

## TECHNICAL SPECIFICATIONS

### OIL FILLED PADMOUNTED SINGLE PHASE TRANSFORMERS

#### I. GENERAL

This specification covers single phase 409, 304L or 400CB stainless steel pad mounted transformers and is used in conjunction with the specifications for Distribution Transformers; Padmounted-General.

#### II. TANK

The transformer tank, sill, door, etc. shall be constructed from 409, 304L or 400CB stainless steel.

#### III. COMPONENTS

All components shall be installed in accordance with component manufacturers' instructions.

#### IV. BUSHING, TERMINALS AND ACCESSORIES

IV.1. Primary bushing wells, secondary bushing terminals, parking stand, drip shield, and safety and warning labels shall be located as shown in Exhibit I.

IV.2. Transformers shall be supplied with two high voltage epoxy or nylon bushing wells with removable studs (*Components 701-9185-720, GE 9U03-BRB001, Cooper B4956B94H01, Cooper 2638372C02R, ERMCO 9U03DAR125, HI 0061-100272-406, ABB 2B10537H01*) suitable for receiving loadbreak bushing inserts to permit operating the transformer from a looped primary cable system. 4 kV and 13 kV transformers shall be equipped with 25 kV components except fuses and isolation links, as indicated below.

IV.3. 26kV bushing inserts with drain lug including dust covers shall be supplied and installed. Installation to include bonding these inserts to ground. (Bond with #14 solid Bare Copper). JEA ITEM ID "BUSWI001" as approved in the "JEA Master Mater Catalog, Electric" are the only units acceptable.

<https://apps.jea.com/MaterialsCatalog/emmc.pdf>

IV.4. Three secondary bushings (*Colt 70131452, Cooper 2690286D06, HI 0061-100389-300, ERMCO 300002-74, ECI 9U10BAA002, or ABB 4961B17H01*) shall be constructed of one-piece epoxy or nylon with 5/8"x11" studs having thread lengths no less than 1-1/2" long for 50 and 75 KVA, and (*Colt 70133452, Cooper 2690286D07, HI 0061-00200-610/620, or ABB 4961B18H01*) 1"x14" studs with thread lengths no less than 1-3/4" long for 100 and 167 KVA. The neutral terminals on all transformers shall be grounded externally through a bushing. The low voltage bushings shall be arranged as shown in Figure 1 of C57.12.25.

IV.5. Secondary connector kits shall be supplied and installed. 25KVA, 50 KVA and 75 KVA transformers will have JEA ITEM ID CNNTS001 as approved in the JEA Master Mater Catalog, Electric. 100 KVA and 167 KVA transformers will have JEA ITEM ID CNNTS002 as approved in the JEA Master Material Catalog.

<https://apps.jea.com/MaterialsCatalog/emmc.pdf>

NOTE: Please assure that the connector, jam nut and secondary arrestor ring terminal (if installed) will fit correctly on the stud.

IV.6. A tank ground lug shall be supplied and installed (Anderson GTCS-34A, Dossert TGC8-50M, ITT Blackburn TTC2, Maclean Power Systems BVC-207 or Penn-Union HGSE-020).

IV.7. All primary bushing wells, primary bushings, fuse holders and secondary bushings shall be externally clamped, not welded, to the tank wall and shall have leads of sufficient length to insure that all bushings and bushing wells can be changed without opening the tank.

- IV.8. An oil-drip shield shall be provided beneath the bayonet fuse to prevent oil from dripping on a primary bushing. It shall be constructed such that it will not interfere with the switching operation of the unit.
- IV.9. An under-oil arrestor (GE or Cooper) with disconnect switch shall be furnished in all 4 kV pad mounted transformers.
- IV.10. Transformers shall be equipped with oil-immersed bayonet overload sensing fuse holders with RTE series or ERMCO bayonet fuses. In addition, the transformers shall also be equipped with internal oil-immersed isolation links to protect against internal transformer faults. Isolation links shall be RTE. Fuse and isolation link are to be sized in accordance with manufacture's specifications. Alternate suppliers to the above listed components will be evaluated for use. Approval prior to bid opening is required.

