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Product ID: 291360

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



Image:

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-R20-1P-GMA-250KVA-SZ-LT-DF-Z6-BB-CZ-1B2-M1 1-Wire 1PH Pad Mount Transformer

Transformer Type: Pad Mounted, Compartmental - Type I
Transformer Configuration: Liquid Filled Pad Mounted
Transformer Feed Type: Loop Feed
Phase: Single Phase
Capacity: 250
Vector Group: II6
Transformer Polarity: Subtractive
Primary Voltage: 34500GrdY/19950
Primary Voltage Class: 35 kV Class
Primary Phasor: Grounded Wye
Primary BIL: 150 KV
Secondary Voltage: 240/120V (L-N-L)
Secondary Phasor: Dual Winding Single Phase
Secondary BIL: 30 KV
Radio Influence Voltage (RIV): <100 microvolts @ 110% nameplate voltage
Frequency: 60 Hz

Temperature Rise: 65°C

Cooling Class: KNAN; Self-Cooled
Forced Air (Fans): None
Tap Changer: N/A
Tap Qty: N/A
Tap %: N/A

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: 99.20%
Based on transformer operating at 50% of nameplate base kVA.

Load Losses Based on 85°C Reference Temp.
No Load Loss (in watts)*: +/- 683W
Load Loss (in watts)*: +/- 2763W
Total Load Loss (in watts)*: +/- 3445W

Tap Changer Switch Location: N/A
Impedance: 1.0-4.5% Typical
Primary Connection Type: Dead Front
Primary Termination Arrangement: ANSI Type I Arrangement
Primary Termination: Externally Clamped Well Bushings w/ Removable Studs, 200A Load Break Elbows w/ Inserts
Primary Connection Qty: (2) Primary Connections w/ (2) Standoff Brackets for Parked Elbows
Primary Bushing Rating: 35 kV Class, 150 kV BIL, 200A Load Break
Primary Neutral Connection: Primary H2 Neutral Internally Bonded to Tank
Primary Surge Arrestors: N/A
Primary Surge Arrestor Voltage Rating: N/A
Primary Over Current Protection (OCP): (1) 15A Bayonet Type Expulsion Fuse in Series w/ (1) 65A Partial-Range Current-Limiting Fuse
Primary Over Current Protection Method: Weak-Link Expulsion Fuse, Current Limiting Fuse
Primary Over Current Protection Holder: Bayonet Fuse Holder w/ Drip Shield
Primary Grounding Provisions: (1) Welded Ground Bung, 1/2"-13 UNC Tapped Hole, 7/16" Deep Bung, w/ Grounding Terminal Clamp for 2/0-8 AWG Stranded Wire
Secondary Connection Type: Live Font
Secondary Termination Arrangement: ANSI Type I Arrangement
Secondary Connections: One-Piece Epoxy Bushings w/ 1-13 x 1-3/4" Long Copper Threaded Studs, Externally Clamped, w/ NEMA Spade Terminals, 4-Hole Spade, Externally Clamped, Accepts up to (4) Single Lug connections with (1) cables per side of Spade connector
Secondary Over Current Protection (OCP): N/A
Secondary Connection Qty: (3)
Primary 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) Welded Ground Bung, 1/2"-13 UNC Tapped Hole, 7/16" Deep Bung, w/ Grounding Terminal Clamp for 2/0-8 AWG Stranded Wire
Housing Grounding Provisions: Lid Cover & Base Sill Grounded to Tank via 4 AWG Flexible Copper Braid Ground Strap via Welded Ground Bungs, 1/2"-13 UNC Tapped Hole, 7/16" Deep Bungs
Exterior Grounding Provisions: (3) Welded Ground Bungs, 1/2"-13 UNC Tapped Hole, 7/16" Deep Bungs - Located on Left Side, Right Side, Left Rear Side of Tank
Metering Current Transformer (CT): N/A
Metering Panel: N/A
Auxiliary Control Panel : N/A
Load Break Switch: 2-Position Load Break Switch: On/Off Operation, "OPEN" at 6 O'clock Position, "CLOSED" at 12 O'clock Position, w/ Metal Switch Plate Diagram & Yellow Decals
Load Break Switch Qty: (1)
Load Break Switch Rating: 38 kV Phase-to-Phase, 21.9 kV Phase-to-Ground, 150 kV BIL, 200A Continuous Current, 10kA Symmetrical, 16kA Asymmetrical
Load Break Switch Location: High Voltage (HV) Front Compartment
Efficiency Standard(s): Meets DOE 2016 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 Capacity*: 125 Gallons
Liquid Level Indicator: Non-Mechanical Sight Glass Liquid Level Gauge, 1"-11-1/2 NPT (Heartland HLG-1000 equivalent)
Temperature Indicator: N/A
Pressure/Vacuum Indicator: Analog Gauge
Pressure Relief Device: Automatic Action w/ Pull Tab, Cracking Pressure @ 10 PSIG, Releasing Pressure @ 8 PSIG, Flow @ 15 PSIG (50 SCFM) @ 14.7 PSGI
Fault Indicator: Mounting Provisions for (1) indicator, Upper Right Front of Cabinet Door for Kearny H29-3014-00.

