

Ningbo Huiyoudi Electrical Appliance Technology Co., Ltd.

TEST REPORT

SCOPE OF WORK:

EMC report

Model:

DF-019, DF-019A, DF-019C, DF-021,
DF-020, DF-020A

REPORT NUMBER

180900470SHA-001/Amendment 4

ISSUE DATE

May 31, 2023

DOCUMENT CONTROL NUMBER

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Report no. 180900470SHA-001/Amendment 4

Applicant : **Ningbo Huiyoudi Electrical Appliance Technology Co., Ltd.**
No. 3 xinyang road, Ditang Street, Yuyao, Zhejiang, P. R. China

Manufacturer : **Ningbo Huiyoudi Electrical Appliance Technology Co., Ltd.**
No. 3 xinyang road, Ditang Street, Yuyao, Zhejiang, P. R. China

Factory : **Ningbo Huiyoudi Electrical Appliance Technology Co., Ltd.**
No. 3 xinyang road, Ditang Street, Yuyao, Zhejiang, P. R. China

Summary

The equipment complies with the requirements according to the following standard(s) or Specification:

***EN IEC 55014-1:2021:** Electromagnetic compatibility-Requirements for household appliances, electric tools and similar apparatus Part 1: Emission

***EN IEC 55014-2:2021:** Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity – Product family standard

***EN IEC 61000-3-2:2019+A1:2021:** Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current $\leq 16A$ per phase)

***EN 61000-3-3:2013+A1:2019+A2:2021:** 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 $\leq 16A$ per phase and not subject to conditional connection

PREPARED BY:

REVIEWED BY:



Reggie Yuan
Project Engineer



Offa Zhou
Reviewer

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Product Description	: Steam brush (fabric steamer)
Type/Model(s)	: DF-019, DF-019A, DF-019C, DF-021, DF-020, DF-020A
Rating(s)	: 220-240V~, 50-60Hz, Class I DF-019, DF-019A, DF-020: 1100W DF-021: 1200W DF-019C, DF-020A: 1500W
Brand name	: /
Date of test	: May 24-May 25, 2023
Base testing laboratory	: Intertek Testing Services Shanghai
Amendment 4:	
<p>The original test report ref. No. 180900470SHA-001 dated on October 31, 2018 with amendment 1 dated on April 30, 2019, amendment 2 dated on April 09, 2021, amendment 3 dated on October 15, 2021 were modified on May 31, 2023 to include the following additions and/or changes:</p> <ol style="list-style-type: none"> 1. “*” means the standard has been updated by the new standards listed in this report. 2. Added two models: DF-020, DF-020A. Added alternative pump DJMP-2 (for DF-019A, DF-019C, DF-020, DF-020A), pump EJ-01 (for DF-019A, DF-019C). DF-020 series and DF-019 series share similar appearance and structure. DF020 is same as DF-020A, except the rated power input <p>Based on engineering judgement, additional testing items of Conducted Emission, Disturbance Power, Mains terminal discontinuous disturbance voltage/click, Harmonics, Flicker are performed on DF-019C with Alternative pump EJ-01, DF-020A with Alternative pump DJMP-2. This amendment test report should be read in conjunction with the based test report.</p>	

Revision History

Report No.	Version	Description	Issued Date
180900470SHA-001/ Amendment 4	Rev. 01	Initial issue of report	May 31, 2023

Measurement result summary

TEST ITEM	TEST RESULT	NOTE
<i>Mains terminal continuous disturbance voltage</i>	<i>Pass</i>	
<i>Mains terminal discontinuous disturbance voltage/click</i>	<i>Pass</i>	
<i>Continuous disturbance power</i>	<i>Pass</i>	
Radiated Emission ⁽¹⁾	Pass	
<i>Harmonics</i>	<i>Pass</i>	
<i>Voltage fluctuation-Flicker</i>	<i>Pass</i>	
Electrostatic Discharge (ESD)	Pass	
RF electromagnetic field susceptibility	NA	
Electric Fast Transient /Burst (EFT/B)	Pass	
Surge	Pass	
Injected Current	Pass	
Voltage dips and interruption	Pass	

Notes:

1. The item(s) in “bold & italic” means the additional tests has been performed, and test result will be listed in the ANNEX of this amendment report.
2. NA=Not Applicable.
3. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.
4. Additions, Deviations and Exclusions from Standards: None.

⁽¹⁾ As for in the disturbance power test all emission readings from the EUT are lower than the applicable limits (Table 7) reduced by the margin (Table 8) and the maximum clock frequency is less than 30MHz, the EUT is deemed to comply with the Radiated Emission requirement without test.

Annex I: Instrument list

Conducted Emission/Disturbance Power					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2023-07-18
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2023-11-09
<input checked="" type="checkbox"/>	Absorbing clamp	R&S	MDS 21	EC 2108	2023-06-04
Discontinuous Disturbance Voltage					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Click meter	AFJ	DDA55	EC 5320	2023-12-07
<input checked="" type="checkbox"/>	A.M.N.	AFJ	LS16C	EC 5320-1	2023-11-09
Harmonics / Flicker					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Three phase Harmonic-flicker system	EM TEST	DPA503N	EC 5383	2023-07-17
		EM TEST	NETWAVE-30-400	EC 5383-2	2023-07-17
Test Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2024-01-10
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2024-03-24
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 5198	2024-03-08

Annex II: Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Mains terminal continuous disturbance voltage	25	42	NA
Mains terminal discontinuous disturbance voltage/click	25	42	NA
Continuous disturbance power	25	42	NA
Radiated Emission	NA	NA	NA
Harmonics	26	45	NA
Voltage fluctuation-Flicker	26	45	NA
Electrostatic Discharge (ESD)	NA	NA	NA
RF electromagnetic field susceptibility	NA	NA	NA
Electric Fast Transient /Burst (EFT/B)	NA	NA	NA
Surge	NA	NA	NA
Injected Current	NA	NA	NA
Voltage dips and interruption	NA	NA	NA

