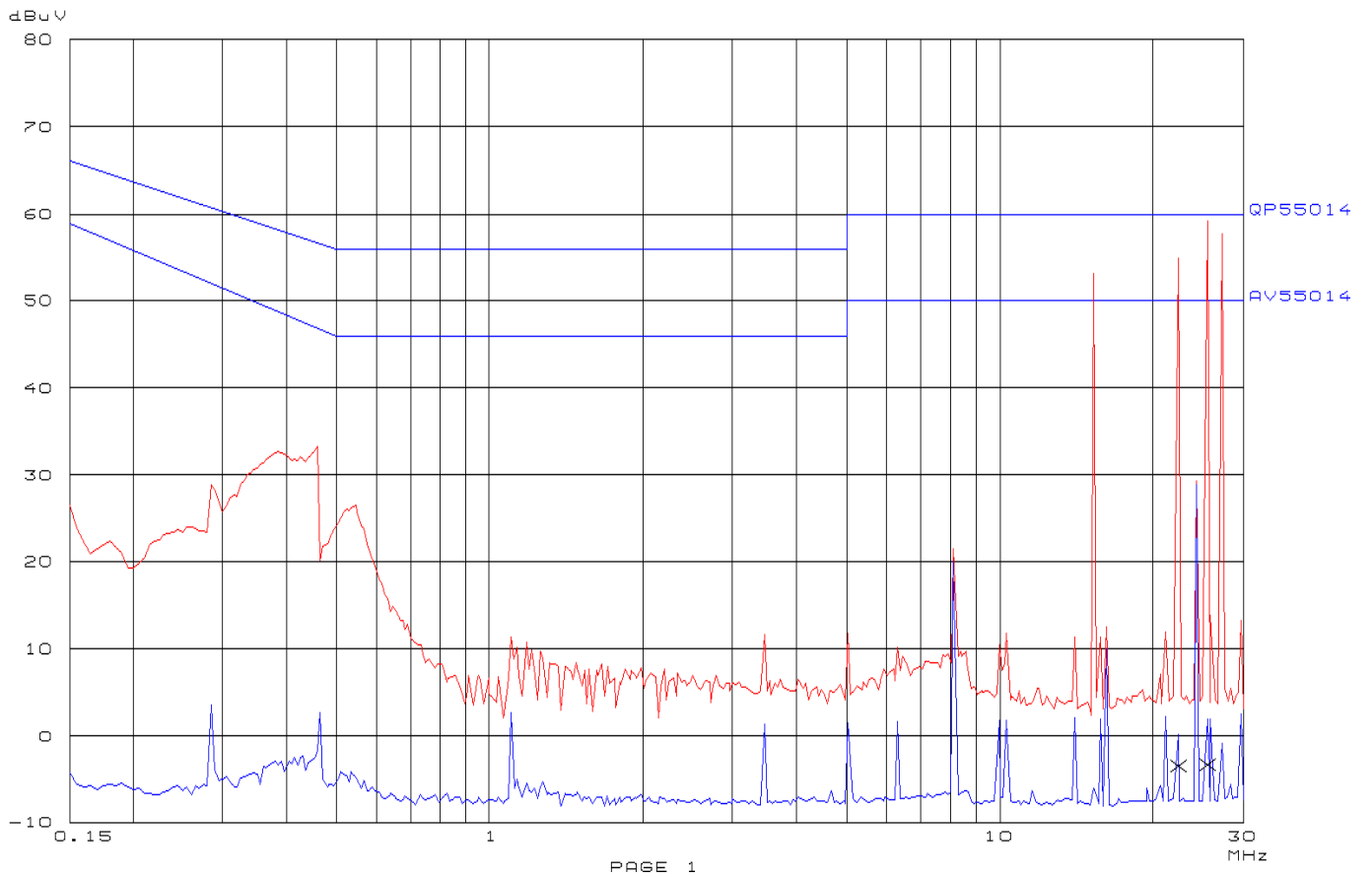
Table with 3 columns: Frequency MHz, AC Level dBuV, AC Limit dBuV.

no Results

\* limit exceeded

NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 EO  
Manuf: teonowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Specs: EN 55014  
Comment: phase line



PAGE 1



NEMKO S.p.A. PT Dpt.
CONDUCTED EMISSION AC MAINS

EUT: P29 EO
Manuf: t@onwind SPA
Op Cond: See relevant paragraph of test report
Operator: G. D. Angelo
Test Spec: EN 55014
Comment: please line

Final Measurement Results:

Table with 3 columns: Frequency MHz, QP Level dBuV, QP Limit dBuV. Rows for 22.40000 and 25.55000 MHz.

Table with 3 columns: Frequency MHz, AV Level dBuV, AV Limit dBuV.

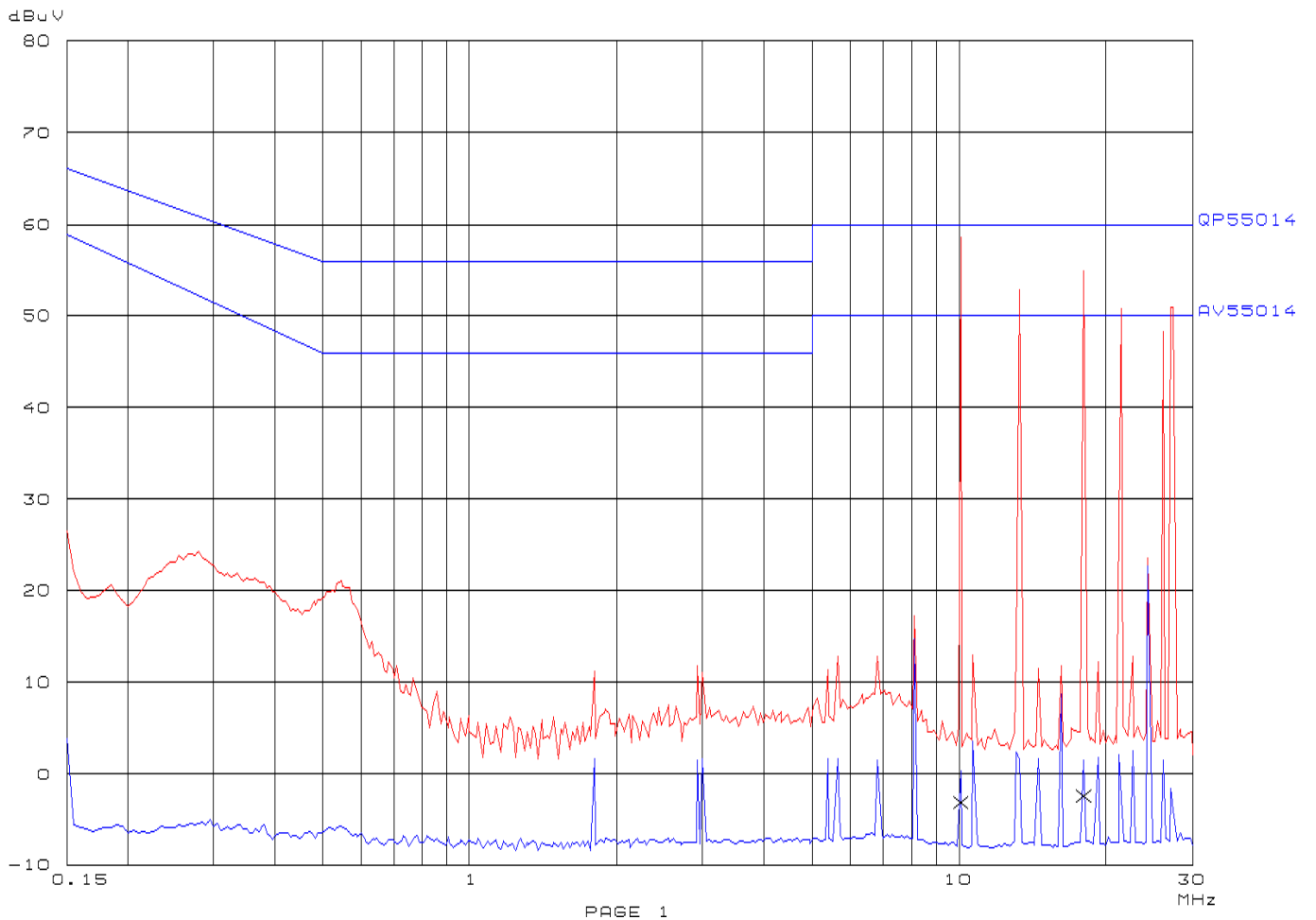
no Results

\* limit exceeded



NEMKO S.p.A. PT Dpt.  
CONDUCTED EMISSION AC MAINS

EUT: P29 E0  
Manuf: teonowind SPA  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Specs: EN 55014  
Comment: PHASE line





NEMKO S.p.A. PT Dpt.
CONDUCTED EMISSION AC MAINS

EUT: P29 EO
Manuf: teonwind SPA
Op Cond: See relevant paragraph of test report
Operator: G. D Angelo
Test Spec: EN 55014
Comment: PHASE line

Final Measurement Results:

Table with 3 columns: Frequency MHz, QP Level dBuV, QP Limit dBuV. Rows for 10.06000 and 18.02000 MHz.

Table with 3 columns: Frequency MHz, AV Level dBuV, AV Limit dBuV.

no Results

\* limit exceeded

## DISCONTINUOUS DISTURBANCE VOLTAGE

First Run (Hob Top) Operation mode according to clause 7.3.4.1

Frequency	Clicks<10ms	10ms<Clicks<20ms	Clicks>20 ms	Switching operations (n)	Time (T)	Click rate (N)
[MHz]	[No.]	[No.]	[No.]	[No.]	[min]	[No./min]
0,15	0	0	0	40	12	1.67
0,50	40	0	0	40	12	1.67
1,40	28	0	0	40	12	1.67
30,0	0	0	0	40	12	1.67

*Appliance which has a click rate N less than 5 clicks per minute, and which has instantaneous switching (90% clicks shorter than 10 ms and none >20ms ) shall be deemed to comply with the limits, regardless of the click's amplitude.*

First Run (Hob Bottom) Operation mode according to clause 7.3.4.1

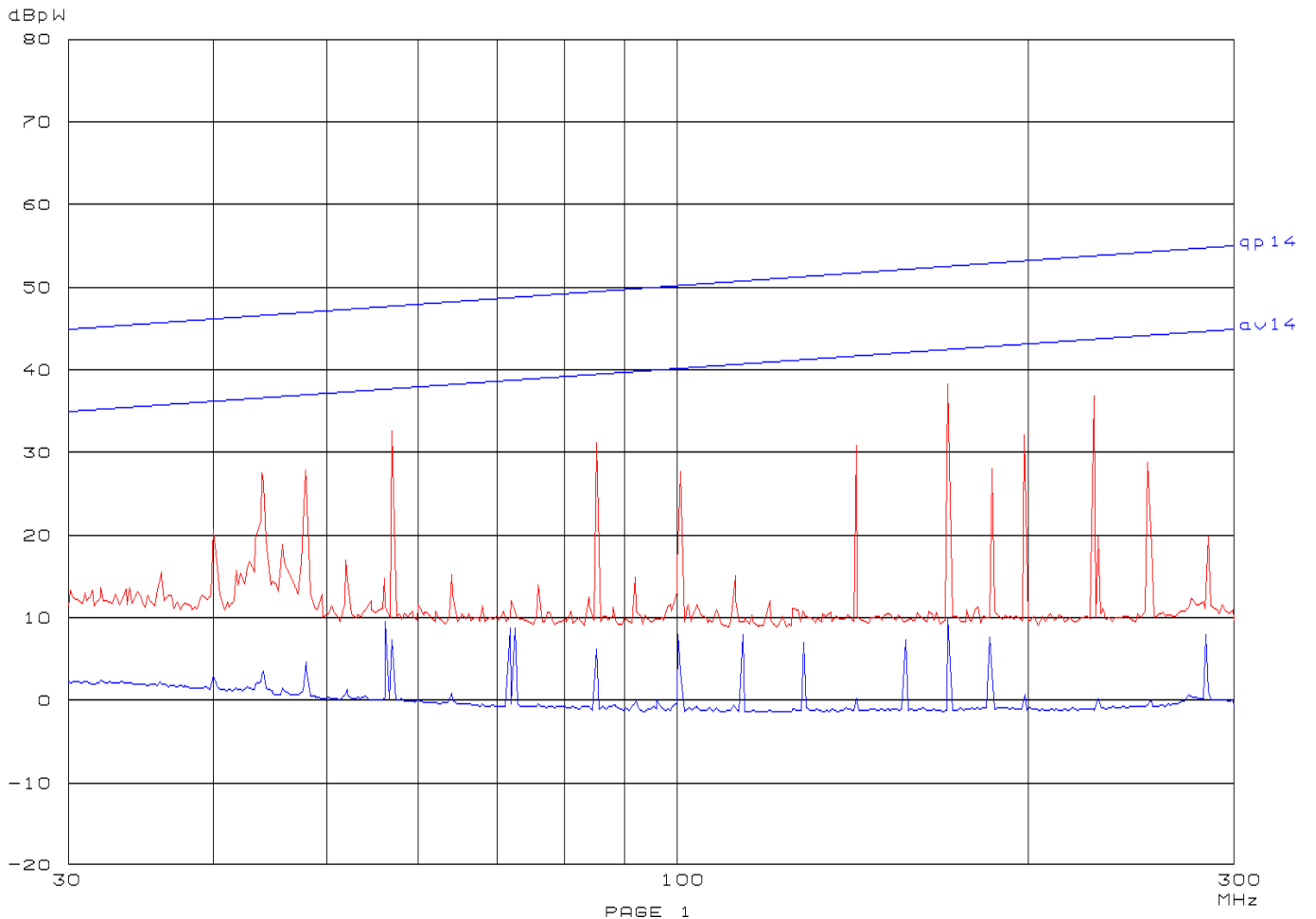
Frequency	Clicks<10ms	10ms<Clicks<20ms	Clicks>20 ms	Switching operations (n)	Time (T)	Click rate (N)
[MHz]	[No.]	[No.]	[No.]	[No.]	[min]	[No./min]
0,15	0	0	0	40	16	1.25
0,50	40	0	0	40	16	1.25
1,40	32	0	0	40	16	1.25
30,0	0	0	0	40	16	1.25

*Appliance which has a click rate N less than 5 clicks per minute, and which has instantaneous switching (90% clicks shorter than 10 ms and none >20ms ) shall be deemed to comply with the limits, regardless of the click's amplitude.*

**DISTURBANCE POWER**

NEMKO S.p.A. PT Dpt  
 DISTURBANCE RADIATED POWER

EUT: P29 E0  
 Manuf: TECNOWINDS.p.A.  
 Op Cond: See relevant paragraph of test report  
 Operator: G. D Angelo  
 Test Spec: EN 55014-1  
 Comment: Clampat 0 cm  
 r1=1 r2=1



