

SECTION 26 22 03

LOW-VOLTAGE TRANSFORMERS FOR NONLINEAR LOADS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes transformers for nonlinear loads.
- B. Related Sections:
 - 1. Division 26 - Raceway and Boxes for Electrical Systems.
 - 2. Division 26 - Low-Voltage Transformers.
 - 3. Division 26 - Low-Voltage Transformer Load Centers.

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
 - 2. NEMA ST 20 - Dry Type Transformers for General Applications.
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, k-factor, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.
- C. Test Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.

1.04 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of transformers.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

- C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 TRANSFORMERS FOR NONLINEAR LOADS

- A. Manufacturers:
 - 1. Square D
 - 2. Eaton
 - 3. General Electric
 - 4. Substitutions: Division 01 - Product Requirements.
- B. Product Description: NEMA ST 20, factory-assembled, air cooled dry type transformers, ratings as required to complete the work, designed to supply 50 percent nonlinear load.
- C. Primary Voltage: 480 volts, 3 phase
- D. Secondary Voltage: 208Y/120 volts, 3 phase
- E. Core Flux Density: Below saturation at 10 percent primary overvoltage.
- F. Insulation and temperature rise: Class 220 insulation system with 80 degrees C average winding temperature rise.
- G. Case temperature: Do not exceed 30 degrees C rise above ambient at warmest point at full load.
- H. Winding Taps:
 - 1. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
 - 2. Transformers 15 kVA and Larger: NEMA ST 20.
- I. Sound Levels: NEMA ST 20
 - 1. 1-5 kVA: 60 dB.
 - 2. 6-25 kVA: 60 dB.
 - 3. 26-150 kVA: 60 dB.
 - 4. 151-225 kVA: 60 dB.
 - 5. 226-300 kVA: 60 dB.
 - 6. 301-500 kVA: 60 dB.
- J. Basic Impulse Level: 10 kV.
- K. Ground core and coil assembly to enclosure by means of visible flexible copper grounding strap.
- L. Mounting:
 - 1. 1-15 kVA: Suitable for wall mounting.
 - 2. 16-75 kVA: Suitable for floor mounting.
 - 3. Larger than 75 kVA: Suitable for floor mounting.
- M. Coil Conductors: Continuous copper windings with terminations brazed or welded. Individually insulate secondary conductors and arrange to minimize hysteresis and eddy current losses at harmonic frequencies. Size secondary neutral conductor at twice secondary phase conductor ampacity.

- N. Electrostatic Shield: Copper, between primary and secondary windings.
- O. Enclosure: NEMA ST 20, Type 1 ventilated. Furnish lifting eyes or brackets.
- P. Isolate core and coil from enclosure using vibration-absorbing mounts.
- Q. Nameplate: Include transformer connection data.

2.02 SOURCE QUALITY CONTROL

- A. Production test each unit according to NEMA ST 20.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify mounting supports are properly sized and located, including concealed bracing in walls.

3.02 EXISTING WORK

- A. Disconnect and remove high voltage, oil-filled transformers in basement.
- B. Remove all associated equipment and wiring completely back to source.
- C. Clean and repair existing transformers to remain or to be reinstalled.

3.03 INSTALLATION

- A. Set transformer plumb and level.
- B. Use flexible conduit, in accordance with Division 26, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- C. Support transformers in accordance with Division 26.
 - 1. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by manufacturer.
 - 2. Mount floor-mounted transformers on vibration isolating pads suitable for isolating transformer noise from building structure.
 - 3. Mount trapeze-mounted transformers as required to complete the work per program.
- D. Provide seismic restraints.
- E. Install grounding and bonding in accordance with Division 26.

3.04 FIELD QUALITY CONTROL

- A. Division 01 Quality Requirements and Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.2.1.

3.05 ADJUSTING

- A. Division 01 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION