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MT-PSTC-R7-1P-GEHR-50MVA-GTA-HT-LT-D6-CMFF-CZ-2ZZ-M1

50/66.67/83.33 MVA @ 55°C Rise – 56/74.67/93.33 MVA @ 65°C Rise Substation Power Transformer – ONAN/ONAF/ONAF – Automatic Gas-Seal/Nitrogen Oil Preservation – 154000Y/88912 V Grounded-Wye Primary – 46000Y/26558 V Grounded-Wye Secondary – 12450 V Delta Tertiary – ANSI 70 Gray

Product ID: 344135

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



Image: MT-PSTC-R7-1P-GEHR-50MVA-GTA-HT-LT-D6-CMFF-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-R7-1P-GEHR-50MVA-GTA-HT-LT-D6-CMFF-CZ-2ZZ-M1 Substation Power Transformer	Ratings
Transformer Type: Substation Power Transformer, Automatic Gas-Seal/Nitrogen Oil Preservation System, Round Core Type, 3 Separate Windings	Meets/Exceeds DOE 2016 Efficiency Ratings
Transformer Configuration: Liquid Filled Pad Mounted	Meets/Exceeds CSA Efficiency Ratings
Transformer Feed Type: Radial Feed	Complies with ANSI / IEEE C57.12.00
Operation: Approved for Step-Down Operations	Complies with ANSI / IEEE C57 12.28
Phase: Single Phase, Subtractive Polarity	Complies with ANSI / IEEE C57 12.29
Capacity (w/o Fans): 50 MVA (50,000 KVA) (@ 55°C Temperature Rise) - 56 MVA (56,000 KVA) (@ 65°C Temperature Rise)	Complies with ANSI / IEEE C57 12.34
Capacity (w/ 1st Stage Fans): 66.67 MVA (66,670 KVA) (@ 55°C Temperature Rise) - 74.67 MVA (74,670 KVA) (@ 65°C Temperature Rise)	Complies with CSA C2.1-06
Capacity (w/ 2nd Stage Fans): 83.33 MVA (83,330 KVA) (@ 55°C Temperature Rise) - 93.33 MVA (93,330 KVA) (@ 65°C Temperature Rise)	Complies with CSA C802-3
Vector Group: Ii0i0	Complies with ANSI / IEEE C57 12.35
Primary Voltage: 154000Y/88912	Complies with ANSI / IEEE C57.12.70
Primary Voltage Switch: N/A	Complies with ANSI / IEEE C57.12.10
Primary Voltage Class: 161 kV Class	Complies with ANSI / IEEE C57.12.90
Primary Phasor: Grounded Wye	Complies with ANSI / IEEE C57.12.131
Primary BIL: 750 kV	Complies with ANSI / IEEE C62.11

Primary Neutral BIL: 250 kV
Primary Line Continuous Current Ratings (at 93.33 MVA): 1,050 A
Secondary Voltage: 46000Y/26558
Secondary Voltage Class: 48 kV Class
Secondary Phasor: Grounded Wye
Secondary BIL: 250 kV
Secondary Neutral BIL: 250 kV
Secondary Line Continuous Current Ratings (at 93.33 MVA): 3,514 A
Tertiary Capacity:17.5/23.33/29.167 MVA @55°C, 19.6/26.13/32.67 MVA @65°C
Tertiary Voltage: 12450V
Tertiary Voltage Class: 15 kV Class
Tertiary Phasor: Delta
Tertiary Winding BIL: 150 kV
Tertiary Neutral BIL: N/A

Tertiary Line Continuous Current Ratings (at 32.67 MVA): 2,624 A at 32.67 MVA and 12,450 V winding-terminal voltage.

Frequency: 60 Hz

Temperature Rise: 55°C and 65°C average winding-rise ratings as listed in the capacity schedule. At the 65°C winding-rise rating: maximum top-oil rise 65°C and maximum winding hot-spot rise 80°C above ambient; hot-spot allowance 15°C above average winding rise. Maximum ambient temperature: 40°C.

