

Document Title:

Technical Specifications 1P-120/240V-50kVA-60Hz Electronic Voltage Regulator

Document Owner:

Engineering

Authorizations: Signatures obtained per ECN of A release

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Revision History

Revision	Description	ECN #	Date	By
A	Initial Preliminary Release		9/6/2014	GW
B	Revised for sub-cycle regulation, added Geomagnetic Disturbance		7/13/2018	GW
C	Corrected and expanded on the voltage regulation accuracy		2/6/2019	GW
D	Added PIR & Power Angle, CHG response time, CHG dovetail drawing, CHG Nominal kVA from 50 to 48	461	11/6/2019	GW

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TECHNICAL SPECIFICATIONS:

Key Features - 99% efficiency, surge protection, automatic pass thru mode – service is not interrupted, four quadrant operation for net metering and co-generation applications, programmable operation, multiple set points, thermal protection.
Optional data collection, remote monitoring and fault diagnostics.

Service Information – 120/240V split phase, 3 wire with ground, 200 Amp

Power Rating – 48 kVA Nominal - 63kVA for 1 hr, 50 kVA for 4hr, 38.4 kVA continuous (160 Amps per phase)

Motor Rating – Largest single motor load 10 HP

Input Voltage - Nominal range 228-250, Controllable range (see Note 1), Operational range 160-300V_{RMS}

Output Voltage - Software programmable (220-250V in 0.1V steps), hardware/software enabled multiple set-points

Regulation Accuracy – Typically $\pm 0.1V$ L-N of the set-point within the controllable voltage range, regardless of load power factor (see Note 1 for exceptions)

Boost/Buck Range – 8.3% of input voltage, nominally ± 20 Volts at 240V in.

Phase unbalance – Not regulated N-L only L-L – (Note 2)

Regulation Response Time – 0.8 to 8 milliseconds maximum, depending on the magnitude and characteristics of the input voltage change.

Software interface – Optically isolated serial interface or Blue tooth, also optional LAN, WAN

Efficiency - Greater than 99% at loads above 4 kVA, 99.5% for loads greater than 10 kVA

Frequency - 60Hz ± 0.25 Hz at specified voltage accuracy. ± 4 Hz with 0.25V drift at extremes.

Over Current Protection – Externally supplied, transient overload internally self protecting (Note 3)

Power Factor of EVR - The EVR™ by itself is a slightly capacitive load (0.5 kVAR per phase)

Power Factor of load - 0.5 leading to 0.5 lagging (the EVR does not change the load PF)

Four Quadrant Power Operation – Reverse power can flow from Distributed Generation PV etc. without affecting regulation accuracy. (Note 7)

Power Interactive Regulation (PIR) – can be programed to perform bi-directional line drop compensation.

Harmonic Distortion - Less than 0.2 % added THD (the EVR does not change the load THD)

Surge Protection – Meets ANSI C62.41-1991 Category C1, 6 kV/3 kA 8/20us, UL 1449 2nd edition (Note 4)

Dielectric (production test) – 1.8 kV

Geomagnetic Disturbances – Functional with $\pm 4V$ DC on mains, tolerant of higher values

Wiring Method – 4 external eye bolt style bushings, Phase A&B in, Phase A&B out, Chassis ground

Mounting Method – Mounts to round poles and flat cross arms using PN102415 - Dovetail Assembly w/Locking Pin, (Note 6)

Status Indicator Light - Green = ok, Flashing = fault, (in pass thru) Off = regulator has failed (in pass thru) Dry contact closure for building automation interface, optional communications available.

Dimensions – 20.7" W x 24.4" H x 13.3" D (527mm W x 619mm H x 337mm D) (W does not include bushings)

Weight – 124 Lbs (56 kg,) Shipping 162 Lbs (74 kg.)

Enclosure – Powder coated Aluminum, IP44, standard

Environmental - minus 40° to + 50°C at continuous load rating (Note 5); 0-90% relative humidity; 1-6,000 ft elevation

Safety Agency - pending TUV CUE – based on IEC 62103, EN 61558-2-12

AIC Rating – 22kA (Note 3)

EMI/EMC - Meets conducted and radiated emission requirements for Class B as described in FCC Rules and Regulations, Part 15, Subpart J.

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Data Collection – Time stamped fault log, 24 to 48 hours of ½ sec interval average Line Voltage, Load Voltage, and Load Current, kW & PA, up to 12 months of 1 min. interval average Line Voltage, Load Voltage, and Load Current, kW & PA, plus the Min & Max ½ sec data values for each 1 min interval, plus internal temperature.

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Options –

Options are available from the following categories. Consult the Pacific Volt Option Matrix for availability.

Communications & Remote Monitoring

Software & Data Collection

(**Note 1**) The Electronic Voltage Regulator EVR™ can Boost or Buck the incoming line voltage +/- 8.3%. In functional terms this means that if the set-point is programmed to 240 volts, it will maintain an output voltage of 240 volts +/- 0.1 V within the controllable line voltage range of 222-260V. With a 228 volt set-point the controllable range is 212-248V. Outside of that range it continues to buck or boost by +/- 8% of the line voltage. The regulator will function with L-L voltage between 160V and 300V, outside of that range it stops regulating. Service is not interrupted. Normal operation returns after the input voltage returns to within the specified limits. Voltage accuracy is based on the 1 minute average of one cycle RMS voltage values with <1% Voltage THD on the input line at 60Hz. Output voltage will drift up to 1.5V at extreme cold temperatures. *Also refer to frequency spec.*

(**Note 2**) In this split phase configuration the phases are not regulated separately, regulation is based on L-L voltage. Therefor L-N unbalance depends on the load unbalance and transformer impedance. The EVR does not change the power phase angle.

