Larson Electronics LLC
9419 E US HWY 175, Kemp, TX 75143
Phone: 800.369.6671

www.LarsonElectronics.com
Email: sales@LarsonElectronics.com
Fax: 903.498.3364

**MT-PML-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-CZ-2B4-M1**

# 45 KVA Pad Mount Transformer - 23900GrdY/13800 & 12470GrdY/7200 Grounded Wye Primary, 480Y/277 Wye-N Secondary - Copper, KNAN/Bell Green

**Product ID: 299691**



**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-R7-3P-GMP-45KVA-YE-LT-DF-A6-BB-CZ-2B4-M1 3PH Pad Mount Transformer**

**Transformer Type: Pad Mounted, Compartmental-Type**
**Transformer Configuration: Liquid Filled Pad Mounted**
**Transformer Feed Type: Loop Feed**
**Operation: Step-Down Operation (Not Approved for Step-Up)**
**Phase: Three Phase**
**Capacity: 45 KVA**
**Vector Group: YnYn0**
**Primary Voltage: 23900GrdY/13800 & 12470GrdY/7200**
**Primary Voltage Switch: Included Primary Selector Switch**
**Primary Voltage Class: 25 kV Class**
**Primary Phasor: Grounded Wye**
**Primary BIL: 125 KV**
**Secondary Voltage: 480Y/277**
**Secondary Voltage Class: 1.2 kV Class**
**Secondary Phasor: Wye-N**
**Secondary BIL: 30 KV**
**Frequency: 60 Hz**
**Temperature Rise: 65°C**
**Insulation Rating: Class E Insulation - 120°C, 248°F**
**Cooling Class: KNAN; Self-Cooled**
**Forced Air (Fans): None**
**Tap Changer: 5-position Tap Changer**
**Tap Qty: (2) FCAN Above Taps, (2) FCBN Below Taps**
**Tap %: 2.5%**
**Tap Changer Switch Rating: 200-Amp, 15 kV**
**Tap Changer Switch Location: High Voltage (HV) [Left Side] Front Compartment**
**Impedance: 1.0-4.5% Typical, Target 2.70-4.5%**

**Ratings**

Meets/Exceeds DOE 2016 Efficiency Ratings
Meets/Exceeds CSA Efficiency Ratings
Complies with ANSI / IEEE C57.12.00
Complies with ANSI / IEEE C57 12.28
Complies with ANSI / IEEE C57 12.29
Complies with ANSI / IEEE C57 12.34
Complies with ANSI / IEEE C57 12.35
Complies with ANSI / IEEE C57.12.70
Complies with ANSI / IEEE C57.12.110
Complies with ANSI / IEEE C57.12.131
Complies with ANSI / IEEE C62.11
Complies with ANSI / IEEE C62.22
Complies with ANSI / IEEE 386
Complies with ANSI / IEEE C2
Complies with ANSI / IEEE C37.47
Complies with ANSI Z535.4
Complies with ASTM D3487
Complies with ASTM D6871
Complies with NEMA 260-1996
Complies with 10 CFR Part 431
Complies with CSA C2.1-06
Complies with CSA C50
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C88-16
Complies with CSA C227.4
Complies with CSA C227.5