Insulation Rating: Class E Insulation - 120°C, 248°F with thermally upgraded insulation
Cooling Class: ONAN/ONAF/ONAF; Self-Cooled/Fan-Cooled

Forced Air (Fans): Included, 240 VAC, 60 Hz, single-phase, with separately protected cooling stages, Hand/Off/Auto controls, and lead-stage selection. Automatically controlled by contacts on the hot-spot temperature gauge.

HV Tap Changer: 5-Position De-energized Tap Changer
HV Tap Qty: (4) FCAN Above Taps
HV Tap %: 2.5% Taps, (5) 169400 V; (4) 165500 V; (3) 161700 V; (2) 157850 V; (1) 154000 V
HV Tap Changer Switch Rating: 154 kV, OFF-Load Rated
HV Tap Changer Switch Location: High Voltage (HV)
TV Tap Changer: 3-Position De-energized Tap Changer
TV Tap Qty: (2) FCAN Above Taps
TV Tap %: Taps, (3) 13660 V; (2) 13140 V; (1) 12450 V; Final nominal tap voltages and step percentages shall match the EPB-approved tertiary tap schedule.
TV Tap Changer Switch Rating: 15 kV, OFF-Load Rated
TV Tap Changer Switch Location: Tertiary winding de-energized tap changer, with external operating handle; physical handle location shall be identified on the final GA drawing.

Impedance: H-X: 8.9% at 50 MVA; H-Y: 5.0% at 17.5 MVA; X-Y: 1.8% at 17.5 MVA with ±5% tolerance

Primary Connection Type: Live Front
Primary Termination Arrangement: Top Mounted Bushings
Primary Termination: Porcelain Bushings, Condenser Type, Air Bushing
Primary Connection Qty: (2)
Primary Bushing Rating: Draw lead H1, 161 kV Class, 750 kV BIL, 1200 A, comparable to LAPP B84430-63; Draw lead H2, 250 kV BIL comparable to LAPP B88480
Primary Neutral Connection: Included

Complies with CSA C88-16
Complies with ANSI / IEEE 386
Complies with CSA C88.1
Complies with ANSI / IEEE C2
Complies with ANSI / IEEE C37.47
Complies with ANSI Z535.4
Complies with CSA C50
Complies with ASTM D3487
Complies with ANSI / IEEE C62.22
Complies with CSA C88
Complies with ASTM D6871
Complies with NEMA 260-1996
Complies with 10 CFR Part 431
Complies with CSA C227.4 & C227.5

Complies with CSA C802.1

Features

Non-PCB Insulating Fluid

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

Primary Surge Arrestors: Included, Side Station Class

Primary Surge Arrester Application: 154 kV nominal system, 161 kV equipment class. Retain Rated/Duty-Cycle Voltage: 144 kV; MCOV: 115 kV.

Primary Surge Arrestor Duty Cycle:144 kV
Primary Surge Arrestor MCOV Rating: 115 kV
Primary Over Current Protection (OCP): N/A
Primary Over Current Protection Method: N/A

Primary Over Current Protection Holder: N/A

Primary Current Transformer(s): H1: One 1200:5 Multi-ratio (1200:5, 1000:5, 800:5, 600:5, 500:5, 400:5, 300:5, 200:5, 100:5), C800 w/ Heavy-duty shorting terminal blocks for all CT taps, H2: separate winding-temperature CT.

H1: One additional 1000/2000:5 A, C800 bushing current transformer (separately supplied spare). All CT leads shall terminate at heavy-duty shorting terminal blocks.

