

STAMFORD®

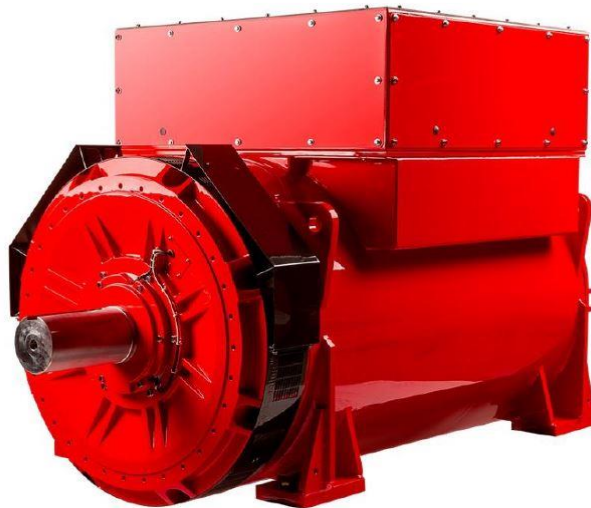
S9H1D-H4 Wdg.63 - Technical Data Sheet

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	DM110	DECS100	DECS150		
Voltage Regulation	± 0.25%	± 0.25%	± 0.25%		with 4% Engine Governing
AVR Power	PMG	PMG	PMG		

No Load Excitation Voltage (V)	12.4 - 11.5
No Load Excitation Current (A)	1 - 0.93
Full Load Excitation Voltage (V)	46.9
Full Load Excitation Current (A)	3.8
Exciter Time Constant (seconds)	0.34

STAMFORD

S9H1D-H4 Wdg.63

Electrical Data			
Insulation System	H		
Stator Winding	Double Layer Lap		
Winding Pitch	5/6		
Winding Leads	6		
Winding Number	63		
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	47.88		
		50 Hz	60 Hz
Telephone Interference	THF<2%	TIF<50	
Cooling Air Flow	2.78 m³/sec	3.33 m³/sec	
Voltage Series Star (V)	5500	6600	
Voltage Parallel Star (V)	-	-	
Voltage Delta (V)	-	-	
kVA Base Rating (Class H) for Reactance Values (kVA)	4520	5250	
Saturated Values in Per Unit at Base Ratings and Voltages			
Xd Dir. Axis Synchronous	2.461	2.382	
X'd Dir. Axis Transient	0.192	0.186	
X''d Dir. Axis Subtransient	0.130	0.125	
Xq Quad. Axis Reactance	1.209	1.170	
X''q Quad. Axis Subtransient	0.207	0.200	
XL Stator Leakage Reactance	0.093	0.090	
X2 Negative Sequence Reactance	0.173	0.167	
X0 Zero Sequence Reactance	0.098	0.095	
Unsaturated Values in Per Unit at Base Ratings and Voltages			
Xd Dir. Axis Synchronous	2.953	2.858	
X'd Dir. Axis Transient	0.221	0.214	
X''d Dir. Axis Subtransient	0.152	0.147	
Xq Quad. Axis Reactance	1.245	1.205	
X''q Quad. Axis Subtransient	0.248	0.240	
XL Stator Leakage Reactance	0.105	0.102	
Xlr Rotor Leakage Reactance	0.221	0.214	
X2 Negative Sequence Reactance	0.208	0.201	
X0 Zero Sequence Reactance	0.115	0.111	

