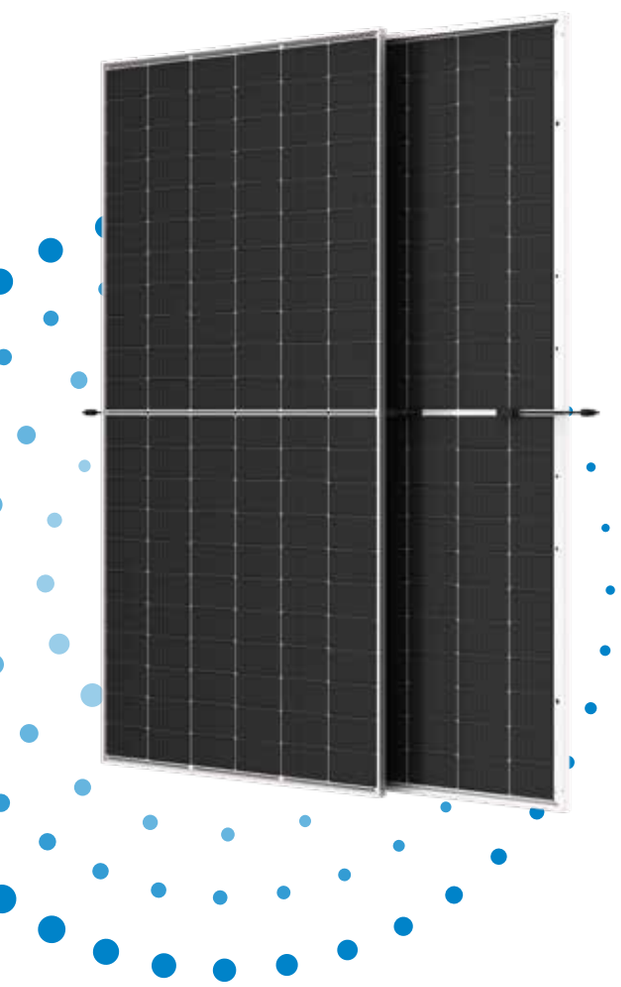
Vertex N

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

PRODUCT: TSM-XXXNEG19RC.20

POWER RANGE: 570-595W

595W	0~+5W	22.0%
MAXIMUM POWER OUTPUT	BINNING TOLERANCE	MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components
- Higher return on Investment

High power up to 595W

- Up to 22.0% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection

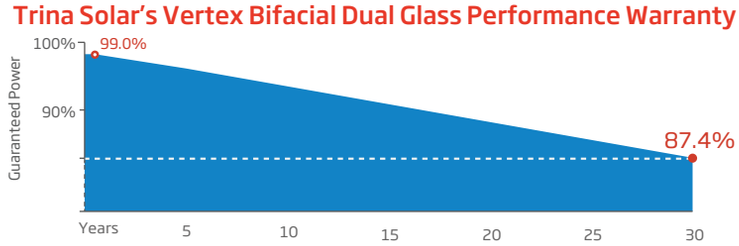
High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control and fire class rating C
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.30%) and operating temperature
- Up to 30% additional power gain from back side depending on albedo

Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



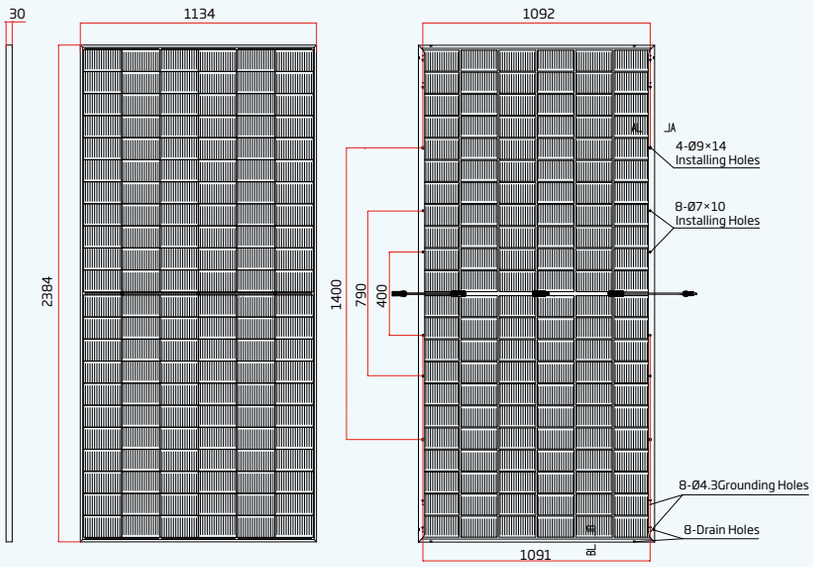
Comprehensive Products and System Certificates

