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## MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1

# 167 KVA Pad Mount Transformer - 12470Y/7200 & 4160Y/2400 Grounded Wye Primary, 277V Secondary - Mineral Oil Fluid / ONAN

**Product ID: 299926**

**Please see last page for supporting documentation for this product(certificates, CAD files & drawings, IES files, wiring diagrams, etc).**



**Larson Electronics LLC manufactures a wide variety of products, including custom built to spec designs. The pictures displayed for this unit are a general representation of form factor for the product line and may not accurately represent this exact configuration in every detail due to custom builds and changes between similar products in our standard catalog. The specifics for this configuration are listed in the specification table and supporting documentation (CAD files, Dimensional Drawing, Name Plate Diagram, Wiring Diagram, etc.). This means that specific details (receptacles, plugs, wires, connections, mounting brackets, external finishes, etc.) may not be accurately represented in images vs specifications. Please review specifications and do not order based solely on images.**

**MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 1-Wire 1PH Pad Mount Transformer**

**Transformer Type:** Pad Mounted, Compartmental-Type
**Transformer Configuration:** Liquid Filled Pad Mounted
**Transformer Feed Type:** Loop Feed
**Phase:** Single Phase
**Capacity:** 167
**Primary Voltage:** 12470GrdY/7200 & 4160GrdY/2400
**Primary Voltage Switch: Included, 2-Position Dual Voltage Switch Changer**
**Primary Phasor:** Grounded Wye
**Primary BIL:** 95 KV
**Secondary Voltage:** 277V (L-N-L)
**Secondary Phasor:** Dual Winding Single Phase
**Secondary BIL:** 30 KV
**Frequency:** 60 Hz
**Temperature Rise:** 65°C
**Cooling Class:** ONAN; Self-Cooled
**Forced Air (Fans):** None
**Tap Changer:** 5-Position Tap Changer
**Tap Qty:** (2) FCAN; (2) FCBN
**Tap %:** 2.5%
**Impedance:** 1.0-4.5%
**Primary Connection Type:** Dead Front
**Primary Termination:** Standoff Well Bushings w/ Removable Studs, 200A Load Break Elbows w/ Inserts
**Primary Connection Qty:** (2) Primary Connections w/ (2) Standoff Brackets for Parked

**Ratings**

Meets/Exceeds DOE 2016 Efficiency Ratings
Complies with ANSI / IEEE #C57.12.00
Complies with ANSI / IEEE #C57.12.25
Complies with ANSI / IEEE C57 12.28
Complies with ANSI / IEEE C57 12.38

Complies with ANSI / IEEE C57.12.70
Complies with ASTM D3487
Pentahead Entry Assembly
High-Fire Point Natural Ester Insulating Fluid
Non-PCB Insulating Fluid
Tamper Proof Housing
Lift Up Pad Lockable Lid

**Efficiency:** 99.10%
**No Load Loss (in watts)*:** +/- 455W
**Load Loss (in watts)*:** +/- 1833W
**Total Load Loss (in watts)*:** +/- 2288W

Elbows
**Primary Grounding Provisions:** (1) Grounding lug, accepts #2 copper
**Primary Surge Arrestors:** (1) High Voltage Dead Break Elbow Surge Arrestor, Metal-Oxide-Varistor units included
**Primary Surge Arrestor Voltage Rating:** 10 kV Class
**Primary Surge Arrestor MCOV Rating:** 8.4 kVrms
**Primary Over Current Protection (OCP):** Bayonet Fuses, Partial-Range Current-Limiting Fuses
**Primary Over Current Protection Method:** Fused
**Primary Over Current Protection Holder:** Bayonet Fuse Holder w/ Drip Shield
**Secondary Connection Type:** Live Front
**Secondary Connections:** Threaded Stud Terminals, 1" Threaded Copper Studs w/ Jam Nuts
**Secondary Connection Qty:** (2) w/ (1) Jam Nut on X1, X1 and (2) Jam Nuts on X3
**Secondary Grounding Provisions:** (1) Grounding lug, accepts #2 copper
**Transformer Protection:** Bayonet Fuse
**Load Break Switch:** (1) 4-Position Load Break Switch
**Efficiency:** Meet DOE 2016 Standard
**Insulation Fluid:** Mineral Oil Insulating Fluid - Non-PCB Fluid
**Fluid Capacity*:** 125 Gallons
**Liquid Level Indicator:** Analog Gauge
**Temperature Indicator:** Analog Gauge
**Pressure/Vacuum Indicator:** Analog Gauge
**Pressure Relief Device:** Included, Automatic Action
**Fill Valve:** Included
**Drain Valve:** Included, w/ Sampler
**Surge Arresters:** High Elbow Surge Arresters on the Primary Side
**Front:** Dead Front Primary, Live Front Secondary
**Winding Material: Copper**
**Ambient Temperature Rating:** 40°C
**Sound Level:** 55 dBA
**Elevation (Altitude):** 3300ft (1000 meters) Above Sea Level
**Tank Material:** Coated Steel
**Cabinet Material:** Coated Steel
**Base Platform Material:**Coated Steel
**Housing Type:** Tamper Resistant w/ Pad-lockable Lift-up Lid
**Paint Type:** Munsell Green Paint and Undercoating
**Finish Color:** Munsell 7.0 GY 3.29/1.5 Bell Green

