P R O D U C T C A T A L O G U E

Aytemiz MAKELSAN®

Uninterruptible Power Supplies/Generator

POWER FORLIFE

www.makelsan.com.tr

Commitment to Power Quality and Innovation

At Aytemiz-Makelsan, we are committed to provide complete energy solutions that guarantee power quality for all critical applications. The first class manufacturing facility headquartered in Istanbul, where Europe and Asia meet, is one of the fastest-growing metropolitan economies in the world, we are proud to keep investing in technology and production and we provide high quality with fast delivery to our worldwide clients.

A SPECIALIST IN POWER ELECTRONIC

Complete Energy Solutions Provider

LEADING MANUFACTURER OF UNINTERRUPTIBLE POWER SUPPLIES SINCE 1976

Aytemiz-Makelsan was founded in 1976 with the aim of designing electrical power systems. Today Aytemiz-Makelsan is a leading European brand which manufactures a wide range of high technology uninterruptible power supplies and power quality products from 650VA up to 8MVA.

Headquarted in Istanbul, Turkey, Aytemiz-Makelsan combines R&D, manufacturing, global sales and aftersale service processes with more than 300 qualified professionals in a fully modernized 25.000 sqm factory equipped with state-of-art machinery.

Aytemiz-Makelsan product range varies from Static & Dynamic Uninterruptible Power Supplies, Servo & Static Voltage Regulators to Renewable Energy Products, DC Power Supply, Telecom Equipments, Battery Chargers, Inverters and Datacenter Solutions.

With more than 25 area sales and service offices, 300 resellers in Turkey, over 100 global distributors worldwide and over 45 years experience in design, manufacturing and distribution in the power supply industry. Aytemiz-Makelsan is committed to provide complete energy solutions that guarantee power quality for all kinds of critical applications.

Istanbul Headquarter & Factory

Largest Uninterruptible Power Supply Production Facility

Aytemiz-Makelsan products are manufactured in Istanbul factory which is the largest UPS production facility of the region and all production process is monitored and developed according to ISO 9001 Quality Control System.

LEVELUPS
SERIES

10-1000 kVA **3:3** PHASE

10-30 kVA **3:1** PHASE

ONLINE UPS

DATA CENTER · MEDICAL · TRANSPORT · INDUSTRY · EMERGENCY

Three LEVEL 3 UPS

kW=kVA

96% Efficiency

VFI TYPE — UPS ONLINE

TOWER

PF= 1.0 — POWER FACTOR

Service — SERVICE

HIGHLIGHTS

- True Three Level Rectifier and Inverter Technology
- Ultra High Energy Efficiency
- Full Rated Power Factor kW=kVA

Innovative 3 Level Technology

• LEVELUPS Series with Innovative 3 Level Technology is a true on-line double conversion, three-phase UPS system that provides one of the highest level energy efficiencies in the industry.

• Three level inverter & rectifier design LEVELUPS Series brings the newest power conversion technology and delivers efficiency up to 96% at 50-75% load operation which is the most common operating range.

BUREAU VERITAS Certification — The LEVELUPS Series is attested by Bureau Veritas with regard to performance (EN 62040-3)

Higher Level of Efficiency than the EU CoC for AC UPS

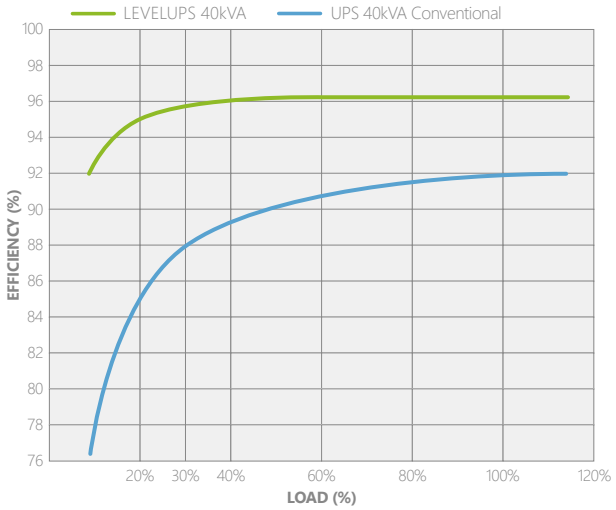
CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN® Uninterruptible Power Supplies

