

Part 1 General

1.1 RELATED SECTIONS

- .1 26 05 00 - Common Work Results for Electrical: Product Data; Delivery, Storage and Handling.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.2 No. 47-13(R2018), Dry-Type Transformers.
 - .2 CSA C9-17, Dry-Type Transformers.
 - .3 CSA C802.2-18, Minimum Efficiency Values for Dry-Type Transformers.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 013300 - Submittal Procedures.
- .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 phases.
 - .5 Polarity or angular displacement.
 - .6 Full load efficiency.
 - .7 Regulation at unity pf.
 - .8 BIL.
 - .9 Insulation type.
 - .10 Sound rating.

1.4 CONTROL SUBMITTALS

- .1 Submit to Engineer digital copy (in pdf format) of standard factory test certificate for the transformer in accordance with C22.2 No. 47.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for dry type transformers for incorporation into manual specified in Section 017800 - Closeout Submittals.
- .2 Operation and maintenance instructions to include:
 - .1 Tap changing.
 - .2 Recommended environmental conditions.
 - .3 Recommended periodic inspection and maintenance.
 - .4 Bushing replacement.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Store transformers indoors in dry location.
- .2 Transformers to be shipped fully plywood crated complete with shrink-wrap and desiccant packs. Ensure that the transformers are properly packaged prior to shipping.
 - .1 Crate to incorporate shock wave indicators.
- .3 Include all shipping and storage charges required to send equipment to the site. Include charges for on and off loading of the equipment into storage areas designated by the client.

1.7 EXTRA MATERIALS

- .1 Provide maintenance materials in accordance with Section 017800 - Closeout Submittals.

Part 2 Products

2.1 MATERIALS

- .1 Dry-type transformers: to CSA C22.2 No. 47 and CSA C802.2.

2.2 TRANSFORMER CHARACTERISTICS

- .1 Type: ANN/(Provisional ANF).
- .2 Rating: 2000 kVA, 3 phase, provisions only for fan forced air cooling, 60 Hz.
- .3 220 insulation system class, 150 °C temperature rise.
- .4 Impedance: between 5-6 %.
- .5 Primary winding: 25 KV, delta, BIL 150 kV.
- .6 Secondary winding: 480 V, wye, BIL 10 kV, four wire with neutral brought out and solidly grounded.
- .7 No load and Full load losses to meet CSA standard C802.2.
- .8 Sound rating: <66dB.
- .9 ENCLOSURE
 - .1 Sprinklerproof enclosure
 - .2 Fabricated from sheet steel.
 - .3 Bolted removable panels for access to tap connections, enclosed terminals.
 - .4 Conductor entry:
 - .1 Entry for primary and secondary busbars.
 - .2 Transformer manufacturer to provide flexible connectors for both primary and secondary connections and to coordinate with primary and secondary switchgear manufacturers.
 - .5 Designed for floor mounting.
 - .6 Indoor, ventilated, self cooled type. Temperature of exposed metal parts not to exceed 65°C rise.

- .10 VOLTAGE TAPS
 - .1 Standard 5 taps, one at nominal voltage, 2 at 2.5% intervals above nominal, 2 at 2.5% intervals below nominal.
- .11 TAP CHANGER
 - .1 Bolted-link type.
- .12 WINDINGS
 - .1 Primary and secondary coils:
 - .1 Copper.
 - .2 Mechanical Coil Supports of GP03 or similar with Nomex Aramid papers and laminates for insulation
 - .3 Vacuum Pressure Impregnation (PVI) with Polyester Resin.
 - .4 Windings shall be self supporting disk wound.
 - .2 Coil and core assembly:
 - .1 Taps located at front of coils for accessibility.
 - .3 Flexible core ground strap
- .13 ACCESSORIES
 - .1 Winding temperature detector relay and sensing elements with two set of SPDT contacts to allow for future fan control and high temperature alarming.
 - .2 Wiring and terminal box for protective devices.
 - .3 Grounding terminal: inside of enclosure.

2.3 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 260500 - Electrical General Requirements.
- .2 Equipment labels: nameplate size 7.

2.4 MANUFACTURERS

- .1 Acceptable manufacturers: Hammond Power Systems (Hammond/Delta), Siemens, Eaton ABB, Schneider/Square D, Virginia Transformer, Cutler Hammer, Hitachi, Or Approved equals.

Part 3 Execution

3.1 INSTALLATION

- .1 Locate, install and ground transformers 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 circuit.
- .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 Use torque wrench to adjust internal connections in accordance with manufacturers' recommended values.
- .9 Check transformer for dryness before putting it into service and if it has not been energized for some considerable time.
- .10 Provided dedicated system ground to transformer neutral point if present.

3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with manufacturer's installation instructions.

END OF SECTION