NEMKO S.p.A. PT Dpt  
DISTURBANCE RADIATED POWER

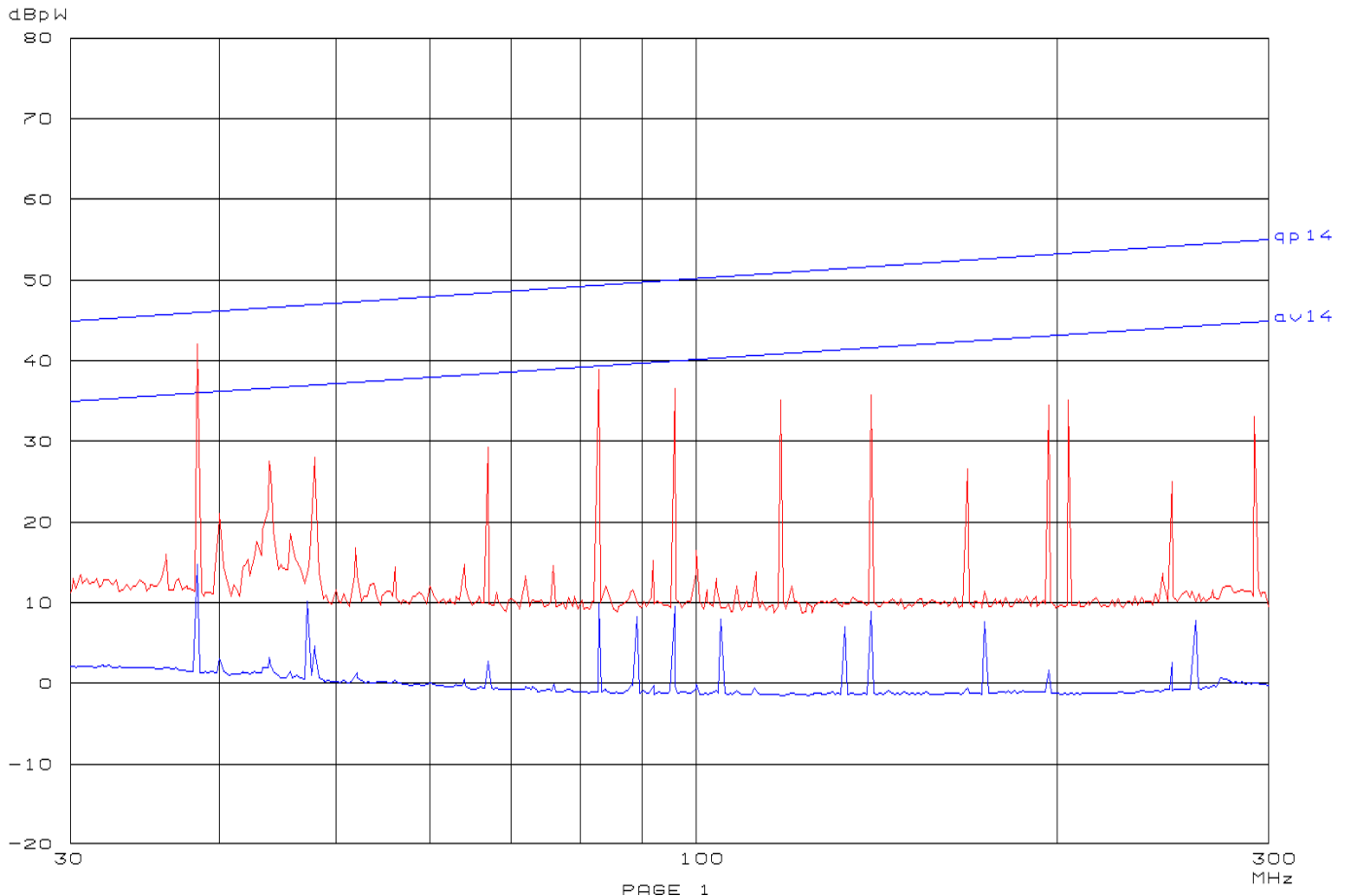
EUT: P29 EO  
Manuf: TECNOWINDS.p.A.  
Op Cond: See relevant paragraph of test report  
Operator: G. D. Angelo  
Test Spec: EN 55014-1  
Comment: C143pat 0 cm  
r1=1 r2=1

Final Measurement Results:

no Results

NEMKO S.p.A. PT Dpt  
DISTURBANCE RADIATED POWER

EUT: P29 E0  
Manuf: TECNOWINDS.p.A.  
Op Cond: See relevant paragraph of test report  
Operator: G. D Angelo  
Test Spec: EN 55014-1  
Comment: Clampat 0 cm  
r1=5 r2=5





NEMKO S.p.A. PT Dpt
DISTURBANCE RADIATED POWER

EUT: P29 EO
Manuf: TECNOWINDS.p.A.
Op Cond: See relevant paragraph of test report
Operator: G. D. Agello
Test Spec: EN 55014-1
Comment: r1=5 r2=5

Final Measurement Results:

Table with 3 columns: Frequency (MHz), QP Level (dBpW), QP Limit (dBpW). Row 1: 38.35000, 15.8, 46.0

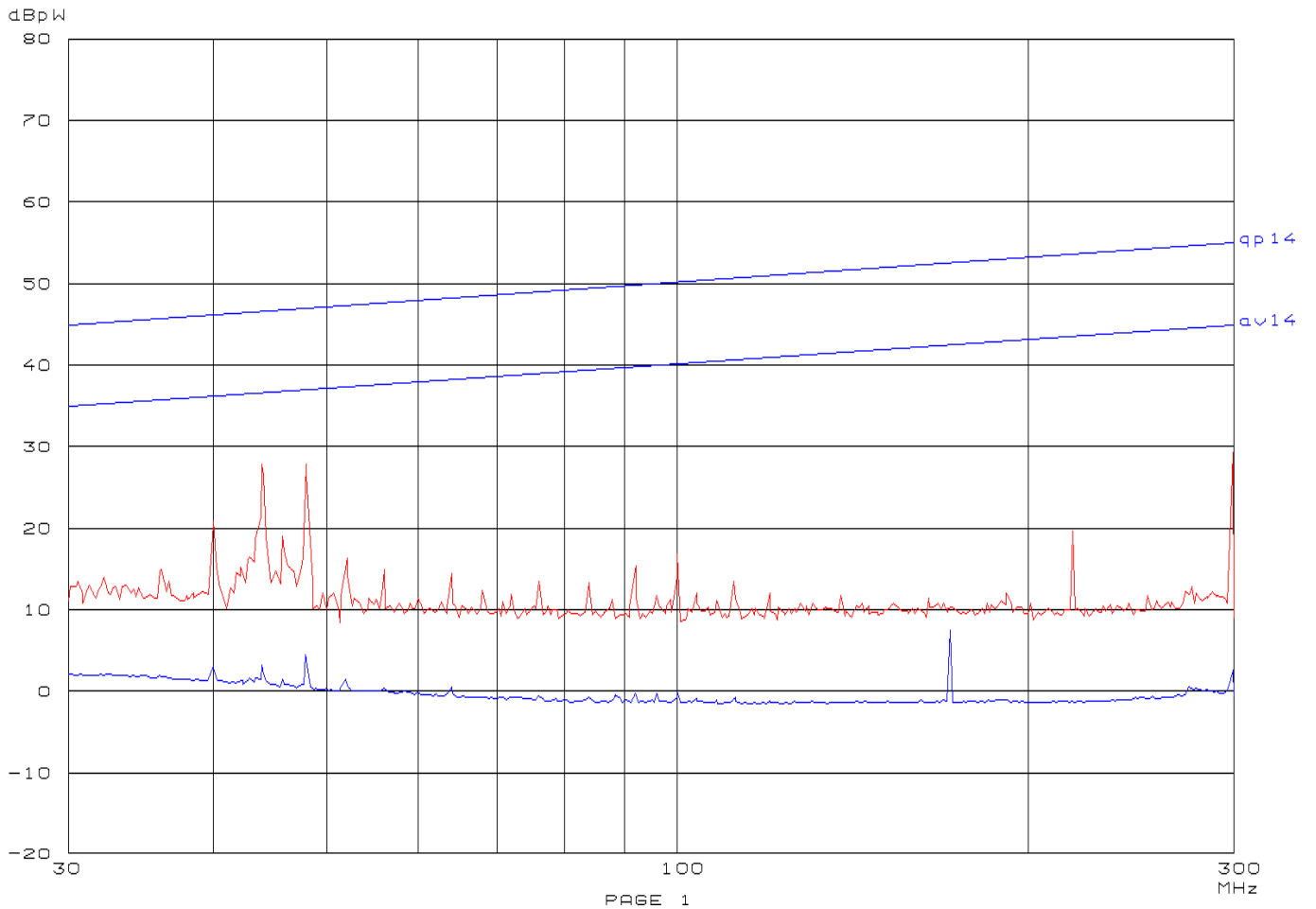
Table with 3 columns: Frequency (MHz), AV Level (dBpW), AV Limit (dBpW)

no Results

\* limit exceeded

NEMKO S.p.A. PT Dpt  
 DISTURBANCE RADIATED POWER

EUT: P29 E0  
 Manuf: TECNOWINDS.p.A.  
 Op Cond: See relevant paragraph of test report  
 Operator: G. D Angelo  
 Test Spec: EN 55014-1  
 Comment: Clampat 0 om  
 r1=9 r2=9







NEMKO S.p.A. PT Dpt  
DISTURBANCE RADIATED POWER

EUT: P29 EO  
Manuf: TECNOWINDS.p.A.  
Op Cond: See relevant paragraph of test report  
Operator: G. D. Angelo  
Test Spec: EN 55014-1  
Comment: r1=0 r2=0

Final Measurement Results:  
no Results

**HARMONIC CURRENT**

Operation mode: Hobs (Top)  
 Remarks: Max heating

Urms = 230.1V      Freq = 49.974      Range: 25 A  
 Irms = 7.690A      Ipk = 10.90A      cf = 1.417  
 P = 1769W      S = 1770VA      pf = 1.000  
 THDi = 0.10 %      THDu = 0.10 %      Class A

Test - Time : 5min ( 100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms% [%]	Irms%L [%]	Imax [A]	Imax%L [%]	Limit [A]	Status	Vrms [V]
1	50	5.4656		7.6874	99.960		7.6889				230.06
2	100	0.0006	0.0542	0.0031	0.0397	0.2826	0.0259	2.4018	1.0800		0.1227
3	150	0.0013	0.0577	0.0061	0.0794	0.2654	0.0153	0.6634	2.3000		0.0491
4	200	0.0000	0.0012	0.0000	0.0000	0.0000	0.0092	2.1291	0.4300		0.0000
5	250	0.0013	0.1122	0.0061	0.0794	0.5354	0.0092	0.8031	1.1400		0.0245
6	300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0046	1.5259	0.3000		0.0000
7	350	0.0000	0.0000	0.0000	0.0000	0.0000	0.0031	0.3963	0.7700		0.0245
8	400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0031	1.3269	0.2300		0.0000
9	450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0031	0.7629	0.4000		0.0245
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.8293	0.1840		0.0000
11	550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.4624	0.3300		0.0245
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.9951	0.1533		0.0000
13	650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.7266	0.2100		0.0245
14	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.1610	0.1314		0.0000
15	750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.0173	0.1500		0.0245
16	800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.3269	0.1150		0.0000
17	850	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.1529	0.1324		0.0000
18	900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.4927	0.1022		0.0000
19	950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.2885	0.1184		0.0000
20	1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.6586	0.0920		0.0000
21	1050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.4242	0.1071		0.0000
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	1.8244	0.0836		0.0000
23	1150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0978		0.0000
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767		0.0000
25	1250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0900		0.0000
26	1300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0708		0.0000
27	1350	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833		0.0000
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657		0.0000
29	1450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0776		0.0000
30	1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0613		0.0000
31	1550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0726		0.0000
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575		0.0000
33	1650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0682		0.0000
34	1700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0541		0.0000
35	1750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0643		0.0000
36	1800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0511		0.0000
37	1850	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0608		0.0000
38	1900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484		0.0000
39	1950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0577		0.0000
40	2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460		0.0000

Operation mode: Hobs (Bottom)  
 Remarks: Max heating

Urms = 230.3V      Freq = 49.987      Range: 25 A  
 Irms = 0.024A      Ipk = 0.073A      cf = 3.000  
 P = 3.681W      S = 5.623VA      pf = 0.655  
 THDi = 0.70 %      THDu = 0.10 %      Class A

Test - Time : 5min ( 100 %)

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms% [%]	Irms%L [%]	Imax [A]	Imax%L [%]	Limit [A]	Status	Vrms [V]
1	50	4.2224		1.0300	4218.8		5.2673				230.23
2	100	0.0001	0.0056	0.0000	0.0000	0.0000	0.0168	1.5541	1.0800		0.1227
3	150	0.0009	0.0383	0.0046	18.750	0.1990	0.0122	0.5307	2.3000		0.0245
4	200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0061	1.4194	0.4300		0.0000
5	250	0.0009	0.0765	0.0046	18.750	0.4015	0.0076	0.6692	1.1400		0.0000
6	300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.5086	0.3000		0.0000
7	350	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.1982	0.7700		0.0000
8	400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.6634	0.2300		0.0000
9	450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.3815	0.4000		0.0000
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.8293	0.1840		0.0000
11	550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.4624	0.3300		0.0000
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.9951	0.1533		0.0000
13	650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.7266	0.2100		0.0000
14	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1314		0.0000
15	750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1500		0.0000
16	800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1150		0.0000
17	850	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1324		0.0000
18	900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1022		0.0000
19	950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1184		0.0000
20	1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0920		0.0000
21	1050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1071		0.0000
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0836		0.0000
23	1150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0978		0.0000
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767		0.0000
25	1250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0900		0.0000
26	1300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0708		0.0000
27	1350	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833		0.0000
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657		0.0000
29	1450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0776		0.0000
30	1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0613		0.0000
31	1550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0726		0.0000
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575		0.0000
33	1650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0682		0.0000
34	1700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0541		0.0000
35	1750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0643		0.0000
36	1800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0511		0.0000
37	1850	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0608		0.0000
38	1900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484		0.0000
39	1950	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0577		0.0000
40	2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460		0.0000

### VOLTAGE FLUCTUATIONS AND FLICKER

Operation mode: Hobs (Top)  
Remarks: According to clause A.1.1

Urms = 230.3V      Freq = 50.000      Range: 25 A  
Irms = 0.024A      Ipk = 0.061A      cf = 2.500  
P = 4.295W      S = 5.623VA      pf = 0.764

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits :      Pst : 1.00  
              dmax : 4.00 %      dc : 3.30 %  
              dtLim: 3.30 %      dt>Lim: 500ms

Test completed, Result: PASSED

Pst	dmax	dc	dt>Lim
	[%]	[%]	[ms]
0.913	1.590	1.570	0.000

Operation mode: Hobs (Bottom)  
Remarks: According to clause A.1.1

Urms = 230.3V      Freq = 49.987      Range: 10 A  
Irms = 0.039A      Ipk = 0.068A      cf = 1.750  
P = 4.172W      S = 8.996VA      pf = 0.464

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits :      Pst : 1.00  
              dmax : 4.00 %      dc : 3.30 %  
              dtLim: 3.30 %      dt>Lim: 500ms

Test completed, Result: PASSED

Pst	dmax	dc	dt>Lim
	[%]	[%]	[ms]
0.523	1.100	1.080	0.000

## MEASUREMENTS – ORDER NUMBER 94011

### SCOPE OF WORK

The manufacturer introduces a new radiant heating element for this family design. At the same time the electronics has been adapted to the heater and is also included in this sample, in order to qualify it for this family.