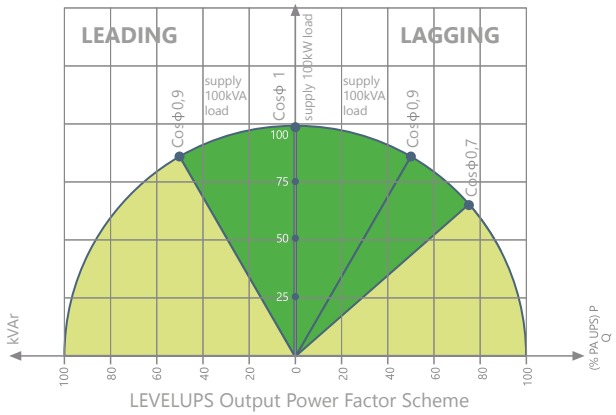
High Efficiency & Low Total Cost of Ownership

- Less energy consumption to supply the loads thanks to high efficiency up to 96%.
- Reduced energy loss.
- Reduced electricity usage and air conditioning requirements.
- Reduction in operating cost of UPS.
- IGBT based power factor correction technology provides input power factor close to 1 (≥ 0,99). The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.
- Low input current total harmonic distortion (THDi) less than 3% helps to avoid the disturbance and expensive harmonic filters.
- Small footprint and easy maintenance.



High Output Power Factor 1

- Output power factor of 1 (kVA=kW) rate provides up to 25% more active power than a traditional UPS.
- Suitable for modern power supply application with unit or capacitive power factor (e.g. new servers generation).
- No reduction in active power from 0,9 leading to 0,9 lagging.



LEVELUPS Output Power Factor Scheme

Maximum Availability

- Parallel configuration up to 8 units per redundancy (N+1) and power increase.
- Loop connection helps the UPS system to continue the operation when the connection cable is inturrupted.

Standard Electrical Features

- Parallel-Redundant (N+X) Systems
- Co-Aging
- Dual Input
- Common Battery
- Backfeed Protection
- Cold Start (Optional)
- Advanced Battery Management
- Short Circuit and Overload Protection
- Parallel Ready
- Redundant Power Supply
- Power Walk-in for Progressive Rectifier Start-up when the Mains is Restored
- Battery Temperature Sensor
- Static and Manual Bypass Operation

Advanced Communication Features

- 1500 Real Time Event Log with Detailed Parameters
- User Friendly Multilingual 320x240 Graphic Display Provides Operation Information
- Monitoring and Shutdown Software
- RS232 Serial and RS485 Ports
- 2 Communication Slots
- ModBUS RTU / ModBUS TCP (Optional)
- Remote Emergency Power Off (Optional)
- Remote Display Panel (Optional)
- Dry Contact (Optional)
- SNMP (Optional)
- ProfiBUS (Optional)

Flexibility

- Temperature sensor for external battery cabinets for extended runtimes.
- External battery cabinets for different sizes of batteries to provide extended runtimes.
- Different sizes of 10-40kVA cabinets for larger capacity of internal batteries when long autonomy times are required.
- 3/1 Phase version is available for 10-30kVA power ratings
- Frequency converter mode.
- Isolation transformers to vary neutral connectivity in the event of separate power sources or for galvanic isolation between input and output.
- Compatible version with EN 50171 for supplying power to emergency lighting systems.

