

S1L2-R1 Winding 14

S1L2-R1 - Technical Data Sheet

Standards

Stamford industrial alternators meet the requirements of IEC EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100 and AS1359. 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	AVR Power
AS540	Self-Excited
Voltage Regulation	± 1%
No Load Excitation Voltage (V)	7.8 V
Full Load Excitation Voltage (V)	42.7 V



Electrical Data										
Insulation System	Class H									
Stator Winding	Double Layer Concentric									
Winding Pitch	Two Thirds									
Winding Leads	12									
Winding Number		14								
Number of Poles		4								
IP Rating	IP23									
RFI Suppression	EN 61000-6-2 & EN 61000-6-4, refer to factory for others									
Waveform Distortion	NO LOAD < 2.5	% NON-DISTORT	ING BALANCED LINI	EAR LOAD < 5.0%						
Short Circuit Ratio			1/Xd							
Steady State X/R Ratio			N/A							
			60 Hz							
Telephone Interference		Т	TF<75							
Voltage Series Star	380	400	416	_						
Voltage Parallel Star	190	200	208	-						
Voltage Series Delta	220	230	240	_						
kVA Base Rating (Class H)	62.5	62.5	62.5	-						
Saturated Values in Per Unit at Base	Ratings and Voltag	es								
Xd Dir. Axis Synchronous	3.468	3.130	2.894	-						
X'd Dir. Axis Transient	0.121	0.109	0.101	-						
X"d Dir. Axis Subtransient	0.108	0.097	0.090	-						
Xq Quad. Axis Reactance	2.083	1.880	1.738 -							
X"q Quad. Axis Subtransient	0.209	0.188	0.174	-						
XL Stator Leakage Reactance	0.121	0.109	0.101	-						
X2 Negative Sequence Reactance	0.107	-								
X0 Zero Sequence Reactance	0.085 0.077 0.071									
Unsaturated Values in Per Unit at Ba	se Ratings and Vol	tages								
Xd Dir. Axis Synchronous	4.162	3.756	3.473	-						
X'd Dir. Axis Transient	0.139	0.126	0.116	-						
X"d Dir. Axis Subtransient	0.126	0.114	0.105	-						
Xq Quad. Axis Reactance	2.145	1.936	1.790	-						
X"q Quad. Axis Subtransient	0.250	0.226	0.209	-						
XL Stator Leakage Reactance	0.137	0.123	0.114	-						
X2 Negative Sequence Reactance	0.128	0.116	0.107	-						
X0 Zero Sequence Reactance	0.100	0.090	0.083	-						
Time Constants (Seconds)										
T'd TRANSIENT TIME CONST.	0.014									
T"d SUB-TRANSTIME CONST.	0.002									
T'do O.C. FIELD TIME CONST.	0.624									
Ta ARMATURE TIME CONST.	0.005									
	0.000									

Page 2



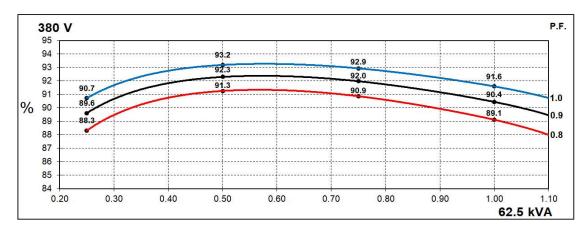
Resistances in Ohms (Ω) at 22°C					
Stator Winding Resistance (Ra)	$0.094~\Omega$ per phase series star connected				
Rotor Winding Resistance (Rf)	1.100 Ω 14.700 Ω				
Exciter Stator Winding Resistance					
Exciter Rotor Winding Resistance	0.104 Ω per phase				
Positive Sequence Resistance (R1)	0 118 O				
Negative Sequence Resistance (R2	0.135 Ω				
Zero Sequence Resistance (R0)	0.118 Ω				
Aux Winding Resistance	N/A				
Mechanical data					
Cooling Air	0.212 m³/sec				
	All alternator rotors are dynamically balanced to better than				
Shaft and Keys	BS6861: Part 1 Grade 2.5 for minimum vibration in operation.				
Bearing	Single Bearing				
Weight Complete Alternator	204.6 kg				
Weight Wound Stator	89.8 kg				
Weight Wound Rotor	78 kg				
Moment of Inertia	0.3544 kgm ²				
Shipping weight in a Crate	252 kg 1050X570X960 mm				
Packing Crate Size	1050X570X960 mm				
Maximum Over Speed	2250 RPM for two minutes				
Bearing Drive End	N/A				
Bearing Non-Drive End	Ball Bearing, 6306-2RS1				

