SECTION 26 22 00

LOW-VOLTAGE (BELOW 600 VOLT) TRANSFORMERS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes two-winding transformers.

B. Related Sections:

1. Division 26 - Raceway and Boxes for Electrical Systems.
2. Division 26 - Low-Voltage Transformer Load Centers.

1.02 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA ST 1 - Specialty Transformers (Except General Purpose Type).
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. The Design/Builder's electrical contractor shall submit 1/4"=1'0" scale sketches of all electrical rooms and areas including actual dimensions of all equipment in electrical rooms and indicate clearances per LACEC, as well as door swings or other obstacles. Sketches shall be submitted along with or prior to shop drawing submittals. Shop drawing submittal without sketches shall be returned and not reviewed.

C. Product Data: Submit outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

D. Test Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.

E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

F. Manufacturer's Certificate: Submit testing report along with shop drawings

G. Manufacturer shall provide special seismic certification with submittal.

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 five years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Division 01 - Product Requirements: Product storage and handling requirements.

B. 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 TWO-WINDING TRANSFORMERS

A. Manufacturers:

1. Eaton Electric – Cutler Hammer Products
2. Siemens ITE
3. Square D
4. Substitutions: Not Permitted.

B. Product Description: NEMA ST 20, factory-assembled, naturally ventilated, dry type transformers, ratings as required to complete the work. (Forced air cooled transformers are not acceptable.)

C. Primary Voltage: 480 volts, 3 phase.

D. Secondary Voltage: 208Y/120 volts, 3 phase.

E. Insulation system and average winding temperature rise for rated kVA as follows:

1. 1-15 kVA: Class 185 with 115 degrees C rise.
2. 16-500 kVA: Class 220 with 115 degrees C rise.

F. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

G. 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: Six 2-1/2 percent full capacity primary taps, two above and four below. Furnish pistol grip for each phase NEMA ST 20.

H. Sound Levels: NEMA ST 20. Maximum sound levels are as follows:

1. 1-5 kVA: 30 dB.
2. 6-25 kVA: 40 dB.
3. 26-150 kVA: 42 dB.
4. 151-225 kVA: 43 dB.
5. 226-300 kVA: 47 dB.
6. 301-500 kVA: 51 dB.

I. Basic Impulse Level: 10 kV for transformers less than 300 kVA, 30 kV for transformers 300 kVA and larger.

J. Ground core and coil assembly to enclosure by means of visible flexible copper grounding strap.

K. Mounting:

1. 1-15 kVA: Suitable for wall mounting.
2. 16-75 kVA: Suitable for wall, floor, or trapeze mounting.
3. Larger than 75 kVA: Suitable for floor mounting.

L. Coil Conductors: Continuous windings with terminations brazed or welded.

M. Winding: All windings shall be copper.

N. Enclosure: NEMA ST 20, Type 1 indoor, dry locations, Type 3R outdoor or drop location. Furnish lifting eyes or brackets.

O. Isolate core and coil from enclosure using vibration-absorbing mounts.

P. Fan cooled transformers are not permitted.

Q. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

2.02 SOURCE QUALITY CONTROL

A. Production test each unit according to NEMA ST20.

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.

C. Verify that surfaces are suitable for installing transformer supports.

3.02 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. Do not make conduit connections to front or rear 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 per Code and as required to complete the work.

D. Provide seismic restraints.

E. Install grounding and bonding in accordance with Division 26.

F. Install grounding bushings on all conduits.

G. Install jumpers from enclosure to conduit grounding bushing.

3.03 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.

3.04 ADJUSTING

A. Division 01 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

END OF SECTION