Larson Electronics LLC
9419 E US HWY 175, Kemp, TX 75143
Phone: 800.369.6671

www.LarsonElectronics.com
Email: sales@LarsonElectronics.com
Fax: 903.498.3364

**MT-PSTH-R7-3P-GTD-33.6MVA-GMQ-HT-LT-X6-BMFF-CZ-2ZZ-M1**

# 33.6/44.8/56 MVA Hermetically Sealed Substation Power Transformer- 92000Y/53120 Grounded Wye Primary, 13200Y/7620 Grounded Wye Secondary - ONAN/ONAF/ONAF, Mineral Oil - Light Grey - NEMA 4X

**Product ID: 313882**

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



**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-PSTH-R7-3P-GTD-33.6MVA-GMQ-HT-LT-X6-BMFF-CZ-2ZZ-M1 Substation Transformer**

**Transformer Type: Substation Power Transformer, Hermetically Sealed Type**
**Transformer Configuration: Liquid Filled**
**Transformer Feed Type: Radial Feed**
**Operation: Step-Down Operation (Not Approved for Step-Up)**
**Phase: Three Phase**
**Capacity (w/o Fans) 33.6 MVA (33,600 KVA)**
**Capacity (w/ Fans, Stage 1): 44.8 MVA (44,800 KVA)**
**Capacity (w/ Fans, Stage 2): 56 MVA (56,000 KVA)**
**Vector Group: YNyn2+d**
**Primary Voltage: 92000Y/53120**
**Primary Voltage Switch: N/A**
**Primary Line Voltage Class: 115 kV Class**
**Primary Neutral Voltage Class:** 15 kV Class
**Primary Phasor: Grounded Wye**
**Primary Line BIL: 450 KV**
**Primary Neutral BIL:** 450 KV
**Secondary Voltage: 13200Y/7620**
**Secondary Line Voltage Class: 15 kV Class**
**Secondary Neutral Voltage Class:** 15 kV Class
**Secondary Phasor: Grounded Wye**
**Secondary Line BIL: 110 KV**
**Secondary Neutral BIL:** 110 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 C88-16
Complies with CSA C227.4
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 CSA C227.5
Complies with ANSI / IEEE C62.11
Complies with ANSI / IEEE C62.22
Complies with ANSI Z535.4
Complies with ANSI / IEEE 386
Complies with ANSI / IEEE C2
Complies with ANSI / IEEE C37.47
Complies with CSA C802.1
Complies with ASTM D3487
Complies with ASTM D6871