MODEL															
Capacity		10kVA	15kVA	20kVA	10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	80kVA	100kVA	120kVA
Power Watt		9kW	13.5kW	18kW	9kW	13.5kW	18kW	27kW	36kW	54kW	72kW	90kW	108kW	72kW	90kW	108kW
INPUT																
Nominal Voltage		380/400/415 VAC 3 P+N (Optional 220/380 VAC -37% +22% 3 P+N+PE)														
Voltage Tolerance		-20% +15%														
Frequency Tolerance		50 / 60 Hz ±10% (Selectable)														
Power Factor		>0.99														
Total Harmonic Distortion (THDi)		<3%														
OUTPUT																
Power Factor		0.9 (1 Optional)														
Nominal Voltage		380/400/415 VAC 3 P+N														
Voltage Tolerance		Statik ±1, Dynamic ±3														
Frequency Tolerance		50 / 60 Hz ±0,01% (Battery Mode)														
Output THD		Linear Load <1% / Non-Linear Load <3%														
Crest Factor		3:1														
Overload Capacity*		At 125% Load 10min, At 150% Load 1min														
Efficiency (Online Mode)		96%														
Efficiency (Eco Mode)		99%														
BYPASS																
Nominal Voltage		380/400/415 VAC 3 P+N														
Voltage Tolerance		%15 (Configurable from 10% to 30%)														
Frequency Tolerance		±5 (Selectable)														
BATTERY																
Type		VRLA / GEL														
Quantity (12V DC VRLA)		60														
Charge Capacity		12,5% of Active Power (Nominal 0,1 C10, Adjustable)														
Recharge Time		6-8 hours														
Internal Battery		62 x 7Ah or 9Ah			60 x 7Ah or 9Ah			External Battery			External Battery			External Battery		
ENVIRONMENTAL																
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C														
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C														
Protection Class		IP20														
Humidity		0-95% (Without Condensation)														
Altitude		<1000m: Correction Factor 1, <2000m: Correction Factor >0.92, <3000m: Correction Factor >0.84														
Noise Level		<53dBA			<53dBA		<55dBA		<60dBA		<65dBA			<65dBA		
COMMUNICATION																
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option														
STANDARDS																
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB														
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)														
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report														
DIMENSIONS & WEIGHT		10kVA	15kVA	20kVA	10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	80kVA	100kVA	120kVA
Cabinet Dimensions (mm)	Width	370			490						530			763	810	
	Depth	660			805						780			771	820	
	Height	850			1190						1290			1555	1705	
Net Weight (kg)		85	85	85	125	126	131	145	173	323				331	353	368
Packaging Dimensions (mm)	Width	500			600						650			900	900	
	Depth	760			900						900			970	970	
	Height	1000			1400						1400			2040	2040	
Gross Weight (kg)		105	105	105	145	146	151	166	193	353				361	383	398

* under certain conditions.
3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