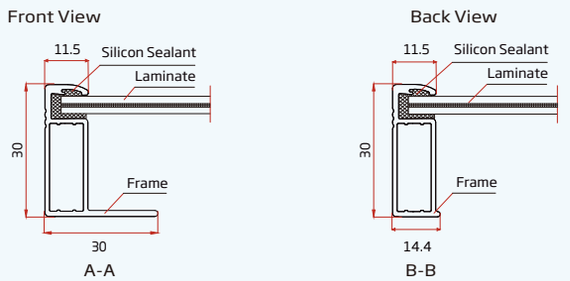
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

Trinasolar

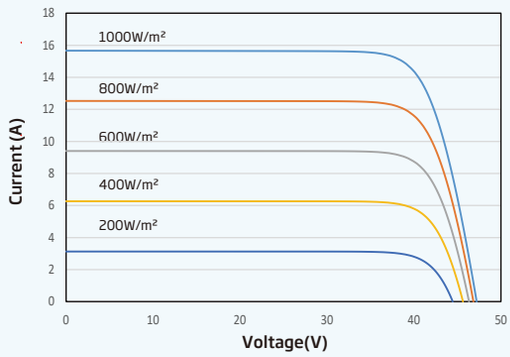
Vertex N BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

DIMENSIONS OF PV MODULE(mm)

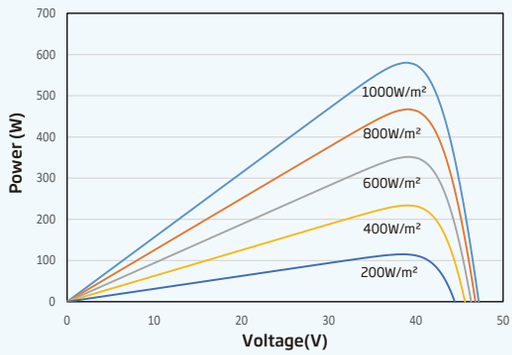




I-V CURVES OF PV MODULE(590 W)



P-V CURVES OF PV MODULE(590 W)



ELECTRICAL DATA (STC) TSM-XXXNEG19RC.20 (XXX=570-595)

Peak Power Watts-PMAX (Wp)*	570	575	580	585	590	595
Binning Tolerance-PMAX (W)	0 ~ +5					
Maximum Power Voltage-VMPP (V)	38.6	38.9	39.2	39.5	39.7	40.0
Maximum Power Current-IMPP (A)	14.75	14.78	14.79	14.82	14.86	14.89
Open Circuit Voltage-VOC (V)	46.6	46.9	47.2	47.5	47.8	48.1
Short Circuit Current-ISC (A)	15.61	15.63	15.65	15.68	15.72	15.76
Module Efficiency η m (%)	21.1	21.3	21.5	21.6	21.8	22.0

STC: Irrdiance 1000W/m2, Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 10% Irradiance ratio)

Total Equivalent power -PMAX (Wp)	616	621	626	632	637	643
Maximum Power Voltage-VMPP (V)	38.6	38.9	39.2	39.5	39.7	40.0
Maximum Power Current-IMPP (A)	15.93	15.96	15.97	16.01	16.05	16.08
Open Circuit Voltage-VOC (V)	46.6	46.9	47.2	47.5	47.8	48.1
Short Circuit Current-ISC (A)	16.86	16.88	16.90	16.93	16.98	17.02
Irradiance ratio (rear/front)	10%					

Power Bifaciality:80±5%.

ELECTRICAL DATA (NOCT)

Maximum Power-PMAX (Wp)	434	438	442	446	450	454
Maximum Power Voltage-VMPP (V)	36.3	36.5	36.8	37.1	37.3	37.6
Maximum Power Current-IMPP (A)	11.97	11.99	12.00	12.02	12.05	12.08
Open Circuit Voltage-VOC (V)	44.2	44.5	44.7	45.0	45.3	45.6
Short Circuit Current-ISC (A)	12.58	12.59	12.61	12.64	12.67	12.70

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	N type
No. of cells	132 cells
Module Dimensions	2384×1134×30 mm (93.86×44.65×1.18 inches)
Weight	33.1kg (72.97lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	Staubli MC4 EVO2 / Trina Solar TS4

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of PMAX	- 0.30%/°C
Temperature Coefficient of VOC	- 0.24%/°C
Temperature Coefficient of ISC	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	35A

