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MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1

96/128/160 MVA Substation Power Transformer, Conservator Type - 230000Y/132800V Grounded Wye Primary, 34500Y/19920V Grounded Wye Secondary, 13800V Delta Tertiary - ONAN/ONAF/ONAF, Mineral Oil - Dark Grey

Product ID: 338311

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



Image: MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-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-GXN-96MVA-GMA-HT-LT-F6-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): 96 MVA (96,000 KVA)
Capacity (w/ Fans, Stage 1): 128 MVA (128,000 KVA)
Capacity (w/ Fans, Stage 2): 160 MVA (160,000 KVA)
Vector Group: YNyn0+d
Primary Voltage: 230000Y/132800V
Primary Voltage Switch: N/A
Primary Voltage Class: 230 kV Class
Primary Phasor: Grounded Wye
Primary BIL: 900 KV
Secondary Voltage: 34500Y/19920V
Secondary Voltage Class: 35 kV Class
Secondary Phasor: Grounded Wye
Secondary BIL: 200 KV

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 C802-3
Complies with CSA C227.5
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

Tertiary winding: 13800V Delta
Frequency: 60 Hz
Temperature Rise: 65°C
Insulation Rating: Class A Insulation
Cooling Class: ONAN/ONAF/ONAF
Forced Air (Fans): Included, Two-Stage Automatic Cooling
Cooling Radiator: Included, Galvanized/Painted Steel Construction
L.V Tap Changer: N/A
L.V Tap Qty: N/A
L.V Tap %: N/A
L.V Tap Changer Switch Rating: N/A
L.V Tap Changer Switch Location: N/A
H.V Tap Changer: Vacuum OLTC, Reinhausen (MR) or Equivalent
H.V Tap Qty: 33 Positions (16 Raise, Neutral, 16 Lower)
H.V Tap %: ±10% Total Range
H.V Tap Changer Switch Rating: 245 KV
H.V Tap Step Size: 0.625%
H.V Tap Changer Switch Location: Separate Oil-Filled Compartment with Motor Drive, Position Indicator, Operation Counter, SCADA Ready Controls
DETC Tap Changer: Included
DETC Tap Qty: Five Positions
DETC Tap Range: ±5%
DETC Step Size: 2.5%
Impedance (Typical): 9% @ 96 MVA
Primary Connection Type: Live Front
Primary Termination Arrangement: Inline, Top Mounted
Primary Termination: NEMA 4-Hole Pad connectors
Primary Bushing Qty: (3)
Primary Bushing Rating: 230 KV Class, 900 kV BIL, Porcelain, ANSI #70 Sky Grey, with threaded stud type silver plated, oil-filled condenser type
Primary Neutral Connection: Included, Grounded Wye Neutral
Primary Surge Arrestors: Included, (3) metal-oxide station type, ANSI #70 Sky Grey
Primary Surge Arrestor Voltage Rating: 180 kV
Primary Surge Arrestor MCOV Rating: 148 kV
Primary Over Current Protection (OCP): N/A
Primary Bushing CT: Included, (3) Per Phase, 1200:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
Primary Neutral CT: Included, (3), 1200:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
Primary Over Current Protection Holder: N/A
Primary Grounding Provisions: Two Ground Pads Located at Diagonal Corners
Secondary Connection Type: Live Front
Secondary Termination Arrangement: Inline, Top Mounted
Secondary Termination: NEMA 4-Hole Pad connectors
Secondary Bushing Qty: (3) Phase + (1) Neutral
Secondary Bushing Rating: 34.5 KV Class, 200 kV BIL, Porcelain OIP
Secondary Neutral Connection: Included, 35 kV Class, 200 kV BIL, 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, (3) Per Phase, 3000:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
Secondary Neutral CT: Included, (3), 3000:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
Secondary Surge Arrestors: Included, (3) Station Class MOV
Secondary Surge Arrestor Voltage Rating: 30 KV
Secondary Surge Arrestor MCOV Rating: 24 KV
Secondary Grounding Provisions: Included Ground Pads

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 C2.1-06
Complies with CSA C802.1
Complies with CSA C50
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C88-16

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 4X 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*

Tertiary Bushing CT: Included, (2), 3000:5 Ratio MR, C800 Accuracy Class, 5-Lead, 2.0 Thermal Rating Factor
DGA Analyzer: Included, Infra-Red / Gas Chromatograph Type
Bushing Monitor: Included, All Bushings
Fiber Optic Thermal Sensors: Included, One Per Winding Per Phase Plus Two Spares Per Winding (27 Total)
Metering Current Transformer (CT): Included
Metering Panel: N/A
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, SEL-2414 Control Relay
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 Transducer: Included, SEL-2600
RTD: Platinum, 100 Ohm at 0°C
Ground Pads: Included, (2) Bronze or Stainless Steel
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 Devices (PRD): Included, (2) Qualitrol XPRD or Equivalent
Oil Preservation System: Conservator Type With Nitrile Rubber Bladder
Breathers: Maintenance-Free, One For Main Tank And One For LTC Compartment, 120 VAC Operated
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: TBD
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: Stainless Steel, NEMA 4X
Base Platform Material: Coated Steel
Hardware Material: Stainless Steel

