

VALIADIS S.A.

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

Type	K180M-2	Poles	2	Power	22,0	IE:3
Voltage	400 V	Current	38,5 A	Frequency	50	kW
Speed	2958 r/min	Duty	S1	Connection	Δ	Hz
Ins.class	F	Weight	235 kg		IP55	
MAJOR CONTENTS			TEST VALUE			
95,0 °C PHASE RESISTANCE OF WINDING	Ω					0,2884
NO LOAD CURRENT	A					11,241
NO LOAD INPUT	W					668,99
CORE LOSS(Pfe)	W					324,40
WINDAGE FRICTION LOSS(Pfw)	W					313,55
STATOR WINDING LOSS(Pcu1)	W					399,64
ROTOR WINDING LOSS(Pcu2)	W					320,91
STRAY LOAD LOSS(Ps)	W					255,26
LOCKED ROTOR CURRENT	A					316,542
LOCKED ROTOR INPUT @ FULL LOAD	W					103163
LOCKED ROTOR TORQUE	N.m					176,1
PULL OUT TORQUE	N.m					241,8
LOCKED ROTOR CURRENT/RATED CURRENT	P.U					8,23
LOCKED ROTOR TORQUE/RATED TORQUE	P.U					2,48
PULL OUT TORQUE/RATED TORQUE	P.U					3,40
FULL LOAD TORQUE	N.m					71,1
FULL LOAD CURRENT	A					38,5
FULL LOAD SLIP	%					1,402
INPUT @ FULL LOAD	kW					23,615
FULL LOAD SPEED	r/min					2957,9
EFFICIENCY @ FULL LOAD	%					93,16
EFFICIENCY @ 75% LOAD	%					93,25
POWER FACTOR @ FULL LOAD						0,886
STATOR WINDING TEMPERATURE RISE	K					47
D.E. BEARINGS TEMPERATURE BY PT100	°C					32,4
STATOR WINDING TEMPERATURE	°C					52,5
High voltage test	V	1800			Imin	
Insulation resistance	MΩ					500
NOISE (LW)	dB(A)					84
VIBRATION	mm/s					0,7