STAMFORD

S9H1D-H4 Wdg.63

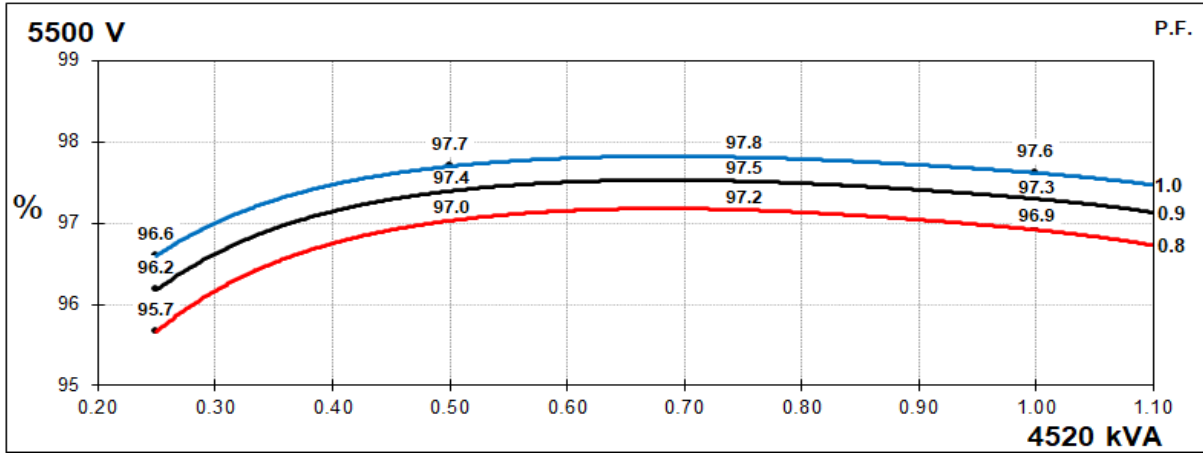
Time Constants (Seconds)		
T'd Transient Time Const.	0.230	
T''d Sub-Transient Time Const.	0.017	
T'do O.C. Field Time Const.	3.068	
Ta Armature Time Const.	0.085	
T''q Sub-Transient Time Const.	0.0190	
Resistances in Ohms (Ω) at 22^oC		
Stator Winding Resistance (Ra), per phase for series connected	0.0420	
Rotor Winding Resistance (Rf)	0.81	
Exciter Stator Winding Resistance	11.2	
Exciter Rotor Winding Resistance per phase	0.016	
PMG Phase Resistance (Rpmg) per phase	1.91	
Positive Sequence Resistance (R1)	0.0525	
Negative Sequence Resistance (R2)	0.0605	
Zero Sequence Resistance (R0)	0.0525	
Saturation Factors	5500V	6600V
SG1.0	0.176	0.176
SG1.2	0.762	0.762
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		00, None
Moment of Inertia	-	126.3 kgm ²
Weight Wound Stator	-	3076kg
Weight Wound Rotor	-	2862kg
Weight Complete Alternator	-	7750kg
Shipping weight in a Crate	-	8152kg
Packing Crate Size	-	300 x 200 x 220(cm)
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	NU1036
Bearing Non-Drive End	-	6328

STAMFORD[®]

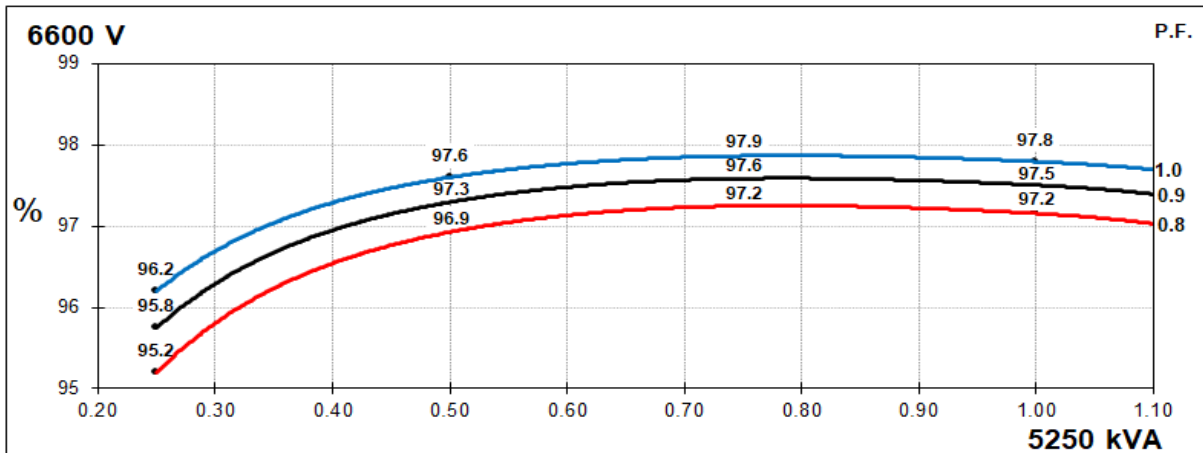
S9H1D-H4 Wdg.63

THREE PHASE EFFICIENCY CURVES

50Hz



60Hz

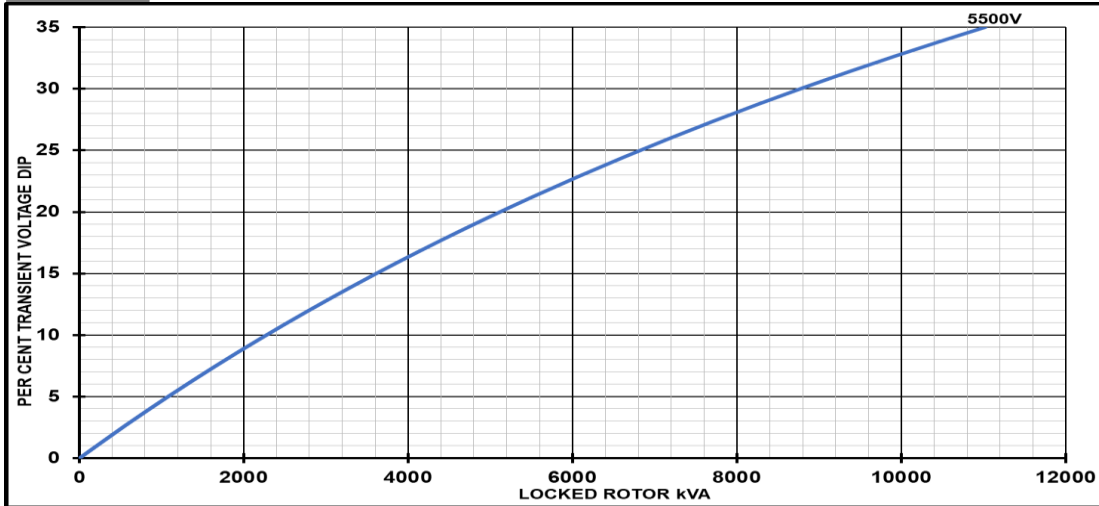


STAMFORD®

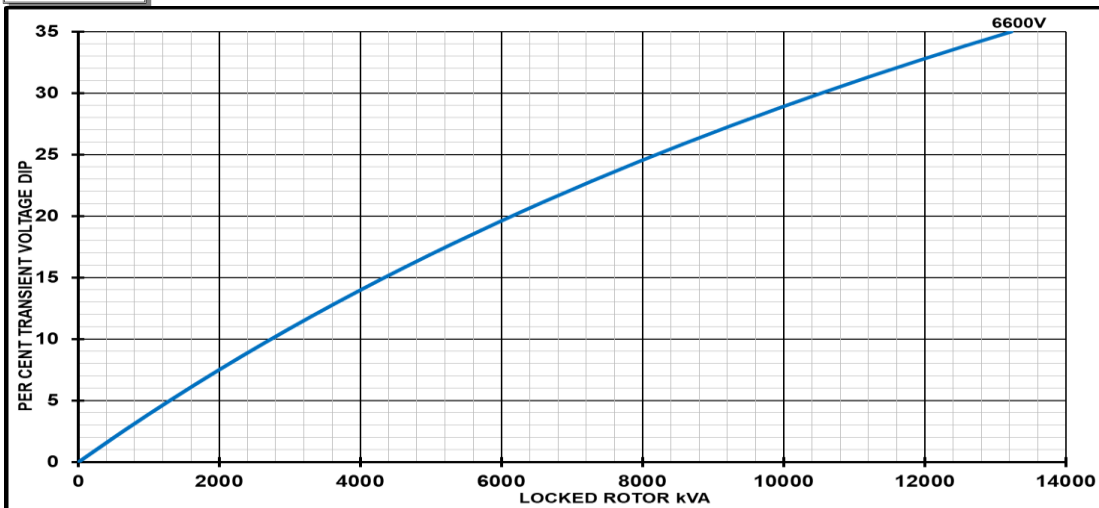
S9H1D-H4 Wdg.63

Locked Rotor Motor Starting Curves - Separately Excited

50Hz



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		

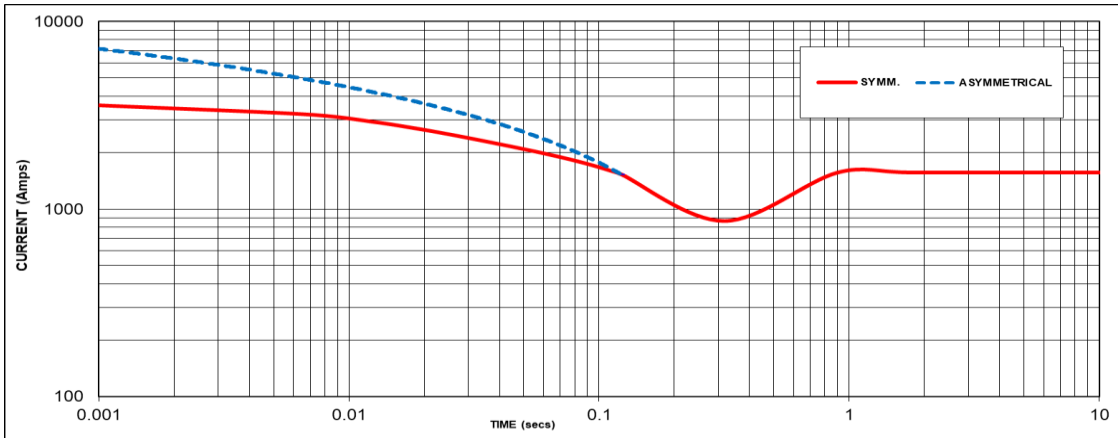
Note: To determine % Transient Voltage Dip or Voltage Rise at various PF, multiply the % Voltage Dip from the curve directly by the Scaling Factor.