Primary Grounding Provisions: (2) copper-faced ground pads welded at opposite points on the transformer tank, with NEMA-standard tapped holes. Provide brackets adjacent to each pad and along the tank wall to support the continuous ground conductor to the surge arresters.
Secondary Connection Type: Live Front

Secondary Termination Arrangement: Top Mounted Porcelain Bushings

Secondary Connections: Porcelain Bushings, Condenser Type, Air Bushing
Secondary Connection Qty: (2)

Secondary Line Bushing Rating: Draw lead X1/X2, 46 kV Class, 250 kV BIL, 4000 A, comparable to LAPP B66457

Secondary Over Current Protection (OCP): N/A
Secondary Neutral Connection: Included
Secondary Neutral Bushing Rating: 46 kV Class, 250 kV BIL
Secondary Surge Arrestors: Included, Side Station Class

Secondary Surge Arrester Application: 46 kV nominal system. Retain Rated/Duty-Cycle Voltage: 45 kV; MCOV: 36.5 kV.

Secondary Surge Arrestor Duty Cycle:45 kV
Secondary Surge Arrestor MCOV Rating: 36.5 kV
Secondary Current Transformer(s): X1: One 4000:5 Multi-ratio (4000:5, 3600:5, 3200:5, 2800:5, 2400:5, 2000:5, 1600:5, 1200:5, 800:5, 400:5), C800 (on X1) w/ Heavy-duty shorting terminal blocks for all CT taps, X2: separate Winding-temperature CT on X2 Bushing. All CT taps and leads terminate at heavy-duty shorting terminal blocks. Ratios, polarity, location, and terminal assignments shall be shown on the CT schedule and wiring drawing.
Secondary Grounding Provisions: (1) NEMA Ground Bar attached to tank via (2) Welded Ground Bungs
Tertiary Connection Type: Live Front
Tertiary Termination Arrangement: Top Mounted Porcelain Bushings
Tertiary Termination: Porcelain Bushings, Condenser Type, Air Bushing
Tertiary Connection Qty: (2)
Tertiary Line Bushing Rating: Draw lead Y1/Y2, 25 kV Class, 150 kV BIL, 3000 A, comparable to LAPP B88256
Tertiary Neutral Connection: N/A

Efficiency %: 99.53% at 50% load (25 MVA) on the 50 MVA base rating, unity power factor, calculated using 50 kW no-load loss and 270 kW full-load load loss. Excludes auxiliary power consumption.

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

Load Losses at 100% of 50 MVA Base, Referenced to 85°C: 270 kW
No Load Loss (in watts): 50,000 W (50 kW)
Full Load Loss (in watts) at 100%: 270,000 W (270 kW)
Total Transformer Loss at 100% of 50 MVA Base: 320 kW, comprising 50 kW no-load loss plus 270 kW load loss; excludes auxiliary power consumption.
Note: *Losses offered are guaranteed bid values*

Labeling:
External Non-PCB Label
External Warning & Danger Label
External Barcode Label
Internal Busing & Accessory Labeling
Stainless Steel Riveted Nameplate

Tertiary Neutral Bushing Rating: N/A
Tertiary Surge Arrestors: N/A
Tertiary Current Transformer(s): Y2: Winding-temperature CT (On Y2 Bushing), taps/leads terminate at the shorting terminal blocks. Ratios, polarity, location, and terminal assignments shall be shown on the CT schedule and wiring drawing.
Current Transformer (CT) Terminal Blocks: All protection and winding-temperature CT taps/leads terminate at heavy-duty shorting terminal blocks
Metering Current Transformer (CT): N/A
Metering Panel: N/A

Auxiliary Control Panel: Included, incoming AC supply: 240 VAC, 60 Hz, single-phase. DC control/alarm circuits: 125 VDC.

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 Insulating Fluid, Non-PCB Fluid, inhibited with 0.3% DBPC and minimum 46 dynes/cm interfacial tension
Fluid (Oil) Capacity*: 7814 Gal
Fluid (Oil) Weight*: 57,042 lbs

Oil Preservation System: Automatic gas-seal/nitrogen preservation system, complete with nitrogen supply cylinder, cabinet, regulators, gauges, piping, valves, and alarms. Alarm contacts shall be suitable for the 125 VDC control circuits.