## **V. TRANSFORMER TAP CHANGER**

Tap changers will be furnished on all transformers (note additional requirements for 23KV – 27kV transformers). Tap changers will have two positions above and below nominal voltage of 2-2.5% each for a total range of 10%. Tap changers shall have a positive "Snap Action" or "Cam Action" operation. Manufacturer may supply any of the following approved manufacturer's tap changer switch.

Central Moloney  
Cooper Power System  
ABB

## **VI. MOUNTING**

- VI.1. Transformers shall be compatible with JEA standard concrete mounting pad. (See Exhibit II).
- VI.2. The base of the assembly shall be provided with a suitable flange as shown on Exhibit I, to permit anchoring the unit on the pad from within the cable terminating compartments. It shall also be constructed such that it may be skidded or slid into place on the mounting pad without disturbing the entrance cable.
- VI.3. Two stainless steel hold down cleats shall be provided for each transformer. The cleats shall be supplied for anchoring the front sill to the pad. Two 5/8" X 2" bolts shall be provided for lifting each transformer into place. See Exhibit II for reference. The cleats shall be attached to the parking stand holder to prevent loss during shipping or being discarded with the pallet. The bolts shall be attached in a manner to prevent loss.

## **VII. ADDITIONAL REQUIREMENTS**

- VII.1. Transformers shall be labeled with the JEA ITEM ID on the outside of the Transformer. The label shall be placed on the top of the transformer tank next to the primary side of the transformer. This labeling shall have a black background with yellow reflective characters and are to be made with 3M Scotchlite Sheetings (Series 3200) and 3M Ink and Toners. Individual characters or a single label may be used. Labels are to be 1" tall with 3/4" characters. Other labeling to accomplish this purchase must be approved by the Design, Construction and Material Standards department of JEA before implementation.
- VII.2. A domed cover shall be provided to aid in water run-off.
- VII.3. The transformer front shall be reinforced sufficiently to prevent the secondary connectors from making contact with the door side caused from buckling and bowing.
- VII.4. A 5/16" Dia. hole shall be Drilled or Punched into the skirt of the enclosure in order to accommodate a FCI (Purchased Separately). This hole is to be capped during shipment to prevent any water leakage. The hole shall be located centered with the primary side on the skirt of the Transformer (see EXHIBIT IV for example location).

## VIII. NAMEPLATE ADDITIONAL INFORMATION

Indication of the stainless steel tank shall be stamped on the nameplate by either 304L, 409SS or 400CB STAINLESS STEEL.

## IX. SAFETY LABELS

Bilingual Warning and Danger labels shall be in accordance with NEMA Standards Publication No. 260-1982, and shall be placed as follows:

- IX.1. A Warning label shall be mounted on the outside of each door as close as possible to and directly above the door handle.
- IX.2. A Danger label shall be mounted inside and centered on the face of the transformer between the primary and secondary bushings, which allows it to be viewed when the door is in the open position

## X. SHRUB LABEL

A Shrub Label (Almetek Industries, Inc. Catalog #JEASHRUBTX or Electromark Catalog #JEA021-X-SX-I13) shall be supplied and installed on the center of the transformer lid.

## XI. RATINGS

The following is the "Transformer Ratings" table for primary and secondary voltages, BIL and KVA ratings of those transformers being bid.

