

# 16320S01 - TRANSFORMER SPECIFICATIONS

## 1. GENERAL DESIGN GUIDELINES

1. UK's recommendations on transformer design are listed below in order of preference.
  1. Indoor transformer, cast coil, unit substation. 1st. choice
  2. Indoor transformer, VPI (Epoxy Encapsulated) coil, unit substation. 2nd. choice
  3. Pad mount indoors, less flammable liquid, switch. 3rd. choice
  4. Pad mount outdoors, less flammable liquid, switch. 4th. choice
  5. Pad mount outdoors, oil liquid, switch. 5th. choice
2. Cast coil and VPI coil provided shall be unit substation type mounted in line with matching switchgear including high voltage load break switch and fuses in a transformer room.
3. Pad mount transformers installed outside of buildings shall be liquid filled, concrete pad mounted and completely enclosed with high voltage switching and fusing (removable oil fusing) and shall be dead front type with bushing wells and inserts, not one piece bushing. Transformers shall conform to the requirements of the State Fire Marshall's office for distance from the building.

## 2. SPECIFICATIONS FOR ALL TRANSFORMERS

1. Built to ANSI Standard C57.12.00 - 1968. ANSI short circuit test (Sample Unit) data, ANSI impulse test - full and chopped wave (Sample Unit) data and certified test data (ANSI) (Actual Unit) shall be provided to the University.
2. Current limiting fuses shall protect all transformers.
3. KVA size as specified.
4. Primary voltage - 12,470 volts delta connected, 95 kV BIL.
5. Secondary voltage - 120/208 Y volts or 277/480 Y volts, 30 kV BIL. The low voltage neutral shall be brought out through a fully insulated bushing in the secondary compartment and grounded externally.
6. Three phases.
7. 60 Hertz frequency.
8. Temperature Rise above ambient shall not exceed 65 C.
9. 98% conductivity copper coil.
10. Two winding transformer - 3 coils.
11.  $\pm 2 \frac{1}{2}\%$  taps - external handle for de-energized operation.
12. Impedance - not less than 4% and not more than 7%.
13. Noise level - not to exceed NEMA Standard levels.
14. Shall be supplied with lightning arrestors on the high voltage side, if not protected by switch equipped with lightning arrestors.
15. Bolted connection will be acceptable only from lead to bushing. All other connections shall be welded or adequately crimped.

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### 16. Accessories:

1. Dial type temperature gauge
2. Threaded grounding lug
3. Lifting lugs and the ability to be skid in all directions
4. Warranty period - 1 year
5. Permanent nameplate data submitted before shipment to site.

### 3. ADDITIONAL SPECIFICATIONS FOR OUTDOOR TRANSFORMERS ONLY:

1. Must be liquid filled and have a bolted tank cover. Liquid shall be mineral oil or UL listed less-flammable liquid. Transformers shall be manufactured, equipped, and installed to conform to the UL classification of the liquid.
2. Outdoor pad mounted transformers shall be protected by Partial range under oil current limiting fuse in series with a bayonet fuse if rated at 1000 KVA or less. Transformers installed outside and rated above 1000 KVA shall be supplied with a fused air interrupter switch on the high side.
3. Outdoor pad mounted transformers shall be furnished with a hot-stick operable three-phase, load-break, primary, under oil switch.
4. The completely assembled tank with all accessories in place, except for the pressure relief valve, must withstand a test pressure of 12 PSI.
5. Shall be loop feed-through type with six two-piece bushing wells with inserts (200 amp if size allows).
6. Internal leads shall be of sufficient length to permit field replacement of bushings without opening the tank.
7. Transformer paint color shall be Munsell Green # 7GY3.29/1.5
8. Accessories:
  1. Liquid level gauge
  2. Vacuum pressure gauge and valve
  3. Drain valve with a built-in sampling device
  4. Upper filling plug
  5. Pressure-relief valve
  6. Welded steel tank
  7. Lifting lugs and skiddable in all directions

### 4. ADDITIONAL SPECIFICATIONS FOR INDOOR TRANSFORMERS ONLY:

1. Transformer paint color shall be coordinated to match switchgear color.