Test report - ELP5P1G

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: 290/I/11

Frame: 184T **Type:** ELP **Serial no:** AC141482

MOTOR DESCRIPTION:

Manufacturer:	US Motors / FME Indukta	
Rated power:	5	[Hp]
Number of poles:	2	
Rated voitage:	575	[V]
Rated current:	4.96	[A]
Speed:	3535	[RPM]
Frequency:	60	[Hz]
Power factor:	0.85	[-]
Nominal efficiency"f":	88.5	[%]
Number of phases:	3	
Time rating:	S1	
Service factor:	1.4	
NEMA design:	A	
KVA code:	N	
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)

USMOTORS
e|LINE Premium

NEMA Premium

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A.7.1.2 Temperature measurement

Cold winding temperature, tdet cold (°C)	24
Cold stator winding resistance, R_{cold} (W).	2.64000

A.7.1.3 Heat-run test

Stator winding resistance, R_{hr}, (W).	2.97622
Stator winding temperature, $t_{res\ hr}$, (°C)	56.9
Ambient temperature, tamb hr, °C)	26

A.7.1.4 Load test

% of full load	140	121	102	79	50	18
Torque output, T_{lt} (i), (Nm)	14.10	12.24	10.32	7.99	5.04	1.85
Power input, $P_{in\ lt}$ (i), (kW)	5.8372	5.0529	4.2538	3.3008	2.1372	0.9038
each line current, $I_{a\ lt}$(i), $I_{b\ lt}$(i), $I_{c\ lt}$(i) (A)	6.595	5.803	5.032	4.120	3.204	2.458
Rotational speed, n_{lt} (i), (RPM)	3495.0	3511.0	3526.0	3545.0	3566.0	3587.0
Stator winding temperature, $t_{det\ lt}$ (i), (°C)	59.4	58.8	58.6	58.3	57.3	55
Ambient temperature, tamb lt (i), (°C)	26.7	26.7	26.7	26.7	26.7	26.7
each line-to-line voltage, $V_{a\text{-}b\ lt}$(i), $V_{b\text{-}c\ lt}$(i), $V_{c\text{-}a\ lt}$(i) (V)	574.42	575.75	574.42	575.46	575.79	575.29
Frequency, f_{lt} (i), (Hz)	60.02	60.02	60.00	60.01	59.98	60.01

A.7.1.5 Dynamometer correction test

	No			Tdyno cf, (Nm)	0	
$T_{lt\ corr}$ =	14.10	12.24	10.32	7.99	5.04	1.85

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)	604.83	575.79	547.21	287.38	202.17	140.29
each line current, $I_{a\ lt}$(i), $I_{b\ lt}$(i), $I_{c\ lt}$(i) (A)	2.526	2.266	2.112	0.986	0.715	0.544
(c) power input, $P_{in\ nl}$ (i), (kW)	0.23294	0.21756	0.1952	0.09833	0.078651	0.06689
(d-1) stator winding temperature, $t_{det\ nl}$ (i), (°C)	40	39.6	39.5	38.8	38.4	37.8
(h) frequency, f_{nl} (i), (Hz)	60.01	60.00	60.01	60.01	60.01	60.01

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)	6.59	5.80	5.03	4.12	3.20	2.46
Slip per unit corrected, $S_{corr\ lt}$(i)	0.0295	0.0250	0.0206	0.0155	0.0092	0.0038
Power input, $P_{in\ lt}$ (i), (kW)	5.837	5.053	4.254	3.301	2.137	0.904
Core loss, P_{core}(i), (kW)	0.128	0.131	0.131	0.133	0.136	0.137
Windage-friction loss $P_{wind\text{-}frict}$, (kW)	0.057	0.057	0.057	0.057	0.057	0.057
Stray-load losses, $P_{stray\text{-}load\ lt}$(i) (kW)	0.155	0.117	0.083	0.050	0.020	0.003
Stator winding correction, $P_{corr\ stator\ lt}$(i) (kW)	0.193	0.150	0.113	0.076	0.046	0.027
Rotor winding correction, $P_{corr\ rotor\ lt}$(i) (kW)	0.163	0.120	0.083	0.048	0.018	0.003
Power Factor, PF_{lt}(i), (%)	88.966	87.321	84.967	80.380	66.890	36.907
Efficiency, Eff_{lt}, (%)	88.059	88.636	89.028	88.973	87.070	74.900
					γ =	0.998

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.