**Mounting:** Pad Mount

**Conduit Opening:** Bottom Feed Underground Entry/Exit

**Dimensions*:** 41"-L x 43.5"-D x 31.75"-H

**Weight*:** 1950 lb

*Please note that numbers are approximate and subject to change

**Special Orders - Special Requirements**
Contact us for special requirements

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**The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 Industrial Pad Mount Transformer from Larson Electronics offers powerful, reliable, and efficient power distribution in indoor, outdoor, and public locations. The low operating costs, low heat emissions, and low cost of ownership makes this transformer ideal for a wide range of applications and businesses. An enclosed design caters to installations on concrete pads without protective fencing.**
***PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS****
**Transformer Features:** With a transformer rating of 167 kVA, the industrial transformer features a primary voltage of single-phase 12470Y/7200 & 4160Y/2400 and a secondary voltage of single-phase 277V (L-N-L). The unit has a primary loop feed and dead-front primary connections. We also offer systems with radial feed and dead front primary/live front secondary connections. This transformer features a 5-position tap changer with (2) +/- 2.5% taps above and (2) +/- 2.5% taps below to allow small changes for voltage. This pad mount transformer features primary well bushings and standard spade connectors on the secondary side. Equipped with copper windings, this transformer consists of one coil and two core loops.
The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 is air cooled and does not have fans or mounting provision for fans. This unit features a 60°C

temperature rise for reduced heat waste, increased reliability and longer life. The transformer meets DOE 2016 efficiency standards. The combination of low temperature rise and high efficiency makes this unit suitable for use in electrical rooms, air conditioned spaces in buildings, underground vaults, and similar locations, in addition to outdoor areas.

**Insulation Fluid:** The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 features mineral oil insulation fluid. We offer transformers with FR-3 oil fluid, if needed.

**Gauges:** The following gauges are included with the system: liquid level, temperature, and pressure/vacuum gauges. Standard liquid level, temperature, and pressure/vacuum gauges are analog, manual reading types. These gauges do not have auxiliary contacts.

**Fault Pressure Devices:** This transformer features an automatic action fault pressure device. Fault pressure devices are used to detect high rates of pressure rise within the tank.

**Rapid Rise Relay:** There are no rapid rise relays on the unit. This safety component is designed for protection when a rapid increase in tank pressure occurs. The relay is suitable for detecting sudden pressure fluctuations above predetermined safe limits.

**Surge Arresters:** This system comes with high elbow surge arresters on the primary side. Designed for over-voltage and transient voltage protection, the components prevent damage caused by lightning, internal switching or voltage surges. We can offer models without high elbow surge arresters that have mounting provisions for customer-provided surge arresters.

**Load Break Switch:** The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 is equipped with a load break switch. This switch has four positions: A side on + transformer on, B side on + transformer on, A and B sides + transformer on, and A and B sides + transformer off.

**Valves:** The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 is equipped with a fill valve and drain valve with sampler port.

**Protection Fuses:** This transformer contains bayonet protection fuses on the primary side. For units without protection fuses, up stream protection is provided. We recommend provisions for protection fuses when possible, as blown fuses may require more frequent oil changes.

**Mount:** The heavy-duty enclosure makes the unit suitable for both indoor and outdoor applications. This power distribution system can be pad mounted on concrete pads.

