

Test report - ELP15P1G

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: 295//11

Frame: 254T

Type: ELP

Serial no: AC058962

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	15	[Hp]
Number of poles:	2	
Rated voltage:	575	[V]
Rated current:	14.08	[A]
Speed:	3540	[RPM]
Frequency:	60	[Hz]
Power factor:	0.87	[-]
Nominal efficiency"η":	91.7	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.3	
NEMA design:	B	
KVA code:	G	
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) 24.3
Cold stator winding resistance, R_{cold} (W) 0.96000

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W) 1.10007
Stator winding temperature, $t_{es\ hr}$ (°C) 62.1
Ambient temperature, $t_{amb\ hr}$ (°C) 27

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

$T_{it\ corr} =$

133	116	101	76	50	20
40.040	35.080	30.530	22.870	15.130	6.074
16.20320	14.17650	12.34730	9.30780	6.26880	2.78358
18.5080	16.2699	14.2677	11.1515	8.2856	5.6776
3519.0	3531.0	3542.0	3559.0	3573.0	3590.0
62.10	62.25	62.55	61.05	58.15	56.10
27.0	27.0	27.0	27.0	27.0	27.0
575.500	574.746	575.950	575.125	575.117	576.008
60.024	60.019	60.000	60.010	59.981	60.007
No	Tdyno cf, (Nm)			0	
40.040	35.080	30.530	22.870	15.130	6.074

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
604.01	575.76	547.27	288.53	201.68	141.07
5.246	4.865	4.580	2.325	1.735	1.488
0.51174	0.48267	0.45932	0.29046	0.25337	0.23331
36.4	36.6	36.25	35.6	35.05	34.1
60.01	60.01	60.01	60.01	60.01	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
19.50	17.25	15.00	11.25	7.50	3.75
14.55	12.87	11.19	8.40	5.60	2.80
18.51	16.27	14.27	11.15	8.29	5.68
0.0227	0.0193	0.0159	0.0115	0.0072	0.0029
16.203	14.177	12.347	9.308	6.269	2.784
0.222	0.222	0.224	0.226	0.228	0.231
0.214	0.214	0.214	0.214	0.214	0.214
0.096	0.073	0.056	0.031	0.014	0.002
0.561	0.434	0.334	0.204	0.113	0.053
0.350	0.261	0.188	0.102	0.043	0.007
87.828	87.528	86.750	83.790	75.953	49.142
91.132	91.522	91.783	91.622	90.190	84.076
$\gamma =$					0.992

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

Date of testing: 10-Nov-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.