

SECTION 26 22 00 - LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.1 SUBMITTAL REQUIREMENTS

- A. Product Data
 - 1. For each type and size include rated nameplate data, capacities, weights, dimensions, minimum clearances, location and size of each connection, performance, etc.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to being equivalent and subject to compliance with requirements, provide product by one of the manufacturers listed below. If not listed, submit as substitution.
 - 1. Square D; a brand of Schneider Electric.
 - 2. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 3. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 4. Siemens Energy & Automation, Inc.

2.2 GENERAL TRANSFORMER REQUIREMENTS

- A. Provide factory-assembled and -tested, air-cooled units for 60-Hz service, grain-oriented, non-aging silicon steel cores, and ratings for continuous operation at respective listed kVA.
- B. Provide terminal enclosure, with cover, to accommodate primary and secondary coil wiring connections, and to accommodate electrical supply raceway terminal connectors. Provide terminal leads with connectors installed. Provide wiring connectors suitable for copper or aluminum wiring. Cushion-mount transformers with external vibration isolation supports.
- C. Coils: Continuous windings without splices except for taps, one leg per phase, with brazed or pressure type internal coil connections. Provide Copper coils.

2.3 DISTRIBUTION TRANSFORMERS

- A. Comply with NEMA ST 20, and list and label as complying with UL 1561.
- B. Taps for Transformers:
 - 1. Smaller Than 3 kVA: One 5 percent tap above normal full capacity.
 - 2. 7.5 to 24 kVA: One 5 percent tap above and one 5 percent tap below normal full capacity.
 - 3. 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.
- C. Features:
 - 1. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150-degree C rise above 40 degree C ambient temperature.
 - 2. Provide transformers with 10kV BIL ratings.
 - 3. Energy Efficiency for Transformers: Complying with DOE 2016 Efficiency standard, and tested according to DOE 10 CFR Part 431: 2016, including Appendix A.

4. Enclosure: Ventilated, NEMA 250 Type 1 for indoor applications and Type 3R for exterior applications. Finish Color: Gray.
- D. Low-Sound-Level Requirements: Maximum sound levels, when factory tested according to IEEE C57.12.91, as follows:
 1. 9 kVA and Less: 45 dB
 2. 30 to 50 kVA: 45 dB
 3. 51 to 150 kVA: 50 dB
 4. 151 to 300 kVA: 55 dB
 5. 301 to 500 kVA: 60 dB
 6. 501 to 750 kVA: 62 dB
 7. 751 to 1000 kVA: 64 dB

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Maximum ground resistance shall be 5 ohms at location of transformer.
- B. Construct concrete housekeeping pad bases, and anchor floor-mounting transformers according to manufacturer's written instructions, requirements in Section 26 05 29.00 "Hangers and Supports for Electrical Systems", and other related sections. Cushion-mount transformers with external vibration isolation supports.
- C. Transformers locations are shown for schematic purposes. Determine exact location in field based on surrounding building conditions, work of other trades, factory recommendations, ventilation requirements, maintenance access, and requirements of the NFPA 70 (including working clearance requirements).
- D. From the time of manufacture, through shipping/storage phases, keep transformers dry, free of condensation, and free of rapid temperature fluctuations. Do not store transformers outdoors. Maintain transformers at temperatures above ambient while in storage.
- E. Provide local primary disconnect switch for each transformer, and local secondary overcurrent protection. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems." and in accordance with NFPA 250. Provide flexible metal grounding strap for grounding of core and coils. Provide final connections with an accurate torque wrench, and tighten to factory published torque values, and submit written documentation showing factory recommendations and actual values. Provide final connections to primary and secondary taps as necessary to fulfill project voltage requirements.

3.2 FIELD QUALITY CONTROL

- A. Tests and Inspections: Provide testing and keep written and dated log for the following
 1. "Hi-Pot" or "Megger", at factory at time of shipping.
 2. "Megger", at job site, immediately prior to final connections.
 3. Phase rotation and turns ratio, at factory at time of shipping.
 4. Phase rotation and turns ratio, at job site, immediately prior to final connections.
 5. Secondary voltage under no load, after installation.
 6. Secondary voltage under full load, after installation.

3.3 ADJUSTING

- A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals.

Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.

END OF SECTION 26 22 00