**Benefits:** The MT-PML-R7-1P-GMR.NF-167KVA-SM-LT-DF-A6-BM-CZ-2B4-M1 pad mount transformer offers many benefits to consumers. This transformer provides owners with significant energy savings, as well as offering environmental benefits. Higher efficiency not only extends the life of the transformer, but also turns into cost savings for owners in the form of lower energy bills and decreased cost of ownership.

**Applications:** General purposes, industrial sites, electrical rooms, underground vaults, manufacturing facilities, steel plants, offshore, commercial, military, processing plants, electric power distribution, utilities, public locations, and more. Larson Electronics is a manufacturer and as such can build stationary and portable transformer systems to your specifications. Although we carry several models of power distribution transformer systems, we can deliver custom ordered units almost as quickly as our prebuilt units. If this model does not meet your needs, please contact us at 1-800-369-6671 or sales@larsonelectronics.com to discuss your specific requirements.

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# Frequently Asked Questions (FAQ)

**Q. What type of transformers does Larson Electronics offer?**

A. Larson Electronics offered dry type transformers and liquid filled transformers. For liquid filled transformers, Larson Electronics' offers overhead distribution transformers (utility pole mount), pad mounted distribution transformers (mounts to a concrete pad), pad mounted power transformers, underground submersible distribution transformers, and substation transformers.

**Q. What are the main benefits of a liquid filled transformer?**

A. Liquid filled transformers have higher energy efficiency, durability, short circuit strength, low sound level, lower maintenance costs, and longer useful life expectancy compared to dry type transformers.

**Q. What types of transformer liquids does Larson Electronics use?**

A. Larson Electronics offered mineral oil fluid (ONAN) and biodegradable fluid (KNAN). On request we can provide brand name FR3 fluid or other brand name fluids for additional cost and lead time. All fluids offered by Larson Electronics are non-PCB containing fluids.

**Q. What is the difference between mineral oil (ONAN) and biodegradable fluid (KNAN)?**

A. Mineral oil has a flash point of 147-165°C. Biodegradable insulation fluids have a higher flash point up to 350°C. Using biodegradable fluids reduce the risk of potential fire due to the transformer overheating. Utilizing biodegradable fluids extends the lifespan on the transformer due to better insulation, higher flash point, better moisture resistance, and higher maximum voltage breakdown points over mineral oils.

**Q. What is the difference between FR3 fluid and biodegradable fluid?**

A. Envirotemp FR3 is a brand name of biodegradable ester oils made by Cargill. Cargill is not the only manufacturer of biodegradable ester fluids used for cooling liquid filled transformers. Larson Electronics stocks RAPO biodegradable fluid that exceeds testing for ASTM D6871. Cargill Envirotemp FR3 can be used in substitution of the standard biodegradable fluid. This substitution will increase cost and lead times.

**Q. Do Larson Electronics transformers contain PCB?**

A. All dry-type and liquid filled transformers manufactured by Larson Electronics are PCB (polychlorinated biphenyl) free at the time of shipment. Mixtures of polychlorinated biphenyls (PCB's) were banned commercially for use as transformers cooling fluids in 1977 due to being toxic, bio-accumulative, not at all biodegradable, and difficult to dispose of safely. None of Larson

Electronics transformers contain PCB and only use PCB-free fluids.

**Q. What are the transformer ratings?**

A. IEEE Std C57.12.20 (Overhead Type), IEEE Std C57.12.34 (Three-Phase Pad-Mounted Compartmental), IEEE Std C57.12.38 (Single-Phase Pad-Mounted), IEEE Std C57.12.36 (Distribution Substation Transformers). For more detailed list of standards, please see the ASTM Certificate 1 link.

**Q. Is this transformer UL Listed? Is this transformer CSA Listed?**

A. By default, no. The majority of medium voltage transformer installations do not require certification by a Nationally Recognized Testing Laboratory (NRTL) unless being installed inside a building. Medium voltage equipment is built to and complies to ANSI, ASTM, DOE, IEEE, and NETA standards. UL is one of multiple NRTLs per OSHA certification for testing facilities for USA standards. CSA is one of multiple NRTLs per Canada certification standards. For an additional fee, we can submit your order for NRTL testing after completion of build. This testing service is per order, requires payment of testing fees, and will increase lead time.

