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## MT-PSTC-R7-3P-DEXD-180MVA-GMA-HT-LT-X6-BMFF-CZ-2ZZ-M1

# 180/240/300 MVA Substation Power Transformer, Conservator Type - 345000V Delta Primary, 34500Y/19920 Grounded Wye Secondary - ONAN/ONAF/ONAF, Mineral Oil - Dark Grey

**Product ID: 332980**



Image: MT-PSTC-R7-3P-DEXD-180MVA-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-DEXD-180MVA-GMA-HT-LT-X6-BMFF-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 (Approved for Step-Up)
**Phase:** Three Phase
**Capacity (w/o Fans):** 180 MVA (180,000 KVA)
**Capacity (w/ Fans, Stage 1)** 240 MVA (240,000 KVA)
**Capacity (w/ Fans, Stage 2):** 300 MVA (300,000 KVA)
**Vector Group:** Dyn1
**Primary Voltage:** 345000V
**Primary Voltage Switch:** N/A
**Primary Voltage Class:** 345 kV Class
**Primary Phasor:** Delta
**Primary BIL:** 1175 KV
**Secondary Voltage:** 34500Y/19920
**Secondary Voltage Class:** 35 kV Class
**Secondary Phasor:** Grounded Wye
**Secondary BIL:** 200 KV
**Tertiary winding:** N/A
**Frequency:** 60 Hz
**Temperature Rise:** 65°C, 80°C Hot Spot
**Insulation Rating:** Class A Insulation
**Cooling Class:** ONAN/ONAF/ONAF
**Forced Air (Fans):** Included, Two-Stages, Totally Enclosed, Individually Protected Type,

**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 CSA C227.5
Complies with CSA C2.1-06
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 CSA C227.4
Complies with ASTM D3487
Complies with ASTM D6871
Complies with NEMA 260-1996
Complies with 10 CFR Part 431
Complies with CSA C50

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 De-energized Tap Changer (DETC)
**H.V Tap Qty:** (2) FCAN Above Taps, (2) FCBN Below Taps
**H.V Tap %:** 2.5%
**H.V Tap Changer Switch Rating:** 345 KV
**H.V Tap Changer Switch Location:** H.V Side, Top Mounted
**L.V Tap Changer:** 33-Position ON-Load Tap Changer (OLTC), Mfr: Reinhausen, Type: RMV-II, Capable Of Interface With SCADA For Position And Control
**L.V Tap Qty:** (16) FCAN Above Taps, (16) FCBN Below Taps
**L.V Tap %:** 5/8%
**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% @ 180 MVA
**Primary Connection Type:** Live Front, Porcelain Insulator w/ threaded stud type silver plated, Sky Gray (ANSI 70) w/ provision for power factor testing, Oil-filled condenser type
**Primary Termination Arrangement:** Inline, Top Mounted in ANSI Segment 3
**Primary Termination:** NEMA 4-Hole Pad connectors
**Primary Bushing Qty:** (3)
**Primary Bushing Rating:** 345 KV Class, 1175 kV BIL, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type
**Primary Neutral Connection:** N/A
**Primary Surge Arrestors:** Included, (3) metal-oxide station type, ANSI #70 Sky Grey
**Primary Surge Arrestor Voltage Rating:** 258 KV
**Primary Surge Arrestor MCOV Rating:** 209 KV
**Primary Over Current Protection (OCP):** N/A
**Primary Bushing CT:** Included, (2) Per Each Phase, 400:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
**Primary Over Current Protection Holder:** N/A
**Primary Grounding Provisions:** Two copper faced ground pad located at diagonal corners near base, w/ two-bolt terminal connectors
**Secondary Connection Type:** Live Front
**Secondary Termination Arrangement:** Inline, Top Mounted
**Secondary Termination:** NEMA 4-Hole Pad connectors
**Secondary Bushing Qty:** (4)
**Secondary Bushing Rating:** 34.5 KV Class, 200 kV BIL, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type
**Secondary Neutral Connection:** Included, 20 KV Class, 200 kV BIL, 1200 A, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type
**Secondary Over Current Protection (OCP):** Included
**Secondary Bushing CT:** Included, (2) Per Each Phase, 3000:5 Ratio MR, 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 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-

Complies with CSA C802.1
Complies with CSA C88-16
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C802-3

**Features**
Hot Stick Included, HV Door Mount
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

**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):** TBD
**On-Load Loss (in watts):** TBD
**Total Load Loss (in watts) at 100%:** TBD

**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*

Lead, 2.0 Thermal Rating Factor
**Metering Current Transformer (CT):** Included
**Metering 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
**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
**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*:** TBD

**Transformer Monitoring:** Included Monitor SEL 2414 P/N: 241421ACA913A851130 with Annunciator 2533 P/N: 2533012130XA2X0

**Liquid Level Indicator:** Included, with low level alarm and critical low level trip contacts, 125 vdc alarm contacts
**Winding Temperature Indicator:** Included Thermometer, Messko, Type: MT-ST/60 VMR/4C/4M
**RTD:** Included, for Ambient Air, Top Oil and Bottom Oil, Qualitrol Model 103-047 or equivalent
**Liquid Temperature Indicator:** Included Thermometer, Messko, Type: MT-ST/60 RM/2C/2M
**Pressure/Vacuum Indicator:** Included, With Scale Range Of Plus Or Minus 10 PSI
**Rapid Rise Relay:** Included, 125 vdc, with alarm and trip contacts
**Pressure Relief Valve:** Included, visual signal flag and 125 vdc alarm contacts
**Nitrogen Oil Preservation System:** Included Inert Gas Pressure ($N_2$) System, With A Nitrogen Tank And All Necessary Accessories, Positive Pressure ≤ 8 psig
**Pressure Reducer:** Included, Three-Stage
**Gas Relay:** Included