Liquid Level Indicator: Main Tank Oil-Level Gauge w/ Alarm and Trip Contacts, suitable for 125 VDC Control Circuits
Liquid Temperature Indicator: Analog Dial Gauge, w/ Alarm and Trip Contacts, 125 VDC
Winding Temperature Indicator: Analog Dial Gauge, w/ Alarm and Trip Contacts, 125 VDC

Pressure/Vacuum Indicator: Main-Tank Pressure/Vacuum Gauge with Alarm and Trip Contacts Suitable for 125 VDC Control Circuits.

Pressure Relief Device: Included, Automatic Action, 125 VDC

Sudden Pressure Relay: Included, with auxiliary lockout relay and 125 VDC control circuit. Relay shall be installed so it can be removed for testing while the transformer remains in service.

Fault Indicator: Included — sudden-pressure protection with auxiliary lockout relay; see Sudden Pressure Relay specification.

Cabinet heaters: Included, w/ thermostatic moisture protection, 240 VAC

External core-ground connection: Included, core ground brought separately through the tank wall using an insulated bushing and connected to a NEMA two-hole ground pad and terminal connector within 12 inches of the high-voltage bushing. Provide a protective cover marked “Core Ground.”

Gas Sampler Valve: Included, Schrader Valve
Fill Valve: 1" NPT Port w/ Removable Bolt Plug

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

Special Tests:
Temperature Rise Test
Lightning Impulse Level
Dissolved Gas Analysis Test
Current Transformer Test
Sweep Frequency Analysis Test

Fill Valve Location: Front Compartment
Drain Valve: 1" NPT Port w/ 5/8" NPT Sampler Valve
Drain Valve Location: Front Compartment
Winding Material: Copper, circular
Ambient Temperature Rating: 40°C
Ambient Operating Temperature Range: -20°C to +40°C
Sound Level: 71 dBA
Elevation (Altitude): < 3,300ft (< 1000 m) Above Sea Level
Core Material: Grain Oriented Silicon Steel
Tank Material: Coated Steel
Cabinet Material: Coated Steel
Base Platform Material: Coated Steel
Control Box Material/Rating: Stainless Steel, NEMA 4

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: Main tank with automatic gas-seal/nitrogen preservation system; separate NEMA 4 weatherproof wiring cabinet.

Seismic Rating: Yes
Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating
Finish Color: ANSI 70 Sky Grey
Mounting: Pad Mounted
Conduit Opening: N/A
Tank Cover Access Handhole: Included 2 cover manholes with minimum 20" opening
Jacking Provisions: Minimum four jack-boss locations with at least 13" of clearance below the base
Dimensions*: Maximum fully assembled dimensions do not exceed 276" W x 300" L
Dry Weight (w/o Oil)*: 128,752 lbs, subject to confirmation on the GA and shipping drawings
Total Weight (Liquid Filled)*: 186,291 lbs, subject to confirmation on the GA and shipping drawings
Shipping Dimensions*: To be established on the shipping drawing. Accessory package weights and dimensions shall be identified on the packing list.
Shipping Weight — Main Body Without Oil and Separately Shipped Accessories*: To be established on the shipping drawing. Accessory package weights and dimensions shall be identified on the packing list.
Foundation Interface*: Final base is designed for exact rail arrangement in GA drawing, designed for parallel rails spaced 72" apart on an 8ft x 16ft foundation. Rail contact points, base overhang, and anchor details shall be shown on the project GA/foundation drawing.
*Please note that numbers are approximate and subject to change

Shipping:

Heavy-haul shipping for the transformer main tank and separately shipped accessories

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-R7-1P-GEHR-50MVA-GTA-HT-LT-D6-CMFF-CZ-2ZZ-M1 Substation Power 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 make this transformer ideal for a wide range of applications and businesses.

PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS*

Transformer Features: Single-phase, three-winding, liquid-filled substation power transformer designed for step-down service at **60 Hz**, featuring subtractive polarity, an **li0i0 vector group**,

circular copper windings, and a round core constructed from grain-oriented silicon steel. The transformer uses non-PCB mineral insulating oil and an **automatic gas-seal/nitrogen oil-preservation system**, complete with nitrogen cylinder, cabinet, regulators, gauges, piping, valves, and alarms.

The unit is intended for bank connections on a **154,000Y/88,912 V grounded-wye primary system**, a **46,000Y/26,558 V grounded-wye secondary system**, and a **12,450 V delta tertiary**. The individual single-phase winding voltages are approximately **88.912 kV primary, 26.558 kV secondary, and 12.45 kV tertiary**.

Transformer capacity varies with cooling stage and winding temperature rise:

Cooling stage	Capacity at 55°C rise	Capacity at 65°C rise
ONAN — self-cooled	50 MVA	56 MVA
ONAF — first fan stage	66.67 MVA	74.67 MVA
ONAF — second fan stage	83.33 MVA	93.33 MVA

The tertiary winding is rated **17.5/23.33/29.167 MVA at 55°C rise** and **19.6/26.13/32.67 MVA at 65°C rise**, corresponding to the three cooling stages. Two separately protected fan stages operate from **240 V AC, single-phase, 60 Hz**, with Hand/Off/Auto controls and lead-stage selection.

Voltage adjustment is provided by a **five-position primary de-energized tap changer**, covering the listed system-voltage range of **154–169.4 kV**, and a **three-position tertiary de-energized tap changer** with listed settings of **12.45, 13.14, and 13.66 kV**, subject to the approved tap schedule. Specified winding impedances are **8.9% H–X at 50 MVA**, **5.0% H–Y at 17.5 MVA**, and **1.8% X–Y at 17.5 MVA**, with ±5% tolerance.

Top-mounted, live-front porcelain condenser bushings provide primary, secondary, and tertiary connections. Insulation levels include **750 kV primary BIL**, **250 kV secondary BIL**, and **150 kV tertiary BIL**. The primary line bushing is rated **1,200 A**, secondary bushings **4,000 A**, and tertiary bushings **3,000 A**. Station-class surge arresters are included on the primary and secondary sides. Protection accessories include **C800 multi-ratio bushing CTs**, winding-temperature CTs, and heavy-duty shorting terminal blocks.

Monitoring and protection equipment includes oil-level, oil-temperature, winding-temperature, and pressure/vacuum indicators; alarm and trip contacts; an automatic pressure-relief device; and a sudden-pressure relay with auxiliary lockout relay. Control and alarm circuits operate at **125 V DC**. The auxiliary controls include thermostatically controlled **240 V AC cabinet heaters**, a **stainless steel NEMA 4 control box**, and a separate **NEMA 3R weatherproof wiring cabinet**.

The coated-steel tank and base have a weatherproof, UV-resistant epoxy finish in **ANSI 70 sky grey**. Installation and maintenance provisions include lifting lugs, jacking points, roller/skidding provisions, grounding pads, an accessible external core-ground connection, oil filling and sampling connections, and two tank-cover manholes with minimum **20-inch openings**.

The specified operating environment is **−20°C to +40°C**, at elevations below **1,000 m**, with a listed sound level of **71 dBA**. Approximate oil capacity is **7,925 gallons**, dry weight is **128,752 lb**, and total oil-filled weight is **189,600 lb**. Maximum assembled footprint is **276 inches wide × 300 inches long**. Final dimensions, weights, rail interfaces, and anchoring details are subject to confirmation on the approved general-arrangement and shipping drawings.

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

Warranty: 24 Months.

Export Control Classification Number (ECCN): EAR99

Links (Click on the below items to view):

- **HigResPic1**(https://www.larsonelectronics.com/images/product/HigResPic1/344135.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)