



ROYCECROSSGROUP



ROYCE CROSS GROUP

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

NAMEPLATE DATA			
HM2-160L-6 FRAME	IEC TYPE	11 kW	971 r/min
6 POLE	3 PHASE	415 VOLTS	50 Hz
ROYCE CROSS GROUP MANUFACTURER	20.9 AMPS	IP55 IP	
	S1 DUTY	F INS.CLASS	CONNECTION

MAJOR CONTENTS	UNIT	TEST VALUE
STATOR RESISTANCE OF PHASE	OHM	1.15595
NO LOAD CURRENT	AMP	9.35
NO LOAD INPUT	W	511.8
CORE LOSS(Pfe)	W	388.7
WINDAGE FRICTION LOSS(Pfw)	W	29.0
STATOR WINDING LOSS(Pcu1)	W	508.5
ROTOR WINDING LOSS(Pcu2)	W	304.2
STRAY LOAD LOSS(Ps)	W	61.7
FULL LOAD CURRENT	AMP	20.99
LOCKED ROTOR CURRENT	AMP	115.60
LOCKED ROTOR CURRENT/FULL LOAD CURRENT	P.U.	5.53
FULL LOAD TORQUE	N.m	107.92
LOCKED ROTOR TORQUE	N.m	219.45
LOCKED ROTOR TORQUE/FULL LOAD TORQUE	P.U.	2.03
PULL OUT TORQUE	N.m	263.97
PULL OUT TORQUE/FULL LOAD TORQUE	P.U.	2.44
INPUT @ FULL LOAD	kW	12.29
EFFICIENCY @ FULL LOAD	%	89.49
POWER FACTOR @ FULL LOAD		0.81
FULL LOAD SLIP	%	2.670
FULL LOAD SPEED	r/min	973.3
STATOR WINDING TEMPERATURE RISE	K	67
D.E. BEARINGS TEMPERATURE BY PT100	Deg. C	53.8
AMBIENT TEMPERATURE OF TESTING	Deg. C	9.9
NOISE	dB(A)	69
VIBRATION	mm/s	0.8

The data above is calculated as per IEC 34-2, all data at nominal Volts.

	ROYCE CROSS GROUP	SERIAL NO.	0		
					0

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Type	HM2-160L-6		Poles	6		Power	11.0 kW
Voltage	415	V	Current	20.9	A	Frequency	50 Hz
Speed	971	r/min	Duty	S1		Connection	△
Ins. class	F		Weight	0	kg		IP55

NO LOAD TEST

VOL	mul.	Hz	I01	I02	I03	mul.	W1	W2	mul.	
482.3	1	50	3.038	3.065	2.983	5	-797.3	1007.3	5	71.5
450.9	1	50	2.389	2.408	2.355	5	-587.5	732.6	5	71.6
415.4	1	50	1.878	1.888	1.859	5	-423.5	526.2	5	71.7
365.3	1	50	3.579	3.590	3.564	2	-701.3	878.4	2	71.7
318.8	1	50	2.905	2.911	2.898	2	-491.3	622.7	2	71.6
266.5	1	50	2.302	2.305	2.300	2	-319.3	415.8	2	71.4
206.4	1	50	1.709	1.717	1.702	2	-180.9	244.9	2	70.9
175.7	1	50	1.426	1.432	1.419	2	-126.4	175.7	2	70.6
145.8	1	50	1.167	1.168	1.162	2	-82.0	121.3	2	70.4
98.1	1	50	0.791	0.787	0.784	2	-32.8	58.3	2	70.1

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Type	HM2-160L-6	Poles	6	Power	11.0	kW
Voltage	415 V	Current	20.9 A	Frequency	50.0	Hz
Speed	971 r/min	Duty	S1	Connection		
Ins. class	F	Weight	0 kg		IP55	

LOCKED ROTOR TEST

VOL	mul.	Ik1	Ik2	Ik3	mul.	W1	W2	mul.	Torqu N. m
415.4	1.0	2.314	2.315	2.317	50.0	-87.2	1023.5	50	219.97
368.1	1.0	1.955	1.956	1.959	50.0	-69.3	761.9	50	163.86
325.8	1.0	1.652	1.653	1.654	50.0	-58.6	565.8	50	120.41
279.3	1.0	1.346	1.345	1.347	50.0	-47.5	391.8	50	81.50
242.0	1.0	2.786	2.788	2.786	20.0	-98.0	694.2	20	56.89
195.4	1.0	2.117	2.116	2.117	20.0	-70.3	420.1	20	33.68
154.4	1.0	1.586	1.586	1.587	20.0	-46.4	244.9	20	19.54
110.3	1.0	1.080	1.079	1.080	20.0	-24.3	117.3	20	9.42