Testing was performed on the PI29 EO1500 model

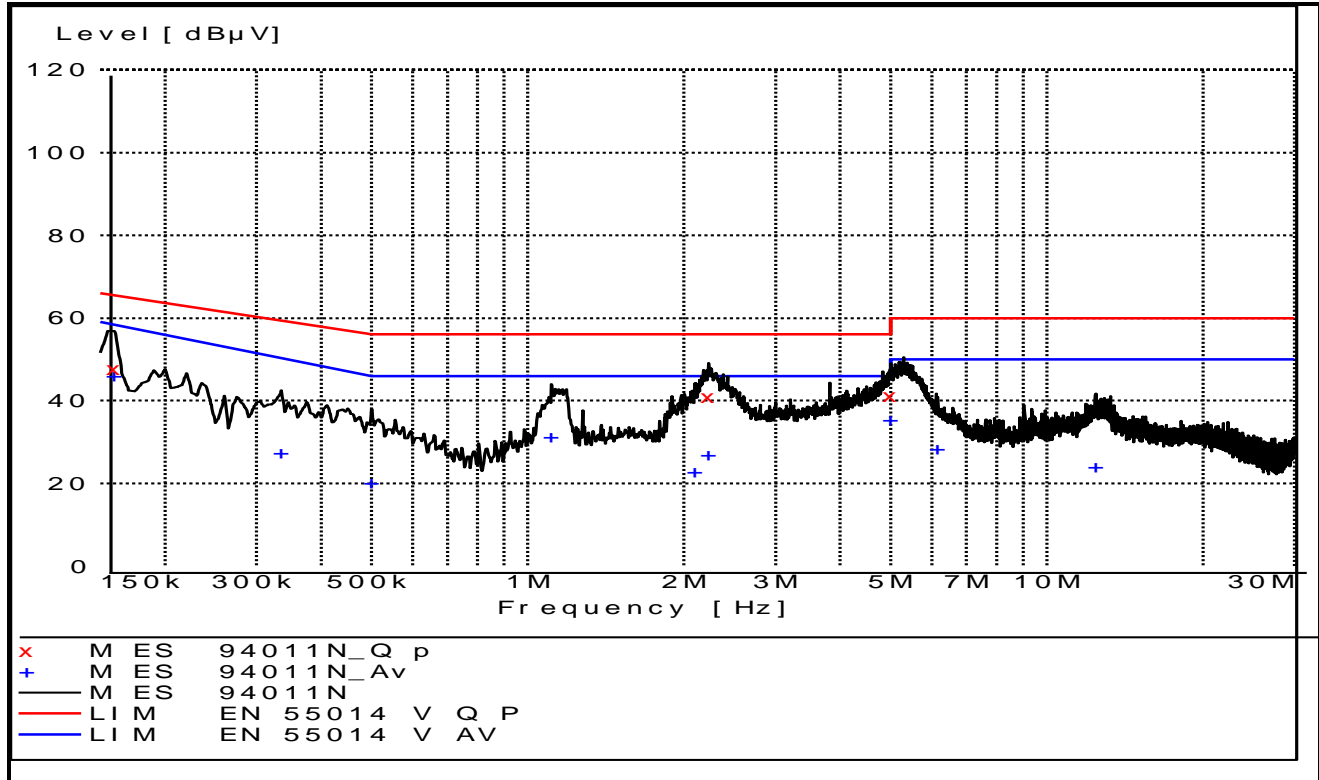
Components qualified this time:

Component	Manufacturer	Model	Conformity
Thermostat	EGO	60.25170.006	Tested
Control unit	Diehl AKO Stiftung & Co.	TC4 Standard H	Tested
PCB of touch control & display in control unit	DIEHL	Controls 711890	Tested
PCB of power supply in control unit	DIEHL	Controls 714649	Tested

### USED TEST EQUIPMENT

Equipment	Manufacturer	Model	Serial N°	Calibration
EMI Receiver	Rohde&Schwarz	ESHS30	N-3529	08/2007
LISN	Rohde&Schwarz	ESH2-Z5	N-3558	10/2007
Puls Limiter	Rohde&Schwarz	ESH3-Z2	N-3932	06/2008
Click Analyzer	AFJ International	CL55C	N-4166	11/2007
LISN	AFJ International	LS16C	N-4166.01	06/2008
Clamp	Rohde&Schwarz	MDS21	N-4275	12/2007
EMI Receiver	Rohde&Schwarz	ESVS20	N-2886	07/2007
Power Analyzer	California Instruments	C15000iX-400-CTS	N-4082	03/2008
ESD Generator	Schaffner	NSG435	N-3355	03/2008
CS Test System	Schaffner	BestEMC	N-4103	05/2008
Amplifier	Amplifier Research	75A250	N-3883	-/-
Attenuator	Narda	FSCM99899769-6	N-4189	-/-
CDN	FCC	FCC-801-6-M3	N-3814	06/2008
Power Meter	Boonton	9200C	N-3718	10/2007
RF Generator	Rohde&Schwarz	SMG	N-2885	02/2009

**MAINS DISTURBANCE VOLTAGE**



Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)

**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.160000	47.70	10.10	65.50	-17.80	QP	N	Pass
2.230000	40.80	10.20	56.00	-15.20	QP	N	Pass
5.000000	41.20	10.40	56.00	-14.80	QP	N	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.160000	46.10	10.10	58.30	-12.20	AV	N	Pass
0.335000	27.50	10.10	50.30	-22.80	AV	N	Pass
0.500000	20.20	10.10	46.00	-25.80	AV	L1	Pass
1.110000	31.20	10.20	46.00	-14.80	AV	N	Pass
2.100000	22.80	10.20	46.00	-23.20	AV	L1	Pass
2.230000	27.10	10.20	46.00	-18.90	AV	N	Pass
5.000000	35.40	10.40	46.00	-10.60	AV	N	Pass
6.155000	28.30	10.40	50.00	-21.70	AV	L1	Pass
12.410000	24.10	10.70	50.00	-25.90	AV	N	Pass

**DISCONTINUOUS DISTURBANCE VOLTAGE**

	Rx1 150KHz	Rx2 500KHz	Rx3 1.4MHz	Rx4 30MHz
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**OBSERVATION**

Short (T<10ms)	40	40
Long (10ms<T<200ms)	0	0
Fast Long (10ms<T<20ms)	0	0
Total Clicks	40	40
Continuous Events	0	0
2 Click	0	0
Continuous Time	0.0	0.0
Limit [dBuV]	66	56

**CALCULATION**

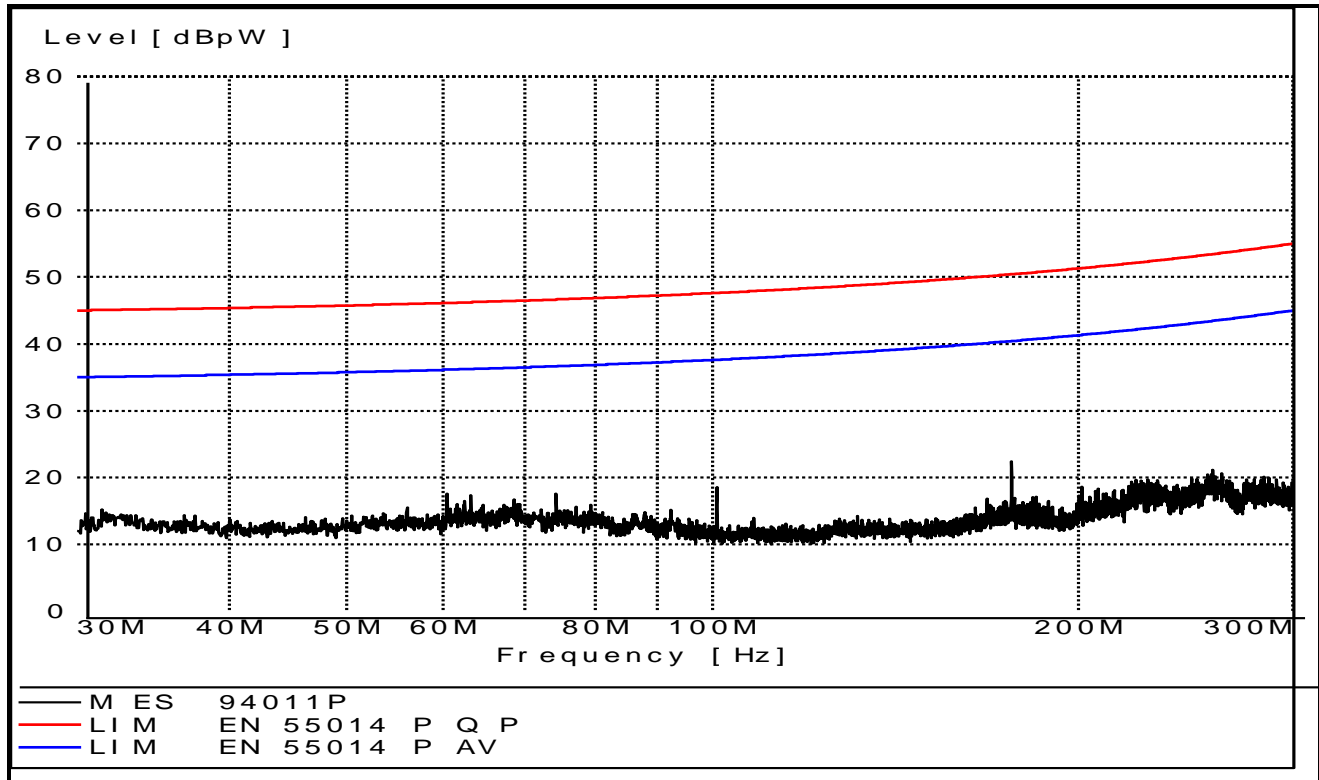
Duration of Test	120min	120min	120min	120min
Click rate (N)	2.80	2.80	2.80	2.80
New Limit [dBuV]	-	-	-	-
Allowed Clicks	-	-	-	-

**QUALIFICATION**

Short	-	-	-	-
Long	-	-	-	-
Total Clicks	-	-	-	-
Continuous Events	-	-	-	-
2 Click	-	-	-	-
Continuous Time	-	-	-	-
Verdict	Pass	Pass	Pass	Pass



### DISTURBANCE POWER



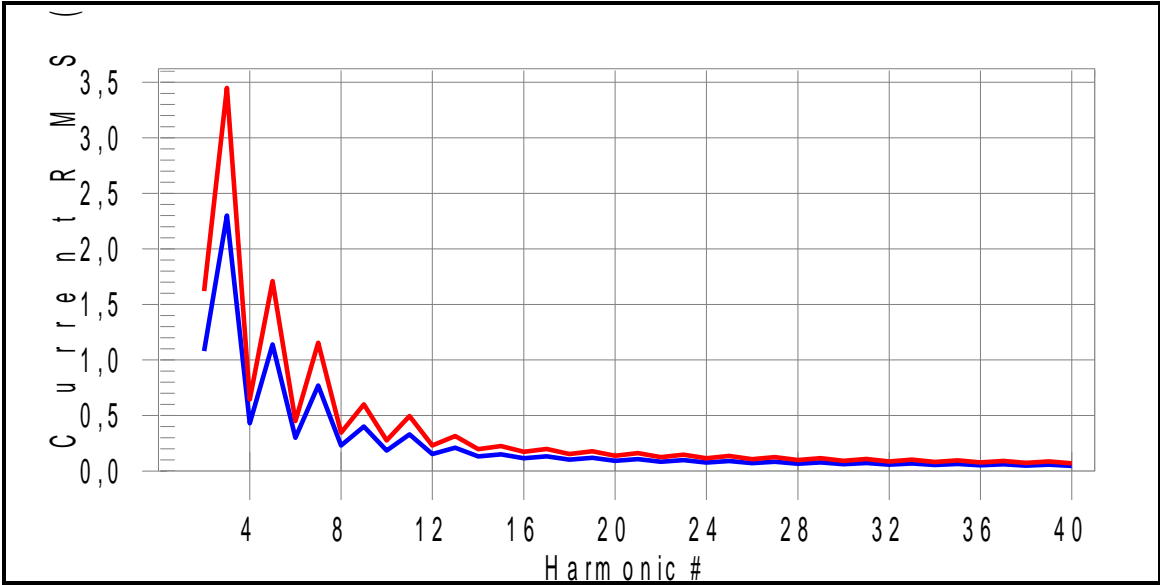
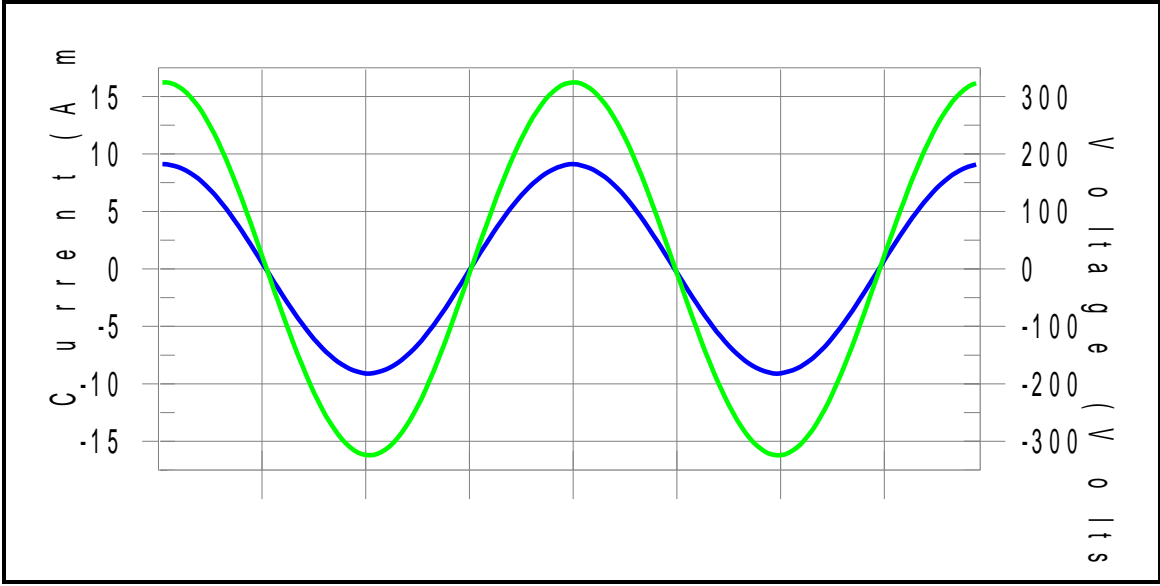
Note: This preview is a peak detector scan at the clamps 0 point. Any quasi-peak or average detector measurements are conducted at a localised maxima ("x" = quasi-peak / "+" = average. Measurement data are presented below)

