

MT-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-CZ-2ZZ-M1

4.5 MVA Conservator Substation Transformer - 138000V Delta Primary, 12000V Secondary - ONAN, Light Grey, NEMA 4X Enclosure

Product ID: 313118

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



Image: MT-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-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-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-CZ-2ZZ-M1 Conservator Substation Transformer

Transformer Type: Substation Power Transformer, Conservator Type
Transformer Configuration: Liquid Filled Pad Mounted
Transformer Feed Type: Radial Feed
Operation: Approved for Step-Up and Step-Down Operations
Phase: Single Phase
Capacity: 4.5 MVA (4500 KVA)
Vector Group: II6
Primary Voltage: 138000V
Primary Voltage Switch: N/A
Primary Voltage Class: 138 kV Class
Primary Phasor: Delta
Primary BIL: 650 kV
Secondary Voltage: 12000V
Secondary Voltage Class: 25 kV Class
Secondary Phasor: Single Phase
Secondary BIL: 95 KV
Frequency: 25 Hz
Excitation Current (@ 110% of Rated Voltage): ≤ 3% Of Rated Current
Power Factor: 0.8 lagging

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 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 ASTM D3487
Complies with CSA C802.1
Complies with CSA C802-3

Load Cycle: Design duty: continuous full load, 100% of 4.5 MVA, 24 h/day, 25 Hz. Indicative overload capability per IEEE C57.91 (pre-load 70%, 30 °C ambient; hot-spot ≤ 120 °C planned / ≤ 130 °C emergency; top-oil $\leq 105/110$ °C): 4 h at 1.15/1.25 pu; 2 h at 1.25/1.35 pu; 1 h at 1.35/1.45 pu.

Temperature Rise: 65°C

Insulation Rating: Class E Insulation - 120°C, 248°F

Cooling Class: ONAN; Self Cooled

Forced Air (Fans): N/A

Tap Changer: 5-Position Off-Load Tap Changer

Tap Qty: (2) FCAN Above Taps, (2) FCBN Below Taps

Tap %: 2.5% Taps

Tap Changer Switch Rating: 25 kV, Off-Load Rated

Tap Changer Switch Location: 6" above transformer base

Impedance: 4.0-4.3%

Primary Connection Type: Live Front

Primary Termination Arrangement: Top Mounted Terminals

Primary Termination: Porcelain Bushings, OIP condenser type, Each Is Provided w/ GE Type KA-108 Capacitance Bushing Potential Device, Model #44H996C400

Primary Connection Qty: (2) Primary Connections

Primary Bushing Rating: 138 kV class, 650 kV BIL (per IEEE C57.19.01 a 650 kV BIL bushing is the 138 kV class). 1-min dry withstand 310 kV, 10-s wet 275 kV. 600 A

Primary Neutral Connection: N/A

Primary Surge Arrestors: Included

Primary Surge Arrestor Voltage Rating: 108 kV, Station class

Primary Surge Arrestor MCOV Rating: 84 kV

Primary Over Current Protection (OCP): N/A

Primary Over Current Protection Method: N/A

Primary Over Current Protection Holder: N/A

Primary Current Transformers: Included, Window-Type, (2) on Each Bushing, C50 Relaying Accuracy Class, 300:5 MR Ratio, continuous thermal rating factor (RF) = 2.0 at 30°C, mounted around the bushing inside the tank in oil; secondary leads to terminal blocks in the NEMA 4X wiring cabinet (shorting-type blocks)

Primary Grounding Provisions: NEMA 2-hole grounding pads

Secondary Connection Type: Live Front

Secondary Termination Arrangement: Top Mounted Porcelain Bushings

Secondary Connections: Porcelain Bushings, w/ Flat NEMA Spade

Secondary Connection Qty: (2)

Secondary Bushing Rating: 23 kV Class, 110 kV BIL

Secondary Connection Supports: N/A

Secondary Surge Arrestors: Included

Secondary Surge Arrestor Voltage Rating: 21 kV, Station class

Secondary Surge Arrestor MCOV Rating: 17 kV

Secondary Over Current Protection (OCP): N/A

Secondary Current Transformers: Included, Window-Type, (2) on Each Bushing, C200 Relaying Accuracy Class, 600:5 MR Ratio, continuous thermal rating factor (RF) = 2.0 at 30°C, mounted around the bushing inside the tank in oil; secondary leads to terminal blocks in the NEMA 4X wiring cabinet (shorting-type blocks)

Secondary Neutral Connection: TBD

Secondary Grounding Provisions: (1) NEMA Ground Bar Attached to Tank via (2) Welded Ground Bungs

Metering Current Transformer (CT): N/A

Metering Panel: N/A

Auxiliary Control Panel : N/A

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-4

Complies with CSA C50

Complies with ASTM D6871

Complies with NEMA 260-1996

Complies with 10 CFR Part 431

Complies with CSA C2.1-06

Complies with CSA C88-16

Complies with CSA C88

Complies with CSA C88.1

Complies with CSA C227.5

Complies with CSA C227.4

Features

Penta-head Bolt Entry Assembly

High-Fire Point Insulating Fluid

Non-PCB Insulating Fluid

Tamper Proof Housing

Hinged Front Compartment Doors, Pad Lockable

NEMA 4X Wiring Compartment, Stainless steel

Hot Stick Included, HV Door Mount

Efficiency % (@ 25% Load): TBD

Efficiency % (@ 50% Load): TBD

Efficiency % (@ 75% Load): TBD

Efficiency % (@ Full Load): TBD

Efficiency % (@ 150% Load): TBD

Efficiency % (@ 200% Load): TBD

Load Losses Based on 75°C Reference Temp.

