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MT-PSTC-R4-3P-GMA-135MVA-GEXD-HT-LT-X6-BMFF-CZ-2ZZ-M1

135/180/225 MVA Substation Power Transformer, Conservator Type - 34500Y/19920 Grounded Wye Primary, 345000Y/200000 Grounded Wye Secondary, 13800V Delta Tertiary - ONAN/ONAF/ONAF, Mineral Oil - Light Grey - NEMA 4X

Product ID: 310285



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-R4-3P-GMA-135MVA-GEXD-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-Up Operation (Not Approved for Step-Down)
Phase: Three Phase
Capacity (w/o Fans): 135 MVA (135,000 KVA)
Capacity (w/ Fans, Stage 1): 180 MVA (180,000 KVA)
Capacity (w/ Fans, Stage 2): 225 MVA (225,000 KVA)
Vector Group: YNyn0+d
Primary Voltage: 34500Y/19920
Primary Voltage Switch: N/A
Primary Voltage Class: 35 kV Class
Primary Phasor: Grounded Wye
Primary BIL: 200 KV
Secondary Voltage: 345000Y/200000
Secondary Voltage Class: 345 kV Class
Secondary Phasor: Grounded Wye
Secondary BIL: 1175 KV
Tertiary Voltage: 13800v Delta
Frequency: 60 Hz
Temperature Rise: 65°C
Insulation Rating: Class A 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. Fan Motors Are Totally Enclosed And Furnished Without Centrifugal Switches, 120/240, single-

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 C2.1-06
Complies with 10 CFR Part 431
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 CSA C227.5
Complies with CSA C802-3

Complies with CSA C802.1

phase power supply
Cooling Radiator: Included, Fabricated from steel, Has Upper And Lower Drain Plugs, ANSI #70 Grey, Contains Individual Shut-Off Valves, Interchangeable
H.V Tap Changer: 33-Position ON-Load Tap Changer (OLTC), MFR: Reinhausen, Type: VRS III, Capable Of Interface With SCADA For Position And Control
H.V Tap Qty: (16) FCAN Above Taps, (16) FCBN Below Taps
H.V Tap %: 0.625%
H.V Tap Changer Switch Rating: 345 KV±16x0.625% kV
H.V Tap Changer Switch Location: H.V Side, Top Mounted In a Separate Mineral Oil Compartment equipped with the following:
1. Liquid Level Gauge W/ two Alarm Contacts And An additional Form “C” Contact For Low Level Rated At 20 Amps 125 VAC
2. Cover-mounted extra-large mechanical Pressure Relief Device (Provided By MR, Messko LPRD Type) with automatic resealing operation, 2-form "C" alarm contacts. “A” contact to I/O module. Other form “C” to terminal board, mechanical signal for indication of device operation
3. Drain Valve W/ Sampling Device
4. Filling Plug (located at the top of the compartment
5. A Lip To Prevent Oil Spills After Draining The Compartment
6. A drive mechanism with: drive motor (shall be easily accessible and not immersed in oil, powered by 240/120V ± 10%, single phase, 60 Hz source derived from the output of a circuit breaker), Local position indicator, Operation counter. The driving motor with its controls and interlocks are housed in an NEMA 4X weather-proof
7. MR OLTC Monitoring
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