#### Quasi Peak Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
-	-	-	-	-	-	-	PASS

#### Average Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
-	-	-	-	-	-	-	PASS

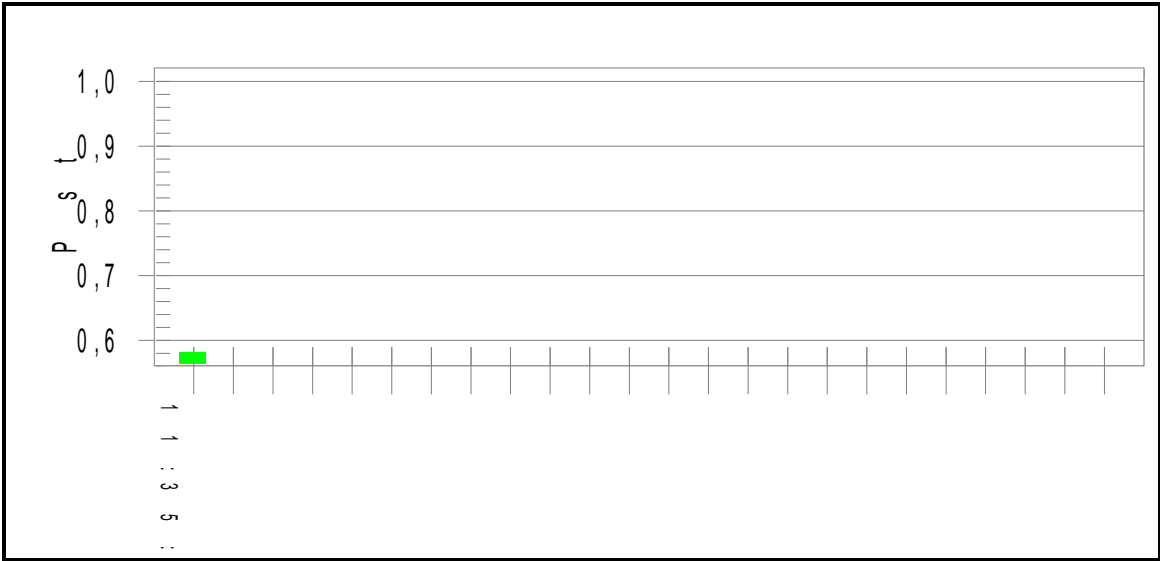
**HARMONIC DISTORTION**


Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0,012	1,080	1,1	0,015	1,620	0,93	Pass
3	0,017	2,300	0,7	0,020	3,450	0,59	Pass
4	0,004	0,430	0,9	0,006	0,645	0,90	Pass
5	0,005	1,140	0,4	0,007	1,710	0,39	Pass
6	0,002	0,300	0,8	0,004	0,450	0,85	Pass
7	0,004	0,770	0,6	0,006	1,155	0,48	Pass
8	0,002	0,230	0,8	0,003	0,345	0,84	Pass
9	0,004	0,400	1,0	0,005	0,600	0,81	Pass
10	0,002	0,184	0,8	0,002	0,276	0,86	Pass
11	0,002	0,330	0,7	0,003	0,495	0,64	Pass
12	0,001	0,153	0,8	0,002	0,230	0,85	Pass
13	0,002	0,210	1,2	0,003	0,315	1,02	Pass
14	0,001	0,131	0,8	0,002	0,197	0,82	Pass
15	0,003	0,150	1,7	0,003	0,225	1,33	Pass
16	0,001	0,115	0,8	0,002	0,173	0,93	Pass
17	0,002	0,132	1,5	0,003	0,199	1,26	Pass
18	0,001	0,102	0,9	0,001	0,153	0,93	Pass
19	0,002	0,118	1,7	0,003	0,178	1,44	Pass
20	0,001	0,092	0,8	0,001	0,138	0,90	Pass
21	0,002	0,107	1,6	0,002	0,161	1,31	Pass
22	0,001	0,084	0,8	0,001	0,125	0,86	Pass
23	0,002	0,098	1,8	0,002	0,147	1,50	Pass
24	0,001	0,077	0,8	0,001	0,115	0,90	Pass
25	0,002	0,090	2,3	0,003	0,135	2,10	Pass
26	0,001	0,071	0,9	0,001	0,106	0,96	Pass
27	0,002	0,083	2,4	0,003	0,125	2,05	Pass
28	0,001	0,066	0,9	0,001	0,099	0,94	Pass
29	0,001	0,078	1,3	0,001	0,116	1,14	Pass
30	0,001	0,061	0,9	0,001	0,092	0,93	Pass
31	0,001	0,073	1,4	0,001	0,109	1,25	Pass
32	0,001	0,058	0,9	0,001	0,086	0,96	Pass
33	0,001	0,068	1,1	0,001	0,102	0,98	Pass
34	0,000	0,054	0,8	0,001	0,081	0,89	Pass
35	0,001	0,064	1,0	0,001	0,096	0,97	Pass
36	0,000	0,051	0,8	0,001	0,077	0,91	Pass
37	0,001	0,061	0,8	0,001	0,091	0,83	Pass
38	0,000	0,048	0,9	0,001	0,073	0,90	Pass
39	0,001	0,058	0,9	0,001	0,087	0,87	Pass
40	0,000	0,046	0,7	0,001	0,069	0,75	Pass

**VOLTAGE FLUCTUATIONS**

Parameter	Limit	Measured	Result
Dmax	4 %	-1.35 %	PASS
Dc	3.3 %	-1.12 %	PASS
Dt	500 msec	0.0 msec	PASS
Pst	1.0	0.582	PASS

Note:



## MEASUREMENTS – ORDER NUMBER 247715

### SCOPE OF WORK

Two new electronic touch controls from EIKA have been introduced in the family, and are qualified with these tests. One new heating element from EGO has been introduced in the family, qualified without testing, due to similarities with previously approved elements in this series.

Testing was performed on the P58 EO6400 model (The EuT has been fully EMC tested)

Components qualified this time:

Component	Manufacturer	Model	Conformity
PCB / touch control	EIKA	BN330D36211107	Approved variant of BN340D36211107 (tested in P58 EO6400)
PCB / touch control	EIKA	BN320D36211107	Approved variant of BN340D36211107 (tested in P58 EO6400)
Heating element	EGO	10.58213.xxx	Approved variant of 10.58211.xxx

### USED TEST EQUIPMENT

Equipment	Manufacturer	Model	Serial N°	Calibration due date
EMI Receiver	Rohde&Schwarz	ESHS30	N-3529	08/2014
LISN	Rohde&Schwarz	ESH2-Z5	N-3558	02/2015
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	N-3932	10/2014
Click Analyzer	AFJ International	CL55C	N-4166	06/2014
LISN	AFJ International	LS16C	N-4166.01	06/2014
Clamp	Rohde&Schwarz	MDS21	N-4275	03/2014
EMI Receiver	Rohde&Schwarz	ESVS20	N-2886	04/2014
Power Analyzer	California Instruments	C15000iX-400-CTS	N-4082	03/2017
ESD Generator	EM Test AG	ESD30N	N-4643	01/2014
Amplifier	Amplifier Research	75A250	N-3883	N/A
Attenuator	Narda	FSCM99899769-6	N-4189	N/A
CDN	FCC	FCC-801-6-M3	N-3814	N/A
Power Meter	Agilent Tech.	EPM E4419B	N-4459	10/2015
RF Generator	Rohde&Schwarz	SMY 02	N-3936	05/2015

**PHOTOS (P58 EO6400)**



Notes: Test set-up for Mains Port Disturbance Voltage



Notes: Test set-up for Disturbance Power



Notes: The tested model P58 EO6400



Notes: Test set-up for immunity to ESD

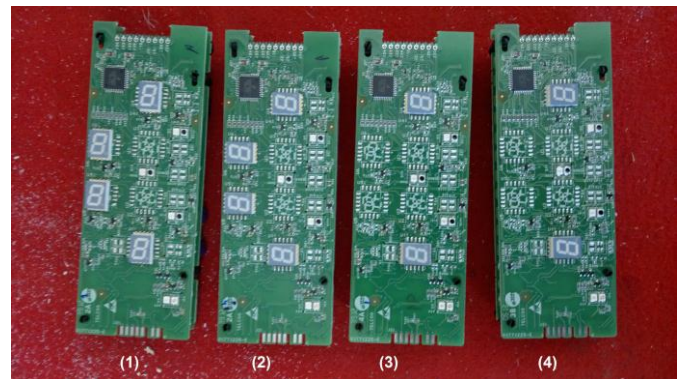
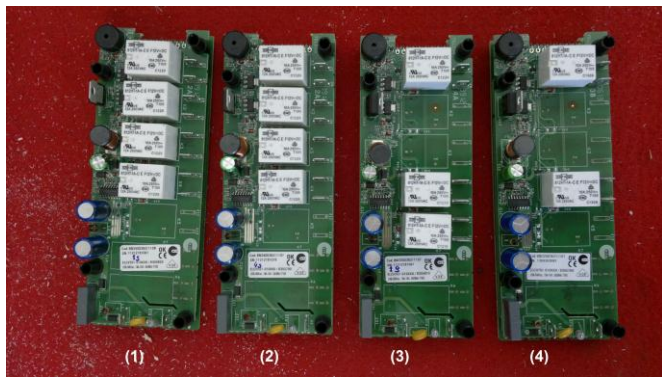


Notes: Test set-up for Injected current



Notes: Test set-up for EFT and Surge

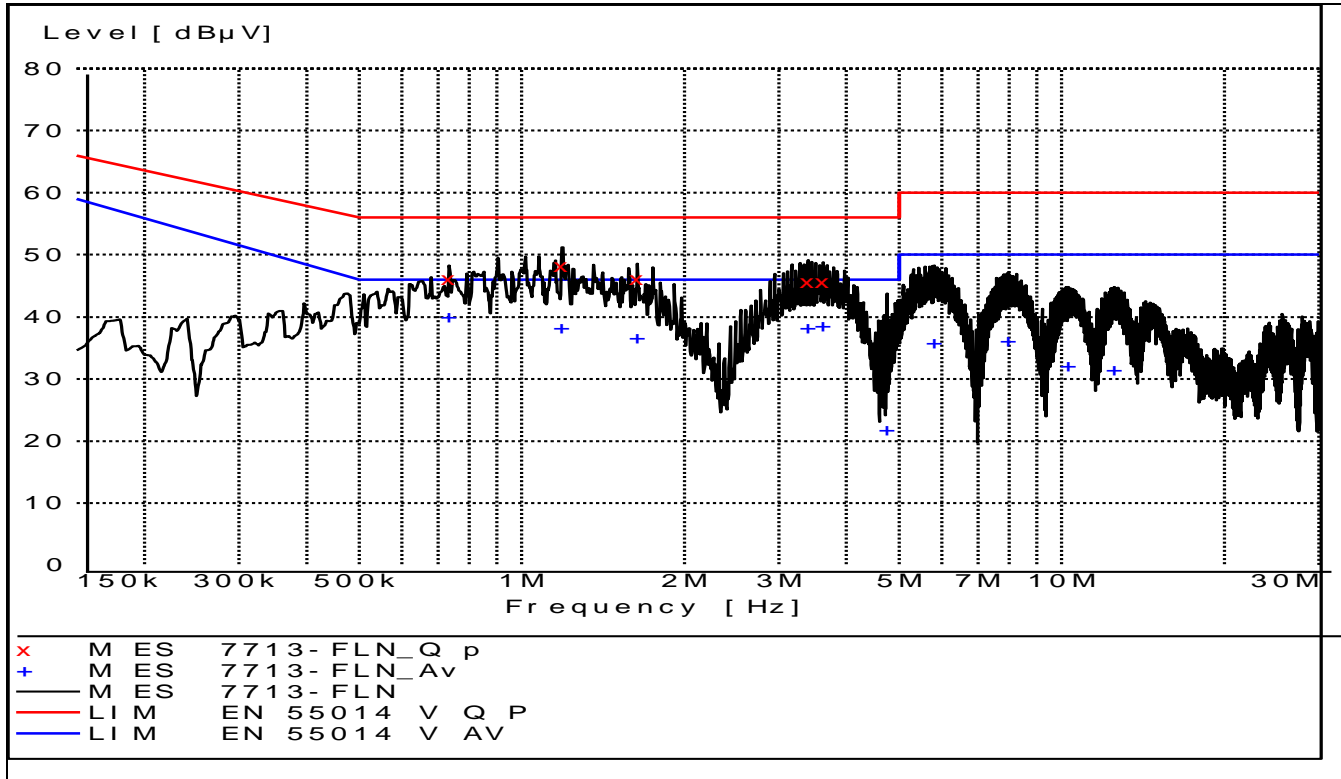




- (1) BN340D3621110B (for P58, P75 only)
- (2) BN340D36211107 (for P58, P75 only)
- (3) BN330D36211107 (for P29 only)
- (4) BN320D36211107 (for P29 only)

## MAINS DISTURBANCE VOLTAGE

### Disturbance Preview (Front Left Zone)



Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)



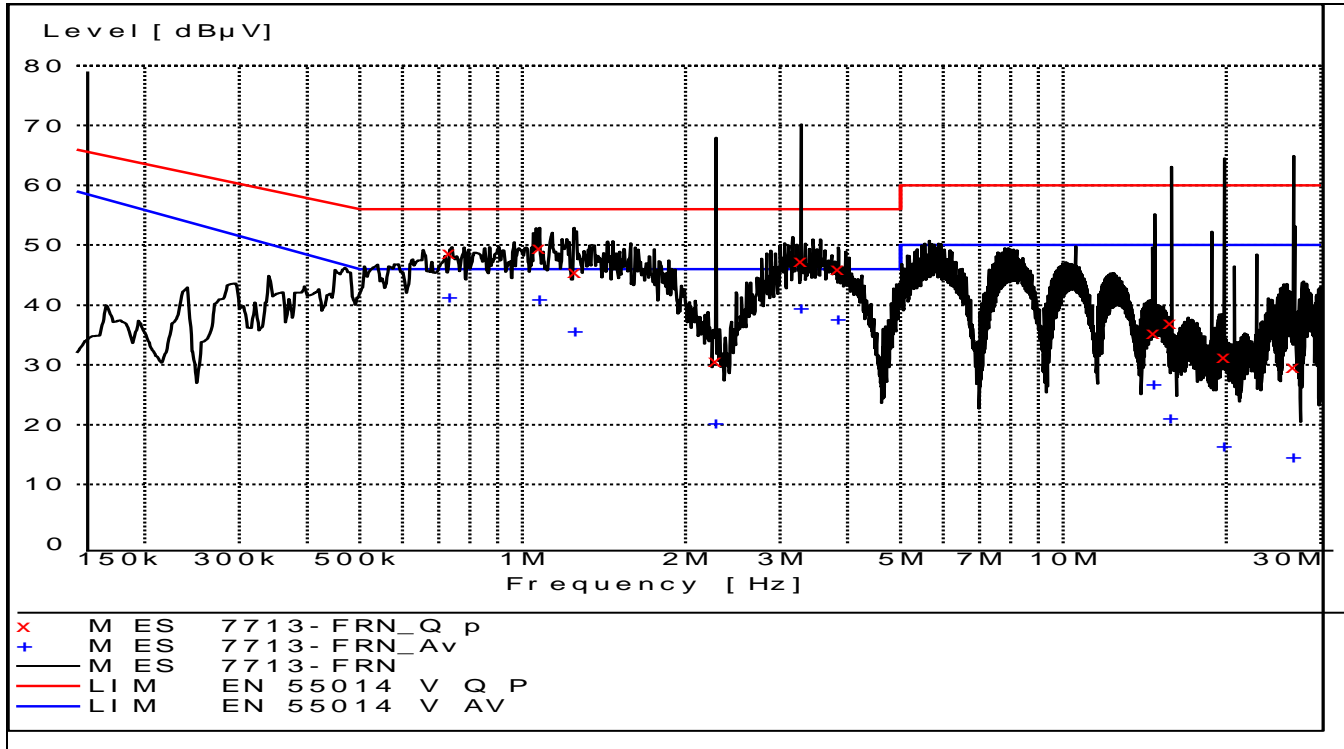
**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.735000	46.10	10.30	56.00	9.90	QP	L1	Pass
1.190000	48.20	10.30	56.00	7.80	QP	L1	Pass
1.640000	46.10	10.30	56.00	9.90	QP	L1	Pass
3.395000	45.60	10.30	56.00	10.40	QP	L1	Pass
3.620000	45.70	10.40	56.00	10.30	QP	L1	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.735000	40.00	10.30	46.00	6.00	AV	L1	Pass
1.190000	38.20	10.30	46.00	7.80	AV	L1	Pass
1.640000	36.70	10.30	46.00	9.30	AV	L1	Pass
3.395000	38.30	10.30	46.00	7.70	AV	L1	Pass
3.620000	38.50	10.40	46.00	7.50	AV	L1	Pass
4.750000	21.70	10.50	46.00	24.30	AV	L1	Pass
5.820000	35.80	10.50	50.00	14.20	AV	L1	Pass
7.985000	36.10	10.60	50.00	13.90	AV	L1	Pass
10.310000	32.20	10.70	50.00	17.80	AV	L1	Pass
12.565000	31.40	10.80	50.00	18.60	AV	L1	Pass

