

TECHNICAL DATA SHEET



**ALTERNATOR PRO22M F/4**

*Three-Phase brushless synchronous alternator with AVR - 4 poles*

## PRO22M F/4

### COMMON DATA

Rated Power at 50Hz	kVA	150	
Rated Power at 60Hz	kVA	180	
Rated Power Factor		0,8	
Nominal Temperature	°C	40	
Control System		self-excited	
Execution		brushless	
Regulation Type		AVR	
Insulation Class		H	
Protection		IP23	
Maximum Over speed	rpm	2250	
Overload		110% of rated power for one hour in a cycle of 6 hours	
Air Flow Requirement	m <sup>3</sup> /min	20,1 at 50Hz	23,5 at 60Hz
R.F.I. Suppression		Standard EN55011	

### REGULATION DATA

AVR	HVR11	HVR30
Sensing	single-phase	three-phase
Voltage Regulation	±1%	±1%
Sustained Short Circuit	> 250% of rated current	

### WINDING DATA

Stator Winding	Double layer with auxiliary winding		
Rotor Winding	with damping cage		
Winding Pitch	2/3		
Number of Leads of Stator	12		
Stator Winding Resistance	Ω	0,012 at 20°C	
Rotor Winding Resistance	Ω	4,52 at 20°C	
Exciter Stator Resistance	Ω	14,3 at 20°C	
Exciter Rotor Resistance	Ω	0,47 at 20°C	
THD at full load	<3%		
THD at no load	<3%		
Excitation at no load	Adc	0,76	
Excitation at full load	Adc	2,5	

### STANDARD

References	EN60034-1 ISO8528-3 EN55011
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### ON REQUEST

UL 1446, Systems of Insulating Materials - General CSA-C22.2 No. 0, Appendix B, General Requirements - Canadian Electrical Code, Part I

CAN/CSA - C22.2 No. 100-14 (R2009) Motors and Generators, UL1004-1 2nd ed. Rotating Electrical Machines - General Requirements, UL1004-4 2nd ed. Electric Generators

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### ELECTRICAL DATA

Frequency		50Hz - 1500rpm				60Hz - 1800rpm			
Voltage Series Star	V	<b>380/220</b>	<b>400/230</b>	<b>415/240</b>	<b>440/254</b>	<b>415/240</b>	<b>440/254</b>	<b>460/266</b>	<b>480/277</b>
Rated Power in Class H (125°C/40°C)	kVA	150	150	150	125	150	170	180	180
	kW	120	120	120	100	120	136	144	144
Rated Power in Class F (105°C/40°C)	kVA	139,5	139,5	139,5	117	139	158	167,5	167,5
	kW	111,6	111,6	111,6	93,6	111,2	126,4	134	134
Rated Power Standby (150°C/40°C)	kVA	162	162	162	136	162	184	195	195
	kW	129,6	129,6	129,6	108,8	129,6	147,2	156	156
Rated Power Standby (163°C/27°C)	kVA	169,5	169,5	169,5	142	170	192	203,5	203,5
	kW	135,6	135,6	135,6	113,6	136	153,6	162,8	162,8

### EFFICIENCY IN CL. H

4/4		92,6%						92,8%
3/4		92,8%						93,0%
2/4		91,0%						91,7%
1/4		88,5%						89,9%

### REACTANCES AND TIME CONSTANTS

Pcc		0,44							
X <sub>d</sub> - dir. axis synchronous		321%	290%	269%	200%	323%	326%	316%	290%
X' <sub>d</sub> - dir. axis transient		19,9%	18,0%	16,7%	12,4%	20,1%	20,2%	19,6%	18,0%
X'' <sub>d</sub> - dir. axis subtransient		9,4%	8,5%	7,9%	5,9%	9,5%	9,6%	9,3%	8,5%
X <sub>q</sub> - quad. axis reactance		214%	193%	179%	133%	215%	217%	210%	193%
T' <sub>do</sub> - O.C. field time constant						310ms			
T' <sub>d</sub> - Transient time constant						23ms			
T'' <sub>d</sub> - Sub-transient time constant						10ms			