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

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: Weatherproof Outdoor Installation
Seismic Rating: N/A
Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating
Finish Color: Dark Grey
Mounting: Supporting Structures
Conduit Opening: Bottom
Tank Cover Access Handhole: Included, with bolted and gasketed manhole on top of tank
Dimensions*: 338.27"-W x 325.28"-D x 292.56"-H
Weight*: 192.90 ton
*Please note that numbers are approximate and subject to change

Special Orders - Special Requirements
Contact us for special requirements
Toll Free: 1-800-369-6671
Intl: 1-903-270-1187
Fax: 1-903-765-7664
E-mail: sales@larsonelectronics.com

The MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1 Conservator Substation Power Transformer from Larson Electronics offers powerful, reliable, and efficient power distribution for utility, industrial and power generation applications. Designed for outdoor substation service, this three-winding transformer provides low operating costs, excellent voltage regulation, and dependable long-term performance. The conservator design ensures proper oil expansion management while maintaining insulation integrity through a sealed oil preservation system with maintenance-free breathers. The transformer is intended for installation 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 230000Y/132800V Grounded Wye, a secondary voltage of three-phase 34500Y/19920V Grounded Wye, and a tertiary winding rated at 13800V Delta. This system is rated for 96 MVA (96,000 KVA) natural cooled, 128 MVA (128,000 KVA) first stage fan cooled, and 160 MVA (160,000 KVA) second stage fan cooled. The transformer is equipped with a vacuum on-load tap changer (OLTC) on the high-voltage winding, providing ±10% voltage regulation through 33 positions, as well as a de-energized tap changer (DETC) with ±5% adjustment capability.

The system features copper windings for superior electrical conductivity, mechanical strength, and thermal performance. The transformer utilizes a three-phase core-form construction and incorporates a grounded-wye primary winding, grounded-wye secondary winding, and delta-connected tertiary winding for improved system stability and harmonic mitigation.

The MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1 is equipped with ONAN/ONAF/ONAF cooling utilizing radiators and two stages of forced-air cooling fans. The conservator oil preservation system includes a nitrile rubber bladder and maintenance-free breathers for both the main tank and load tap changer compartment.

Temperature Rise: This unit features a 65°C temperature rise for increased reliability, reduced losses, and extended service life. At 65°C temperature rise, the transformer delivers 96 MVA natural cooled, 128 MVA first-stage fan cooled, and 160 MVA second-stage fan cooled. The combination of high efficiency and controlled operating temperatures makes this transformer suitable for continuous utility and industrial service.

Insulation Fluid: The MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1 features non-PCB mineral oil insulating fluid. The transformer is supplied with a conservator oil

preservation system utilizing a nitrile rubber bladder to minimize oil contamination and moisture ingress.

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.

Monitoring and Diagnostics: This transformer is equipped with a SEL-2414 control relay, SEL-2600 RTD transducer, dissolved gas analyzer (DGA), bushing monitoring system, fiber optic winding temperature monitoring, liquid level indication, winding temperature indication, liquid temperature indication, pressure/vacuum indication, and rapid rise pressure monitoring. These systems provide continuous transformer condition assessment and enhanced operational reliability.

Gauges: The following gauges are included with the system: liquid level indicator, liquid temperature indicator, winding temperature indicator, and pressure/vacuum indicator. Standard monitoring devices are mounted for easy viewing and maintenance access.

Fault Pressure Devices: The transformer includes a Buchholz relay for fault detection and gas accumulation monitoring. Dual pressure relief devices provide additional protection against excessive internal pressure conditions.

Gas Relay: A gas relay is included for transformer protection and monitoring. The relay detects gas accumulation and sudden oil movement caused by internal faults and provides alarm and trip functions.

Surge arresters: This system comes equipped with station-class metal oxide surge arresters on both the primary and secondary sides for protection against transient overvoltages and lightning-induced surges.

Load Break Switch: The transformer is not equipped with a load break switch.

Valves: The MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1 is equipped with fill valves, drain valves with sampling provisions, and pressure relief devices to facilitate maintenance and safe operation.

