

Test report - ELP30P2G

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: 304/I/11

Frame: 286T

Type: ELP

Serial no: AC151329

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	30	[Hp]
Number of poles:	4	
Rated voltage:	575	[V]
Rated current:	29.6	[A]
Speed:	1780	[RPM]
Frequency:	60	[Hz]
Power factor:	0.80	[-]
Nominal efficiency"η":	93.6	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.3	
NEMA design:	A	
KVA code:	L	
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) 22.4
Cold stator winding resistance, R_{cold} (W) 0.35330

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W) 0.41421
Stator winding temperature, $t_{es\ hr}$ (°C) 66.7
Ambient temperature, $t_{amb\ hr}$ (°C) 23.6

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_{it} (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_{it} (i), (Hz)

A.7.1.5 Dynamometer correction test

$T_{it\ corr} =$

143	121	99	77	50	20
171.20	145.20	118.60	92.64	60.05	23.61
34.2719	29.0489	23.726	18.5816	12.1895	5.2131
38.640	33.251	27.323	21.917	15.847	10.614
1760.0	1769.0	1779.0	1780.0	1788.0	1796.0
84.1	84	83.5	82.1	80.9	79.7
25.0	25.0	25.0	25.0	25.0	25.0
575.81	574.22	575.66	574.36	575.38	575.93
60.02	60.02	60.00	60.01	59.98	60.01
No	Tdyno cf, (Nm)			0	
171.20	145.20	118.60	92.64	60.05	23.61

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	50	35	25
604.58	575.00	547.13	286.73	202.22	141.23
10.282	9.265	8.449	3.780	2.654	2.026
0.7226	0.6987	0.6039	0.29231	0.23525	0.20095
58.2	57.8	57.6	56.6	55.9	55.1
60.02	60.02	60.02	60.02	60.02	60.02

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
39.00	34.50	30.00	22.50	15.00	7.50
29.10	25.75	22.39	16.79	11.19	5.60
38.64	33.25	27.32	21.92	15.85	10.61
0.0226	0.0175	0.0117	0.0113	0.0064	0.0024
34.272	29.049	23.726	18.582	12.190	5.213
0.445	0.446	0.456	0.457	0.466	0.473
0.173	0.173	0.173	0.173	0.173	0.173
0.398	0.287	0.191	0.117	0.049	0.008
0.932	0.690	0.466	0.300	0.157	0.070
0.743	0.489	0.266	0.202	0.074	0.011
88.933	87.840	87.092	85.225	77.182	49.236
92.147	92.824	93.458	93.280	92.460	85.893
$\gamma =$					0.989

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

Date of testing: 4-Nov-11

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

Appendices:

1) List of measurement instruments used in tests.