Test Report No.:	**28212426 001**		**Page 1 of 21**
Client:	**Elpumps kft.** 4900, Fehérgyarmat, Vasvári P. u. 65, Hungary		
Manufacturer:	**Elpumps kft.** 4900, Fehérgyarmat, Vasvári P. u. 65, Hungary		
Test item:	**Household waterworks**		
Identification:	**JPV900; JPV1300; JPV1300B; JPV1300 INOX; JPV1500; JPV1500B; VB25/900; VB25/1300; VB25/1300B; VB25/1300 INOX; VB25/1500; VB 25/1500B; VB50/1300; VB50/1500; VP300; BP10; BP14; BP1/4; BP18/3; BP22/3;**	**Serial No.:**	**000335/2011**
Receipt No.:	**93329446**	**Date of receipt:**	**2011-08-22**
Testing location:	**TÜV Rheinland InterCert Kft.** H-1135 Budapest, Béke utca 43., Hungary		
Test specification:	**EN 61000-6-3:2007+A1:2011** **EN 55014-1:2006+A1:2009** **EN 61000-3-2:2006+A1:2009+A1:2009** **EN 61000-3-3:2008** **EN 55014-2:1997+A1:2001+A2:2008**		
Test result:	**The test item passed the test specification(s).**		
Testing laboratory	**TÜV Rheinland InterCert Kft.** H-1132 Budapest, Váci út 48/A-B., Hungary		

Tested by:			**Reviewed by:**		
2011-08-30	János Horváth				
2011-08-30	Tamás Novotny		2011-08-30	Imre Király	
Date	**Name**	**Signature**	**Date**	**Name**	**Signature**

Other Aspects:

Place of manufacture: Elpumps kft.
4900, Fehérgyarmat, Vasvári P. u. 65, Hungary

Rated data: 230V, 50Hz, 300..1600W (varies with type)

Abbreviations:	**P(ass)**	=	**passed**
	F(ail)	=	**failed**
	N/A	=	**not applicable**
	N/T	=	**not tested**

Note(s):
The equipment under test is a water pump that serves for private use in a house and garden. The unit is suitable for watering of gardens and lands, and household water supply. The pump is equipped with a pressure switch, that switches the pump off in case the pressure is high. During the tests, the suction pipe was fitted with a foot valve, the pressure pipe was fitted with a stopcock.

The tested appliance doesn't contain any electronic control circuitry, so the appliance is deemed to fulfil the immunity requirements of EN 55014-2:1997+A1:2001+A2:2008 without testing.

The emission tests were conducted according to EN 55014-1:2006+A1:2009, but an additional radiated disturbance test was also conducted, in order to fully comply with the requirements of EN 61000-6-3:2007+A1:2011.

The family consists of the types listed on page 1., the listed types are equal to the tested type regarding EMC aspects. The main difference that affects EMC test results is the rated power, the type VB25/1500 was tested, that has the highest power rating.

Photo of the appliance:

Photos of rated plates:

Contents:

Radio-frequency disturbances of household and similar appliances 5
Harmonic current 13
Voltage fluctuations and flicker 17

We draw the kind attention of the Applicant (manufacturer) to that according to Clause 4 of standard EN 61000-3-11:2000 (Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection):

„If equipment complies with the requirements of EN 61000-3-3 and therefore is not subject to conditional connection, it may be declared so by the manufacturer in documentation made available to users before purchase.
Equipment which does not meet the limits of EN 61000-3-3, when tested or evaluated with reference impedance Z_{ref}, is subject to conditional connection, and the manufacturer shall either:

a.) determine the maximum permissible system impedance Z_{max} at the interface point of the user's supply in accordance with 6.2, declare Z_{max} in the equipment instruction manual and instruct the user to determine in consultation with the supply authority, if necessary, that the equipment is connected only to a supply of that impedance or less, or

b.) test the equipment in accordance with 6.3 and declare in the equipment instruction manual that the equipment is intended for use only in premises having a service current capacity ≥ 100 A per phase, supplied from a distribution network having a nominal voltage of 400/230 V, and instruct the user to determine in consultation with the supply authority, if necessary, that the service current capacity at the interface point is sufficient for the equipment.
The equipment shall be clearly marked as being suitable for use only in premises having a service current capacity equal to or greater than 100 A per phase.

NOTE1	In the case of option a), restrictions to connection may be imposed by the supply authority on the use of equipment if the actual system impedance at the interface point on the user's premises, Z_{act}, exceeds Z_{max}.
NOTE2	In the case of option b) a new symbol (IEC 60417-5855) is under consideration for the purpose of marking equipment.
NOTE3	For options a) and b), if the supply capacity and/or the actual system impedance Z_{act} have been declared to, or measured by, the user, this information may be used to assess the suitability of equipment without reference to the supply authority."

