

Test report - ELP5P3G

Object of test: Three-phase electric squirrel-cage motor
Kind of test: Determination of efficiency acc. To CSA C390-10 - clause 5.1
Test report no: 271/OPK/11

Frame: 215T

Type: ELP

Serial no: AC150691

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	5	[Hp]
Number of poles:	6	
Rated voltage:	575	[V]
Rated current:	5.6	[A]
Speed:	1170	[RPM]
Frequency:	60	[Hz]
Power factor:	0.75	[-]
Nominal efficiency"η"	89.5	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.3	
NEMA design:	B	
KVA code:	J	
Insulation class:	F	
Max. amb. temperature:	40	[°C]

TESTING SCHEDULE

- 1) Winding resistance measurements (clause 7.1.2)
- 2) Heat-run test for S.F 1.0 (clause 7.1.3)
- 3) Load test (clause 7.1.4)
- 4) No-load test. (clause 7.1.7)
- 5) Determination of efficiency (clause 7.2.6)

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A.7.1.2 Temperature measurement

Cold winding temperature, $t_{det\ cold}$ (°C) 26.2
Cold stator winding resistance, R_{cold} (W). 4.29172

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 4.85200
Stator winding temperature, $t_{es\ hr}$ (°C) 60.2
Ambient temperature, $t_{amb\ hr}$ (°C) 23.3

A.7.1.4 Load test

% of full load
Torque output, T_{it} (i), (Nm)
Power input, $P_{in\ it}$ (i), (kW)
each line current, $I_{a\ it}$ (i), $I_{b\ it}$ (i), $I_{c\ it}$ (i) (A)
Rotational speed, n_t (i), (RPM)
Stator winding temperature, $t_{et\ it}$ (i), (°C)
Ambient temperature, $t_{amb\ it}$ (i), (°C)
each line-to-line voltage, $V_{a-b\ it}$ (i), $V_{b-c\ it}$ (i), $V_{c-a\ it}$ (i) (V)
Frequency, f_t (i), (Hz)

A.7.1.5 Dynamometer correction test

$T_{it\ corr} =$

140	120	101	72	48	18
42.59	36.46	30.69	22.05	14.62	5.37
5.89278	5.00738	4.19264	3.0141	2.03479	0.83799
6.946	5.977	5.129	3.981	3.144	2.425
1140.0	1150.0	1159.0	1172.0	1182.0	1194.0
65.1	64.4	63.5	62	60.9	59.2
23.2	23.2	23.2	23.2	23.2	23.2
575.49	575.76	575.43	574.64	575.64	575.26
60.02	60.03	60.01	60.02	60.02	60.03
No	Tdyno cf, (Nm)			0	
42.59	36.46	30.69	22.05	14.62	5.37

A.7.1.7 No-Load test

% of nominal voltage,
each line-to-line voltage, $V_{a-b\ nl}$ (i), $V_{b-c\ nl}$ (i), $V_{c-a\ nl}$ (i) (V)
each line current, $I_{a\ nl}$ (i), $I_{b\ nl}$ (i), $I_{c\ nl}$ (i) (A)
(c) power input, $P_{in\ nl}$ (i), (kW)
(d-1) stator winding temperature, $t_{det\ nl}$ (i), (°C)
(h) frequency, f_{nl} (i), (Hz)

105	100	95	49	35	24
603.48	574.76	545.00	283.61	200.78	140.38
2.434	2.296	2.159	1.075	0.764	0.551
0.1688	0.1572	0.1428	0.05832	0.04086	0.03116
49.9	49.5	49	48.1	47.5	46.7
60.01	60.01	60.01	60.01	60.00	60.01

A 7.2 Calculation

% of full load
Power output corrected, $P_{corr\ out\ it}$ (i), (HP)
Power output corrected, $P_{corr\ out\ it}$ (i), (kW)
Line current, $I_{avg\ it}$ (i) (A)
Slip per unit corrected, $S_{corr\ it}$ (i)
Power input, $P_{in\ it}$ (i), (kW)
Core loss, P_{core} (i), (kW)
Windage-friction loss $P_{wind-frict}$ (kW)
Stray-load losses, $P_{stray-load\ it}$ (i) (kW)
Stator winding correction, $P_{corr\ stator\ it}$ (i) (kW)
Rotor winding correction, $P_{corr\ rotor\ it}$ (i) (kW)
Power Factor, PF_{it} (i), (%)
Efficiency, Eff_{it} (%)

130	115	100	75	50	25
6.50	5.75	5.00	3.75	2.50	1.25
4.85	4.29	3.73	2.80	1.87	0.93
6.95	5.98	5.13	3.98	3.14	2.43
0.0502	0.0421	0.0344	0.0238	0.0156	0.0056
5.893	5.007	4.193	3.014	2.035	0.838
0.090	0.091	0.092	0.094	0.096	0.097
0.022	0.022	0.022	0.022	0.022	0.022
0.068	0.050	0.035	0.018	0.008	0.001
0.353	0.262	0.193	0.116	0.072	0.043
0.274	0.196	0.135	0.067	0.029	0.004
85.111	84.008	82.017	76.076	64.905	34.677
86.297	87.593	88.611	89.469	88.816	80.000
$\gamma =$					0.989

Summary: Parameters of tested motor are in compliance with requirements.

Date of testing: 14-Nov-11

Measurements made by:	D Formas	M Ptazkis	G Tialka
Test Report written by:	T Dobosz	Approved by:	A Opitek

Appendices:

1) List of measurement instruments used in tests.