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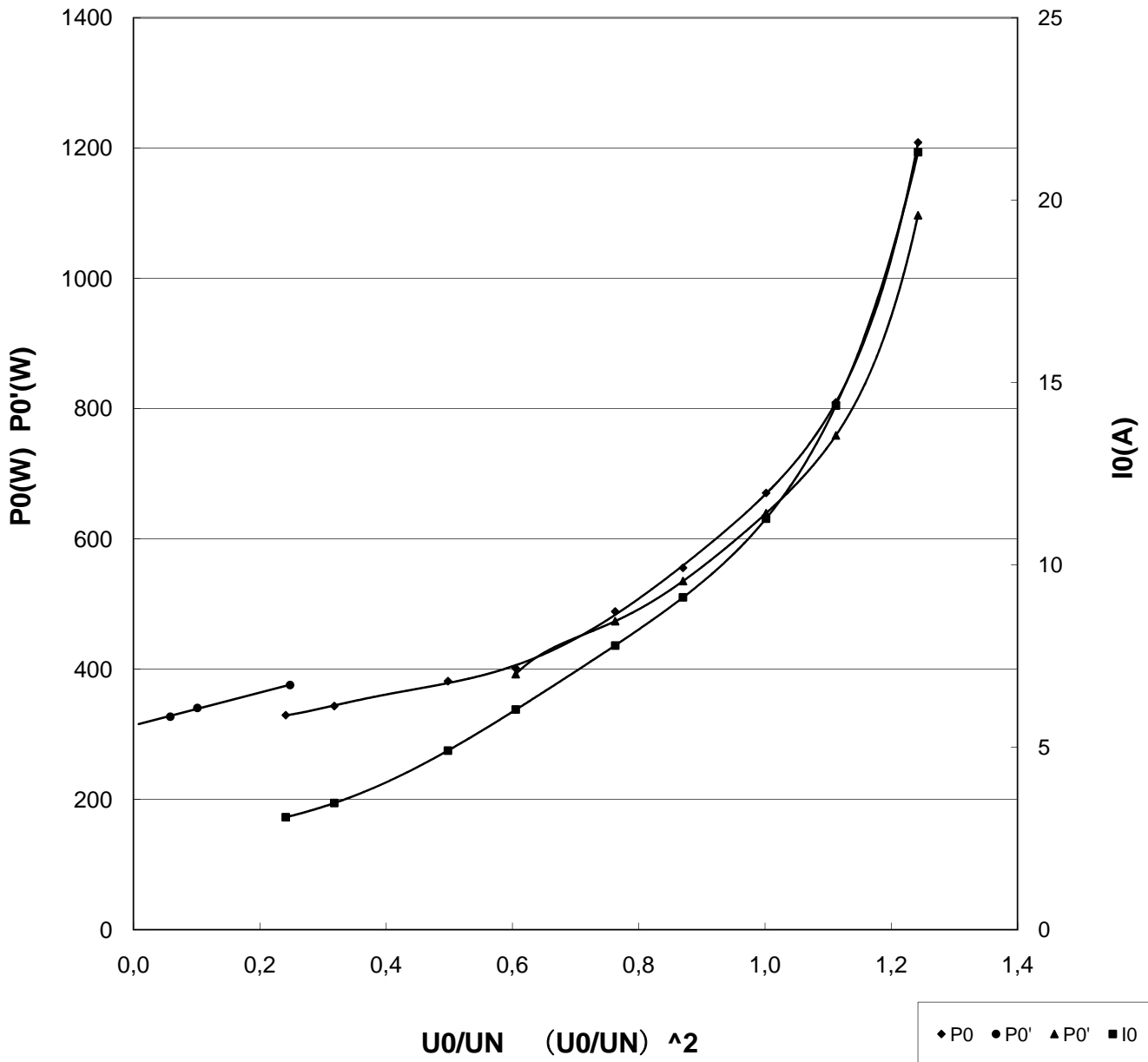
Type	K180M-2		Poles	2		Power	22,0 kW		IE:3		
Voltage	400	V	Current	38,5	A	Frequency	50 Hz				
Speed	2958	r/min	Duty	S1		Connection	Δ				
Ins.class	F		Weight	235	kg			IP55			
NO LOAD TEST											
VOL	mul.	HZ	I01	I02	I03	mul.	W1	W2	mul.	°C	Ω
496,8	1	50	4,265	4,185	4,339	5	-850	1091,7	5	46,4	0,16393
444,8	1	50	2,874	2,829	2,919	5	-507,7	669,6	5	46,2	0,16381
400,6	1	50	2,250	2,225	2,287	5	-349,2	483,3	5	46	0,16369
348,0	1	50	1,817	1,802	1,848	5	-236,6	347,7	5	45,8	0,16358
305,1	1	50	1,554	1,540	1,579	5	-169,3	267,0	5	45,6	0,16346
242,1	1	50	3,004	2,986	3,064	2	-232,8	433,4	2	45,2	0,16323
199,2	1	50	2,441	2,427	2,494	2	-123,4	314,2	2	45,1	0,16317
127,2	1	50	1,718	1,729	1,761	2	-7,5	179,2	2	44,6	0,16288
96,4	1	50	1,529	1,540	1,556	2	30,7	134,0	2	44,3	0,16270
data calculation of no load											
V%	U0/UN	I0	P0	(U0/UN)^2	P0cu1	P0'					
124,2%	1,24	21,315	1208,5	1,543	111,72	1096,78					
111,2%	1,11	14,370	809,5	1,237	50,74	758,76					
100,2%	1,00	11,270	670,5	1,003	31,19	639,31					
87,0%	0,87	9,112	555,5	0,757	20,37	535,13					
76,3%	0,76	7,788	488,5	0,582	14,87	473,63					
60,5%	0,61	6,036	401,2	0,366	8,92	392,28					
49,8%	0,50	4,908	381,6	0,248	5,90	375,70					
31,8%	0,32	3,472	343,4	0,101	2,95	340,45					
24,1%	0,24	3,083	329,4	0,058	2,32	327,08					
RESULTS AT: 400 V											
N.L.AMP	11,24	N.L.LOSS(W)	668,99	Pw(W)	313,5	Pe(W)	324,4				