WARRANTY

12 year Product Workmanship Warranty

30 year Power Warranty

1% first year degradation

0.40% Annual Power Attenuation

(Please refer to product warranty for details)

Modules per box: 36 pieces

Modules per 40' container: 720 pieces

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_EN_2023_Aus_A
Country of Origin: China

www.trinasolar.com

SG125HV

String Inverter for 1500 Vdc System

SUNGROW
Clean power for all

HIGH YIELD

- Patented five-level topology, max. efficiency 98.9 %, European efficiency 98.7 %, CEC efficiency 98.5 %
- Full power operation without derating at 50 ℃
- Patented anti-PID function

EASY O&M

- Virtual central solution, easy for O&M
- Compact design and light weight for easy installation

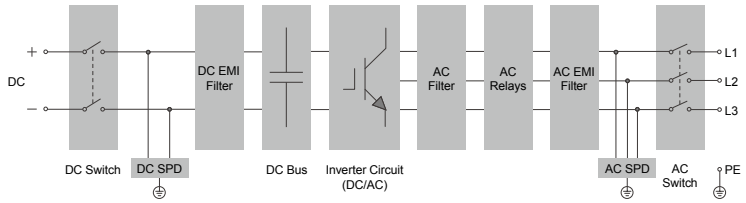
SAVED INVESTMENT

- DC 1500V,AC 600V, low system initial investment
- 1 to 5MW power block design for lower AC transformer and labor cost
- Max.DC/AC ratio up to 1.5

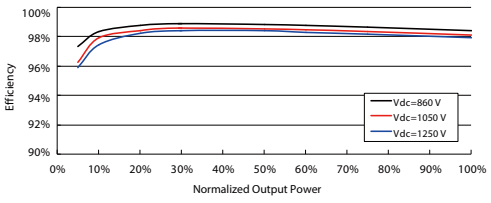
GRID SUPPORT

- Compliance with both IEC and UL safety,EMC and grid support regulations
- Low/High voltage ride through(L/HVRT)
- Active & reactive power control and power ramp rate control

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG125HV
Input (DC)	
Max. PV input voltage	1500 V
Min. PV input voltage / Start-up input voltage	860 V / 920 V
Nominal PV input voltage	1050 V
MPP voltage range	860 – 1450 V
MPP voltage range for nominal power	860 – 1250 V
No. of independent MPP inputs	1
No. of DC inputs	1
Max. PV input current	148 A
Max. DC short-circuit current	250 A
Output (AC)	
AC output power	125 kVA @ 50 ℃
Max. AC output current	120 A
Nominal AC voltage	3 / PE, 600 V
AC voltage range	480 – 690 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading - 0.8 lagging
Feed-in phases / connection phases	3 / 3
Efficiency	
Max. efficiency / European efficiency	98.9% / 98.7%
CEC efficiency	98.5%
Protection	
DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
DC switch	Yes
AC switch	Yes
Q at night function	No
Anti-PID function	Yes
Overvoltage protection	DC Type II / AC Type II
General Data	
Dimensions (W*H*D)	670*902*296 mm 26.4''*35.5''*11.7''
Weight	76 kg 167.5 lb
Isolation method	Transformerless
Degree of protection	IP 65 NEMA 4X
Night power consumption	< 4 W
Operating ambient temperature range	-30 to 60 ℃ (> 50 ℃ derating) -22 to 140 ℉ (> 122 ℉ derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating) 13123 ft (> 9843 ft derating)
Display / Communication	LED, Bluetooth+APP / RS485
DC connection type	OT or DT terminal (Max. 185 mm² 350 Kcmil)
AC connection type	OT or DT terminal (Max. 185 mm² 350 Kcmil)
Compliance	UL1741, UL1741SA, IEEE1547, IEEE1547.1, CSA C22.2 107.1-01-2001, FCC Part15 Sub-part B Class A Limits, California Rule 21, IEC 62109-1/-2, IEC 61000-6-2/-4, IEC 61727, IEC62116, BDEW, EN50549,VDE-AR-N 4110:2018, VDE-AR-N 4120:2018, UNE 206007-1:2013, P.O.12.3, UTE C15-712-1:2013, CEI 0-16:2017, IEC 61683, PEA, NTCO
Grid Support	LVRT, HVRT, ZVRT, active & reactive power regulation, PF control, soft start/stop

ARRAY TECHNOLOGIES

FOLLOW THE SUN.
FOLLOW THE LEADER.

