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MT-PSTH-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-M1

20 / 29.86 / 37.33 MVA Hermetically Sealed Substation Transformer -13800V Delta Primary, 34500Y/19920 Grounded Wye Secondary - Aluminum - ONAN/ONAF/ONAF - Grey

Product ID: 313917



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-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-M1 Substation Transformer

Transformer Type: Substation Power Transformer, Hermetically Sealed Type
Transformer Configuration: Liquid Filled
Operation: Step-Up Operation (Approved for Step-Down Operation)
Phase: Three Phase
Transformer Feed Type: Radial Feed
Capacity (w/o Fans, @ 55°C): 20 MVA (20,000 KVA)
Capacity (w/ Fans, First Stage, @ 65°C): 29.86 MVA (29,860 KVA)
Capacity (w/ Fans, Second Stage, @ 65°C): 37.33 MVA (37,330 KVA)
Primary Voltage: 13800V
Primary Voltage Class: 15 kV
Primary Winding BIL: 110 kV
Primary Phasor: Delta
Secondary Voltage: 34500Y/19920
Secondary Voltage Class: 35 kV
Secondary Line Winding BIL: 200 kV
Secondary Neutral Winding BIL: 110 kV
Secondary Phasor: Grounded Wye
Vector Group: YNd1
Frequency: 60 Hz
Temperature Rise: 55/65°C
Short Circuit Withstand Rating: 50 kA, 2 sec.
Forced Air (Fans): Included, Dual Stage, 480V AC, 3Ph
Radiator: Included, Removable Cold Rolled Steel
Tap Changer: 17-Position On-Load Tap Changer
Tap Qty: (8) FCAN Above Taps, (8) FCBN Below Taps
Tap %: 1.25% Taps
Tap Changer Location: HV Side

Ratings

Listed for United States and Canada
Meets/Exceeds DOE 2016 Efficiency Ratings
Meets/Exceeds CSA Efficiency Ratings
Complies with ANSI / IEEE C37.47
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 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 CSA C802.1
Complies with CSA C50
Complies with ANSI / IEEE 386
Complies with ANSI / IEEE C2
Complies With IEEE Std 693-2018
Complies with 10 CFR Part 431
Complies with ANSI Z535.4
Complies with ASTM D3487
Complies with ASTM D6871
Complies with NEMA 260-1996
Complies with CSA C227.5
Complies with CSA C802-3

Impedance: 7.0% ± 7.5%
Primary Connection Type: Live Front
Primary Termination Arrangement: Top Mounted Porcelain Bushings
Primary Connection: NEMA H-Spade Terminals
Primary Connection Qty: (3) Primary Connections
Primary Bushing Rating: 15 kV Class, 150 kV BIL
Primary Neutral Connection: N/A
Primary Surge Arrestors: Provisions for 8.4 MCOV Only
Primary Surge Arrestor Voltage Rating: N/A
Primary Surge Arrestor MCOV Rating: N/A
Primary Over Current Protection (OCP): N/A
Primary Over Current Protection Method: N/A
Primary Over Current Protection Holder: N/A
Primary Grounding Provisions: N/A
Primary Cuurent Transformers: Included, (3) Per Each Phase, 2000:5 MR Relaying, C400 Accuracy Class
Secondary Connection Type: Live Front
Secondary Termination Arrangement: Top Mounted Porcelain Bushings
Secondary Connections: NEMA H-Spade Terminals
Secondary Connection Qty: (4)
Secondary Connection Supports: N/A
Secondary Surge Arrestors: Provisions for 20 MCOV Only
Secondary Surge Arrestor Voltage Rating: N/A
Secondary Surge Arrestor MCOV Rating: N/A
Secondary Over Current Protection (OCP): N/A
Primary Line Bushing Rating: 35 kV Class, 250 kV BIL
Secondary Neutral Connection: Included, 200 kV BIL
Secondary Grounding Provisions: (1) NEMA Ground Bar attached to tank via (2) Welded Ground Bungs
Secondary Line Cuurent Transformers: Included, (3) Per Each Phase, 800:5 MR Relaying, C400 Accuracy Class & (1) Per Each Phase, 800:5 MR Metering, 0.3 Accuracy Class, 1.8 Burden, 2.0/1.5 RF
Secondary Neutral Cuurent Transformers: Included, (2) 800:5 MR Relaying, C400 Accuracy Class
Auxiliary Voltage: 120/240, 1Ph-3W & 125 VDC
Insulation Fluid: Mineral Oil Insulating Fluid, Non-PCB Fluid
Fluid Capacity: TBD
Cooling Class: ONAN/ONAF/ONAF
Liquid Preservation System: Included, Sealed Tank Per IEEE C57.12.10
Liquid Level Gauge: Included, Magnetic Type, Qualitrol
Liquid Temperature Gauge: Included, Analog Type
Pressure/Vacuum Gauge: Included, Analog Type
Fault Pressure Device: None
Pressure Relief Valve: Included
Fill Valve: Included
Drain Valve w/ Sampler Port: Included
Rapid Rise Relay: Included
Annunciator: Included, SEL-2523 Advanced Annunciator Panel
DGA Analyzer: Included
Temperature Monitoring: Included, Qualitrol 509
Protection Relay: Included, SEL 787
Load Break Switch: N/A
Winding Material: Aluminum
Ambient Temperature Rating: 30°C
Sound Level: Complies to NEMA TR-1
Cabinet Type: No Doors
Paint Type: Grey
Mounting: Pad Mounted
Conduit Opening: N/A
Dimensions: 267.7"-W, 181.1"-D, 212.6"-H
Weight: 11,231 lbs