As the equipment does not comply with the requirements of EN 61000-3-3 standard, therefore we specify the Z_{max} supply network impedance to which the tested appliance may be connected (see page 20.).

Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Date of measurement:	*2011-08-29*	*2011-08-29*	*2011-08-29*
Ambient conditions:	*Shielded cabinet*	*Power measuring table*	Semi-anechoic chamber
Ambient temperature:	*30 °C*	*28 °C*	26 °C
Relative humidity:	*30-60 %*	*30-60 %*	53 %
Air pressure	*1017 hPa*	*1017hPa*	1017hPa

Test setup:

Laboratory test ☒ Post-installation test ☐

Measuring method:	Tested:
Continuous disturbances – disturbance voltage Frequency range 148,5 kHz - 30 MHz (see measurement results on page 6-7.)	☒
Continuous disturbances – disturbance power Frequency range 30 MHz – 300 MHz (see measurement results on page 8.)	☒
Continuous radiated disturbances Frequency range 30 MHz – 1000 MHz (see measurement results on page 9., see note)	☒
Discontinuous disturbances (see measurement results on page 10.)	☒

Calculated measurement uncertainty for
Continuous disturbances – disturbance voltage: ± 2.54 dB k= 1.744
Radiated disturbances (30 MHz – 200 MHz): ± 4.73 dB k= 2
Radiated disturbance (200 MHz – 1000 MHz): ± 4.86 dB k= 2
Discontinuous (click) disturbances disturbances: amplitude: ± 1.41 dB k= 2
impulse width: ± 5.39 % k= 2

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s):
According to EN 55014-1:2006 A1:2009 figure 10 the measurement of disturbance field is not necessary. The tested appliance complies with the limits of disturbance power of table 2a reduced by the value in table 2b and the EUT does not incorporate clock frequency above 30 MHz. The measurement was done, in order to fully comply with EN 61000-6-3:2007+A1:2011.

Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz

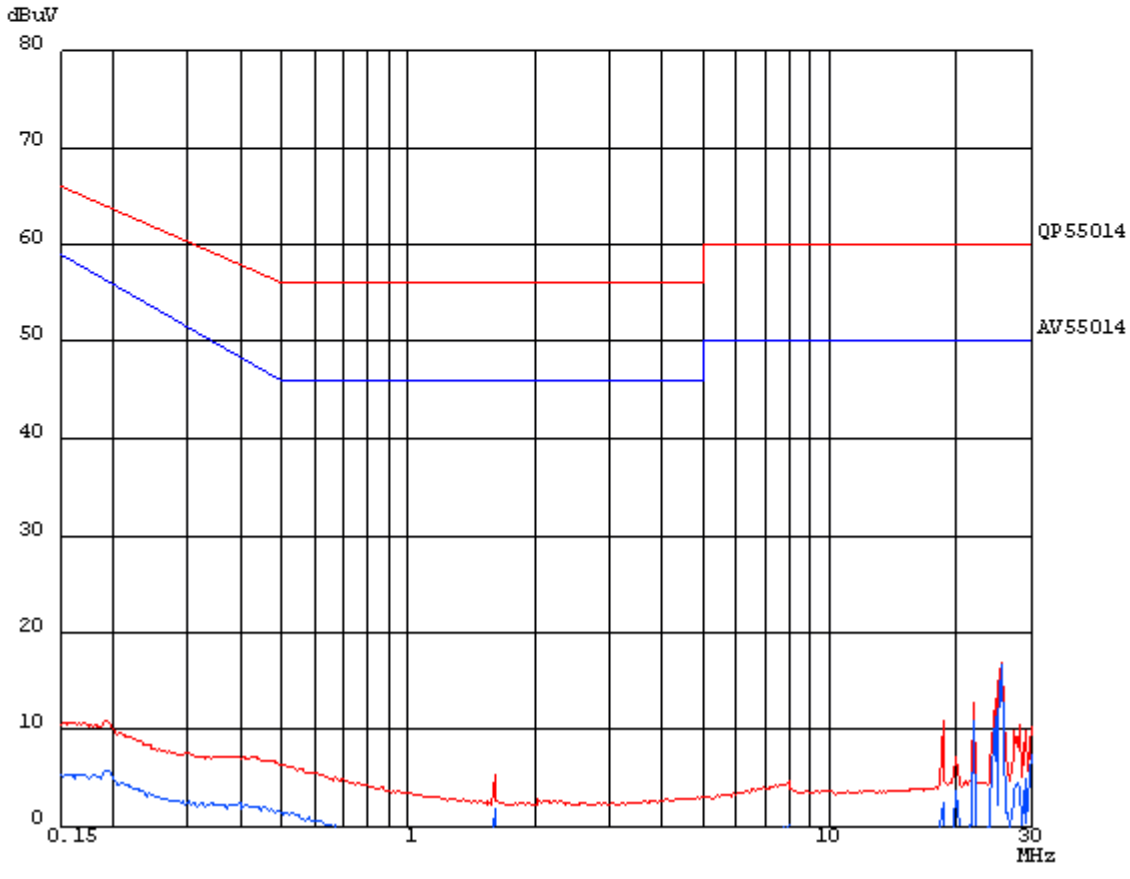
Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed in normal operation mode.*