ENGINEERED SIMPLICITY

99.9%
UPTIME

7%
LOWER LCOE

31%
LOWER LIFETIME O&M

Array DuraTrack®

The most durable, reliable tracking system under the sun. While our single-bolt module clamp and forgiving tolerances streamline installation, and our flexibly linked architecture maximizes power density, it's our innovative use of fewer components and a failure-free wind management system that makes Array Technologies the best choice for solar trackers. **Better. Stronger. Smarter.**

Zero Scheduled Maintenance

Maintenance-free motors and gears, fewer moving parts, and industrial-grade components, means no scheduled maintenance required for our customers. While our competitors average two unscheduled maintenance events per day, we average only one per year.

High Power Density

Higher density means more power and more profit. DuraTrack offers the unique ability to maximize the power density of each site, boasting up to 120 modules per row and higher density than our closest competition.

Failure-free wind management

Nobody can control the weather, but DuraTrack self-manages wind events to power through even the harshest storms.

Fewer Components. Greater Reliability.

Array was founded on a philosophy of engineered simplicity. Minimizing potential failure points. With fewer components than competitors, DuraTrack consistently delivers higher reliability and superior uptime.

ARRAY TECHNOLOGIES

FOLLOW THE SUN. FOLLOW THE LEADER.

IEC PTL US CERTIFIED

COST VERSUS VALUE

Value is more than the cost of a tracking system. It's about building with forgiving tolerance and fewer parts so construction crews can work efficiently. It means protecting your investment with a failure-free wind management system. It also includes increasing power density. But most of all, value is measured in operational uptime, or reliability.

THE GLOBAL LEADER IN RELIABILITY

Maintenance-free motors and gears, fewer moving parts, and industrial-grade components, means no scheduled maintenance required for our customers. While our competitors average two unscheduled maintenance events per day, we average only one per year.

ARRAY TECHNOLOGIES, INC.

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Albuquerque, NM 87109 USA

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+1.505.881.7572

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arraytechinc.com

30+ GW YEARS OF OPERATION

NEARLY **200X** FEWER ELECTRICAL COMPONENTS PER 100MWAC THAN DECENTRALIZED TRACKERS

STRUCTURAL & MECHANICAL FEATURES/SPECIFICATIONS

Tracker Type	Horizontal single axis (1 module in portrait)
Ground Cover Ratio (GCR)	Site configurable. Typical: 28-45%
Linked Rows per Drive Motor	Up to 32
Drive Type	Rotating gear drive connected by drivelines (no driveline or bearing lubrication required)
Array Height	Torque Tube Elevation: 54" standard, adjustable (48" min height above grade)
Tracking Range of Motion	+/- 52°
Terrain Flexibility (N-S)	Up to 8.5° standard (up to 15° optional)
Terrain Flexibility (E-W)	Up to 25° combined angle
Wind Protection	Autonomous passive mechanical system No sensors or grid power required to activate
Max Wind Speed	140mph (225 km/h) per ASCE 7-10 (3-second gust), higher wind speeds possible depending on project conditions
Operating Temp Range	Standard: -4°F to 140°F (-20°C to 60°C) Optional: -40°F to 104°F (-40°C to 40°C)
Materials	Pre-galv steel, HDG steel and aluminum structural members, as required.
Codes and Standards	Certified to UL 3703 and IEC 62817

MODULE COMPATIBLITY

c-Si Modules per Row (1500V DC)	Typical: 84-112 Maximum: 120
First Solar Modules per Row (1500V DC)	Series 6 Plus: 84-108 Series 7: 96-114
Modules Supported	Most commercially available, including framed or frameless crystalline, thin film, bifacial, and back rails
Module Attachment	Single fastener, high-speed mounting clamps with integrated grounding. Traditional rails for crystalline in landscape, custom racking for thin film and frameless crystalline and bifacial per manufacturer specs.

CONTROL SYSTEM DETAILS

Baseline Solar Tracking Method	SANDIA's Ephemeris Model
Control Electronics	SmarTrack™ Controller Site Data Controller 6X Motor Controllers
Communications	MODBUS TCP
Backtracking	Yes (Optional terrain adaptive backtracking with SmarTrack)
Diffuse Light Response	Optional with SmarTrack
Night-time Stow	Yes (configurable)
Tracking Accuracy	+/- 2°
Motor Type	2HP, 3 Phase, 480V AC

INSTALLATION, OPERATION, AND MAINTENANCE

Annual Power Consumption (kWh per 1 MW)	Approximately 310 kWh per MW
PE Stamped Structural Calculations & Drawings	Yes
On-site Training and System Commissioning	Yes
Connection	100% bolted connections. No drilling, cutting or welding on-site or in-field fabrication
Scheduled Maintenance	None required
Module Cleaning Compatibility	Robotic, Tractor, Manual
Warranty	10 years structural; 5 years drive and controls components

