



## **ALTERNATOR PRO22M F/4**

*three-phase brushless synchronous alternator with AVR - 4 poles*

Technical Data Sheet

## 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 Overspeed	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	0.012 at 20°C	
Rotor Winding Resistance	4.52 at 20°C	
Exciter Stator Resistance	14.3 at 20°C	
Exciter Rotor Resistance	0.47 at 20°C	
THD at full load	<3%	
THD at no load	<3%	
Excitation at no load	A <sub>dc</sub>	0.76
Excitation at full load	A <sub>dc</sub>	2.5

### STANDARD

References	EN60034-1 ISO8528-3 EN55011
------------	-----------------------------

## PRO22M F/4

### 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		\

# PRO22M F/4

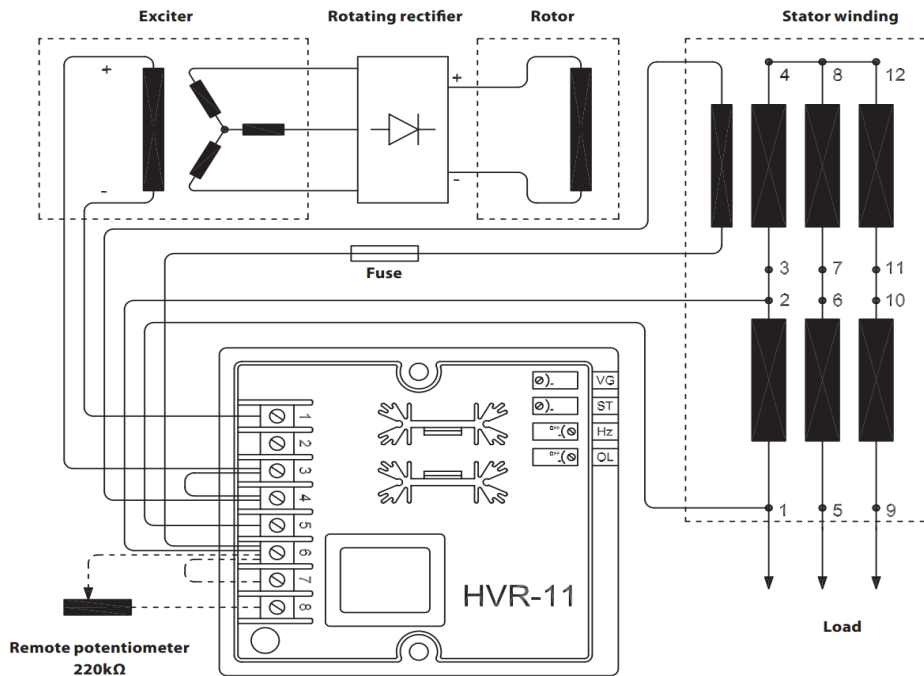
## MOMENT OF INERZIA

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>	1.48
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

## POWER VARIATION ACCORDING TO TEMPERATURE AND ALTITUDE

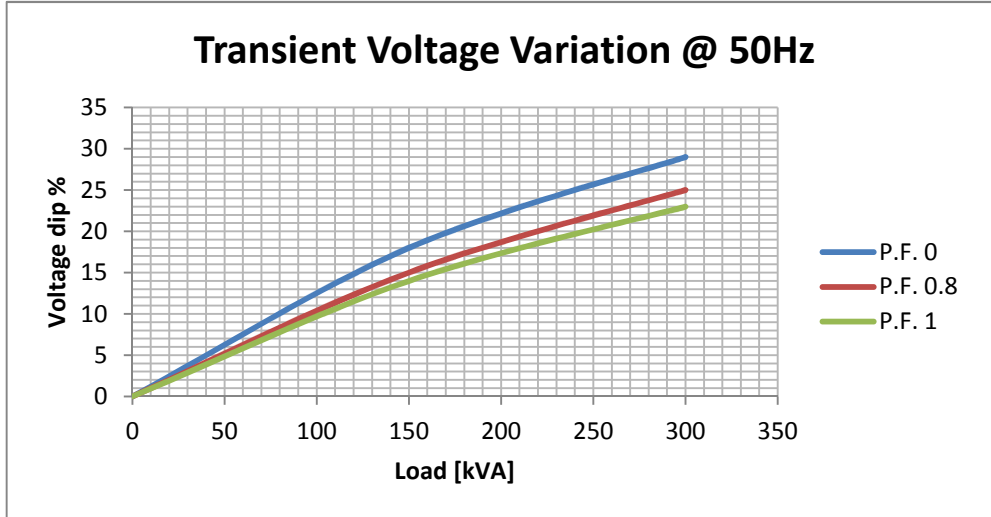
Altitude	Ambient temperature				
	25°C	40°C	45°C	50°C	55°C
< 1000m	1.09	1	0.96	0.93	0.91
1000m - 1500m	1.01	0.96	0.92	0.89	0.87
1500m - 2000m	0.96	0.91	0.87	0.84	0.83
2000m - 3000m	0.9	0.85	0.81	0.78	0.76