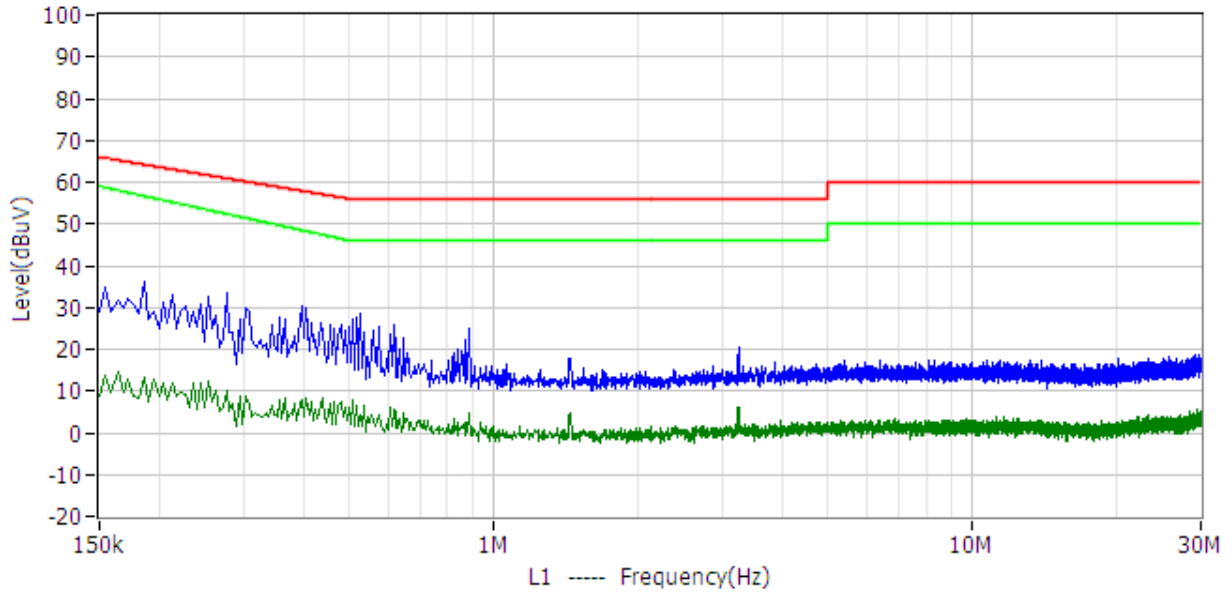
Notes: NA =Not Applicable

Annex III: Test Result

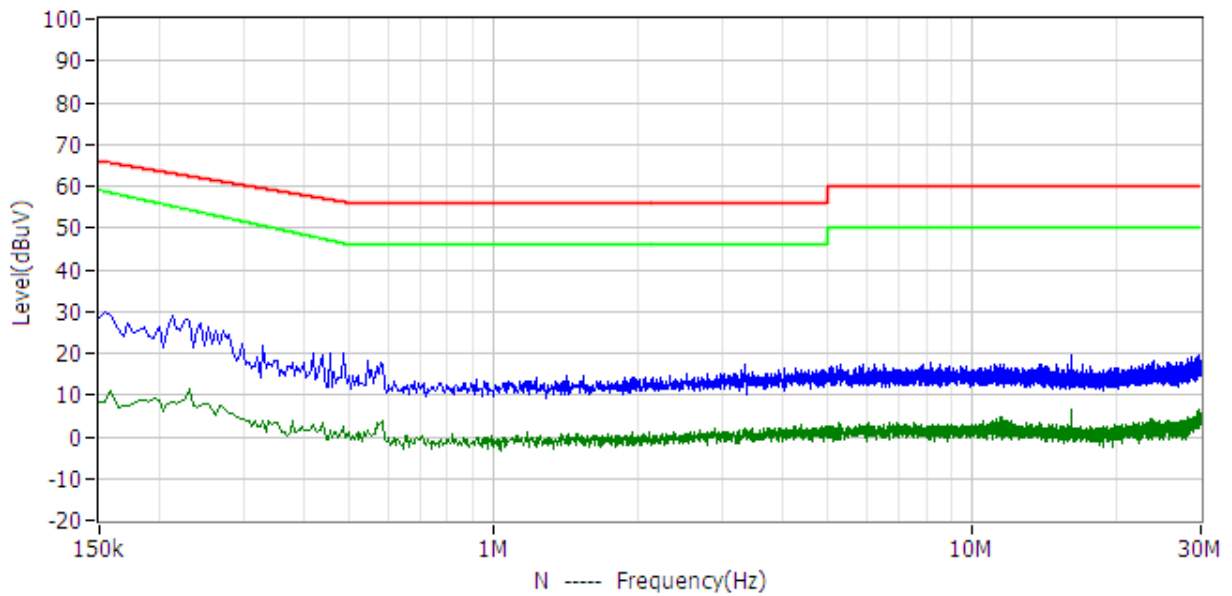
Mains Terminal Continuous Disturbance Voltage

