

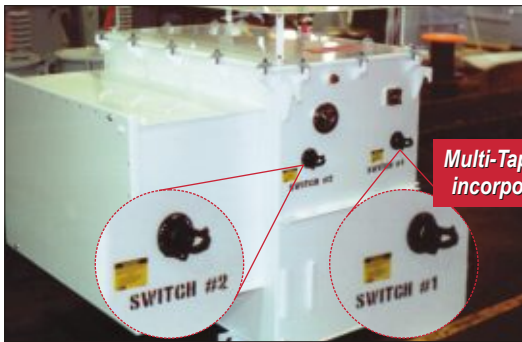
MOLONEY ELECTRIC INC.

OIL FIELD TRANSFORMERS

- ◆ **TRANSFORMER FLEXIBILITY**
- ◆ **REDUCED OVERALL OPERATING COSTS**
- ◆ **DESIGNED TO MEET YOUR SPECIFIC APPLICATION**



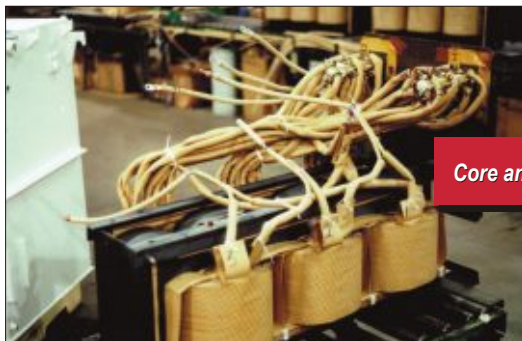
With over a century of experience and expertise in the design and manufacture of reliable, high quality distribution transformers, Moloney Electric is one of the most trusted names in the field. Included in our extensive product line is a wide range of specialized transformers for the oil industry, such as transformers for submersible pump systems, variable speed drives, and step up and down applications. Like all Moloney Electric transformers, the ISO 9001 Quality Assurance Program is in place to ensure that you consistently receive a high quality product.



Multi-Tap Unit with 25 taps incorporating 2 switches

Moloney Electric's transformers incorporate wound core technology which features an advanced five legged design. This design element reduces the circulating current and ferro-resonance within the tank, both of which can contribute to overheating. This feature is especially important where harmonic loading is a concern.

All our coils can be designed to provide the special taps needed for various voltage requirements on Electrical Submersible Pump (ESP) applications. This feature eliminates the need to change transformers out, thus reducing the need for redundancy in transformers and also the cost of removing and reinstalling transformers.



Core and Coil Assembly

The coil construction provides a high mechanical strength assembly, which delivers additional reliability for units in the field. This rugged construction is critical for remote applications and all other applications where enhanced reliability is of particular concern.

Units designed for variable speed drives include special ducting, and conductors, and are designed to allow for additional heating which occurs due to harmonics and loading in this type of transformer. Details on the harmonic content should be provided at the time of quotation. Designs incorporate copper windings as a standard. Aluminum conductor can be supplied as an option on the LV section of the coil in certain applications. All the coils incorporate diamond spotted, epoxy coated insulating paper for additional mechanical strength. All the insulating paper is thermally upgraded, providing for normal long life of the active parts and for an extended transformer life.



Transformer with sunshade

The specialized tap ranges that are available eliminate the need to change transformers as the voltage requirements change. The taps are rated full capacity at all tap positions, thus providing the maximum rating required. Taps are available in up to 25 different positions. Typical range is shown on the nameplate drawing (see typical nameplate drawing on inside right page).

The temperature rise is based on the operating temperature of the applicable environment and on the operating requirements of the transformer, such as harmonic loading. All inquiries should clearly identify the unique temperature requirements. Reference to the average and maximum ambient temperature is important for maximum design optimization and life of the transformer. Unless specified otherwise, units will be designed with a 55°C rise based on a maximum ambient temperature of 50°C, and a maximum ambient average temperature of 40°C over a 24 hour period.

In addition to the multi tap arrangement for low voltage variations, units can be designed and provided with a high voltage series multiple incorporating an externally operated switch. The outstanding benefit of this design feature is that it allows these units to be used as spares for several different applications and also allows you to move the units from one voltage area to a different one. These specific requirements should be forwarded to your local Moloney Electric representative for review.

Standard mechanical features include a sealed tank design, which provides an air space inside the transformer enclosure to allow for expansion and contraction while eliminating the contact between the oil and the outside environment. A pressure relief device set at a determined pressure is used to expel air during expansion and prevent the entry of air during contraction and normal operation. The air space is filled with dry nitrogen prior to shipment from the factory. The sealed tank design also reduces the transformer's overall size and allows for easier handling & reduced field maintenance.



