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## MT-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1

# 39/52/65 MVA Substation Power Transformer, Conservator Type - 69000V-138000V Wye-N Dual Primary, 34500Y/19920 Grounded Wye Secondary - ONAN/ONAF/ONAF, Mineral Oil - Light Grey

**Product ID: 305110**



**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-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 Conservator Transformer**

**Transformer Type: Substation Power Transformer, Conservator Type**
**Transformer Configuration: Liquid Filled**
**Transformer Feed Type: N/A**
**Operation: Step-Down Operation (Not Approved for Step-Up)**
**Phase: Three Phase**
**Capacity (w/o Fans, @ 55/65$^{O}$C) 39 MVA (39,000 KVA)**
**Capacity (w/ Fans, Stage 1, @ 55/65oC): 52MVA (52,000 KVA)**
**Capacity (w/ Fans, Stage 2, @ 55/65oC): 65 MVA (65,000 KVA)**
**Vector Group: YNyn0(d1)**
**Primary Voltage: 69000V - 138000V**
**Primary Voltage Switch: Included**
**Primary Voltage Class: 72 - 138 kV Class**
**Primary Phasor: Wye-N**
**Primary BIL: 350 - 550 KV**
**Secondary Voltage: 34500Y/19920**
**Secondary Voltage Class: 35 kV Class**
**Secondary Phasor: Grounded Wye**
**Secondary BIL: 200 KV**
**Tertiary Winding Voltage: 13800V**
**Tertiary Winding Voltage Class: 35 kV Class**
**Tertiary Winding Phasor: Delta**
**Tertiary Winding BIL: 110 KV**
**Frequency: 60 Hz**
**Temperature Rise: 55/65°C**
**Insulation Rating: Class A Insulation**
**Cooling Class: ONAN/ONAF/ONAF**
**Forced Air (Fans): Included, Two-Stages, 115V-1Ph rating, totally Enclosed,**

**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 C37.47
Complies with ANSI / IEEE C2
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 Z535.4
Complies with 10 CFR Part 431
Complies with NEMA 260-1996
Complies with ASTM D3487
Complies with ASTM D6871
Complies with CSA C802.1
Complies with CSA C802-3
Complies with CSA C2.1-06
Complies with CSA C50
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C88-16

**Individually Protected Type, Fan Blades Of One-Piece Cast aluminum, Galvanized Fan Guards. Fan Motors Are Totally Enclosed And Furnished Without Centrifugal Switches.**
**Cooling Radiator: Included, Has Upper And Lower Drain Plugs, ANSI #70 Sky Grey, Contains Individual Shut-Off Valves, Interchangeable**
**H.V (69 KV) Tap Changer: 16-Position On-Load Tap Changer (OLTC), Hitachi ABB, Vacuum type**
**H.V (69 KV) Tap Qty: (8) FCAN Above Taps, (8) FCBN Below Taps**
**H.V (69 KV) Tap %: 2.5%**
**H.V (69 KV) Tap Changer Switch Rating: 72 KV**
**H.V (69 KV) Tap Changer Switch Location: H.V Side, Top Mounted**
**H.V (138 KV) Tap Changer: 16-Position On-Load Tap Changer (OLTC), Hitachi ABB, Vacuum type**
**H.V (138 KV) Tap Qty: (8) FCAN Above Taps, (8) FCBN Below Taps**
**H.V (138 KV) Tap %: 1.25%**
**H.V (138 KV) Tap Changer Switch Rating: 138 KV**
**H.V (138 KV) Tap Changer Switch Location: H.V Side, Top Mounted**
**Impedance (@ 65 MVA, 55/65$^{o}$C): 12.5%**
**Primary Connection Type: Live Front**
**Primary Termination Arrangement: Inline, Top Mounted**
**Primary Termination: NEMA 4-Hole Pad connectors, Hitachi ABB China OIP bushings**
**Primary Bushing Qty: (3)**
**Primary Bushing Rating: 72 KV Class, 350-550 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type**
**Primary Neutral Connection: N/A**
**Primary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Sky Grey, Connected to stainless steel ground pad at the base of the transformer**
**Primary Surge Arrestor Voltage Rating: 54 KV**
**Primary Surge Arrestor MCOV Rating: 42 KV rms**
**Primary Over Current Protection (OCP): Included**
**Primary Bushing CT: Included, (2) Per Each Phase (600:5 MR, C400 Relaying Accuracy Class)**
**Primary Over Current Protection Holder: N/A**
**Primary Grounding Provisions: N/A**
**Secondary Connection Type: Live Front**
**Secondary Termination Arrangement: Inline, Top Mounted**
**Secondary Termination: NEMA 4-Hole Pad connectors, Hitachi ABB China OIP bushings**
**Secondary Bushing Qty: (4)**
**Secondary Bushing Rating: 25 KV Class, 110 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type**
**Secondary Neutral Connection: 25 KV Class, 110 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type**
**Secondary Over Current Protection (OCP): Included**
**Secondary Bushing CT: Included, (2) Per Each Phase (1200:5 MR, C400 Relaying Accuracy Class)**
**Secondary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Sky Grey, Connected to stainless steel ground pad at the base of the transformer**
**Secondary Surge Arrestor Voltage Rating: 15 KV**
**Secondary Surge Arrestor MCOV Rating: 9 KV**
**Secondary Grounding Provisions: Included, (2) Grounding Pads Located On Diagonally Opposite Corners Of The Tank Base For Grounding Of The Transformer With Bolt Type Connectors For Connection To 2/0 to 500 KCMIL Stranded Copper conductor**
**Neutral Bushing CT: Included, (2) 1200:5 MR, C400 Relaying Accuracy Class**
**Tertiary Bushing: NEMA 4-Hole Pad connectors, Hitachi ABB China OIP bushings**
**Metering Current Transformer (CT): Included**
**Metering Panel: Included**
**Auxiliary Control Panel : Included, Contains Power Sources 125 Vdc, 120/240 Vac-1Ph**
**Load Break Switch: N/A**
**Load Break Switch Qty: N/A**
**Load Break Switch Rating: N/A**
**Load Break Switch Location: N/A**
**Efficiency Standard(s): Meets ANSI/IEEE Standards**
**K-Factor Rating (Harmonic Mitigation): K-1 (Standard)**
**Current Total Harmonic Distortion: 5.0%**
**Insulation Fluid: Mineral Oil - Non-PCB Fluid**
**Fluid (Oil) Capacity*: TBD**
**Fluid (Oil) Weight*: 59524.81**