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

CPS Energy Specification

CPS Energy Specification

Cross for CPS Mat. No 1005557

Design Requirements:
ANSI Type I Arrangement
Bushing Spacing per CPS Spec. 426-20
1.5" Welded Stainless Steel Base Strip
Domed Tank & Lid for Water Drainage
304 Stainless Steel Hardware
Mounting Provisions for Fault Indicator
Lid & Base Sill Grounded to Tank via Flexible Copper Braid Ground Strap
(3) External Ground Bungs
(2) Internal Ground Bungs
X2 Grounded to Tank
Width: 38" Max.
Depth: 46" Max.
Cabinet Depth: 17" Min.
H1 Bushing Height: 25.5"
Min. 3-Mils Thick Coating on Top Surfaces
Min. 5-Mils Thick Coating within 8" of Base
SS Riveted Nameplate w/ CPS Mat. No & Barcode
Bi-Lingual WARNING & Danger Labels
Non-PCB Label
Barcode Label
Shipped on pallet on open flatbed

Pallet Skid Facing Outward Sides of Truck

Fill Valve: 1/2" NPT Port w/ Removable Bolt
Fill Valve Location: Front Compartment
Drain Valve: 1/2" NPT Port w/ Removable Bolt (No Sampler Valve)
Drain Valve Location: Front Compartment
Winding Material: Copper
Ambient Temperature Rating: 40°C
Sound Level: 55 dBA
Elevation (Altitude): 3300ft (1000 meters) Above Sea Level or Lower
Core Material: Grain Oriented Steel
Tank Material: Coated Steel
Cabinet Material: Coated Steel
Base Platform Material: Coated Steel, Min 12GA, w/ 1.5" 304 SS Welded Base Strip
Base Sill: Removable 14GA 304 SS Sill to Slide the On & Off the Pad w/o Cables, w/ 2" Access hole and removable access hole plate
Hardware Material: 304 Stainless Steel Bolts, Hinges, Hinge Pins
Housing Type: Tamper Resistant w/ Pad-lockable Lift-up Lid & Lifting Bolt Lugs for 5/8" Bolts
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, (2) 6" x 2" x 1/4" thick hold down cleats w/ 1/2" x 9/16 slotted hole for 1/2" mounting bolt
Conduit Opening: Bottom Feed Underground Entry/Exit
Dimensions*: 46"-W x 42"-D x 37"-H
Weight*: 3150 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-R20-1P-GMA-250KVA-SZ-LT-DF-Z6-BB-CZ-1B2-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*

This transformer is built to CPS Energy Specification 426-20, and is a cross for CPS Material No. 1005557

Transformer Features: With a transformer rating of 250 kVA, the industrial transformer features a primary voltage of single-phase 34500GrdY/19920 Grounded Wye and a secondary voltage of single-phase 240/120V (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 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-R20-1P-GMA-250KVA-SZ-LT-DF-Z6-BB-CZ-1B2-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-R20-1P-GMA-250KVA-SZ-LT-DF-Z6-BB-CZ-1B2-M1 features

biodegradable cooling fluid (KNAN) that is comparable to FR3 fluid. We offer transformers with mineral 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: This transformer is equipped with a non-mechanical float type sight glass liquid level gauge. This transformer does not feature temperature or pressure/vacuum gauges.

