

Test report - ELP25P2D

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: 135/I/11

Frame: 284T

Type: ELP

Serial no: AC062550

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 25 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 30.5 [A]
Speed: 1780 [RPM]
Frequency: 60 [Hz]
Power factor: 0.82 [-]
Nominal efficiency" η ": 93.6 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.2
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) 25.4
Cold stator winding resistance, R_{cold} (W) 0.28431

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W) 0.33198
Stator winding temperature, $t_{res\ hr}$ (°C) 69.0
Ambient temperature, $t_{amb\ hr}$ (°C) 25.6

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)

147	121	102	73	51	21
146.99	121.13	101.77	72.91	51.19	20.99
29.2426	24.0367	20.1963	14.5375	10.365	4.5822
41.673	34.060	29.744	22.667	18.018	12.087
1765.0	1774.0	1782.0	1784.0	1789.0	1796.0
79.1	79	78.1	76.8	75.9	74.1
25.0	25.0	25.0	25.0	25.0	25.0
460.13	459.91	459.02	460.98	459.55	460.73
59.97	60.01	60.00	60.00	60.02	60.00
No	T _{dyno cf} , (Nm)				0
146.99	121.13	101.77	72.91	51.19	20.99

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
483.37	459.46	437.28	230.34	161.98	112.79
11.253	10.179	9.215	4.062	2.736	2.148
0.7304	0.7093	0.6294	0.29938	0.22415	0.1994
63.1	62.6	62.2	61.7	61	60.6
60.03	60.01	60.01	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
32.50	28.75	25.00	18.75	12.50	6.25
24.25	21.46	18.66	13.99	9.33	4.66
41.67	34.06	29.74	22.67	18.02	12.09
0.0190	0.0146	0.0101	0.0089	0.0066	0.0023
29.243	24.037	20.196	14.538	10.365	4.582
0.470	0.475	0.476	0.488	0.488	0.496
0.163	0.163	0.163	0.163	0.163	0.163
0.161	0.110	0.077	0.040	0.020	0.003
0.863	0.577	0.440	0.255	0.161	0.073
0.530	0.336	0.194	0.123	0.064	0.009
88.047	88.592	85.405	80.326	72.272	47.505
92.519	93.091	93.311	92.643	91.356	83.760
					$\gamma =$ 0.962

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

Date of testing: 9-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.