

**DRY TYPE TRANSFORMERS – 4160V**

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**1. GENERAL**

**1.1 References**

- .1 CSA C9, Dry-Type Transformers.
- .2 EEMAC GL1-3, Transformer and Reactor Bushings.

**1.2 Source Quality Control**

- .1 Submit to Contract Administrator [6] copies of standard factory test certificates of each transformer and type test of each transformer in accordance with CSA C9.

**1.3 Shop Drawings**

- .1 Submit shop drawings in accordance with Section 01300 – Submittals.
- .2 Include:
  - .1 Dimensioned drawing showing enclosure, mounting devices, terminals, taps, internal and external component layout.
  - .2 Technical data:
    - .1 kVA rating.
    - .2 Primary and secondary voltages.
    - .3 Frequency.
    - .4 Three phase.
    - .5 Polarity or angular displacement.
    - .6 Full load efficiency.
    - .7 Regulation at unity pf.
    - .8 BIL.
    - .9 Insulation type.
    - .10 Sound rating.

**1.4 Operation and Maintenance Data**

- .1 Provide operation and maintenance data for dry type transformers for incorporation into manual specified in Section 16010 - Electrical General Requirements.
- .2 Operation and maintenance instructions to include:
  - .1 Tap changing.
  - .2 Recommended environmental conditions.
  - .3 Recommended periodic inspection and maintenance.
  - .4 Bushing replacement.

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**1.5 Storage**

- .1 Store transformers indoors in a dry location.

**2. PRODUCTS**

**2.1 Materials**

- .1 Dry-type transformers: to CSA C9, CAN/CSA C802 and NEAM TP-1.
- .2 Bushings: to EEMAC GL1-3.

**2.2 Transformer Characteristics**

- .1 Type: ANN
- .2 Rating: 300 kVA, 3 phase, provisions only for fan forced air cooling, 60 Hz.
- .3 220 insulation system class, 150°C temperature rise.
- .4 Impedance: standard.
- .5 Primary winding: 4160V, delta, BIL 30 kV.
- .6 Secondary winding: 600 V, star, BIL 10 kV, four wire with neutral brought out and effectively grounded.
- .7 Losses not to exceed CAN/CSA C802 and NEMA TP-1 standards.

**2.3 Enclosure**

- .1 Fabricated from sheet steel.
- .2 Bolted removable panels for access to tap connections, enclosed terminals

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.3 Conductor entry:

- .1 Knockouts
- .2 Potheads
- .3 Junction boxes
- .4 Bushings
- .5 Clamping rings
- .6 Entry for cable.

- .4 Indoor, ventilated, self air cooled type. Temperature of exposed metal parts not to exceed 65°C rise.

**2.4 Voltage Taps**

- .1 Standard.

**2.5 Tap Changer**

- .1 Bolted-link type.

**2.6 Windings**

- .1 Primary and secondary coils:
  - .1 Copper.
  - .2 Open.
- .2 Coil and core assembly:
  - .1 Taps located at front of coils for accessibility.

**2.7 Accessories**

- .1 Winding temperature detector relay and sensing elements with one set of SPDT contacts.
- .2 Wiring and terminal box for protective devices.
- .3 Grounding terminal: outside of enclosure.

**2.8 Equipment Identification**

- .1 Provide equipment identification in accordance with Section 16010 - Electrical General Requirements.
- .2 Equipment labels: nameplate size 7

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**3. EXECUTION**

**3.1 Installation**

- .1 Locate, install and ground transformer[s] in accordance with manufacturer's instructions.
- .2 Set and secure transformers in place, rigid plumb and square.
- .3 Connect primary bushings to high voltage circuit.
- .4 Connect secondary terminals to secondary cable.
- .5 Use flexible conduit to make connections to transformer.
- .6 Energize transformers and check secondary no-load voltage.
- .7 Adjust primary taps as necessary to produce rated secondary voltage at no-load.
- .8 Wire one set of contacts on winding temperature detector relay to protection relay.
- .9 Use torque wrench to adjust internal connections in accordance with manufacturers' recommended values.
- .10 Check transformer for dryness before putting it into service and if it has not been energized for some considerable time.

**3.2 Field Quality Control**

- .1 Energize transformers and apply incremental loads:
  - .1 0% for 4 h.
  - .2 10% for next 1 h.
  - .3 25% for next 2 h.
  - .4 50% for next 3 h.
  - .5 Full load.
  - .6 At each load change, check temperatures ambient, enclosure, and winding.

**END OF SECTION**