STAMFORD[®]

S9H1D-H4 Wdg.63

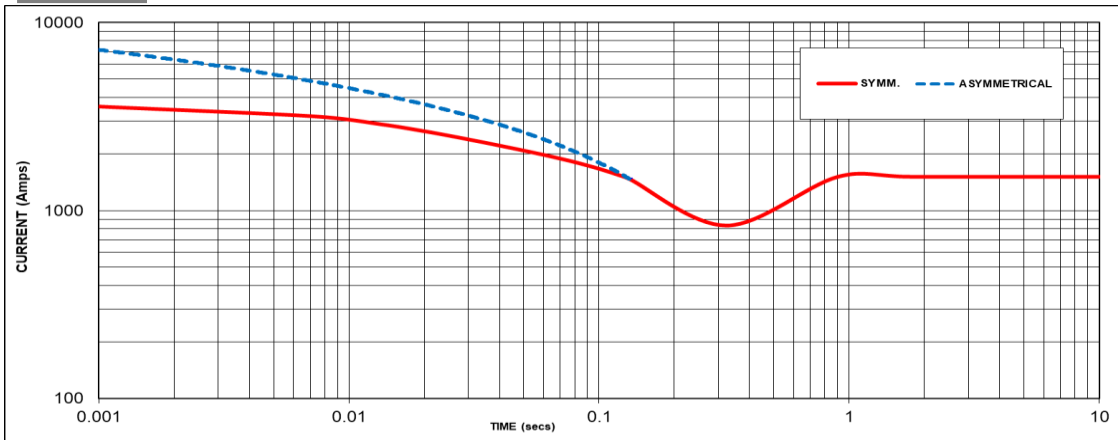
Three-phase Short Circuit Decrement Curve - Separately Excited

50Hz



Sustained Short Circuit = 1566 Amps

60Hz



Sustained Short Circuit = 1516 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
5500V	X 1.00	6600V	X 1.00
-	-	-	-
-	-	-	-
-	-	-	-

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.

Note 3

All other times are unchanged

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

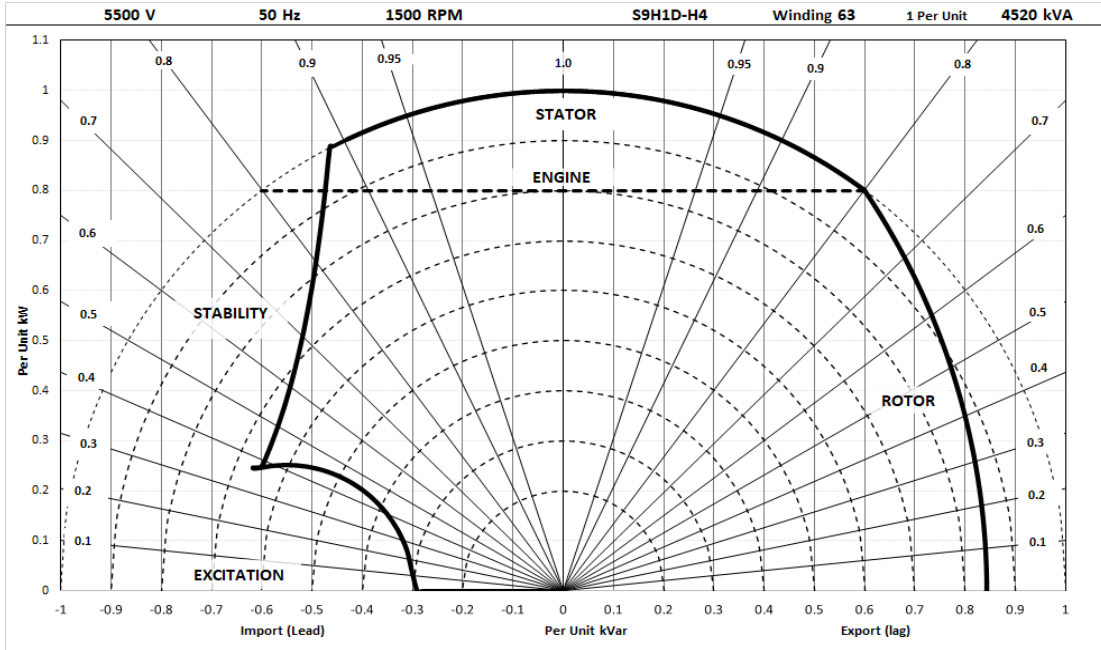
Series Delta = Curve current value X 1.732