Disturbance Preview (Front Right Zone)



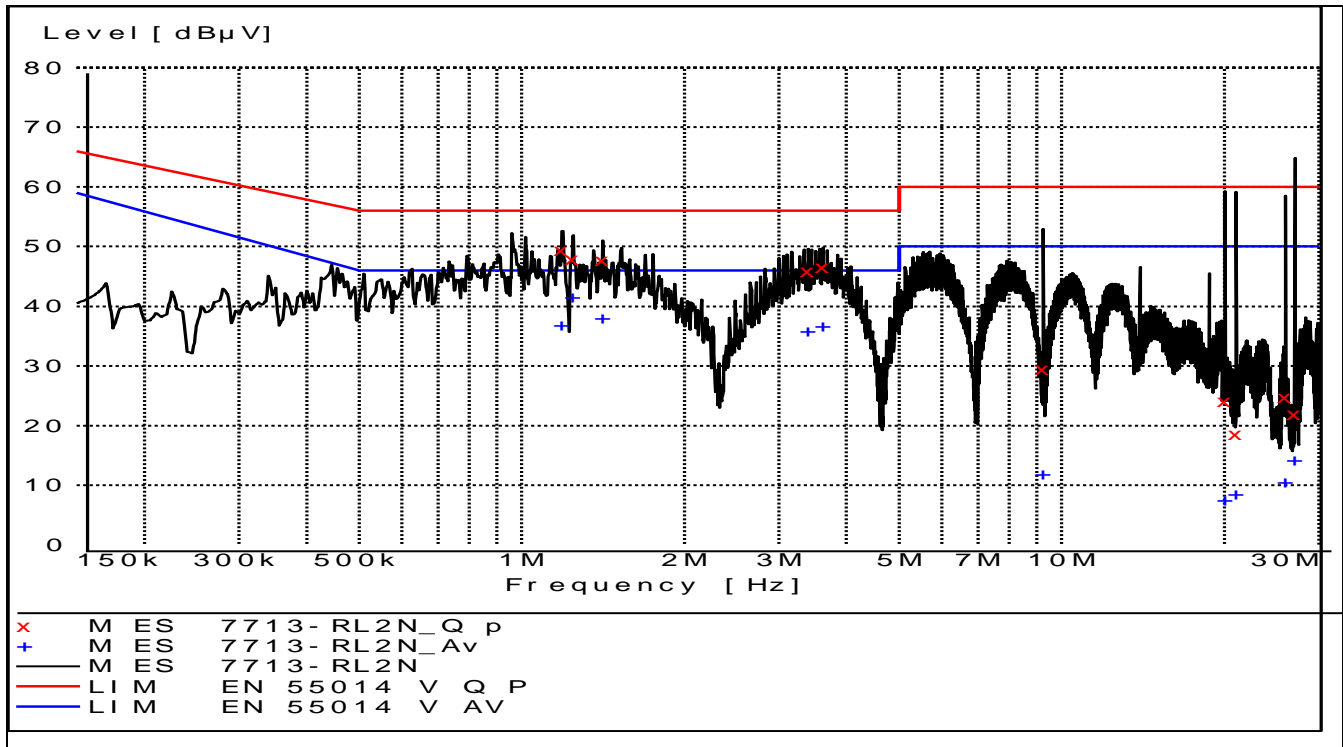
Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)

**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.735000	48.70	10.30	56.00	7.30	QP	L1	Pass
1.075000	49.50	10.30	56.00	6.50	QP	L1	Pass
1.255000	45.60	10.30	56.00	10.40	QP	L1	Pass
2.280000	30.60	10.30	56.00	25.40	QP	L1	Pass
3.280000	47.40	10.30	56.00	8.60	QP	L1	Pass
14.750000	35.30	11.00	60.00	24.70	QP	L1	Pass
15.850000	37.00	11.00	60.00	23.00	QP	L1	Pass
19.920000	31.30	11.30	60.00	28.70	QP	L1	Pass
26.680000	29.60	11.50	60.00	30.40	QP	N	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.735000	41.40	10.30	46.00	4.60	AV	L1	Pass
1.075000	41.10	10.30	46.00	4.90	AV	L1	Pass
1.255000	35.70	10.30	46.00	10.30	AV	L1	Pass
2.280000	20.30	10.30	46.00	25.70	AV	L1	Pass
3.280000	39.50	10.30	46.00	6.50	AV	L1	Pass
14.750000	26.80	11.00	50.00	23.20	AV	L1	Pass
15.850000	21.10	11.00	50.00	28.90	AV	L1	Pass
19.920000	16.40	11.30	50.00	33.60	AV	L1	Pass
26.680000	14.60	11.50	50.00	35.40	AV	N	Pass

**Disturbance Preview (Rear Left Zone)**


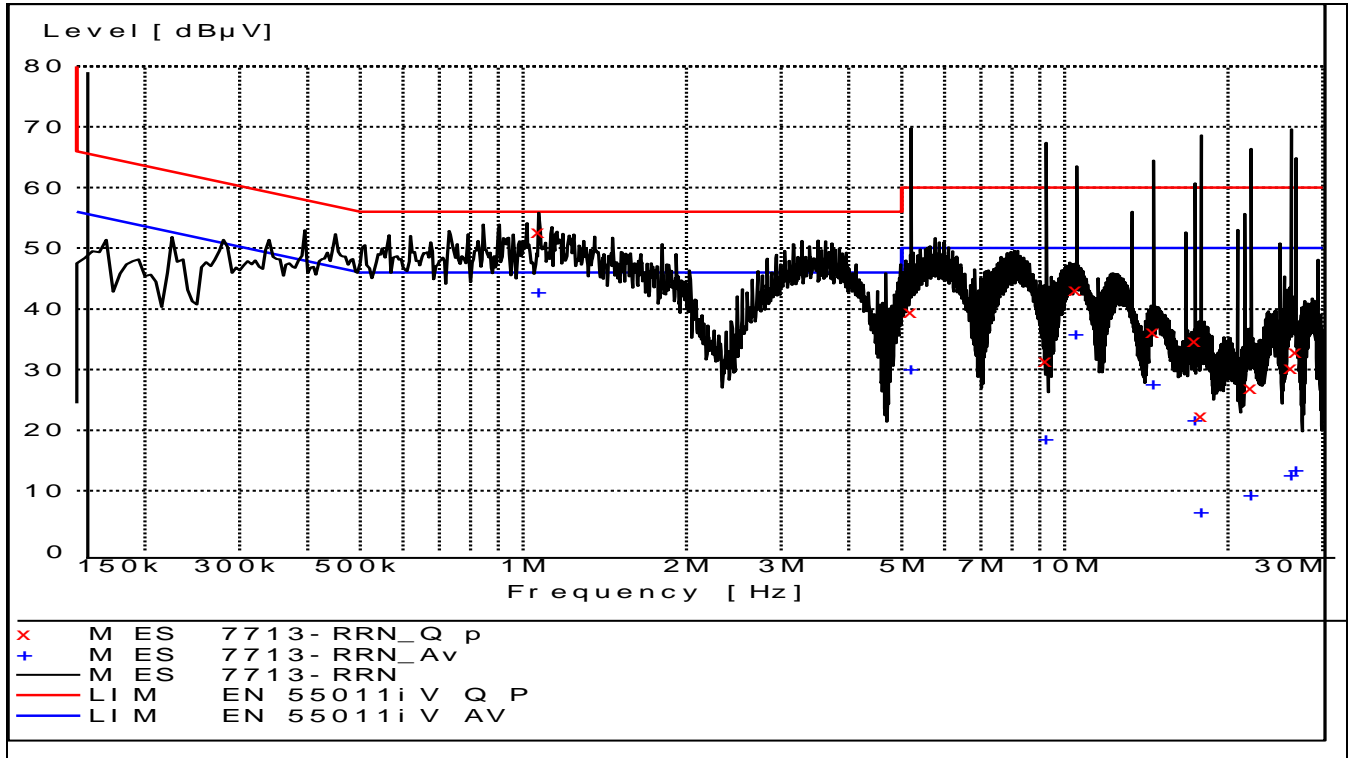
Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)

**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
1.190000	49.50	10.30	56.00	6.50	QP	L1	Pass
1.245000	48.00	10.30	56.00	8.00	QP	L1	Pass
1.415000	47.80	10.30	56.00	8.20	QP	L1	Pass
3.400000	45.90	10.30	56.00	10.10	QP	L1	Pass
3.615000	46.70	10.40	56.00	9.30	QP	L1	Pass
9.260000	29.50	10.60	60.00	30.50	QP	L1	Pass
20.105000	24.10	11.30	60.00	35.90	QP	N	Pass
21.095000	18.50	11.40	60.00	41.50	QP	N	Pass
26.020000	24.80	11.50	60.00	35.20	QP	N	Pass
27.040000	21.90	11.50	60.00	38.10	QP	N	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
1.190000	36.90	10.30	46.00	9.10	AV	L1	Pass
1.245000	41.60	10.30	46.00	4.40	AV	L1	Pass
1.415000	38.10	10.30	46.00	7.90	AV	L1	Pass
3.400000	35.80	10.30	46.00	10.20	AV	L1	Pass
3.615000	36.70	10.40	46.00	9.30	AV	L1	Pass
9.260000	11.80	10.60	50.00	38.20	AV	L1	Pass
20.105000	7.50	11.30	50.00	42.50	AV	N	Pass
21.095000	8.60	11.40	50.00	41.40	AV	N	Pass
26.020000	10.50	11.50	50.00	39.50	AV	N	Pass
27.040000	14.20	11.50	50.00	35.80	AV	N	Pass

**Disturbance Preview (Rear Right Zone)**


Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)

**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.065600	15.50	10.10	87.50	72.00	QP	N	Pass
0.071800	30.20	10.10	86.70	56.50	QP	N	Pass
0.147600	22.20	10.10	80.10	57.90	QP	N	Pass
1.070000	52.80	10.30	56.00	3.20	QP	L1	Pass
5.210000	39.40	10.50	60.00	20.60	QP	L1	Pass
9.255000	31.40	10.60	60.00	28.60	QP	L1	Pass
10.515000	43.10	10.70	60.00	16.90	QP	L1	Pass
14.585000	36.30	11.00	60.00	23.70	QP	L1	Pass
17.415000	34.70	11.10	60.00	25.30	QP	L1	Pass
17.925000	22.40	11.10	60.00	37.60	QP	N	Pass
22.110000	27.00	11.40	60.00	33.00	QP	N	Pass
26.225000	30.30	11.50	60.00	29.70	QP	N	Pass
26.760000	32.90	11.50	60.00	27.10	QP	L1	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
1.070000	42.70	10.30	46.00	3.30	AV	L1	Pass
5.210000	30.10	10.50	50.00	19.90	AV	L1	Pass
9.255000	18.50	10.60	50.00	31.50	AV	L1	Pass
10.515000	35.80	10.70	50.00	14.20	AV	L1	Pass
14.585000	27.60	11.00	50.00	22.40	AV	L1	Pass
17.415000	21.70	11.10	50.00	28.30	AV	L1	Pass
17.925000	6.50	11.10	50.00	43.50	AV	N	Pass
22.110000	9.30	11.40	50.00	40.70	AV	N	Pass
26.225000	12.60	11.50	50.00	37.40	AV	N	Pass
26.760000	13.40	11.50	50.00	36.60	AV	L1	Pass

**DISCONTINUOUS DISTURBANCE VOLTAGE**

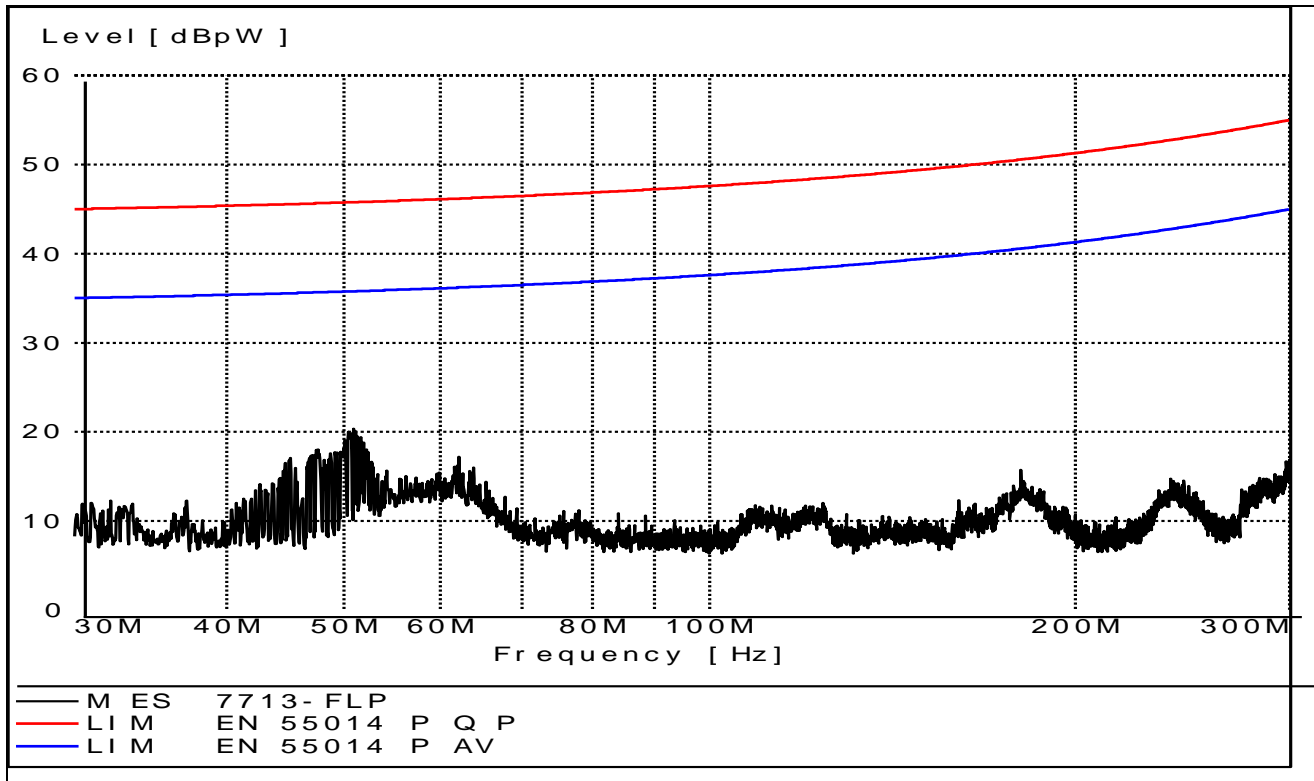
Frequency	Clicks < 10ms	10ms<Clicks<20ms	Clicks > 10ms	Switching operations(n)	Time (T)	Click rate (N)
(MHz)	(No.)	(No.)	(No.)	(No.)	(min)	(No./min)
0.15	0	0	0	0	120	0
0.50	0	0	0	0	120	0
1.4	0	0	0	0	120	0
30.0	0	0	0	0	120	0

Click rate is below 5 and no click was observed during the observation period, hence no amplitude limitation applies. No further measurements required, the specimen complies with the requirements.



