

Part 1 General

1.1 RELATED WORK

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

1.2 REFERENCES

- .1 ANSI/IEEE 386-2016, Separable Insulated Connector Systems for Power Distribution Systems above 600V.
- .2 CAN/CSA C2.1-06(R2017), Single-Phase and Three-Phase Liquid-Filled Distribution Transformers
- .3 CAN/CSA C227.4-06(R2017), Three-Phase, Pad-Mounted Distribution Transformers with Separable Insulated High-Voltage Connectors
- .4 CSA C227.5-08(R2018), Three-Phase Live-Front Pad-Mounted Distribution Transformers

1.3 SOURCE QUALITY CONTROL

- .1 Submit to Engineer standard factory test certificates of each transformer and type test of each transformer with high voltage accessories in accordance with CSA C2.1.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 013300 - Submittal Procedures.
- .2 Indicate:
 - .1 Anchoring method and dimensioned foundation template.
 - .2 Dimensioned cable entry locations.
 - .3 Dimensioned cable termination height.
 - .4 Identified internal and external component layout on assembly drawing.
 - .5 Insulating liquid capacity.
 - .6 Catalog data on all devices including pressure-relief valves, oil sampling valves, gauges, fuses, fuse mounting methods, bushing wells, bushing inserts, spades, separable connectors, etc.
- .3 Submit primary fuse time-current characteristics.
- .4 Factory Tests: Furnish manufacturer's certified standard test reports for the transformer, including losses and transformer impedance.
- .5 Instruction Manuals: Furnish manufacturer's installation and maintenance manuals on the transformers and accessories.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for pad mounted distribution transformers for incorporation into manual specified in Section 017800 - Closeout Submittals.
- .2 Include insulating liquid maintenance data.

1.6 EXTRA MATERIALS

- .1 Provide maintenance materials in accordance with Section 017800 - Closeout Submittals.
- .2 Include:
 - .1 3 spare primary fuse refills.
 - .2 2 penta-head sockets

Part 2 Products

2.1 EQUIPMENT

- .1 Three phase pad mounted transformers: to CSA C2.1.
- .2 Three phase dead front pad mounted distribution transformers: to CSAC227.4.
- .3 Three phase live front pad mounted distribution transformers: to CSA C227.5.
- .4 Separable insulated connectors for power distribution systems above 600V: to ANSI/IEEE 386.
- .5 Oil filled pad mounted distribution transformer(s) complete with primary and secondary cable compartments, options and accessories to form complete factory assembled, self contained, steel fabricated unit for mounting on prefabricated concrete pad.
- .6 High voltage bushings or high voltage bushing wells for connection to distribution system through separable insulated connectors for dead front operation. Provide each bushing well with matching bushing inserts and parking stands with insulated parking bushings.
- .7 Separable insulated connectors.
- .8 Primary cable terminals with hole for 9.5mm diameter 16 thread bolt for attachment of solder lug or clamp connector in vertical plane.
- .9 Spade type low voltage terminals – 4-hole NEMA pattern.
- .10 Connectors for primary and secondary cables
- .11 Primary protection oil immersed fuse.
- .12 28kV inserts BIL rating of 140kV
- .13 Three-27.6kV, lightning arresters: to Section 264101- Primary Lighting Arresters.

- .14 Load break inserts for elbow connectors.
- .15 Stays to hold compartment doors in 110° open position.

2.2 TRANSFORMER CHARACTERISTICS

- .1 Primary voltage: 27.6V, 60Hz, delta connected, 3phase, 3 wire.
- .2 Secondary voltage: 600V, wye connected, 3phase, 4wire, neutral solidly grounded.
- .3 Capacity: 750 kVA.
- .4 Basic impulse level: 125 kV.
- .5 Impedance: 4%
- .6 Losses to CSA C802.1-23(R2023)

2.3 ENCLOSURE

- .1 Door bolts: Penta-head
- .2 Low voltage door with three-point latching mechanism, vault type handle, and single padlocking provision.
- .3 High voltage door fastenings inaccessible until low voltage door has been opened.

2.4 TAP CHANGER

- .1 Externally operated off-load tap changer, with provision for padlocking on 3phase units.
- .2 Taps: Four-2.5% taps, 2-FCAN, 2-FCBN.

2.5 ACCESSORIES

- .1 Pressure relief device.
- .2 50 mm drain valve.
- .3 25 mm filler plug.

2.6 GROUNDING

- .1 Copper grounding bus size 5 x 25 mm.
- .2 Provide 4 grounding connectors, size per drawing, or if not indicated, sized to take conductor from #4 to #4/0 AWG.

2.7 FINISH

- .1 Finish exterior of unit in accordance with Section 260500 - Electrical General Requirements.

2.8 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 260500 - Electrical General Requirements.
- .2 Nameplate showing information in accordance with CSA C2.

2.9 WARNING SIGNS

- .1 Provide warning signs in accordance with Section 260500- Electrical General Requirements with tamper-proof stainless-steel screws.

Part 3 Execution

3.1 INSPECTION

- .1 Check factory made connections of transformer unit for mechanical security and electrical continuity.
- .2 Check transformer insulating liquid for correct quantity and specification according to manufacturer's instructions.

3.2 INSTALLATION

- .1 Set and secure transformer unit in place, rigid, plumb and square.
- .2 Make connections.
- .3 Connect transformer unit ground bus to system ground.
- .4 Ensure care is taken to prevent contamination of liquid and components when field filling transformer(s).
- .5 Use only metal hose when field-filling transformer with oil: never, under any circumstances, use rubber hose.
- .6 Set taps to produce rated secondary voltage at no-load.

3.3 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 260500 - Electrical General Requirements and Section 260510 Electrical Testing.
- .2 Inspect primary and secondary connections for tightness and for signs of overheating.
- .3 Inspect and clean bushings and insulators.
- .4 Check oil level and temperature indicators.
- .5 Set transformer taps to rated voltage as specified.
- .6 Inspect for oil leaks and excessive rusting.

- .7 Inspect oil level.
- .8 Check fuses for correctness of type and size.
- .9 Check for grounding and neutral continuity between primary and secondary circuits of transformer.
- .10 48 hours after putting transformer into service under typical load, provide an Infrared scan of the transformer primary and secondary connections, determining if any hot spots are present. Provide report and thermal pictures to client. Any hot spots will have to be corrected at contractor expense, and another infrared scan completed after correction.

END OF SECTION