Introduction

These instructions have been prepared to assist in the installation, operation and service of Central Moloney (CM) single phase overhead distribution transformers. Central Moloney overhead distribution transformers are designed for installation on single phase above ground systems. All units are constructed for weather exposed mounting on a utility pole. All possible installation, operation and service contingencies are not discussed. If additional information is required, contact a factory representative at:

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Instructions for Single Phase Overhead Distribution Transformers

**Safety**

These instructions are intended for personnel who are fully acquainted with accepted safety procedures and practices for installing, servicing and operating electrical equipment.

**Receiving**

As soon as a transformer is received, it should be inspected for evidence of carrier or handling damage that may have occurred during shipment. If such damage is apparent, please notify a Central Moloney representative. Claims for shipping damages should be filed with the delivering carrier.

When moving a transformer with a fork truck, the fork truck should be of proper capacity. Pole mounted equipment may also be moved with cranes and hoists. Lifting an un-palletized transformer with a fork truck may cause damage to the finish of the unit.

Lifting lugs are provided near the top of the transformer for unloading transformers by crane or hoist. The transformer should not be lifted by placing a continuous loop of cable or chain around the unit or lifting lugs. Cable pull angles should be used but not over 30° from vertical. Spreaders should be used to hold the lifting cables apart to avoid bending the tank or lifting hooks.

Do not use the radiators or cooling vents for lifting. Lift the transformer using all the lifting lugs provided.

**Failure to follow these instruction may result in damage of the equipment.** Be sure to check the total weight of the equipment (see nameplate) and the capacity and condition of the lifting and hoisting equipment. Do not use a fork truck or crane with capacities less than the weight of the transformer.
Storage

*Transformers should be stored in an upright position* on a pallet to prevent damage. Never double stack a transformer or store units where they will be subject to external damage.

Transformer Mounting

The transformer should be mounted level and the pole must be strong enough to support the weight of the transformer.

*Caution: High voltage switches and tap changers are no-load devices. Do not operate unless the transformer has been de-energized.*

To operate tap changers, use the appropriate procedure:

**Method 1 - Locking Screw Type Handle**

*De-energize the transformer. Failure to do so may result in possible injury or death.*
Back out the locking screw until it is clear of the locking hole.

Turn the handle to the required position and align the locking screw with the locking hole.

To prevent possibility of movement, tighten the locking screw.

Method 2 - Pull and Turn Type Handle

De-energize the transformer. Failure to do so may result in possible injury or death.

Pull handle out from tap changer body enough to clear raised tap indicator letter.

Twist handle to appropriate letter.

Allow spring to reseat handle over appropriate raised tap indicator letter.

To operate dual voltage switches, use the appropriate procedure:

Hook-Stick/Lever Locking Screw Handle
De-energize the transformer. Failure to do so may result in possible injury or death.

Back out the locking screw until it is clear of the locking hole.

Turn the handle to the required position and align the locking screw with the locking hole.

To prevent possibility of movement, tighten the locking screw.

Installation

Begin with caution. Be sure that you understand the purpose and function of all equipment and accessories before proceeding with installation. A lineman should wear protective clothing and required equipment. A hotstick should be used for all groundings, testing, connections, and reconnections during operations. A transformer should be treated as an energized transformer until you are certain of its condition.

Warning: Transformers contain a flammable mineral oil and caution should be taken to prevent damage which could result in fire or possible explosion.

Making the System Connections

Dual voltage switches and taps should be in proper positions and tank should be grounded before doing any work. The transformer tank ground must be connected to a permanent low impedance ground. The bushings, terminal lugs and all connections should be clean before making connections. All dirt, grease or foreign material should be removed. The transformer neutrals should be connected before completing other system connections. All unused leads should be insulated from ground and from all other leads and connections. All connectors should be correctly rated for the application intended.
Pre-Service Inspection

Before being connected to the system, inspect all new transformers or transformers being energized after a period of storage.

The transformer should be inspected for nicks, scrapes or scratches. Any damage to the exterior finish should be repaired promptly to prevent rust. Touch-up paint is available upon request from the factory.

The cover and all gaskets or seals at operating devices should be inspected for evidence of leakage. Leaks and improperly tightened gaskets should be repaired before the transformer is placed in service.

Central Moloney transformers are shipped ready for installation, with the insulating fluid at the 25°C level. The fluid level can be determined by removing the oil-level plug, or by removing the tank cover. To remove the cover, see the procedure on page 10.

Warning: It is imperative that the transformer tank be vented to zero pressure before the oil plug is removed. The transformer can be vented manually by pulling the pressure relief device with a hotstick. Failure to properly vent a transformer may cause severe damage to the equipment or personal injury.

All settings of dual voltage switches and tap changers should be made prior to any high voltage or low voltage connections. The dual voltage switches are set at the factory at the higher voltage position unless otherwise specified by the customer.

The tap changers are set at the factory at the rated nameplate voltage unless otherwise specified. The tap changer positions are referenced on the nameplate.

Caution: High voltage switches and tap changers are no-load devices. They must not be operated unless the transformer has been de-energized.

