

# VALIADIS S.A.

## ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

Type	K160L-2	Poles	2	Power	18,5	kW	IE:3
Voltage	400 V	Current	32,5 A	Frequency	50	Hz	
Speed	2942 r/min	Duty	S1	Connecti	△		
Ins.class	F	Weight	183 kg		IP55		
MAJOR CONTENTS				TEST VALUE			
95,0	°C	PHASE RESISTANCE OF WII	Ω	0,4515			
NO LOAD CURRENT			A	8,640			
NO LOAD INPUT			W	428,89			
CORE LOSS(Pfe)			W	308,38			
WINDAGE FRICTION LOSS(Pfw)			W	90,46			
STATOR WINDING LOSS(Pcu1)			W	467,10			
ROTOR WINDING LOSS(Pcu2)			W	372,84			
STRAY LOAD LOSS(Ps)			W	308,95			
LOCKED ROTOR CURRENT			A	245,678			
LOCKED ROTOR INPUT @ FULL LOAD			W	80815			
LOCKED ROTOR TORQUE			N.m	156,8			
PULL OUT TORQUE			N.m	191,4			
LOCKED ROTOR CURRENT/RATED CURF			P.U	7,57			
LOCKED ROTOR TORQUE/RATED TORQL			P.U	2,61			
PULL OUT TORQUE/RATED TORQUE			P.U	3,18			
FULL LOAD TORQUE			N.m	60,1			
FULL LOAD CURRENT			A	32,5			
FULL LOAD SLIP			%	1,934			
INPUT @ FULL LOAD			kW	20,049			
FULL LOAD SPEED			r/min	2942,0			
EFFICIENCY @ FULL LOAD			%	92,27			
EFFICIENCY @ 75% LOAD			%	93,03			
POWER FACTOR @ FULL LOAD				0,892			
STATOR WINDING TEMPERATURE RISE			K	62			
D.E. BEARINGS TEMPERATURE BY PT10			°C	41,2			
STATOR WINDING TEMPERATURE			°C	69,5			
High voltage test			V	1800	Imin		
Insulation resistance			MΩ	500			
NOISE ( LW)			dB(A)	77			
VIBRATION			mm/s	1,3			

