

Test report - ELP32P3G

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: 289/I/11

Frame: 182T

Type: ELP

Serial no: AC148787

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	1.5	[Hp]
Number of poles:	6	
Rated voltage:	575	[V]
Rated current:	1.92	[A]
Speed:	1170	[RPM]
Frequency:	60	[Hz]
Power factor:	0.68	[-]
Nominal efficiency"η":	87.5	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.4	
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) 35.5
Cold stator winding resistance, R_{cold} (W). 11.28000

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 12.02140
Stator winding temperature, $t_{es\ hr}$ (°C) 53.2
Ambient temperature, $t_{amb\ hr}$ (°C) 35

A.7.1.4 Load test

% of full load
Torque output, T_{it} (i), (Nm)
Power input, $P_{in\ it}$ (i), (kW)
each line current, $I_{a\ it}$ (i), $I_{b\ it}$ (i), $I_{c\ it}$ (i) (A)
Rotational speed, n_t (i), (RPM)
Stator winding temperature, $t_{et\ it}$ (i), (°C)
Ambient temperature, $t_{amb\ it}$ (i), (°C)
each line-to-line voltage, $V_{a-b\ it}$ (i), $V_{b-c\ it}$ (i), $V_{c-a\ it}$ (i) (V)
Frequency, f_t (i), (Hz)

A.7.1.5 Dynamometer correction test

$T_{it\ corr} =$

143	125	101	75	47	18
13.07	11.38	9.18	6.90	4.29	1.66
1.8363	1.5936	1.2919	0.9817	0.6317	0.294
2.452	2.143	1.902	1.656	1.414	1.274
1157.1	1163.3	1172.1	1179.0	1187.3	1195.4
53.4	53.6	53.6	53.4	53.1	52.5
35.0	35.0	35.0	35.0	35.0	35.0
575.50	575.76	575.61	575.65	574.11	574.71
60.02	60.02	60.00	60.01	59.98	60.01
No	Tdyno cf, (Nm)				0
13.07	11.38	9.18	6.90	4.29	1.66

A.7.1.7 No-Load test

% of nominal voltage,
each line-to-line voltage, $V_{a-b\ nl}$ (i), $V_{b-c\ nl}$ (i), $V_{c-a\ nl}$ (i) (V)
each line current, $I_{a\ nl}$ (i), $I_{b\ nl}$ (i), $I_{c\ nl}$ (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
604.34	575.40	546.50	287.06	199.49	140.14
1.358	1.250	1.154	0.529	0.361	0.259
0.09447	0.08471	0.07662	0.027148	0.017533	0.01266
48	48	47.9	47.7	47.5	47.2
60.01	59.99	60.00	60.00	60.01	60.00

A 7.2 Calculation

% of full load
Power output corrected, $P_{corr\ out\ it}$ (i), (HP)
Power output corrected, $P_{corr\ out\ it}$ (i), (kW)
Line current, $I_{avg\ it}$ (i) (A)
Slip per unit corrected, $S_{corr\ it}$ (i)
Power input, $P_{in\ it}$ (i), (kW)
Core loss, P_{core} (i), (kW)
Windage-friction loss $P_{wind-frict}$ (kW)
Stray-load losses, $P_{stray-load\ it}$ (i) (kW)
Stator winding correction, $P_{corr\ stator\ it}$ (i) (kW)
Rotor winding correction, $P_{corr\ rotor\ it}$ (i) (kW)
Power Factor, PF_{it} (i), (%)
Efficiency, Eff_{it} (i), (%)

130	115	100	75	50	25
1.95	1.73	1.50	1.13	0.75	0.38
1.46	1.29	1.12	0.84	0.56	0.28
2.45	2.14	1.90	1.66	1.41	1.27
0.0347	0.0297	0.0223	0.0170	0.0099	0.0038
1.836	1.594	1.292	0.982	0.632	0.294
0.046	0.046	0.047	0.047	0.048	0.048
0.008	0.008	0.008	0.008	0.008	0.008
0.031	0.024	0.015	0.009	0.003	0.001
0.105	0.080	0.063	0.048	0.035	0.028
0.059	0.044	0.026	0.015	0.005	0.001
75.131	74.580	68.114	59.441	44.922	23.179
86.461	87.342	87.627	87.060	84.259	70.734
$\gamma =$					0.992

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

Date of testing: 10-Nov-11

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

Appendices:

1) List of measurement instruments used in tests.