The transformer must be connected to a permanent, low-resistance ground. Central Moloney overhead distribution transformers are equipped with a grounding lug for making the ground connection.
**Warning:** Before any other electrical connection is made, the transformer tank must be grounded. A transformer which is systems connected and not grounded should be regarded as energized. An energized transformer should be considered extremely dangerous. Wye-wye winding connected transformers are designed for use on systems having a grounded neutral connector. All windings designed for grounded neutral operations MUST be permanently and solidly connected to a system neutral without resistance.

Arresters ordered with the transformer are installed at the factory. **BEFORE** the transformer is connected to a high voltage line, all arresters and tank ground connections must be completed.

Primary connections are provided by internally clamped bushings with tin-plated eyebolt or spade terminals suitable for either copper or aluminum conductors.

**Warning:** Primary leads are not to be connected until all other connections are made.

**Central Moloney** transformers are designed to carry a rated load with a temperature rise equal to or less than the value shown on the nameplate. The coil insulation has been made with thermally upgraded materials to ensure long life at rated loads. Prolonged overloads will result in overheating and accelerated aging of the insulation which may lead to early failure of the transformer.

**Maintenance**

**Warning:** The transformer MUST be de-energized before any maintenance or service is performed. Working on an energized transformer is extremely dangerous and could result in death.

The transformer should be periodically inspected for evidence of tampering, or external damage. Any exterior damage should be repaired at once. Scratches or damage to the protective coatings should be touched up properly to prevent rust. The area around the transformer should be kept as clean as possible. Any tools required for maintenance should not be kept on or against the transformer to protect the exterior coating.
Plugs, switches and bushings should be inspected for evidence of insulating fluid seepage. If a leak is detected, the gaskets should be replaced or the plugs resealed. This may require that the tank be opened and the insulating fluid be drawn down to the appropriate level.

**Removing Cover**

*When removing a tank cover, perform the following:*

Thoroughly clean the cover, cover band and cover mounted insulators.

The transformer should be vented from all pressure. A pressure relief valve may be specified for this purpose. If a pressure relief valve is not specified by the customer, the pressure may be slowly relieved by removing the plug vent located near the top of the transformer tank. To prevent any personal injury, the person removing the plug should stand to the side when venting the tank.

Loosen and then remove the cover band. Remove ground strap from connections.

When removing the cover, lift vertically and gently to prevent damage to cover, tank gaskets, or bushings. The high voltage bushing leads are attached with sufficient slack to remove the cover enough for the leads to be disconnected.

**Internal Inspection**

An internal inspection should be made to note defects or damage which might prevent proper operation of the transformer.

Inspect for moisture on underside of cover. Look for loose, shifted, or damaged parts (bushings, fuse holders, etc.) which may result in broken or loose connections. Check for signs of contaminated insulating fluid (sediment or foreign objects on the tank bottom, dirt or air bubbles suspended in the fluid).
Caution: If the transformer seal is broken for any reason, it is important that the transformer be kept dry and free of moisture and resealed carefully. The life of the transformer depends on the absence of moisture in its insulation fluid.

Handling of Insulating Fluid

Central Moloney transformers are filled with mineral oil (non-PCB < 1ppm). Refer to ANSI C57.106, Guide for Acceptance and Maintenance of Insulating Oil in Equipment, for additional guidelines when testing and handling insulating oil.

A fluid sample should be taken from the transformer if it is determined that moisture is inside the tank, or if there is evidence that the insulating fluid may be otherwise contaminated. A sample should be drawn from the bottom of the tank. If moisture is present in the fluid, the transformer should be dried out.

Disposal of Insulating Oil

All state and federal regulations regarding the disposal of oil filled electric equipment should be followed when disposing of a transformer or transformer insulating oil.

Bushing Removal and Replacement

To remove or replace transformer bushings, perform the following:

To prevent injury, de-energize the transformer.

Open the transformer tank and lower the oil below the transformer bushing.

Disconnect all internal leads. Release the internal bushing clamp bolts and remove the retaining spring and clamp, then the bushing and gasket can be removed.
To install a new bushing and gasket, install the bushing into the cover. If the original gasket has not been pinched or cut, it can be reused. Put the bushing clamp over the bushing, install the retaining spring, and tighten the clamp bolts.

Reconnect all internal leads to the original position and tighten all connections.

Be sure the insulating fluid is returned to the 25°C level as marked inside the tank. Inspect the bushing for any leaks or seepage, then reinstall the cover assembly.

**Testing**

All surge arresters must be disconnected before dielectric tests are run on the transformer. Immediately, reconnect arresters after the tests are completed. *Failure to disconnect arresters during dielectric test may result in failure of the transformer.*

**Replacement Parts**

When ordering replacement parts, provide the transformer serial number and a description of the replacement part required.

To order parts contact:

Central Moloney, Inc.
Components Operation
5500 Jefferson Parkway
Pine Bluff, Arkansas 71602
Phone: (501) 247-5320
Fax: (501) 247-5369

*These instructions do not claim to cover all details or variations in equipment, procedures, or processes described, nor to provide directions for meeting every possible emergency during installation, operation, or maintenance. If additional information is required to satisfy a problem not covered, please contact your Central Moloney representative.*