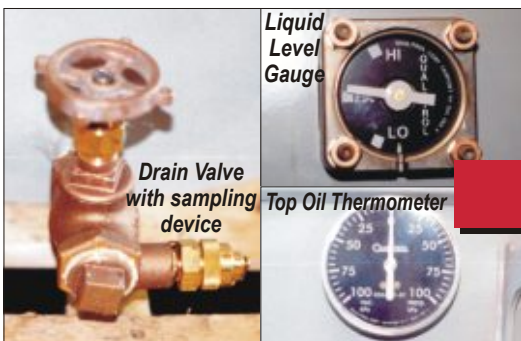
Sealed Tank Design with HV & LV termination boxes

Various enclosure styles can be provided. The designs can include open air bushings, cable termination boxes, or a padmounted style with door access to HV and LV compartments by means of pad-lockable doors. The designs can also include standard porcelain bushings or bushing wells and inserts for deadfront designs. Optional items such as cable glands, cable stress relief kits and cable elbow terminations can be provided. The compactness and accessibility of a deadfront padmount design unit provides for ease of installation and operation. The rigid enclosures are designed for adverse handling and environment conditions. In addition to this, most of Moloney Electric's units can be designed without radiators. This provides several benefits such as smaller size and reduced handling and maintenance in the field.



Padmount Design

Moloney Electric understands the unique requirements for a durable and long lasting external finish. Units are generally supplied with a white finish colour, with various other colours available. All our units receive an extremely durable powder paint coat finish which provides a durable finish for most environments, especially those normally seen in oil field applications. All metallic parts receive a thorough preparation, followed by the powder coat paint finish. This durable finish provides a long lasting unit for your environment. The finish has been tested in accordance with ANSI standard C57.12.29 and it exceeds a salt spray finish test of over 1500 hours. All the units are supplied completely oil filled and assembled. Other features include:



Accessories

- ◆ HV and LV bushings can be supplied c/w connectors for cable termination. Extra creep bushings can be provided as required.
- ◆ Optional bushing wells can be supplied for deadfront application.
- ◆ Inserts and cable elbows can also be provided based on cable specification details being provided.
- ◆ Drain valve w/sampling device
- ◆ Self sealing pressure relief valve.
- ◆ Oil temperature gauge, can be provided with maximum indicating hand and as an option with alarm contacts.
- ◆ Oil level gauge.
- ◆ Filling and processing plugs.
- ◆ Lifting plugs.
- ◆ Bolted cover.
- ◆ Earth terminal with eye bolt connector.
- ◆ Rating plate with all data including tap positions and other pertinent details. Additional data can be provided on the rating plate upon request.
- ◆ Optional items can include sunshades, cable glands, cable stress relief kits, loadbreak switches for isolating transformers and stainless steel tanks for specialized environments.



Unit with extra creep bushings

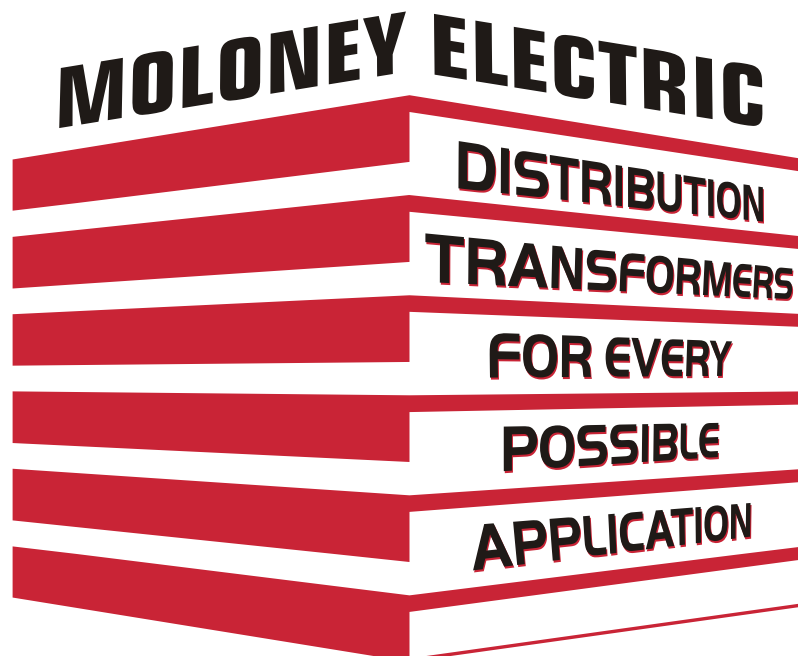
IMPORTANT NOTICE

Moloney Electric's transformers are custom designed and built to suit your specific applications. It is therefore important that we know your requirements clearly for our transformers to best meet your needs and provide you with a long lasting unit that reduces your overall operating costs.

Please complete our transformer data sheet and forward it to your local Moloney Electric representative. The following reference specifications are generally applied to the units, and all other requirements should be clearly indicated at the time of quotation:

- ◆ **CSA Standard C2-M91 for polemount or platform mounted units**
- ◆ **CSA Standard C227.4 for totally enclosed padmounted units**

Other references for specifications are available such as ANSI C57.12, IEC 76, etc.



Moloney Electric Vision Statement

**To be recognized as a reliable supplier
of transformers, whose committed team
of knowledgeable employees
consistently meets the expectations
of our customers and shareholders**

 **www.moloneytx.com**
MOLONEY ELECTRIC INC.

35 Leading Road
Toronto, ON, Canada, M9V 4B7
Tel: (416) 534-9226
Fax: (416) 534-6906

120 Diamond Avenue
Spruce Grove, AB, Canada, T7X 3B2
Tel: (780) 962-4567
Fax: (780) 962-4566

153 Bridge Street
Sackville, NB, Canada, E4L 3P4
Tel: (506) 536-1065
Fax: (506) 536-0920

Email: sales@moloneytx.com