

Test report - ELP7P1D

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: 343/I/10

Frame: 213T

Type: ELP

Serial no: AB135492

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 7.5 [Hp]
Number of poles: 2
Rated voltage: 460 [V]
Rated current: 8.5 [A]
Speed: 3525 [RPM]
Frequency: 60 [Hz]
Power factor: 0.92 [-]
Nominal efficiency" η ": 89.5 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.3
NEMA design: A
KVA code: K
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) 17.2
Cold stator winding resistance, R_{cold} (W). 1.36996

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 1.54914
Stator winding temperature, $t_{res\ hr}$ (°C) 50.1
Ambient temperature, $t_{amb\ hr}$ (°C) 18.9

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)

139	121	100	78	51	19
21.13	18.39	15.21	11.86	7.78	2.91
8.687	7.537	6.2258	4.8701	3.2531	1.3783
11.650	10.127	8.480	6.813	4.960	3.202
3498.9	3515.2	3529.0	3544.4	3564.2	3588.0
52.7	53.6	52.7	52.1	49.6	48.4
19.1	19.1	19.1	19.1	19.1	19.1
459.30	460.10	460.83	460.47	460.40	460.03
60.00	60.01	59.97	59.97	59.98	60.02
No	T _{dyno cf} , (Nm)				0
21.13	18.39	15.21	11.86	7.78	2.91

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	25
483.13	460.47	437.27	230.83	161.60	112.77
2.831	2.706	2.561	1.320	1.020	0.886
0.26944	0.25859	0.24432	0.1532	0.13889	0.12277
30.8	30.7	30.6	30.4	30	29.6
59.98	60.03	60.00	60.02	60.02	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
9.75	8.63	7.50	5.63	3.75	1.88
7.28	6.44	5.60	4.20	2.80	1.40
11.65	10.13	8.48	6.81	4.96	3.20
0.0286	0.0241	0.0196	0.0153	0.0099	0.0039
8.687	7.537	6.226	4.870	3.253	1.378
0.119	0.121	0.122	0.123	0.125	0.126
0.115	0.115	0.115	0.115	0.115	0.115
0.152	0.115	0.079	0.048	0.021	0.003
0.322	0.243	0.171	0.110	0.058	0.024
0.236	0.173	0.116	0.071	0.030	0.005
93.732	93.394	91.980	89.623	82.247	54.022
89.124	89.819	90.308	90.400	89.262	80.166
					$\gamma =$ 0.997

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

Date of testing: 21-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.