(**Note 3**) When ordering the Electronic Voltage Regulator EVR™ without the internal circuit breaker option, an external line disconnect and protection means is required. If the momentary inrush current exceeds $\approx 420A_{RMS}$, the EVR™ will disabled itself and will automatically go to pass thru mode allowing for unregulated operation. The EVR™ will resume regulation approximately 2 sec. after the current returns to the normal range. The EVR™ will survive load fault currents up to 22kA capacity when protected by an appropriate fuse or circuit breaker of 200 A_{RMS} maximum rating.

(**Note 4**) For transient surge suppression the input is protected with metal-oxide varistors (MOV) rated at 570 joules and 70kA. The transient surge suppression protects the EVR™ and all loads and equipment, from line side transients.

(**Note 5**) The EVR™ is equipped with internal temperature sensing, which will stop regulation in case of excessive temperature. During over-temperature shutdown, the EVR™ will automatically go to pass thru mode, allowing for unregulated operation. Regulation returns when internal temperatures reduce to normal levels.

(**Note 6**) The Dovetail mounting assembly – see page 4

(**Note 7**) The ERV cannot be back fed from a distribution transformer and maintain regulation accuracy. In this condition the regulator will go into either a full buck or boost state on the input terminals. The regulator should be placed in the standby state (regulation is disabled) if this condition is temporarily necessary for line maintenance.

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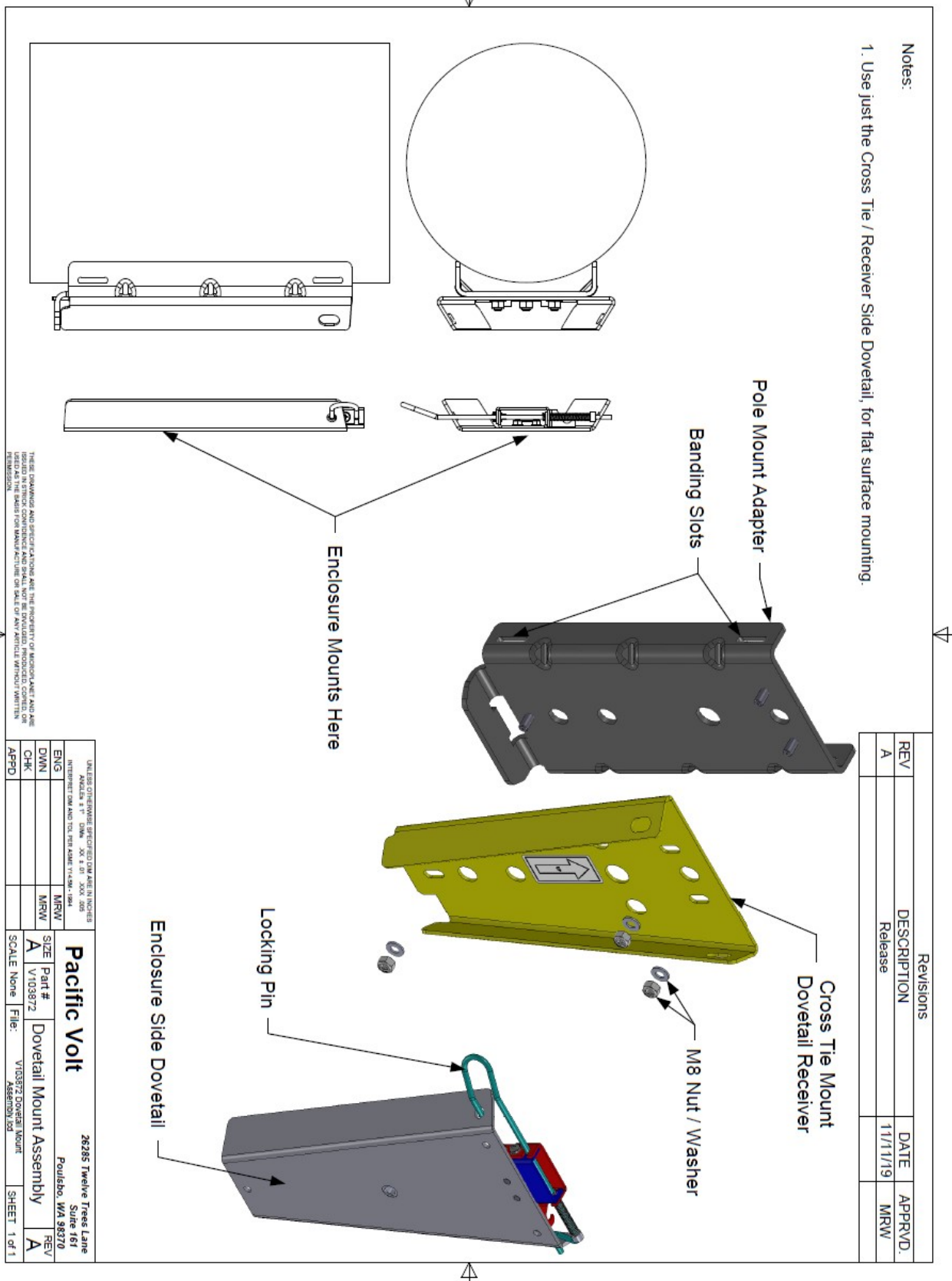
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