

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 CSA International.
 - .1 CAN/CSA-C22.2 No.47-M90(R2007), Air-Cooled Transformers (Dry Type).
 - .2 CSA C9-02(R2007), Dry-Type Transformers.
 - .3 CAN/CSA-C802.2-06, Minimum Efficiency Values for Dry Type Transformers.
- .2 National Electrical Manufacturers Association (NEMA).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for dry type transformers and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for dry type transformers for incorporation into manual.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect dry type transformers from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products.

Part 2 Products

2.1 TRANSFORMERS

- .1 All required transformers to be provided from same manufacturer.
- .2 Features:
 - .1 Type: ANN.
 - .2 Single or 3 phase, as indicated.
 - .3 Capacity: as indicated.
 - .4 Primary voltage, secondary voltage: as indicated, 60 Hz.
 - .5 3-phase transformer with 3 delta-mounted primary windings and three star-mounted secondary windings.
 - .6 Voltage taps: 4, $\pm 2\frac{1}{2}\%$, $\pm 5\%$.
 - .7 Insulation: Class H, 150°C temperature rise.
 - .8 Efficiency: to CSA C802.2.
 - .9 Basic Impulse Level (BIL): standard.
 - .10 Hipot: standard.
 - .11 Average sound level: standard.
 - .12 Impedance at 170° C: standard.
 - .13 Enclosure: NEMA 1, removable metal front panel, sprinkler proof.
 - .14 Mounting: floor or wall.
 - .15 Finish: in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - .16 Copper windings.
 - .17 K-Rated Transformers as indicated on drawings.
 - .18 Voltage Regulation to be 4% or better.
- .3 Transformer E-S-T2N1 and W-R-T2N1:
 - .1 3-phase.
 - .2 Capacity: 225 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .4 Transformer W-R-T2N2:
 - .1 3-phase.
 - .2 Capacity: 150 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .5 Transformer C-S-T2N4:
 - .1 3-phase.
 - .2 Capacity: 112.5 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.

- .6 Transformers C-S-T2N6, C-S-T2H2 and W-S-T2H1:
 - .1 3-phase.
 - .2 Capacity: 75 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .7 Transformers E-S-T2H1 et C-S-T2N5:
 - .1 3-phase.
 - .2 Capacity: 45 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .8 Transformers C-S-T2H1 and W-R-T2N3:
 - .1 3-phase.
 - .2 Capacity: 30 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .9 Transformer E-S-T2U1 and W-R-T2U1:
 - .1 3-phase.
 - .2 Capacity: 15 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
- .10 Transformers C-S-T2N1 et C-S-T2N2:
 - .1 3-phase.
 - .2 Capacity: 225 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
 - .4 K-13 rated.
- .11 Transformer C-S-T2N3:
 - .1 3-phase.
 - .2 Capacity: 150 kVA.
 - .3 Primary voltage: 600 V; secondary voltage: 120-208 V.
 - .4 K-13 rated.

2.2 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Label size: 7.

2.3 ACCEPTABLE PRODUCTS

- .1 Delta.
- .2 Hammond.
- .3 Bemag.

- .4 Replacement materials or products: approved by addendum according to Instructions to bidders.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for dry type transformers installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Mount dry type transformers up to 75 kVA on the floor on a concrete base or on the wall, as indicated.
- .2 Mount dry type transformers above 75 kVA on floor.
- .3 Ensure adequate clearance around transformer for ventilation.
- .4 Install transformers in level upright position.
- .5 Remove shipping supports only after transformer is installed and just before putting into service.
- .6 Loosen isolation pad bolts until no compression is visible.
- .7 Make primary and secondary connections in accordance with wiring diagram.
- .8 Energize transformers after installation is complete.
- .9 Make conduit entry into bottom 1/3 of transformer enclosure.
- .10 Install vibration isolators between the concrete base and/or supports and the transformer.
- .11 Comply with applicable seismic measures.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by dry type transformers installation.

END OF SECTION