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MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2

1 MVA Solar Step Up Pad Mount Transformer - 600Y/347 Wye-N Primary, 4160V Delta Secondary - KNAN/Bell Green

Product ID: 306330



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-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 Pad Mount Transformer
Transformer Type: Pad Mounted, Compartmental-Type, 5-Legged Core
Transformer Configuration: Liquid Filled Pad Mounted, Solar Inverter Duty
Transformer Feed Type: Loop Feed
Operation: Step-Up Operation (Reverse Feed)
Phase: Three Phase
Capacity: 1 MVA (1000 KVA)
Vector Group: DYN1
Primary Voltage: 600Y/347
Primary Voltage Class: 1.2 kV Class
Primary Phasor: Wye-N
Primary BIL: 45 KV
Secondary Voltage: 4160V
Secondary Voltage Switch: N/A
Secondary Voltage Class: 5 kV Class
Secondary Phasor: Delta
Secondary BIL: 60 KV
Frequency: 60 Hz +/- 5%
Temperature Rise: 65°C - 80°C Max Winding Core Hotpost
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: 600-Amp, 5 kV
Tap Changer Switch Location: High Voltage (HV) Front Compartment
Impedance: 5.0-7.5% Typical, Target 5.75%
Primary Connection Type: Live Front w/ IR Window to View Connections

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 C57.18.10-2021
Complies with ANSI / IEEE C57.110-2018
Complies with ANSI / IEEE C57.159-2016
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

Primary Termination Arrangement: Staggered Terminal Arrangement
Primary Connections: NEMA Spade Terminals, 10-Hole Spade, Externally Clamped, Accepts Up to (10) Double Lug Connections with (5) Cables Per Side of Spade Connector
Primary Connection Qty: (4) Externally Clamped One-Piece Epoxy Bushings Copper Threaded Studs
Primary Connection Supports: Phenolic Spade End Supports
Primary Over Current Protection (OCP): N/A
Primary Side (Load) Winding: Withstands DC Current up to 0.5% of Rated Output Current, Withstands Spikes of 2,500 volts Between Phase and Ground, Withstands dV/dt of 500V/us Between Phase and Ground
Primary Neutral Connection: X0 Neutral Grounded to Tank via 1/2"-13 UNC Tapped Hole, 7/16" Deep Bung & Copper Ground Strap
Primary Grounding Provisions: (1) NEMA Ground Bar Attached to Tank via (2) Welded Ground Bungs in LV Cabinet
Secondary Connection Type: Dead Front w/ IR Window to View Connections
Secondary Termination Arrangement: V Terminal Arrangement
Secondary Termination: Externally Clamped Well Bushings w/ Removable Studs, 600A Load Break Elbows w/ Inserts
Secondary Connection Qty:(6) Primary Connections for Use w/ Elbow Connectors
Secondary Parking Stand Qty: (6) Welded Brackets for Installing Accessory Parking Stand Bushings
Secondary Bushing Rating: 5 kV Class, 45 kV BIL, 600A, Dead Break, IEEE 386 Color Red
Secondary Neutral Connection: N/A
Secondary Surge Arrestors: (3) High Voltage Elbow Surge Arrestors, Included
Secondary Surge Arrestor Voltage Rating: 6 kV Class Elbow Arrestor
Secondary Surge Arrestor MCOV Rating: 5.1 kVrms
Secondary Over Current Protection (OCP): Bayonet Expulsion Fuse in Series w/ Partial-Range Current-Limiting Fuse
Secondary Over Current Protection Method: Fused, Oil-Immersed
Secondary Over Current Protection Holder: Bayonet Fuse Holder w/ Flapper Valve and Drip Shield
Secondary Grounding Provisions: (1) NEMA Ground Bar Attached to Tank via (2) Welded Ground Bungs in HV Cabinet, MV Grounded to Inside of Transformer Core
Metering Current Transformer (CT): N/A
Metering Panel: N/A
Auxiliary Control Panel : External NEMA 4 Control Panel for Gauges, Auxiliary Contacts & Fill Valve
Load Break Switch: 2-Position Load Break Switch
Load Break Switch Qty: (1)
Load Break Switch Rating: 600-Amp, 25 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: Approved for Use w/ Inverters w/ Pulse Wave Outputs
Insulation Fluid: Biodegradable Natural Vegetable Oil Ester Insulating Fluid - Non-PCB Fluid
Fluid Capacity*: 212 Gallons
Fluid Weight*: 1,631 Lbs
Liquid Level Indicator: Analog Dial Gauge w/ (2) Dry Type Form C Auxiliary Contacts (1NO + 1NC) for Remote Alarm Trip for High & Low Levels
Temperature Indicator: Analog Dial Gauge w/ (2) Dry Type Form C Auxiliary Contacts (1NO + 1NC) for Remote Alarm Trip for High & Low Temps
Pressure/Vacuum Indicator: Analog Dial Gauge w/ (2) Dry Type Form C Auxiliary Contacts (1NO + 1NC) for Remote Alarm Trip
Pressure Relief Device: Included, Automatic Action
Fault Indicator: N/A
Gas Sampler Valve: Included, Schrader Valve
Fill Valve: 1" NPT Port w/ Removable Bolt Plug
Fill Valve Location: (1) In HV Cabinet; (1) Externally Mounted in Aux Cabinet
Drain Valve: 1" NPT Port w/ 5/8" NPT Sampler Valve
Drain Valve Location: (1) In HV Cabinet; (1) Externally Mounted on Right Side of Transformer Tank, w/ Pad Locking Hood
Winding Material: Copper
Ambient Temperature Rating: 40°C
Ambient Operating Temperature Range: -40°C to +40°C (-50°F to +104°F)
Electrostatic Shield (Including Core and Coils): Dielectric Barrier & Foil Type Shield, Located Between Primary and Secondary Windings, Bonded Externally to Ground in LV Cabinet
Sound Level: 58 dBA