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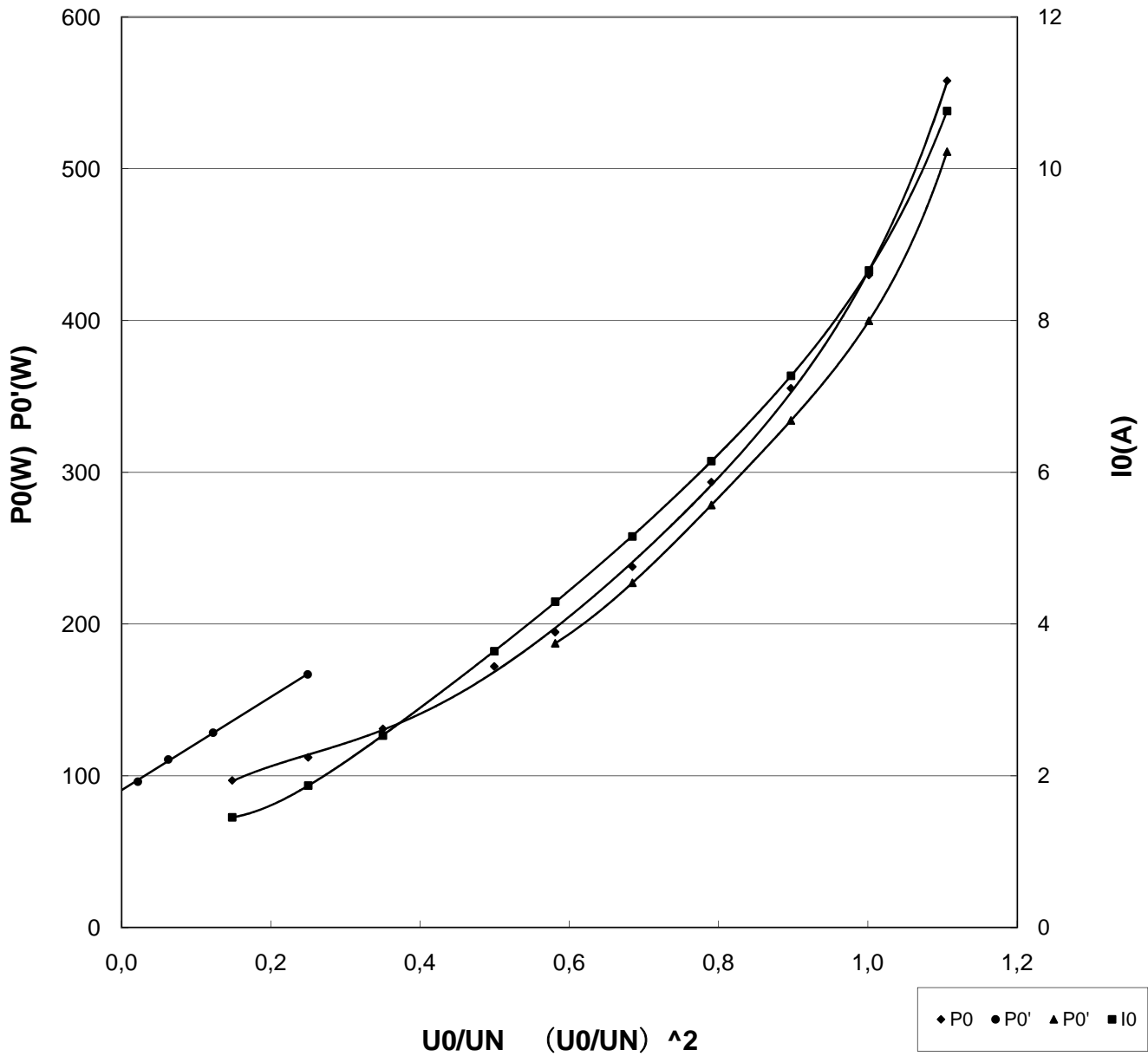
Type	K160L-2		Poles	2		Power	18,5 kW		IE:3		
Voltage	400	V	Current	32,5	A	Frequency	50 Hz				
Speed	2942	r/min	Duty	S1		Connection	Δ				
Ins.class	F		Weight	183	kg			IP55			
NO LOAD TEST											
VOL	mul.	HZ	I01	I02	I03	mul.	W1	W2	mul.	°C	Ω
442,5	1	50	2,163	2,061	2,233	5	-358,8	470,4	5	59,8	0,2688
400,6	1	50	4,198	4,216	4,577	2	-614,0	829,0	2	59,2	0,2683
358,8	1	50	3,490	3,583	3,836	2	-457,2	634,9	2	58,8	0,2679
316,1	1	50	2,942	3,041	3,239	2	-335,1	481,9	2	58,4	0,2675
273,8	1	50	2,460	2,553	2,718	2	-236,7	355,6	2	58,1	0,2673
232,4	1	50	4,160	4,248	4,479	1	-333,4	528,1	1	57,5	0,2667
199,8	1	50	3,537	3,601	3,791	1	-229,0	401,1	1	57,1	0,2664
140,1	1	50	2,464	2,512	2,616	1	-88,5	219,5	1	56,4	0,2657
100,1	1	50	1,836	1,852	1,929	1	-22,1	134,3	1	55,8	0,2652
59,4	1	50	1,439	1,427	1,492	1	20,4	76,6	1	54,0	0,2636
data calculation of no load											
V%	U0/UN	I0	P0	(U0/UN)^2	P0cu1	P0'					
110,6%	1,11	10,762	558,0	1,224	46,70	511,30					
100,1%	1,00	8,661	430,0	1,003	30,18	399,82					
89,7%	0,90	7,273	355,4	0,804	21,26	334,14					
79,0%	0,79	6,148	293,6	0,625	15,17	278,43					
68,5%	0,68	5,154	237,8	0,469	10,65	227,15					
58,1%	0,58	4,296	194,7	0,338	7,38	187,32					
50,0%	0,50	3,643	172,1	0,250	5,30	166,80					
35,0%	0,35	2,531	131,0	0,123	2,55	128,45					
25,0%	0,25	1,872	112,2	0,063	1,39	110,81					
14,8%	0,15	1,453	97,0	0,022	0,83	96,17					
RESULTS AT: 400 V											
N.L.AMP	8,64	N.L.LOSS(W)	428,89	Pw(W)	90,5	Pe(W)	308,4				