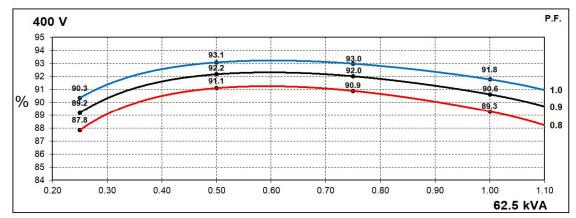


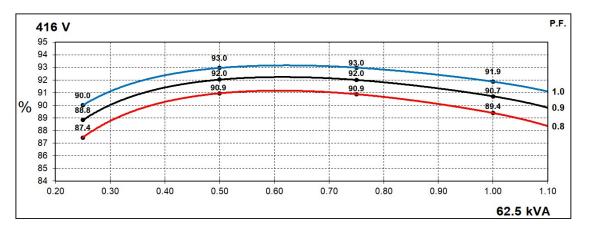
S1L2-R1 Winding 14

Three Phase Efficiency Curves

60Hz Curves





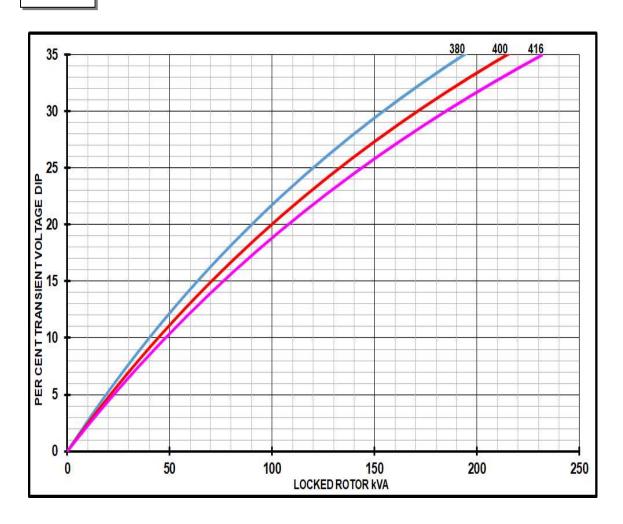




S1L2-R1 Winding 14

Locked Rotor Motor Starting Curves

60Hz



Transient Voltage	Dip Scaling Factor	Transient Voltage Rise Scaling Factor					
Lagging PF	Scaling Factor	Lagging PF	Scaling Factor				
<= 0.4	1.00	<= 0.4	1.25				
0.5	0.95	0.5	1.20				
0.6	0.90	0.6	1.15				
0.7	0.86	0.7	1.10				
0.8	0.83	> 0.7	1.00				
0.9	0.75						
0.95	0.70						
1	0.65						

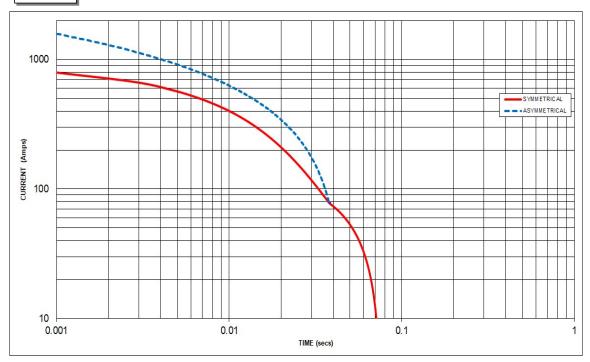
Note: To determine % Transient Voltage Dip or Rise at various PF, multiply the % Voltage Dip from the curve directly by the scaling factor.

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Three-phase Short Circuit Decrement Curve

60Hz



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
-	1	380V	X 1.00
-	-	400V	X 1.05
-	-	416V	X 1.09
-	-	-	-

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:

i i			
	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	N/A	N/A	N/A
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3

Curves are drawn for Star connected machines under no-load excitation at rated speeds. For other connection the following multipliers should be applied to current values as shown:

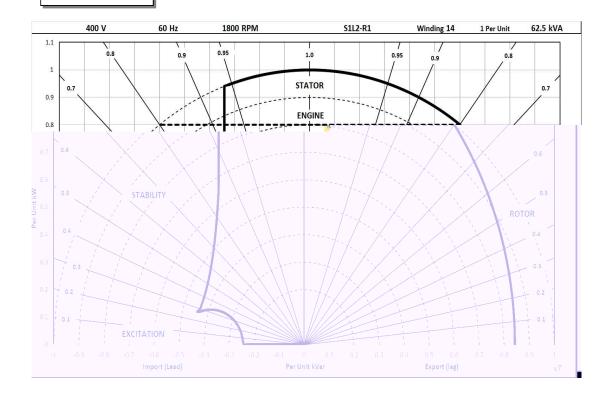
Parallel Star = Curve current value X 2

Series Delta = Curve current value X 1.732



Typical Alternator Operating Charts

400V/60Hz





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					
	Series Star (V)	N/A															
50	Parallel Star (V)			N/A			N/A			N/A							
' '	Series Delta (V)																
ļ	kVA	N/A		N/A							N/A						
	kW						N/A										
	Efficiency (%)																
	kW Input																
		.				1				<u> </u>				ı			
60	Series Star (V)	380	400	416	-	380	400	416	-	380	400	416	-	380	400	416	-
Hz	Parallel Star (V)	190	200	208	-	190	200	208	-	190	200	208	-	190	200	208	-
	Series Delta (V)	220	230	240	-	220	230	240	-	220	230	240	-	220	230	240	-
	kVA	66.3	66.3	66.3	-	65.0	65.0	65.0	-	62.5	62.5	62.5	-	56.0	56.0	56.0	-
	kW	53.0	53.0	53.0	-	52.0	52.0	52.0	-	50.0	50.0	50.0	-	44.8	44.8	44.8	-
	Efficiency (%)	88.5	88.7	88.8	-	88.7	88.9	89.0	-	89.1	89.3	89.4	-	90.0	90.1	90.2	-
	kW Input	59.9	59.8	59.7	-	58.6	58.5	58.4	-	56.1	56.0	55.9	-	49.8	49.7	49.7	-

De-Rates

All values tabulated above are subject to the following reductions:

- 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
- 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 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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