**TRANSFORMER RATINGS**

| ITEM ID    | KVA<br>SIZES | PRIMARY<br>VOLTAGE | SECONDARY<br>VOLTAGE | BIL<br>(KV) |
|------------|--------------|--------------------|----------------------|-------------|
| TRA MP 000 | 25           | 4160GrdY/2400      | 240/120              | 60          |
| TRA MP 001 | 50           | 4160GrdY/2400      | 240/120              | 60          |
| TRA MP 002 | 75           | 4160GrdY/2400      | 240/120              | 60          |
| TRA MP 003 | 100          | 4160GrdY/2400      | 240/120              | 60          |
| TRA MP 004 | 167          | 4160GrdY/2400      | 240/120              | 60          |
| TRA MP 013 | 25           | 13200GrdY/7620     | 240/120              | 95          |
| TRA MP 005 | 50           | 13200GrdY/7620     | 240/120              | 95          |
| TRA MP 006 | 75           | 13200GrdY/7620     | 240/120              | 95          |
| TRA MP 007 | 100          | 13200GrdY/7620     | 240/120              | 95          |
| TRA MP 008 | 167          | 13200GrdY/7620     | 240/120              | 95          |
| TRA MP 016 | 75           | 13200GrdY/7620     | 480/240              | 95          |

**TRANSFORMER RATINGS (CONT)**

| ITEM ID    | KVA<br>SIZES | PRIMARY<br>VOLTAGE | SECONDARY<br>VOLTAGE | BIL<br>(KV) |
|------------|--------------|--------------------|----------------------|-------------|
| TRA MP 014 | 25           | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 009 | 50           | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 010 | 75           | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 011 | 100          | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 012 | 167          | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 017 | 250          | 25565GrdY/14760    | 240/120              | 125         |
| TRA MP 015 | 75           | 25565GrdY/14760    | 480/240              | 125         |
| TRA BA U01 | 50           | 23762GrdY/13720    | 240/120              | 125 ***     |
| TRA BA U02 | 100          | 23762GrdY/13720    | 240/120              | 125 ***     |

\*\*\* 23kV – 27kV Transformers

## **XII. 23KV – 27KV TRANSFORMERS**

These transformers shall be constructed with taps and special markings as shown below.

### **1.1. TAP CHANGER**

- XII.1.1. Tap Changers shall have an external handle
- XII.1.2. Tap Changers shall be set at the 22860 tap at the factory.
- XII.1.3. Tap changers will have two positions above and below nominal voltage of **2-3.79%** (not 2-2.5%) each for a total range of **15.16%** (not 10%). Tap changers shall have a positive “Snap Action” or “Cam Action” operation. Manufacturer may supply any of the following approved manufacturer's tap changer switch.
  - Central Moloney
  - Cooper Power System
  - ABB

### **1.2. SPECIAL LABELING**

The following labeling are in addition to any other labeling requirements.

#### **XII.1.4. TAP CHANGER**

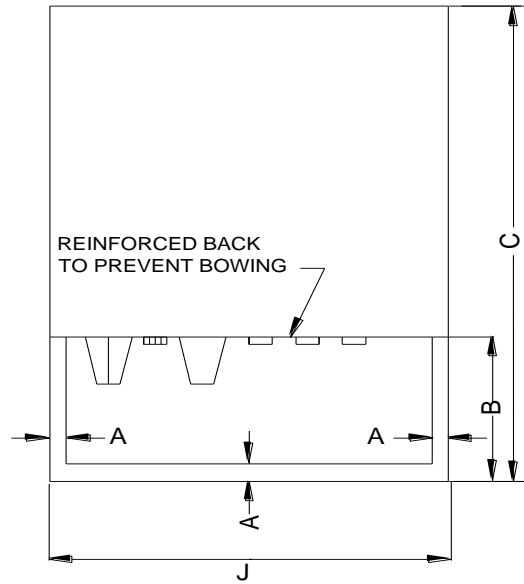
The positions of the tap changer shall be identified using an Engineer Grade Pressure Sensitive label around the tap changer to identify the 23Kv and the 26Kv allowable taps. The labeling shall be as shown in the EXHIBIT OUTLINES, EXHIBIT III. The center diameter, and therefore, the overall diameter, may be modified to fit the tap-changer switch used. The material may also be changed. Approval of the JEA Design, Construction and Material Standards activity shall be required.

#### **XII.1.5. TRANSFORMER LABELING**

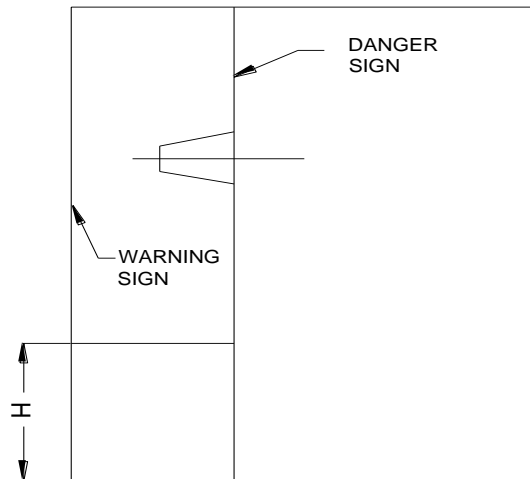
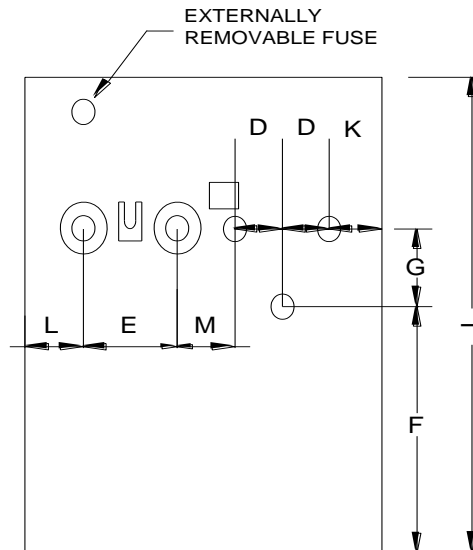
An Engineer Grade Pressure Sensitive label shall be placed on the front of the transformer indicating “BALDWIN”. This tag shall be 1 inch high with ¾” letters and be as long as necessary.

#### **XII.1.6. ENGINEER GRADE PRESSURE SENSITIVE LABELS**

The labels shall have a black background with yellow reflective characters. They are to be made with 3M Scotchlite Sheetings (Series 3200) and 3M Ink and Toners.



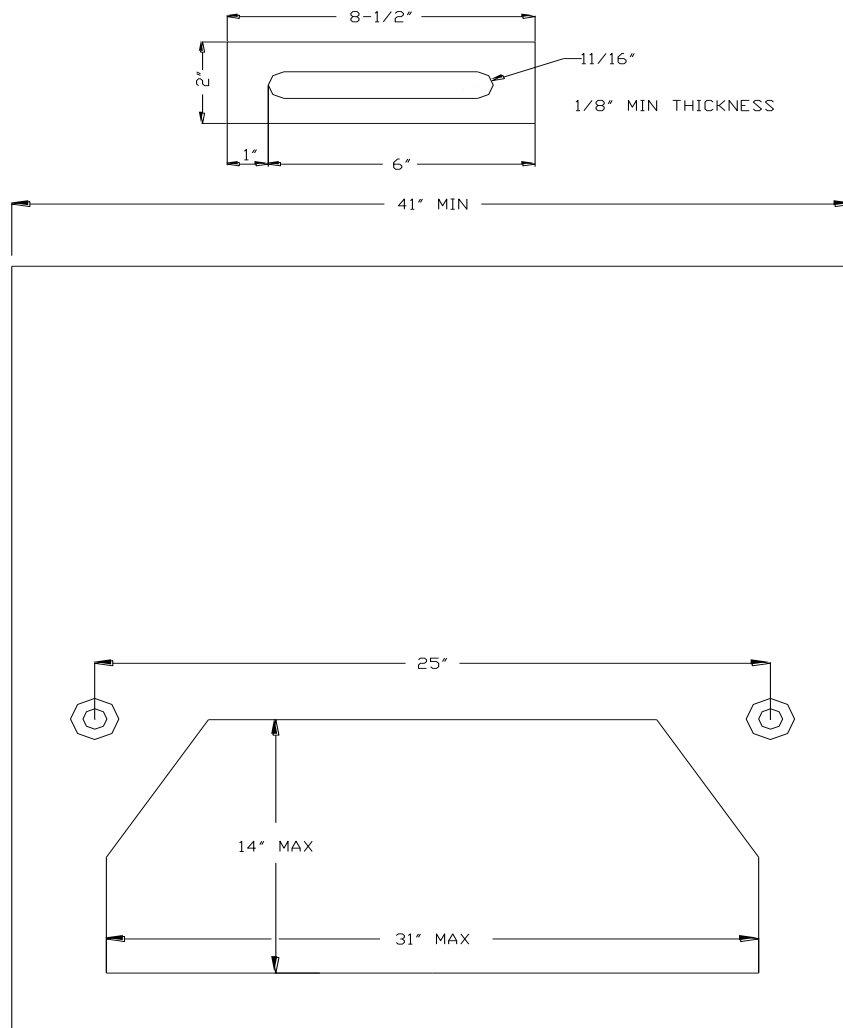
|   | 25 KVA - 100 KVA |        | 167 KVA - 250 KVA |        |
|---|------------------|--------|-------------------|--------|
|   | MIN              | MAX    | MIN               | MAX    |
| A | 3/4"             | 1-1/2" | 3/4"              | 1-1/2" |
| B | 20"              |        | 20"               |        |
| C |                  | 50"    |                   | 50"    |
| D | 3-1/2"           |        | 3-1/2"            |        |
| E | 12"              |        | 12"               |        |
| F | 18"              |        | 18"               |        |
| G | 6"               |        | 6"                |        |
| H | 10-1/2"          |        | 10-1/2"           |        |
| I | 31"              | 34"    | 31"               | 34"    |
| J | 34"              | 40"    | 34"               | 40"    |
| K | 3" **            |        | 5" **             |        |
| L | 3" **            |        | 3" **             |        |
| M | 6"               |        | 9"                |        |
|   |                  |        |                   |        |