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Voltage	400	V	Current	32,5	A	Frequency	50,0 Hz		
Speed	2942	r/min	Duty	S1		Connection	Δ		
Ins.class	F		Weight	183	kg		IP55		

### No Load Curve



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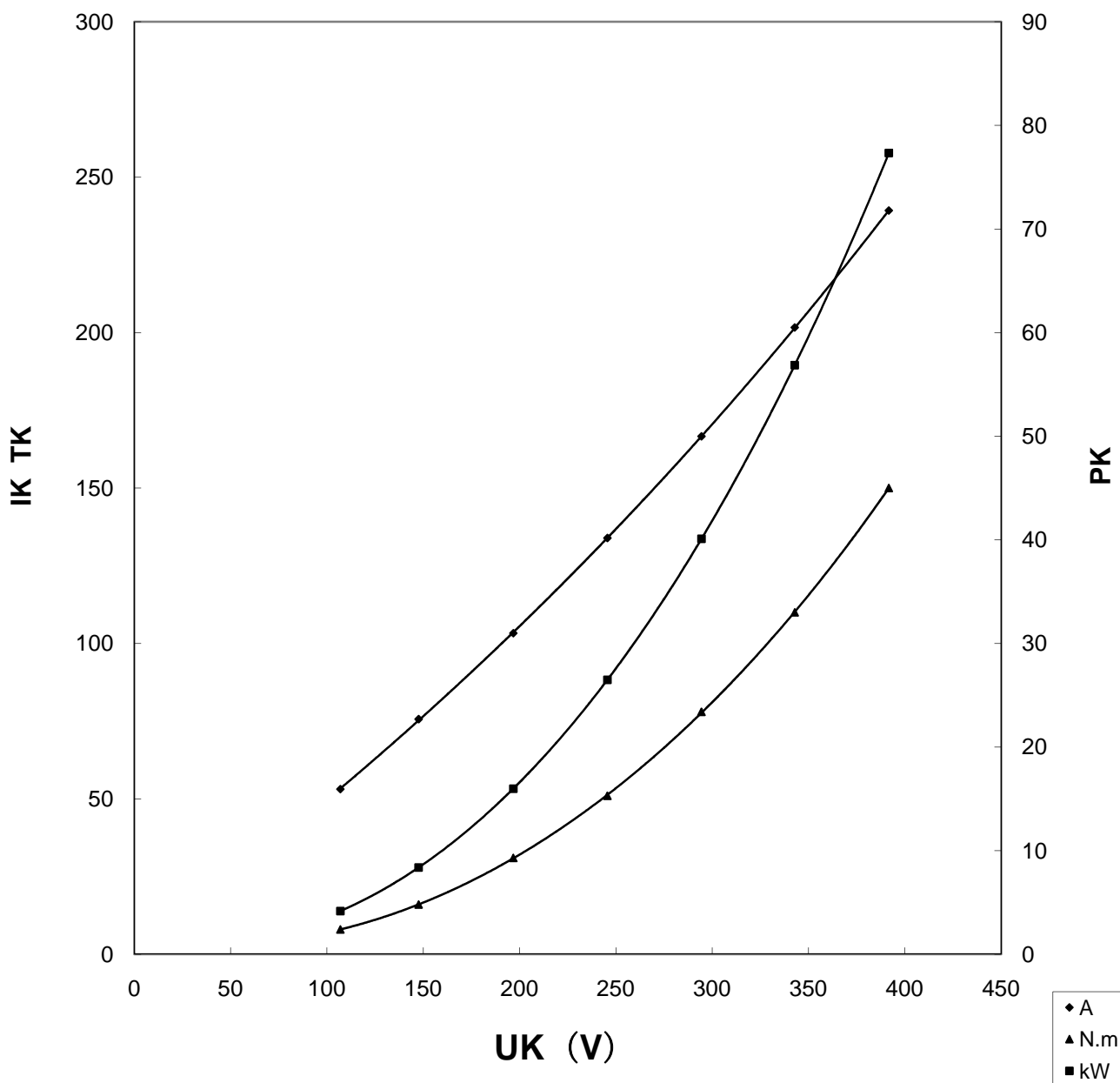
Type	K160L-2		Poles	2		Power	18,5		IE:3	kW
Voltage	400	V	Current	32,5	A	Frequency	50,0		Hz	
Speed	2942	r/min	Duty	S1		Connection	Δ			
Ins.class	F		Weight	183	kg			IP55		
LOCKED ROTOR TEST										
VOL	mul.	Ik1	Ik2	Ik3	mul.	W1	W2	mul.	Torqu ( kg.m)	
391,7	1,0	2,402	2,385	2,391	100,0	-22,4	795,7	100,0	15,31	
342,8	1,0	2,024	2,009	2,017	100,0	-18,2	586,8	100,0	11,22	
294,4	1,0	1,672	1,659	1,668	100,0	-15,1	416,1	100,0	7,96	
245,6	1,0	1,344	1,333	1,340	100,0	-12,4	277,2	100,0	5,20	
196,7	1,0	1,036	1,029	1,034	100,0	-10,2	170,0	100,0	3,16	
147,6	1,0	0,760	0,753	0,756	100,0	-8,2	92,0	100,0	1,63	
106,9	1,0	0,534	0,529	0,531	100,0	-4,7	46,4	100,0	0,82	
data calculation of locked rotor										
Uk	IK	PK	TK	LOGUk		LOGIk	LOGPk	LOGTk		
V	A	kW	N.m							
391,68	239,27	77,330	150,0	2,5929		2,3789	1,8883	2,1761		
342,84	201,65	56,860	110,0	2,5351		2,3046	1,7548	2,0414		
294,42	166,63	40,100	78,0	2,4690		2,2218	1,6031	1,8921		
245,58	133,92	26,480	51,0	2,3902		2,1268	1,4229	1,7076		
196,74	103,30	15,980	31,0	2,2939		2,0141	1,2036	1,4914		
147,58	75,65	8,380	16,0	2,1690		1,8788	0,9232	1,2041		
106,95	53,14	4,170	8,0	2,0292		1,7254	0,6201	0,9031		
performance collection of locked rotor										
at rated volts		at rated current		at 2.5 times rated current		at 100V				
VOLTS ( V )		400		67,625		157,4		100,0		
AMPS ( A )		245,7		32,5		81,3		49,93		
INPUT ( kW )		80,82				10,4		4,217		
TORQUE ( N.m)		156,81								