DF-019C with Alternative pump EJ-01

L-Line

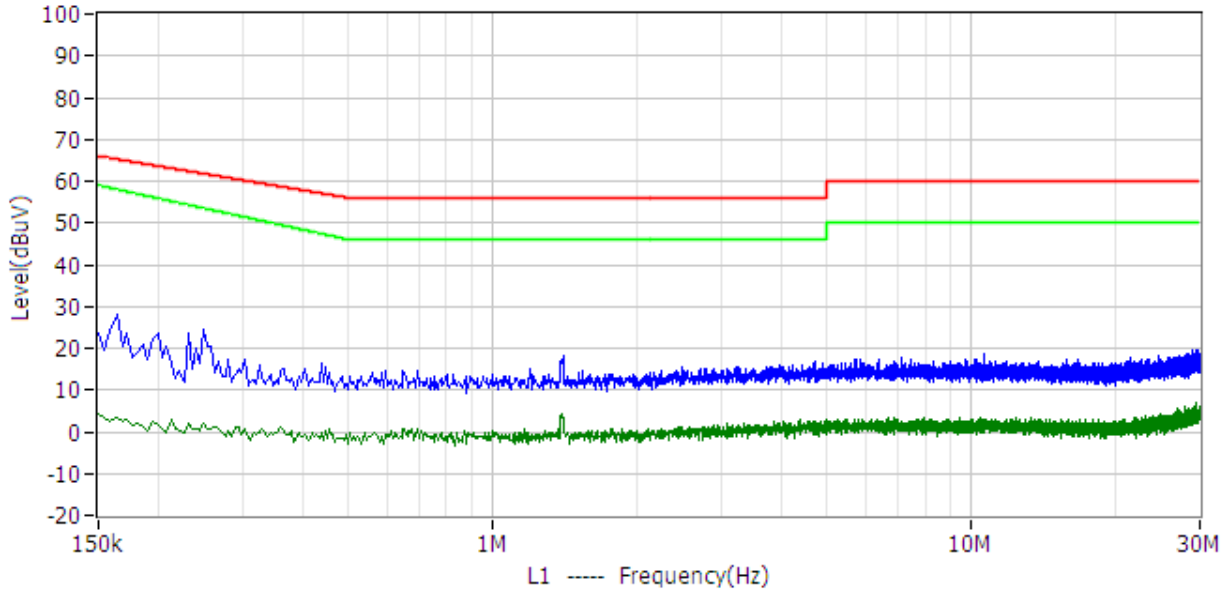


N-Line

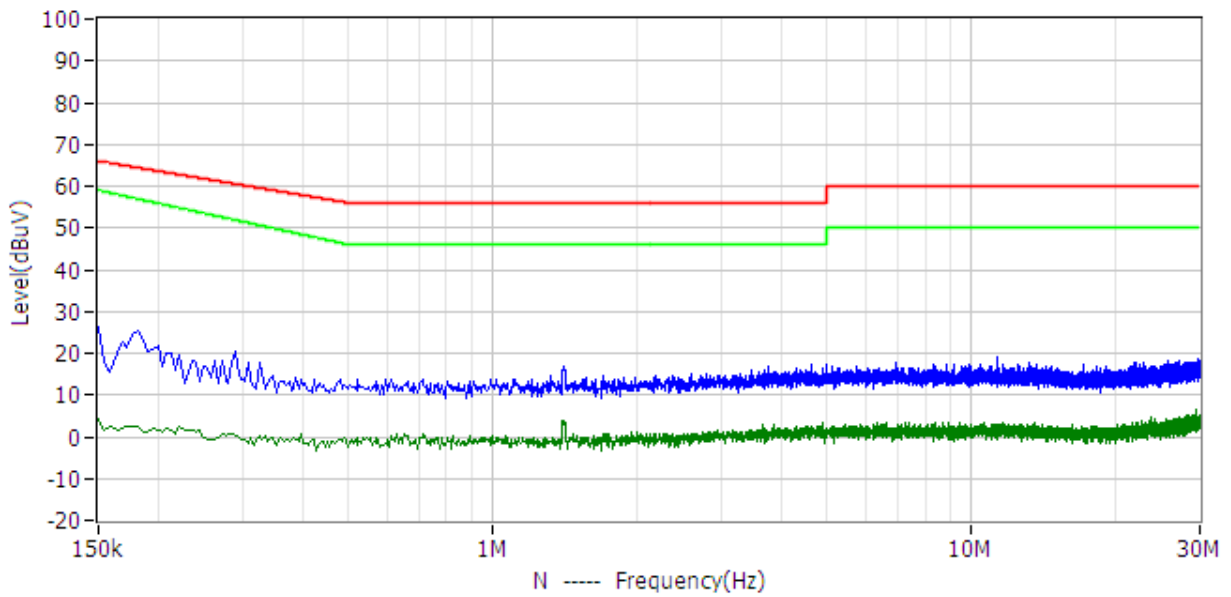


DF-020A with Alternative pump DJMP-2

L-Line

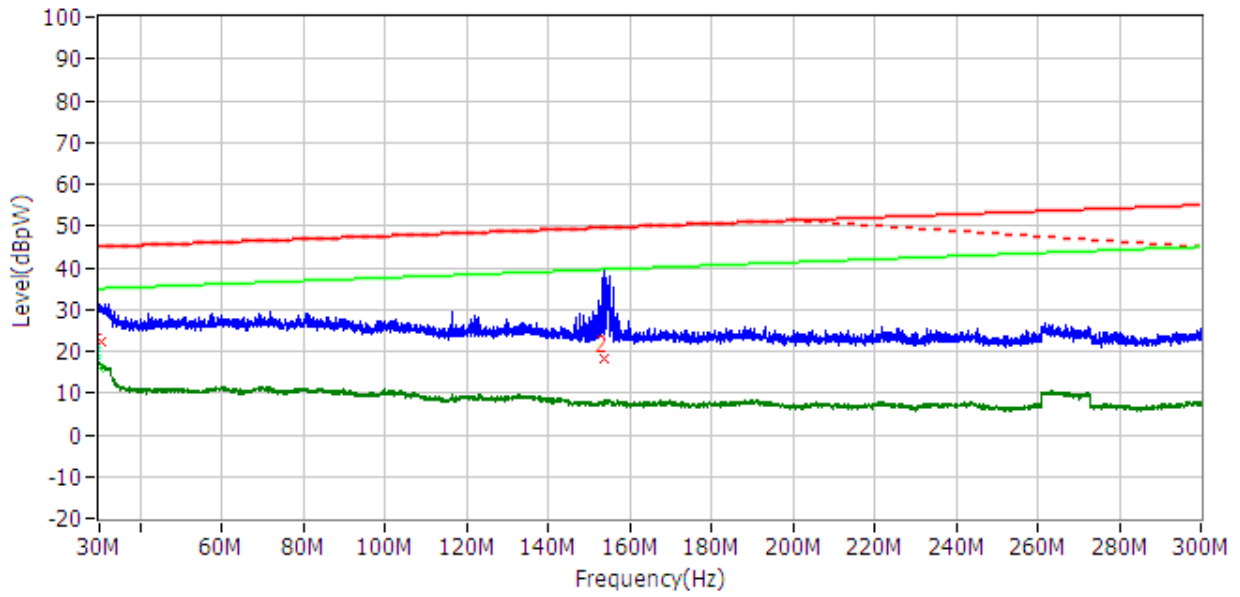


N-Line



