

Test report - ELP5P3D

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: 149/I/11

Frame: 215T

Type: ELP

Serial no: AC061550

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 5 [Hp]
Number of poles: 6
Rated voltage: 460 [V]
Rated current: 7 [A]
Speed: 1170 [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: B
KVA code: J
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) 24.1
Cold stator winding resistance, R_{cold} (W). 2.72891

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 3.09105
Stator winding temperature, $t_{res\ hr}$ (°C) 58.4
Ambient temperature, $t_{amb\ hr}$ (°C) 27.9

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	119	100	73	52	19
43.65	36.32	30.54	22.24	15.82	5.78
6.0428	4.9873	4.1741	3.0406	2.183	0.8844
8.750	7.311	6.268	4.897	4.017	3.010
1139.0	1152.0	1161.0	1172.0	1181.0	1193.0
63.5	64.4	62.2	60.7	59.4	58
27.8	27.8	27.8	27.8	27.8	27.8
459.93	460.50	459.70	460.33	460.50	460.17
60.00	60.01	60.02	60.01	60.01	60.01
No	Tdyno cf, (Nm)				0
43.65	36.32	30.54	22.24	15.82	5.78

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	24
483.77	459.97	437.37	230.27	161.23	112.13
3.027	2.854	2.688	1.364	0.950	0.675
0.16052	0.14325	0.13065	0.0474	0.030675	0.021339
44.3	43.4	43	42.7	42.1	41.8
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, $Eff\ lt$ (i), (%)

130	115	100	75	50	25
6.50	5.75	5.00	3.75	2.50	1.25
4.85	4.29	3.73	2.80	1.87	0.93
8.75	7.31	6.27	4.90	4.02	3.01
0.0501	0.0395	0.0324	0.0233	0.0160	0.0060
6.043	4.987	4.174	3.041	2.183	0.884
0.086	0.088	0.088	0.090	0.091	0.093
0.014	0.014	0.014	0.014	0.014	0.014
0.088	0.061	0.043	0.023	0.012	0.002
0.351	0.245	0.180	0.110	0.074	0.042
0.281	0.184	0.127	0.066	0.032	0.005
86.694	85.530	83.637	77.880	68.139	36.868
86.431	88.147	89.171	90.047	89.795	82.574
$\gamma =$					0.999

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

Date of testing: 13-Jun-11

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

Appendices:

1) List of measurement instruments used in tests.