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Voltage	400 V	Current	32,5 A	Frequency	50,0	kW
Speed	2942 r/min	Duty	S1	Connection	Δ	Hz
Ins.class	F	Weight	183 kg			IP55

### Locked Rotor Curve



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Type	K160L-2	Poles	2	Power	18,5	kW	IE:3
Voltage	400 V	Current	32,5 A	Frequency	50	Hz	
Speed	2942 r/min	Duty	S1	Connection	Δ		
Ins.class	F	Weight	183 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	
14,00	399,9	3,294	3,240	3,273	10	745,7	1286	10	45,7	—	76,3	74,8	—	—	—	—	—	—	—	—	—	14,0
14,30	399,9	3,277	3,221	3,256	10	741,2	1279	10	43,6	—	73,7	72,2	—	—	—	—	—	—	—	—	—	13,9
15,00	400,4	3,291	3,230	3,267	10	744,6	1281	10	42,2	—	71,2	69,7	—	—	—	—	—	—	—	—	—	13,8
15,32	400,2	3,262	3,203	3,241	10	737,4	1270	10	41,7	—	70,3	68,8	—	—	—	—	—	—	—	—	—	13,8
16,00	400,0	3,283	3,218	3,258	10	743,1	1278	10	41,2	—	69,5	68,0	—	—	—	—	—	—	—	—	—	13,9
The average of the last three		32,506			A	20181,7		W	41,2	—	70,3	68,0	—	—	—	—	—	—	—	—	—	13,8