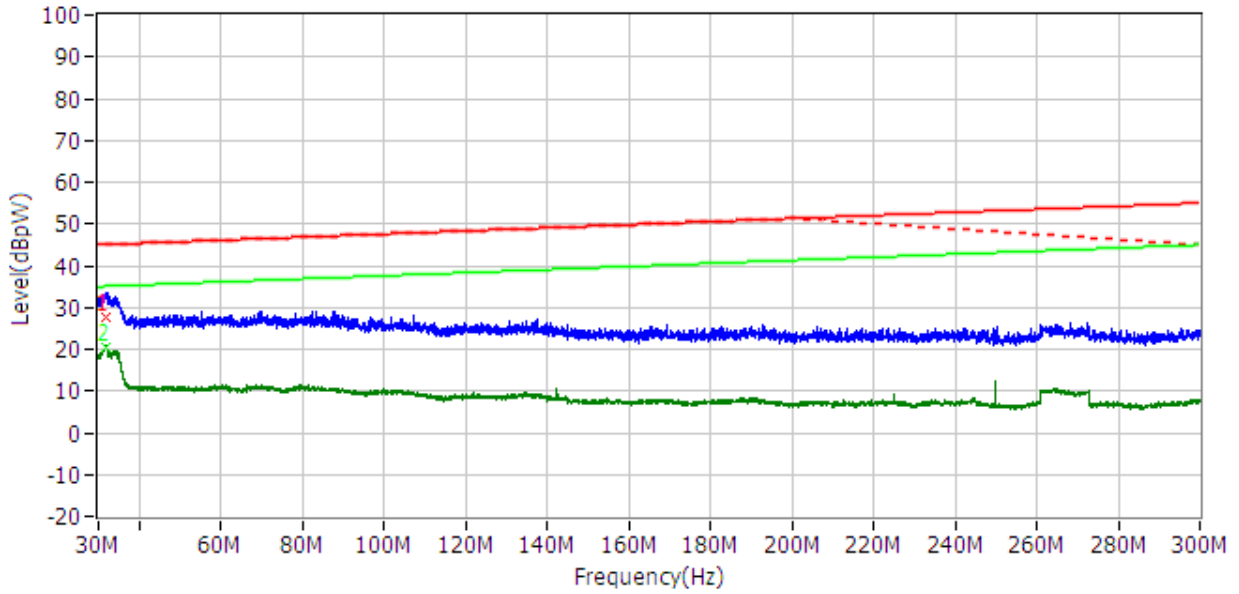
Disturbance Power

DF-019C with Alternative pump EJ-01



No.	Frequency	Limit dBpW	Level dBpW	Delta dB	Factor dB	Detector
1	30.420MHz	45.0	22.1	-22.9	10.1	QP
2	153.540MHz	49.6	18.1	-31.5	6.4	QP
3	30.120MHz	35.0	15.9	-19.1	10.1	CAV