**Q. What is the lifespan of a transformer?**

A. The average lifespan of a liquid filled transformer is 25 years. Many transformers will survive past the 25 year mark and are still in service for up to 35 years.

**Q. What is the difference between Loop Feed and Radial Feed?**

A. Radial feed Transformers will have three high voltage bushings (H1, H2, and H3). There is one bushing for each phase to allow for the incoming high voltage cables. On Wye and Grounded Wye connected Transformers, there will also be an H0 bushing. Loop feed Transformers will have six high voltage bushings (H1A, H2A, H3A, H1B, H2B, and H3B). There are two bushings for each phase. This allows the customer to connect all of their Transformers in a loop configuration. It will also allow the customer to bring two feeds to the Transformer. A four position switch can be used to switch between the A feed and the B feed.

**Q. What is the difference between Dead Front and Live Front?**

A. Live-front: The voltage-carrying parts are exposed. Live-front terminations have high voltage connectors, arresters, or fuses are exposed to the operator after cabinet has been opened. Dead-front: Often referred to as dead-front bushings. Safety is enhanced as there are no current-carrying parts exposed to the operator. For overhead distribution transformers and underground submersible transformers, live front is common. For pad mount transformers, the primary is typically dead front and the secondary is live front. Protection barriers can be added to live front pad mounted transformers

**Q. What is the difference between copper and aluminum windings inside the transformer?**

A. Transformers wound with aluminum or copper wire have similar losses and performance. The choice of using copper or aluminum windings depends upon the application and the individual preferences. The type of winding material does not affect the transformer's reliability. A transformer's life is defined by the life of its insulation system.

**Q. How many BTU's of heat does a transformer generate?**

A. The heat a transformer generates is dependent upon the transformer losses. To determine air conditioning requirements multiply the sum of the full load losses (obtained from factory or test report) of all transformers in the room by 3.41 to obtain the BTUs/hour. For example: A transformer with losses of 2000 watts will generate 6820 BTUs/hour.

**Q. Do you have to ground this transformer?**

A. In most cases the enclosure of the transformer is grounded for safety reasons. However, a transformer will function properly without being grounded. Be sure to research all grounding requirements for your specific application against the NETA and NEC as well as any local electrical codes.

**Q. What types of transformer protection are available?**

A. For over-current protection, Larson Electronics offers Fuses, breakers and interrupters. For over-voltage protection, Larson Electronics offers arresters. Larson Electronics can provide both Primary and Secondary protection equipment.

**Q. What is required for mounting this transformer?**

A. For mounting requirements, please see the ASTM Certificate 2 link.

**Q. Does my primary and secondary voltage matter for a transformer?**

A. Yes, this matters greatly. For primary voltage, most transformers will be equipped with a tap changer for small primary voltage changes due to voltage drop for losses experienced in the transmission line. Some transformers will be equipped with dual voltage primaries with a voltage selector switch to choose which voltage to operate the transformer on. In both cases, these are designed to provide a steady output voltage. It is very important to confirm what voltage your primary voltage being delivered from the utility provider and what the required electrical voltage for the building or house is. You cannot only provide the KVA size, or the abbreviated primary voltage as there is not standardized voltage across the country and each region can be different. Once manufacturing has started, these cannot be changed.

**Q. Where is the detailed dimensional drawing for this unit?**

A. We can provide a feature drawing that shows accessories and estimated form factor. Due to the variety of options and varying voltages, an exact dimensional drawing for the specific unit you have ordered is not available until after purchase and engineering has completed the drawing for your sales order. We do not offer completed detailed engineered drawings before purchase. The feature drawings are detailed enough for concrete pad designs and preliminary engineering site designs.

**Q. What is the warranty of this transformer?**

A. 12 months from point of connecting electrical service to the transformer or 18 months from point of ordering, whichever comes first.

**Q. Can this transformer be customized?**

A. Yes, Larson Electronics allows for customization of all transformers. Please send customization requests to sales@larsonelectronics.com. If you have an engineered specification or engineered drawings, please provide those at the time of request.