Complies with CSA C227.4
Complies with CSA C227.5
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 %: 99.20%
Based on transformer operating at 50% of nameplate base kVA

Load Losses Based on 85°C Reference Temp.
No Load Loss (in watts)): +/- 1,300W
Full Load Loss (in watts) at 100%: +/- 8,500W
Total Load Loss (in watts) at 100%: +/- 9,800W

Total Losses at 55°C LL Temp.& 20°C NL Temp.
Total Load Loss (in watts) at 50%: +/- 3,221W
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

Elevation Rating: 3300ft (1000 meters) Above Sea Level

Core Material: Grain Oriented Steel, 5-Legged Core, Inside Grounded

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 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*: 20"-W x 5"-D
MV/LV Compartment Cabinet Depth*: 24"-D
Tank Cover Access Handhole: 10"-H x 16"-W Bolted Cover Tank Access Hole
Dimensions: 73"-W x 69"-D x 73"-H
Dry Weight (w/o Oil)*: 3,216 Lbs
Total Weight (Liquid Filled)*: 6,834 Lbs
*Please note that numbers are approximate and subject to change

Pallet Skid Facing Outward Sides of Truck
Note: Crated shipping in lieu of palletizing can be done upon request for an additional fee

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The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 from Larson Electronics is a Solar Step Up Pad Mount Transformer that 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. The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 is designed to step up power fed to it from renewable energy sources and feed that current to the grid. This unit is designed to be powered by pulse wave solar inverters.
PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS*
Transformer Features: With a dual transformer rating of 1000 KVA (1 MVA), the industrial transformer features a primary voltage of three-phase 600Y/347 Wye-N and a secondary voltage of three-phase 4160V Delta. This transformer is designed for reverse feed applications, including stepping up low voltage output from solar inverters for feeding to the local utility grid. The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 is ideal for use in renewable energy systems. It is designed to take power fed to it from customer provided solar inverters that are part of renewable energy systems, such as solar panel fields, step up that current, and feed it into the electrical grid. This solar transformer is designed to operate when being fed by pulse wave solar inverters.
The unit has a primary loop feed for single installations and live-front primary connections. This solar step up transformer features a 5-position tap changer on the secondary side with two, +/- 2.5% taps above and two, +/- 2.5% taps below to allow small changes for voltage.
Copper transformer winding material helps improve performance, reduce weight, and lower cost. Compared to aluminum, copper windings have lower eddy losses due to higher resistivity. 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). Made to reduce harmonics, a five-legged wound core design transformer is grounded to the MV ground bar in the HV cabinet.
The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 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. The enclosure on this unit is equipped is equipped with a handhole tank access cover that provides access to the tank to check the transformer core and fuse connections without the need to cut open the entire tank to access those components.
IR Windows: The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 is equipped with IR windows built into the cabinet doors for thermal review and arc safety. This feature allows for easier safety testing routines and maintenance procedures related to arc safety.
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 1000 KVA (1 MVA). 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-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 features biodegradable cooling fluid (KNAN). 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. This unit's gauges are equipped with auxiliary contacts allowing for remote monitoring. The gauges and fill valves on this unit are located in a NEMA 4X rated auxiliary cabinet. There is an additional fill valve and drain valve in the HV cabinet.
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 secondary (medium voltage) 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.
Electrostatic Shielding: The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 features dielectric barrier and foil type shielding between the primary and the secondary to reduce harmonics and provide isolation between the HV and LV windings.
Valves: The MT-PML-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 is equipped

with a pressure relief valve, fill valve, and drain valve with sampler port.
Load Break Switch: This transformer is equipped with three independently operated 2-position load break switches on the secondary (medium voltage) side. One is for the transformer, one is for the secondary A lines, and one is for the secondary B lines.
Protection Fuses: This transformer is equipped with bayonet fuses on the secondary (medium voltage) 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-R4-3P-DNF-1MVA-YC-LT-DF-A6-BB-CZ-2B6-M2 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: Solar step up power distribution, solar panels, electric power distribution, utilities, reverse feed solar, 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)