### DISTURBANCE POWER

#### Disturbance Preview (Front Left Zone)



Note: This preview is a peak detector scan at the clamps 0 point. Any quasi-peak or average detector measurements are conducted at a localised maxima ("x" = quasi-peak / "+" = average. Measurement data are presented below)

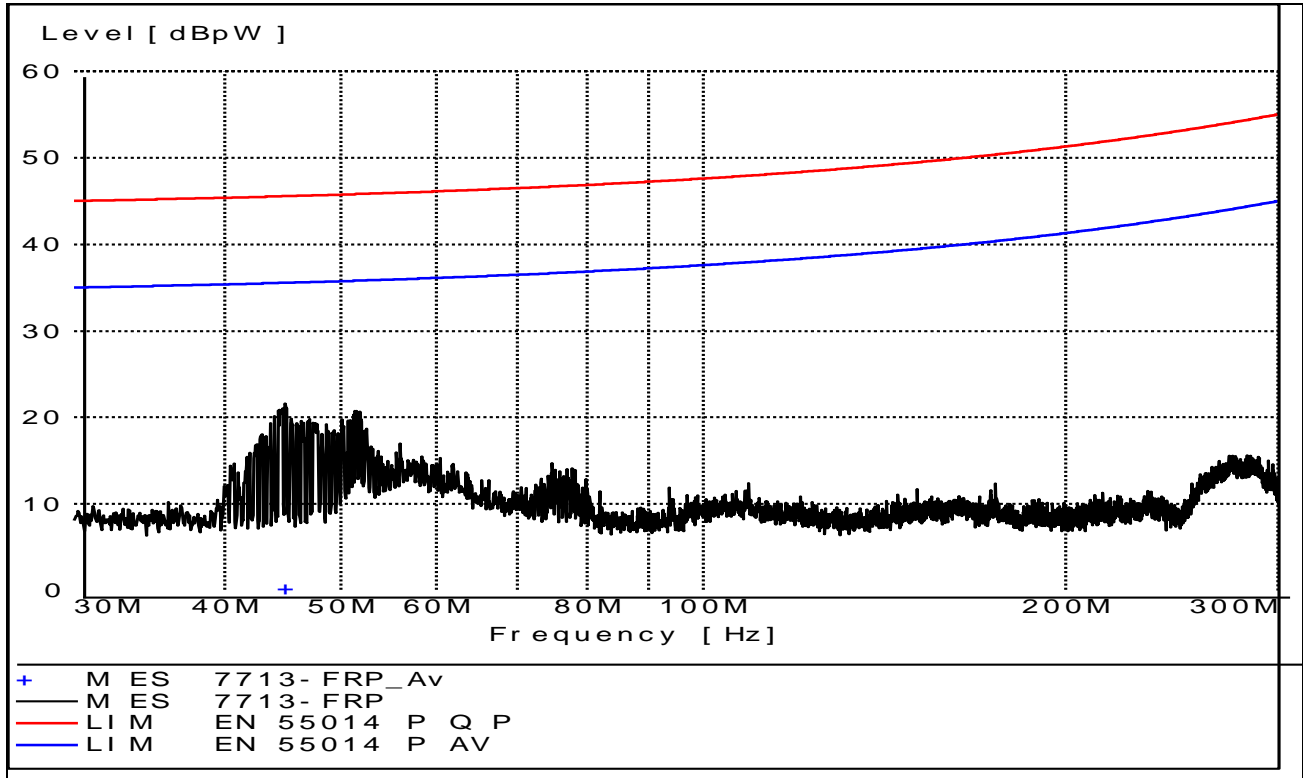
#### Quasi Peak Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
-	-	-	-	-	-	-	Pass

#### Average Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
-	-	-	-	-	-	-	Pass

**Disturbance Preview (Front Right Zone)**



Note: This preview is a peak detector scan at the clamps 0 point. Any quasi-peak or average detector measurements are conducted at a localised maxima ("x" = quasi-peak / "+" = average. Measurement data are presented below)

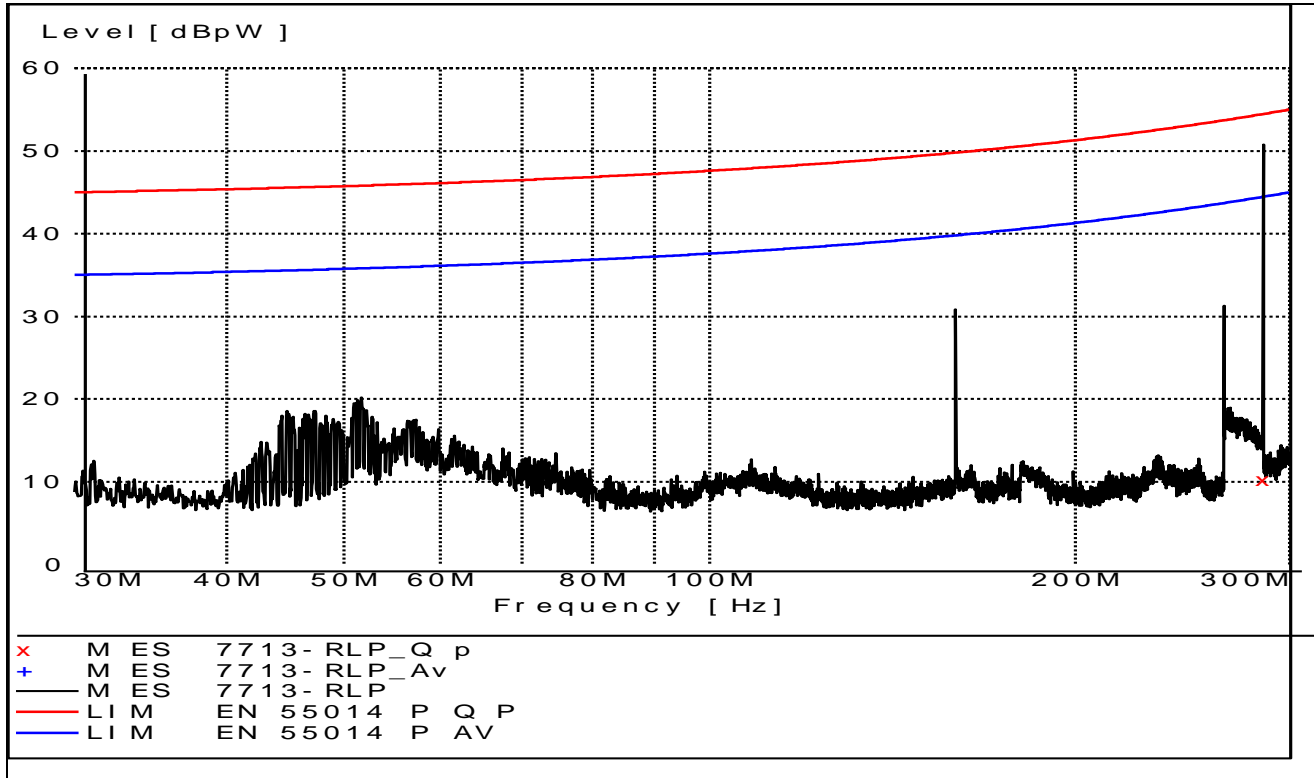
**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
-	-	-	-	-	-	-	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
44.700000	-0.20	8.20	35.5	35.70	AV	49.0	Pass
44.940000	0.30	8.20	35.6	35.30	AV	49.0	Pass

**Disturbance Preview (Rear Left Zone)**



Note: This preview is a peak detector scan at the clamps 0 point. Any quasi-peak or average detector measurements are conducted at a localised maxima ("x" = quasi-peak / "+" = average. Measurement data are presented below)

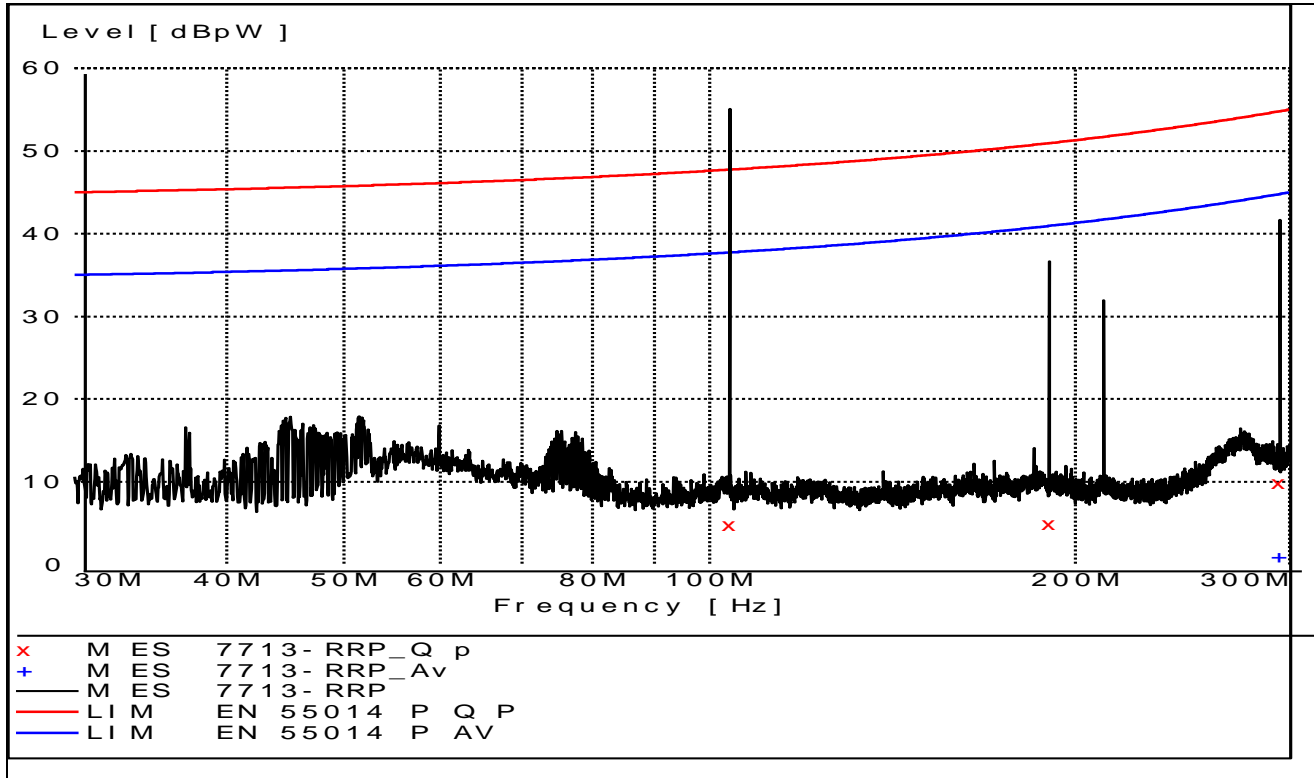
**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
285.480000	10.20	6.80	54.5	44.30	QP	33.0	Pass

**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
159.420000	-1.50	6.80	39.8	41.30	AV	100.0	Pass
264.960000	-1.90	6.60	43.7	45.60	AV	0.0	Pass
285.480000	-0.30	6.80	44.5	44.80	AV	30.0	Pass

**Disturbance Preview (Rear Right Zone)**



Note: This preview is a peak detector scan at the clamps 0 point. Any quasi-peak or average detector measurements are conducted at a localised maxima ("x" = quasi-peak / "+" = average. Measurement data are presented below)

**Quasi Peak Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
103.860000	4.90	7.50	47.7	42.80	QP	55.0	Pass
190.380000	5.00	6.20	50.9	45.90	QP	7.0	Pass
294.480000	9.90	6.80	54.8	44.90	QP	7.0	Pass

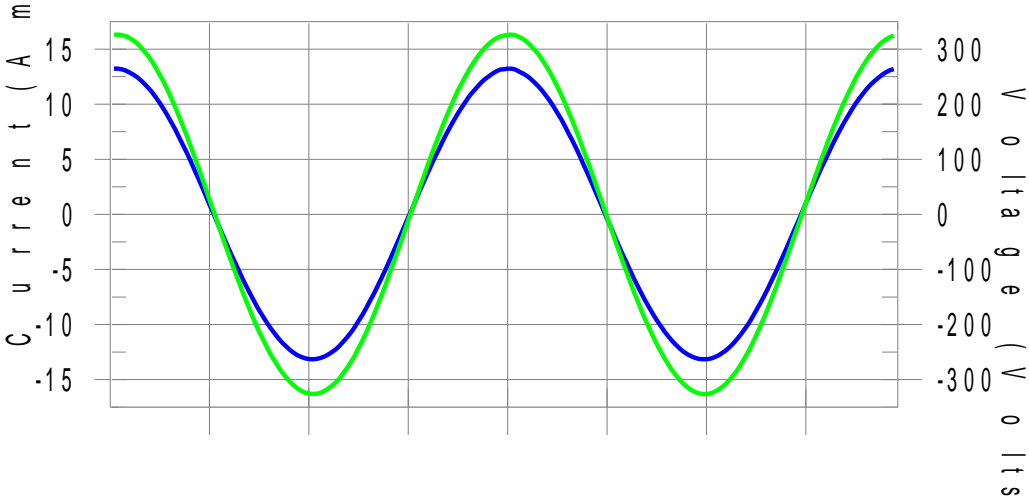
**Average Detector Data**

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
103.860000	-2.70	7.50	37.7	40.40	AV	0.0	Pass
190.380000	-2.70	6.20	40.9	43.60	AV	21.0	Pass
210.960000	-2.20	6.30	41.7	43.90	AV	59.0	Pass
294.480000	1.00	6.80	44.8	43.80	AV	36.0	Pass

**HARMONIC DISTORTION**

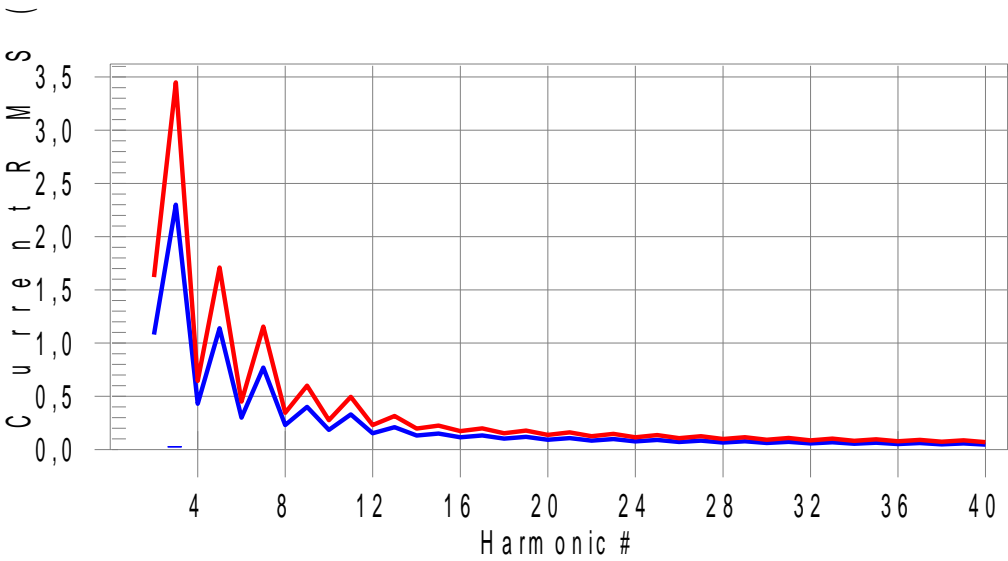
Measurement Data (Front Left Zone)

