

Test report - ELP15P2D

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: 282/I/10

Frame: 254T

Type: ELP

Serial no: AB111778

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 15 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 17.3 [A]
Speed: 1775 [RPM]
Frequency: 60 [Hz]
Power factor: 0.88 [-]
Nominal efficiency" η ": 92.4 [%]
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) 24.6
Cold stator winding resistance, R_{cold} (W). 0.45296

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 0.51003
Stator winding temperature, $t_{res\ hr}$ (°C) 57.2
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)

144	117	101	77	50	19
86.86	70.42	60.68	46.33	30.04	11.47
17.433	14.158	12.201	9.333	6.186	2.6127
23.597	19.470	17.033	13.543	9.997	6.907
1764.0	1771.0	1774.0	1782.0	1788.0	1795.0
65.9	66.2	65.2	64.6	63.3	62.3
26.2	26.2	26.2	26.2	26.2	26.2
460.00	460.30	460.10	460.60	459.50	459.50
59.99	60.01	59.97	60.02	59.98	59.99
No	T _{dyno cf} , (Nm)				0
86.86	70.42	60.68	46.33	30.04	11.47

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
482.90	460.17	437.23	230.10	161.27	112.93
6.710	6.177	5.727	2.751	1.963	1.474
0.4947	0.44496	0.41513	0.19745	0.15619	0.12516
51.9	51.7	51.5	51.2	50.5	49.8
59.99	60.00	60.00	60.00	60.01	60.02

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
19.50	17.25	15.00	11.25	7.50	3.75
14.55	12.87	11.19	8.40	5.60	2.80
23.60	19.47	17.03	13.54	10.00	6.91
0.0196	0.0162	0.0139	0.0102	0.0063	0.0025
17.433	14.158	12.201	9.333	6.186	2.613
0.298	0.301	0.302	0.305	0.305	0.308
0.106	0.106	0.106	0.106	0.106	0.106
0.236	0.155	0.115	0.067	0.028	0.004
0.426	0.290	0.222	0.140	0.076	0.036
0.328	0.219	0.162	0.091	0.036	0.006
92.726	91.208	89.884	86.380	77.751	47.531
92.005	92.438	92.572	92.407	91.074	82.390
					$\gamma =$ 0.979

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

Date of testing: 8-Oct-10

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.