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Ins.class	F	Weight	235 kg			IP55

No Load Curve



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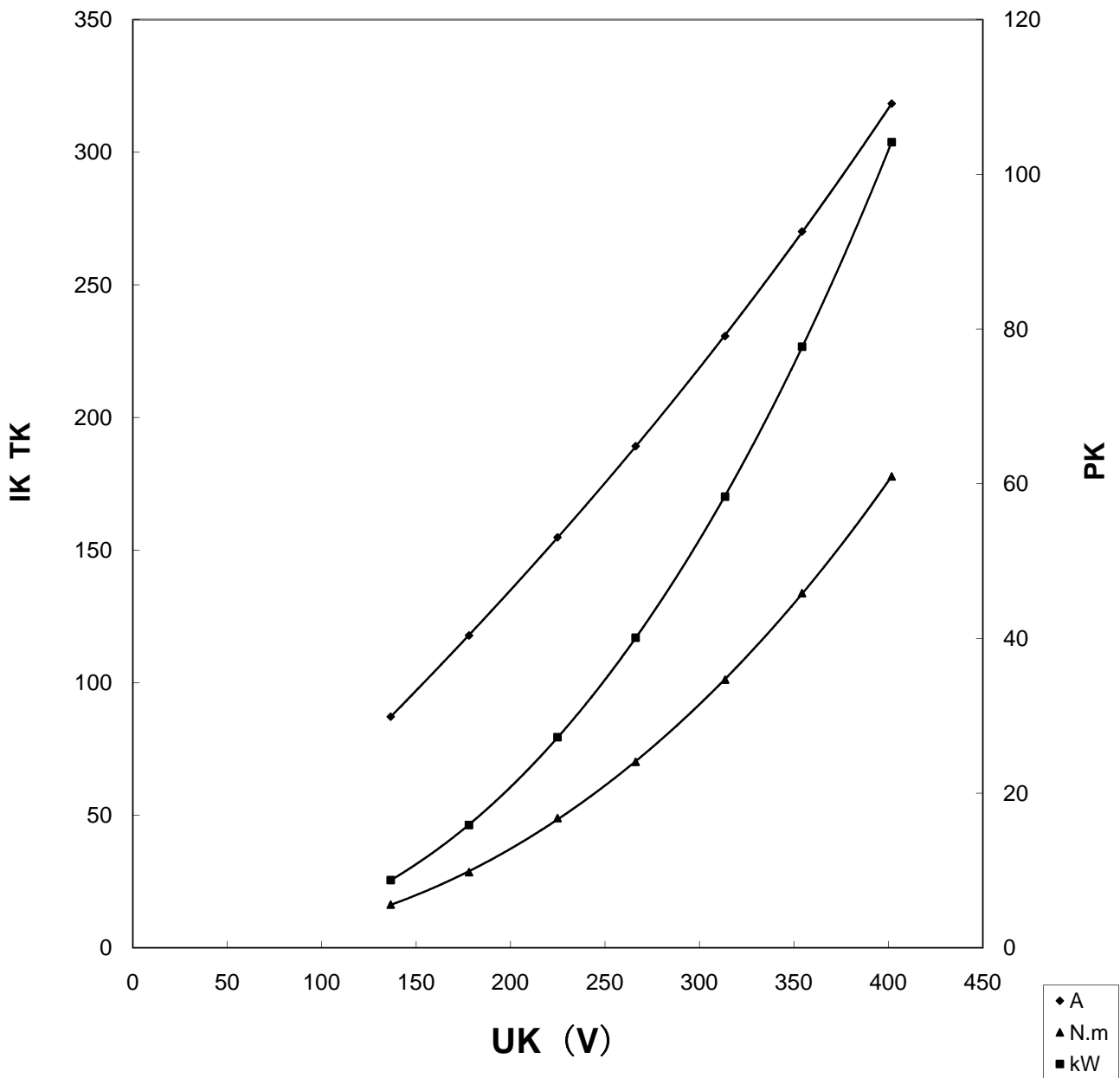
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Speed	2958	r/min	Duty	S1		Connection	Δ		Hz
Ins.class	F		Weight	235	kg	IP55			
LOCKED ROTOR TEST									
VOL	mul.	Ik1	Ik2	Ik3	mul.	W1	W2	mul.	Torqur (kg.m)
401,8	1,0	1,580	1,598	1,598	200,0	-45,1	565,9	200,0	18,1
354,3	1,0	2,682	2,710	2,712	100,0	-68,5	845,7	100,0	13,6
313,6	1,0	2,290	2,314	2,318	100,0	-53,8	637,2	100,0	10,3
266,2	1,0	1,878	1,897	1,900	100,0	-40,7	441,7	100,0	7,2
224,8	1,0	1,536	1,553	1,555	100,0	-30,6	302,9	100,0	5,0
178,0	1,0	2,342	2,361	2,366	50,0	-44,3	362,0	50,0	2,9
136,5	1,0	1,735	1,747	1,749	50,0	-28,2	203,4	50,0	1,7
data calculation of locked rotor									
Uk	IK	PK	TK		LOGUk	LOGIk	LOGPk	LOGTk	
V	A	kW	N.m						
401,79	318,36	104,160	177,79		2,6040	2,5029	2,0177	2,2499	
354,32	270,12	77,720	133,75		2,5494	2,4316	1,8905	2,1263	
313,58	230,70	58,340	101,13		2,4963	2,3630	1,7660	2,0049	
266,21	189,18	40,100	70,14		2,4252	2,2769	1,6031	1,8460	
224,84	154,80	27,230	48,93		2,3519	2,1898	1,4350	1,6896	
178,00	117,81	15,885	28,54		2,2504	2,0712	1,2010	1,4555	
136,53	87,18	8,760	16,31		2,1352	1,9404	0,9425	1,2125	
performance collection of locked rotor									
	at rated volts		at rated current		at 2.5 times rated current		at 100V		
VOLTS (V)	400		66,989		148,9		100,0		
AMPS (A)	316,5		38,5		96,3		61,21		
INPUT (kW)	103,16				10,8		3,222		
TORQUE (N.m)	176,13								