### MECHANICAL DATA

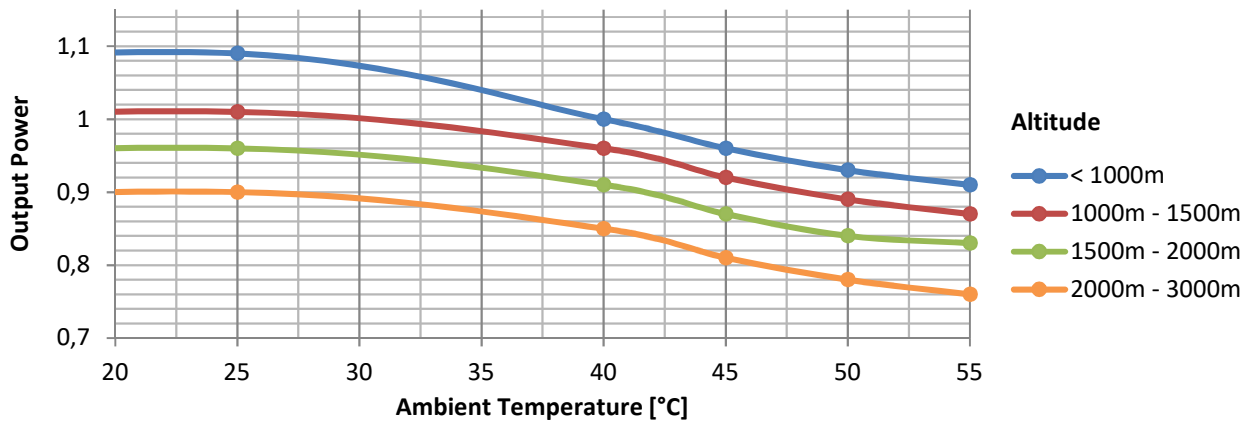
Bearing non drive end				6309-2RS-C3
Bearing drive end (B3/B14 form)				6314-2RS-C3
Weight of generator	in B2	kg		499
	in B3/B14	kg		501
	in B3/B9	kg		\

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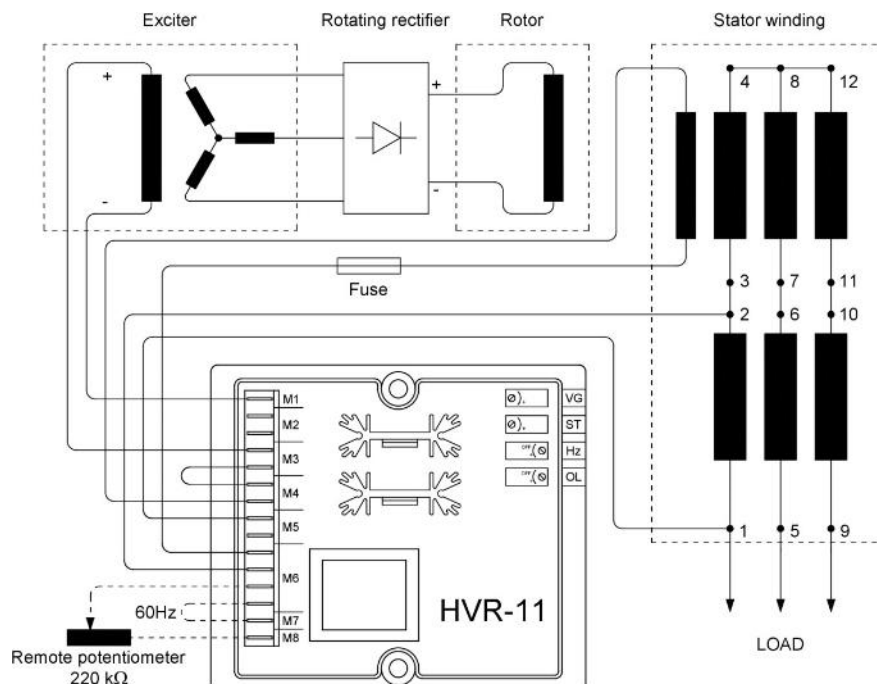
## MOMENT OF INERZIA