Complies with CSA C2.1-06
Complies with CSA C227.4
Complies with CSA C88
Complies with CSA C88.1

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 3R Wiring Compartment

Efficiency %: 99.51%
Based on transformer operating at 50% of nameplate base kVA.

Load Losses Based on 75°C Reference Temp.

Off-Load Loss (in watts): 28,000W
On-Load Loss (in watts): 160,000W
Total Load Loss (in watts) at 100%: 188,000W
Total Losses at 55°C LL Temp.& 20°C NL Temp.
Total Load Loss (in watts) at 50%: 47,000W
Note: Losses offered are typical only, not guaranteed

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

Special Orders - Special Requirements
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The MT-PSTH-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-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 13800V Delta and a secondary voltage of three-phase 34500Y/19920 Grounded Wye. This system is rated for 20 MVA (20,000 KVA) [Natural Cooled] / 29.86 MVA (29,860 KVA) [First Stage Fan Cooled] / 37.33 MVA (37,330 KVA) [Second Stage Fan Cooled]. We offer systems with loop or radial feed, as well as dead front or live front primary connections. This transformer features a 17-position tap changer with eight, +/- 1.25% taps above and eight, +/- 1.25% taps below to allow small changes for voltage. There are no protection fuses present on the system.

The system features aluminum 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-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-M1 has dual stage fans for forced air cooling.

Temperature Rise: This unit features 55/65°C temperature rise for reduced heat waste, increased reliability and longer life. At 55/65/65°C temperature rise, the transformer offers 20 MVA (20,000 KVA) [Natural Cooled] / 29.86 MVA (29,860 KVA) [First Stage Fan Cooled] / 37.33 MVA (37,330 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 electrical rooms, air conditioned spaces in buildings, underground vaults and similar locations, in addition to outdoor areas.

Insulation Fluid: The MT-PSTH-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-M1 features mineral oil 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% loan conditions, which helps preserve the transformer's lifespan and performance.

Gauges: The following gauges are included with the system: liquid level, temperature and pressure/vacuum gauges. Standard liquid level, temperature and pressure/vacuum gauges are analog, manual reading types.

Fault Pressure Devices: There are no fault pressure devices on the unit. Fault pressure devices are used to detect high rates of pressure rise within the tank.

Rapid Rise Relay: There is a rapid rise relay on the unit. This safety component is designed for protection when a rapid increase in tank pressure occurs. The relay is suitable for detecting sudden pressure fluctuations above predetermined safe limits.

Surge arresters: This system doesn't come with surge arresters. Surge arresters are designed for over-voltage and transient voltage protection, the components prevent damage caused by lightning, internal switching or voltage surges. We can offer models without high elbow surge arresters that have mounting provisions for customer-provided surge arresters.

Load Breaker Switch: The transformer is not equipped with load breaker switches.

Valves: The MT-PSTH-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-M1 is equipped with a pressure relief valve, fill valve and drain valve with sampler port.

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 substation transformer should be installed on supporting structures, such as the roof of the transformer main tank.
Benefits: The MT-PSTH-R4-3P-DMP-20MVA-GMA-HT-LT-X6-CMFF-AZ-1ZZ-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)