Impedance (@ 135 MVA, 65^{O}C): 11%
Primary Connection Type: Live Front
Primary Termination Arrangement: Inline, Standard Top Cover- Bottom connect
Primary Termination: NEMA 4-Hole Pad connectors
Primary Bushing Qty: (4)
Primary Bushing Rating: 35 KV Class, 200 KV BIL, 4000 A, Porcelain, ANSI #70 Grey, Includes Visible Oil Level Indicator "Sight Glass", Include test taps for power factor testing and condition monitoring, Oil-Filled Condenser Type, ABB O+ C
Primary Neutral Bushing: Included, 35 KV Class, 200 KV BIL, 2000 A, ABB O+ Dry
Primary Neutral Bushing Location: Standard Top Cover- Bottom Connect
Primary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Grey, Connected to stainless steel ground pad at the base of the transformer
Primary Surge Arrestor Voltage Rating: 35 KV
Primary Surge Arrestor MCOV Rating: 24.4 kV
Primary Over Current Protection (OCP): N/A
Primary Bushing CT: Included, (3) Per Each Phase (4000:5 MR, C800 Accuracy Relaying Class, 2.0 Rating Factor
Primary Neutral Bushing CT: Included, (1) (4000:5 MR, C800 Accuracy Relaying Class, 2.0 Rating Factor)
Primary Over Current Protection Holder: N/A
Primary Grounding Provisions: N/A
Secondary Connection Type: Live Front
Secondary Termination Arrangement: Inline, Standard Top Cover, Draw Lead Connect
Secondary Termination: NEMA 4-Hole Pad connectors
Secondary Bushing Qty: (4)
Secondary Bushing Rating: 345 KV Class, 1175 KV BIL, 1200 A, Porcelain, ANSI #70 Grey, Includes Visible Oil Level Indicator "Sight Glass", Include test taps for power factor testing and condition monitoring, Oil-Filled Condenser Type, ABB O+ C II
Secondary Neutral Bushing: Included, 345 KV Class, 200 KV BIL, 1200 A, ABB O+ Dry
Secondary Neutral Bushing Location: Standard Top Cover- Bottom Connect
Secondary Over Current Protection (OCP): N/A
Secondary Bushing CT: Included, (2) Per Each Phase (1200:5 MR, C800 Accuracy Relaying Class, 2.0 Rating Factor) & (1) Per Each Phase (400:5 MR, 0.15B1.8 Accuracy Class, 2.0 Rating Factor)
Secondary Neutral Bushing CT: Included, (1) (1200:5 MR, C800 Accuracy Relaying Class, 2.0 Rating Factor)
Secondary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Grey, Connected to stainless steel ground pad at the base of the

Complies with NEMA 260-1996

Complies With IEEE Std 693-2018

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

Complies with CSA C50

Features

Hot Stick Included, HV Door Mount
NEMA 4X Wiring Compartment
Hinged Front Compartment Doors, Pad Lockable
Tamper Proof Housing

Penta-head Bolt Entry Assembly

High-Fire Point Insulating Fluid
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): 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

transformer
Secondary Surge Arrestor Voltage Rating: 345 kV
Secondary Surge Arrestor MCOV Rating: 230 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 Stranded Copper Conductor of 4/0 AWG cross-section
Tertiary Winding CT: Included, (1) (2000:5 MR, C800 Accuracy Relaying Class, 2.0 Rating Factor)
Metering Current Transformer (CT): Included
Metering Panel: Included
Auxiliary Control Panel : Included, Contains Power Sources (2) 125 Vdc, (1) 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)
Pulse Drive Rating: N/A
Insulation Fluid: Mineral Oil, Type II, Non-PCB Fluid
Fluid (Oil) Capacity*: TBD
Fluid (Oil) Weight*: TBD
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: N/A
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: N/A
Pressure Reducer: N/A
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: LV Side
Winding Material: Copper
Ambient Temperature Rating: 45°C
Ambient Operating Temperature Range: -10°C to +45°C
Wind Speed Withstand Rating (mi/h): 55.9
Sound Level: Complies to NEMA TR1
Elevation (Altitude): 3300ft (1000 meters) Above Sea Level
Core Material: Silicon Steel, Grain Oriented
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 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

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

Conduit Opening: N/A
Tank Cover Access Handhole: Included
Dimensions: 396" x 315" x 425"
Total Weight*: 544,541.8
Transport Weight*: TBD
*Please note that numbers are approximate and subject to change

Special Orders - Special Requirements
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The MT-PSTC-R4-3P-GMA-135MVA-GEXD-HT-LT-X6-BMFF-CZ-2ZZ-M1 Conservator Substation Transformer 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 34500Y/19920 Grounded Wye and a secondary voltage of three-phase 345000Y/200000 Grounded Wye. This system is rated for 135 MVA (135,000 KVA) natural cooled, 180 MVA (180,000 KVA) first stage fan cooled and 225 MVA (225,000 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 33-position off-load tap changer with sixteen, +/- 0.625% taps above and sixteen, +/- 0.625% 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-R4-3P-GMA-135MVA-GEXD-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 135 MVA (135,000 KVA) natural cooled, 180 MVA (180,000 KVA) first stage fan cooled and 225 MVA (225,000 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-R4-3P-GMA-135MVA-GEXD-HT-LT-X6-BMFF-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 primary and secondary sides.
Load Break Switch: The transformer is not equipped with a load break switch.
Valves: The MT-PSTC-R4-3P-GMA-135MVA-GEXD-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-R4-3P-GMA-135MVA-GEXD-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.

Frequently Asked Questions (FAQ)