Test point: *AC power port – mains connection, pole N.*

Disturbance voltage diagram

```
TUV Rheinland InterCert MEEI Division.
Disturbance voltage.                                  29. Aug 11  16:07
EUT:            VB25/1500.
Manuf:          Elpumps Kft.
Op Cond:        R&S,ESCS30 No:836858/003+ESH3Z2+ESHZ-Z5.
Operator:       Novotny Tamas.
Test Spec:      EN 55014-1.
                230 V, 50 Hz. Pole N.
File name:      VB_N.RES


Scan Settings (1 Range)
|--------- Frequencies -----------||--------- Receiver Settings ---------|
   Start       Stop         Step      IF BW  Detector  M-Time  Atten Preamp
 150k          30M            0.8%      9k     QP+AV      50ms AUTO LN    ON
Final Measurement: x QP / + AV          Transducer No. Start      Stop      Name
                   Meas Time:    1 s                    1     9k       30M     ESH3Z2
```



Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Measurement of disturbance voltage in the frequency range between 150 kHz and 30 MHz

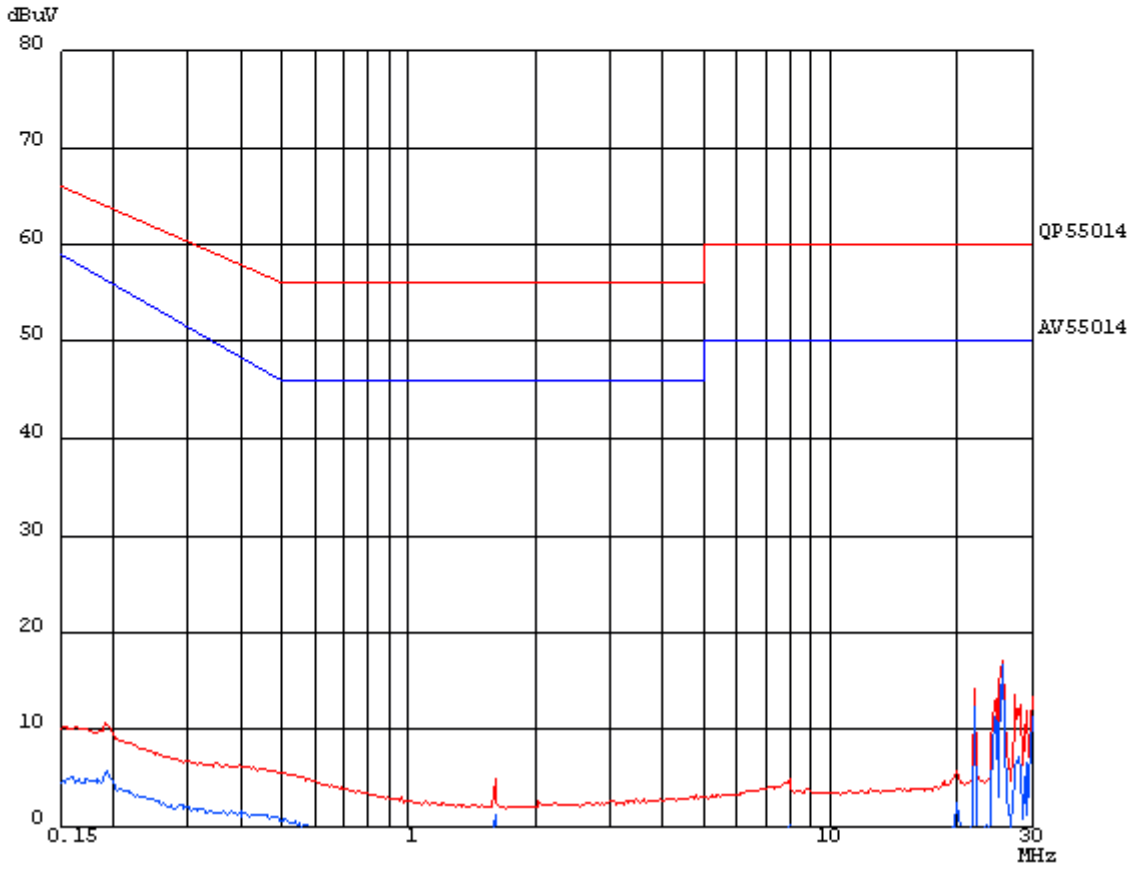
Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed in normal operation mode.*

