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Product ID: 306021

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



Image:

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-GXG-18MVA-GMF-HT-LS-X6-CMFF-CZ-2ZZ-M1 Conservator Transformer	Ratings
Transformer Type: Substation Power Transformer, Conservator Type	Meets/Exceeds DOE 2016 Efficiency Ratings
Transformer Configuration: Liquid Filled	Meets/Exceeds CSA Efficiency Ratings
Transformer Feed Type: N/A	Complies with ANSI / IEEE C57.12.00
Operation: Step-Down Operation (Not Approved for Step-Up)	Complies with ANSI / IEEE C57 12.28
Phase: Three Phase	Complies with ANSI / IEEE C57 12.29
Capacity (w/o Fans, @ 55/65^{o}C) 18 MVA (18,000 KVA) / 20.16 MVA (20,160 KVA)	Complies with ANSI / IEEE C57 12.34
Capacity (w/ Fans, Stage 1, @ 55/65^{o}C): 24 MVA (24,000 KVA) / 26.88 MVA (26,880 KVA)	Complies with CSA C802-3
Capacity (w/ Fans, Stage 2, @ 55/65^{o}C): 30 MVA (30,000 KVA) / 33.6 MVA (33,600 KVA)	Complies with CSA C802.1
Vector Group: YNyn1(d1)	Complies with ANSI / IEEE C57 12.35
Primary Voltage: 134000Y/79674	Complies with ANSI / IEEE C57.12.70
Primary Voltage Switch: N/A	Complies with ANSI / IEEE C57.12.110
Primary Voltage Class: 138 kV Class	Complies with ANSI / IEEE C57.12.131
Primary Phasor: Grounded Wye	Complies with ANSI / IEEE C62.11
Primary BIL: 650 KV	Complies with ANSI / IEEE C62.22
Secondary Voltage: 24940Y/14400	Complies with ANSI / IEEE 386
Secondary Voltage Class: 25 kV Class	Complies with ANSI / IEEE C2
Secondary Phasor: Grounded Wye	Complies with ANSI / IEEE C37.47
Secondary BIL: 150 KV	Complies with ANSI Z535.4
Tertiary Winding: Included, 7200V Delta For Harmonic Suppression, 15 KV Class, 150 KV BIL	Complies with CSA C227.4
Frequency: 60 Hz	Complies with ASTM D3487
Temperature Rise: 55/65°C	Complies with ASTM D6871
Insulation Rating: Class A Insulation	Complies with NEMA 260-1996

Cooling Class: ONAN/ONAF/ONAF
Forced Air (Fans): Included, Two-Stages, 3-Wire, 120/240 V AC-1Ph rating, 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. The Fans are equipped with (1) MCCB, (2) Contactors, clamp-on current transducer with an output of 4-20mA for each stage and SEL-2411 to monitor fan stage current. Fans are of model: Krenz F24-A7836
Cooling Radiator: Included, Has Upper And Lower Drain Plugs, ANSI #70 Light Grey, Contains Individual Shut-Off Valves, Interchangeable, detachable,
H.V Tap Changer: 5-Position De-energized Tap Changer (NLTC), "Wiping" Design Switch
H.V Tap Qty: (2) FCAN Above Taps, (2) FCBN Below Taps
H.V Tap %: 2.5%
H.V Tap Changer Switch Rating: 138 KV
H.V Tap Changer Switch Location: H.V Side, Top Mounted
L.V Tap Changer: 33-Position ON-Load Tap Changer (LTC), MFR: Reinhausen, Type: RMV-II-1500-15, 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: 25 KV
L.V Tap Changer Switch Location: L.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 For Sump Basin Water Pump
2: One thermostatically controlled heater to prevent condensation in the LTC control cabinet
3: Flanged 1-inch brass ball drain valve with a sampling port at the bottom of the compartment. The valve has 1-inch NPT threaded pipe plug on the open end.
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), Local position indicator, Operation counter (easily readable from ground level and located in the LTC motor cabinet)
7: Rehydrating desiccant breather
8: One light fixture, 100 W equivalent, mechanically protected operated by control cabinet door in the LTC control cabinet
9: One 120 VAC 20A, GFI receptacle in the LTC control cabinet
10: Electronic tap position transducer to provide remote indication of the tap position consists of (Incon syncro transmitter Model #1292-KS & Incon receiver and output display Model #1250 to be mounted in the control cabinet)
11: Electrically interlocked hand crank for manual operation of the LTC
Impedance (@ 30 MVA, 55^{o}C): 10.1% (+/- 7.5%)
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: 138 KV Class, 650 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type, Extra Creep
Primary Neutral Connection: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type, Extra Creep
Primary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Light Grey, Connected to stainless steel ground pad at the base of the transformer
Primary Surge Arrestor Voltage Rating: 84 KV
Primary Surge Arrestor MCOV Rating: 15.3 KV rms
Primary Over Current Protection (OCP): N/A
Primary Bushing CT: Included, [(3) 1200:5 MR C800 Accuracy class Relaying class] For Each Bushing
Primary Over Current Protection Holder: N/A
Primary Grounding Provisions: N/A
Secondary Connection Type: Live Front

