

## Specification Guide for Low Voltage, General Purpose, Dry Type Transformers (600 Volt Class) - .05 kVA to 500 kVA

### General

Single and three phase distribution transformers (600 Volt and below). 60 HZ, ventilated transformers above 15kVA need to meet DOE 2016 requirements.

- Provide and install, as referenced on the electrical plans, enclosed dry type transformers as manufactured by SolaHD.

### Standards

- Transformers must be listed by Underwriters Laboratories, evaluated to CSA standards and designed, constructed and rated in accordance with NEMA ST 20 and applicable IEEE & OSHA specifications.

### Construction

#### Cores

- All transformer cores shall be constructed of low loss, high quality, electrical grade laminate steel. By design, the flux density is to be kept well below the saturation level to reduce audible sound level and minimize core losses. The core volume shall allow operation at 10% above rated primary voltage at no load without exceeding the temperature rise of the unit.

#### Coils

- Coil conductors shall be either aluminum or copper and must be continuous. The entire core and coil assembly shall be impregnated with a thermal setting varnish and cured to reduce hot spots in the coils and seal out moisture. Coils with exposed magnet wire will not be acceptable. Transformers shall have common core construction.
- All transformers 1 kVA or larger shall incorporate a faraday (electrostatic) shield between primary and secondary windings for the attenuation of voltage spikes, line noise and voltage transients.
- General purpose transformers are classified as isolation transformers.

#### Electrostatic Shield

- For power conditioning purposes, it is recommended that isolation transformers be equipped with electrostatic shielding between the primary and secondary windings. An electrostatic shield provides a conducting path to ground that reduces the effect of coupling between primary and secondary windings and improves the isolation transformer's ability to isolate its' load from the common-mode noise present on the input power source. Electrostatic shields significantly reduce or eliminate electrical disturbances on the line from being transmitted to the sensitive load.

### Enclosures

- Transformer enclosures shall be constructed of heavy gauge sheet steel and coated with a grey powder paint finish (ANSI 61). Enclosures shall be UL Listed/NEMA Type 1 and 3R rated for outdoor use. This information must be listed on the transformer nameplate.
- Maximum transformer enclosure temperature will not exceed 65°C rise above a 40°C ambient under full load.
- The transformer enclosure must be grounded by the installer in accordance with the latest edition of the National Electric Code and any local codes or ordinances.

### Performance

- Audible sound levels will not exceed limits established in NEMA ST20:

Less than 10 kVA	40 db
10 to 50 kVA	45 db
51 to 150 kVA	50 db
151 to 300 kVA	55 db
301 to 500 kVA	60 db

- Transformers shall incorporate a UL Recognized insulation system.

### Limited Warranty

- Transformers are warranted against material, performance and workmanship defects for a period of ten (10) years from date of manufacture with the provision for an additional two (2) years. Custom transformers come with a 1-year warranty.

### Approval

- Typical performance and dimensional data on similar units must be submitted on all transformers for approval. Factory testing must have been conducted in accordance with NEMA ST20. Submitted performance and dimensional data must include, but is not limited to the following:
  - A. Height, width, depth, mounting dimensions, conduit entry locations and lifting provisions
  - B. Weight
  - C. Transformer losses
  - D. Potential tests both applied and induced
  - E. Temperature - ambient and rise under full load
  - F. Insulation class
  - G. % excitation current
  - H. Electrical schematic including taps
  - I. Polarity and phase rotation
  - J. kVA, frequency and voltage rating
  - K. IR, IX, and IZ percentages at reference temperature
  - L. Audible sound level