T1 T2 : DE BEARING TEMPERATURE

T11 : CORE TEMPERATRE

T12: FRAME TEMPERATRE

T3~T10 : DE WINDING TEMPERATURE

T13 : AMBIENT TEMPERATURE

### WINDING RESISTANCE (HOT) AT END OF TEMPERATURE RISE TEST

TIME (S)	25	30	35	40	45	50	55			
RESISTANCE ( Ω )	0,2837	0,2835	0,2832	0,2829	0,2827	0,2825	0,2823			

### WINDING RESISTANCE(COLD)

Δ	U1-V1	U1-W1	V1-W1	AVERAGE	MIN	AMBIENT TEM.
	0,2234	0,2227	0,2229	0,22299	0,22270	9,5 °C
Y	U1-U2	V1-V2	W1-W2	AVERAGE	MIN	AMBIENT TEM.
						°C

resistance value at 0 sec ( Ω ) 0,285188 calculation value of temp.rising 64,27 K

30 S ( Ω ) 0,283439 calculation value of temp.rising 62,35 K

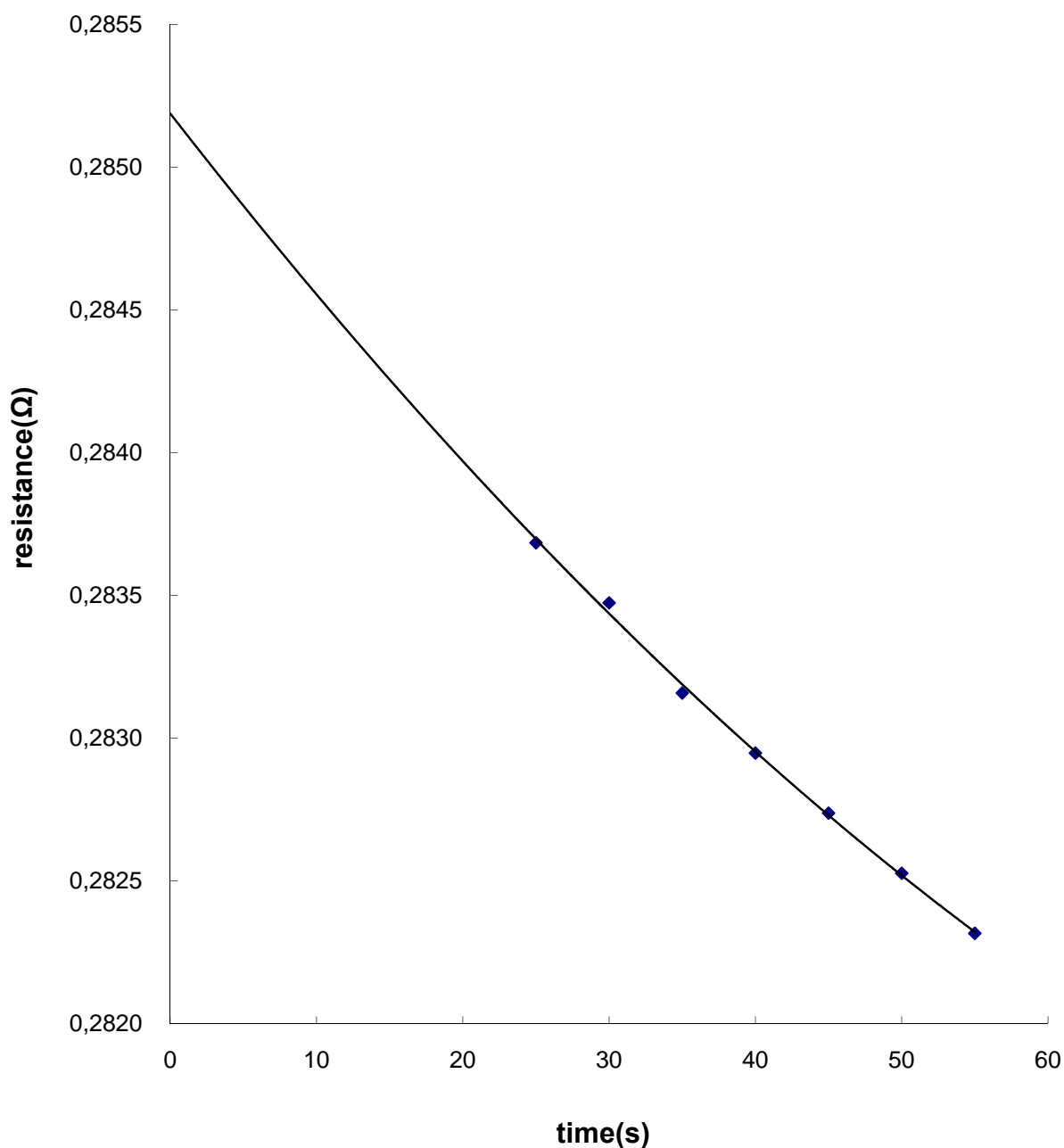
full load curent 32,45 A modify value of temp. rising 62,15 K