B3/B9	kg·m <sup>2</sup>	\
SAE 7½	kg·m <sup>2</sup>	\
SAE 8	kg·m <sup>2</sup>	\
SAE 10	kg·m <sup>2</sup>	\
SAE 11½	kg·m <sup>2</sup>	1,480
SAE 14	kg·m <sup>2</sup>	1,628
SAE 18	kg·m <sup>2</sup>	\
B3/B14	kg·m <sup>2</sup>	1,402

## DERATING CURVES



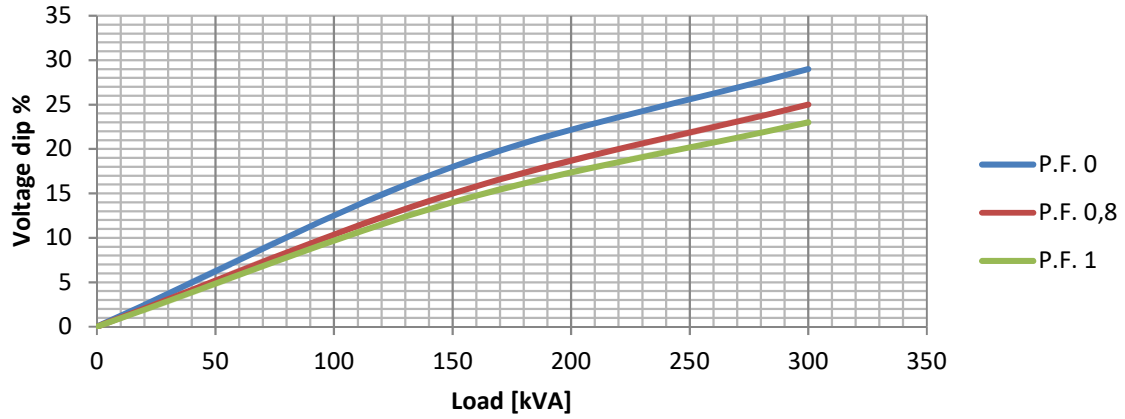
## WIRING DIAGRAM



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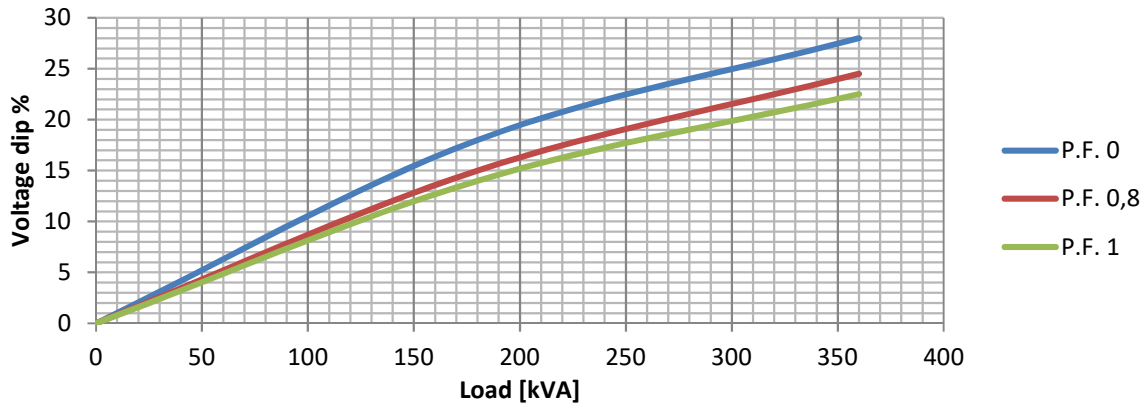
## TRANSIENT VOLTAGE VARIATION 50Hz

