SECTION 26 22 00 - DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.1. SUMMARY:

A. This section includes design and performance requirements for dry-type transformers, typically utilized for use on secondary distribution systems rated 600 VAC and below.

B. Related Sections:
   1. Section 01701 - Building Systems Identification and Labeling

1.2. QUALITY ASSURANCE

A. Transformers shall be Underwriters' Laboratories (UL) Listed and shall be suitable for the intended use on the Project.

1.3. DRY-TYPE TRANSFORMERS – GENERAL REQUIREMENTS:

A. Transformer ratings and types shall be selected to match the requirements of the primary service and the types of load served. In most cases, a general purpose type of transformer shall be adequate for the load.

B. For applications requiring isolation transformers, such as for motor variable speed drives, utilize a rated Drive Isolation-type transformer.

C. For applications where large harmonic loads are anticipated, utilize a non-linear load-type transformer.

D. Transformers shall conform to NEMA TP-1 requirements for energy efficiency and be Energy-Star listed.

E. Transformer windings and terminations shall be copper.

F. Transformers shall be capable of operating at 100% of nameplate rating continuously while in an ambient temperature of 40degrees C (104 degrees F). Maximum temperature rise for transformers shall be 115degrees C at rated load.

G. Transformer sound levels shall not exceed the levels indicated below:

Transformer KVA	Maximum Sound Level (db)
15 - 50	45
51 - 150	50
151 - 300	55
301 - 500	60

H. Three phase transformers shall be wound in a Delta-Wye configuration unless otherwise required for the application.

I. For transformers rated 15 KVA and above, core and coil assemblies shall be impregnated with non-hygroscopic, thermosetting varnish to reduce hot spots and seal out moisture. Mount assemblies to the transformer case with vibration-resistant pads.

J. Transformer core and coil assembly shall be grounded to the transformer enclosure by means of a visible, flexible copper grounding strap.

K. Enclosures for indoor applications shall be NEMA 2 drip-proof rated, with ventilation openings protected against falling dirt. Enclosures for exterior applications shall be rated NEMA 3R minimum.

1.4. TRANSFORMERS – GENERAL PURPOSE TYPE:

A. Transformer insulation type shall be as follows:
   1. Less than 15 KVA: 185 degrees C insulation system.
   2. 15 KVA and above: 220 degrees C insulation system.

B. Taps:
   1. 3 through 12 KVA: two 5% taps below rated primary voltage
   2. 15 KVA and above: six 2.5% taps, 2 above and 4 below rated primary voltage.

C. Core and Coil Assemblies:
   1. For transformers rated 9KVA and below, completely encapsulate the core and coil windings in a resin and aggregate to provide a moisture-proof and shock resistant seal, and to provide reduced sound levels.

1.5. TRANSFORMERS – DRIVE ISOLATION TYPE:

A. Transformer windings shall be specially braced to withstand the thermal and mechanical stresses of DC drive current spikes.

B. Transformer windings shall incorporate an isolated and shielded secondary winding to provide greater isolation of drive “noise” coupling back to the primary windings.

C. Isolation transformer insulation type shall be as follows:
   1. 7.5 KVA and above: 220 degrees C insulation system.

D. Taps:
   1. Six 2.5% taps, 2 above and 4 below rated primary voltage.

1.6. TRANSFORMERS – NON-LINEAR LOAD TYPE:

A. K-factor shall be specified as required for the project. In general, K ratings of 4 or 13 shall be specified.

B. Transformer windings shall incorporate an isolated and shielded secondary winding to provide greater isolation of harmonic “noise” coupling back to the primary windings.

C. Transformer windings shall incorporate a 200% rated neutral winding and double-capacity neutral terminations.

D. Non-Linear Load transformer insulation type shall be as follows:

E. 15 KVA and above: 220 degrees C insulation system.

F. Taps:
   1. Six 2.5% taps, 2 above and 4 below rated primary voltage.

PART 2 – PRODUCTS

2.1. MANUFACTURERS:

A. Transformer manufacturer shall generally match the brand of installed building electrical distribution equipment.

B. Manufacturers:

1. Square D
2. Siemens

PART 3 - EXECUTION

3.1. MOUNTING CONSIDERATIONS:

A. 1-15 kVA: Suitable for wall or trapeze mounting.

B. 30-75 kVA: Suitable for floor or trapeze mounting.

C. Larger than 75 kVA: Suitable for floor mounting.

3.2. INSTALLATION:

A. Provide proper spacing from walls for proper transformer ventilation and cooling.

B. Provide vibration isolating pads suitable for isolating transformer noise and vibration from the building structure; use a minimum 2 foot length of flexible metal conduit to minimize noise transmission.

C. Provide concrete housekeeping pad for floor-mounted transformers.

D. Verify final connections for proper application and workmanship prior to energizing.

E. Verify that all internal shipping braces and brackets are removed.

F. Check primary and secondary voltages and make appropriate tap adjustments after transformer energization to provide optimum voltage conditions to the utilization equipment.

G. Transformer installation shall be left neat and clean with all foreign material removed from inside and around enclosures.

3.3. IDENTIFICATION:

A. Label each transformer with laminated plastic nameplate, secured to the case with corrosion-resistant screws.

END OF SECTION