DF-020A with Alternative pump DJMP-2



No.	Frequency	Limit dBpW	Level dBpW	Delta dB	Factor dB	Detector
1	31.860MHz	45.1	27.5	-17.6	10.1	QP
2	31.800MHz	35.1	20.3	-14.8	10.1	CAV

Mains Terminal Discontinuous Disturbance Voltage

DF-019C with Alternative pump EJ-01

Frequency (MHz)	0.15	0.5	1.4	30.0
Permitted limit for continuous interference (dB μ V)	66.0	56.0	56.0	60.0
Counted click number	40	36	16	0
Observed time (min)	40	40	40	40
Click duration (ms)	<10	<10	<10	-
Click rate N	<5	<5	<5	0
Factor	-	-	-	-
Permitted limits for clicks (dB μ V)	-	-	-	-
Counted clicks exceeding the limits	-	-	-	-
Test result	Pass	Pass	Pass	Pass
Any other descriptions: The click rate is less than 5, all of the caused clicks have a duration less than 10ms, therefore, it complied the standard.				

DF-020A with Alternative pump DJMP-2

Frequency (MHz)	0.15	0.5	1.4	30.0
Permitted limit for continuous interference (dB μ V)	66.0	56.0	56.0	60.0
Counted click number	40	40	16	0
Observed time (min)	34	34	34	34
Click duration (ms)	<10	<10	<10	-
Click rate N	<5	<5	<5	0
Factor	-	-	-	-
Permitted limits for clicks (dB μ v)	-	-	-	-
Counted clicks exceeding the limits	-	-	-	-
Test result	Pass	Pass	Pass	Pass
Any other descriptions: The click rate is less than 5, all of the caused clicks have a duration less than 10ms, therefore, it complied the standard.				

Harmonics

DF-019C with Alternative pump EJ-01

Power and THD results - DS: 1

True power P:	1.409kW	Apparent power S:	1.409kVA
Reactiv power Q:	3.53var	Power factor:	1.000
THD (U):	0.001	THD (I):	0.001
Crest Factor (U):	1.414	Crest Factor (I):	1.415

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	1.204			
2	3.334E-3			PASS
3	2.481E-3			PASS
4	2.617E-3			PASS
5	4.165E-3			PASS
6	1.473E-3			PASS
7	1.475E-3			PASS
8	1.418E-3			PASS
9	1.968E-3			PASS
10	1.296E-3			PASS
11	988.920E-6			PASS
12	971.309E-6			PASS
13	1.185E-3			PASS
14	1.598E-3			PASS
15	1.270E-3			PASS
16	855.230E-6			PASS
17	1.080E-3			PASS
18	1.256E-3			PASS
19	931.430E-6			PASS
20	796.693E-6			PASS
21	1.070E-3			PASS
22	822.510E-6			PASS
23	1.523E-3			PASS
24	793.385E-6			PASS
25	805.655E-6			PASS
26	752.170E-6			PASS
27	1.012E-3			PASS
28	1.116E-3			PASS
29	962.053E-6			PASS
30	699.732E-6			PASS
31	899.677E-6			PASS
32	1.075E-3			PASS
33	751.396E-6			PASS
34	679.260E-6			PASS
35	806.093E-6			PASS
36	726.384E-6			PASS
37	1.180E-3			PASS
38	702.706E-6			PASS

