

Test report - ELP30P2D

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: 144/I/11

Frame: 286T

Type: ELP

Serial no: AC071741

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 30 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 37 [A]
Speed: 1780 [RPM]
Frequency: 60 [Hz]
Power factor: 0.8 [-]
Nominal efficiency" η ": 93.6 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.3
NEMA design: A
KVA code: L
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) 22.4
Cold stator winding resistance, R_{cold} (W). 0.25422

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 0.29805
Stator winding temperature, $t_{res\ hr}$ (°C) 66.7
Ambient temperature, $t_{amb\ hr}$ (°C) 23.6

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)

143	121	99	77	50	20
171.20	145.20	118.60	92.64	60.05	23.61
34.2719	29.0489	23.726	18.5816	12.1895	5.2131
48.300	41.563	34.153	27.396	19.809	13.268
1760.0	1769.0	1779.0	1780.0	1788.0	1796.0
84.1	84	83.5	82.1	80.9	79.7
25.0	25.0	25.0	25.0	25.0	25.0
460.65	459.37	460.53	459.49	460.30	460.74
59.99	60.02	60.01	60.01	60.01	60.01
No	T _{dyno cf} , (Nm)				0
171.20	145.20	118.60	92.64	60.05	23.61

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	25
483.66	460.00	437.70	229.39	161.78	112.98
12.852	11.581	10.561	4.725	3.317	2.532
0.7226	0.6987	0.6039	0.29231	0.23525	0.20095
58.2	57.8	57.6	56.6	55.9	55.1
60.02	60.02	60.02	60.02	60.02	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
39.00	34.50	30.00	22.50	15.00	7.50
29.10	25.75	22.39	16.79	11.19	5.60
48.30	41.56	34.15	27.40	19.81	13.27
0.0220	0.0175	0.0117	0.0114	0.0069	0.0024
34.272	29.049	23.726	18.582	12.190	5.213
0.435	0.436	0.447	0.449	0.459	0.467
0.173	0.173	0.173	0.173	0.173	0.173
0.312	0.225	0.150	0.091	0.038	0.006
1.048	0.776	0.524	0.337	0.176	0.079
0.722	0.486	0.267	0.202	0.080	0.011
88.933	87.840	87.092	85.225	77.182	49.236
92.151	92.783	93.420	93.256	92.400	85.882
					$\gamma =$ 0.986

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

Date of testing: 16-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.