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Voltage	400 V	Current	38,5 A	Frequency	50,0	kW
Speed	2958 r/min	Duty	S1	Connection	Δ	Hz
Ins.class	F	Weight	235 kg			IP55

Locked Rotor Curve



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ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

Type	K180M-2	Poles	2	Power	22 kW	IE:3
Voltage	400 V	Current	38,5 A	Frequency	50 Hz	
Speed	2958 r/min	Duty	S1	Connection	Δ	
Ins.class	F	Weight	235 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	
21,00	400,2	1,908	1,925	1,910	20	420,7	771,5	20	33,2	—	50,5	49,8	—	—	—	—	—	—	—	—	—	10,0
21,29	400,0	1,925	1,935	1,924	20	422,4	773,1	20	33,2	—	52,2	51,4	—	—	—	—	—	—	—	—	—	9,7
22,00	399,9	1,908	1,920	1,908	20	420,7	767,3	20	32,6	—	52,6	51,6	—	—	—	—	—	—	—	—	—	9,7
22,28	400,1	1,928	1,940	1,928	20	424,9	775,9	20	32,4	—	52,5	51,5	—	—	—	—	—	—	—	—	—	9,9
The average of the last three		38,476			A	23895,3		W	32,4	—	52,4	51,5	—	—	—	—	—	—	—	—	—	9,8