**Tertiary Voltage:** 13200V
**Tertiary Voltage Class:** 15 kV Class
**Tertiary Phasor:** Delta, Buried
**Tertiary BIL:** 110 kV
**Tertiary MVA Rating:** 11.2/17.93/18.67 MVA
**Frequency: 60 Hz**
**Temperature Rise: 65°C**
**Insulation Rating: Class E Insulation**
**Cooling Class: ONAN/ONAF/ONAF**
**Forced Air (Fans): Included, Two-Stages, 115V-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.**
**Cooling Radiator: Included, Has Upper And Lower Drain Plugs, ANSI #70 Light Grey, Contains Individual Shut-Off Valves, Interchangeable**
**L.V Tap Changer: 33-Position Load Tap Changer (LTC), Reinhausen, RMV-II Type**
**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, Side Mounted In a Separate mineral oil Compartment equipped with the following:**
**1:** Online Oil Filtration System
**2:** Dehydrating Breather, Messko MTrab DB100
**3:** Sudden Pressure Device, Qualitrol 900-014- 02
**4: Sudden Pressure Seal-In Relay, Qualitrol 909-200- 01**
**5: Pressure Relieve Device, Messko MPrec (10psi)**
**6: Automatic Controller, Reinhausen ETOS MD-IV**
**7: Remote/Local Control Switch**
**8: Paralleling Operation Control System, ETOS MDIV (paralleling functionality included)**
**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 %:** 5/8%
**H.V Tap Changer Switch Rating:** 25 kV
**H.V Tap Changer Switch Location:** H.V Side
**Impedance (@ 33.6 MVA): 8.73% ± 10%**
**Primary Connection Type: Live Front**
**Primary Termination Arrangement: Inline, Top Mounted**
**Primary Termination: NEMA 4-Hole Pad Connectors**
**Primary Bushing Qty: (4)**
**Primary Bushing Rating: 115 KV Class, 550 KV BIL, Porcelain, ANSI #70 light Grey, Draw-Lead, Oil-Filled Condenser Bushing**
**Primary Neutral Connection: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Draw-Lead, Oil-Filled Condenser Bushing**
**Primary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Light Grey**
**Primary Surge Arrestor Voltage Rating: 90 KV**
**Primary Surge Arrestor MCOV Rating: 70 KV**
**Primary Line Bushing CT: Included, (1) Per Each Phase (2000:5 Ratio, 4.0 Thermal Rating Factor, C800 Accuracy Class, 8 Ohms Burden), (1) Per Each Phase (600:5 Ratio, 4.0 Thermal Rating Factor, C800 Accuracy Class, 8 Ohms Burden) & (1) Per Each Phase (600:5 Ratio, 4.0 Thermal Rating Factor, 0.15sB1.8 Accuracy Class, 1.8 Ohms Burden)**
**Primary Neutral Bushing CT:** Included, (1) 600:5 Ratio, 4.0 Thermal Rating Factor, C800 Accuracy Class, 8 Ohms Burden
**Primary Over Current Protection (OCP):** N/A
**Primary Over Current Protection Holder: N/A**
**Primary Grounding Provisions: N/A**
**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: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Bottom Conn., Oil-Filled Condenser Bushing**
**Secondary Neutral Connection: 25 KV Class, 150 KV BIL, Porcelain, ANSI #70 light Grey, Bottom Conn., Oil-Filled Condenser Bushing**
**Secondary Over Current Protection (OCP): N/A**
**Secondary Line Bushing CT: Included, (2) Per Each Phase (3000:5 Ratio, 4.0 Thermal Rating Factor, C800 Accuracy Class, 8 Ohms Burden) & (1) Per Each Phase (2000:5 Ratio, 4.0 Thermal Rating Factor, 0.15sB1.8 Accuracy Class, 1.8 Ohms Burden)**

Complies with NEMA 260-1996
Complies with 10 CFR Part 431
Complies with CSA C2.1-06
Complies With IEEE Std 693-2018
Complies with CSA C50
Complies with CSA C88
Complies with CSA C88.1
Complies with CSA C802-3

**Features**

Penta-head Bolt Entry Assembly
Non-PCB Insulating Fluid
Tamper Proof Housing
Hinged Front Compartment Doors, Pad Lockable
Hot Stick Included, HV Door Mount
NEMA 4X Wiring Compartment

**Efficiency (@ 33.6 MVA): 99.729%**
**Efficiency (@ 44.8 MVA):** 99.681%
**Efficiency (@ 56 MVA): 99.625%**

**Load Losses Based on 85°C Reference Temp.**

**Off-Load Loss (in watts): 38,000W**
**On-Load Loss (in watts): 188,000W**
**Total Load Loss (in watts) at 100%: 226,000W**