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Type	HM2-160L-6		Poles	6		Power	11 kW	
Voltage	415 V		Current	20.9 A		Frequency	50 Hz	
Speed	971 r/min		Duty	S1		Connection		
Ins. class	F		Weight	0 kg			IP55	

TEMPERATURE RISE TEST

TIME (h:min)	V	I1	I2	I3	mul.	W1	W2	mul.	T1 °C	T2 °C	T3 °C	T4 °C	T5 °C	T6 °C	T7 °C	T8 °C	T9 °C	T10 °C	T11 °C	T12 °C	T13 °C
11:00	415.5	2.152	2.169	2.157	10	345.9	940.5	10	46.9	—	75.8	76.3	—	—	—	—	—	—	8.5	—	8.5
11:30	415.4	2.129	2.147	2.136	10	337.7	928.4	10	49.7	—	79.2	79.6	—	—	—	—	—	—	8.8	—	8.8
12:00	415.3	2.112	2.129	2.119	10	335.7	922.1	10	51.2	—	80.5	81.1	—	—	—	—	—	—	8.9	—	8.9
12:30	415.7	2.128	2.146	2.133	10	339.4	929.7	10	52.0	—	81.9	82.5	—	—	—	—	—	—	9.3	—	9.3
13:00	415.4	2.095	2.112	2.099	10	330.7	914.1	10	52.8	—	81.6	82.2	—	—	—	—	—	—	9.5	—	9.5
13:30	415.4	2.112	2.130	2.119	10	335.4	922.2	10	53.5	—	82.1	82.5	—	—	—	—	—	—	9.9	—	9.9
14:00	415.5	2.111	2.126	2.116	10	334.7	920.8	10	53.8	—	82.4	82.9	—	—	—	—	—	—	10.3	—	10.3
最后三点平均值		21.134			A	12526.33		W	53.8	—	82.0	82.9	—	—	—	—	—	—	10.3	—	9.9

T1 T2: DE BEARING TEMPERATURE
T3~T10: DE WINDING TEMPERATURE

T11: CORE TEMPERATRE
T13: AMBIENT TEMPERATURE

T12: FRAME TEMPERATRE

WINDING RESISTANCE (HOT) AT END OF TEMPERATURE RISE TEST

TIME (S)	36	53	70	86	105	132	152	177
RESISTANCE	0.7302	0.7285	0.7268	0.7256	0.7242	0.7225	0.7216	0.7208

WINDING RESISTANCE (COLD)

△	U1-V1	U1-W1	V1-W1	AVERAGE	MIN	AMBIENT TEM.
	0.5672	0.5672	0.5673	0.56723	0.56720	7.9 °C
Y	U1-U2	V1-V2	W1-W2	AVERAGE	MIN	AMBIENT TEM.
	0	0	0	0.000	0	0 °C

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Type	HM2-160L-6	Poles	6	output Power	11.0	kW		
Voltage	415	V	Current	20.9	A	Frequency	50.0	Hz
Speed	971	r/min	Duty	S1	Connection			
Ins. class		F	Weight	0	kg	IP55		

LOAD TEST

V	Hz	A1 (unit)	A2 (unit)	A3 (unit)	mul.	W1 (unit)	W2 (unit)	mul.	r/min
415.1	50.00	2.908	2.928	2.917	10	530.3	1268.3	10	960.5
415.1	50.00	2.588	2.606	2.595	10	457.1	1127.3	10	966.1
415.0	50.00	2.084	2.101	2.089	10	322.5	901.4	10	974.7
415.0	50.00	2.022	2.038	2.025	10	304.4	873.1	10	975.9
415.2	50.00	1.728	1.743	1.730	10	208.4	736.6	10	981.2
415.1	50.00	1.391	1.406	1.390	10	75.0	564.6	10	987.7
415.1	50.00	1.179	1.192	1.172	10	-51.3	423.0	10	993.2

% LOAD	OUTPUT W	INPUT W	AMPS A	Pcu1 W	SLIP %	Pcu2 W	Ps W	EFF %	P. F.
150	16500	18886	30.5	1074.7	4.389	764.1	129.67	87.37	0.861
125	13750	15510	25.5	750.9	3.476	499.6	91.50	88.65	0.846
100	11000	12292	21.0	508.5	2.670	304.2	61.74	89.49	0.815
75	8250	9208	17.1	336.4	1.920	162.9	40.97	89.60	0.750
50	5500	6236	13.8	220.9	1.257	70.7	26.86	88.19	0.627
25	2750	3357	11.5	153.2	0.636	17.9	18.51	81.91	0.405

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Ins. class	F	Weight	0 kg		IP55	

Load Curve

