STAMFORD

S7H1D-E4 Wdg.983 - Technical Data Sheet

Standards

STAMFORD industrial alternators meet the requirements of the relevant parts of the IEC 60034 and the relevant sections of other international standards such as BS5000-3, ISO 8528-3, VDE 0530, NEMA MG1-32, CSA C22.2-100 and AS 60034. Other standards and certifications can be considered on request.

Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Excitation and Voltage Regulators

Excitation System					
AVR Type	DECS100				
Voltage Regulation	± 0.25%				with 4% Engine Governing
AVR Power	PMG				

No Load Excitation Voltage (V)	15.2
No Load Excitation Current (A)	0.83
Full Load Excitation Voltage (V)	61
Full Load Excitation Current (A)	2.7
Exciter Time Constant (seconds)	0.22

STAMFORD

S7H1D-E4 Wdg.983

Electrical Data		
Insulation System	H	
Stator Winding	Double Layer Lap	
Winding Pitch	2/3	
Winding Leads	6	
Winding Number	983	
Number of Poles	4	
IP Rating	IP23	
RFI Suppression	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. Refer to factory for others	
Waveform Distortion	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%	
Short Circuit Ratio	1/Xd	
Steady State X/R Ratio	18.09	
50 Hz		
Telephone Interference	THF<2%	
Cooling Air Flow	2.398 m³/sec	
Voltage Star (V)	10500	11000
Voltage Parallel Star (V)	-	-
Voltage Delta (V)	-	-
kVA Base Rating (Class H) for Reactance Values (kVA)	1175	1175
Saturated Values in Per Unit at Base Ratings and Voltages		
Xd Dir. Axis Synchronous	2.25	2.05
X'd Dir. Axis Transient	0.18	0.17
X"d Dir. Axis Subtransient	0.14	0.12
Xq Quad. Axis Reactance	1.50	1.37
X"q Quad. Axis Subtransient	0.26	0.24
XL Stator Leakage Reactance	0.10	0.09
X2 Negative Sequence Reactance	0.17	0.15
X0 Zero Sequence Reactance	0.02	0.02
Unsaturated Values in Per Unit at Base Ratings and Voltages		
Xd Dir. Axis Synchronous	2.70	2.46
X'd Dir. Axis Transient	0.21	0.19
X"d Dir. Axis Subtransient	0.16	0.15
Xq Quad. Axis Reactance	1.55	1.41
X"q Quad. Axis Subtransient	0.32	0.29
XL Stator Leakage Reactance	0.11	0.10
Xlr Rotor Leakage Reactance	0.03	0.03
X2 Negative Sequence Reactance	0.20	0.18
X0 Zero Sequence Reactance	0.03	0.03

STAMFORD

S7H1D-E4 Wdg.983

Time Constants (Seconds)		
T'd Transient Time Const.	0.128	
T''d Sub-Transient Time Const.	0.018	
T'do O.C. Field Time Const.	3.025	
Ta Armature Time Const.	0.029	
T''q Sub-Transient Time Const.	0.011	
Resistances in Ohms (Ω) at 22^{0}C		
Stator Winding Resistance (Ra), per phase for series connected	1.361	
Rotor Winding Resistance (Rf)	2.187	
Exciter Stator Winding Resistance	19.56	
Exciter Rotor Winding Resistance per phase	0.103	
PMG Phase Resistance (Rpmg) per phase	1.91	
Positive Sequence Resistance (R1)	1.701	
Negative Sequence Resistance (R2)	1.960	
Zero Sequence Resistance (R0)	1.701	
Saturation Factors	11000V	
SG1.0	0.176	
SG1.2	0.731	
Mechanical Data		
Shaft and Keys	All alternator rotors are dynamically balanced to better than ISO 21940-11 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.	
	1 Bearing	2 Bearing
SAE Adaptor	SAE00, 0	SAE00,0
Moment of Inertia	28.5262 kgm²	28.5479 kgm²
Weight Wound Stator	1295kg	1296kg
Weight Wound Rotor	680kg	680kg
Weight Complete Alternator	3788kg	3683kg
Shipping weight in a Crate	3868kg	3763kg
Packing Crate Size	240*140*160(cm)	240*140*160(cm)
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	BALL 6232
Bearing Non-Drive End	BALL 6319	BALL 6319