**Secondary Neutral Bushing CT:** Included, (1) 1200:5 Ratio, 4.0 Thermal Rating Factor, C800 Accuracy Class, 8 Ohms Burden
**Secondary Bushing PT:** N/A
**Secondary Surge Arrestors: Included, (3) Metal Oxide Polymer Housed Station Class, ANSI #70 Light Grey**
**Secondary Surge Arrestor Voltage Rating: 12 KV**
**Secondary Surge Arrestor MCOV Rating: 10.2 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**
**Metering Current Transformer (CT): Included**
**Metering Panel: N/A**
**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)**
**Insulation Fluid: Mineral Oil, Type II, Non-PCB Fluid**
**Fluid (Oil) Capacity*: TBD**
**Fluid (Oil) Weight*: 59,524.81**
**Silica Gel Breather: Included**
**Liquid Level Indicator: Included, Messko MTO Magnetic 6-Inch**
**Winding Temperature Indicator: Included Thermometer, Messko MTST160W(R)**
**Liquid Temperature Indicator: Included, Three-Stage Type, with minor alarm and major alarm contacts, (form "C" alarm contacts)**
**Pressure/Vacuum Indicator: Included, With Scale Range Of Plus Or Minus 10 PSI, w/ Bleeder Valve**
**Rapid Rise Relay: Included, Qualitrol 900-014- 02, w/ Seal-In-Relay Qualitrol 909-200-01**
**Pressure Relief Device: Included, Messko MPREC (10 psi)**
**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**
**Multi-gas online dissolved gas analysis monitor (DGA): Included**
**Fault Indicator: N/A**
**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**
**Max. Sound Level: 78 dBA, Complies with NEMA TR1-2013**
**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: High Seismic Level, Complies with IEEE Std. 693-2018**
**Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating**
**Finish Color: ANSI #70 Light Grey**
**Mounting: Pad Mounted**
**Cables:** N/A
**Conduit Opening: N/A**
**Tank Cover Access Handhole: Included**
**Dimensions*: 197"-W x 79"-D x 150"-H**
**Dry Weight (w/o Oil)*: TBD**
**Total Weight (Liquid Filled)*:** 152,119 lbs
*Please note that numbers are approximate and subject to change

**Total Losses at 55°C LL Temp.& 20°C NL Temp.**

**Total Load Loss (in watts) at 50%: 57,000W**

***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
Pressure Integrity Test
Insulation Resistance Test
Voltage Ratio Error Test
Separate Source Voltage Withstand Test
Short-circuit Impedance Test
Load Loss (Wattage) 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***

**Special Orders - Special Requirements**

Contact us for special requirements

**Toll Free: 1-800-369-6671**
**Intl: 1-903-270-1187**
**Fax: 1-903-498-3364**
**E-mail:** sales@larsonelectronics.com

**The MT-PSTH-R7-3P-GTD-33.6MVA-GMQ-HT-LT-X6-BMFF-CZ-2ZZ-M1 Hermetically Sealed 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 92000Y/53120 Grounded Wye and a secondary voltage of three-phase 13200Y/7620 Grounded Wye. This system is rated for 33.6 MVA (33,600 KVA) natural cooled, 44.8 MVA (44,800 KVA) first stage fan cooled and 56 MVA (56,000 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 ON-load tap changer with sixteen, +/- 5/8% taps above and sixteen, +/- 5/8% 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-PSTH-R7-3P-GTD-33.6MVA-GMQ-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 33.6 MVA (33,600 KVA) natural cooled, 44.8 MVA (44,800 KVA) first stage fan cooled and 56 MVA (56,000 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-PSTH-R7-3P-GTD-33.6MVA-GMQ-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 the primary and secondary sides.

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

**Valves:** The MT-PSTH-R7-3P-GTD-33.6MVA-GMQ-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, upstream protection is provided. We recommend provisions for protection fuses when possible, as blown fuses may require more frequent oil changes.
**Mount:** This hermetically sealed substation transformer is installed on supporting structures, such as the roof of the transformer main tank.
**Benefits:** The MT-PSTH-R7-3P-GTD-33.6MVA-GMQ-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)


CAUTION
CAUTION




**Warranty:** 24 Months.

**Export Control Classification Number (ECCN):** EAR99

Links (Click on the below items to view):

- **HigResPic1**
- **HigResPic2**
- **HigResPic3**
- **Video1**
- **ISO 9001 Certification**
- **Business Certificate**
- **Shipping Time Map**