SRT.specification.06.24.21

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| **Section** |  |  |  |
|  | ***Description*** |  |
|  |  | Fully electronic voltage sag mitigation device with natural convection cooling for ease of maintenance. Unit has deep single, and 3-phase sag correcting capabilities using an inverter & injection transformer design. Overload protection is ideal for industrial loads at 1,000% for 1 second and 500% for 5 seconds. All units have a copper wound transformer and an internal failsafe bypass arrangement to maintain the electrical load. Batteries and/or capacitor energy storage is not required for sag correcting operation. |
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| **1** | ***Scope*** |  |  |
|  | 1.00 |   | Document defines the requirements and responsibilities for design, manufacture, and documentation for a fully electronic, voltage sag mitigation product. |
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| **2** | ***Responsibilities*** |  |
|  |  |  | It is the responsibility of the manufacturer to ensure the equipment has been engineered, fabricated, assembled, and tested in accordance with manufacturer's design specifications. Manufacturer to be certified by ISO 9001:2015 minimum standards. |
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|  | 2.10 |   | ***Manufacturer's Responsibilities*** |
|  |  |  | a) The manufacturer shall have full responsibility for compliance with the requirements of this document. |
|  |  |  | b) The manufacturer shall design, fabricate, and supply the equipment completely assembled, wired, tested, and ready for installation and operation in accordance with this document. |
|  |  |  | c) The manufacturer shall be responsible for providing all necessary documentation required to support product operation in the field. |
|  | 2.20 |   | ***Buyer's (end user) Responsibilities*** |
|  |  |  | a) Receiving and installing the unit. |
|  |  |  | b) Providing source 3-phase voltage to the input of the product within IEEE-519 voltage limits and standards. |
|  |  |  | c) Provide proper clearances around the product as dictated by installation documentation. |
|  |  |  | d) Determine proper enclosure protection as dictated by installation site conditions. |
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| **3** | ***Design Criteria*** |  |
|  | 3.00 |  | Unit will be capable of 1, 2, or 3-phase sag mitigation within a sub-cycle correction time period. |
|  | 3.10 |  | Unit shall provide balanced sinusoidal output. |
|  | 3.20 |  | Unit shall provide phase shift corrections. |
|  | 3.30 |  | Unit design shall include a copper wound transformer. |
|  | 3.40 |  | Unit shall be compatible for all load types. |
|  | 3.50 |  | Unit shall be Microprocessor controlled, inverter based series voltage injection. |
|  | 3.60 |  | Design will employ one (1), 3-phase inverter with self protection on error conditions. |
|  | 3.70 |  | Unit shall operate without batteries. |
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| **4** | ***Technical Requirements*** |
|  |  |  | ***The functionality and performance of the equipment shall be as follows:*** |
|  | 4.10 | Unit Rating | The unit shall have a continuous rating of "XXXX" kVA. |
|  | 4.20 | Phase & Frequency | The unit shall be 3-phase, 60Hz or 50Hz depending on site (Utility) voltage supplied. |
|  | 4.30 | Input Voltage | The nominal input 3-phase voltage shall be 3W+G, Delta configuration, "XXX" V  |
|  | 4.40 | Output Voltage | The output voltage will be 3-phase, 3W+G, Delta configuration. Voltage to match input nominal voltage. |
|  | 4.50 | Input Circuit Breaker | Standard configuration will include appropriately sized input circuit breaker. An external handle or push button to be provided to open & close the input circuit breaker. |
|  | 4.60 | 3-Position Control Switch | A 3-position control switch provided on the front of the unit for: 1) Operate, 2) Standby, 3) Control Power Off. |
|  | 4.70 | Single Phase Sag Correction | 80% sag (20% remaining voltage) corrected to 95% of nominal voltage. |
|  | 4.80 | 3-Phase Sag Correction | 40% sag (60% remaining voltage) corrected to 95% of nominal voltage. |
|  | 4.90 | Output Regulation Tolerance | Unit regulation tolerance to be +/-5% of the target output nominal voltage. |
|  | 4.10 | Response/Correction time | Full sag correction to be within 2ms. |
|  | 4.11 | Correction Duration | Full sag correction for a minimum duration of 100 seconds. |
|  | 4.12 | Phase Shift Correction | Phase shifts to be corrected automatically during sag correction. |