### Transient Voltage Variation @ 50Hz



## TRANSIENT VOLTAGE VARIATION 60Hz

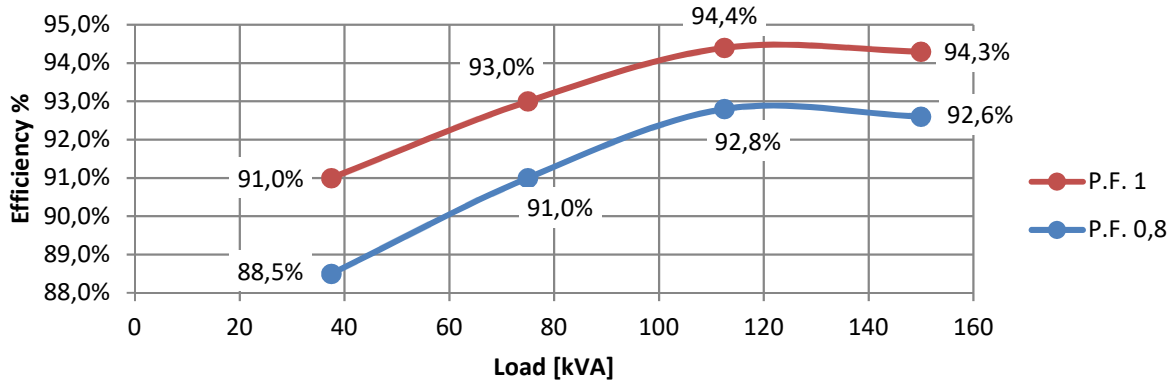
### Transient Voltage Variation @ 60Hz



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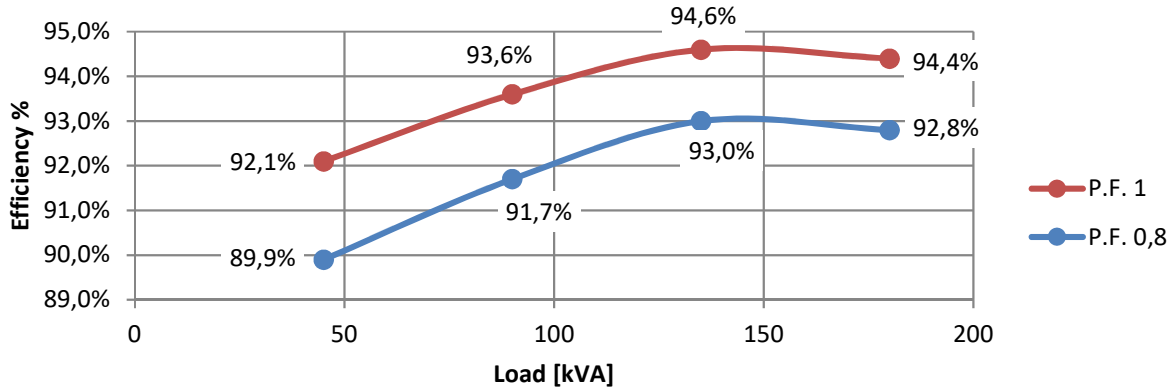
## EFFICIENCY 50Hz

