

DVC 550

Digital Voltage Controller

Data sheet

4921240606J



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1. Product description

1.1 Application

The DVC 550 is a digital automatic voltage regulator, which monitors and regulates the alternator output with rated field current up to 7 A. It is designed for alternators with SHUNT, AREP (auxiliary winding) or PMG (permanent magnet) excitation types. The DVC adjusts the excitation current in the exciter field according to the desired alternator output.

The DVC 550 includes several protections and functions to keep the alternator running in full safe operation.

There are five configurable regulation modes:

1. Voltage
2. Field current (manual mode)
3. Generator power factor
4. Generator kVAR
5. Grid power factor

Regulation features:

- Voltage equalisation
- Droop management
- Soft start
- Load Acceptance Module (L.A.M.) function to assist during heavy load application events
- Negative field forcing

The utility software, DEIF EasyReg Advanced, provides a visual interface to configure values and parameters through the USB port. Power is supplied to the DVC 550 from the USB connection. The DVC 550 also features an event log and data logger option.

Integration with DEIF's AGC-4 and AGC 150 controllers

You can use the DVC 550 with an AGC-4 or AGC 150 controller to perform digital voltage regulation. The AGC can control all of the features for digital voltage regulation and receive fault information directly with the CAN bus communication in a similar way to an Engine Control Unit (ECU).

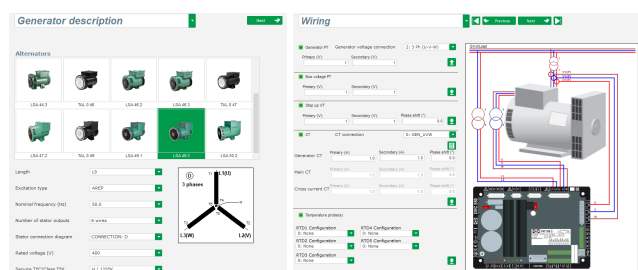
1.2 Operation range

The DVC 550 can operate on a wide range of existing alternators from the market. The excitation current can be 7 A, and the DVC 550 should be fed with maximum 277 V AC from the auxiliary winding, from PMG or from shunt.

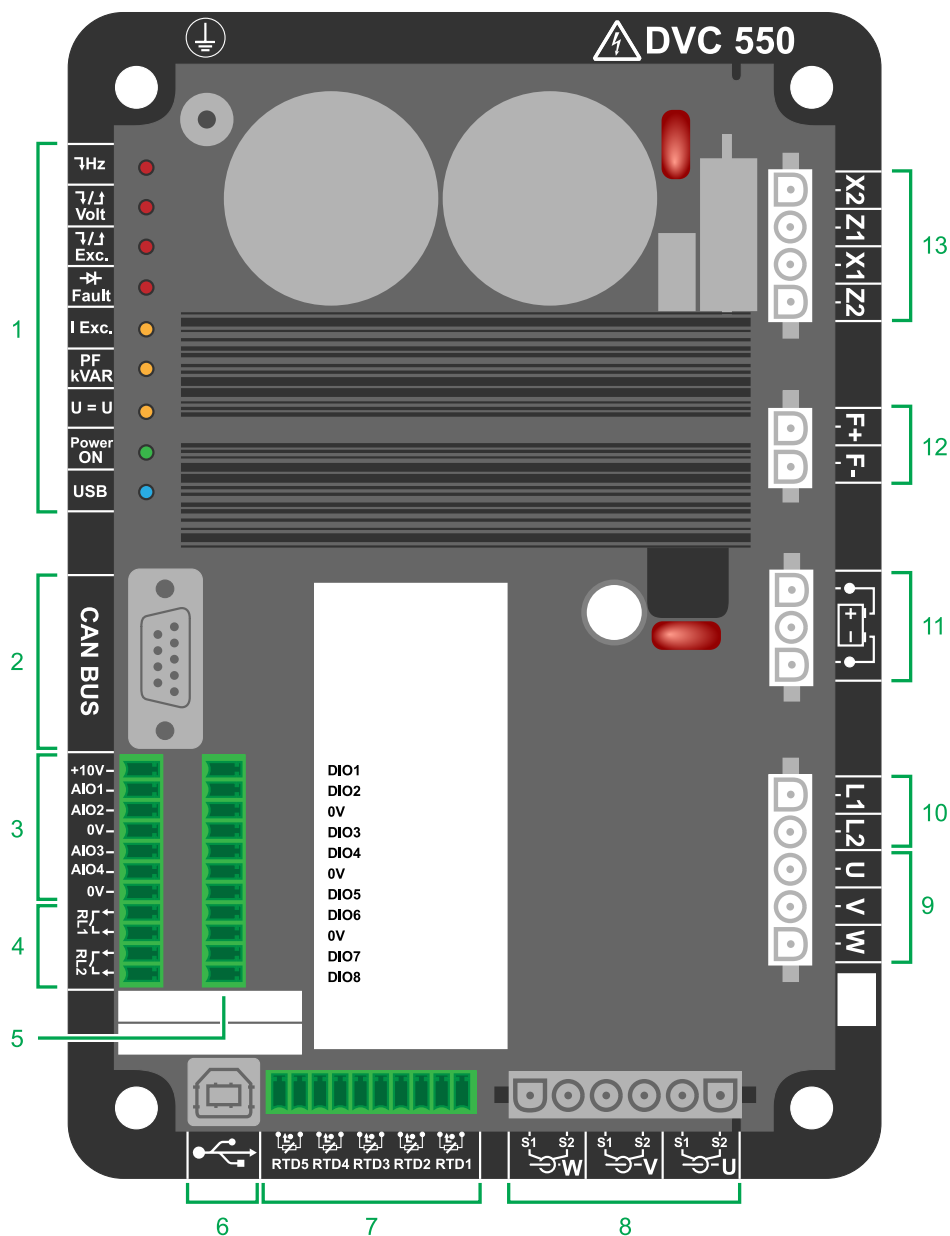
1.3 Setup and configuration

Setup is easily done via the PC utility software, DEIF EasyReg Advanced.

The utility software offers additional features such as monitoring during commissioning, and saving and downloading of settings.



1.4 Terminal description



1. LED indication
2. CAN J1939 port
3. Analogue inputs / outputs
4. Relay outputs
5. Digital inputs / outputs
6. USB port
7. Temperature sensors
 - PTC
 - Pt100
8. Current transformer
 - **U**: Used for paralleling and measurement
 - **V** and **W**: Used for measurement only.
9. Voltage sensing
 - Alternator:
 - **U**, **V**, and/or **W**
10. Voltage sensing
 - **Mains: L1 and L2**
11. DC supply
 - **DC +** and **DC -**
12. Excitation output:
 - **F +** = **E +** field winding
 - **F -** = **E -** field winding
13. Field excitation supply
 - **AREP**: X1, Z1, X2, Z2
 - **PMG**: X2, X1, Z2
 - **SHUNT**: X1, X2

1.5 Software and hardware versions

The information in this document corresponds to the following software and hardware versions.

Table 1.1 Supported versions

Item	Notes	Version
AGC-4	Supported product	4.75.x or later (requires Option T2)
AGC-4 Mk II	Supported product	6.00.x or later
AGC 150	Supported product	1.03.x or later
iE 150	Supported product	1.30.x or later
DVC 550		Hardware: Rev. A Firmware: 1.1
DEIF EasyReg Advanced	Utility software	1.0.6.x or later

1.6 Hardware variants

Type	Variant	Description	Item no.
DVC 550	01	Digital Voltage Controller, DVC 550 7 A, 277 V	2913940160-01

2. Technical specifications

2.1 Electrical specifications

Electrical specifications	Notes
AC supply input	PMG, AREP, SHUNT Range: 50 to 277 V AC
Excitation	Rated field current (continuous): 7 A at 70 °C / 8 A at 55 °C Field forcing current (10s max): 15 A at 70 °C Recommended field resistance: > 4 Ω
Voltage input impedance	Alternator - U V W: 1.885 MΩ phase/ground 682.8 kΩ phase/phase Mains - L1 L2: 3.96 MΩ phase/ground 2.64 MΩ phase/phase
Auxiliary DC power supply	Nominal voltage: 12 V DC or 24 V DC (operating range: 8 to 35 V DC) Consumption: < 1 A
Frequency range	30 to 400 Hz
Generator voltage measurement	3-phase, 2-phase Range: 0 to 530 V AC Consumption: < 2 VA
Grid voltage measurement	2-phase Range: 0 to 530 V AC Consumption: < 2 VA
Generator current measurement	1 or 3-phase Secondary range: 1 or 5 A Consumption: < 2 VA
Protection response time	Delay set to min.: Short circuit: <400 ms Loss of voltage reference: <400 ms Over-voltage: <400 ms Over-excitation: <400 ms High temperature: <400 ms Speed drop: <400 ms Diode fault: <400 ms Stator current unbalance: <400 ms Stator current limitation: <400 ms
Protection functions	Under-voltage (ANSI 27) Open diode and diode short-circuited failures Over-voltage (ANSI 59) Under-frequency (ANSI 81L) Over-frequency (ANSI 81H) Active reverse power (ANSI 32P) Reactive reverse power (ANSI 32Q) Synchro check (ANSI 25)
AC voltage regulation accuracy	±0.25 %, average of three phases, harmonic distortion <20 % ±0.5 %, average of three phases, harmonic distortion 20 to 40 %

Electrical specifications	Notes
	(harmonics associated with six-thyristors load type)
Accuracy class	AC voltage: Class 0.5 Frequency: Class 0.2 AC current: Class 2.5 Field excitation current: Class 5 Pt100 inputs: Class 2 Analogue inputs: Class 1

2.2 Inputs and outputs

Specification	Notes
8 programmable digital inputs and outputs	Output specification: 150 mA - 30 VDC
4 programmable analogue inputs and outputs	4-20 mA / +10 V / 0-10V / potentiometer (1 k Ω)
2 relay outputs	125 V AC, 1 A 30 V DC, 3 A
5 temperature sensors	Type Pt100/PTC Programmable threshold

2.3 Communication

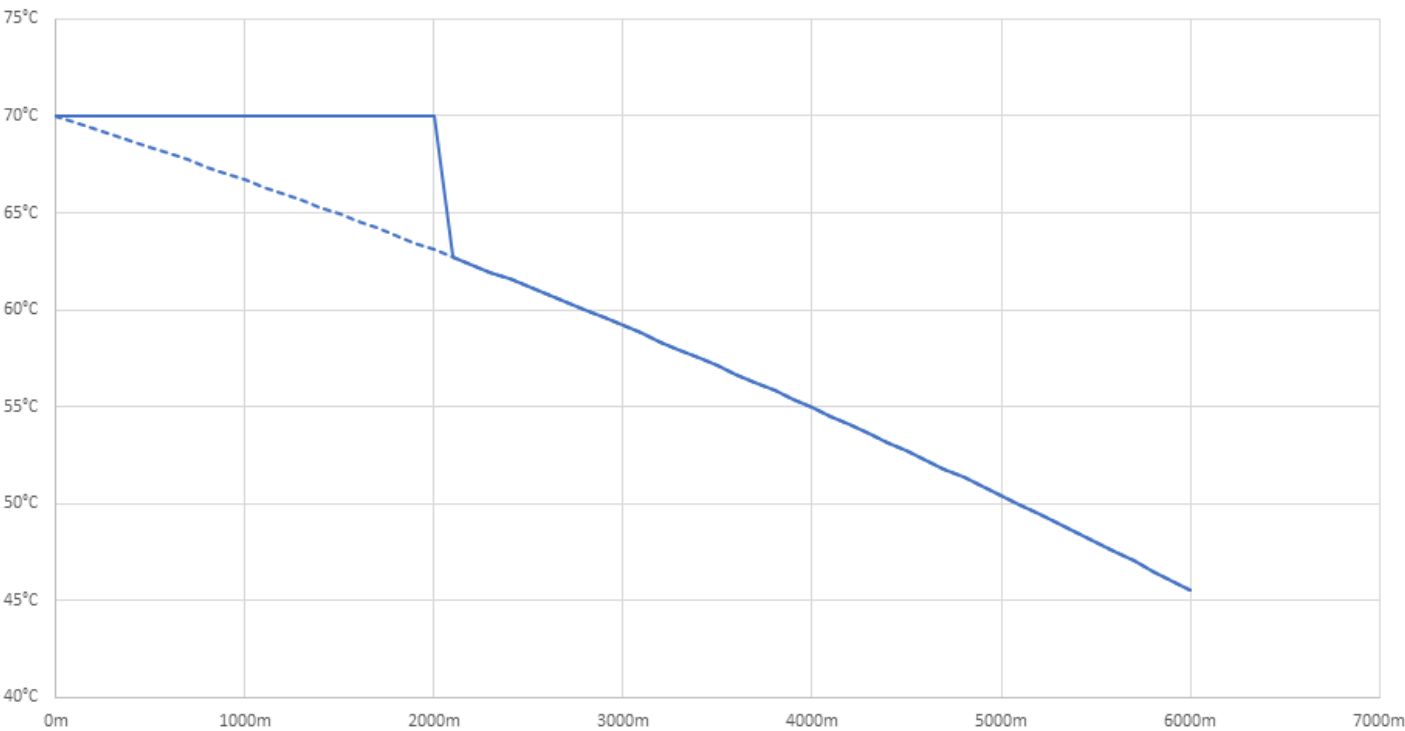
Communication	Notes
Software configuration	DEIF EasyReg Advanced utility software
USB port	Self powered USB-B type (standard USB A to B cable)
CAN J1939	Interface to DEIF equipment

2.4 Environmental conditions

Specification	Notes
Ambient temperature	-40 °C to +70 °C
Operating and storage humidity	95 % RH, IEC 60068-2-30, test Db
Protective level	Terminals: IP 20 To IEC / EN 60529
Flammability	All plastic materials are self-extinguishing, according to UL94 (V1)
Mounting	Mounted in a cabinet or in a terminal box without excessive vibration.
Vibration	3 to 25 Hz 3.5 mm 25 to 100 Hz 4.4 g
Shock	50 g, 11 ms, half sine - I60068-2-27, test Ea Tested with three impacts in each direction in all three axes, in total 18 impacts per test.
Altitude	0 - 2000 m

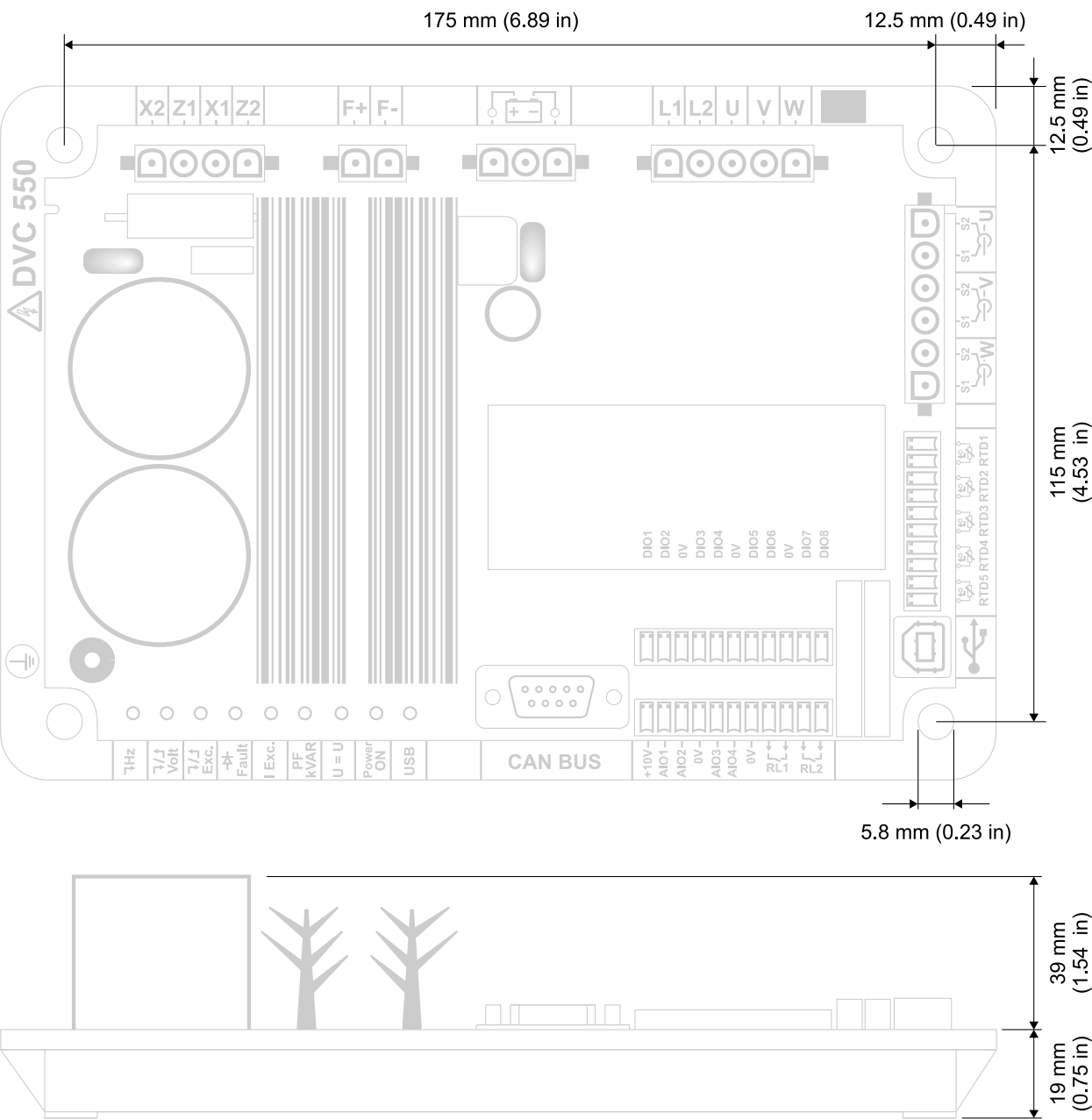
Altitude and maximum operating temperature

The following graph shows the limits of the maximum operating temperature at different altitudes for the DVC 550.



2.5 Dimensions and weight

Figure 2.1 DVC 550 dimensions



Dimensions and weight	Notes
Dimensions	Length overall: 200 mm (7.87 in) Width: 127.5 mm (5.02 in) Depth: 58 mm (2.28 in)
Weight	0.89 kg (1.96 lbs)

2.6 Approvals and standards

Approvals

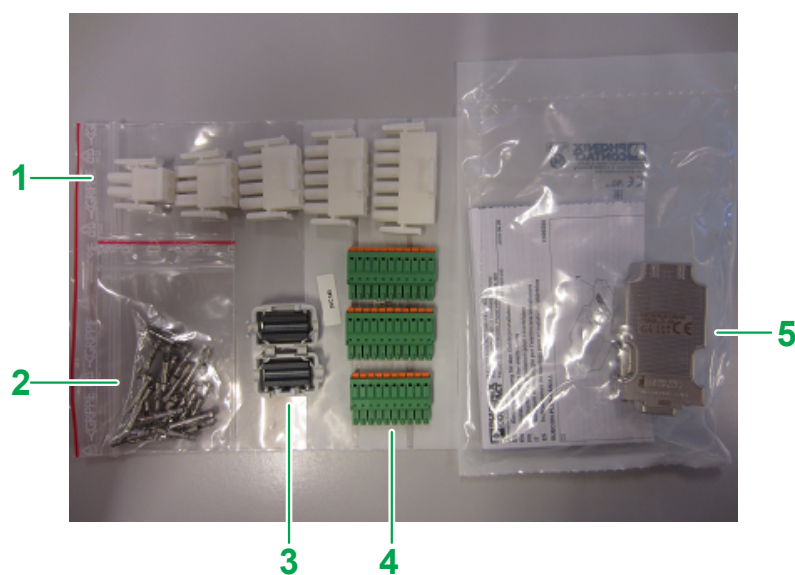
CE, UL

Standards	Notes
EMC	IEC 61000-6-2 IEC 61000-6-4 IACS UR E10 power distr. zone
Safety (insulation intensity)	To IEC 61010-1 Installation category (over-voltage category) III, 300 V, pollution degree 2.
Humidity	IEC 60068-1 and test in accordance with IEC 60068-2-14
Dry heat	IEC 60068-2-2
Damp heat	IEC 60028-2-30
Cold	IEC 60068-2-1
Protective level	Terminals: IP 20 To IEC / EN 60529

3. Accessories

3.1 Connector kit

Description	Order number
The kit includes: • 5 x MATE-N-LOK connectors (2-way, 3-way, 4-way, 5-way, and 6-way) • 2 x FMC mini combi connectors (11 position) • 1 x FMC mini combi connectors (10 position) • 1 x snap-on ferrite core for EMC interference • 1 x D-SUB (9-pin) connector • 25 x AWG connector pins	2913940150.05



1. MATE-N-LOK connectors
2. AWG connector pins
3. Snap-on ferrite core
4. FMC mini combi connectors
5. D-SUB (9 pin) connector

NOTE A connector kit is included when you buy the DVC 550.

4. Legal information

4.1 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

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