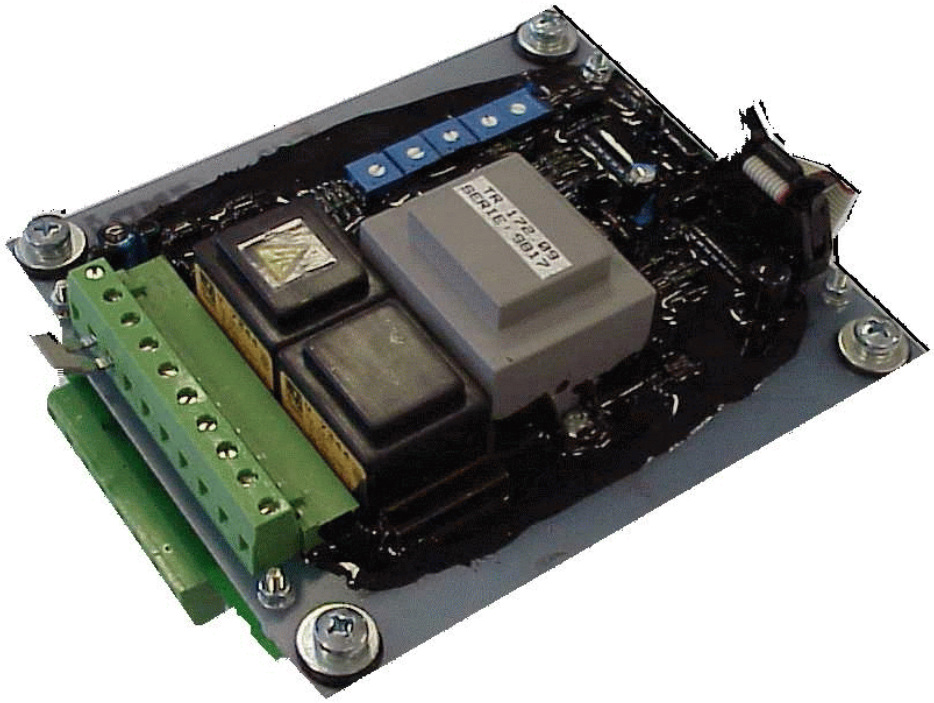
EVA voltage regulator

Gebruiksaanwijzing
Manual



January 2007

WARNINGS

WARNING

The system should not be installed, operated, serviced or modified except by qualified personnel who understand the danger of electric shock hazards and have read and understood the user instructions

WARNING

Never work on a LIVE generator. Unless there is another person present who can switch off the power supply or stop the engine

WARNING

Dangerous voltages are present at the voltage regulator board. Accidental contact with live conductors could result in serious electrical shock or electrocution.
Disconnect the power source before making repairs, connecting test instruments, or removing or making connections to the voltage regulator or generator.

ELECTRICAL HAZARDOUS VOLTAGES DANGEROUS DO NOT OPERATE WHEN NOT FAMILIAR WITH GENERATORS

The manual does not cover all technical details of the product. Specifications may be modified by the manufacturer without notice. For further information, the manufacturer should be contacted.

EVA
EME / Van Kaick Alternative

CONDITIONS FOR INSTALLATION and COMMISSIONING

Mounting and commissioning of this product may only be done by qualified people with knowledge of electrical machines !
This product is meant to be build in, in a closed cabinet or machine, so that any contact with persons is excluded.
Do not touch the printed cardboard during operation. High Voltage !
Only use isolated measuring instruments.
EMRI bv points out that this product is meant to be assembled as a component in a system or installation on which the following standards take effect :

89/336 EEG (EMC guidelines)
72/23 EEG (Low voltage guidelines)

General:

The EVA voltage regulator is a replacement for the avr=s R280/290, Ti7.5D, R260/274, R260/261 avr=s . The avr is also applicable in any generator where the excitation current is within the avr=s limits, and there is an auxiliary winding (with voltage within specifications).
The EVA is a constant voltage voltage regulator. An AVR with Volt per Hertz characteristic is available under type LX4. The LX4 has also PTC -winding temperature input as well as excitation current limitation.

Specifications:

Sensing Voltage		
Sensing U,V,W :	**3 x 400 Volt 50/60Hz, max. 500 Volt (sinewave)**	
Sensing U=,V,W=	**:**	**3 x 230 Volt 50/60Hz, max. 350 Volt (sinewave)**
Supply LH1,LH2 LH3 and LH4	**:**	**1 x 22 Volt upto 1 x 100 Volt or 3 x 15 Volt tot 3 x 100 Volt dc of ac tot 400 Hz**
Ouput voltage	**:**	**Supply voltage**
Output current	**:**	**4 Amp. continuously 10, Amp. max. (1 Second)**
Minimum field resistance	**:**	**ca. 10 Ohm at 120 Volt vsupply voltage proportionel less on decreasing supply voltage**
Adjustment range	**:**	
3 x 400 Volt	**:**	**printpotentiometer (S and T shortened) 275-480 Volt**
3 x 230 Volt	**:**	**printpotentiometer (S and T shortened) 165-280 Volt**
Accuracy	**:**	**< 1%**
Self excitation	**:**	**from 3 Volt remanent magnetism voltage**
Connectors	**:**	**not mutually exchangeable**
Droopinput	**:**	**0.5 Ampère , > 1 VA**
Sizes	**:**	**LxBxH 130 x 150 x 77**
Weight	**:**	**890 gram**
Max. temp	**:**	**40 °C**

Beveiligingen:

Underspeed trip (Ftrip)	**:**	**adjustable between 40 en 60 Hz and jumper to enable - disable Ftrip**
Fuse	**:**	**6.2 x 32 mm 10 A Ultra Rapid**

Monting and connection

The avr is preferably mounted on vibration studs. When placed inside a closed cabinet, sufficient cooling masu be obtained. The connection is according the circuit diagram, where as some generators may differ a little, but the inputs LH1 - LH4 are not sensitive for which winding on which terminal.
The terminal LH1, LH2, LH3 and LH4 are the supply voltage terminals. These terminals are elect rally connected to the terminals S, T, +_and -. The terminals 1 and 2 are only used for connecting a droop transformer when parallel operation is necessary. If not used these terminal can be shortened. The supply LH1 - LH4 may also be sourced by any auxiliary voltage, as long as this voltage is disconnected when the generator is not running.

Frequency (underspeed) trip

The regulator has a built-in Frequency trip function. This function drops the Generator voltage to approximately 50% of the nominal value, when the generator frequency comes below the adjusted value. The factory adjustment is 45 Hz. Adjustment is made at nominal frequency by turning the potmeter counter-clockwise until the voltage decreases. Then turn it the other direction until the red LED just goes out. The frequency of the generator is determined by its rotating speed. The voltage regulator can not adjust the actual frequency.
Do not run the generator on lower speed for longer periods, since this may cause damage to generator and avr.
The frequency trip may be disabled with the jumper switch.

Self excitation circuit

The EVA voltage regulator has a build in self excitation circuit, which operates from 3 Vac up. This circuit is connected to the terminal LH4.

When only one auxiliary winding is present in the generator to supply the avr, do parallel the supply inputs LH1 and LH3, LH2 and LH4 to divide the current over more input rectifiers.

Parallel operation

If the generator operates in parallel operation with one or more generators, reactive load sharing can be accomplished by means of Quadrature Droop Compensation (QDC). Parallel operation requires an EMRI droopkit. The droopkit must be rated to match the generator nominal current.
In order to obtain a proper load distribution the no-load voltages and the amount of voltage droop during load must be set equal for all generators. The adjustments must be made very precise and under equal conditions for each generator (frequency, current, power factor)

The influence of the voltage droop on the generator voltage is depicted in diagram 2.

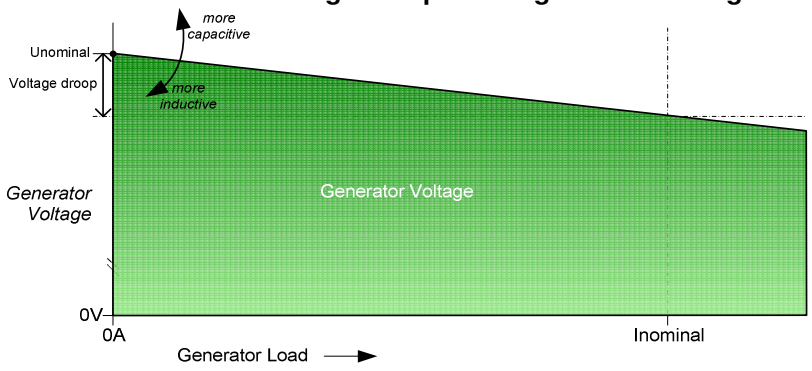
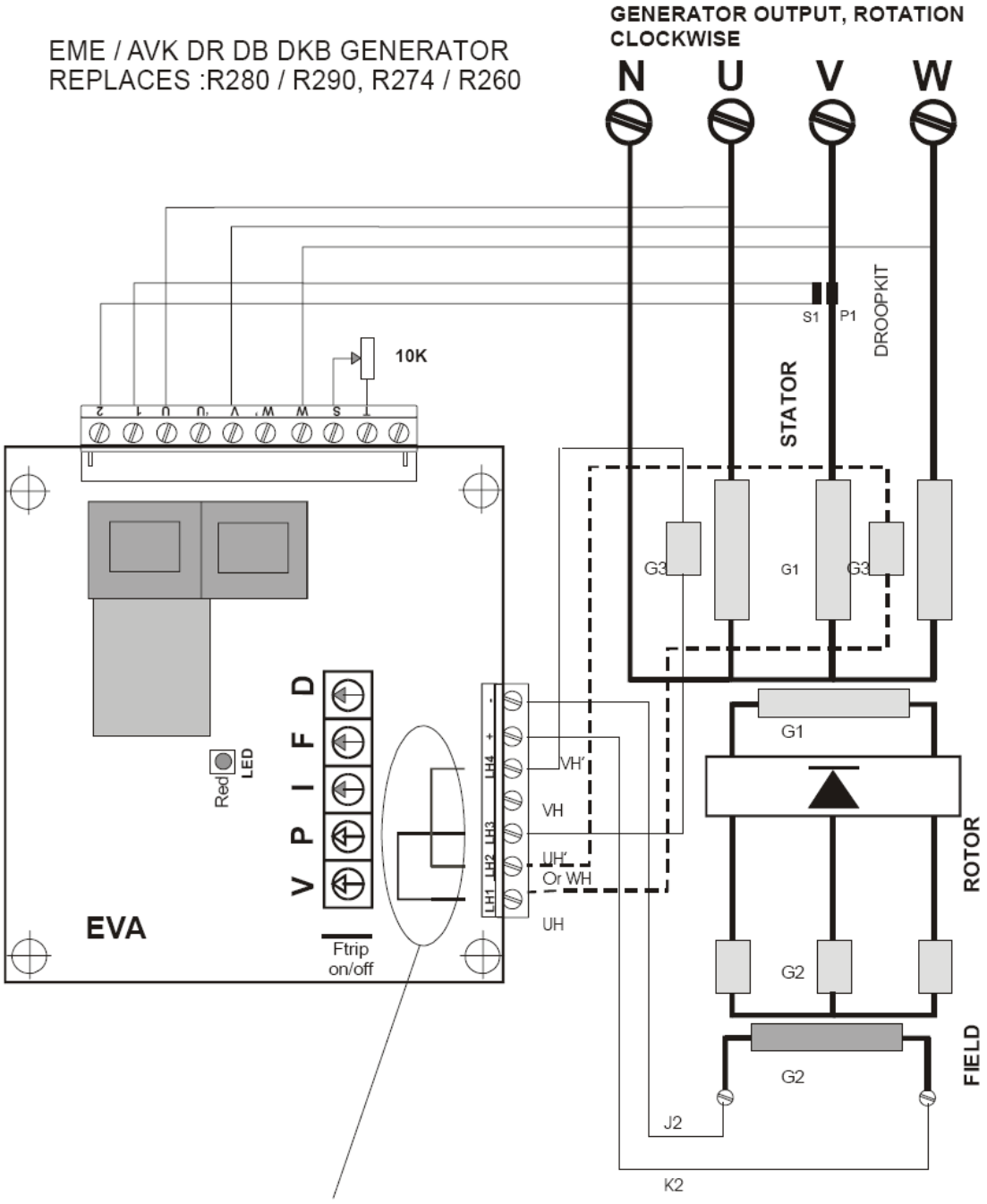


Diagram 2. Voltage droop

EME / AVK DR DB DKB GENERATOR
REPLACES :R280 / R290, R274 / R260



When only one auxiliary winding is present, parallel the inputs LH1-LH3 and LH2-LH4 to divide the current.
Machines may be equipped with two exciter fields
(one is compound excited)
The two auxiliary windings may also be
one auxiliary and a tap from the main winding.
These are differences in the AVK types, but can all be handled by the EVA
Use U' - V - W ', when the generator is 230 Volt between the phases at the main terminals

A.2 Contact

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