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 does not come 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 Breaker Switch: The transformer is equipped with a load break switch. This switch has two positions: transformer on, transformer off. The "OPEN" is at 6 O'clock position, and "CLOSED" is at at 12 O'clock Position. The load break switch has a metal switch plate diagram showing wiring diagram for the load break swatch operation and yellow decals for "OPEN" and "CLOSED" positions.

Valves: This transformer is equipped with a fill valve port and drain valve port without sampler valve.

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-R20-1P-GMA-250KVA-SZ-LT-DF-Z6-BB-CZ-1B2-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 materials do you offer?

A. We offer coated steel and stainless steel tank and housing materials. Stainless steel options include 429 stainless and 304 stainless. For winding materials we offer aluminum and copper conductors.

Q. What standard colors do you offer?

A. Our standard build finish color for pad mounted transformers is Munsell™ 7GY 3.29/1.5 Pad-Mount Green. We do have other standard finishes available on request, including: Munsell™ 9GY 1.5/2.6 Canadian Green, Munsell™ 5BG 7.0/0.4 Light Grey (ANSI #70), Grey (ANSI #61), Munsell™ 10bg 6/1 Blue Grey, Munsell™ 10bg 6/1 Steel Blue, Munsell™ N 9/ Safety White, Federal Standard Desert Tan FS595B-33446, Federal Standard Eagle Feather Tan FS-595-23578, and Federal Standard Tobacco Brown FS595C-30108. If you need a color not listed here, please contact us.

Q. What labeling is on the transformer?

A. Standard labeling includes external stenciling of the KVA, stenciling of high and low voltages, non-PCB sticker, "Mr. Ouchy" warning label, and stainless steel riveted nameplate. Additional labeling to your specifications can be provided at request.

Q. Does this transformer comply with CPS Energy specifications for the greater San Antonio, TX service territory?

A. Yes. This transformer is built to CPS Energy Specification 426-20 for single phase pad mounted transformers.

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.

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. 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. 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. What is required for mounting this transformer?

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

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. 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. 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. 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. 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 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 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. 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 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. 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 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. 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 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 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 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.

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Image:

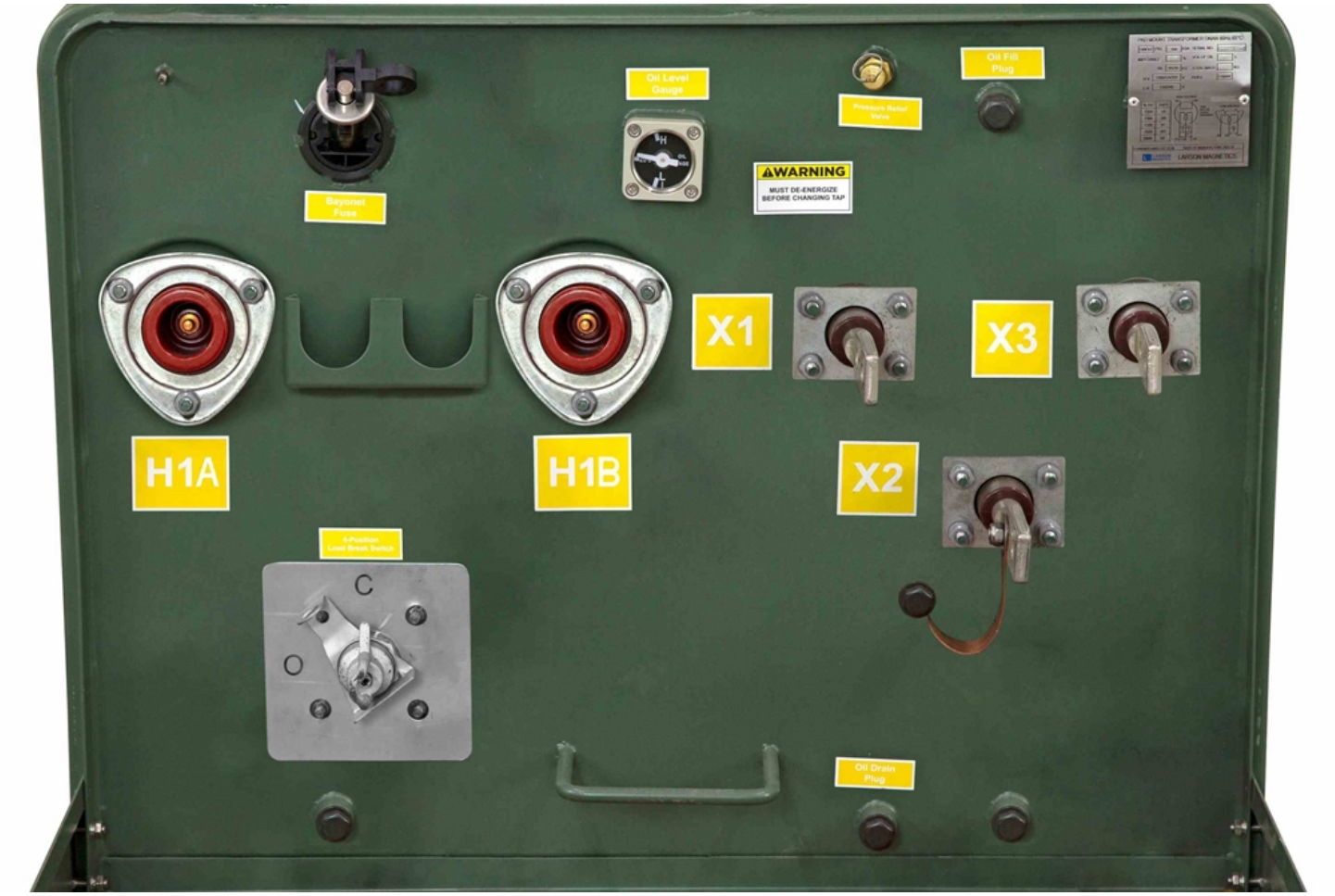

Oil Level Gauge
Pressure Relief Valve
Oil Fill Plug
Bayonet Fuse
WARNING
MUST DE-ENERGIZE BEFORE CHANGING TAP
X1
X3
H1A
H1B
X2
C
O
Oil Drain Plug

Image:



Image:

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Image:

Product ID: 291360

Harmonized System (HS) Code: 85043300
Export Control Classification Number (ECCN): EAR99

Links (Click on the below items to view):

- **ANSI Certificate 1**(https://www.larsonelectronics.com//images/product/ANSICert1/291360.PDF)
- **ASTM Certificate 1**(https://www.larsonelectronics.com//images/product/ASTMCert1/291360.PDF)
- **Catalog Page - Product Series**(https://www.larsonelectronics.com//images/product/CatalogPage/291360.PDF)
- **Concrete Pad Dimensional Drawing**(https://www.larsonelectronics.com//images/product/PadDimensions/291360.PDF)
- **Dimensional Drawing 2D**(https://www.larsonelectronics.com//images/product/DimensionalDrawing/291360.PDF)
- **Electrical Nameplate Diagram**(https://www.larsonelectronics.com//images/product/Nameplate/291360.PDF)
- **FCC Certificate (Federal Communications Commission, USA)**(https://www.larsonelectronics.com//images/product/FCCCert/291360.PDF)
- **Internal Component Spec Sheet 3**(https://www.larsonelectronics.com//images/product/ComponentSpec3/291360.PDF)
- **MSDS (Material Safety Data Sheet**(https://www.larsonelectronics.com//images/product/Msds/291360.PDF)
- **Operations Manual**(https://www.larsonelectronics.com//images/product/Manual/291360.PDF)
- **Wiring Diagram**(https://www.larsonelectronics.com//images/product/WiringDiagram/291360.PDF)
- **HigResPic1**(https://www.larsonelectronics.com//images/product/HigResPic1/291360.JPG)
- **HigResPic2**(https://www.larsonelectronics.com//images/product/HigResPic2/291360.JPG)
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- **HigResPic5**(https://www.larsonelectronics.com//images/product/HigResPic5/291360.JPG)
- **ISO 9001 Certification**(http://larsonelectronics.com/images/pdfdocs/ISO9001.PDF)
- **Business Certificate**(https://www.larsonelectronics.com/images/pdfdocs/w9.PDF)
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