**SINGLE PHASE PADMOUNT TRANSFORMER  
25 KVA -250 KVA: STANDARD DIMENSIONS**

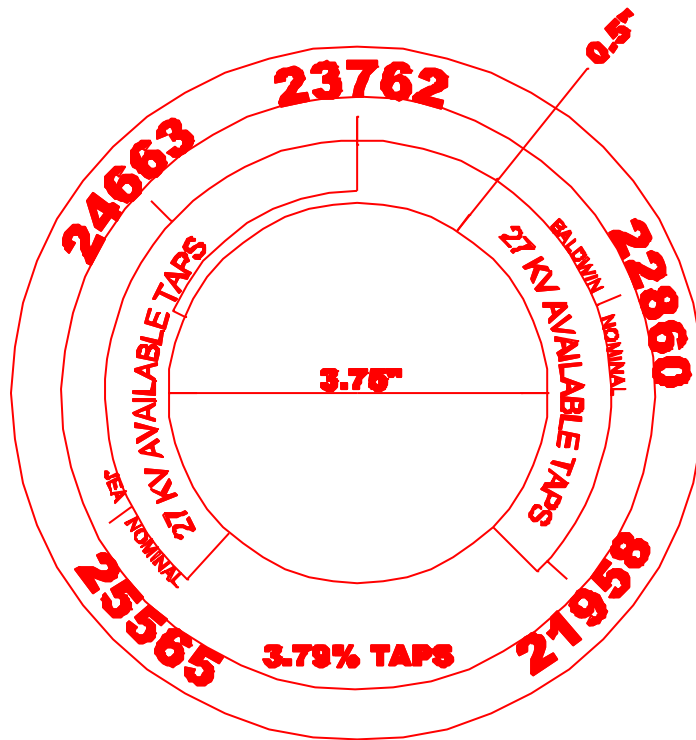
Note: Dimension "A" shall be a minimum of 1 1/2 " when Dimension "J" is 38" or greater.