Complies with CSA C227.4

Complies with CSA C227.5

Complies With IEEE Std 693-2018

**Features**

Pentahead Bolt Entry Assembly
Hot Stick Included, HV Door Mount
NEMA 4X Wiring Compartment
Hinged Front Compartment Doors, Pad Lockable
Tamper Proof Housing
Non-PCB Insulating Fluid

**Efficiency %: N/A**
*Based on transformer operating at 50% of nameplate base kVA.*

**Load Losses Based on 75°C Reference Temp. (@**
**Off-Load Loss (in watts): 34,000W**
**On-Load Loss (in watts): 268,000W**
**Total Load Loss (in watts) at 100%: 302,000W**

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

**Total Load Loss (in watts) at 50%: TBD**

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

**Labeling:**

Externally Stenciled (Painted) KVA Rating
Externally Stenciled (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

**Silica Gel Breather: Included**
**Liquid Level Indicator: Included, Magnetic Type, With High and Low alarm contacts (form "C" alarm contacts). An additional form "C" contact for low level rated at 20 amps 125 VAC for sump basin water pump**
**Winding Temperature Indicator: Included Thermometer, Messko, Type: MT-ST/60 VMR/4C/4M**
**Liquid Temperature Indicator: Included, Three-Stage Type, with minor alarm and major alarm contacts, (form "C" alarm contacts)**
**Pressure/Vacuum Indicator: Included, With Scale Range Of Plus Or Minus 10 PSI**
**Rapid Rise Relay: Included, (63) Qualitrol 910-013-03**
**Pressure Relief Device: Included, (2) cover-mounted extra-large mechanical type, (Qualitrol XPRD), mounted on diagonally opposite ends of the transformer cover, With automatic resealing operation, With 2-form "C" and 2-form "A" alarm contacts. "A" contact to I/O module. Other form "C" to terminal board 3, Includes mechanical signal for indication of device operation, Includes directional discharge outlet and applicable piping to direct discharge to a location approximately 1-foot above base of transformer, Includes screen at pipe exit to prevent animal ingress.**
**Transformer Monitor And I/O Processor: Included, Schweitzer SEL-2414 Transformer Monitor (P/N: 241421ABA913A3A0131), An SEL-2725S Ethernet Switch installed to network the SEL-2411 I/O Controller, SEL-2414 Transformer Monitor, and SEL-2411 Load Tap Changer Controller**
**Nitrogen Oil Preservation System: Included With A Nitrogen Tank And All Necessary Accessories**
**Pressure Reducer: Included, Three-Stage**
**Gas Relay: Included**
**Fault Indicator: Included, Buchholz Relay**
**Gas Sampler Valve: N/A**
**Fill Valve: Included**
**Fill Valve Location: Top Mounted**
**Drain Valve: Included, 2" Globe Type With 3/8" Sampling Valve**
**Drain Valve Location:**
**Winding Material: Copper**
**Ambient Temperature Rating: 40°C**
**Ambient Operating Temperature Range: -40°C to +40°C**
**Sound Level: N/A**
**Elevation (Altitude): 3300ft (1000 meters) Above Sea Level**
**Core Material: Silicon Steel, Grain Oriented**
**Tank Material: Steel**
**Cabinet Material: Steel**
**Base Platform Material: Steel**
**Hardware Material: Stainless Steel**
**Portability: Lifting lugs, provisions for jacking under base, w/ base construction suitable for using rollers or skidding**
**Housing Type: Metal Casing Liquid Filled Transformer**
**Enclosure Rating: NEMA 4X Weatherproof**
**Seismic Rating: Zone 1**
**Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating**
**Finish Color: ANSI #70 Light Grey**
**Mounting: Supporting Structures**
**Conduit Opening: Bottom**
**Tank Cover Access Handhole: Included**
**Dimensions: 311.02"-W, 220.47"-D, 240.16"-H**
**Dry Weight (w/o Oil)*: 214950.7 Lbs**
**Total Weight (Liquid Filled)*: 274475.52 Lbs**
*Please note that numbers are approximate and subject to change

