SECTION 16321

MEDIUM VOLTAGE TRANSFORMERS (DRY TYPE)

NOTE: Dry type Medium voltage transformers are not to be used unless specially approved by the University electrical engineer in writing.

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Dry type pad-mounted distribution transformer.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Pads for transformer support.
   Section 09900 – Painting

1.03 REFERENCES

A. ANSI/IEEE C57.12.01 - General Requirements for Dry-type Distribution and Power Transformers.

B. ANSI C57.12.22 - Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers With High-Voltage Bushings; High Voltage, 34,500 GrdY/19,920 Volts and Below; 2500kVA and smaller.

C. ANSI/IEEE C57.12.91 - Test Code for Dry-Type Distribution and Power Transformers.

D. NEMA 260 - Safety Labels for Pad-mounted Switchgear and Transformers Sited in Public Areas.

1.04 SUBMITTALS

A. Submit shop drawings and product data under the provisions of Section 01300 and Section 16010.

B. Submit shop drawings indicating outline dimensions, connection and support points, weight, specified ratings and materials.

C. Submit product data indicating standard model design tests and options.

D. Submit manufacturer’s installation instructions under provisions of Section 01300.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Sections 01700, 01730, 16010 Division I.
B. Include procedures for cleaning unit and replacing components.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in distribution transformers with three (3) years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products under provisions of Sections 01600 and 16010.

B. Protect dry type transformers from moisture by using appropriate heaters as instructed by the manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS - PAD-MOUNTED TRANSFORMERS

A. General Electric

B. ABB

C. Square D

D. RTE

E. Balteau Standard

2.02 PAD-MOUNTED TRANSFORMERS

A. Dry-Type Transformers: ANSI/IEEE C57.12.01; 3-phase pad-mounted self-cooled transformer unit.

B. Indicate kVA, capacity, secondary voltage. Transformers larger than 1000 kVA shall not be used without special written authorization from the University electrical engineer.

C. Primary Voltage: 13800 kV delta connected; provide 2-2 1/2% AN and 2-2 1/2% BN primary taps.

D. Secondary Voltage: 120/208 or 277/480 volts, WYE connected.

E. Impedance: 5.75 percent 750-1000 kVA
   3.5 percent 75-500 kVA

   Select the impedance after completing the fault study for the distribution to assure optimum value.

F. Basic Impulse Level: Primary Voltage: 95 kV. Secondary Voltage: 30 kV
G. Cooling and Temperature Rise: ANSI/IEEE C57.12.01; Class AA. 220°C insulation class with 150°C rise over 40°C ambient.

H. Primary Terminations: Bushing wells to ANSI/IEEE 386; provide three for radial feed, six for loop primary selective feed. Include bushings for insulated load-break connectors. Specify 1 - 2 position switch for radial feed and 3 - 2 position load break switches for loop feed. The load feed switch shall be wired as shown at the end of section 16320 in the UCB standards.

I. Secondary Terminations: Provide spade lugs.

J. Accessories:
   1. Temperature indicator with alarm contact and control relays
   2. Latching alarm relay and indicating light
   3. Latching control relay
   4. Control (tripping)

K. Coil Conductors: Continuous copper windings.

L. Transformer start-up: The transformer will not be started until all tests are complete and turned over to Owner and engineer (2 sets) for review and approval.

PART 3 - EXECUTION

3.01 EXAMINATION

   A. Verify that pads are ready to receive work.

   B. Verify field measurements are as shown on Drawings.

   C. Verify that required utilities are available, in proper location and ready for use.

3.02 INSTALLATION

   A. Install in accordance with manufacturer’s instructions.

   B. Install safety labels to NEMA 260. Safety labels per NEMA.

3.03 FIELD QUALITY CONTROL

   A. Field testing shall be performed under provisions of Section 01400. Perform the following tests.

      1. Turns test ratio on all taps

      2. Power factor tests or dissipation factor in accordance with manufacturer’s instructions

      3. Excitation tests.
B. Factory test dry-type transformer to ANSI/IEEE C57.12.91 and provide University the test results prior to setting the transformer.

C. Field test transformer to ANSI/IEEE C57.12.91. All field tests to be witnessed by Owner. All test reports shall be turned over to Owner.

3.04 ADJUSTING

A. Adjust primary taps so that secondary voltage is within one and a half percent (1.5%) of rated voltage at full load.

END OF SECTION 16321