## WIRING DIAGRAM

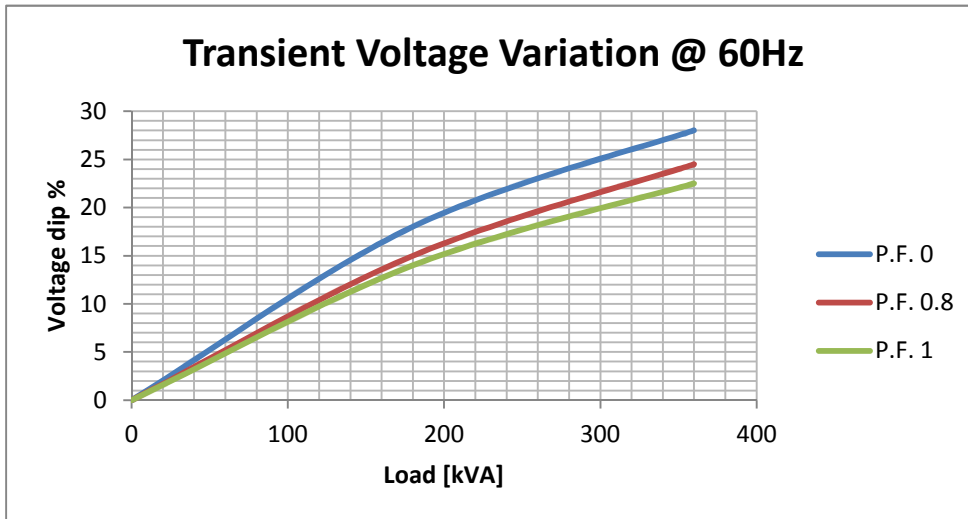


**PRO22M F/4**

**TRANSIENT VOLTAGE VARIATION 50Hz**

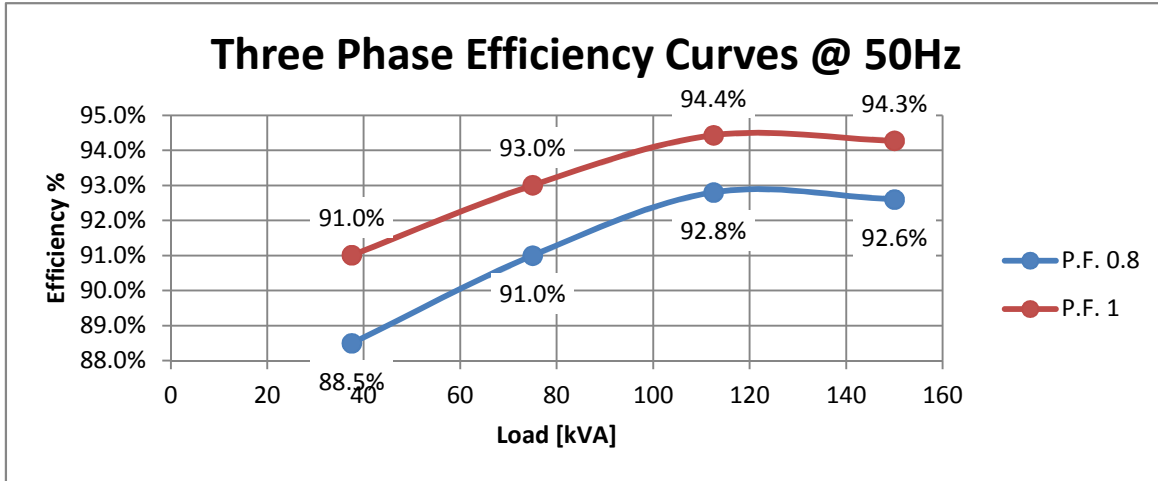


**TRANSIENT VOLTAGE VARIATION 60Hz**

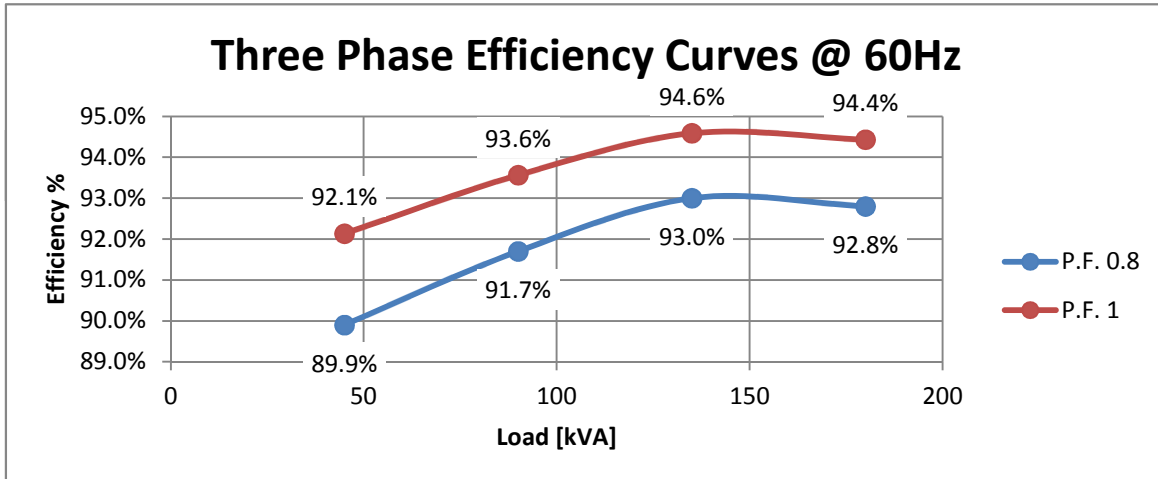


## PRO22M F/4

### EFFICIENCY 50Hz

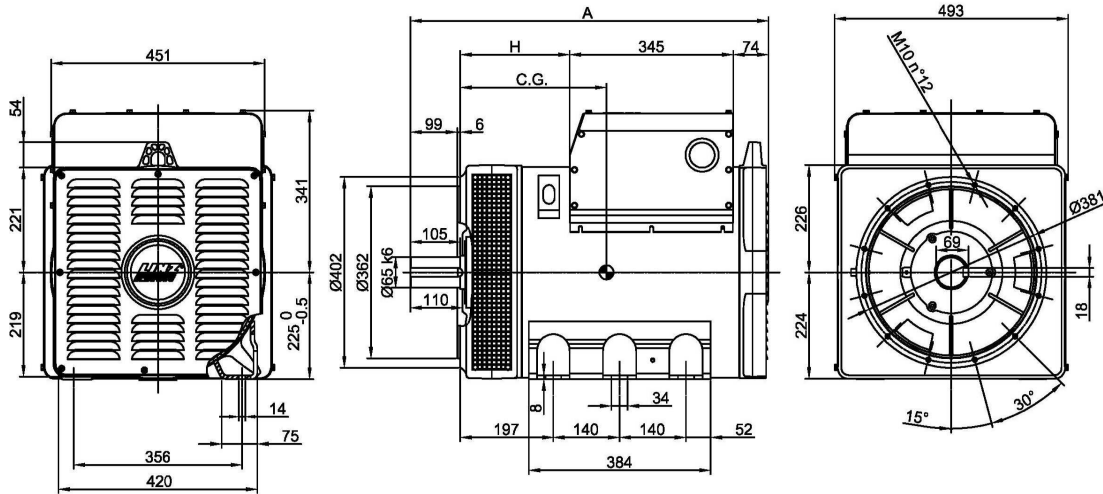


### EFFICIENCY 60Hz

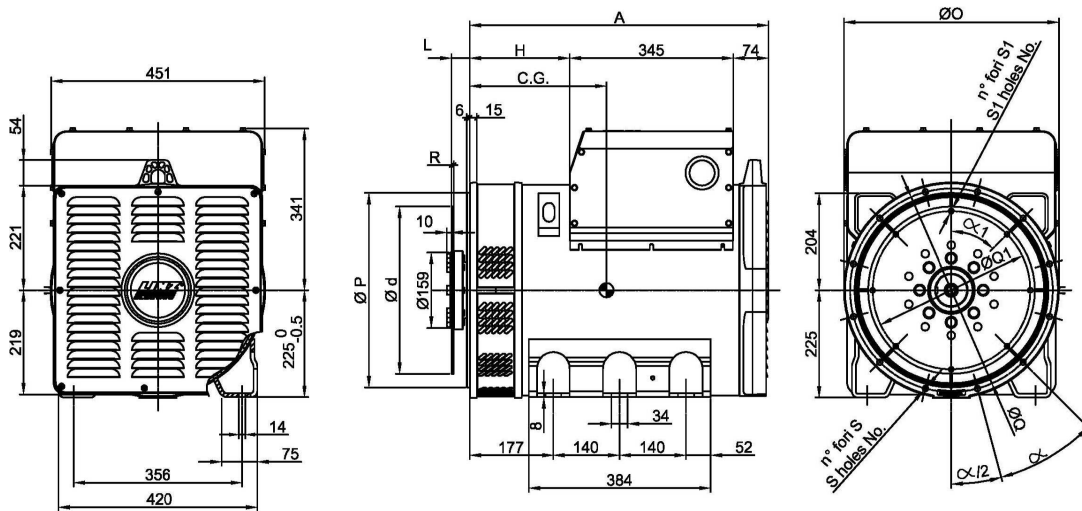


# PRO22M F/4

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	299
PRO22S D/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
PRO22S 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°	