Protection Fuses: This transformer does not include bayonet, ELSP, dry-well, or VFI protection fuses. Primary system protection is expected to be provided by upstream utility or substation protective devices.

Mount: This conservator transformer is designed for installation on supporting structures within utility and industrial substations.

Benefits: The MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1 transformer offers exceptional reliability, low maintenance requirements, superior thermal performance, and long service life. Advanced monitoring systems, conservator oil preservation, and high-

efficiency design contribute to reduced operating costs and improved asset management.

Applications: Utility substations, power generation facilities, renewable energy installations, transmission and distribution systems, industrial plants, petrochemical facilities, steel mills, manufacturing operations, processing facilities, mining operations, military installations, and other medium- and high-voltage power distribution applications.

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

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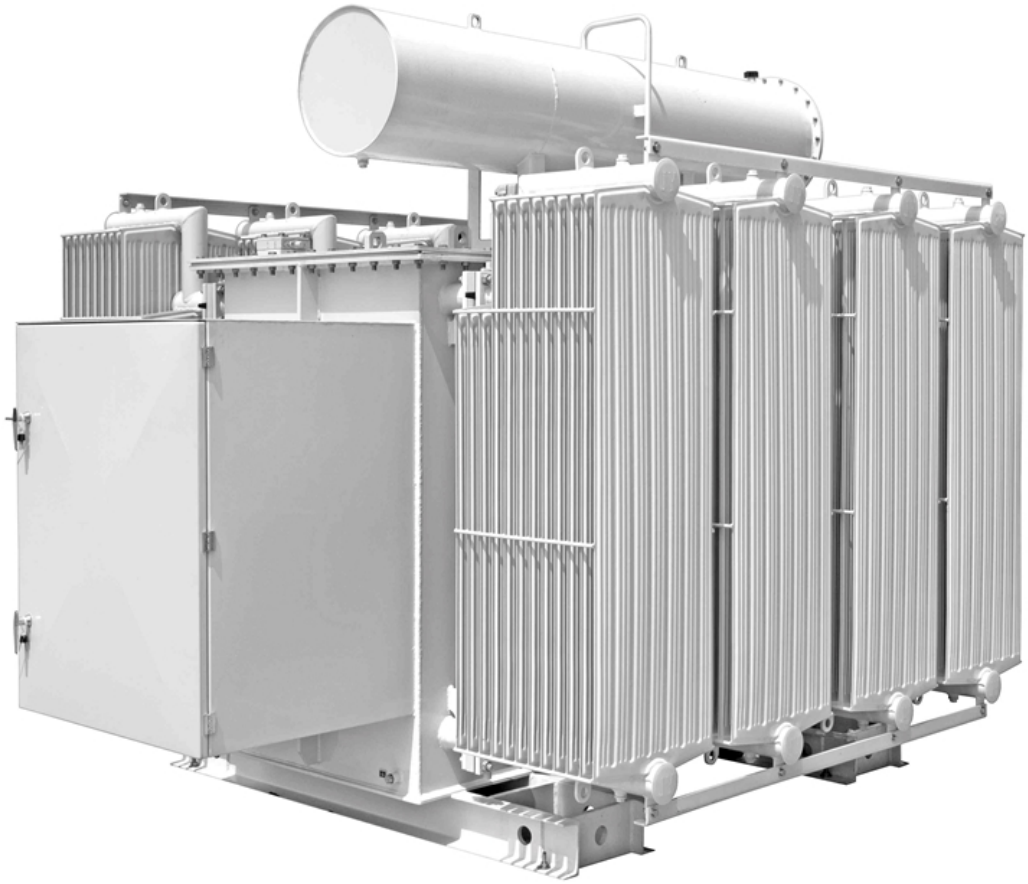


Image: MT-PSTC-R7-3P-GXN-96MVA-GMA-HT-LT-F6-BMFF-CZ-2ZZ-M1

Warranty: 24 Months.

Export Control Classification Number (ECCN): EAR99

Links (Click on the below items to view):

- **HigResPic1**(https://www.larsonelectronics.com/images/product/HigResPic1/338311.JPG)
- **HigResPic2**(https://www.larsonelectronics.com/images/product/HigResPic2/338311.JPG)
- **HigResPic3**(https://www.larsonelectronics.com/images/product/HigResPic3/338311.JPG)
- **Video1**(https://www.youtube.com/watch?v=4-JEyYeYcn8)
- **Video6**(https://www.youtube.com/watch?v=olihKUo24KU)
- **Video7**(https://www.youtube.com/watch?v=Yez7eCilgDE)
- **Video8**(https://www.youtube.com/watch?v=Ac5BDPSy964)
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- **Business Certificate**(https://www.larsonelectronics.com/images/pdfdocs/w9.PDF)
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