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Type	K160L-2		Poles	2		output Power	18,5	IE:3 kW
Voltage	400	V	Current	32,5	A	Frequency	50,0	Hz
Speed	2942	r/min	Duty	S1		Connection	Δ	
Ins.class		F	Weight	183	kg		IP55	

### RESISTANCE CURVE



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<b>Type</b>	K160L-2		<b>Poles</b>	2		<b>Power</b>	18,5		<b>IE:3</b>			
<b>Voltage</b>	400	<b>V</b>	<b>Current</b>	32,5	<b>A</b>	<b>Frequency</b>	50,0		<b>Hz</b>			
<b>Speed</b>	2942	<b>r/min</b>	<b>Duty</b>	S1		<b>Connection</b>	Δ					
<b>Ins.class</b>	F		<b>Weight</b>	183	<b>kg</b>	IP55						
LOAD TEST												
V	HZ	I1	I2	I3	mul.	W1	W2	mul.	r/min	Resistance Ω	Temperature °C	Torque N.m
400,1	50,00	3,951	3,875	3,896	10	897,4	1530,2	10	2930,5	0,2755	67,1	72,4
400,1	50,00	3,618	3,553	3,574	10	817,8	1401,9	10	2937,7	0,2760	67,6	66,2
400,3	50,00	3,289	3,235	3,268	10	738,8	1278,4	10	2944	0,2763	68,0	60,3
400,2	50,00	2,503	2,454	2,482	10	530,0	971,8	10	2959,7	0,2762	67,8	44,7
400,0	50,00	3,613	3,464	3,560	5	652,9	1367,7	5	2973,5	0,2756	67,2	30,1
400,3	50,00	2,373	2,210	2,362	5	216,1	828,8	5	2987,3	0,2748	66,3	14,9
400,0	50,0	1,745	1,752	1,771	5,0	-187,6	398,4	5	2998,3	0,2745	66,0	1,76
400,0	50,0	4,225	4,369	4,381	2,0	-612,2	827,4	2	3000,0	0,2701	61,2	0,00
slope A= 0,08534		intercept B= 6,43			relative coefficient r= 0,983							
LOAD %	P2 W	I A	P1 W	Pcu1s W	Ss %	Pcu2s W	Ps W	Pz W	N.m	EFF %	P.F	
150,0	27750	49,15	30718,3	1071,5	3,214	942,9	717,9	3131,2	91,7	90,34	0,902	
125,0	23125	40,77	25363,1	737,2	2,558	621,9	490,3	2248,3	75,8	91,18	0,898	
100,0	18500	32,45	20049,5	467,1	1,934	372,8	308,9	1547,7	60,2	92,27	0,892	
75,0	13875	24,65	14914,3	269,5	1,392	199,6	170,1	1038,0	44,6	93,03	0,873	
50,0	9250	17,53	9949,1	136,3	0,909	86,4	75,7	697,3	29,8	92,97	0,819	
25,0	4625	11,44	5120,0	58,1	0,434	20,6	18,8	496,3	14,8	90,33	0,646	



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Speed	2942	<b>r/min</b>	Duty	S1		Connection	Δ		
Ins.class	F		Weight	183	<b>kg</b>		IP55		

### LOAD CURVE