39	778.000E-6			PASS
40	691.326E-6			PASS
Maximum harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	6.098			
2	63.198E-3	3.901	1.62	PASS
3	54.611E-3	1.583	3.45	PASS
4	38.147E-3	5.914	645.00E-3	PASS
5	29.643E-3			PASS
6	24.182E-3			PASS
7	20.614E-3			PASS
8	18.217E-3			PASS
9	16.090E-3			PASS
10	14.331E-3			PASS
11	13.151E-3			PASS
12	11.992E-3			PASS
13	11.396E-3			PASS
14	10.721E-3			PASS
15	9.937E-3			PASS
16	9.227E-3			PASS
17	8.757E-3			PASS
18	8.452E-3			PASS
19	8.009E-3			PASS
20	7.665E-3			PASS
21	7.312E-3			PASS
22	6.812E-3			PASS
23	6.866E-3			PASS
24	6.434E-3			PASS
25	6.277E-3			PASS
26	6.030E-3			PASS
27	5.858E-3			PASS
28	5.649E-3			PASS
29	5.533E-3			PASS
30	5.414E-3			PASS
31	5.314E-3			PASS
32	5.164E-3			PASS
33	4.954E-3			PASS
34	4.873E-3			PASS
35	4.852E-3			PASS
36	4.788E-3			PASS
37	4.745E-3			PASS
38	4.495E-3			PASS
39	4.421E-3			PASS
40	4.408E-3			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

DF-020A with Alternative pump DJMP-2

Power and THD results - DS: 1

True power P:	1.4kW	Apparent power S:	1.4kVA
Reactiv power Q:	3.823var	Power factor:	1.000
THD (U):	0.001	THD (I):	0.001
Crest Factor (U):	1.414	Crest Factor (I):	1.414

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	727.381E-3			
2	3.434E-3			PASS
3	2.852E-3			PASS
4	3.589E-3			PASS
5	5.505E-3	0.483	1.14	PASS
6	1.742E-3			PASS
7	1.581E-3			PASS
8	1.803E-3			PASS
9	2.446E-3			PASS
10	1.708E-3			PASS
11	1.111E-3			PASS
12	1.127E-3			PASS
13	1.272E-3			PASS
14	1.927E-3			PASS
15	1.271E-3			PASS
16	1.041E-3			PASS
17	1.160E-3			PASS
18	1.488E-3			PASS
19	1.034E-3			PASS
20	910.138E-6			PASS
21	1.029E-3			PASS
22	929.314E-6			PASS
23	1.724E-3			PASS
24	890.989E-6			PASS
25	917.271E-6			PASS
26	853.063E-6			PASS
27	1.369E-3			PASS
28	939.877E-6			PASS
29	946.476E-6			PASS
30	788.356E-6			PASS
31	934.102E-6			PASS
32	1.245E-3			PASS
33	838.476E-6			PASS
34	777.518E-6			PASS
35	826.601E-6			PASS
36	823.407E-6			PASS
37	1.228E-3			PASS
38	790.460E-6			PASS
39	839.828E-6			PASS
40	786.092E-6			PASS

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	6.063			
2	69.650E-3	4.299	1.62	PASS
3	59.432E-3	1.723	3.45	PASS
4	41.065E-3	6.367	645.00E-3	PASS
5	33.015E-3			PASS
6	26.372E-3			PASS
7	22.971E-3			PASS
8	19.814E-3			PASS
9	17.541E-3			PASS
10	15.771E-3			PASS
11	14.346E-3			PASS
12	13.237E-3			PASS
13	12.276E-3			PASS
14	11.462E-3			PASS
15	10.776E-3			PASS
16	10.168E-3			PASS
17	9.355E-3			PASS
18	9.165E-3			PASS
19	8.329E-3			PASS
20	8.278E-3			PASS
21	7.828E-3			PASS
22	7.536E-3			PASS
23	7.575E-3			PASS
24	6.878E-3			PASS
25	6.688E-3			PASS
26	6.382E-3			PASS
27	6.276E-3			PASS
28	5.937E-3			PASS
29	6.174E-3			PASS
30	5.618E-3			PASS
31	5.735E-3			PASS
32	5.326E-3			PASS
33	5.238E-3			PASS
34	5.045E-3			PASS
35	5.073E-3			PASS
36	4.768E-3			PASS
37	5.266E-3			PASS
38	4.595E-3			PASS
39	4.857E-3			PASS
40	4.450E-3			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Voltage fluctuation-Flicker

DF-019C with Alternative pump EJ-01

	EUT values	Limit	Result
Pst	0.337	1.00	PASS
Plt	0.324	0.65	PASS
dc [%]	0.883	3.30	PASS
dmax [%]	0.924	4.00	PASS
dt [s]	0.000	0.50	PASS

