Test report - ELP5P2G

Object of test: Three-phase electric squirell-cage motor
Kind of test: Determination of efficiency acc. To CSA C390-10 - clause 5.1
Test report no: 291/I/11

Frame: 184T **Type:** ELP **Serial no:** AC139051

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	5	[Hp]
Number of poles:	4	
Rated voitage:	575	[V]
Rated current:	5.36	[A]
Speed:	1770	[RPM]
Frequency:	60	[Hz]
Power factor:	0.78	[-]
Nominal efficiency"f":	89.5	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.4	
NEMA design:	A	
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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A.7.1.2 Temperature measurement

Cold winding temperature, tdet cold (°C)	18.2
Cold stator winding resistance, R_{cold} (W).	3.24000

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr}, (W).	3.72730
Stator winding temperature, $t_{res\ hr}$, (°C)	56.2
Ambient temperature, tamb hr, °C)	21.5

A.7.1.4 Load test

% of full load	144	119	100	74	50	18
Torque output, T_{lt} (i), (Nm)	29.04	23.93	20.23	14.88	10.09	3.58
Power input, $P_{in\ lt}$ (i), (kW)	6.0433	4.9532	4.1866	3.107	2.1666	0.9163
each line current, $I_{a\ lt}$(i), $I_{b\ lt}$(i), $I_{c\ lt}$(i) (A)	7.267	6.179	5.448	4.493	3.811	3.191
Rotational speed, n_{lt} (i), (RPM)	1750.8	1760.2	1767.0	1775.1	1783.8	1794.5
Stator winding temperature, $t_{det\ lt}$ (i), (°C)	60.1	61.1	61.2	59.4	58.2	56.3
Ambient temperature, tamb lt (i), (°C)	22.5	22.5	22.5	22.5	22.5	22.5
each line-to-line voltage, $V_{a\text{-}b\ lt}$(i), $V_{b\text{-}c\ lt}$(i), $V_{c\text{-}a\ lt}$(i) (V)	575.17	574.58	574.46	574.08	574.83	575.46
Frequency, f_{lt} (i), (Hz)	60.02	60.02	60.00	60.01	59.98	60.01

A.7.1.5 Dynamometer correction test

	Yes			Tdyno cf, (Nm)	0.065684211	
$T_{lt\ corr}$ =	29.11	24.00	20.30	14.95	10.16	3.65

A.7.1.7 No-Load test

% of nominal voltage,	105	100	95	50	35	24
each line-to-line voltage, $V_{a\text{-}b\ lt}$(i), $V_{b\text{-}c\ lt}$(i), $V_{c\text{-}a\ lt}$(i) (V)	603.92	575.33	546.96	286.38	201.79	140.42
each line current, $I_{a\ lt}$(i), $I_{b\ lt}$(i), $I_{c\ lt}$(i) (A)	3.579	3.102	2.730	1.043	0.710	0.493
(c) power input, $P_{in\ nl}$ (i), (kW)	0.25986	0.21773	0.18764	0.06598	0.04419	0.033154
(d-1) stator winding temperature, $t_{det\ nl}$ (i), (°C)	40.6	41	40.3	39.4	38.9	38.2
(h) frequency, f_{nl} (i), (Hz)	60.02	59.98	60.01	60.00	59.97	60.00

A 7.2 Calculation

% of full load	130	115	100	75	50	25
Power output corrected, Pcorr out lt(I), (HP)	6.50	5.75	5.00	3.75	2.50	1.25
Power output corrected, Pcorr out lt(I), (kW)	4.85	4.29	3.73	2.80	1.87	0.93
Line current, $I_{avg\ lt}$(i) (A)	7.27	6.18	5.45	4.49	3.81	3.19
Slip per unit corrected, $S_{corr\ lt}$(i)	0.0279	0.0225	0.0184	0.0141	0.0088	0.0032
Power input, $P_{in\ lt}$ (i), (kW)	6.043	4.953	4.187	3.107	2.167	0.916
Core loss, P_{core}(i), (kW)	0.131	0.132	0.134	0.136	0.139	0.142
Windage-friction loss $P_{wind\text{-}frict}$, (kW)	0.023	0.023	0.023	0.023	0.023	0.023
Stray-load losses, $P_{stray\text{-}load\ lt}$(i) (kW)	0.095	0.065	0.046	0.025	0.012	0.001
Stator winding correction, $P_{corr\ stator\ lt}$(i) (kW)	0.299	0.216	0.168	0.114	0.082	0.058
Rotor winding correction, $P_{corr\ rotor\ lt}$(i) (kW)	0.157	0.104	0.071	0.040	0.017	0.002
Power Factor, PF_{lt}(i), (%)	83.480	80.552	77.233	69.540	57.105	28.813
Efficiency, Eff_{lt}, (%)	88.346	89.104	89.429	89.100	87.425	75.298
					γ =	0.979

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

Date of testing: 10-Nov-11

Measurements made dy:	D Formas	M Ptaszkis	G Tlałka
Test Report written by:	T Dobosz	**Approved by:**	A Opitek

Appendices:

1) List of measurement instruments used in tests.