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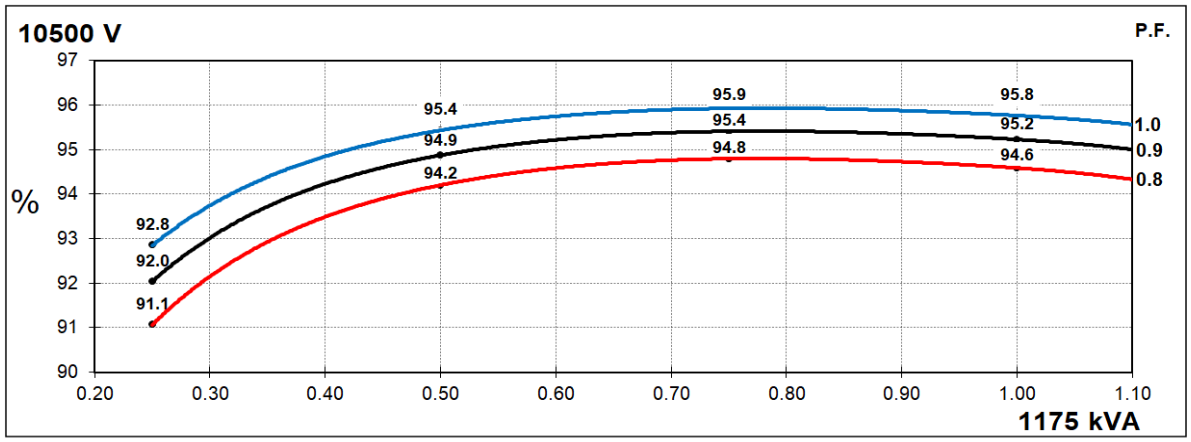
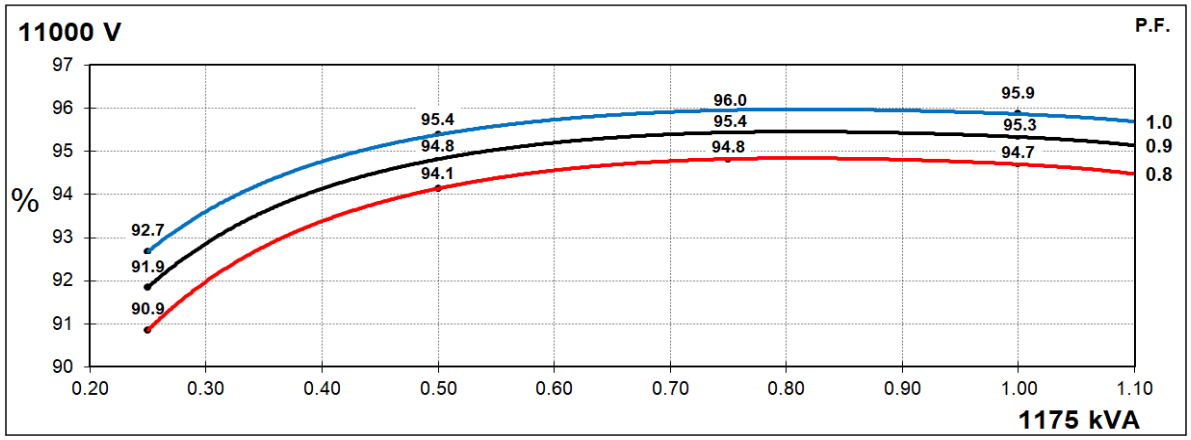
S7H1D-E4 Wdg.983

