

Test report - ELP10P3G

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: 300/I/11

Frame: 256T

Type: ELP

Serial no: AC138934

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	10	[Hp]
Number of poles:	6	
Rated voltage:	575	[V]
Rated current:	10.72	[A]
Speed:	1180	[RPM]
Frequency:	60	[Hz]
Power factor:	0.77	[-]
Nominal efficiency"η"	91.0	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.3	
NEMA design:	A	
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) 22.9
Cold stator winding resistance, R_{cold} (W) 1.06000

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W) 1.15145
Stator winding temperature, $t_{es\ hr}$ (°C) 45.1
Ambient temperature, $t_{amb\ hr}$ (°C) 22

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

$T_{it\ corr} =$

142	121	100	74	51	17
85.84	72.79	60.32	44.80	31.09	10.15
11.672	9.828	8.141	6.07	4.284	1.6061
14.219	12.280	10.608	8.752	7.368	6.067
1172.1	1177.6	1181.1	1187.1	1190.8	1197.4
48.9	49.1	48.7	48.4	47.8	46.9
22.0	22.0	22.0	22.0	22.0	22.0
575.88	575.08	575.63	574.88	574.33	575.17
60.02	60.02	60.00	60.01	59.98	60.01
No	Tdyno cf, (Nm)			0	
85.84	72.79	60.32	44.80	31.09	10.15

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)

104	100	96	50	35	24
600.54	574.54	549.75	287.75	202.42	140.63
6.408	5.936	5.533	2.613	1.818	1.290
0.39773	0.35883	0.32022	0.11823	0.0822	0.058376
37.2	37.1	37	36.7	36.2	36.1
60.00	60.00	60.02	60.00	59.98	60.00

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
13.00	11.50	10.00	7.50	5.00	2.50
9.70	8.58	7.46	5.60	3.73	1.87
14.22	12.28	10.61	8.75	7.37	6.07
0.0239	0.0191	0.0159	0.0110	0.0074	0.0023
11.672	9.828	8.141	6.070	4.284	1.606
0.246	0.247	0.250	0.252	0.253	0.258
0.041	0.041	0.041	0.041	0.041	0.041
0.266	0.192	0.132	0.073	0.035	0.004
0.353	0.263	0.196	0.134	0.095	0.064
0.264	0.178	0.122	0.063	0.029	0.003
82.300	80.348	76.974	69.654	58.449	26.575
89.967	90.619	90.886	90.739	89.409	76.968
$\gamma =$					0.989

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

Date of testing: 10-Oct-11

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

Appendices:

1) List of measurement instruments used in tests.