Test point: *AC power port – mains connection, pole L.*

Disturbance voltage diagram

```
TUV Rheinland InterCert MEEI Division.
Disturbance voltage.                                    29. Aug 11  16:18
EUT:            VB25/1500.
Manuf:          Elpumps Kft.
Op Cond:        R&S,ESCS30 No:836858/003+ESH3Z2+ESH2-Z5.
Operator:       Novotny Tamas.
Test Spec:      EN 55014-1.
                230 V, 50 Hz. Pole L.
File name:      VB_K.RES


Scan Settings (1 Range)
|--------- Frequencies -----------||--------- Receiver Settings ---------|
   Start       Stop         Step      IF BW  Detector  M-Time  Atten Preamp
 150k          30M            0.8%      9k     QP+AV      50ms AUTO LN    ON
Final Measurement: x QP / + AV          Transducer No. Start      Stop      Name
                   Meas Time:    1 s                  1     9k       30M     ESH3Z2
```



Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Measurement of disturbance power in the frequency range between 30 MHz and 300 MHz

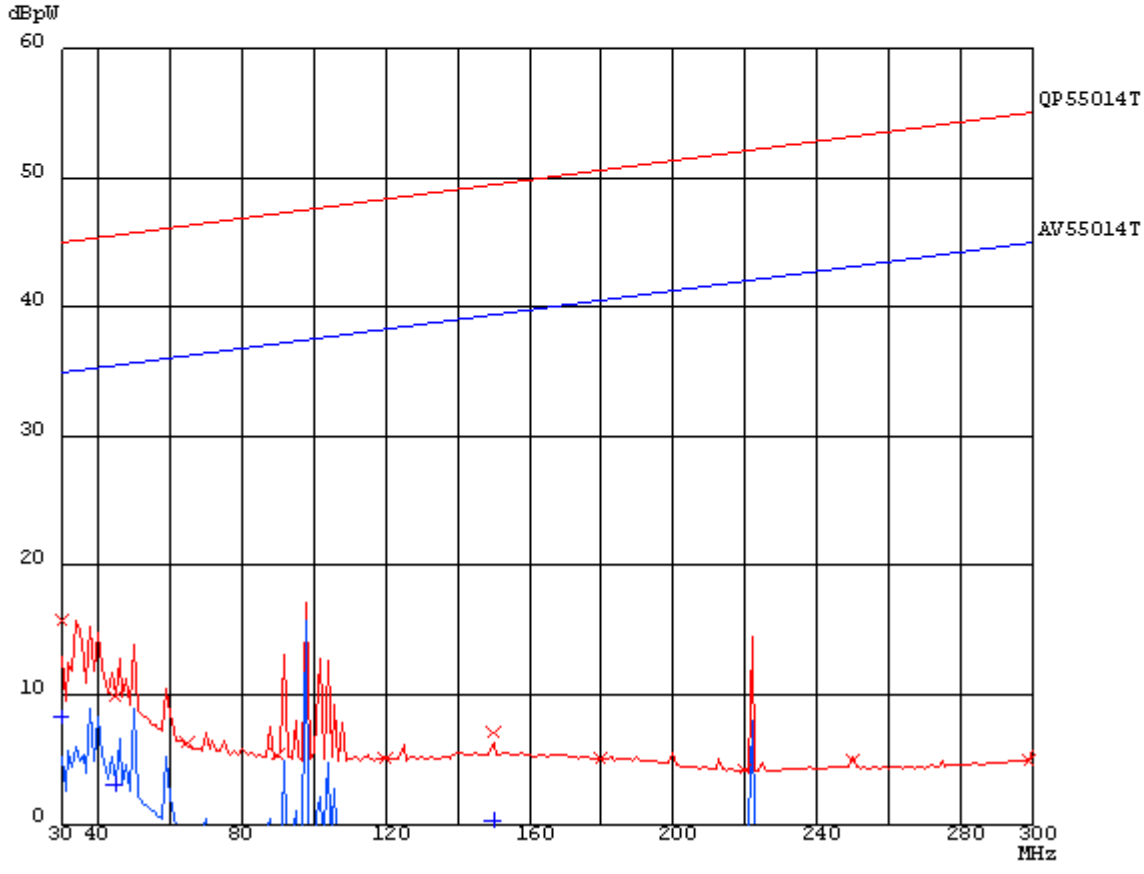
Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed in normal operation mode.*

Test point: *AC power port – mains connection.*

Disturbance power diagram

```
TUV Rheinland InterCert MEEI Division.
Disturbance power.                                    29. Aug 11  15:13
EUT:            VB25/1500.
Manuf:          Elpumps Kft.
Op Cond:        R&S,ESCS30 No:836858/003+MDS21.
Operator:       Novotny Tamas.
Test Spec:      EN 55014-1.
                230 V, 50 Hz.
File name:      vb_t.RES


Scan Settings (1 Range)
|--------- Frequencies -----------||--------- Receiver Settings ---------|
   Start       Stop        Step      IF BW  Detector  M-Time  Atten Preamp
  30M        300M         1M        120k     QP+AV      50ms AUTO LN    ON
Final Measurement: x QP / + AV          Transducer No. Start      Stop      Name
                   Meas Time:    1 s                  7    30M      300M      MDS21
```



Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Measurement of radiated disturbances in the frequency range between 30 MHz and 1 GHz

Description of operating conditions applied for testing of the product (settings, load, program, etc.):	*The measurement was performed in normal operation mode.*
Test point:	*Enclosure port.*
Description of measurement area:	*The measuring was carried out in a semi-anechoic chamber. The surface of the walls, ceiling and floor of the chamber were covered by metal sheets, and they also had a covering made of ferrite tiles and profiles with a special layer against reflexion. The test sample was placed on a turntable made of non-metallic (wood) material.*
Measurement distance:	*10 m*
Height of antenna:	*1…4 m*
Polarisation of antenna	*vertical, horizontal*
Description of cables:	*power supply cable: ~1.5 m long*
Measurement results:	*Evaluable disturbance field strength could not be measured.*

Frequency MHz	Measured value dBµV	Ambient noise dBµV/m	**Actual disturbance level dBµV/m**	**Limit value (for 10m) dBµV/m**	Polarisation of the antenna v / h
-	-	-	-	-	-

Note(s): ---

Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Measurement of click disturbances

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed with the pump switched on and off once per minute, for 20 minutes. (Number of switching operations is 40)*

Discontinuous disturbances:

Evaluation of click disturbances without correction according to the density of the clicks:

Measurement frequencies	MHz	0.15	0.5	1.4	30
Limit value for click disturbances (L_q)	dBµV	*66*	*56*	*56*	*60*
Number of counted clicks	pcs	*16*	*33*	*23*	*0*
Number of counted clicks, that have a duration longer than 20ms	pcs	*0*	*0*	*0*	*0*
Duration of continuous disturbances	sec	*0*	*0*	*0*	*0*

Determination of the click rate (N) (EN 55014-1, Clause C.4.1)

Observation time (T)	min	*20*
Number of switching operations (n_2)	pcs	*40*
f factor (EN 55014-1, Ann. A, Table A2)	-	*1*
Click rate: $N = n_2 \times f / T$	pcs / min.	*2*

The equipment complies with sub-clause 4.2.3.3 of the standard EN 55014-1:

Sub-Clause 4.2.3.3. of the standard EN 55014-1 reads:
Appliances which fulfil the following conditions:
- the click rate is not more than 5,
- none of the caused clicks have a duration longer than 20 ms,
- 90 % of the caused clicks have a duration less than 10 ms

shall be deemed to comply with the limits, independent of the amplitude of the clicks.

Note(s): ---

Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	Next calibration	Applied
Semi anechoic chamber	T-Network	3, 10 m	---	*2011-11*	☒
Shielded cabinet	Siepel	3,5x3,5x2,4m	92155	---	☒
Measuring receiver	R & S	ESCS30	836858/003	*2011-09*	☒
Measuring receiver	R & S	ESVS30	826638/014	*2012-05*	☒
Measuring receiver	R & S	ESHS30	828144/007	*2011-08*	☒
Discontinuous interference analyser	Chase	DIA 1512	5032	*2011-10*	☒
Artificial mains network	R & S	ESH2-Z5	828075/008	*2013-04*	☒
Pulse limiter	R & S	ESH3-Z2	-	*2013-01*	☒
Biconilog antenna	ETS-Lindgren	3142 c	00035886	*2012-06*	☒
Absorbing clamp	R & S	MDS21	827643/018	*2013-04*	☒
RFI power measuring table	HD	KMS560	560/302	---	☒
Clamp controller	HD	HD100	100/304	---	☒

Note(s): ---

Photo(s) on the measuring arrangement:

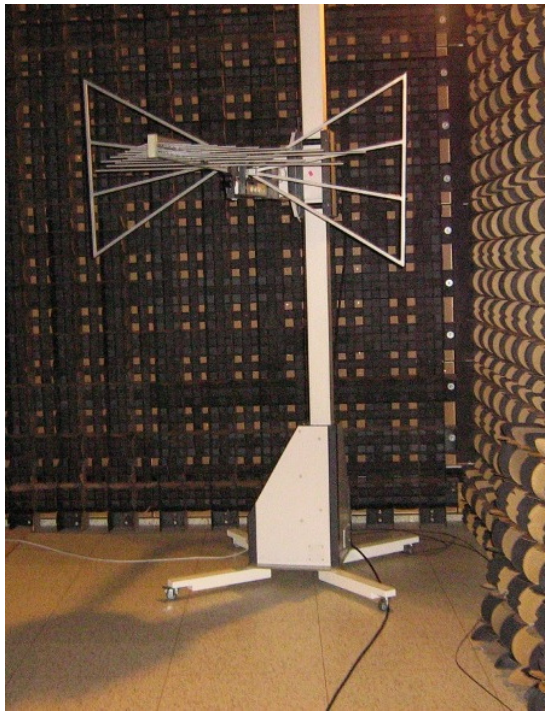
Measurement of disturbance voltage

Measurement ref. No.: 28212426 001	Standard applied: **EN 55014-1:2006+A1:2009** Radio-frequency disturbances of household and similar appliances

Photo(s) on the measuring arrangement:

Measurement of disturbance power

Measurement of discontinuous disturbances



Measurement of radiated disturbances

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Date of measurement: *2011-08-29*

Ambient conditions:

Ambient temperature: *28 °C*

Relative humidity: *30-60 %*

Air pressure *1017 hPa*

Test setup:

Laboratory test ☒ Post-installation test ☐

Classification: *A*

Calculated measurement uncertainty for harmonic current: ± 0.25 %, k= 2

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s): ---

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed in normal operation mode.*

Classification: *A*

Test point: *AC power port – mains connection.*

Allowed max. values of harmonic current of class „A" equipment:

Harmonic No.	Limit for harmonic current [A]
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	0.15 x (15 / n)
Even harmonics	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	0.23 x (8 / n)

Note(s): ---

Measurement ref. No.:	Standard applied:
28212426 001	**EN 61000-3-2:2006+A1:2009+A2:2009**
	Harmonic current

Operating conditions:

Voltage	= 229.636 V	Voltage Distortion	= 0.20 %
Current	= 4.365 A	Current Distortion	= 11.90 %
Power	= 962.178 W	Apparent Power	= 1002.388 VA
CosPhi(1)	= 0.967	Power Factor	= 0.960
Phase	= L1		

Test results:

Hn	I rms	Percentage	Phase	Limits	FAIL
DC	-0.010 A	-0.24 %	--------	no limit	
1	4.333 A	100.00 %	-14.72°	no limit	
2	0.006 A	0.15 %	+115.50°	1.080 A	
3	0.494 A	11.40 %	+153.08°	2.300 A	
4	0.007 A	0.17 %	+17.00°	0.430 A	
5	0.145 A	3.35 %	+144.42°	1.140 A	
6	0.008 A	0.18 %	-35.59°	0.300 A	
7	0.025 A	0.58 %	-56.78°	0.770 A	
8	0.004 A	0.09 %	-58.15°	0.230 A	
9	0.006 A	0.14 %	-62.10°	0.400 A	
10	0.003 A	0.07 %	-101.27°	0.184 A	
11	0.007 A	0.17 %	+160.53°	0.330 A	
12	0.001 A	0.03 %	-100.97°	0.153 A	
13	0.008 A	0.19 %	-151.40°	0.210 A	
14	0.002 A	0.04 %	-179.63°	0.131 A	
15	0.001 A	0.01 %	--------	0.150 A	
16	0.001 A	0.03 %	-149.14°	0.115 A	
17	0.003 A	0.06 %	+115.54°	0.132 A	
18	0.001 A	0.02 %	--------	0.102 A	
19	0.001 A	0.02 %	+96.91°	0.118 A	
20	0.004 A	0.08 %	-170.05°	0.092 A	
21	0.002 A	0.05 %	+29.70°	0.107 A	
22	0.002 A	0.05 %	+125.02°	0.084 A	
23	0.000 A	0.01 %	--------	0.098 A	
24	0.001 A	0.02 %	--------	0.077 A	
25	0.001 A	0.02 %	+161.72°	0.090 A	
26	0.001 A	0.02 %	--------	0.071 A	
27	0.000 A	0.00 %	--------	0.083 A	
28	0.001 A	0.01 %	--------	0.066 A	
29	0.001 A	0.01 %	--------	0.078 A	
30	0.000 A	0.01 %	--------	0.061 A	
31	0.000 A	0.00 %	--------	0.073 A	
32	0.000 A	0.00 %	--------	0.058 A	
33	0.000 A	0.01 %	--------	0.068 A	
34	0.000 A	0.00 %	--------	0.054 A	
35	0.000 A	0.00 %	--------	0.064 A	
36	0.000 A	0.01 %	--------	0.051 A	
37	0.000 A	0.01 %	--------	0.061 A	
38	0.000 A	0.01 %	--------	0.048 A	
39	0.000 A	0.00 %	--------	0.058 A	
40	0.000 A	0.00 %	--------	0.046 A	