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)	54	71	86	100	116	131	146	164		
RESISTANCE (Ω)	0,1695	0,1691	0,1688	0,1684	0,1681	0,1678	0,1675	0,1672		

WINDING RESISTANCE(COLD)

Δ	U1-V1	U1-W1	V1-W1	AVERAGE	MIN	AMBIENT TEM.
	0,1414	0,1414	0,1417	0,14150	0,14140	7,9 °C
Y	U1-U2	V1-V2	W1-W2	AVERAGE	MIN	AMBIENT TEM.
						°C

resistance value at 0 sec (Ω) 0,170964 calculation value of temp.rising 48,92 K

30 S (Ω) 0,170017 calculation value of temp.rising 47,29 K

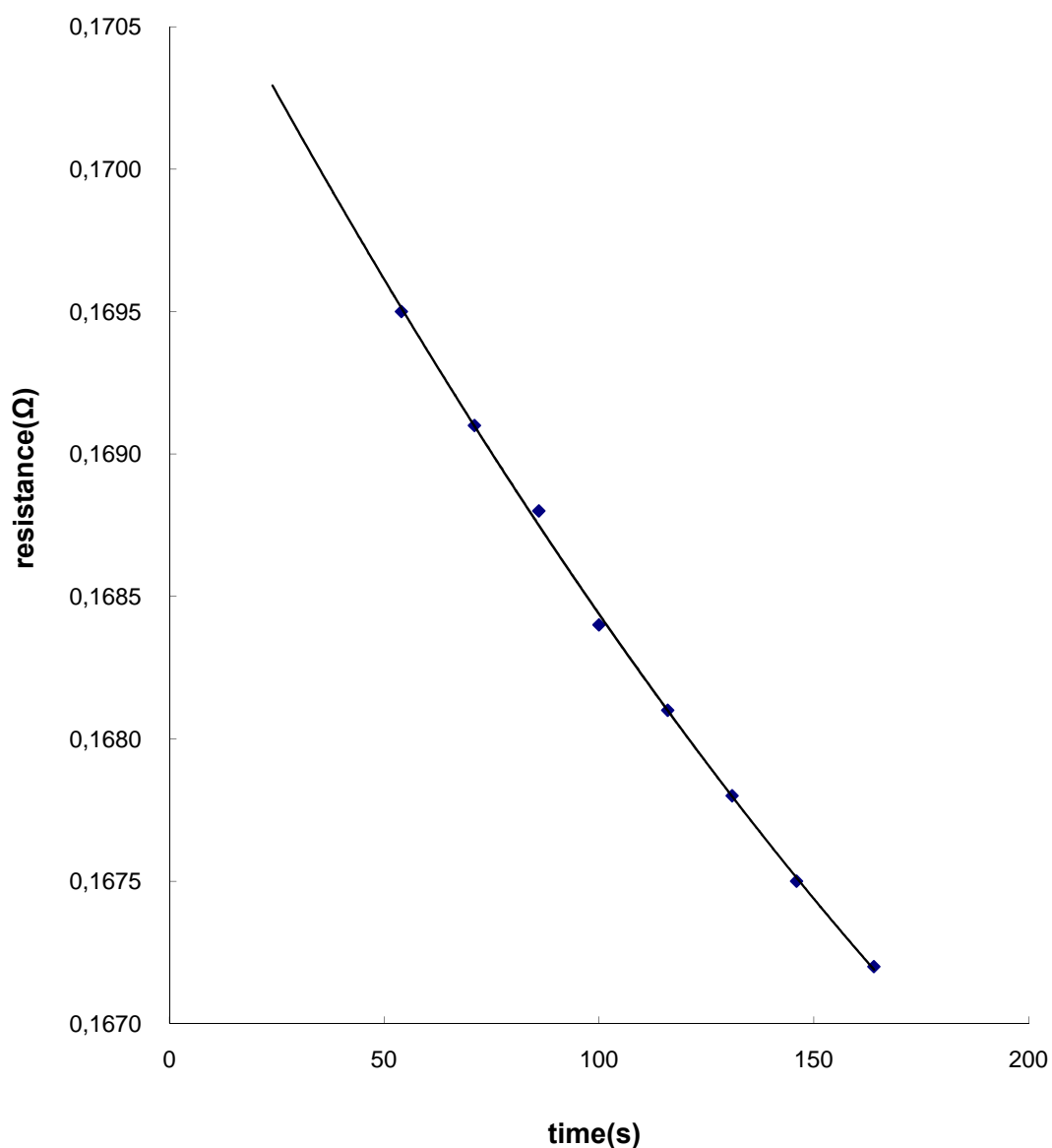
full load curent 38,47 A modify value of temp. rising 47,28 K

