

Test report - ELP32P1D

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: 152/I/11

Frame: 143T

Type: ELP

Serial no: 09/P/015

MOTOR DESCRIPTION:

Manufacturer: US Motors / FME Indukta S.A.
Rated power: 1.5 [Hp]
Number of poles: 2
Rated voltage: 460 [V]
Rated current: 2.1 [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) 17
Cold stator winding resistance, R_{cold} (W). 9.86070

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr} (W). 10.71000
Stator winding temperature, $t_{res\ hr}$ (°C) 38.7
Ambient temperature, $t_{amb\ hr}$ (°C) 22.8

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)

140	119	95	73	47	18
4.24	3.58	2.87	2.19	1.41	0.53
1.8763	1.5899	1.2885	0.9886	0.6788	0.3388
2.743	2.398	2.094	1.789	1.574	1.385
3512.0	3526.0	3543.0	3559.0	3570.0	3588.0
50.5	51.3	51.5	50.7	48.1	47.1
22.2	22.2	22.2	22.2	22.2	22.2
460.07	460.22	459.99	460.18	460.08	460.43
60.00	60.00	60.01	60.01	60.01	60.01
No	Tdyno cf, (Nm)				0
4.24	3.58	2.87	2.19	1.41	0.53

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
483.09	459.81	437.60	229.77	161.24	112.21
1.461	1.291	1.234	0.520	0.393	0.364
0.1332	0.1209	0.1147	0.066686	0.05792	0.05401
35.6	35.9	35.9	35.3	34.3	33.3
60.00	60.00	60.01	60.00	60.01	60.00

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
1.95	1.73	1.50	1.13	0.75	0.38
1.46	1.29	1.12	0.84	0.56	0.28
2.74	2.40	2.09	1.79	1.57	1.39
0.0247	0.0207	0.0161	0.0116	0.0085	0.0035
1.876	1.590	1.289	0.989	0.679	0.339
0.043	0.043	0.044	0.044	0.045	0.046
0.049	0.049	0.049	0.049	0.049	0.049
0.057	0.040	0.026	0.015	0.006	0.001
0.122	0.093	0.071	0.052	0.040	0.031
0.042	0.030	0.019	0.010	0.005	0.001
85.840	83.175	77.232	69.340	54.132	30.672
83.373	83.937	83.841	82.771	78.623	62.410
$\gamma =$					0.972

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

Date of testing: 15-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.