

Test report - ELP1P2D

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: 330/I/10

Frame: 143T

Type: ELP

Serial no: AB135561

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 1 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 1.4 [A]
Speed: 1765 [RPM]
Frequency: 60 [Hz]
Power factor: 0.78 [-]
Nominal efficiency" η ": 85.5 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.4
NEMA design: B
KVA code: M
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) 29.1
Cold stator winding resistance, R_{cold} (W). 15.19940

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 15.56290
Stator winding temperature, $t_{res\ hr}$ (°C) 35.4
Ambient temperature, $t_{amb\ hr}$ (°C) 21.1

A.7.1.4 Load test

% of full load
Torque output, T_{lt} (i), (Nm)
Power input, $P_{in\ lt}$ (i), (kW)
each line current, I_a lt(i), I_b lt(i), I_c lt(i) (A)
Rotational speed, n_{lt} (i), (RPM)
Stator winding temperature, $t_{det\ lt}$ (i), (°C)
Ambient temperature, $t_{amb\ lt}$ (i), (°C)
each line-to-line voltage, V_a-b lt(i), V_b-c lt(i), V_c-a lt(i) (V)
Frequency, f_{lt} (i), (Hz)

144	121	99	77	51	19
5.83	4.88	4.02	3.10	2.07	0.76
1.2391	1.0396	0.8579	0.6699	0.4603	0.20689
1.837	1.598	1.394	1.203	1.017	0.880
1749.0	1757.5	1766.5	1774.5	1783.3	1793.7
38.7	40	39.8	38.3	37.5	36.5
21.8	21.8	21.8	21.8	21.8	21.8
459.93	460.77	460.23	460.57	460.17	460.33
59.99	59.99	60.03	60.02	60.01	60.01
No	T _{dyno cf} , (Nm)				0
5.83	4.88	4.02	3.10	2.07	0.76

A.7.1.5 Dynamometer correction test

$T_{lt\ corr} =$

A.7.1.7 No-Load test

% of nominal voltage,
each line-to-line voltage, V_a-b lt(i), V_b-c lt(i), V_c-a lt(i) (V)
each line current, I_a lt(i), I_b lt(i), I_c lt(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
483.07	459.97	437.33	230.50	161.20	112.07
0.915	0.851	0.798	0.380	0.267	0.224
0.078762	0.07091	0.067202	0.031893	0.02586	0.02425
32.1	31.9	31.9	31.7	30.8	30
60.01	60.01	60.03	60.01	60.03	60.00

A 7.2 Calculation

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

130	115	100	75	50	25
1.30	1.15	1.00	0.75	0.50	0.25
0.97	0.86	0.75	0.56	0.37	0.19
1.84	1.60	1.39	1.20	1.02	0.88
0.0284	0.0236	0.0192	0.0147	0.0096	0.0038
1.239	1.040	0.858	0.670	0.460	0.207
0.032	0.032	0.032	0.032	0.032	0.033
0.021	0.021	0.021	0.021	0.021	0.021
0.017	0.012	0.008	0.005	0.002	0.000
0.080	0.060	0.046	0.034	0.024	0.018
0.032	0.022	0.015	0.009	0.004	0.001
84.672	81.534	77.203	69.806	56.805	29.487
85.323	85.795	85.765	84.893	81.763	64.666
					$\gamma =$ 0.973

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

Date of testing: 14-Sep-11

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

Appendices:

1) List of measurement instruments used in tests.