|  | 4.13 | Overload/Inrush Capability | Unit to be capable of withstanding inrush currents of 1,000% for on second, 500% for 5 seconds, 200% for 60 seconds |
|  | 4.14 | Efficiency | Unit to be equal to, or greater than 99% efficient under normal operating conditions. |
|  | 4.15 | Operating Frequency | Unit to be fully functional if frequency range is within +/-3% of nominal frequency. |
|  | 4.16 | Surge Suppression | Unit to include on board surge suppression with ANSI/IEEE C22.2 classification. |
|  | 4.17 | Failsafe Bypass | Unit to include auto-actuation failsafe bypass on high temperature, over current, or component failure with no loss of electrical load. |
|  | 4.18 | Inverter Operation | Non-continuous inverter operation - Activation during sag correction only. |
|  | 4.19 | Cooling | Standard configuration for normal cooling shall be natural convection, with fan assist for inverter cooling during sag correction. |
|  | 4.20 | Input Connection | The input shall be a 3-phase delta (3W+G) hardwired to the input circuit breaker. |
|  | 4.21 | Output Connection | The output shall be a 3-phase delta (3W+G) hardwired to a lug-type connector (s). |
|  | 4.22 | Neutral | No neutral connection required. |
|  | 4.23 | Grounding Connection | Internal input and output ground terminals shall be provided. Input ground connection is required. |
|  | 4.24 | Cable Entry | The standard unit will permit cable entry from the top, bottom or sides. |
|  | 4.25 | Remote Alarm Contacts | 2 sets of remote alarm contacts to be provided with standard unit. |
|  | 4.26 | Display | Standard unit configuration will include a touch screen color display to provide unit status, event logs, date, time, and troubleshooting diagnostic assistance. |
|  | 4.27 | Event log Recording |  Unit display event log functions to include: 1) Record Number, 2) Type of Event, 3) Date & Time stamp, 4) Record Details, 5) Navigation Scroll Arrows, and 6) Record Counter. |
|  | 4.28 | Enclosure | The unit enclosure shall be freestanding, constructed to NEMA-1 (IP-10) standards with a structural steel fabricated base. Standard color to be ANSI 61-grey. |
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| **5** | ***Operating Environment*** |
|  |  | Ambient Temperature | The unit shall be capable of continuous operation within an ambient air temperature of 32° to 104° F (0° to 40°C). |
|  |  | Relative Humidity | The unit shall be capable of continuous operation within a relative humidity of 0-95% non-condensing. |
|  |  | Operating Altitude | The unit shall be capable of continuous operation at full load without de-rating at altitude from 0 to 3,300 feet (1,000M). |
|  |  | Audible Noise | Audible noise during normal operation to be less than 65dBA at a distance of 1 meter. |
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| **6** | ***Installation*** |  |
|  |  | Assembly | Unit shall be fully assembled and properly packaged for shipment. |
|  |  | Setup | The unit shall not require any special setup considerations other than installing the appropriate input, and output connections. Installation of unit shall not require field measurements, adjustment, programming or modification of settings. Unit shall boot up and begin normal operation upon energizing the unit. |
|  |  | Special Tools | No special tools required for installation, startup, and energization of the unit. |
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| **7** | ***Documentation*** |  |
|  | 7.00 | Manuals | One reproducible hard copy and "PDF" versions shall be supplied for Operation and Maintenance of the supplied product. |
|  | 7.10 | Drawings | a) One set of approval drawings are supplied prior to manufacturing release for client review and approval. |
|  |  |  | b) One set of "as built" drawings are supplied at time of shipment (with new unit) to include: 1) Mechanical drawings, 2) Installation and Handling drawings, 3) Electrical drawings, and 4) Unit specifications. |
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| **8** | ***Warranty*** |  |
|  | 8.00 |  | The standard equipment shall be covered by the manufacturer's standard warranty for eighteen (18) months from date of shipment, or twelve (12) months from date of first operation, whichever occurs first. |
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| **9** | ***Spare Parts*** |  |
|  | 9.00 |  | Available as option to new unit purchase. Typical parts include: Control board sets, SCR assemblies, MOV, Snubbers, and Fuses where appropriate. |