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-PML-3P-13200D-2500KVA-480Y.277-N3R

2500 kVA Pad Mount Transformer - 13200V Delta Primary - 480Y/277 Wye Secondary - Oil Cooled

Product ID: 236633

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

MT-PML-3P-13200D-2500KVA-480Y.277-N3R Pad Mount Transformer

Phase: Three Phase
Frequency: 60 Hz
Vector Group: Dyn11
kVA: 2500
Primary Voltage: 13200 V Delta
Primary Connection: Delta
Primary kV Class: 15 kV
Primary BIL: 95 kV
Primary FCAN: 2 x 2.5%
Primary FCBN: 2 x 2.5%
Primary Bushings: (6) 200 Amp Cooper Bushing Wells w/ Removable Studs
Inserts: (6) 15 kV, 95 kV BIL Cooper Load-Break Inserts
Secondary Voltage: 480Y/277 V Wye
Secondary Connection: Wye
Secondary kV Class: 1.2 kV
Secondary BIL: 30 kV
Secondary Bushings: (4) Integral Aluminum 12-Hole Spade Bushings
Bushing Supports: Standard LV Bushing Support Assembly
Gauges/Fittings: Liquid Level Gauge
Gauges/Fittings: Thermometer, Dial-Type
Gauges/Fittings: Pressure / Vacuum Gauge
Gauges/Fittings: Drain Valve (1") w/ Sampler in LV Compartment
Gauges/Fittings: Pressure Relief Device, 35 SCFM
Gauges/Fittings: IR Port
Tank Accessories: (3) IEEE Standard Two-Hole Ground Pads
Winding Material: Aluminum
Efficiency Specification: DOE 2016
Overcurrent Protection: None
Impedance: 5.76%
No Load Losses @ 105% Voltage @ 20°C: 2599 Watts
Cooling Class: ONAN
Insulating Fluid: Mineral Oil (Non-PCB)
Elevation: -
Temperature Rise: 65°C
IEEE K-Dimension : Loop Feed Per IEEE C57.12.34-2015 Figure 11 Minimum Dimensions (Without Bails)
Sound Level: NEMA TR1 Standard
Cabinet Hardware: Penta Head Cabinet Door Bolts
Cover: Welded Cover w/ Handhole

Ratings

Listed for United States and Canada
ONAN Cooling Class
Mineral Oil Filled
IEEE C57
Dead Front
Loop Feed

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

Nameplate: EPS Standard
Finish: Munsell Green (Munsell 7GY 3.29/1.5) Topcoat
Dimensions: 67.40"H x 100.36"W x 74.86"D
Weight: -
Mounting: Pad Mount

Special Orders- Requirements
Contact us for special requirements
Toll Free: 1-800-369-6671
Intl: 1-214-616-6180
E-mail: sales@larsonelectronics.com

The MT-PML-3P-13200D-2500KVA-480Y.277-N3R 13200 V Delta 3 Phase Energy Efficient Dead Front Loop Feed Pad Mount Transformer from Larson Electronics is powerful, reliable and designed with the environment in mind. Suitable for both indoor and outdoor applications, the MT-PML-3P-13200D-2500KVA-480Y.277-N3R provides increased reliablity and protection against critical equipment failures. The lower operating costs, lower heat emissions and lower 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: With a transformer rating of 2500 kVA, the MT-PML-3P-13200D-2500KVA-480Y.277-N3R transformer is a three phase unit with a primary voltage of 7200 V Delta. It also provides a secondary voltage of 480Y/277 V Wye. Featuring robust construction, this unit`s cores are manufactured with non-aging, cold-rolled silicon steel laminations using state of the art technology.
This unit boasts a low cost of ownership and is highly energy efficient. Lower heat emissions mean less cooling is needed as well. The Standard NEMA Type 3R enclosure makes the unit suitable for both indoor and outdoor applications and it can be pad mounted. The unit also features mineral oil insulating fluid and a 65°C temperature rise. The MT-PML-3P-13200D-2500KVA-480Y.277-N3R is designed so that no excess oil heating occurs from unbalanced loads or phase loss on the primary side.
Benefits: The MT-PML-3P-13200D-2500KVA-480Y.277-N3R pad mount transformer offers many benefits to the consumer. Precision cut aluminum transformer winding material help to improve performance. The close tolerances used during manufacturing also eliminates burrs which hinder performance. Each core is specially coated to prevent the ingress of moisture and are electrically balanced to minimize axial forces during short circuit situations.
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 turn into cost savings for owners in the form of lower energy bills and decreased cost of ownership.
Applications: General purposes.
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.