

**Technical Specification for  
Single-Phase Dead Front Loop Feed  
Pad Mounted Distribution Transformers**

**Specification TPM - 10**



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# COLLEGE PARK POWER

## SINGLE PHASE PAD MOUNT TRANSFORMERS

This specification provides standardization of physical and electrical requirements for single-phase self-cooled, oil-immersed pad mounted transformers designed for underground distribution systems.

### I. General Information

- a. Provisions and terminology of current revisions of American National Standards Institute Standards C57.12.00, 12.10, 12.20, 12.22, 12.26, 12.70, 12.80, 12.90 apply.
- b. Winding temperature rise above ambient shall not exceed 65° C at rated capacity.
- c. "Dead front", loop feed design shall be employed, unless otherwise specified.

### II. Construction Features

- a. A sealed tank system is required
- b. Tank shall be welded steel construction (13-gauge minimum) with a removable flip-top door for front cabinet access to bushings, etc. Door shall be attached with stainless steel hinges with a minimum pin diameter of 3/8". The cabinet and tank shall form a tamper resistant unit, preventing the insertion of foreign objects when closed. Recessed front penta-head bolt and pad lock provisions are required.
- c. Lifting and rolling provisions are required.
- d. Physical size limitations apply as follows.
  - Length (front): minimum not less than 30" or more than 36"
  - Width (side): not more than 42"
  - Height: not more than 28" up to 100 kVA; nor more than 32" for 167 kVA and above
- e. The high voltage neutral winding shall be internally grounded.
- f. A 5-inch (+ / - 1/12") sill is required, the front of which shall not be covered by the door.
- g. Provision for Fault Indicator is NOT required unless otherwise specified.

### III. Electrical Characteristics

- a. Unless otherwise specified, the primary voltage shall be 12.47kV GRDY / 7.2kV. Secondary voltage shall be 240/120v. All voltages are 60 hertz.
- b. Primary insulation class is 15 kV (95 kV BIL). Secondary insulation class is 1.2 kV (30 BIL).
- c. Taps are not required unless otherwise specified.
- d. Allowable percent impedance shall be between 1.5% and 3.0%.

IV. Bushings and Terminals

- a. Two high voltage externally clamped bushing wells for looped primary systems are required. Two 200 amp screw-out load-break inserts designed to mate with G.E. "Sure Make", RTE "SBT", or Elastimold are required.
- b. Low-voltage and neutral terminals shall be epoxy-filled externally clamped with threaded studs ( 5/8"-11, minimum length 1 ¼" for 25kVA thru 75kVA; 1" 14, minimum length 1 ¾" for 1000 kVA and larger). 6-hole spades are to be provided unless otherwise specified.
- c. The neutral connection of the low-voltage winding shall be brought out on insulated bushings and grounded to the ground connection in the low-voltage compartment with a removable ground strap.
- d. Terminal marking shall be per ANSI C57.12.70.

V. Required Features

- a. Tank grounding provision
- b. Accessory / parking stand
- c. Oil level gauge and oil filler plug
- d. Pressure relief device
- e. Bayonet-type fuse holder for oil immersed, dual element expulsion fuse. If located above a high-voltage bushing, a drip shield is required.
- f. Provide fuses as listed in Table A.
- g. Corrosion-proof nameplate per ANSI C57.12.25.
- h. Non-PCB oil, the type of which shall be noted on the nameplate.

VI. Testing

- a. Routine tests on all transformers shall be as specified in Section 8 of the ANSI C57.12.00 latest revision thereof. ANSI Test Code C57.12.90 shall be followed for all testing procedures.
- b. Loss evaluation tests shall be performed on all transformers and cost of ownership shall be determined based on a formula provided by the City. Certified test results shall be provided to the City.
- c. The Total Ownership Cost (TOC) shall be determined with the following formula:  
**EFC (\$) = [4.81 x NLL (watts)] + [2.10 x LL (watts)] + Purchase Price**  
where: NLL= No Load (core) Losses, and LL = Load (winding) Losses.
- d. Dielectric test shall be in accordance with ANSI Standard C57.12.26.
- e. Doors shall be opened and closed several times before manufacturer delivers unit, checking for misalignment, warping, improper hinging, etc.

VII. Miscellaneous

- a. Transformers shall be furnished with grounding lugs.
- b. All exterior nuts and bolts shall be stainless steel.
- c. The liquid supplied in these transformers shall be a non-PCB type as defined by Federal Regulation # 40CFR 761, dated May 31, 1979 and subsequent revisions.

The liquid contained in these transformers shall be identified as a non-PCB type on the nameplate on the transformer and on a separate label, no larger than 3" x 5", affixed to the transformer tank in the immediate vicinity of the nameplate. Should any other oil be identified as a hazardous substance, it shall not be used.

- d. Transformers shall be delivered on a flatbed truck or otherwise open carriage. A minimum 24-hour prior notice of shipment is required. Shipment in an enclosed body or no 24-hour notice may result in refusal of the shipment. College Park will not be responsible for any additional shipping charges.
- e. A corrosion preventive undercoating shall be applied to all surfaces that are in contact with the pad and shall include the lower 4" of the tank or cabinet walls and base sill. Paint shall be of such quality as to resist rust, fading, etc., for a minimum 15-year (exposed to the elements) period. Color shall be Munsell 7GY, Outdoor Green.
- f. The transformer(s) shall be assembled in the United States from components the majority of which are domestically produced.
- g. NEMA standard 9-15-1982 Figure 1 and Figure 2 safety labels shall be provided.
- h. Information on the instruction nameplate shall comply with ANSI Standard C57.12.07 and shall include the date of manufacture and type of oil utilized.
- i. All regulations, codes and standards referred to in this document, such as ANSI, NEMA, CFR, and others, are meant as minimum reference points. Any subsequent updates in effect at the time of the request for quote should be used in the construction of the units requested. Failure to comply will be cause for rejection of the bid or the unit(s) if it is determined they do not meet these minimum requirements.

## TABLE A

### PRIMARY FUSING for PAD MOUNTED TRANSFORMERS USING BAYONET FUSES

Single Phase		Three Phase	
kVA	Fuse (amps)	kVA	Fuse (amps)
25	5	75	5
37.5	8	112.5	8
50	12	150	12
75	15	225	15
100	25	300	25
		500	30
		750	30
		1000	
		1500	

All pad-mounted transformers ordered by the City of College Park Electrical Department shall be equipped with the above fuses.

All 1500 kVA transformers shall be clearly labeled "DO NOT OPERATE FUSES UNDER LOAD" or similar adjacent to the bayonet fuses.