THREE PHASE EFFICIENCY CURVES

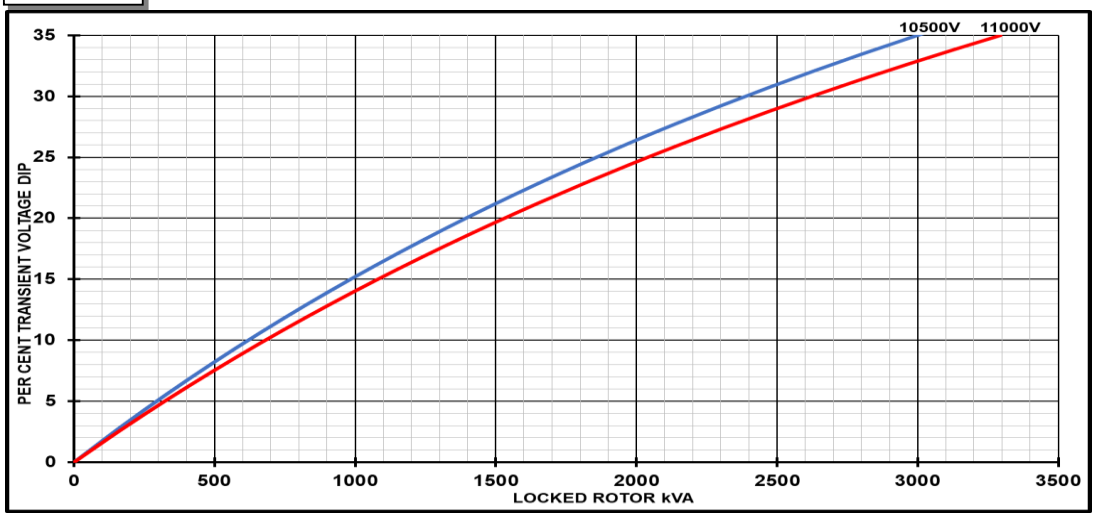
50Hz





Locked Rotor Motor Starting Curves - Separately Excited

50Hz



Transient Voltage Dip Scaling Factor	
Lagging PF	Scaling Factor
<= 0.4	1.00
0.5	0.95
0.6	0.90
0.7	0.86
0.8	0.83
0.9	0.75
0.95	0.70
1	0.65

Transient Voltage Rise Scaling Factor	
Lagging PF	Scaling Factor
<= 0.4	1.25
0.5	1.20
0.6	1.15
0.7	1.10
> 0.7	1.00

Note: To determine % Transient Voltage Dip or Voltage Rise at various PF, multiply the % Voltage Dip from the curve directly by the Scaling Factor.

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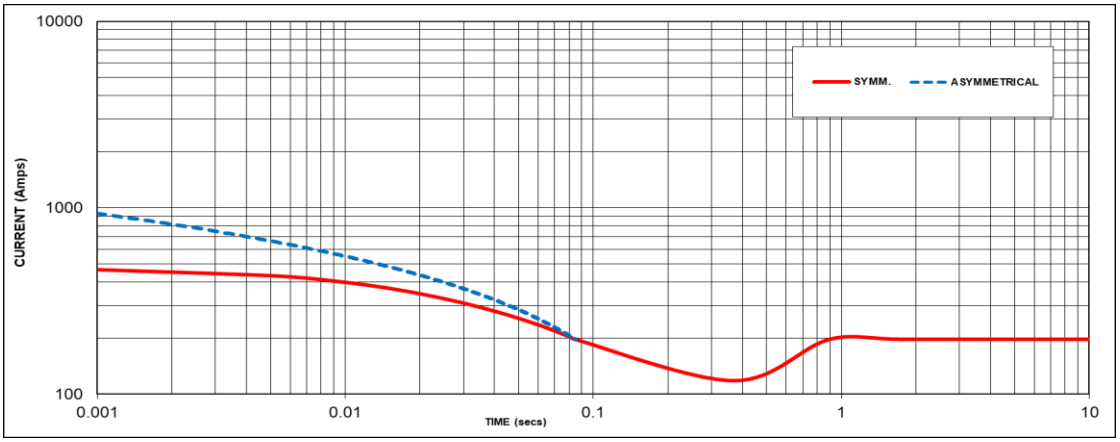
S7H1D-E4 Wdg.983

Three-phase Short Circuit Decrement Curve - Separately Excited

50Hz



Sustained Short Circuit = 197 Amps

Note 1
The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
10500V	X 0.95	-	X 1.00
11000V	X 1.00	-	X 1.06
-	-	-	X 1.12
-	-	-	X 1.17

The sustained current value is constant irrespective of voltage level

Note 2
The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3
Curves are drawn for Star connections under no-load excitation at rated speeds. For other connection (where applicable) the following multipliers should be applied to current values as shown :
Parallel Star = Curve current value X 2
Series Delta = Curve current value X 1.732