DF-020A with Alternative pump DJMP-2

	EUT values	Limit	Result
Pst	0.438	1.00	PASS
Plt	0.427	0.65	PASS
dc [%]	1.146	3.30	PASS
dmax [%]	1.182	4.00	PASS
dt [s]	0.000	0.50	PASS

Annex IV: Photograph of equipment under test

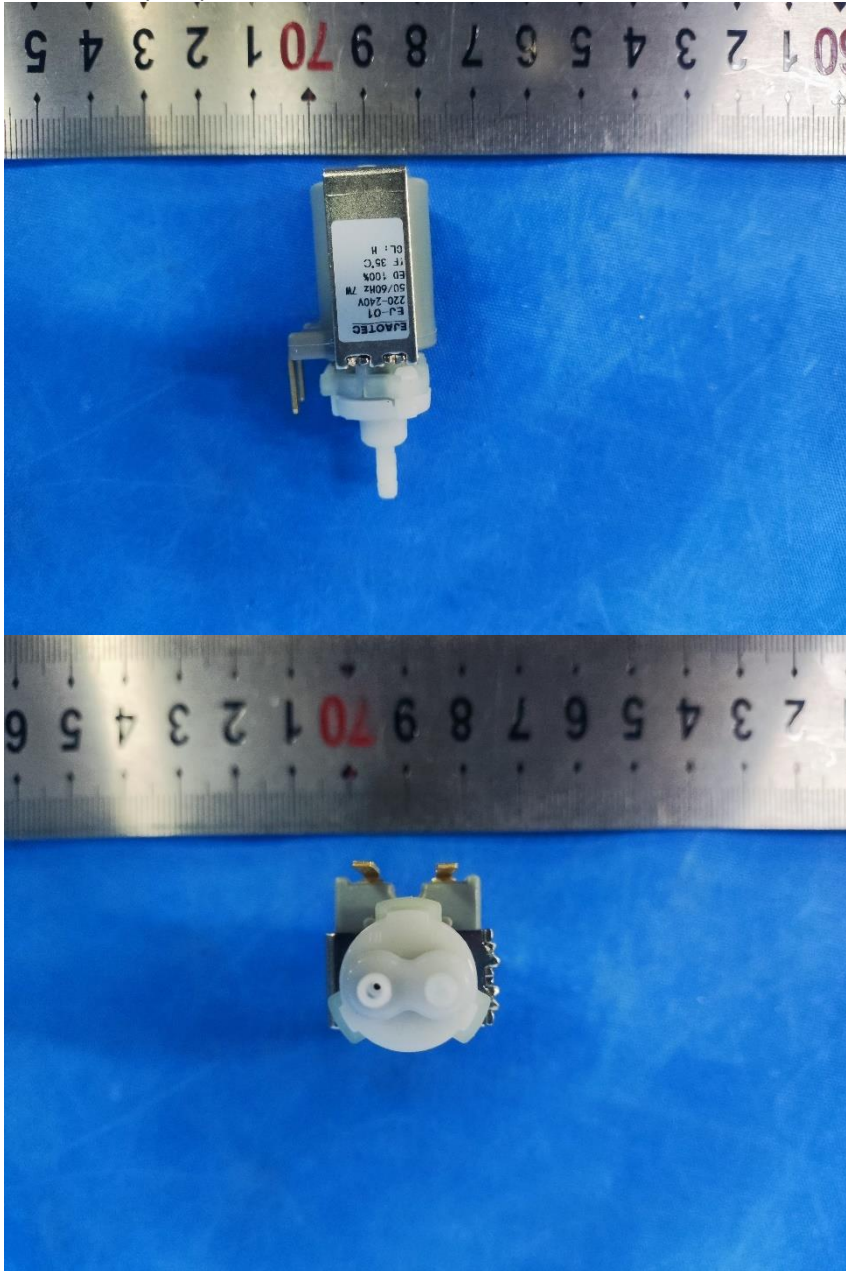
DF-020, DF-020A



Alternative pump DJMP-2 view for DF-019A, DF-019C, DF-020, DF-020A



Alternative pump EJ-01 view for DF-019A, DF-019C



END of the report