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## MT-PSTC-R7-3P-DXN-72MVA-GMA-HT-LT-X6-BMFF-CZ-2ZZ-M1

# 72/96/120 MVA Substation Power Transformer, Conservator Type - 230000V Delta Primary, 34500Y/19920 Grounded Wye Secondary - ONAN/ONAF/ONAF, Mineral Oil - Dark Grey

**Product ID: 339399**



Image: MT-PSTC-R7-3P-DXN-72MVA-GMA-HT-LT-X6-BMFF-CZ-2ZZ-M1

**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-DXN-72MVA-GMA-HT-LT-X6-BMFF-CZ-2ZZ-M3 Conservator Transformer | Ratings |
|---|---|
| **Transformer Type:** Substation Power Transformer, Conservator Type (Sealed Bladder System) | Complies with ANSI / IEEE C57.12.00 |
| **Transformer Configuration:** Liquid Filled | Complies with ANSI / IEEE C57 12.28 |
| **Transformer Feed Type:** N/A | Complies with ANSI / IEEE C57 12.29 |
| **Operation:** Step-Down Operation (Approved for Step-Up) | Complies with ANSI / IEEE C57 12.34 |
| **Phase:** Three Phase | Complies with ANSI / IEEE C57 12.35 |
| **Capacity (w/o Fans):** 72 MVA (72,000 KVA) | Complies with ANSI / IEEE C57.12.70 |
| **Capacity (w/ Fans, Stage 1):** 96 MVA (96,000 KVA) | Complies with ANSI / IEEE C57.12.106 |
| **Capacity (w/ Fans, Stage 2):** 120 MVA (120,000 KVA) | Complies with ANSI / IEEE C57.12.110 |
| **Vector Group:** DYN1 | Complies with ANSI / IEEE C57.12.131 |
| **Primary Voltage:** 230000V | Complies with ANSI / IEEE C57.91 |
| **Primary Voltage Switch:** N/A | Complies with ANSI / IEEE C62.11 |
| **Primary Voltage Class:** 230 kV Class | Complies with ANSI / IEEE C62.22 |
| **Primary Phasor:** Delta | Complies with ANSI / IEEE 386 |
| **Primary BIL:** 900 KV | Complies with ANSI / IEEE C2 |
| **Secondary Voltage:** 34500Y/19920 | Complies with ANSI / IEEE C37.47 |
| **Secondary Voltage Class:** 38 kV Class | Complies with ANSI / IEEE 693 |
| **Secondary Phasor:** Grounded Wye | |
| **Secondary BIL:** 200 KV | |
| **Tertiary winding:** N/A | |
| **Frequency:** 60 Hz | |
| **Temperature Rise:** 65°C Top Oil, 80°C Hot Spot, 40°C Ambient | |
| **Insulation Rating:** 110°C Insulation | |
| **Cooling Class:** ONAN/ONAF/ONAF | |

