

POWER COMMANDER PLUS

Series 900/200 Electronic Line Voltage Regulator with Computer Grade Isolation Transformer

GENERAL SPECIFICATION

1.0 General

This specification describes the electrical and physical aspects of the Power Commander Plus-Series 900/200 Electronic Line Voltage Regulator with an internal Computer Grade Isolation Transformer. All systems are designed and manufactured to assure maximum reliability, flexibility, serviceability and performance. The Power Commander Plus- Series 900/200 uses seamless electronic control to provide output voltage regulation within 1% of nominal. The output is adjustable $\pm 10\%$ from nominal with an internal potentiometer. In addition to tight voltage regulation, the Power Commander Plus steps the voltage up or down to the desired level, gives isolation, and provides transient and noise attenuation.

2.0 Standards

The Power Commander Systems are designed and manufactured in accordance with the following:

- Institute of Electrical and Electronic Engineers (IEEE 597)
- National Fire Protection Association (NFPA 70), National Electrical Code (NEC)
- Underwriters Laboratory (UL 1012)

3.0 Performance Specifications

- 3.1 Nominal Input Voltage - 208 or 480 Single Phase; 208 or 480 Three Phase.
- 3.2 Nominal Output Voltage - 120/240 Single Phase; 208/120Y or 480/277Y Three Phase, adjustable by $\pm 10\%$.
- 3.3 Output Voltage Regulation - $\pm 1\%$ or better for input voltage fluctuations of +10% to -20% of nominal, and from no load to full load.
- 3.4 Remote Sensing - The output voltage can be sensed and regulated at the load, automatically compensating for line and wire losses due to long distances to the load.
- 3.5 Frequency Range - 57 to 63 Hz for 60 Hertz models. 48 to 52 Hz for 50 Hertz models.
- 3.6 Output Voltage Adjustment Range - Adjustable to $\pm 10\%$ with internally located potentiometer.
- 3.7 Correction Time – 5 to 9 cycles under worst case conditions.

- 3.8 Efficiency - 89% to 92%, KVA size dependent.
- 3.9 Power Factor - 0.95 typical at full load.
- 3.10 Harmonic Content - Less than 5% THD added under linear load.
- 3.11 Overload Capability - 500% for 10 seconds, 1000% for one cycle. Conforms to IEEE 597.
- 3.12 Audible Noise - Less than 60dBA @ 1 meter.
- 3.13 MTBF is a minimum of 100,000 hours.

4.0 Regulating Transformer

- 4.1 Transformers are buck-boost dry type, convection or fan air cooled, 600 volt class.
- 4.2 The transformer is electrically and magnetically regulated. There are no moving parts.
- 4.3 All transformer windings are class N (200° C) insulated copper.
- 4.4 A class N installation system is utilized throughout with operating temperatures not to exceed 115°C over a 40°C ambient temperature.
- 4.5 Transformer core manufactured utilizing M-6 grade, grain oriented, stress relieved silicon transformer steel.
- 4.6 Interface terminals are provided for input and output conductors.
- 4.7 All leads, wires and terminals are labeled to correspond with circuit wiring diagram.
- 4.8 Transformers are vacuum impregnated with an epoxy resin.

5.0 Input Isolation Transformer (Three Phase units only)

- 5.1 The isolation transformer is configured in a three phase delta primary and includes taps at 2.5% increments with two (2) above and four (4) below the nominal voltage.
- 5.2 Input terminals are provided for input conductors.
- 5.3 The transformer secondary will be "wye" configured with three phase conductors and a newly derived neutral conductor. The newly derived neutral is effectively bonded to the cabinet enclosure and a grounding terminal lug so the isolated output can be effectively referenced (grounded).
- 5.4 Common Mode noise attenuation is 120dB or better.
- 5.5 The transformer windings are all copper conductor construction, with separate primary and secondary isolated windings. The transformer conforms to NEC article 250-5D, that specifies a separately derived power source.

- 5.6 The transformer incorporates a solid foil, double copper electrostatic shield to minimize inner winding capacitance, as well as transient and noise coupling between primary and secondary windings.
- 5.7 Grain oriented, M6 grade, silicon transformer steel is utilized.
- 5.8 Flux density will not exceed 15K gauss.
- 5.9 Class N, 200°C insulation systems are used throughout with a maximum temperature rise of 115°C above an ambient of 40°C.
- 5.10 The transformer is designed for natural convection cooling.
- 5.11 Transverse Mode noise attenuation will be 3 dB at 1000 hertz and 20 dB per decade to 50 dB with a resistive load.

6.0 Output Isolation Transformer (Single Phase units only)

- 6.1 The isolation transformer includes primary taps at 2.5% increments with two (2) above and four (4) below the nominal voltage.
- 6.2 The newly derived neutral is effectively bonded to the cabinet enclosure and a grounding terminal lug so that the isolated output can be effectively referenced (grounded).
- 6.3 Output terminal lugs are provided for termination of the output phase conductors, one neutral conductor, and one ground conductor.
- 6.4 Common Mode noise attenuation is 120dB or better.
- 6.5 The transformer windings are all copper conductor construction, with separate primary and secondary isolated windings. The transformer conforms to NEC article 250-5D, that specifies a separately derived power source.
- 6.6 The transformer incorporates a solid foil, double copper electrostatic shield to minimize inner winding capacitance, as well as transient and noise coupling between primary and secondary windings.
- 6.7 Grain oriented, M6 grade, silicon transformer steel is utilized.
- 6.8 Flux density will not exceed 15K gauss.
- 6.9 Class N, 200°C insulation systems are used throughout with a maximum temperature rise of 115°C above an ambient of 40°C.
- 6.10 The transformer is designed for natural convection cooling.
- 6.11 Transverse Mode noise attenuation will be 3 dB at 1000 hertz and 20 dB per decade to 50 dB with a resistive load.

7.0 Cabinet Construction

- 7.1 Cabinet is attractive, functional, NEMA type 1 general purpose indoor enclosure.
- 7.2 Cabinet is manufactured from heavy gauge steel. Base sub-structure is adequate for fork lifting.
- 7.3 Powder-coat paint finish with proper pre-treatment is provided.

8.0 Warranty

Controlled Power Company guarantees all systems will be free from defects in material and workmanship for a period of (1) year following shipment from the factory.