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Voltage	400 V	Current	38,5 A	Frequency	50,0	kW
Speed	2958 r/min	Duty	S1	Connection	Δ	Hz
Ins.class	F	Weight	235 kg		IP55	

RESISTANCE CURVE



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Speed	2958	r/min	Duty	S1		Connection	Δ		Hz			
Ins.class	F		Weight	235	kg	IP55						
LOAD TEST												
V	HZ	I1	I2	I3	mul.	W1	W2	mul.	r/min	Resist nce Ω	Temper ature °C	Torqu r N.m
399,9	50,00	2,905	2,916	2,906	20	649,7	1151,3	20	2935,5	0,1669	51,5	107,05
400,1	49,99	2,437	2,446	2,432	20	549,3	969,4	20	2947,1	0,1672	52,0	90,41
399,8	50,00	1,939	1,949	1,933	20	421,3	770,6	20	2959,7	0,1675	52,6	70,70
399,9	50,00	1,752	1,761	1,745	20	370,8	697,2	20	2964,3	0,1676	52,7	63,34
400,0	50,00	1,515	1,525	1,506	20	305,2	605,1	20	2970,1	0,1676	52,7	53,76
400,1	50,00	2,539	2,500	2,529	10	475,5	991,4	10	2976,5	0,1674	52,4	42,90
400,3	50,00	2,196	2,156	2,185	10	364,6	852,5	10	2980,6	0,1672	52,1	35,21
400,1	50,00	1,539	1,502	1,533	10	123,9	564,0	10	2989,8	0,1669	51,5	18,60
400,2	50,0	2,394	2,342	2,399	5,0	-186,2	658,2	5	2996,8	0,1662	50,3	4,40
400,0	50,0	2,268	2,239	2,299	5,0	-351,8	486,5	5	3000,0	0,1641	46,7	0,00
slope A= 0,05064 intercept B= 1,72 relative coefficient r= 0,995												
LOAD %	P2 W	I A	P1 W	Pcu1s W	Ss %	Pcu2s W	Ps W	Pz W	N.m	EFF %	P.F	
150,0	33000	58,02	35922,8	909,1	2,269	787,0	587,7	2921,7	107,7	91,86	0,894	
125,0	27500	47,71	29679,8	614,7	1,797	516,6	403,6	2172,9	89,3	92,66	0,898	
100,0	22000	38,47	23614,6	399,6	1,402	320,9	255,3	1613,8	71,0	93,16	0,886	
75,0	16500	29,57	17694,2	236,2	1,018	174,5	143,0	1191,6	53,1	93,25	0,864	
50,0	11000	21,46	11904,0	124,4	0,667	76,4	63,2	901,9	35,3	92,41	0,801	
25,0	5500	14,44	6222,5	56,3	0,320	18,7	15,5	728,4	17,5	88,39	0,622	

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Speed	2958	r/min	Duty	S1		Connection	Δ		
Ins.class	F		Weight	235	kg		IP55		

LOAD CURVE