**EXHIBIT I**



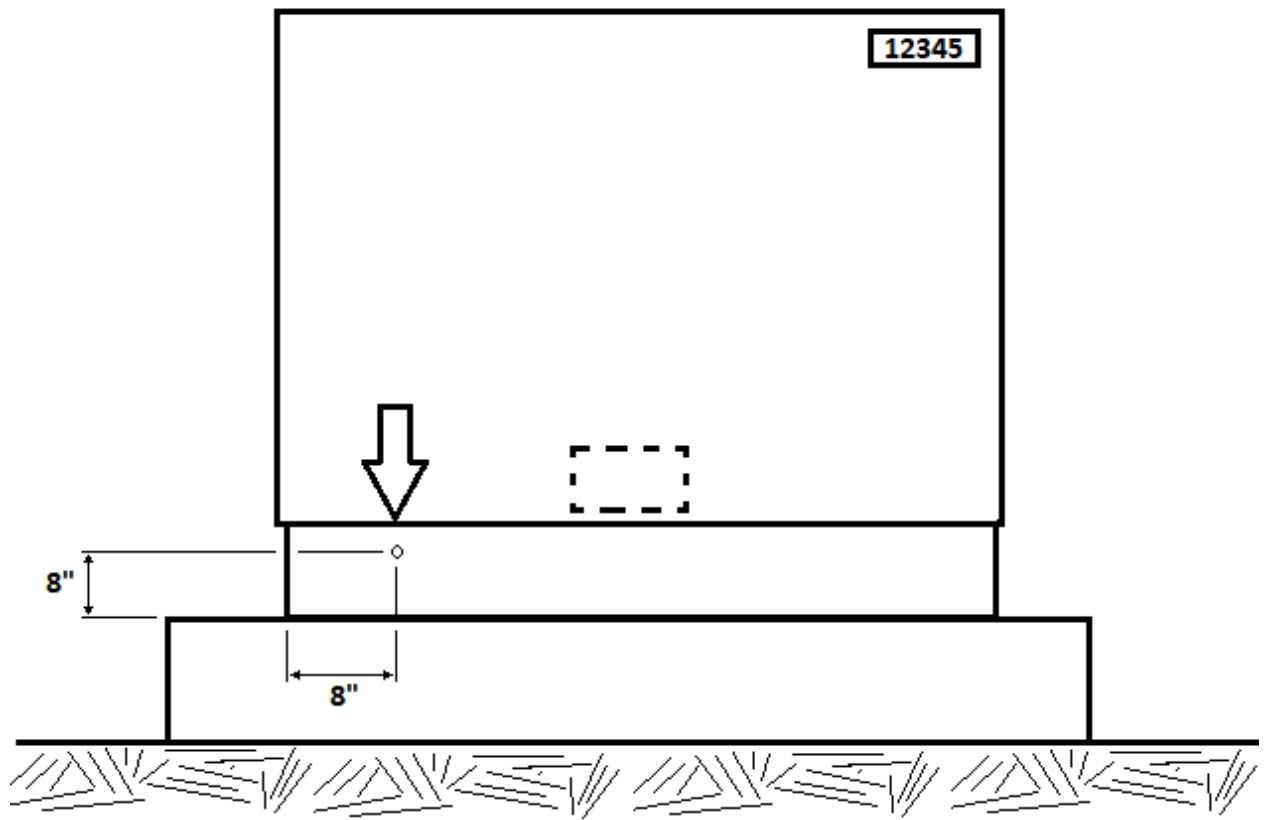
SINGLE PHASE PADMOUNT TRANSFORMER  
25 KVA -250 KVA  
CONCRETE MOUNTING PAD DIMENSIONS

## EXHIBIT II



23KV -27 KV TAP CHANGER LABEL

### EXHIBIT III



EXAMPLE LOCATION OF 5/16" DIA. HOLE ON  
SINGLE PHASE PADMOUNT TRANSFORMER

## EXHIBIT IV



## **Adjustments**

| <u>Date</u> | <u>Change</u>   | <u>Author</u> |
|-------------|---|---------------|
| 8/31/17     | Changed the Picture of the FCI 5/16" dia. hole location on page 8 | PARKTA        |
| 8/31/17     | Adjusted the hole location description in VII.4 on page 2 and 3   | PARKTA        |
| 11/13/19    | Updated Picture on pg8 to include FCI Hole location.              | PARKTA        |