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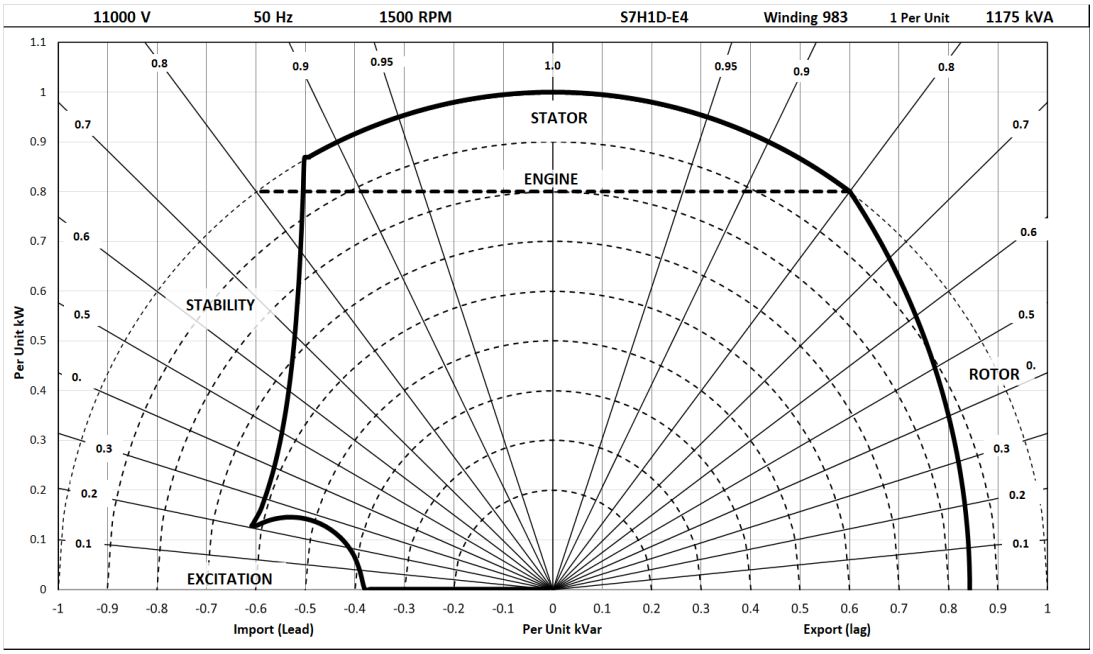
S7H1D-E4 Wdg.983

Typical Alternator Operating Charts

11000V/50Hz



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S7H1D-E4 Wdg.983

RATINGS AT 0.8 POWER FACTOR

	Class - Temp Rise	Standby - 163/27°C		Standby - 150/40°C		Cont. H - 125/40°C		Cont. F - 105/40°C	
50 Hz	Star (V)	10500	11000	10500	11000	10500	11000	10500	11000
	Parallel Star (V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	kVA	1295	1295	1255	1255	1175	1175	1090	1090
	kW	1036	1036	1004	1004	940	940	872	872
	Efficiency (%)	94.4	94.5	94.4	94.6	94.6	94.7	94.7	94.8
	kW Input	1098	1096	1063	1062	994	993	921	920

60 Hz	Star (V)	N/A	N/A	N/A	N/A
	Parallel Star (V)	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A
	kVA	N/A	N/A	N/A	N/A
	kW	N/A	N/A	N/A	N/A
	Efficiency (%)	N/A	N/A	N/A	N/A
	kW Input	N/A	N/A	N/A	N/A

De-rates

All values tabulated above are subject to the following reductions:

- 5% when air inlet filters are fitted
- 3% for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- 3% for every 5°C by which the operational ambient temperature exceeds 40°C @ Class H temperature rise (please refer to applications for ambient temperature de-rates at other temperature rise classes)
- For marine alternators, 3% for every 5°C by which the operational ambient temperature exceeds 50°C
- For any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60°C and altitude exceeding 4000 meters (for <690V) or 1500 meters (for >690V) must be referred to applications.

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (http://stamford-avk.com/)

Note: Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

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