

ITEM 670.8601--25 - DRY TYPE TRANSFORMERS

1. DESCRIPTION:

- 1.01 This work shall consist of furnishing and installing a dry type transformer in accordance with the plans, specifications and as directed by the Engineer.

2. MATERIALS:

- 2.01 Transformer:
As manufactured by General Electric, Siemens/ITE, Square D, Westinghouse or an approved equal. The transformer shall be UL listed and labeled, and meet all applicable NEMA and IEEE standards.
- 2.02 Enclosure:
Ventilated, drip-proof code gauge steel housing with bolted removable access panels, phosphatized and finished with corrosion inhibiting undercoat and ANSI-61 gray baked enamel. Transformers shall be suitable for mounting on floor, or other substantial structure, except for 15 KVA size and smaller which shall be suitable for wall mounting. Transformers placed outdoors shall be mounted on a concrete foundation, meeting the requirements of Section 555, with a NEMA 3R enclosure in accordance with NEMA standards.
- 2.03 Core and Coil:
Constructed of continuous copper or aluminum windings and high grade non-aging, grain oriented silicon steel core laminations having high magnetic permeabilities and low hysteresis and eddy current losses. Core and coil of units rated 15 KVA or more shall be completely isolated from the enclosure using vibration absorbing mounts and shall have flexible grounding strap connected to the enclosure. Connections to primary and secondary bushings shall be made using fully rated flexible straps.
- 2.04 Insulation System:
Minimum 185EC temperature class for transformer sizes below 30 KVA; and minimum 220EC temperature class for transformer sizes 30 KVA and larger.
- 2.05 Temperature Rise:
Winding temperature rise by resistance limited to 115EC for transformer sizes below 30 KVA; and 150EC for transformer sizes 30 KVA and larger, referenced to 40EC ambient temperature. Hot spot temperature shall not exceed 30EC above winding temperature rise rating. Case temperature shall not exceed 35EC above 40EC ambient temperature.
- 2.06 Taps:
Two 5% FCBN taps for transformer sizes below 30 KVA; and two 2-1/2% FCAN and four 2-1/2% FCBN taps for transformer sizes 30 KVA and larger; referenced to nameplate voltage.
- 2.07 Noise Levels:
Less than ANSI standards.
- 2.08 Ratings:
KVA rating, voltages, phases and configuration is indicated. Minimum impedance: 4.5%.

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2. MATERIALS: (cont'd)

- 2.09 Shielding:
Provide an electrostatic shield between primary and secondary windings grounded to a common point on the enclosure. Minimum attenuation required 100:1.
- 2.10 Test Data:
(for transformers of identical design to proposed units). Include: Losses at 0, 25, 50, 75, 100% rated load; percent regulation at 80% and 100% power factor; % X and % R values; maximum sound level of transformer in enclosure; and maximum hotspot and average temperature rise over 40EC ambient.
- 2.11 Basis of Acceptance:
Acceptance of the Dry Type Transformer will be based on manufacturer's certification of compliance with these specification requirements.

3. CONSTRUCTION DETAILS:

- 3.01 Shop Drawings:
Indicating ratings, dimensions and features for each transformer and all accessories used on the project, shall be submitted to the engineer for approval. The contractor is not to order materials until approval is obtained.
- 3.02 Mounting:
Install transformers on floors or walls, or suspend from building structure as indicated, with mounting provisions, supporting means and methods as required for the weights and types of building construction encountered, and in compliance with all building and seismic codes. All floor mounted transformers to be set on 4 in high concrete housekeeping pads. All transformers located outdoors shall include a NEMA 3R enclosure and foundation in accordance with NEMA standards.
- 3.03 Conduit Connections:
Make all conduit connections to transformer cases using flexible metal conduit, or as directed by the Engineer.
- 3.04 Ground:
Shall be installed as indicated on plans or as required.
- 3.05 Sound Dampening:
Comply with manufacturer's instructions related to relaxing tension or removal of shipping hold down provisions on the sound dampening system.
- 3.06 Ventilation Openings:
Do not obstruct transformer ventilation openings.
- 3.07 Taps:
Set transformer taps for proper secondary voltage.

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3. CONSTRUCTION DETAILS: (cont'd)

3.08 Testing:

The testing requirements of Section 670-3.16 shall apply.

4. METHOD OF MEASUREMENT:

4.01 The work will be measured as the number of dry type transformers satisfactorily installed.

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5. BASIS OF PAYMENT:

5.01 The unit price bid for each transformer shall include the cost of furnishing and installing with electrical connections, foundation, enclosures, field adjustments and all labor, materials, equipment and incidentals necessary to satisfactorily complete the work.