SPECIFICATION FOR
SINGLE PHASE POLEMOUNT DISTRIBUTION TRANSFORMERS

1. **SCOPE**

This specification covers the electrical and mechanical requirements of single phase overhead pole-mounted distribution transformers.

2. **APPLICABLE STANDARDS**

2.1. The transformer specified shall be furnished in accordance with the latest applicable ANSI, IEEE, and NEMA standards, and the latest applicable codes, except as required otherwise by this specification.

2.2. The latest revision of the following publications shall be used in conjunction with this specification, and form a part of this specification to the extent specified herein.

- IEEE Std C57.12.20 – IEEE Standard for Overhead-Type Distribution Transformers, 500kVA and Smaller: High Voltage, 34500V and Below; Low Voltage, 7970/13800Y V and below
- NEMA TR 1 – Transformers, Regulators and Reactors, Audible Sound Levels
3. SPECIFIC REQUIREMENTS

3.1. Construction

3.1.1. No Amorphous core transformers will be accepted.

Comply__________  Exception__________

3.1.2. All polemount transformers are to have two (2) primary bushings unless otherwise specified.

Comply__________  Exception__________

3.1.3. No taps are required.

3.1.4. Relief of small pressure increases will be by an automatic relief device(s) with manual operating capability; or by removal of a small diameter plug mounted on the side of the tank above the normal oil surface.

Comply__________  Exception__________

3.1.5. Automatic relief of a sudden large pressure increase, which may be due to fault conditions inside or through the transformer, shall be accomplished without loss of cover or other parts.

Comply__________  Exception__________

3.1.6. The bushing terminals provided shall be tin plated to accommodate both aluminum and copper conductors.

Comply__________  Exception__________

3.1.7. Ground strap shall be provided.

Comply__________  Exception__________
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4. TEST REQUIREMENTS

At a minimum, all units shall be tested for the following:

4.1. No-Load losses at rated current
    *No load losses will be reported at 95 °C or 20 °C for 75 °C AWR units, and 85 °C or 20 °C for 65 °C or 65/75 °C AWR units.

4.2. Total losses at rated current
    *Total losses and impedance values will be reported at 95 °C for 75 °C AWR units, and 85 °C for 65 °C AWR units.

4.3. Percent Impedance at rated current

4.4. Excitation current (100% voltage) test

4.5. Winding resistance measurement tests

Comply__________ Exception__________

5. DOCUMENTATION

5.1. Performance data for the following shall be provided with the bid:
    5.1.1. Physical Dimensions
    5.1.2. Temperature rating
    5.1.3. Core Construction
    5.1.4. Core and Winding Losses
    5.1.5. Percent Impedance

Comply__________ Exception__________

5.2. The following shall be provided after bid acceptance:
    5.2.1. Certified Test Results
    5.2.2. Manuals
    5.2.3. Final Drawings

Comply__________ Exception__________

6. SHIPPING AND HANDLING

6.1. Transformers shall be shipped anchored to wood pallets.

Comply__________ Exception__________
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7. EVALUATION

7.1. Idaho Falls Power reserves the right to select the equipment which in its opinion best meets its requirements.

7.2. Award of bid will be on the basis of delivery, compliance with these specifications and price using the cost evaluation procedure described below. At the time of award of bid items, Idaho Falls Power reserves the right to accept delivery at a later date (not to exceed 60 days) than suggested by the Bidder. Idaho Falls Power reserves the right to accept individual bid items.

7.3. Prior to award of bid items and upon request from Idaho Falls Power, Bidders shall be required to provide product reference material and/or certified test reports within ten (10) days substantiating their products' expected loss performance, and compliance with the requirements set forth in these specifications. Failure to satisfy this request can result in bid rejection for noncompliance.

7.4. Terms

7.4.1. No-Load Loss: Excitation (or core) loss at 100% rated voltage.
7.4.2. Load Loss: Winding (or copper) loss at a reference temperature of 85 degrees centigrade and full load current.
7.4.3. Rated Voltage: High and low-side nominal voltages as specified herein for each Item Number distribution transformer.
7.4.4. BCL: Bidders expected no-load (core) loss in KW for each Item Number based on available certified test data showing the expected average losses of the transformers designated for the vendor's bid.
7.4.5. BWL: Bidders expected load (winding) loss in KW for each Item Number based on available certified test data showing the expected average losses of the transformers designated for the vendor's bid.
7.4.6. ACL: Actual no-load loss in KW (average of actual no-load loss tests on all units supplied for each bid item).
7.4.7. AWL: Actual load loss in KW (average of actual load loss tests on all units supplied for each bid item).

7.5. Cost Evaluation

The following amounts will be added algebraically to each item's loss evaluated unit price:
No-Load Loss: (BCL KW) X $2000/KW = Amount to Add

Load Loss: (BWL KW) X $500/KW = Amount to Add

The evaluation process above is strictly for determining the lowest loss evaluated bid for each Item Number. Actual adjustment to the purchase price for losses is specified below.

Note: Bidders which misrepresent the expected BCL and BWL values will not be allowed to submit future bids to Idaho Falls Power for a period of time to be determined by Idaho Falls Power.
7.6. Payment Adjusted for Losses

Certified copies of the actual no-load and load loss test data shall be supplied with each loss evaluated transformer purchased under these specifications.

When the average of the actual measured losses of all loss evaluated transformers supplied for each item (considered as an individual lot) is higher than the bid loss (BCL or BWL) the following amount will be subtracted from the offer unit price to arrive at the actual price to be paid:

No-Load Loss: \([(ACL-BCL) \text{ KW}] \times \$2000/\text{KW} = \text{Amount to Subtract}\]
Load Loss: \([(AWL-BWL) \text{ KW}] \times \$500/\text{KW} = \text{Amount to Subtract}\]

When an Item Number's actual average is lower than the bid loss, the following amount will be added to the contract unit price to arrive at the actual price to be paid:

No-Load Loss: \[(BCL-ACL) \text{ KW}] \times \$1000/\text{KW} = \text{Amount to Add}\]
Load Loss: \[(BWL-AWL) \text{ KW}] \times \$250/\text{KW} = \text{Amount to Add}\]

7.7. Guaranteed Values of Losses

The Vendor will guarantee that the tolerances between the actual loss values and the bid loss values for each Item Number's loss evaluated transformer or transformers, on a given order (Item Number) shall not exceed the percentages in Table 2.

Table 2*
Tolerances for Single Phase and Three Phase Transformer Losses

<table>
<thead>
<tr>
<th>Number of Units on One Order</th>
<th>Basis of Determination</th>
<th>No-Load Losses (%)</th>
<th>Total Losses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 Unit</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>2 or More</td>
<td>Each Unit</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>2 or More</td>
<td>Ave of All Units</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

(*These percentages are from ANSI C57.12.00-1980 modified by Idaho Falls Power.)