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

**Special Orders - Special Requirements**
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**The MT-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 Conservator Substation from Larson Electronics offers powerful, reliable, and efficient power distribution in outdoor 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. This transformer ensures extra space for storing oil and is equipped with breathers to facilitate air flow. The conservator transformer should be installed on supporting structures.**
***PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS****
**Transformer Features:** The industrial transformer features a dual primary voltages of three-phase 69000V-138000V Wye-N and a secondary voltage of

three-phase 34500Y/19920V Grounded Wye. This system is rated for 39MVA (39,000 KVA) natural cooled, 52 MVA (52,000 KVA) first stage fan cooled and 65 MVA (65,000 KVA) second stage fan cooled. We offer systems with loop or radial feed, as well as dead front or live front primary connections. The transformer features a 5-position off-load tap changer with two, +/- 2.5% taps above and two, +/- 2.5% taps below to allow small changes for voltage. There is a rapid rise relay 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-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 has fans for forced air cooling. This non-sealed system features breathers for cooling when operating temperatures increase.
**Temperature Rise:** This unit features 55/65°C temperature rise for reduced heat waste, increased reliability and longer life. At 55/65°C temperature rise, the transformer offers 39 MVA (39,000 KVA) natural cooled, 52 MVA (52,000 KVA) first stage fan cooled and 65 MVA (65,000 KVA) second stage fan cooled. The transformer meets standard efficiency requirements. The combination of low temperature rise and high efficiency makes this unit suitable for use in outdoor areas.
**Insulation Fluid:** The MT-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 features mineral oil Insulation fluid (ONAN/ONAF/ONAF). We offer transformers with biodegradable or FR-3 fluids, 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% load conditions, which helps preserve the transformer's lifespan and performance.
**Gauges:** The following gauges are included with the system: liquid level indicator, Fluid temperature indicator, Winding Temperature Indicator, pressure/vacuum indicator. Standard liquid level, temperature and pressure/vacuum gauges are analog dial types.
**Fault Pressure Devices:** There is a Rapid Pressure Rise Relay and Seal-In Relay on this unit.
**Gas Relay:** A gas relay with indicators for light gas and heavy gas is included with the transformer. The relay includes two Dry Type Form C auxiliary contacts (1NO + 1NC) for remote alarm when pressure rises above in-field set pressure located in auxiliary control cabinet.
**Surge arresters:** This system comes with surge arresters on both the primary and secondary sides.
**Load Break Switch:** The transformer is not equipped with a load break switch.
**Valves:** The MT-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 is equipped with a pressure relief valve.
**Protection Fuses:** This transformer does not have 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:** This conservator substation installed on supporting structures, such as the roof of the transformer main tank.
**Benefits:** The MT-PSTC-R7-3P-YXA.XK-39MVA-GMA-HT-LT-X6-CMFF-CZ-2ZZ-M1 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 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.

# Frequently Asked Questions (FAQ)