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-2:2006+A1:2009+A2:2009** Harmonic current

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	Next calibration	Applied
Digital flickermeter -real time harmonic analyser	PMM	PMM 1000	H90598	*2012-05*	☒
Power supply	Kikusui	PCR 2000L	A0000448	*	☒
Power supply	Kikusui	PCR 2000L	A0000449	*	☒
Multimeter	Hioki	3257-50	040418901	*2011-10*	☒

Additional information:

** The power supplies are not calibrated instruments. Their output parameters are checked during each measurement.*

Note(s): ---

Photo(s) on the measuring arrangement:

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-3:2008** Voltage fluctuations and flicker

Date of measurement: *2011-08-29*

Ambient conditions:

Ambient temperature: *28 °C*

Relative humidity: *30-60 %*

Air pressure *1017 hPa*

Test setup:

Laboratory test ☒ Post-installation test ☐

Evaluation based on the test results:

Passed ☒ Failed ☐

Note(s): ---

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-3:2008** Voltage fluctuations and flicker

Operating conditions:

Description of operating conditions applied for testing of the product (settings, load, program, etc.): *The measurement was performed with the pump switched on and off once per minute.*

Test point: *AC power port – mains connection.*

Results of measurement of voltage fluctuations and voltage changes:

Limits	Measured value	Limit value
Value of short term flicker indicator (P_{st})	-	-
Value of long term flicker indicator (P_{lt})	-	-
Time of d(t) during a voltage change for more 3.3 %	*200 ms*	500 ms
Relative steady-state voltage change d_c	*1.337 %*	3.3 %
Maximum relative voltage change d_{max}		
a) without additional conditions	*5.139 %*	3.0 %
b)	-	-
- manual switching		
- automatic switching more frequently twice per day and having a delayed restart		
- manual restart after power supply interruption		
c)	-	-
- is attended whilst in use		
- is switched on automatically or manually no more than twice per day and having a delayed restart, or manual restart after power supply interruption		

Note(s): *Although the equipment is not hand switched, the flicker measurement was performed according to EN 61000-3-3:2008 Annex B, the limits for long term flicker indicator(P_{st}) and long term flicker indicator(P_{lt}) were not taken into account.*

Measurement ref. No.:	Standard applied:
28212426 001	**EN 61000-3-3:2008**
	Voltage fluctuations and flicker

Measured values:

Channel 1 measured values

N	Time	Pmax	Pst	Plt	dt Over	dmax	dc	FAIL
1	10:27	88.56	1.929	0.843	0.160	5.214	1.269	FAIL
2	10:28	88.64	1.940	1.065	0.180	5.198	1.310	FAIL
3	10:29	90.52	1.958	1.224	0.200	5.536	1.337	FAIL
4	10:30	88.98	1.936	1.346	0.200	5.298	1.325	FAIL
5	10:31	88.45	1.919	1.446	0.180	5.427	1.313	FAIL
6	10:32	87.08	1.910	1.534	0.190	5.322	1.318	FAIL
7	10:33	84.85	1.869	1.607	0.170	5.121	1.317	FAIL
8	10:34	86.85	1.916	1.679	0.200	5.425	1.315	FAIL
9	10:35	85.45	1.890	1.749	0.172	5.130	1.311	FAIL
10	10:36	82.65	1.842	1.798	0.160	5.048	1.322	FAIL
11	10:37	86.09	1.892	1.855	0.180	5.420	1.314	FAIL
12	10:38	85.40	1.887	1.743	0.170	5.122	1.311	FAIL
13	10:39	81.60	1.836	1.848	0.150	4.983	1.310	FAIL
14	10:40	84.71	1.874	1.842	0.170	5.289	1.310	FAIL
15	10:41	83.21	1.853	1.832	0.170	5.075	1.288	FAIL
16	10:42	82.32	1.842	1.824	0.170	5.026	1.308	FAIL
17	10:43	80.39	1.828	1.816	0.170	4.956	1.312	FAIL
18	10:44	81.03	1.824	1.808	0.160	5.012	1.312	FAIL
19	10:45	79.95	1.831	1.805	0.170	4.937	1.330	FAIL
20	10:46	81.72	1.841	1.798	0.170	5.057	1.330	FAIL
21	10:47	83.05	1.833	1.794	0.180	5.274	1.314	FAIL
22	10:48	79.78	1.836	1.793	0.160	4.989	1.291	FAIL
23	10:49	78.75	1.809	1.786	0.160	4.884	1.291	FAIL
24	10:50	80.38	1.822	1.836	0.170	4.995	1.296	FAIL
Limits:			no lim.	no lim.	0.500	3.000	3.300	

