

Test report - ELP10P2D

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: 141/I/11

Frame: 215T

Type: ELP

Serial no: AC066855

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 10 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 12.5 [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). 0.97577

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 1.14664
Stator winding temperature, $t_{res\ hr}$ (°C) 67.2
Ambient temperature, $t_{amb\ hr}$ (°C) 25

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)

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
16.243	13.992	11.976	9.548	7.402	5.657
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
459.97	460.37	460.13	460.17	460.20	459.23
60.00	60.00	60.02	60.01	60.02	60.01
No	T _{dyno cf} , (Nm)				0
56.61	48.20	40.47	30.14	19.63	7.90

A.7.1.5 Dynamometer correction test

Tlt 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
483.60	459.80	437.20	230.17	161.67	112.57
5.665	5.197	4.717	2.110	1.482	1.057
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, $P_{corr\ out\ lt}$ (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
13.00	11.50	10.00	7.50	5.00	2.50
9.70	8.58	7.46	5.60	3.73	1.87
16.24	13.99	11.98	9.55	7.40	5.66
0.0310	0.0261	0.0213	0.0157	0.0098	0.0042
11.501	9.747	8.159	6.108	4.059	1.804
0.188	0.190	0.192	0.194	0.196	0.198
0.035	0.035	0.035	0.035	0.035	0.035
0.119	0.087	0.061	0.034	0.014	0.002
0.454	0.337	0.247	0.157	0.094	0.055
0.337	0.240	0.164	0.090	0.037	0.006
88.877	87.365	85.483	80.262	68.799	40.088
90.145	90.879	91.436	91.648	90.714	83.554
					$\gamma =$ 0.954

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

Date of testing: 13-Jun-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.