

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 16010 - Electrical General Requirements.
- .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.

1.5 Storage

- .1 Store transformers indoors in a dry location.

2. PRODUCTS

2.1 Materials

- .1 Dry-type transformers: to CSA C9.
- .2 Bushings: to EEMAC GL1-3.

2.2 Transformer Characteristics

- .1 Type: ANN.
- .2 Rating: Transformer LT-3: 2000 kVA, 3 phase, 60 Hz., K-4 rating.
Transformer LT-4: 300 kVA, 3 phase, 60Hz
- .3 220⁰ insulation system class, 115°C temperature rise.
- .4 Impedance: 7.5%.
- .5 Primary winding: 5000 V, Delta, BIL 60 kV.
- .6 Secondary winding: 347/600 V, star, four wire with neutral brought out and effectively grounded.
- .7 Sound rating: 65dBA.

2.3 Enclosure

- .1 Fabricated from sheet steel.
- .2 Bolted removable panels for access to tap connections, enclosed terminals other accessories.
- .3 Conductor entry:
 - .1 Entry for busbars.

- .4 Designed for floor.
- .5 Transformer LT-3: outdoor, ventilated, self cooled type, CSA 3 Enclosure.
- .6 Transformer LT-4: Indoor, ventilated, self cooled type, CSA 1 Enclosure.
- .7 Pad Mounted Type: conductors entry through bottom of pad.

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 Vacuum cast epoxy
- .2 Coil and core assembly:
 - .1 Taps located at front of coils for accessibility.
- .3 Sound level: not to exceed 65 dB.

2.7 Accessories

- .1 Winding temperature detector relay and sensing elements with two sets of SPDT contacts.
- .2 Wiring and terminal box for protective devices.
- .3 Digital type winding temperature indicator with alarm contacts.
- .4 Grounding terminal: inside of enclosure.

2.8 Equipment Identification

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

2.9 Acceptable products:

- Hammond Manufacturing
- Delta Transformers
- BEMAG Transformers

3. EXECUTION

3.1 Installation

- .1 Locate, install and ground transformer in accordance with manufacturer's instructions.
- .2 Set and secure transformers in place, rigid plumb and square.
- .3 Connect primary terminals to high voltage circuit.
- .4 Connect secondary terminals to secondary feeder.
- .5 Transformer LT-3: install primary and secondary cable sleeves through pump station roof and transformer pad. Seal and make weather proof after cable installation is completed.
- .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 sound alarm, wire second set of contacts to PLC alarm for high transformer temperature.
- .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 Perform tests in accordance with Section 16980 - Testing, Adjusting and Balancing of Electrical Equipment and Systems.
- .2 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 Once per hour and at each load change, check temperatures ambient, enclosure and winding.

END OF SECTION