



CITY OF LOMPOC
UTILITIES DEPARTMENT
ELECTRICAL DIVISION
SPECIFICATION NO. ELE-104

2400V-OIL FILED
POLEMOUNTED TRANSFORMERS
STAINLESS STEEL

February 2010

SPECIFICATION NO. E-104

SPECIFICATIONS **2400 VOLT OIL FILED POLEMOUNTED TRANSFORMERS**

DIVISION 1 – GENERAL REQUIREMENTS

1-1 GENERAL

Electrical design and materials shall conform to the latest revisions of EEI-NEMA and ANSI Standards for Oil-Filled Equipment. It is the intent of these specifications to describe equipment of the best design and construction, for the service for which it is intended.

1-2 TESTS

Transformers shall receive and pass at least the following tests in accordance with the applicable ANSI and NEMA Standards:

- | | |
|---------------------------|--|
| (1) Load and no-load loss | (5) Applied and induced potential test |
| (2) Exciting current | (6) Impulse voltage test |
| (3) Polarity check | (7) Tank pressure test |
| (4) Ratio check | |

1-3 GUARANTEE

The manufacturer shall guarantee all equipment delivered under these specifications against any and all defects in material and/or workmanship for a period of at least one year from date of acceptance. The manufacturer shall rectify all such defects by repair or replacement at his own expense and assume responsibility for associated shipping costs.

1-4 TECHNICAL INFORMATION

The following specifications shall be met:

1. Insulation level: 95 kv BIL (min.).
2. Insulation rating: 65° C rise.
3. Paint: All exterior surfaces shall be painted (coated) ANSI 70 gray, using a system of coordinated and thoroughly tested materials and application techniques that will assure long life. Special attention shall be given to welds, seams, edges and rough spots. Painting shall meet requirements of ANSI Standards C57.12.28-1988 (latest revision).

DIVISION 1 – GENERAL REQUIREMENTS (cont.)

4. Lifting Lugs: Lifting lugs shall be provided on the tank and shall be located in such a way to avoid interference between lifting slings and any attachments on the transformer and to avoid scratching the transformer coating.

5. Tanks: Tanks shall be tested at a pressure equal to or greater than the maximum operating pressure and for a sufficient period of time to insure that all welds are free from leaks. Tank and radiator construction shall be consistent with good manufacturing and design practices prevalent in the transformer industry, and together they should continue to a high quality product. **The entire transformer tank, tank’s removable lid and retaining ring (if applicable) shall be stainless steel (AISI series 300 or 400).**

6. Nameplates: Stainless steel or anodized aluminum nameplate shall be securely attached to the transformer by means of metal screws, rivets or similar mechanical device(s). The letters and numbers shall be stamped or engraved on the nameplate. The nameplate shall include the words, “Fluid is less than one p.p.m. PCB”, refer to Section 1-6. The instruction nameplate shall contain the information specified in Section 5.12 of ANSI Standard C57.12.00-1993 (latest revision).

7. Sound Level: The sound level shall be equal to or better than EEI-NEMA Standards.

8. Size: Size of the transformer, including radiators (fins), shall not interfere with installation or G.O. 95 requirements when banked together on cluster bracket (Turner Electric #305-100 or approved equal).

9. Height & Weight: Height and weight of the transformer shall be as listed below:

<u>Size (KVA)</u>	<u>Maximum Weight (lbs.)</u>	<u>Maximum Height (inches) Including Bushings</u>
15	400	45
25	500	45
37.5	625	45
50	800	45
75	1,100	51
100	1,200	51
167	1,600	51

DIVISION 1 – GENERAL REQUIREMENTS (cont.)

1-5 LOSSES

Losses will be considered in the evaluation of this bid as follows:

No-load (core) loss @ \$6.34/watt.

Load (winding) loss @ \$4.31/watt.

The cost of losses will be added to the equipment price (bid price) F.O.B. Lompoc, including maximum escalation, to determine the evaluated low bid of vendor otherwise meeting these specifications. All bidders shall supply the following guaranteed loss data for use in the evaluation, in addition to other data listed in the specifications:

1. No-load losses in watts at rated secondary voltage.
2. Load losses in watts at rated secondary voltage and rated load. The standard reference temperature for load loss shall be 85°C.
3. Upon requests, furnish certification/statement of the guaranteed loss measurement error of the test equipment and measurement method to be used, including the basis for determination of the accuracy of the test equipment and measurement method.

The successful bidder shall supply a certified test report of actual losses of the unit(s) to be supplied. The no-load and load losses for each group (type and size) of transformer(s) will be averaged separately within their respective categories (no-load and load losses). If the average tested no-load (core) and/or load (winding) losses of the transformer group exceed the watt losses quoted in the proposal, the contract price shall be reduced by the above amounts per watt of actual group averaged no-load and/or actual load loss in excess of that quoted in the proposal. No-load loss penalties will be evaluated separately from load loss penalties. No additional payment will be made to the manufacturer or bidder for actual losses lower than the losses quoted in the proposal.

Certified test report of losses shall be submitted by the manufacturer prior to or at the time of shipment of the transformer.

1-6 PCB CONTENT

Transformer fluid shall be guaranteed to contain less than one p.p.m. by weight (mg/kg) polychlorinated biphenyls (PCB). Certified test report of PCB content shall be produced upon request. The transformer nameplate to include the words, “Fluid is less than one p.p.m. PCB.”

POLEMOUNT TRANSFORMERS – OIL FILLED

DIVISION 2-SINGLE PHASE

2-1 GENERAL

In addition to that specified in Division 1 – General Requirements, transformers shall be provided with the following:

1. High voltage Bushings (Porcelain):
 - a. Quantity: Two
 - b. Bushing terminals to be clamp-type suitable for use with copper and aluminum conductor.
 - c. Shall be tank wall-mounted.
2. Low voltage Bushings (**Porcelain**)
 - a. Quantity:

277-Volt: Two

All Others: Three
 - b. Shall be tank wall-mounted.
 - c. Bushing terminals:

100 KVA and lower: Shall be clamp-type suitable for use with copper and aluminum conductor.

Over 100 KVA: Shall be NEMA-4 pads (4-hole).
3. Pressure relief valve: Qualitrol 202-030-01, or an approved equal.
4. Lifting lugs shall be welded to the tank.
5. Provide tank grounding lug and a visible tank-to-cover ground strap.
6. Hanger brackets, welded to the tank.
7. Hanger brackets shall permit bolting of transformer directly to pole.
8. Single phase, 60 Hz, OISC.

DIVISION 2-SINIGLE PHASE (cont.)

2-2 RATINGS AND DESIGN

Transformers shall have the following ratings and design:

1. Distribution type, pole-bolted transformers.
2. 2400 volt primary, to be used on 4160V GRD, WYE system, unless specified otherwise on proposal form. The primary bushings shall be (Porcelain) tank wall mounted.
3. Single phase.
4. **Without arresters, fuses (weaklinks) or taps.**
5. Each transformer to have a properly sized hook stick operated breaker on the secondary side, tank wall-mounted-- externally operated.
6. Secondary voltage to be as specified on proposal form.
7. KVA rating to be as specified on proposal form.