

Test report - ELP3P2D

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: 313/I/10

Frame: 182T

Type: ELP

Serial no: AB116062

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 3 [Hp]
Number of poles: 4
Rated voltage: 460 [V]
Rated current: 4.2 [A]
Speed: 1775 [RPM]
Frequency: 60 [Hz]
Power factor: 0.75 [-]
Nominal efficiency" η ": 89.5 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.3
NEMA design: A
KVA code: M
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)

Test report - ELP3P2D

Frame: 182T

Type: ELP

Serial no: AB116062

A.7.1.2 Temperature measurement

Cold winding temperature, $t_{det\ cold}$ (°C) 19
Cold stator winding resistance, R_{cold} (W). 2.72903

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 3.00042
Stator winding temperature, $t_{res\ hr}$ (°C) 44.2
Ambient temperature, $t_{amb\ hr}$ (°C) 19.8

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)

142	119	99	75	50	19
17.13	14.37	11.97	9.04	5.99	2.30
3.5519	2.9922	2.5045	1.914	1.3099	0.6059
5.415	4.728	4.179	3.550	3.018	2.597
1763.0	1769.0	1774.0	1782.0	1789.0	1794.0
47	46.8	46.7	46	45.4	44.3
20.0	20.0	20.0	20.0	20.0	20.0
459.67	460.63	459.80	459.63	460.27	460.00
60.01	60.00	60.00	60.01	60.03	59.98
Yes	T _{dyno cf} (Nm)				0.08618838
17.22	14.46	12.06	9.13	6.07	2.39

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
484.60	459.67	437.23	229.60	161.00	112.33
2.761	2.487	2.298	0.989	0.673	0.497
0.1749	0.15744	0.14081	0.05559	0.03915	0.03623
34.7	35	35	34.7	33.7	33.1
60.03	60.01	59.99	60.00	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, $Eff\ lt$ (i), (%)

130	115	100	75	50	25
3.90	3.45	3.00	2.25	1.50	0.75
2.91	2.57	2.24	1.68	1.12	0.56
5.41	4.73	4.18	3.55	3.02	2.60
0.0211	0.0174	0.0147	0.0103	0.0067	0.0030
3.552	2.992	2.505	1.914	1.310	0.606
0.096	0.097	0.098	0.099	0.100	0.101
0.028	0.028	0.028	0.028	0.028	0.028
0.059	0.042	0.029	0.017	0.007	0.001
0.134	0.102	0.080	0.058	0.042	0.031
0.070	0.049	0.034	0.018	0.008	0.001
82.392	79.328	75.252	67.724	54.450	29.283
89.089	89.354	89.245	88.523	85.831	73.060
$\gamma =$					0.980

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

Date of testing: 2-Sep-11

Measurements made by:	D Formas	M Ptazkisz	G Tlałka
Test Report written by:	T Dobosz	Approved by:	A Opitek

Appendices:

1) List of measurement instruments used in tests.