

**Specification Number:** 26 20 00.17

**Product Name:** ENERGY EFFICIENT LIGHTING AND DISTRIBUTION TRANSFORMERS

## **SECTION 26 20 00.17**

# **ENERGY EFFICIENT LIGHTING AND DISTRIBUTION TRANSFORMERS**

## **PART 1 GENERAL**

### **1.01 SECTION INCLUDES**

- A. Dry-type energy efficient transformers per CSA C802.2, NEMA TP1, with primary and secondary voltages of 600V and less and capacity ratings 15kVA through 750kVA.

Note: Paragraphs and words marked in [ ] are alternates. Select only one.

### **1.02 REFERENCES**

- A. NFPA 70 - National Electrical Code
- B. NEMA ST20
- C. UL 1561
- D. NEMA TP1
- E. NEMA TP2
- F. CSA C22.2 No. 47
- G. CSA C802.2
- H. Canadian Electrical Code (CEC)

### **1.03 SUBMITTALS**

- A. Suppliers asking consideration as an approved equal shall submit complete, warranted performance data and physical dimensions for similar transformers. Data shall be submitted for each size specified, and shall be received by the consultant engineer no less than 10 days prior to the bid due date for consideration.

### **1.04 STANDARDS**

- A. Transformers 750kVA and smaller shall be listed by Underwriters Laboratories and/or CSA.
- B. Conform to the requirements of ANSI/NFPA 70.
- C. Transformers are to be manufactured and tested in accordance with NEMA ST20, CSA C22.2 No. 47.
- D. Transformers losses shall conform to NEMA TP1, CSA C802.2 requirements
- E. Transformers losses shall be tested in accord with NEMA TP2, CSA C802.2 procedures

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Transformers shall be as manufactured by Square D Company or approved equal.
- B. Approved manufacturers shall be registered firms in accordance with ISO 9001:1994 SIC 3612 (US); which is the design and manufacture of low voltage dry type power, distribution and specialty transformers.

### **2.02 RATINGS INFORMATION**

- A. All insulating materials are to exceed NEMA ST20, CSA C22.2 No. 47 standards and be rated for 220°C UL, CSA component recognized insulation system.
- B. Transformers 15kVA and larger shall be 150°C temperature rise above 40°C ambient. Transformers 25kVA and larger shall have a minimum of 4 - 2.5% full capacity primary taps. Exact voltages and taps to be as designated on the plans or the transformer schedule.
- C. The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.

- D. Transformers shall be low loss type with minimum efficiencies per NEMA TP1, CSA C802.2 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2, CSA C802.2.

Single Phase		Three Phase	
kVA	Efficiency	kVA	Efficiency
15	97.7%	15	97.0%
25	98.0%	30	97.5%
37.5	98.2%	45	97.7%
50	98.3%	75	98.0%
75	98.5%	112.5	98.2%
100	98.6%	150	98.3%
167	98.7%	225	98.5%
250	98.8%	300	98.6%
333	98.9%	500	98.7%
		750	98.8%

- E. The transformer(s) shall be rated as indicated in the following schedule:

Identification Number(s)  
 kVA Rating  
 Voltages  
 Phase  
 Frequency

## 2.03 CONSTRUCTION

- A. Transformer coils shall be of the continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish
- B. All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.
- C. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC, cUL/CSA and CEC standards.
- D. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL, CSA recognized for outdoor use. The coating color shall be ANSI 49.

## 2.04 SOUND LEVELS

- A. Sound levels shall be warranted by the manufacturer not to exceed the following:

15 to 50KVA - 45dB; 51 to 150kVA - 50dB; 151 to 300kVA - 55dB; 301 to 500kVA - 60dB; 501 to 700kVA - 62dB; 701 to 1000kVA - 64dB; 1001 to 1500kVA - 65dB; 1501 to 2000kVA - 66dB

Note: Lower sound levels may be desirable for critical areas such as hospitals, schools or office areas. Contact your local Square D representative for specific recommendations.

#### **2.05 OPTIONAL ACCESSORIES**

- A. [Provide weathershields for units ID#\_\_\_\_\_750kVA max.]
- B. [Provide wall mounting brackets for units ID#\_\_\_\_\_75kVA max. three-phase, 50kVA max. single-phase]
- C. [Provide ceiling mounting brackets for units ID#\_\_\_\_\_150kVA max.]

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Not used

END OF SECTION