**Fault Indicator:** Included, Buchholz Relay

**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:** -30°C to +40°C

**Isokeraunic Level :** 50 thunderstorm - days/year
**Wind Velocity:** 120 MPH
**Sound Level:** Complies with C57.12.90
**Elevation (Altitude):** 3300ft (1000 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 using rollers or skidding
**Housing Type:** Metal Casing Liquid Filled Transformer
**Enclosure Rating:** NEMA 3R Weatherproof
**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

**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
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 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 ground
Lightning Impulse 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*

compartment is a non-skid coating, Radiator is electrostatic coated
**Finish Color:** Dark Grey
**Mounting:** Supporting Structures
**Conduit Opening:** Bottom
**Tank Cover Access Handhole:** Included
**Dimensions*:** 456"-W x 228"-D x 396"-H
**Weight*:** 660,000 lbs
*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-PSTC-R7-3P-DEXD-180MVA-GMA-HT-LT-X6-BMFF-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 primary voltage of three-phase 345000V Delta and a secondary voltage of three-phase 34500Y/19920V Wye-N. This system is rated for 180 MVA (180,000 KVA) natural cooled, 240 MVA (240,000 KVA) first stage fan cooled and 300 MVA (300,000 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 in 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 a rectangular coil and a 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-DEXD-180MVA-GMA-HT-LT-X6-BMFF-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 65°C temperature rise for reduced heat waste, increased reliability and longer life. At 65°C temperature rise, the transformer offers 180 MVA (180,000 KVA) natural cooled, 240 MVA (240,000 KVA) first stage fan cooled and 300 MVA (300,000 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-DEXD-180MVA-GMA-HT-LT-X6-BMFF-CZ-2ZZ-M1 features mineral oil 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 Buchholz relay fault indicator 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-DEXD-180MVA-GMA-HT-LT-X6-BMFF-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-DEXD-180MVA-GMA-HT-LT-X6-BMFF-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.

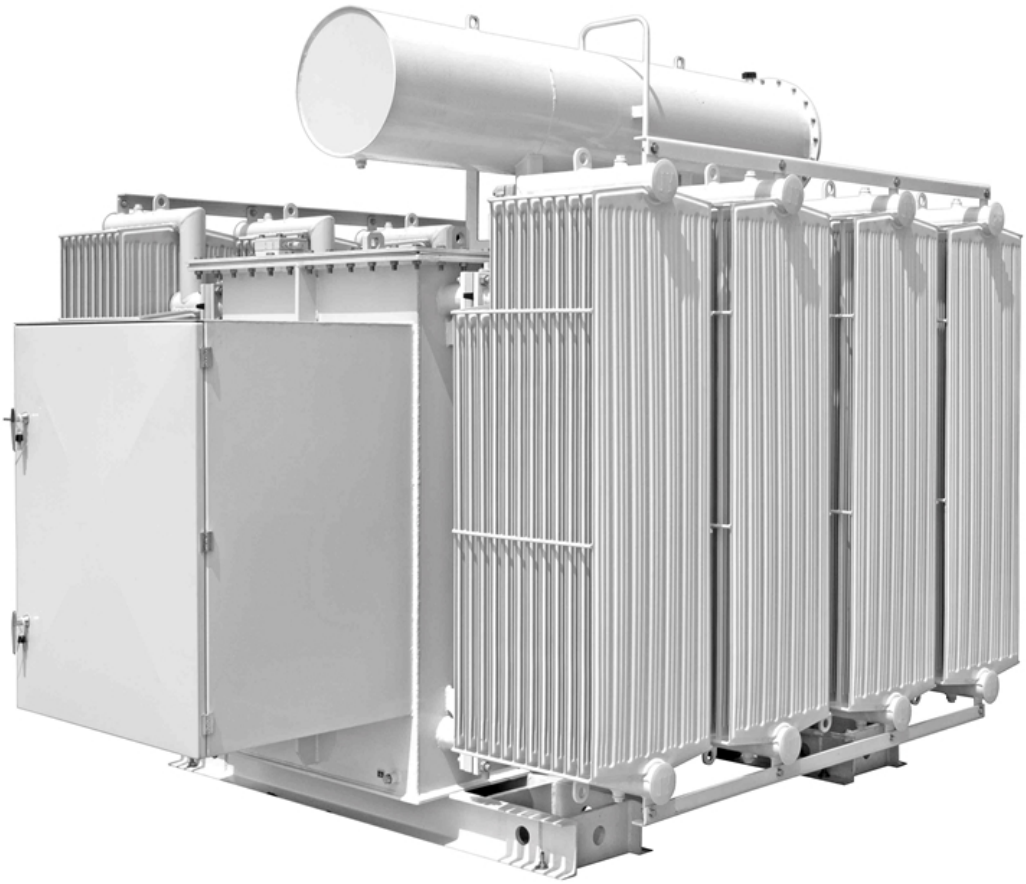
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# Frequently Asked Questions (FAQ)

There are no Faqs