**Forced Air (Fans):** Included, Two-Stages, Totally Enclosed, Individually Protected Type, Fan Blades Of One-Piece Cast aluminum, Galvanized Fan Guards. w/ Automatic - Off - Manual operation for cooling control
**Cooling Radiator:** Included, Interchangeable, Has Upper And Lower Drain Plugs, ANSI #70 Sky Grey
**H V Tap Changer:** 5-Position No Load Tap Changer (NLTC)
**H V Tap Qty:** (2) FCAN Above Taps, (2) FCBN Below Taps
**H V Tap %:** 2.5%
**H V Tap Changer Switch Rating:** 252kV
**H.V Tap Changer Switch Location:** H.V Side, Side Mounted
**L.V Tap Changer:** 33-Position ON-Load Tap Changer (OLTC), HUAMING, Capable Of Interface With SCADA For Position And Control, minimum 500,000 operation, <25 year design life, w/ manual and automatic control, Communication - COM1 port RS232 with RS-485 annd fiber optic, Local-remote LTC control
**L.V Tap Qty:** (16) FCAN Above Taps, (16) FCBN Below Taps
**L.V. Tap %:** 10%
**L.V Tap Changer Switch Rating:** 35 KV
**L.V Tap Changer Switch Location:** L.V Side, Top Mounted In a Separate Oil Compartment Equipped With: Magnetic level indicator with form "C" alarm contacts, Breather, Drain, filter and sampling valves, Hinged maintenance door with oil-resistant gasket, Manhole for inspection of contacts without lowering oil level, Liquid temperature indicator with form "C" alarm contacts. These indicators have minimum 6" diameter dials, Cover-mounted mechanical pressure relief device with (automatic resealing operation, form "C" alarm contacts & Mechanical signal for indication of device operation), Pressure control switch with trip contacts, Filling plug located at the top of the compartment, a lip to prevent oil spills after draining compartment and open the door, motor drive which is easily accessible and not immersed in oil, Local position indicator, Operation counter. Includes Automatic, Digital Control, high limit/low blocking, line drop compensation, SCADA ready, with COM1 port, RS232 w/ RS-485 and fiber optic interfaces; DNP3.0 protocol, COM2 port, RS232, preferred manufacturer, Beckwith M-2001D or equal
**Impedance (Typical):** 10.5% @ 72 MVA
**Primary Connection Type:** Exposed/Live Front Connection, Porcelain Insulator w/ threaded stud type silver plated, Sky Gray (ANSI 70) w/ provision for power factor testing, Oil-filled condenser type, Removable stud to pad connectors
**Primary Termination Arrangement:** Inline, Top Mounted in ANSI Segment 3
**Primary Termination:** NEMA 4-Hole Pad connectors
**Primary Bushing Qty:** (3)
**Primary Bushing Rating:** 230 KV Class, 900 kV BIL, 1200A, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type, NEMA 4-hole Pads, Standard Creepage Distance
**Primary Neutral Connection:** N/A
**Primary Surge Arrestors:** Included, (3) metal-oxide station type, ANSI #70 Sky Grey
**Primary Surge Arrestor Voltage Rating:** 192 KV
**Primary Surge Arrestor MCOV Rating:** 152 KV
**Primary Over Current Protection (OCP):** N/A
**Primary Bushing CT:** Included, (3) Per Each Phase, 800:5 Multi Ratio ( 800:5, 600:5, 500:5, 400:5, 300:5, 200:5, 100:5), C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor, Tap shall exit the tank through cast resin barrier block and terminated on CT shorting blocks in the control cabinet
**Primary Over Current Protection Holder:** N/A
**Primary Grounding Provisions:** Two copper faced ground pad (stainless steel) located at diagonal corners near base, w/ two-bolt terminal connectors,
**Secondary Connection Type:** Exposed/Live Front Connection, Porcelain Insulator w/ threaded stud type silver plated, Sky Gray (ANSI 70) w/ provision for power factor testing, Oil-filled condenser type, Removable stud to pad connectors,
**Secondary Termination Arrangement:** Inline, Top Mounted, ANSI Segment 1
**Secondary Termination:** NEMA 4-Hole Pad connectors
**Secondary Bushing Qty:** (4)
**Secondary Bushing Rating:** 34.5 KV Class, 200 kV BIL, 3000 A, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type, Standard Creepage Distance
**Secondary Neutral Connection:** Included, 20 KV Class, 200 kV BIL, 3000 A,

**Features**
Penta-head 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
Fall Protection Anchor

**Efficiency %:** N/A

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

**Load Losses Based on 85°C Reference Temp.**
**Off-Load Loss (in watts):** 87kW
**On-Load Loss (in watts):** 650kW

**Total Load Loss (in watts) at 100%:** 737kW

**Guaranteed max losses*

Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type, 25" Creepage Distance
**Secondary Over Current Protection (OCP):** N/A
**Secondary Bushing CT:** Included, (2) Per Each Phase, 2000:5 Multi Ratio (2000:5, 1500:5, 1200:5, 1000:5, 800:5, 500:5, 300:5), C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
**Secondary Surge Arrestors:** Included, (3) metal-oxide station type, ANSI #70 Sky Grey
**Secondary Surge Arrestor Voltage Rating:** 30 KV
**Secondary Surge Arrestor MCOV Rating:** 24.4 KV
**Secondary Grounding Provisions:** Included, (2) Grounding Pads (stainless steel) 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
**Secondary Neutral Bushing CT:** Included, (1) 1200:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
**Metering Current Transformer (CT):** N/A
**Annunciator Panel:** Included, SEL-2533 annunciator with DC power supply w/ support for DNP 3.0 comm protocol w/ 14 digital inputs and 7 digital outputs (Alarms: N2 Tank Hi, N2 Tank Low, Sudden Pressure Relief, Low Oil Level, Loss of Fans, Rapid Pressure Rise, Hi Oil Temperature, Hi Winding Temperature)
**Auxiliary Control Panel :** Included, 120/240 Vac single-phase for fans, space heaters and other accessories, 125 volts dc for control functions, w/ 120V 100W light fixture w/ SPST switch and 120V, 20A 1P duplex grounding type receptacle w/ protective fuses w/ complete auxiliary protection schedule. Oil/fire resistant cables, permanently identified.
**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)
**Pulse Drive Rating:** N/A

**Insulation Fluid:** 10 C Mineral Oil Fluid - Non-PCB Fluid

**Fluid (Oil) Capacity*:** TBD
**Fluid (Oil) Weight*:** 88,183.42 lbs

**Transformer Monitoring:** Included, SEL 2414, 49TM wired through ABB FT1 switches, with undervoltage relay (63 FP Main, 27M Loss of Main AC, 27-1 Loss of AC Cooling Stage 1, 27-1 Loss of AC Cooling Stage 2, Annunciator General Alarm, 26Q Trip, 49T, Trip, 71Q low low trip)

