

Test report - ELP2P1D

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: 16/I/10

Frame: 143T

Type: ELP

Serial no: 09/P/021

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 2 [Hp]
Number of poles: 2
Rated voltage: 460 [V]
Rated current: 2.7 [A]
Speed: 3525 [RPM]
Frequency: 60 [Hz]
Power factor: 0.82 [-]
Nominal efficiency" η ": 85.5 [%]
Number of phases: 3
Time rating: S1
Service factor: 1.4
NEMA design: B
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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Frame: 145T

Type: ELP

Serial no: 09/P/021

A.7.1.2 Temperature measurement

Cold winding temperature, $t_{det\ cold}$ (°C) 19.3
Cold stator winding resistance, R_{cold} (W). 7.07510

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 7.87080
Stator winding temperature, $t_{res\ hr}$ (°C) 47.8
Ambient temperature, $t_{amb\ hr}$ (°C) 21.3

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)

140	119	101	70	49	15
5.65	4.81	4.08	2.85	1.99	0.60
2.4284	2.0697	1.7548	1.2429	0.8927	0.3615
3.471	3.049	2.707	2.096	1.829	1.436
3503.1	3518.2	3533.0	3553.2	3567.1	3590.4
48.7	49.3	49.2	48.1	45.7	44.1
21.2	21.2	21.2	21.2	21.2	21.2
459.70	460.33	459.87	460.17	460.53	459.77
60.00	60.00	60.00	60.00	60.00	60.00
No	T _{dyno cf} (Nm)				0
5.65	4.81	4.08	2.85	1.99	0.60

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)

104	100	96	50	35	24
480.40	459.83	440.90	230.63	161.03	112.17
1.610	1.484	1.332	0.594	0.427	0.374
0.1319	0.1229	0.1139	0.063992	0.05412	0.05035
29.7	29.8	29.9	29.7	29.1	28.8
60.02	60.00	60.01	60.01	60.00	59.99

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
2.60	2.30	2.00	1.50	1.00	0.50
1.94	1.72	1.49	1.12	0.75	0.37
3.47	3.05	2.71	2.10	1.83	1.44
0.0272	0.0229	0.0188	0.0131	0.0093	0.0028
2.428	2.070	1.755	1.243	0.893	0.362
0.049	0.050	0.050	0.051	0.052	0.053
0.045	0.045	0.045	0.045	0.045	0.045
0.054	0.039	0.028	0.014	0.007	0.001
0.144	0.111	0.088	0.053	0.040	0.025
0.061	0.044	0.030	0.015	0.007	0.001
87.860	85.146	81.395	74.411	61.184	31.610
85.482	86.064	86.257	85.726	83.070	65.718
$\gamma =$					0.974

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

Date of testing: 10-Nov-11

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

Appendices:

1) List of measurement instruments used in tests.