Channel 2 measured values (Source Check)

N	Time	Pmax	Pst	Plt	dt Over	dmax	dc	FAIL
1	10:27	0.183	0.172	0.075	0.000	0.297	0.010	
2	10:28	0.192	0.172	0.095	0.000	0.291	0.014	
3	10:29	0.202	0.173	0.109	0.000	0.315	0.016	
4	10:30	0.190	0.171	0.119	0.000	0.289	*****	
5	10:31	0.200	0.173	0.129	0.000	0.308	*****	
6	10:32	0.176	0.170	0.136	0.000	0.317	*****	
7	10:33	0.174	0.170	0.143	0.000	0.323	*****	
8	10:34	0.188	0.171	0.150	0.000	0.328	*****	
9	10:35	0.173	0.170	0.156	0.000	0.335	*****	
10	10:36	0.168	0.169	0.161	0.000	0.340	*****	
11	10:37	0.190	0.171	0.166	0.000	0.345	*****	
12	10:38	0.176	0.170	0.136	0.000	0.317	*****	
13	10:39	0.159	0.168	0.166	0.000	0.355	*****	
14	10:40	0.174	0.170	0.166	0.000	0.362	*****	
15	10:41	0.164	0.169	0.166	0.000	0.368	*****	
16	10:42	0.174	0.169	0.165	0.000	0.373	*****	
17	10:43	0.152	0.168	0.165	0.000	0.376	*****	
18	10:44	0.157	0.168	0.165	0.000	0.381	*****	
19	10:45	0.158	0.168	0.165	0.000	0.386	*****	
20	10:46	0.152	0.167	0.164	0.000	0.389	*****	
21	10:47	0.161	0.168	0.164	0.000	0.392	0.165	
22	10:48	0.149	0.167	0.164	0.000	0.276	*****	
23	10:49	0.156	0.168	0.164	0.000	0.282	*****	
24	10:50	0.160	0.168	0.168	0.000	0.287	*****	
Limits:			0.400	no lim.	no lim.	0.2dmax1	no lim.	

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-3:2008** Voltage fluctuations and flicker

As seen from the test results, the equipment does not comply with the requirements of EN 61000-3-3 standard.
According to Sub-Clause 6.2.2 of standard EN 61000-3-11 (Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection), in such cases the equipment may only be connected to a supply network having a lower impedance than that specified by EN 61000-3-3 as a reference network for the measurements.
The manufacturer shall determine and declare this Z_{max} impedance in the user's manual of the equipment.
The result of our calculation is specified below (taking into account the most unfavourable measured value, d_{max} =5.536):

Z_{ref} according to EN 61000-3-11 clause 6.2.2 — Ra = 0.24 Ω, Xa = 0.15 Ω at 50 Hz; Rn = 0.16 Ω, Xn = 0.10 Ω at 50 Hz; Z_{ref} = 0.472 Ω

$Z_{sys1} = Z_{ref} * d_{max}limit / d_{max}$	*0.472 * 3 / 5.536*	*0.255 Ω*
$Z_{sys2} = Z_{ref} * 0.033 / d_c$	*0.472 * 3.3 /1.337*	*1.164 Ω*
$Z_{sys3} = Z_{ref} * (1 / P_{st})^{3/2}$	*0.472 * (1 / P_{st})$^{3/2}$*	*N/A*
$Z_{sys4} = Z_{ref} *(0.65 / P_{lt})^{3/2}$	*0.472 * (0.65 / P_{lt})$^{3/2}$*	*N/A*
Z_{sys}	Minimum of above	*0.255 Ω*

The equipment shall be connected to a supply network the impedance of which is equal to or lower than the above calculated value (Z_{sys} = Z_{max}= 0.255 Ohm).

Measurement ref. No.: 28212426 001	Standard applied: **EN 61000-3-3:2008** Voltage fluctuations and flicker

Test instruments used:

Denomination	Manufacturer	Type	Serial No.	*Next calibration*	Applied
Digital flickermeter -real time harmonic analyser	PMM	PMM 1000	H90598	*2012-05*	☒
Reference impedance	PMM	PMM 1001	0000J91201	*2012-05*	☒
Power supply	Kikusui	PCR 2000L	A0000233	*	☒
Power supply	Kikusui	PCR 2000L	A0000448	*	☒
Multimeter	Hioki	3257-50	040418901	*2011-10*	☒

Additional information:

** The power supplies are not calibrated instruments. Their output parameters are checked during each measurement.*

Note(s): ---

Photo(s) on the measuring arrangement: