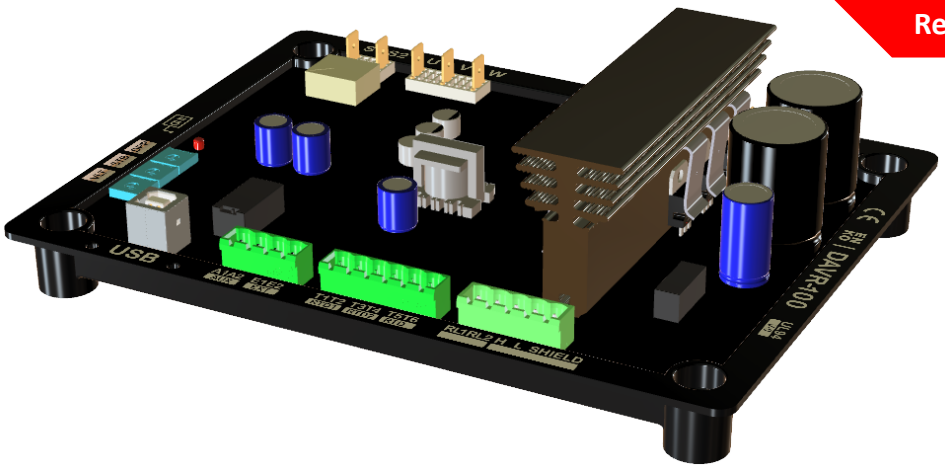
Digital Voltage Regulators



DAVR-100

Digital Voltage Regulators for Synchronous Alternators

Product Description:

DAVR-100 is designed for high-performance applications, fulfilling a wide range of requirements for both stand-alone applications as well as parallel running generator groups for high-power generation.

It is based on a high-capacity signal processing microcontroller design architecture, integrated with intelligent IGBT power drive stage for alternator excitation. There are various optional features, where the customer can select for their specific application. The AVR unit is equipped with comprehensive communication capabilities, which can be interfaced to peripheral intelligent control devices for complex operations. All COM ports are galvanically isolated for safe network connection.

Excitation drive is designed to deliver high-power even during stator short circuit conditions, with an ample 15.0Adc current for 10 seconds. Continuous excitation power at maximum temperature can exceed 7.0Adc. The EXCITATION current is monitored precisely for protection against alternator faults. The AVR can be connected in SHUNT or AUX mode, as well as connection to 3-phase PMG power source.

Voltage regulation is based on synthesised measurement of the 3-pahse sense inputs and high sampling frequency enables high harmonic waveform analyses, which can perform better than 0.25% accuracy even with highly distorted load conditions. All PID parameters are monitored and set with an intelligent algorithm for stable operation under all load conditions and at the same time optimum performance is delivered at high block load switching, minimising the voltage fluctuations.

DAVR-100 is designed with integrated **“Block Load Module”** (BLM®) function, which monitors the behaviour of the generator by making fast FFT waveform analyses and relaxes the burden on the engine so that; engine capacity can be down-sized compared to competition on the market. This brings a big advantage when the generator is manufactured according to ISO8528 standard.

Alternator phase current is measured at high-resolution for “DROOP” compensation or LINE compensation with excellent performance. Also, with MOTOR START function, it can control the field excitation for starting high power AC motors without tripping the protection devices.

Alarm events can be linked to any limit of the AVR parameters, using PC Tools SW package. On-board integrated ALARM relay has SPST N/C contact, which can be controlled to trigger specific protection sequences directly from the AVR unit.

DAVR-100 has three built-in RTD temperature sensor inputs, which can be used to monitor critical temperatures on the generator during operation. This feature can also be linked directly to the ALARM relay so that, if there are any excess temperature conditions, automatic load shedding sequences can be initiated via this function. This is a very useful feature, if the generator is operating under very harsh conditions.

MAIN FEATURES:

- High-performance signal processor- based design,
- Continuous Excitation drive capability, in excess of 7.0Adc, 150% overload capacity for 120 sec., 220% for 10 seconds,
- Measurement of FIELD current for effective OEX protection function,
- Integrated BLM® function control to improve BLOCK-LOAD handling capability of the generator,
- 3-Phase TRUE RMS sense voltage measurement for precise voltage regulation in high-harmonic distorted load conditions,
- SHUNT, AUX and PMG connection modes for power input to AVR,
- AUXILIARY analogue inputs for external control of AVR functions,
- 3xPt100 temperature sensing input for alternator winding safety.
- Excellent stability control through digital signal processing,
- “LINE” compensation or “DROOP” compensation by parameter configuration setting,
- Stator current and motor current measurement and protection,
- ALARM relay output for external safety sequence control of the generator,
- Galvanically isolated USB and CAN BUS communication ports for AVR parameter configuration and integration to system network,
- Encapsulated construction for extreme environmental operating conditions,
- Construction is resistant to high vibration mounting,
- CE compliant for EMC emissions,
- UL compliant safety standards,