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



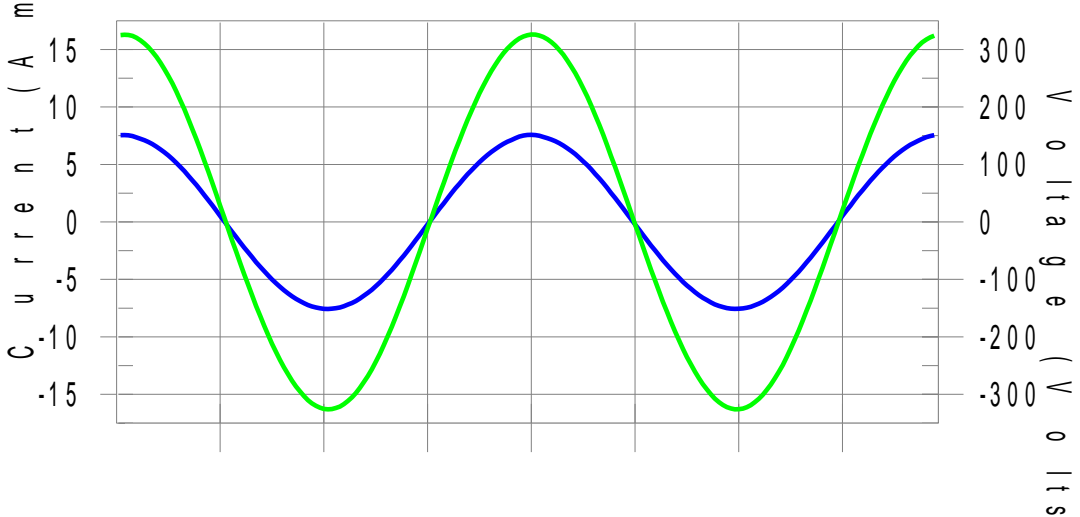
Highest parameter values during test:

V_RMS (Volts):	230,84	Frequency(Hz):	50,00
I_Peak (Amps):	13,296	I_RMS (Amps):	9,313
I_Fund (Amps):	9,304	Crest Factor:	1,431
Power (Watts):	2147,7	Power Factor:	1,000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0,008	1,080	0,7	0,012	1,620	0,71	Pass
3	0,024	2,300	1,1	0,030	3,450	0,87	Pass
4	0,006	0,430	1,5	0,008	0,645	1,26	Pass
5	0,007	1,140	0,6	0,008	1,710	0,49	Pass
6	0,006	0,300	2,1	0,009	0,450	2,06	Pass
7	0,006	0,770	0,8	0,007	1,155	0,64	Pass
8	0,004	0,230	1,9	0,005	0,345	1,51	Pass
9	0,006	0,400	1,6	0,007	0,600	1,13	Pass
10	0,003	0,184	1,6	0,004	0,276	1,38	Pass
11	0,002	0,330	0,7	0,003	0,495	0,63	Pass
12	0,003	0,153	1,7	0,003	0,230	1,32	Pass
13	0,002	0,210	0,9	0,002	0,315	0,79	Pass
14	0,002	0,131	1,4	0,002	0,197	1,06	Pass
15	0,002	0,150	1,1	0,002	0,225	0,86	Pass
16	0,002	0,115	1,4	0,002	0,173	1,16	Pass
17	0,001	0,132	1,1	0,002	0,199	0,83	Pass
18	0,001	0,102	1,1	0,001	0,153	0,92	Pass
19	0,001	0,118	1,0	0,001	0,178	0,81	Pass
20	0,001	0,092	0,8	0,001	0,138	0,72	Pass
21	0,002	0,107	1,4	0,002	0,161	1,23	Pass
22	0,001	0,084	1,6	0,002	0,125	1,39	Pass
23	0,002	0,098	1,7	0,002	0,147	1,43	Pass
24	0,001	0,077	1,9	0,002	0,115	1,69	Pass
25	0,004	0,090	3,9	0,004	0,135	3,21	Pass
26	0,001	0,071	2,0	0,002	0,106	2,33	Pass
27	0,003	0,083	3,9	0,004	0,125	3,20	Pass
28	0,001	0,066	1,7	0,002	0,099	1,78	Pass
29	0,001	0,078	1,7	0,002	0,116	1,38	Pass
30	0,001	0,061	1,3	0,001	0,092	1,06	Pass
31	0,001	0,073	1,5	0,002	0,109	1,50	Pass
32	0,001	0,058	1,4	0,001	0,086	1,30	Pass
33	0,001	0,068	1,4	0,001	0,102	1,11	Pass
34	0,001	0,054	1,1	0,001	0,081	0,83	Pass
35	0,001	0,064	1,2	0,001	0,096	0,95	Pass
36	0,001	0,051	1,4	0,001	0,077	0,98	Pass
37	0,001	0,061	1,4	0,001	0,091	1,11	Pass
38	0,001	0,048	1,0	0,001	0,073	0,79	Pass
39	0,001	0,058	1,2	0,001	0,087	1,02	Pass
40	0,001	0,046	1,2	0,001	0,069	1,00	Pass

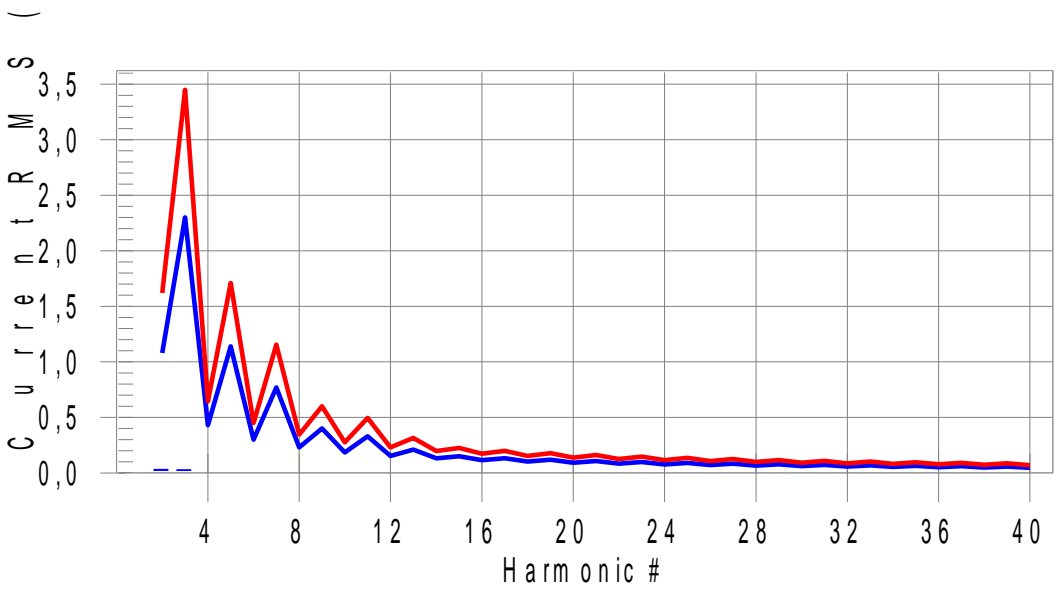
Measurement Data (Front Right Zone)

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Highest parameter values during test:

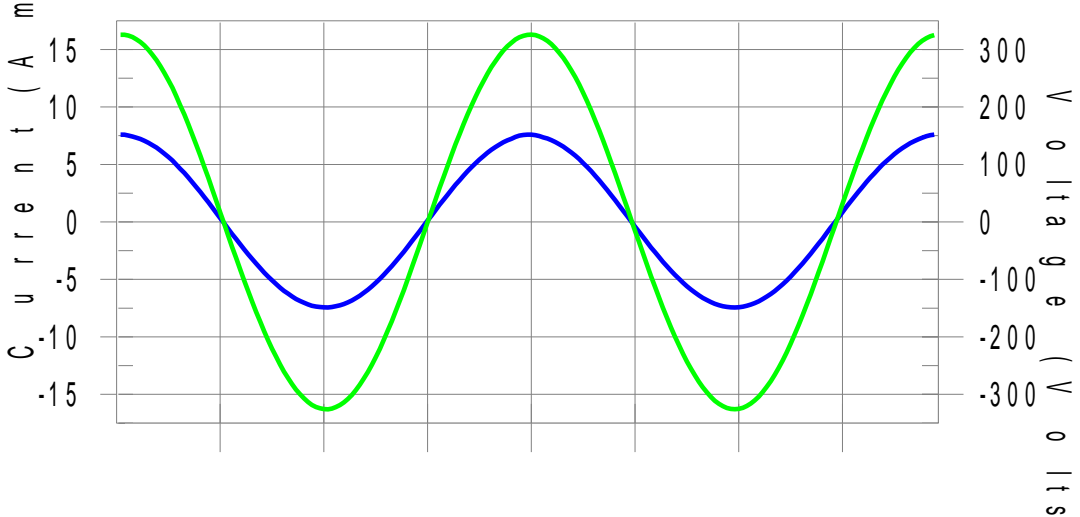
V_RMS (Volts):	230,75	Frequency(Hz):	50,00
I_Peak (Amps):	7,593	I_RMS (Amps):	5,325
I_Fund (Amps):	5,267	Crest Factor:	8,066
Power (Watts):	1214,9	Power Factor:	1,000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0,006	1,080	0,6	0,033	1,620	2,04	Pass
3	0,012	2,300	0,5	0,029	3,450	0,85	Pass
4	0,006	0,430	1,4	0,021	0,645	3,22	Pass
5	0,007	1,140	0,6	0,016	1,710	0,93	Pass
6	0,006	0,300	1,8	0,013	0,450	2,99	Pass
7	0,006	0,770	0,8	0,012	1,155	1,01	Pass
8	0,004	0,230	1,9	0,010	0,345	2,94	Pass
9	0,005	0,400	1,2	0,009	0,600	1,55	Pass
10	0,003	0,184	1,7	0,008	0,276	3,07	Pass
11	0,002	0,330	0,7	0,008	0,495	1,54	Pass
12	0,002	0,153	1,6	0,007	0,230	2,94	Pass
13	0,002	0,210	0,9	0,006	0,315	1,88	Pass
14	0,001	0,131	1,1	0,005	0,197	2,66	Pass
15	0,001	0,150	0,9	0,005	0,225	2,06	Pass
16	0,001	0,115	0,9	0,004	0,173	2,27	Pass
17	0,001	0,132	0,4	0,003	0,199	1,73	Pass
18	0,001	0,102	0,5	0,003	0,153	2,08	Pass
19	0,001	0,118	0,6	0,003	0,178	1,77	Pass
20	0,001	0,092	0,5	0,003	0,138	2,18	Pass
21	0,001	0,107	1,0	0,003	0,161	1,94	Pass
22	0,001	0,084	0,9	0,003	0,125	2,38	Pass
23	0,001	0,098	1,3	0,003	0,147	1,97	Pass
24	0,001	0,077	1,0	0,003	0,115	2,44	Pass
25	0,003	0,090	2,8	0,004	0,135	2,73	Pass
26	0,001	0,071	1,0	0,003	0,106	2,37	Pass
27	0,002	0,083	2,7	0,003	0,125	2,70	Pass
28	0,000	0,066	0,5	0,002	0,099	2,21	Pass
29	0,001	0,078	1,2	0,002	0,116	1,83	Pass
30	0,000	0,061	0,6	0,002	0,092	2,05	Pass
31	0,001	0,073	1,0	0,002	0,109	1,73	Pass
32	0,000	0,058	0,6	0,002	0,086	2,09	Pass
33	0,001	0,068	0,8	0,002	0,102	1,76	Pass
34	0,000	0,054	0,6	0,002	0,081	2,29	Pass
35	0,000	0,064	0,7	0,002	0,096	1,91	Pass
36	0,000	0,051	0,8	0,002	0,077	2,38	Pass
37	0,000	0,061	0,6	0,002	0,091	2,02	Pass
38	0,000	0,048	0,6	0,002	0,073	2,39	Pass
39	0,000	0,058	0,7	0,002	0,087	1,98	Pass
40	0,000	0,046	0,7	0,001	0,069	1,87	Pass



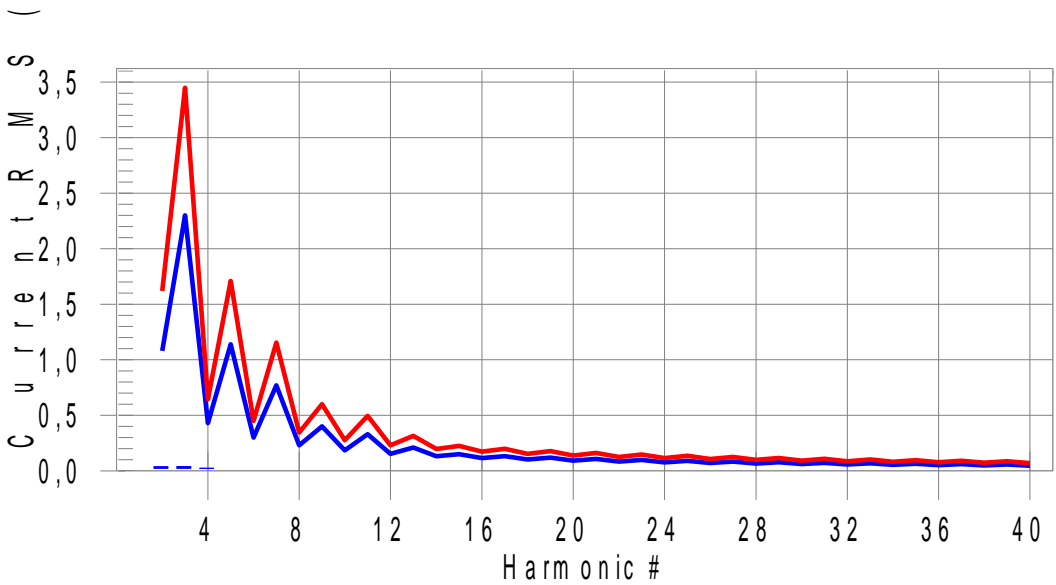
Measurement Data (Rear Left Zone)

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



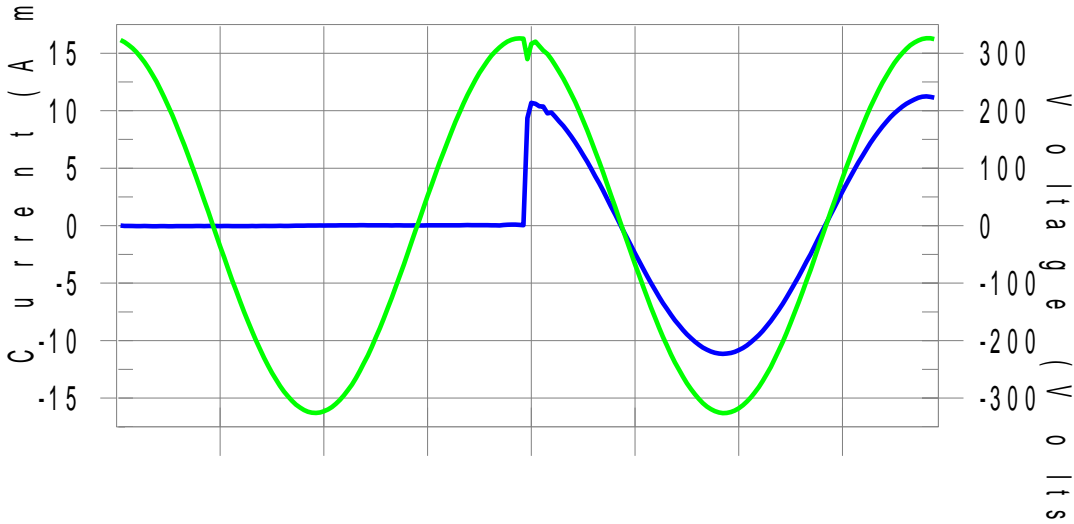
Highest parameter values during test:

