KUOSHUAY INDUSTRIAL Co., LTD.

Input-Output Test of Induction Machine With Segregation of Losses

Type KHE001 Design B Frame D90L Output 2.238 kW Phase 3

Frequency 60 Hz Voltage 230 V Synchronous r/min 3600 rpm Serial No 1010130001

Degrees C Temperature Rise 33.3 Time Rating S1 Model No

Date of Test 1-Feb-12

Cold Stator Winding Resistance Between Terminals (1) 0.9034 Ohms @ (2) 16.9 ℃

Hot Stator Winding Resistance Between Terminals (3) 1.0284 Ohms @ (4) 51.9 ℃

in (5) 18.6 ℃ Ambient

Item	Description (Motoring) (Generating)	1	2	3	4	5	6
6	Ambient Temperature θa, ℃	18.6	18.7	18.6	18.7	18.6	18.6
7	Stator Winding Temperature θ_N, ℃	49.7	50.9	51.6	52.1	51.9	50.5
8	Frequency f, Hz	60.00	60.00	60.00	60.00	60.00	60.00
9	Synchronous Speed n_s, min^{-1}	3600.0	3599.9	3600.0	3600.0	3599.9	3600.1
10	Slip Speed s^{-1}, min^{-1}	13.0	25.9	40.0	54.0	68.9	84.1
11	Speed n, min^{-1}	3587	3574	3560	3546	3531	3516
12	Line-to-Line Voltage U_n, V	230.33	230.26	230.21	230.15	230.09	230.04
13	Line Current I, A *	3.387	4.454	5.800	7.278	8.895	10.340
14	Input Power P_1, W	744.1	1335.8	1946.5	2563.6	3209.4	3772.2
15	Core Losses P_{FE}, W	116.88	116.88	116.88	116.88	116.88	116.88
16	Stator Winding Losses $(I^2R)s$, W	17.56	30.50	51.83	81.77	122.04	164.11
17	Power Across Air Gap, W	609.7	1188.4	1777.8	2365.0	2970.5	3491.2
18	Rotor Winding Losses $(I^2R)r$, W	2.20	8.56	19.75	35.47	56.89	81.52
19	Windage and Friction Losses P_f, W	26.13	26.13	26.13	26.13	26.13	26.13
20	Total Conventional Losses, W	162.77	182.07	214.59	260.25	321.94	388.64
21	Torque T_d, N · m	1.506	3.003	4.488	6.014	7.580	9.020
22	Dynamometer Correction, N · m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	Corrected Torque T, N · m	1.506	3.003	4.488	6.014	7.580	9.020
24	Output Power P_2, W	565.5	1123.8	1673.3	2233.4	2802.8	3321.1
25	Apparent Total Losses, W	178.56	212.00	273.24	330.22	406.64	451.05
26	Additional-Load Losses P_{LL}, W	15.782	29.930	58.642	69.964	84.695	62.415
	Intercept: 21.3215 *Slope*: 1.2187	*Correlation Factor*: 0.9521			*Point Deleted*: 6		
27	Stator Winding Losses $(I^2R)ss$, W	18.09	31.29	53.05	83.54	124.78	168.61
28	Corrected Power Across Air Gap, W	609.1	1187.6	1776.6	2363.2	2967.7	3486.7
29	Corrected Slip, min^{-1}	13.1	26.0	40.0	54.0	68.9	84.5
30	Corrected Speed, min^{-1} *	3586.9	3573.9	3560.0	3546.0	3531.0	3515.6
31	Rotor Winding Losses $(I^2R)rs$, W, at (t_s)℃	2.22	8.59	19.76	35.42	56.84	81.82
32	Corrected Additional-Load Losses, W	17.30	31.06	45.26	59.61	74.62	87.71
33	Corrected Total Losses, W	180.62	213.95	261.08	321.59	399.25	481.15
34	Output Power P_{2N}, W	563.5	1121.9	1685.4	2242.0	2810.2	3291.1
35	Outputt Power P_{2N}, kW	0.563	1.122	1.685	2.242	2.810	3.291
35.1	Output Power P_{2N}, % *	25.2	50.1	75.3	100.2	125.6	147.1
36	Efficiency η, % *	75.73	83.98	86.59	87.46	87.56	87.24
37	Power Factor $cos\varphi$, % *	55.07	75.19	84.17	88.36	90.53	91.56

Summary of Characteristics

Load, in % of rated	25%	50%	75%	100%	125%	150%
Power Factor $cos\varphi$, %	54.92	75.15	84.12	88.34	90.51	91.70
Efficiency η, %	75.67	83.97	86.58	87.45	87.57	87.20
Speed n, min^{-1}	3587	3574	3560	3546	3531	3513
Line Current I, A	3.38	4.45	5.78	7.27	8.86	10.54

※Tested by IEC 60034-2-1 Method 2 (2007)

Approved by: 國帥工業 Checked by: 國帥工業 Tested by: 國帥工業