STAMFORD®

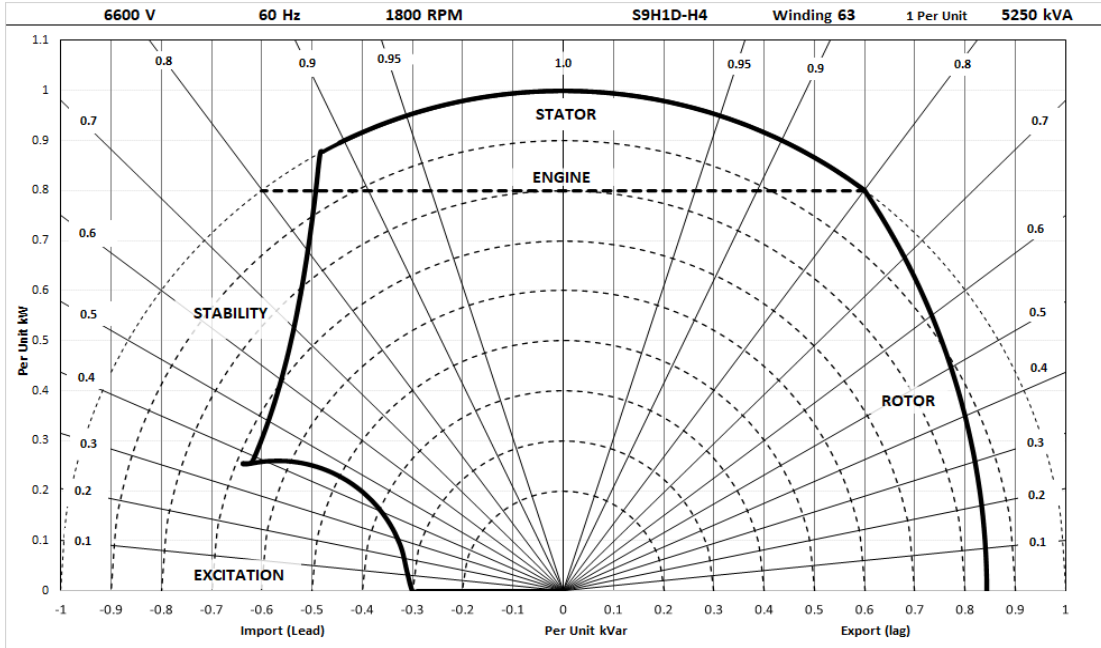
S9H1D-H4 Wdg.63

Typical Alternator Operating Charts

5500V/50Hz



6600V/60Hz



STAMFORD®

S9H1D-H4 Wdg.63

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)	5500	5500	5500	5500
	Parallel Star (V)	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A
	kVA	4972	4836	4520	4158
	kW	3978	3869	3616	3326
	Efficiency (%)	96.7	96.8	96.9	97.0
	kW Input	4111	3997	3731	3428

60 Hz	Star (V)	6600	6600	6600	6600
	Parallel Star (V)	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A
	kVA	5775	5618	5250	5097
	kW	4620	4494	4200	4078
	Efficiency (%)	97.0	97.1	97.2	97.2
	kW Input	4761	4629	4323	4196

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 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.



Follow us @stamfordavk



Cummins Generator Technologies



View our videos at youtube.com/stamfordavk

stamford-avk.com

**For Applications Support:
applications@cummins.com**

**For Customer Service:
emea.service@cummins.com**

**For General Enquiries:
Stamford-avk@cummins.com**

Copyright 2023. Cummins Generator Technologies Ltd. All rights reserved.
Cummins and the Cummins logo are registered trade marks of Cummins Inc.
STAMFORD is a registered trade mark of Cummins Generator Technologies Ltd.