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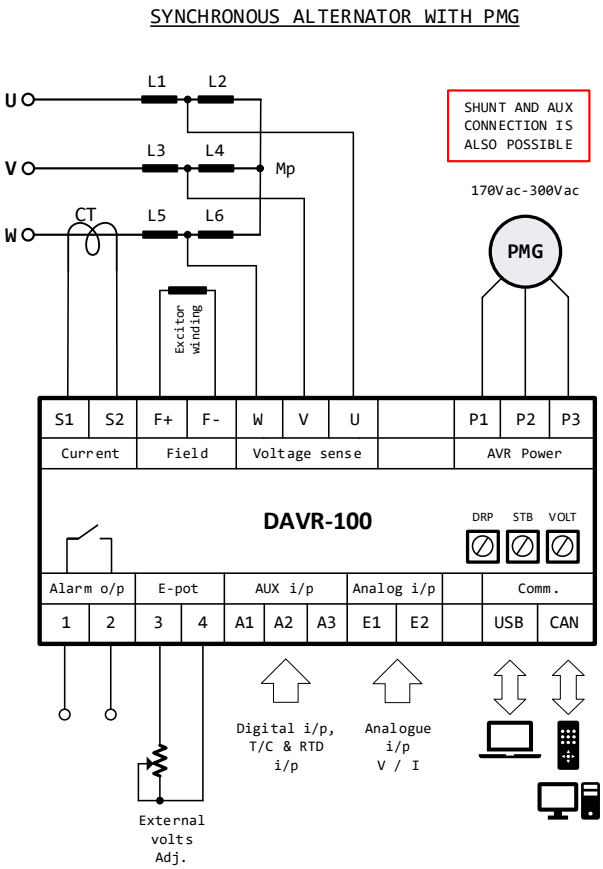
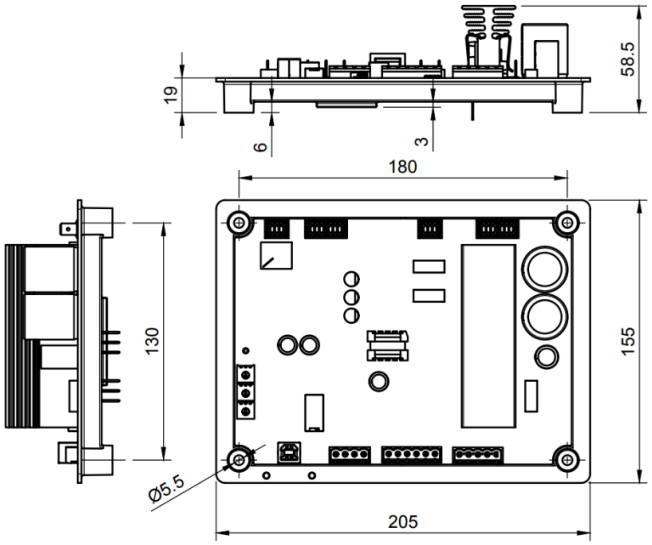
Technical Specifications:

Technical Specifications	Value	Description
Sensing voltage range:	100Vac to 480Vac	3-phase, 2-phase, or single-phase sense input connection
Power connection to AVR:	Shunt / Auxiliary/3-phase PMG	300Vac maximum limit
Voltage regulation:	<0.25%	No-load to full load, PF>0.8 and ΔT<40°C
Voltage sensing type:	TRUE RMS calculation, capable of operation with high harmonic loads, 3-phase sensing	
Operating frequency:	45Hz to 70Hz	
Operating temperature range:	-35°C to +60°C	30%RH to 95%RH non-condensing
Voltage adjustment:	On-board trimmer	±20% of selected voltage range
	External pot trimming	±10% of set voltage value
	AUX input signal	±15% of set voltage value
Current sensing:	X/5 Class-1 CT (on-board)	Single-phase sensing, fitted on alternator phase-V
CT burden:	1VA (3VA maximum)	
Current sensing compensation:	DROOP compensation	Reactive load compensation
	LINE compensation	Load dependent line DROP compensation
	Motor Start Current	Monitoring and control of motor inrush current
Excitation current:	7.0Adc continuous	Rated for maximum operating temperature range
	10.0Adc 120 seconds	
	15.0Adc for 10 seconds	
FIELD impedance range:	5Ω to 50Ω	15Ω nominal winding impedance
AUX. signal input:	Analogue voltage input, External pot input	
	3 x Temperature input for Pt100 type sensor (RTD)	
BLM® function:	BLOCK-LOAD acceptance limit setting with integrated comprehensive algorithm,	
Protection functions:	UFRO	Under Frequency Roll off protection
	LOS	Loss of sensing voltage protection
	OEX	Over Excitation protection
	SOFT START SEQUENCE	Controlled start / synchronous start of multiple sets
ALARM Output:	2.0Aac SPST N/C contact	Configurable via PC Tools SW package
Communication Ports:	USB COMM port (isolated)	For AVR parameter configuration
	CAN J1939 (isolated)	For system network connection and monitoring
EMC Compliance:	EN61000-6-2/4 EN6068-1-2-14-30 UL94 V2 flammability safety compliance	
Enclosure protection class:	Component protection to IP65, Terminal protection to IP00	
Overall dimensions:	155x205x59 mm	
Weight:	340gr	

Connection Diagram:



Mechanical Dimensions:



UL94 V-2

Compliance:

DAVR-100 is tested and compliant to CE regulations for emitted and conducted RFI interference, according to EN61000-6-2. Immunity is tested against EN61000-6-4. Vibration: EN60068-6-2 Dielectric strength: IEC255, Flammability: UL94, Safety: UL508