**SECTION 26 11 17**

**Medium voltage RC-Snubber**

1. GENERAL
	1. Description
		1. This specification is for medium voltages three phase metal-enclosed RC-Snubber. The RC-Snubber protects the windings of a medium voltage transformer, generator of motor from high frequency voltage transients associated with lightning strikes and circuit-breaker switching.
		2. Snubber shall reduce rate of rise of the surge wave and reduce stress on insulation due to switching and lightning surges. Snubber shall be sized to provide protection of turn-to turn insulation of medium voltage generators, motors and transformers.
		3. The RC Snubber surge protector shall come fully assembled and ready for interconnection. All exceptions to this specification shall be clearly stated with your bid. If no exceptions are taken, the bid should include the phrase "no exceptions have been taken".
	2. QUALITY ASSURANCE
		1. Manufacturer: For equipment required for the work of this section, provide product as RC Surge Snubber (APT part number: APN 1575) as manufactured by Advanced Power Technologies (APT), Lafayette, IN.
	3. submittals
		1. Product Data: Submit manufacturer's printed product data.
		2. Drawings: Submit shop drawings for approval. Include components, materials, finishes, detailed plan and elevation views.
	4. applicable publications
		1. Publications listed below (including amendments, addenda, revisions, supplements and errata) were referenced to form parts of this specification.
		2. American National Standards Institute (ANSI):

C37.20.2................Guide for Enclosure Categories and Related Requirements

C57.142.................Guide to Describe the Occurrence and Mitigation of Switching Transients Induced by Transformers, Switching Device, and System Interaction

C62.11..................Standard for Metal-Oxide Surge Arresters for AC Power Circuits

* + 1. National Electrical Manufacturer's Association (NEMA):

CP-1....................Standards for Shunt Capacitors

* + 1. National Fire Protection Association (NFPA):

70-11...................National Electrical Code (NEC)

* + 1. International Electrotechnical Commission (IEC):

600099-4................Standard for Metal-Oxide Surge Arresters without gaps for AC Systems

1. PRODUCTS
	1. General
		1. System Rating:
			1. System Line-Line Voltage: 13.8 kV
			2. System Line-Ground Voltage: 7.96 kV
			3. BIL rating: 95 kV
			4. 10 seconds overvoltage: 30 kV
		2. Snubber shall conform to the arrangements and details shown on the drawings.
		3. Snubber shall be assembled, connected, and wired at the factory so that only external circuit connections are required at the construction site.
		4. Packaging shall include the snubber to be stretch wrapped and mounted to a skid and to provide adequate protection against rough handling during shipment.
	2. Housing
		1. Frames and enclosures:
			1. Enclosure shall be designed according to NEMA 1 standard for indoor operation, mountable in any position – upright, side, or inverted, and manufactured from Carbon Steel.
			2. Cable entry shall be from the top, bottom or side depending on the orientation of mounting and installation requirements.
			3. Versatility of cable connections is essential to minimize the cable lengths between the terminals of the surge snubber and the terminals of the protected equipment.
		2. Markings and Nameplates:
			1. Each snubber section shall have a label permanently affixed to it, listing the following information: Name of manufacturer, system voltage and frequency enclosure type, and manufacturer's shop order number.
			2. The nameplates shall be produced from clear textured polycarbonate, laminated on high performance pressure sensitive adhesive. The printing shall be done on the interior surface of the laminate to avoid scratching or other deterioration of text. The lettering shall be white on black background.
		3. Finish:
			1. One (1) powder coat of ANSI 61 Light Gray shall be applied to all interior and exterior surfaces.
			2. The final finish must be exterior rated for either NEMA 1 or NEMA 3R use.
	3. Busing:
		1. Silver plated copper busbar shall be used for landing all cable connections.
	4. RC Surge SNubber:
		1. The capacitive elements shall be hermetically sealed with Low-loss polypropylene film and aluminum foil, Non-PCB dielectric fluid, internal discharge resistors to reduce the residual voltage to less than 50 V in 5 minutes of de-energization and designed for indoor/outdoor use with an ambient temperature range of -40°C to +50°C.
		2. Capacitance per phase: 0.25µF, ±10% or as indicated on the drawings.
		3. Resistance per phase: 34MΩ
		4. Surge snubber shall have 10 seconds overvoltage ratings coordinated and suitable for use with 10 seconds rated neutral grounding resistors.
	5. Surge Arrester:
		1. The surge snubber assembly shall include station class surge arrester if shown on the drawing.
		2. The surge arrester shall meet consist of high performance metal oxide disks molded in a shatter-proof polymer housing.
		3. The metal oxide disks are enclosed in a support assembly consisting of reinforced epoxy / fiberglass loops connecting the upper and lower aluminum end pieces. The silicone polymer material is then molded directly to the metal oxide loop assembly eliminating any air pockets which could cause moisture ingress over time.
		4. The silicone rubber housing features high tracking and arc resistance, excellent hydrophobic properties, and resistance to weathering, UV radiation and pollution.
		5. Surge arresters shall be rated as indicated on the drawings and elsewhere in the specification:
2. EXECUTION
	1. INSTALLATION
		1. Install as close to the terminals of the protected winding as possible.
		2. Install in accordance with the NEC, as shown on the drawings, and as recommended by the manufacturer.

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