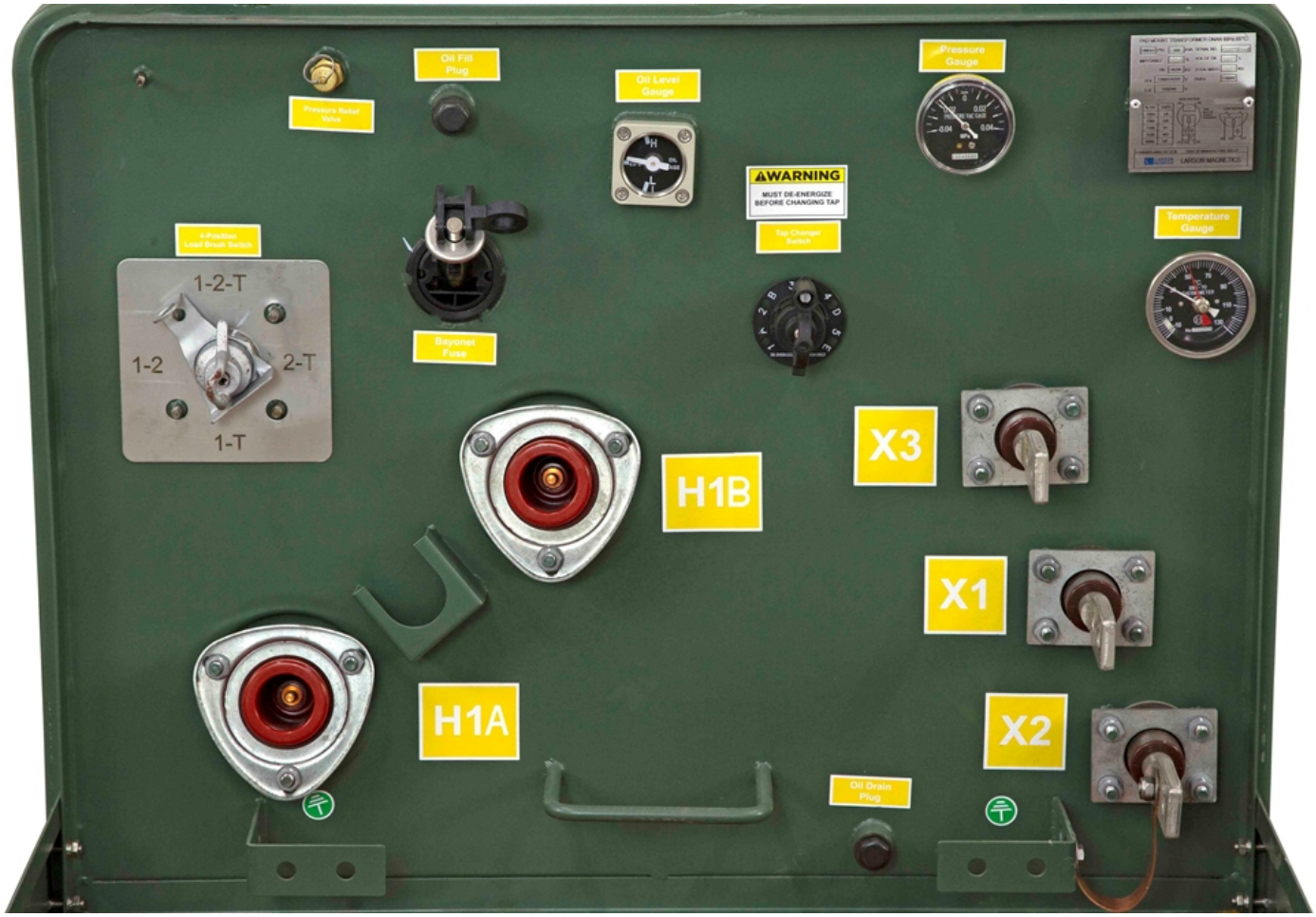
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- **ANSI Certificate 1**
- **ANSI Certificate 2**
- **ASTM Certificate 1**
- **Catalog Page - Product Series**
- **Concrete Pad Dimensional Drawing**
- **FCC Certificate (Federal Communications Commission, USA)**
- **MSDS (Material Safety Data Sheet**
- **Operations Manual**
- **HigResPic1**
- **HigResPic2**
- **HigResPic3**
- **HigResPic4**
- **HigResPic5**
- **Video1**
- **Video2**
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- **ISO 9001 Certification**
- **Business Certificate**
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