

Test report - ELP32P1G

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: 273/OPK/11

Frame: 143T

Type: ELP

Serial no: AC150361

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	1.5	[Hp]
Number of poles:	2	
Rated voltage:	575	[V]
Rated current:	1.7	[A]
Speed:	3540	[RPM]
Frequency:	60	[Hz]
Power factor:	0.78	[-]
Nominal efficiency"η":	84.0	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.4	
NEMA design:	B	
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)

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A.7.1.2 Temperature measurement

Cold winding temperature, $t_{det\ cold}$ (°C) 26.3
Cold stator winding resistance, R_{cold} (W). 14.79930

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 16.24290
Stator winding temperature, $t_{es\ hr}$ (°C) 51.7
Ambient temperature, $t_{amb\ hr}$ (°C) 22.9

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

$T_{it\ corr} =$

138	116	100	74	52	19
4.18	3.51	3.02	2.23	1.57	0.58
1.7948	1.5057	1.2957	0.9768	0.709	0.31456
2.106	1.851	1.670	1.411	1.194	1.001
3515.0	3530.0	3541.0	3557.0	3570.0	3588.0
48.8	50.6	49	48	47.5	46.3
23.0	23.0	23.0	23.0	23.0	23.0
575.47	575.73	575.17	575.80	574.67	574.93
60.00	60.00	60.00	60.01	60.01	60.01
No	Tdyno cf, (Nm)				0
4.18	3.51	3.02	2.23	1.57	0.58

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
604.47	574.97	546.63	284.83	200.37	140.03
1.084	0.995	0.897	0.401	0.297	0.271
0.1223	0.1133	0.1049	0.05726	0.04953	0.04894
37.3	37.1	37.1	36.6	35.2	35
60.02	60.01	60.01	60.01	60.02	60.02

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
2.11	1.85	1.67	1.41	1.19	1.00
0.0238	0.0195	0.0166	0.0122	0.0086	0.0036
1.795	1.506	1.296	0.977	0.709	0.315
0.042	0.043	0.043	0.044	0.044	0.045
0.044	0.044	0.044	0.044	0.044	0.044
0.038	0.027	0.020	0.011	0.005	0.001
0.109	0.084	0.068	0.049	0.035	0.025
0.039	0.027	0.020	0.011	0.005	0.001
85.498	81.571	77.860	69.419	59.663	31.545
84.817	85.065	84.913	83.741	81.027	63.168
$\gamma =$					0.984

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

Date of testing: 10-Nov-11

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

Appendices:

1) List of measurement instruments used in tests.