

Test report - ELP10P2G

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: 294/I/11

Frame: 215T

Type: ELP

Serial no: AC147671

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	10	[Hp]
Number of poles:	4	
Rated voltage:	575	[V]
Rated current:	10	[A]
Speed:	1770	[RPM]
Frequency:	60	[Hz]
Power factor:	0.82	[-]
Nominal efficiency"η":	91.7	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.3	
NEMA design:	A	
KVA code:	H	
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) 22.2
Cold stator winding resistance, R_{cold} (W). 1.42670

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 1.67653
Stator winding temperature, $t_{es\ hr}$ (°C) 67.2
Ambient temperature, $t_{amb\ hr}$ (°C) 25

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

$T_{it\ corr} =$

141	120	101	75	49	20
56.61	48.20	40.47	30.14	19.63	7.90
11.501	9.747	8.159	6.108	4.0592	1.8037
12.994	11.193	9.581	7.638	5.922	4.525
1744.0	1753.0	1762.0	1772.0	1783.0	1793.0
71.1	71.8	72.5	70	67.8	64.8
25.6	25.6	25.6	25.6	25.6	25.6
574.96	575.46	575.17	575.21	575.25	574.04
60.02	60.02	60.00	60.01	59.98	60.01
No	Tdyno cf, (Nm)				0
56.61	48.20	40.47	30.14	19.63	7.90

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	24
604.50	574.75	546.50	287.71	202.08	140.71
4.532	4.158	3.773	1.688	1.186	0.846
0.30638	0.27812	0.2513	0.07229	0.053224	0.044322
48.4	46.6	46.4	46	45.7	45.1
60.00	60.01	60.00	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
13.00	11.50	10.00	7.50	5.00	2.50
9.70	8.58	7.46	5.60	3.73	1.87
12.99	11.19	9.58	7.64	5.92	4.53
0.0315	0.0264	0.0210	0.0158	0.0092	0.0041
11.501	9.747	8.159	6.108	4.059	1.804
0.191	0.193	0.195	0.197	0.199	0.200
0.035	0.035	0.035	0.035	0.035	0.035
0.139	0.100	0.071	0.039	0.017	0.003
0.425	0.315	0.231	0.147	0.088	0.051
0.343	0.243	0.162	0.091	0.035	0.006
88.877	87.365	85.483	80.262	68.799	40.088
90.154	90.894	91.493	91.667	90.790	83.580
$\gamma =$					0.971

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

Date of testing: 14-Oct-11

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

Appendices:

1) List of measurement instruments used in tests.