V_RMS (Volts):	230,74	Frequency(Hz):	50,00
I_Peak (Amps):	7,608	I_RMS (Amps):	5,289
I_Fund (Amps):	5,226	Crest Factor:	2,623
Power (Watts):	1205,6	Power Factor:	1,000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0,007	1,080	0,6	0,038	1,620	2,33	Pass
3	0,013	2,300	0,5	0,039	3,450	1,13	Pass
4	0,006	0,430	1,4	0,023	0,645	3,56	Pass
5	0,007	1,140	0,6	0,020	1,710	1,15	Pass
6	0,005	0,300	1,8	0,016	0,450	3,61	Pass
7	0,006	0,770	0,8	0,015	1,155	1,27	Pass
8	0,004	0,230	1,8	0,012	0,345	3,51	Pass
9	0,005	0,400	1,1	0,011	0,600	1,90	Pass
10	0,003	0,184	1,7	0,010	0,276	3,54	Pass
11	0,002	0,330	0,7	0,009	0,495	1,74	Pass
12	0,002	0,153	1,6	0,008	0,230	3,30	Pass
13	0,002	0,210	0,9	0,007	0,315	2,16	Pass
14	0,002	0,131	1,2	0,006	0,197	3,14	Pass
15	0,001	0,150	1,0	0,006	0,225	2,52	Pass
16	0,001	0,115	1,0	0,005	0,173	2,95	Pass
17	0,001	0,132	0,5	0,005	0,199	2,27	Pass
18	0,001	0,102	0,5	0,004	0,153	2,72	Pass
19	0,001	0,118	0,6	0,004	0,178	2,31	Pass
20	0,001	0,092	0,6	0,004	0,138	2,82	Pass
21	0,001	0,107	1,0	0,004	0,161	2,50	Pass
22	0,001	0,084	0,9	0,004	0,125	2,94	Pass
23	0,001	0,098	1,2	0,004	0,147	2,61	Pass
24	0,001	0,077	1,0	0,004	0,115	3,06	Pass
25	0,003	0,090	2,8	0,005	0,135	3,58	Pass
26	0,001	0,071	1,1	0,003	0,106	3,02	Pass
27	0,002	0,083	2,8	0,004	0,125	3,51	Pass
28	0,000	0,066	0,7	0,003	0,099	2,93	Pass
29	0,001	0,078	1,2	0,003	0,116	2,64	Pass
30	0,000	0,061	0,7	0,003	0,092	2,88	Pass
31	0,001	0,073	0,9	0,003	0,109	2,51	Pass
32	0,000	0,058	0,6	0,002	0,086	2,86	Pass
33	0,001	0,068	0,8	0,003	0,102	2,60	Pass
34	0,000	0,054	0,6	0,002	0,081	2,89	Pass
35	0,000	0,064	0,7	0,002	0,096	2,45	Pass
36	0,000	0,051	0,8	0,002	0,077	2,99	Pass
37	0,000	0,061	0,7	0,002	0,091	2,51	Pass
38	0,000	0,048	0,7	0,002	0,073	3,01	Pass
39	0,000	0,058	0,8	0,002	0,087	2,55	Pass
40	0,000	0,046	0,8	0,002	0,069	2,42	Pass

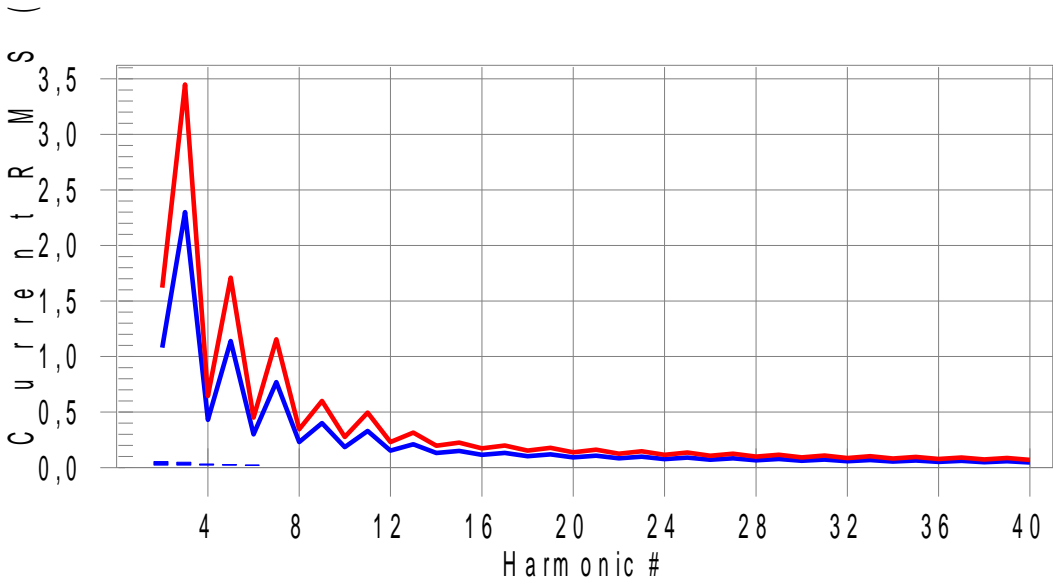
**Measurement Data (Rear Right Zone)**

**Current & voltage waveforms**



**Harmonics and Class A limit line**

**European Limits**



Highest parameter values during test:

V_RMS (Volts):	230,80	Frequency(Hz):	50,00
I_Peak (Amps):	12,015	I_RMS (Amps):	7,899
I_Fund (Amps):	7,809	Crest Factor:	3,709
Power (Watts):	1801,8	Power Factor:	1,000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0,011	1,080	1,0	0,055	1,620	3,36	Pass
3	0,019	2,300	0,8	0,048	3,450	1,40	Pass
4	0,008	0,430	1,9	0,033	0,645	5,07	Pass
5	0,009	1,140	0,8	0,025	1,710	1,48	Pass
6	0,006	0,300	2,2	0,021	0,450	4,76	Pass
7	0,007	0,770	0,9	0,018	1,155	1,60	Pass
8	0,005	0,230	2,1	0,016	0,345	4,56	Pass
9	0,006	0,400	1,4	0,014	0,600	2,33	Pass
10	0,004	0,184	2,0	0,013	0,276	4,60	Pass
11	0,003	0,330	0,9	0,011	0,495	2,27	Pass
12	0,003	0,153	2,0	0,010	0,230	4,34	Pass
13	0,002	0,210	1,2	0,009	0,315	2,89	Pass
14	0,002	0,131	1,6	0,008	0,197	4,18	Pass
15	0,002	0,150	1,1	0,008	0,225	3,35	Pass
16	0,002	0,115	1,5	0,007	0,173	3,90	Pass
17	0,001	0,132	1,0	0,006	0,199	3,15	Pass
18	0,001	0,102	1,1	0,006	0,153	3,78	Pass
19	0,001	0,118	1,0	0,006	0,178	3,10	Pass
20	0,001	0,092	0,9	0,005	0,138	3,88	Pass
21	0,002	0,107	1,5	0,005	0,161	3,24	Pass
22	0,001	0,084	1,4	0,005	0,125	4,02	Pass
23	0,002	0,098	1,7	0,005	0,147	3,37	Pass
24	0,001	0,077	1,5	0,005	0,115	4,10	Pass
25	0,003	0,090	3,4	0,005	0,135	3,77	Pass
26	0,001	0,071	1,6	0,004	0,106	4,10	Pass
27	0,003	0,083	3,3	0,005	0,125	3,83	Pass
28	0,001	0,066	1,1	0,004	0,099	4,15	Pass
29	0,001	0,078	1,6	0,004	0,116	3,53	Pass
30	0,001	0,061	1,3	0,004	0,092	4,13	Pass
31	0,001	0,073	1,4	0,004	0,109	3,47	Pass
32	0,001	0,058	1,2	0,004	0,086	4,17	Pass
33	0,001	0,068	1,3	0,004	0,102	3,52	Pass
34	0,001	0,054	1,2	0,004	0,081	4,40	Pass
35	0,001	0,064	1,3	0,004	0,096	3,69	Pass
36	0,001	0,051	1,4	0,003	0,077	4,46	Pass
37	0,001	0,061	1,2	0,003	0,091	3,71	Pass
38	0,001	0,048	1,3	0,003	0,073	4,46	Pass
39	0,001	0,058	1,3	0,003	0,087	3,67	Pass
40	0,001	0,046	1,4	0,002	0,069	3,34	Pass

**VOLTAGE FLUCTUATIONS AND FLICKER**

**Measurement Data (Front Left Zone)**

**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	230,70		
Highest dt (%):	1,58	Test limit (%):	3,30 Pass
Time(mS) > dt:	0,0	Test limit (mS):	500,0 Pass
Highest dc (%):	1,53	Test limit (%):	3,30 Pass
Highest dmax (%):	1,63	Test limit (%):	4,00 Pass
Highest Pst (10 min. period):	0,773	Test limit:	1,000 Pass

**Measurement Data (Front Right Zone)**

**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	230,73		
Highest dt (%):	0,99	Test limit (%):	3,30 Pass
Time(mS) > dt:	0,0	Test limit (mS):	500,0 Pass
Highest dc (%):	0,93	Test limit (%):	3,30 Pass
Highest dmax (%):	1,11	Test limit (%):	4,00 Pass
Highest Pst (10 min. period):	0,458	Test limit:	1,000 Pass

**Measurement Data (Rear Left Zone)**

**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	227,20		
Highest dt (%):	1,61	Test limit (%):	3,30 Pass
Time(mS) > dt:	0,0	Test limit (mS):	500,0 Pass
Highest dc (%):	1,54	Test limit (%):	3,30 Pass
Highest dmax (%):	1,65	Test limit (%):	4,00 Pass
Highest Pst (10 min. period):	0,749	Test limit:	1,000 Pass

**Measurement Data (Rear Right Zone)**

**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	230,56		
Highest dt (%):	1,49	Test limit (%):	3,30 Pass
Time(mS) > dt:	0,0	Test limit (mS):	500,0 Pass
Highest dc (%):	1,29	Test limit (%):	3,30 Pass
Highest dmax (%):	1,49	Test limit (%):	4,00 Pass
Highest Pst (10 min. period):	0,652	Test limit:	1,000 Pass

## COMPONENT LISTS

### COMPONENT LIST FOR EO1500

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Heating element	EGO	10.57911.xxx	230V ~ 1500W 305mm x 185mm
Thermostat	EGO	60.25170.xxx	16A 250V~ / 10A 400V~ T250
Control unit	Diehl AKO Stiftung & Co.	TC4 Standard H	230-240V 50-60Hz T 105 contact: 250V 10A relays 100 000
	Diehl AKO Stiftung & Co.	TC5-S-DO-1Z-1R-T****	230V 50/60Hz T 105 contact: 250V 10A relays 100 000
PCB of touch control & display in control unit	DIEHL	Controls 711890	94V-0
PCB of power supply in control unit	DIEHL	Controls 714649	94V-0

**COMPONENT LIST FOR MODELS OTHER THAN EO1500**

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Heating element front	Ceramaspeed	165N7-L.....	1200W 230V~ Ø145mm
	EGO	10.54111.xxx	1200W 230V~ Ø145mm
	Irca	V217209	1200W 220-240V~ Ø145mm
	EGO	10.74631.xxx	1200W 220-240V~ Ø145mm
	EIKA	1652032932	1200W 230V~ Ø145mm HL type
	EIKA	1652032832	1200W 230V~ Ø145mm HL type
	EIKA	1650632832	1200W 230V~ Ø145mm RM type
	EIKA	1650632932	1200W 230V~ Ø145mm RM type
	EIKA	1650734832	1200W 230V~ Ø145mm RT type
Heating element back	Ceramaspeed	200N7-L.....	1800W 230V~ Ø180mm
	EGO	10.58111.xxx	1800W 230V~ Ø180mm
	EGO	10.58211.xxx	1700/600W 230V~ Ø100/180mm
	Ceramaspeed	200T8-L6705D	1700/700W 230V~Ø120/180mm
	<b>EGO</b>	<b>10.58213.xxx</b>	<b>1700/700W 230V~ Ø120/180mm</b>
	EGO	10.88631.xxx	1700W 230-240V~ Ø180mm
	Irca	1V417347	1700W 220-240V~ Ø180mm
	EIKA	2000632832	1700W 230V~ Ø180mm RM type
	EIKA	2000632932	1700W 230V~ Ø180mm RM type
	EIKA	2000734832	1700W 230V~ Ø180mm RT type
	EIKA	2002032932	1800W 230V~ Ø180mm HL type
	EIKA	2002032832	1800W 230V~ Ø180mm HL type
Thermostat	Electrovac	Z98	12A 250V~ / 8A 400V~ T250
	Electrovac	Z95	12A 250V~ / 8A 400V~ T250
	EGO	60.25171.003	16A 250V~ / 10A 400V~ T250
Power PCB	Cherry GmbH	YS7-1163	--
Control PCB	PGA	9922, 9920, 9901 and 991R2.1	--

**COMPONENTS SPECIFIC TO MODELS EO2900 AND EO3000**

**Control Unit #1:**

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Power PCB	Cherry Gmbh	YS7-1104I07IE	AC 230 – 240V , 8A/10A T105°C

**Control Unit #2:**

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Power PCB	DIEHL	TC 13703 - x TC4 13704-x	AC 220 – 240 V, 8A/10A
Control unit	Diehl AKO Stiftung & Co.	TC5-S-DO-2Z-2R-*****	230V 50/60Hz T 105 contact: 250V 10A relays 100 000

**Control Unit #3:**

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Power / Touch control PCB	EIKA	BN330D36211107	208-240V~
	EIKA	BN320D36211107	208-240V~



## COMPONENTS SPECIFIC TO MODELS RO2900, RO3000, MO2900 AND MO3000

### With Energy Regulator:

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Energy Regulator	EGO	50.57021.010	250Vac 13A / 0,5A T150
	Invensis Siebe	MSA	250Vac 15A / 0,5A T125
	Invensis Siebe	M(D)P(A)	250Vac 15A / 0,5A T125
	EGO	50.75021.000	230V 13A T125
	EGO	50.77021.000	230V 13A T125
	EGO	50.57071.041	240Vac 13A / 0,6A T125
	EGO	50.57079.050	240Vac 13A / 0,6A T150

### With Commutator/Rotary Switch:

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Commutator	EGO	46.27266.500	250Vac 16A T150
	EGO	41.41723.005	230Vac 10A / 400V 8A T150
	EGO	Type E/010508	230Vac 10A / 400V 8A T150
Heating element back	EGO	10.78431.xxx	1700W 230-240V~ Ø180mm
	Irca	1V427252	1700W 220-240V~ Ø180mm
	Ceramaspeed	200M58750L	1700W 200-250V~ Ø180mm
Heating element front	Irca	1V227252	1200W 220-240V~ Ø145mm
	Ceramaspeed	165M58749L	1200W 200-240V~ Ø145mm
	EGO	10.74431.xxx	1200W 220-240V~ Ø145mm

\* Components in bold letters are the ones added during the latest update of the report.