### Efficiency Curves @ 50Hz



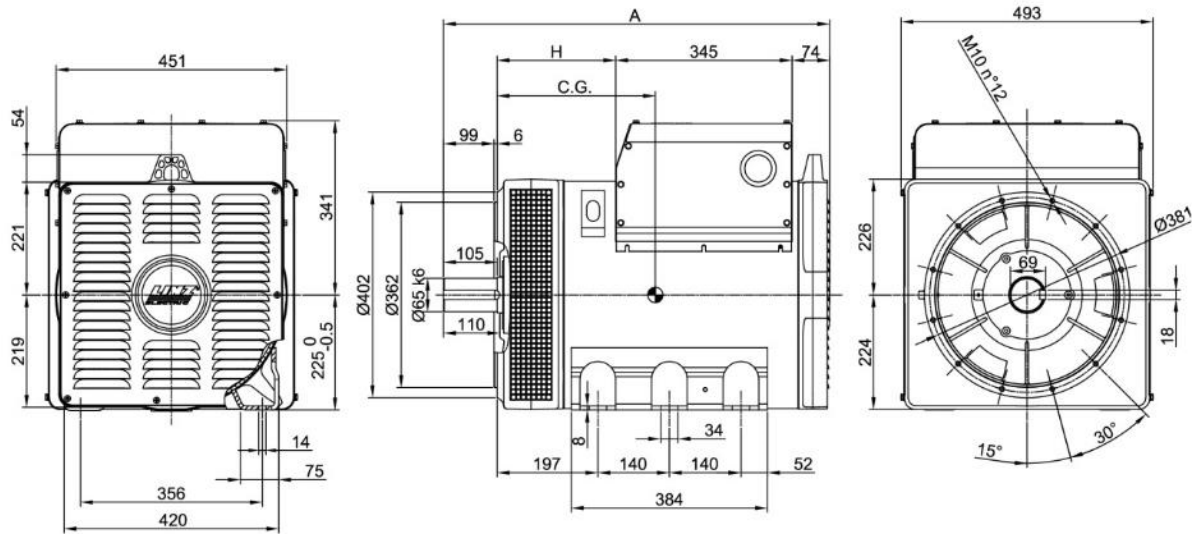
## EFFICIENCY 60Hz

### Efficiency Curves @ 60Hz

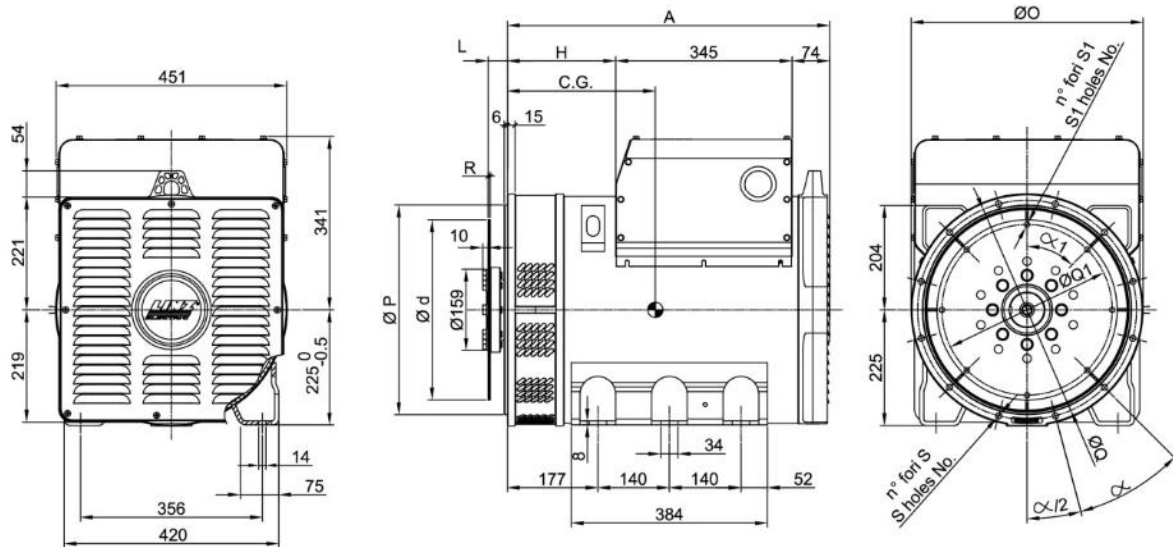


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## FORMA - FORM B3/B14



## FORMA - FORM SAE



FORMA - FORM		A	H
B3/B14	PRO 22S	756	232
	PRO 22M	886	362
SAE	PRO 22S	631	212
	PRO 22M	761	342

TIPO - TYPE	C.G.
PRO22S A/4 B3/B14	284
PRO22S B/4 B3/B14	293
PRO22S C/4 B3/B14	313
PRO22M E/4 B3/B14	359
PRO22M F/4 B3/B14	377

TIPO - TYPE	C.G.
PRO22S A/4 SAE	270
PRO22S B/4 SAE	279
PRO22S C/4 SAE	285
PRO22M D/4 SAE	298
PRO22M E/4 SAE	344
PRO22M F/4 SAE	362

SAE N.	FLANGIE - FLANGES - BRIDAS					
	Ø O	Ø P	Ø Q	n. fori holes No.	S	α
3	454	409.6	428.6	12	12	30°
2	492	447.68	466.7			
1	552	511.18	530.2			

SAE N.	GIUNTI A DISCO - COUPLING DISCS - JUNTAS A DISCOS						
	L	Ø d	Ø Q1	n. fori holes No.	S1	α1	R
11 1/2	39.6	352.42	333.37	8	10.5	45°	6
14	25.4	466.72	438.15	8	14	45°	