Complies with 10 CFR Part 431

Complies with CSA C2.1-06

Complies with CSA C227.5

Complies with CSA C50
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C88-16
Complies With IEEE Std 693-2018

Features

Pentahead Bolt Entry Assembly

Non-PCB Insulating Fluid

Tamper Proof Housing
Hinged Front Compartment Doors, Pad Lockable
NEMA 4X Wiring Compartment

Hot Stick Included, HV Door Mount

Efficiency %: N/A

Secondary Termination Arrangement: Inline, Side Mounted

Secondary Termination: NEMA 4-Hole Pad connectors

Secondary Bushing Qty: (3)

Secondary Bushing Rating: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type, Extra Creep

Secondary Neutral Connection: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Includes Visible Oil Level Indicator "Sight Glass", Oil-Filled Condenser Type, Extra Creep

Secondary Over Current Protection (OCP): N/A

Secondary Bushing CT: Included, [(3) 1200:5 MR C400 Accuracy class Relaying class] For Each Bushing

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: 26 KV

Secondary Surge Arrestor MCOV Rating: 15 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)

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*: 59,524.81

Silica Gel Breather: Included

Liquid Level Indicator: Included, Magnetic Type, Qualitrol “039” series 6”,

Winding Temperature Indicator: Included, A Reinhausen PT100 RTD is installed inside a well of the main tank with a heater that uses CT current with a 800:5 ratio to be used for winding temperature for control of cooling fans and for alarm and is furnished and wired to SEL-2600D inside control cabinet for use within SEL-2411

Liquid Temperature Indicator: Included, A Reinhausen PT100 RTD is installed inside a well to be used for liquid temperature for alarm and is furnished and wired to SEL-2600D inside control cabinet for use within SEL-2411.

Pressure/Vacuum Indicator: Included, Qualitrol model 050-35E, ranging from -10 to +10 psi, mounted at eye level, Equipped with Qualitrol pressure control bleeder, model 351- 2-5A, designed to release pressure at 5psi and mounted in between the transformer tank and the pressure-vacuum gauge

Rapid Rise Relay: Included, Qualitrol, model 900-FLA-T-96-C5M, that will operate on a sudden abnormal change of pressure in the transformer tank due to an internal fault

Pressure Relief Device: Included, (2) Messko off-shore model MPREC-OD pressure relief device with visual indicator and 2 form-A alarm contacts are installed on the main tank. Discharge PVC pipe is installed from the device across the cover of the transformer and 12” down the side of the transformer and is fitted with a provision to prevent insect/reptile intrusion.

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, SEL-2411 Load Tap Changer Controller

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

Load Losses Based on 75°C Reference Temp.

Off-Load Loss (in watts): 21800W, ±10% Tolerance

On-Load Loss (in watts): 120890W, ±10% Tolerance

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

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

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: N/A
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: 316 Stainless Steel
Cabinet Material: 316 Stainless Steel
Base Platform Material: 316 Stainless Steel
Hardware Material: Stainless Steel
Nameplate Material: 316 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)*: 214,950.7 Lbs
Total Weight (Liquid Filled)*: 274,475.52 Lbs
*Please note that numbers are approximate and subject to change

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
Contact us for special requirements
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The MT-PSTC-R7-3P-GXG-18MVA-GMF-HT-LS-X6-CMFF-CS-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 134000Y/79674 Grounded Wye and a secondary voltage of three-phase 24940Y/14400 Grounded Wye. This system is rated for 18MVA (18,000 KVA) natural cooled, 24MVA (24,000 KVA) first stage fan cooled and 30MVA (30,000 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-GXG-18MVA-GMF-HT-LS-X6-CMFF-CS-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°C temperature rise, the transformer offers 18 MVA (18,000 KVA) natural cooled, 24 MVA (24,000 KVA) first stage fan cooled and 30 MVA (30,000 KVA) second stage fan cooled. At 65°C temperature rise, the transformer offers 20.16 MVA (20,160 KVA) natural cooled, 26.88 MVA (26,880 KVA) first stage fan cooled and 33.6 MVA (33,600 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-GXG-18MVA-GMF-HT-LS-X6-CMFF-CS-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-GXG-18MVA-GMF-HT-LS-X6-CMFF-CS-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-GXG-18MVA-GMF-HT-LS-X6-CMFF-CS-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

Product ID: 306021

Warranty: 24 Months.

Export Control Classification Number (ECCN): EAR99

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Links (Click on the below items to view):

- **Operations Manual**(https://www.larsonelectronics.com//images/product/Manual/306021.PDF)
- **HigResPic1**(https://www.larsonelectronics.com//images/product/HigResPic1/306021.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)
- **ISO 9001 Certification**(http://larsonelectronics.com/images/pdfdocs/ISO9001.PDF)
- **Business Certificate**(https://www.larsonelectronics.com/images/pdfdocs/w9.PDF)
- **Shipping Time Map**(https://www.larsonelectronics.com/images/product/ShippingTimeMap/ShippingTimeMap.pdf)