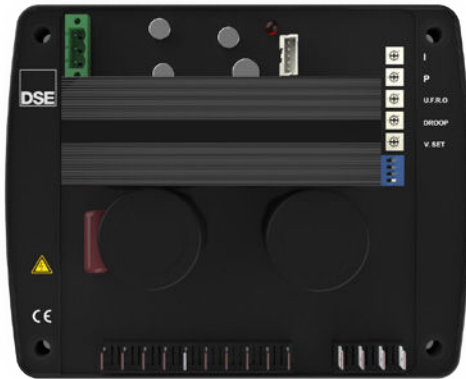


## DSEA109 Digital Automatic Voltage Regulator (AVR) with CAN Communications & PMG Support

Part Number: A109-01



### Overview

The DSEA109 Digital Automatic Voltage Regulator (AVR) is designed to regulate the output voltage of an AC generator. The DSEA109 is supplied by either a Permanent Magnet Generator (PMG), stator auxiliary winding or self excited from the generator's main stator windings (shunt).

The DSEA109 eliminates the complexities involved with analogue AVR designs. Analogue AVR designs can be oversensitive to change in temperature which affects the generators output voltage stability, where as the DSEA109 AVR maintains a smooth, stable regulated AC output voltage, regardless of the electrical load connected. The DSEA109 also features 3 phase generator terminal sensing for better regulation.

The DSEA109 is simple to install and set up using the DSE Configuration Suite PC Software with the DSE815 configuration interface. On board DIP switches and potentiometers can be used to further adjust the selected configuration and set points within the AVR at a later date by on site maintenance engineers.

The DSEA109 has numerous advanced features such as a CAN port providing J1939 communications. This allows the AVR to be connected to supported DSE modules to display AVR instrumentation, and send control commands such as voltage adjustment and configuration selection. In addition to this, the DSEA109 also provides a soft start ramping feature, connection for a droop CT and the ability to perform remote voltage set point adjustment. All of these feature make it perfect for synchronising and loadsharing applications.

The DSEA109 AVR is an ideal option for both OEM and retro-fit solutions and is a suitable aftermarket replacement for multiple OEM AVR products. Speak to DSE's dedicated Technical Support team before placing your order to confirm full compatibility.

### Key Features

- LED indication for fault and operating status
- On board DIP switch selection for 6 configurations and 2 stability ranges
- On board potentiometer adjustment for generator voltage set point, droop percentage, UFRO start frequency, proportional (gain) and integral (stability).
- Remote generator voltage set point adjustment using 5 kΩ potentiometer (with open circuit protection) and/or – 10 V to +10 V DC control signal.
- Compatible with single phase and 3 phase power supply source supplied from a Self Excited (Shunt), Auxiliary Winding or PMG connection.
- Single or 3 phase generator terminal voltage sensing
- Loss of generator terminal voltage sensing protection
- Under Frequency Roll Off (UFRO) protection with optional instantaneous step.
- Over excitation protection
- Optional idle running detection to prevent over excitation
- Soft ramping of generator terminal voltage to set point on start up.
- CAN port providing J1939 communication allowing compatible DSE modules to display AVR instrumentation and send control commands for voltage control and stability/configuration selection.

### Product Documentation

053-245 – DSEA109 Installation Instructions

057-295 – DSEA109 Operator Manual

057-294 - DSEA109 Configuration Suite PC Software Manual



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Part Number: A109-01

Specifications	
<b>Power Supply</b>	
Supply Source	Self Excited (Shunt), Auxiliary Winding or PMG
Supply Input	Single Phase or 3 Phase
Voltage Range	100 V <sub>AC</sub> to 270 V <sub>AC</sub>
Frequency Range	40 Hz to 400 Hz
<b>Generator Terminal Voltage Measurement</b>	
Measurement Input	Single Phase or 3 Phase
Voltage Range	15 V <sub>AC</sub> to 600 V <sub>AC</sub> Phase to Neutral or Phase to Phase
Voltage Accuracy	±0.5 %
Frequency Range	40 Hz to 65 Hz
Frequency Accuracy	±0.2 Hz
<b>Drop CT Current Measurement</b>	
Measurement Input	Single Phase
Current Range	0 A to 5 A
VA Rating	0.25 VA
Accuracy	±0.05 A
Drop Adjustment	0 % to 10 %
<b>Remote Bias Inputs</b>	
Number	2
Type	1 Resistive Analogue Input 1 Voltage Analogue Input
Resistive Analogue Input Range	0 Ω to 5 kΩ
Resistive Bias Range	±1 % to ±16 % of Nominal Voltage
Voltage Analogue Input Range	-10 VDC to +10 VDC
Voltage Analogue Input Impedance	Greater than 10 kΩ
Voltage Bias Range	±1 %/V to ±16 %/V of Nominal Voltage
<b>Excitation Output</b>	
Voltage Range	0 V <sub>DC</sub> to 100 V <sub>DC</sub> continuous 100 V <sub>DC</sub> to 150 V <sub>DC</sub> for 10 seconds
Current Range	0 A <sub>DC</sub> to 7 A <sub>DC</sub> continuous 7 A <sub>DC</sub> to 15 A <sub>DC</sub> for 10 seconds
Maximum Continuous Output Power	500 W
Exciter Winding Impedance	5 Ω to 50 Ω
Exciter Winding Inductance	0.3 H to 1.2 H

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## DSEA109 Digital Automatic Voltage Regulator (AVR) with CAN Communications & PMG Support

Part Number: A109-01

Specifications	
<b>Communications</b>	
DSE815 Configuration Port	1 Programming Port
CAN	1 Fully Isolated Port
<b>Temperature</b>	
Operating Temperature	-40 °C to +70 °C / -40 °F to +158 °F
Storage Temperature	-40 °C to +85 °C / -40 °F to +185 °F
<b>Dimensions</b>	
Overall (W x H x D)	180 mm x 145 mm x 61 mm / 7.09 " x 4.72" x 2.40 "
<b>Mounting</b>	
Type	Chassis Mounting
Mounting Holes	4 M5 mounting holes with 150 mm x 120 mm / 5.91 " x 4.72 " centres
Weight	0.62 kg / 1.37 lb

Related Products		
<b>DSEGenSet®</b>		
DSEG8900	7" Colour Parallel Genset Controller	G8900-01
DSEG8600	Parallel Genset Controller with Integral Heater	G8600-01
DSE8610 MKII	Synchronising & Load Sharing Auto Start Control Module	8610-02
DSE7420 MKII	Auto Mains (Utility) Failure Control Module	7420-03
DSE7410 MKII	Auto Start Control Module	7410-03
DSE7320 MKII	Auto Mains (Utility) Failure Control Module	7320-03
DSE7310 MKII	Auto Start Control Module	7310-03
<b>Accessories</b>		
DSE815	DSE AVR Communication Interface	0815-01

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Part Number: A109-01

Environmental Testing Standards	
<b>Electro-Magnetic Compatibility</b>	
BS EN 61000-6-2	EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4	EMC Generic Emission Standard for the Industrial Environment
<b>Electrical Safety</b>	
BS EN 60950	Safety of Information Technology Equipment, including Electrical Business Equipment
<b>Temperature</b>	
BS EN 60068-2-1	Ab/Ae Cold Test -30 °C
BS EN 60068-2-2	Bb/Be Dry Heat +70 °C
<b>Vibration</b>	
BS EN 60068-2-6	Ten sweeps in each of three major axes 5 Hz to 8 Hz at ±7.5 mm, 8 Hz to 500 Hz at 2 G <sub>n</sub>
<b>Humidity</b>	
BS EN 60068-2-30	Db Damp Heat Cyclic 20/55 °C at 95% Relative Humidity 48 Hours
BS EN 60068-2-78	Cab Damp Heat Static 40 °C at 93% Relative Humidity 48 Hours
<b>Shock</b>	
BS EN 60068-2-27	Three shocks in each of three major axes 15 G <sub>n</sub> in 11 ms
<b>Degrees of Protection Provided by Enclosures</b>	
BS EN 60529	IP20

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## DSEA109 Digital Automatic Voltage Regulator (AVR) with CAN Communications & PMG Support

Part Number: A109-01

Pin Out Description	
Pin	Description
U	Self Excited (Shunt), Auxiliary Winding or PMG L1
V	Self Excited (Shunt), Auxiliary Winding or PMG L2/N
W	Self Excited (Shunt), Auxiliary Winding or PMG L3
F+	Exciter Output Positive
F-	Exciter Output Negative
S1	Droop CT S1
S2	Droop CT S2
L1	Generator Terminal L1 Voltage
N (L2)	Generator Terminal L2/N Voltage
L3	Generator Terminal L3 Voltage
P1	0 $\Omega$ to 5 k $\Omega$ Remote Bias Input
P2	0 $\Omega$ to 5 k $\Omega$ Remote Bias Input
A+	-10 V to +10 V Remote Bias Input Positive
A-	-10 V to +10 V Remote Bias Input Negative
CAN H	CANbus High
CAN L	CANbus Low
SCR	CANbus Screen

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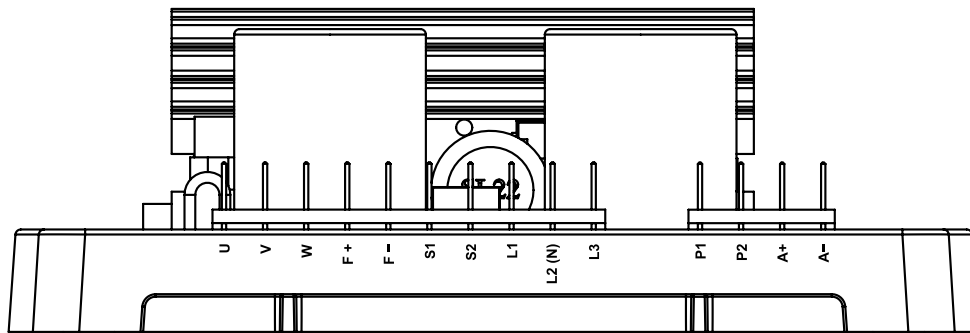
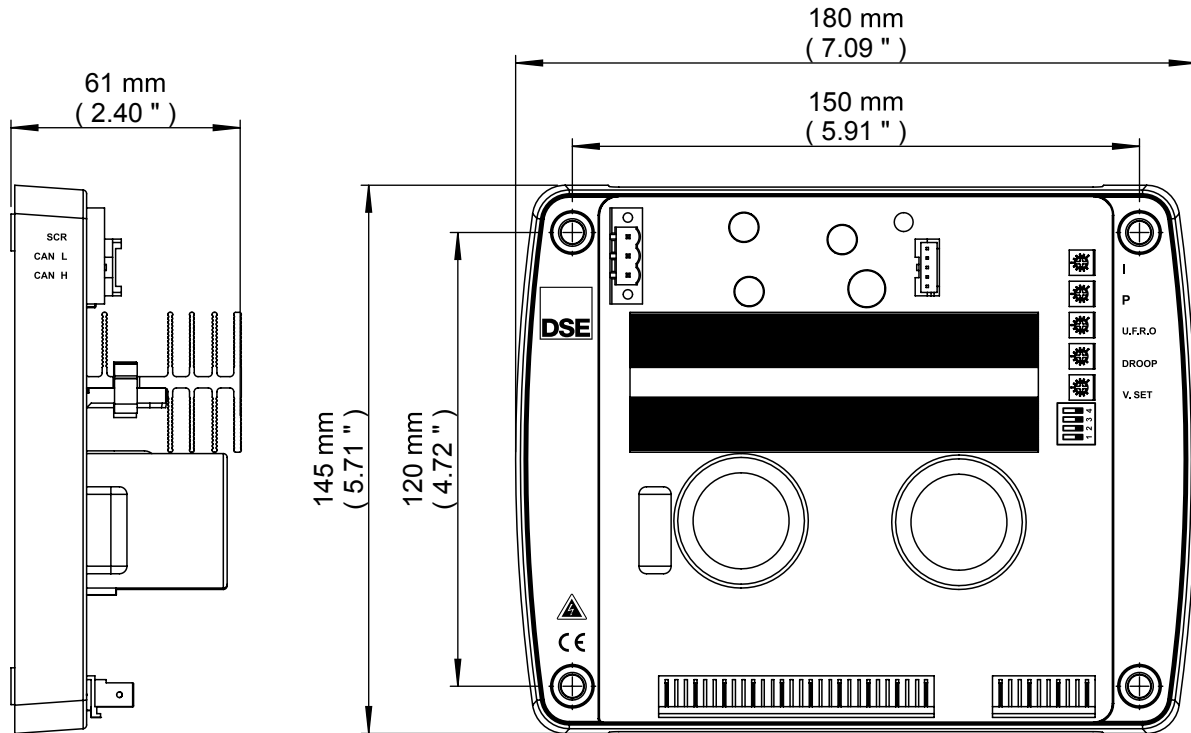
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**DSEA109** Digital Automatic Voltage Regulator (AVR) with CAN Communications & PMG Support

Part Number: A109-01

Technical Drawing & Connection label



**Product Documentation**

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