**Primary Connection Type: Dead Front**
**Primary Termination Arrangement: V Terminal Arrangement**
**Primary Termination: Externally Clamped Well Bushings w/ Removable Studs, 200A Load Break Elbows w/ Inserts**
**Primary Connection Qty: (6) Primary Connections for use w/ Elbow Connectors**
**Primary Parking Stand Qty: (6) Welded Brackets for Installing Accessory Parking Stand Bushings**
**Primary Bushing Rating: 15 kV Class, 95 kV BIL, 200A, Load Break, IEEE 386 Color Red**
**Primary Neutral Connection: Primary HO Neutral Internally Bonded to Tank**
**Primary Surge Arrestors: (3) High Voltage Elbow Surge Arrestors, Included**
**Primary Surge Arrestor Voltage Rating: 10 kV Class Elbow Arrestor**
**Primary Surge Arrestor MCOV Rating: 8.4 kVrms**
**Primary Over Current Protection (OCP): Bayonet Expulsion Fuse in series w/ Partial-Range Current-Limiting Fuse**
**Primary Over Current Protection Method: Fused, Oil-Immersed**
**Primary Over Current Protection Holder: Bayonet Fuse Holder w/ Flapper Valve and External Drip Shield**
**Primary Grounding Provisions: (1) NEMA Ground Bar attached to tank via (2) Welded Ground Bungs in HV Cabinet**
**Secondary Connection Type: Live Front**
**Secondary Termination Arrangement: Staggered Terminal Arrangement**
**Secondary Connections: NEMA Spade Terminals, 4-Hole H Spade NEMA Secondary Terminal, Externally Clamped, Accepts up to (4) Double Lug connections with (2) cables per side of Spade connector**
**Secondary Connection Qty: (4) Externally Clamped One-Piece Epoxy Bushings Copper Threaded Studs**
**Secondary Connection Supports: N/A**
**Secondary Over Current Protection (OCP): N/A**
**Secondary Neutral Connection: Secondary X2 Neutral Grounded to Tank via 1/2”-13 UNC Tapped Hole, 7/16” Deep Bung & Copper Ground Strap**
**Secondary Grounding Provisions: (1) NEMA Ground Bar attached to tank via (2) Welded Ground Bungs in LV Cabinet**
**Metering Current Transformer (CT): N/A**
**Metering Panel: N/A**
**Auxiliary Control Panel : N/A**
**Load Break Switch: 4-Position Load Break Switch**
**Load Break Switch Qty: (1)**
**Load Break Switch Rating: 200-Amp, 15 kV**
**Load Break Switch Location: High Voltage (HV) Front Compartment**
**Efficiency Standard(s): Meets DOE 2016 Standards, Meets CSA Standards Meets ANSI/IEEE Standards**
**K-Factor Rating (Harmonic Mitigation): K-1 (Standard)**
**Pulse Drive Rating: N/A**
**Insulation Fluid: Biodegradable Natural Vegetable Oil Ester Insulating Fluid - Non-PCB Fluid**
**Fluid (Oil) Capacity*: 70 Gallons**
**Fluid (Oil) Weight*: 539 lb**
**Liquid Level Indicator: Analog Dial Gauge**
**Temperature Indicator: Analog Dial Gauge**
**Pressure/Vacuum Indicator: Analog Dial Gauge**
**Pressure Relief Device: Included, Automatic Action**
**Fault Indicator: Included, non-resettable device detects and provides indication of transformer internal fault**
**Gas Sampler Valve: Included, Schrader Valve**
**Fill Valve: 1" NPT Port w/ Removable Bolt Plug**
**Fill Valve Location: Front Compartment**
**Drain Valve: 1" NPT Port w/ 5/8" NPT Sampler Valve**
**Drain Valve Location: Front Compartment**
**Winding Material: Copper**
**Ambient Temperature Rating: 40°C**
**Ambient Operating Temperature Range: -40°C to +40°C (-50°F to +104°F)**
**Sound Level: 48 dBA**
**Elevation (Altitude): 3300ft (1000 meters) Above Sea Level**
**Core Material: Grain Oriented Steel**
**Tank Material: Coated Steel**
**Cabinet Material: Coated Steel**
**Base Platform Material: Coated Steel**
**Portability: Lifting lugs, provisions for jacking under base, w/ base construction suitable for using rollers or skidding**
**Housing Type: Compartmental Air-Filled Cabinet w/ Locking Doors, HV Compartment Left, LV Compartment Right, Steel Barrier Separation, HV Door Spring-Loaded**

Complies with CSA C802-3
Complies with CSA C802.1

**Features**

Pentahead Bolt Entry Assembly
High-Fire Point Insulating Fluid
Non-PCB Insulating Fluid
Tamper Proof Housing
Hinged Front Compartment Doors, Pad Lockable
NEMA 3R Wiring Compartment
Hot Stick Included, HV Door Mount

**Efficiency %: 98.50%**

*Based on transformer operating at 50% of nameplate base kVA.*

**Load Losses Based on 85°C Reference Temp.**

**No Load Loss (in watts): +/- 114W**

**Full Load Loss (in watts) at 100%: +/- 570W**

**Total Load Loss (in watts) at 100%: +/- 684W**

**Total Losses at 55°C LL Temp.& 20°C NL Temp.**

**Total Load Loss (in watts) at 50%: +/- 248W**

***Note: Losses offered are typical only, not guaranteed***

**Labeling:**

Externally Stencilled (Painted) KVA Rating
Externally Stencilled (Painted) Voltage Rating
External Non-PCB Label
External Warning & Danger Label
External Barcode Label
Internal Busing & Accessory Labeling
Stainless Steel Riveted Nameplate

**Factory Tests:**

Winding Resistance Test
Insulation Resistance Test
Voltage Ratio Error Test
Short-circuit Impedance Test
No-load Loss (Wattage) Test
Load Loss (Wattage) Test
Induced Voltage Withstand Test
Separate Source Voltage Withstand Test
Pressure Integrity Test Test

**Shipping:**

Shipped on pallet on open flatbed
Palletized on Wooden Pallet w/ Skid Pockets
Pallet Skid Facing Outward Sides of Truck
***Note: Crated shipping in lieu of palletizing can be done upon request for an additional fee***

**Release Pin in LV Compartment**
**Enclosure Rating: NEMA 3R Weatherproof Wiring Cabinet, Sealed Tank**
**Seismic Rating: Yes**
**Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating**
**Finish Color: Munsell™ 7.0 GY 3.29/1.5 Bell Green**
**Mounting: Pad Mounted**
**Conduit Opening: Bottom Feed Underground Entry/Exit**
**HV Compartment Base Wireway Dimensions*: 20"-W x 5"-D**
**LV Compartment Base Wireway Dimensions*: 16"-W x 5"-D**
**MV/LV Compartment Cabinet Depth*: 20"-D**
**Tank Cover Access Handhole: N/A**
**Dimensions*: 68"-W x 39"-D x 50"-H**
**Dry Weight (w/o Oil)*: 663 lb**
**Total Weight (Liquid Filled)*: 1,701 lb**
*Please note that numbers are approximate and subject to change

**Special Orders - Requirements**
Contact us for special requirements
**Toll Free:1-800-369-6671**
**Intl:1-214-616-6180**
**Fax:1-903-498-3364**
**E-mail:sales@larsonelectronics.com**

**The MT-PML-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-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 45 KVA, the industrial transformer features a primary voltage of three-phase 23900GrdY/13800 & 12470GrdY/7200 Grounded Wye and a secondary voltage of three-phase 480Y/277 Wye-N. The unit has a primary loop feed for single installations and dead-front primary connections. We also offer systems with loop feed and live front primary connections. This transformer features a 5-position tap changer with two, +/- 2.5% taps above and two, +/- 2.5% taps below to allow small changes for voltage. There are no load break switches, rapid rise relays and protection fuses present on the system.
The system features copper windings for high strength and thermal/electrical conductivity. This transformer consists of rectangular coil and five-legged wound core design with three coils and four core loops (this is for three-phase transformers only; single-phase units have one coil and two core loops).
The MT-PML-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-CZ-2B4-M1 is air cooled and does not have fans or mounting provision for fans.
**Enclosure Design:** This pad mounted transformer is a compartmental design. The tank and housing are fabricated from steel. The front electrical enclosure carries a NEMA 3R rating. The high voltage and low voltage compartments are located in front of the transformer tank, with the high voltage compartment on the left side and low voltage compartment on the right side. The HV and LV compartments are air filled and separated by a full length steel barrier between the compartments. A removable steel plate at the base of the HV and LV compartments prevents rodents and other intrusions from entering the enclosure once installed. This steel plate allows for underground conduit entry into the enclosure compartments. Two hinged exterior doors allows for access into the compartments. A single pad lockable handle on the low voltage compartment door allows for securing the transformer. A spring loaded pin within the low voltage compartment prevents the high voltage door from being opened without pulling the safety pin. A hot stick is included in the high voltage compartment, mounted to the HV door.
**Temperature Rise:** This unit features 65°C temperature rise for reduced heat waste, increased reliability and longer life. At 65°C temperature rise, the transformer offers 45 KVA. The transformer meets standard efficiency requirements. 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-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-CZ-2B4-

M1 features biodegradable cooling fluid (KNAN) with a capacity of 70 gallons. We offer transformers with FR-3 oil fluid, if needed.
**Biodegradable Fluid:** Biodegradable cooling fluid (vegetable oil) has a higher heat capacity compared to mineral oil, making the liquid safer to use and more reliable during operations. Vegetable oil has a higher flash point and fire point than mineral oil, hydrocarbon oil, silicone oil and synthetic ester. This cooling fluid is also non-toxic and can tolerate higher breakdown voltages than mineral oil. When operating at high temperatures, biodegradable cooling liquid sustains up to 120% loan conditions, which helps preserve the transformer's lifespan and performance.
**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 Arrestors:** This system comes with high elbow surge arrestors 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 arrestors that have mounting provisions for customer-provided surge arrestors.
**Load Breaker Switch:** The transformer 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-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-CZ-2B4-M1 is equipped with a pressure relief valve, 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-R7-3P-GMW.MR-45KVA-YE-LT-DF-A6-BB-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)