

DRY TYPE TRANSFORMERS – 4160V

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, star, BIL 30 kV.
- .6 Secondary winding: 600 V, delta 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.

.5 Pad mounted type:

- .1 Conductor entry through bottom for underground distribution, with separate high and low voltage compartments divided by full length metal barrier.
- .2 Each compartment to have access door with concealed hinges.
- .3 Secondary door to have 3-point latch, external operating handle, provision for padlocking and arranged so that secondary door must be open before access gained to primary compartment.

.6 Open type: no enclosure, for installation in switchgear enclosure.

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.

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- .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

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