Fiber Components:
Mounting Corning Patch, Connection of SEL-2414, Ribbon cable SEL C7800 connect the SEL 2812MRX0

**Oil Level Indicator:** Included, with low level alarm and critical low level trip contacts, 125 vdc alarm contacts
**Winding Temperature Indicator:** Included Thermometer, 120 C hot spot monitoring, 65 degree C over 40 degree C ambient
**RTD:** Included, for Ambient Air, Top Oil and Bottom Oil, Qualitrol Model 103-047 or equivalent
**Oil Temperature Indicator:** Included Thermometer,Maximum top oil 105 degree , 65 degree C over 40 degree C ambient
**Pressure/Vacuum Indicator:** Included, With Scale Range Of Plus Or Minus 10 PSI
**Sudden Pressure Relay/Buc:** Included, Qualitrol, 125 vdc, with alarm and trip contacts
**Buchholz Relay:** Included, with alarm and trip contacts
**Tank Pressure Relief Relay:** Included, visual signal flag and 125 vdc alarm contacts
**Fan Undervoltage Monitoring:** Included, 27P, 27B

**Labeling:**

Nameplate - ANSI C57.12.00 Table 7 Data, Supplier Name, Factory Location

**Stenciling:**

Externally Stenciled (Painted) KVA Rating
Externally Stenciled (Painted) Voltage Rating
Externally Stenciled (Painted) CG Marking

**Labels:**

External Non-PCB Label
External Warning & Danger Label
External Barcode Label
Internal Busing & Accessory Labeling

**Factory Tests:**

Winding Resistance Test, Transformer Turns Ratio Test
Short-circuit Impedance Test (will not result in an impedance change exceeding 2% of the impedance value measured prior to short circuit testing)
Insulation Resistance Test
Voltage Ratio, Polarity Error Test

Load Loss (Wattage) Test

Separate Source Voltage Withstand Test
Induced Voltage Withstand Test
No-load Loss (Wattage) Test
Pressure Integrity Test

**Special Tests:**

Temperature Rise Test
Insulation Power Factor Test - winding to winding & winding to

**On-line Dissolved Gas Analysis Monitor:** Included, with valves Serveron (TM8) multi-gas monitoring system
**Gas Sampler Valve:** N/A
**Fill Valve:** Included, with vacuum filling
**Fill Valve Location:** Top Mounted
**Drain Valve:** Included W/ Sampling Port, with vacuum drying
**Drain Valve Location:** Side of transformer tank
**Winding Material:** Copper
**Ambient Temperature Rating:** 40°C

**Ambient Operating Temperature Range:** -40°C to +40°C

**Isokeraunic Level :** 50 thunderstorm - days/year
**Wind Velocity:** 120 MPH Exposure C, Importance Factor 1.15

**Ice Loading:** NESC Light Loading District

**Sound Level:** Complies with C57.12.90, <= 65dB
**Elevation (Altitude):** 3300ft (1006 meters) Above Sea Level
**Core Material:** Silicon Steel Laminations, Grain Oriented, cold-rolled, non-aging, Round Core/Coil Design
**Tank Material:** Coated Steel
**Cabinet Material:** Coated Steel
**Base Platform Material:** Coated Steel
**Hardware Material:** Stainless Steel
**Portability:** Lifting lugs, provisions for jacking under base, w/ base construction suitable for pad foundation
**Housing Type:** Metal Casing Liquid Filled Transformer, Full vacuum and positive pressure applied at the cover at least 10 psig, 2 round manhole covers with 24" Diameter, tank seams double welded, operating pressure of 8 psi with 25% margin, Continuous Welded Seams
**Enclosure Rating:** NEMA 4X Weatherproof, min 24" above the base top of the cabinet less than or equal to 78"
**Seismic Rating:** High seismic, According to IEEE-693 & IEEE C57.114
**Paint Type:** Applied corrosion-resisting primer to all surfaces, Applied top coat baked enamel to provide a minimum of 3 mils (.75 mm) thick, The top of the main tank and LTC compartment is a non-skid coating, Radiator is electrostatic coated. Internal White Coating - White interior for tank, OLTC compartment, and control cabinet. Internal Paint Qualification - 1000-hour, 130°C oil immersion
**Finish Color:** Dark Grey
**Mounting:** Supporting Structures
**Conduit Opening:** Bottom
**Tank Cover Access Handhole:** Included
**Dimensions*:** 402.8"W x 246"D x 300.2"H
**Weight*:** 390,218 lbs
*Please note that numbers are approximate and subject to change

ground

Lightning Impulse Test

Sound Level 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*

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# Frequently Asked Questions (FAQ)

There are no Faqs