No Load Loss (in watts): TBD

Full Load Loss (in watts) at 100%: 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

Labeling:

Externally Stencilled (Painted) KVA Rating

Externally Stencilled (Painted) Voltage Rating

External Non-PCB Label

External Warning & Danger Label

External Barcode Label

Internal Busing & Accessory Labeling

Pulse Drive Rating: Appropriate For Use With 6-Pulse Drive Equipment On Secondary Side Stainless Steel Riveted Nameplate

Insulation Fluid: Mineral Oil, Type II, Non-PCB Fluid

Fluid (Oil) Capacity*: Approx. 2,800 Gallons

Fluid (Oil) Weight*: Approx. 20,500 lbs

Oil Level Indicator: Analog Dial-type Gauge (Located in an externally accessible housing) with two alarm contacts (Alarm-Trip)

Oil Temperature Indicator: Analog Dial-type Gauge with two alarm contacts

Pressure/Vacuum Indicator: Nitrogen System Gauge with two alarm contacts (High-Low)

Pressure Relief Device: Included, Automatic Action, with an alarm contact.

Fault Indicator: N/A

Gas Sampler Valve: N/A

Fill Valve: Included

Fill Valve Location: TBD

Oil Drain Valve: 2" Globe-Type with 3/8" Sampling Valve

Drain Valve Location: Front Compartment

Vacuum-filling (full vacuum) pressure of the main tank: The main tank is designed for full vacuum, i.e. 760 mmHg (101.3 kPa / 14.7 psi) below atmospheric = 0 absolute, with no permanent deformation

Nitrogen Pressure System: Normal operating range 0.5 to 5.0 psig (3.5 to 35 kPa). Low alarm $\approx$ 0.5 psig, high alarm $\approx$ 5 psig. Tank pressure design limit 7 psig (48 kPa) positive; pressure relief device operates at $\approx$ 10 psig (69 kPa) and carries an alarm contact.

Winding Material: Copper

Ambient Temperature Rating: 40°C

Ambient Operating Temperature Range: -40°C to +40°C (-50°F to +104°F)

Sound Level: 67 dBA

Elevation (Altitude): 3300ft (1000 meters) Above Sea Level

Core Material: Grain Oriented Steel

Core Design: Circular

Tank Material: Coated Steel

Cabinet Material: Coated Steel

Base Platform Material: Coated 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 Wiring Cabinet, Stainless steel

Seismic Rating: D, and risk category 2

Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating

Finish Color: Munsell™ 5BG 7.0/0.4 Light Grey (ANSI #70)

Mounting: Skid Type Base w/ Lifting Lugs

Conduit Opening: N/A

Tank Cover Access Manhole: Included, $\geq$ 16" x 20" Size

Dimensions*: Approx. 165 L x 110 W x 180 H (Reference ONLY, to be confirmed according to the actual design)

Dry Weight (w/o Oil)*: Approx. 34,000 lbs

Total Weight (Liquid Filled)*: Approx. 54,500 lbs

*Please note that numbers are approximate and subject to change

Factory Tests:

Winding Resistance Test

Insulation Resistance Test

Voltage Ratio Error Test

Short-circuit Impedance Test

No-load Loss (Wattage) Test

Load Loss (Wattage) Test

Induced Voltage Withstand Test

Separate Source Voltage Withstand Test

Pressure Integrity 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: 1-903-765-7664

E-mail: sales@larsonelectronics.com

The MT-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-CZ-2ZZ-M1 Conservator Substation Transformer from Larson Electronics offers powerful, reliable, and efficient power distribution in indoor or 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. This air tight transformer does not have doors and must be installed in a contained or protected area away from public access.

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 138000V Delta and a secondary voltage of single-phase 12000V. This system carries the following ratings: 4.5 MVA (4500 KVA). The unit has a primary radial feed and live front primary connections. We also offer systems with loop feed and dead front primary connections. This transformer features a 5-position tap changer with two, +/- 2.5% taps above and two, +/- 2.5% taps below to allow small changes for voltage. There are no load break switches or protection fuses 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).

Temperature Rise: This unit features a 50°C ambient temperature rating and a 65°C temperature rise for reduced heat waste, increased reliability, and longer life. At 65°C temperature rise, the transformer offers 4.5 MVA (4500 KVA). 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-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-CZ-2ZZ-M1 features mineral oil (ONAN).

Gauges: The following gauges are included with the system: oil level indicator, oil thermometer, winding hot-spot thermometer and pressure/vacuum gauge. Standard oil level indicator, oil thermometer, 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 comes with surge arresters on the primary and secondary sides. 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 a load breaker switch.

Valves: The MT-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-CZ-2ZZ-M1 is equipped with an oil drain valve, an oil sampling valve, and 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.

Terminal Connections: The primary and secondary terminal connections are located on the top of the transformer. We can configure the location to be top located or side located for both the high voltage and low voltage sides.

Mount: This conservator transformer is equipped with a skid type base with lifting lugs.

Benefits: The MT-PSTC-K4-1P-DXK-4.5MVA-SMT-HT-LT-A2-BM-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)

There are no Faqs



Export Control Classification Number (ECCN): EAR99

Links (Click on the below items to view):

- **Operations Manual**(<https://www.larsonelectronics.com/images/product/Manual/313118.PDF>)
- **HigResPic1**(<https://www.larsonelectronics.com/images/product/HigResPic1/313118.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>)