MODEL										
Capacity		160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA
Power Watt		144kW	180kW	225kW	270kW	360kW	450kW	540kW	720kW	900kW
INPUT										
Nominal Voltage		380/400/415 VAC 3 P+N (Optional 220/380 VAC -37% +22% 3 P+N+PE)								
Voltage Tolerance		-20% +15%								
Frequency Tolerance		50 / 60 Hz ±10% (Selectable)								
Power Factor		>0.99								
Total Harmonic Distortion (THDi)		<3%								
OUTPUT										
Power Factor		0.9 (1 Optional)								
Nominal Voltage		380/400/415 VAC 3 P+N								
Voltage Tolerance		Statik ±1, Dynamic ±3								
Frequency Tolerance		50 / 60 Hz ±0,01% (Battery Mode)								
Output THD		Linear Load <1% / Non-Linear Load <3%								
Crest Factor		3:1								
Overload Capacity*		At 125% Load 10min, At 150% Load 1min								
Efficiency (Online Mode)		96%								
Efficiency (Eco Mode)		99%								
BYPASS										
Nominal Voltage		380/400/415 VAC 3 P+N								
Voltage Tolerance		15% (Configurable from 10% to 30%)								
Frequency Tolerance		±5 (Selectable)								
BATTERY										
Type		VRLA / GEL								
Quantity (12V DC VRLA)		60								
Charge Capacity		12,5% of Active Power (Nominal 0,1 C10, Adjustable)								
Recharge Time		6-8 hours								
Internal Battery		External Battery								
ENVIRONMENTAL										
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C								
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C								
Protection Class		IP20								
Humidity		0-95% (Without Condensation)								
Altitude		<1000m: Correction Factor 1, <2000m: Correction Factor >0.92, <3000m: Correction Factor >0.84								
Noise Level		<72dBA					<74dBA			<75dBA
COMMUNICATION										
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option								
STANDARDS										
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB								
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)								
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report								
DIMENSIONS & WEIGHT		160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA
Cabinet Dimensions (mm)	Width	830			1200			2000		
	Depth	870			825			870		
	Height	1800			1854			2050		
Net Weight (kg)		475	490	553	830	840	850	1510	1510	1510
Packaging Dimensions (mm)	Width	900			1370			2100		
	Depth	970			845			950		
	Height	2040			2040			2250		
Gross Weight (kg)		505	520	583	870	880	890	1590	1590	1590

* under certain conditions.
3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

LEVELUPS T3

SERIES

10-60 kVA

ONLINE UPS

3:3 PHASE

DATA CENTER | MEDICAL | TRANSPORT | INDUSTRY | EMERGENCY

Three LEVEL 3 UPS

kW=kVA

VFI TYPE — UPS ONLINE

TOWER

PF= 1.0 — POWER FACTOR

Service — SERVICE

HIGHLIGHTS

- True Three Level Rectifier and Inverter Technology
- Ultra High Output Galvanic Isolation Transformer Embedded
- Robust and Reliable Design

Highest Reliability with Embedded Isolation Transformer

• LEVELUPS T3 series is a true VFI on-line double conversion, three-phase UPS system with innovative 3 level technology and engineered to provide high level of energy efficiency and reliable and robust protection for most demanding industrial and medical environments.

• Three level inverter and rectifier technology and with embedded isolation transformer makes LEVELUPS T3 series one of the most reliable systems for data security and other critical applications.

BUREAU VERITAS Certification — The LEVELUPS Series is attested by Bureau Veritas with regard to performance (EN 62040-3)

CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN Uninterruptible Power Supplies

Compact Design

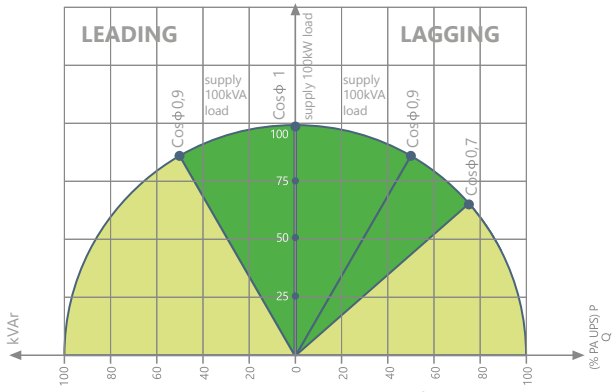
- Designed with an Integrated transformer ensuring galvanic isolation on the output for ultimate safe installation.
- Easy to install and service and can be integrated into harsh commercial and industrial environments.
- Compact footprint and matching battery cabinets.

Low Total Cost of Ownership

- Less energy consumption to supply the loads thanks to high efficiency.
- Reduced energy loss.
- Reduced electricity usage and air conditioning requirements.
- Reduction in operating cost of UPS.
- IGBT based power factor correction technology provides input power factor close to 1 (≥ 0,99). The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.
- Low input current total harmonic distortion (THDi) less than%3 helps to avoid the disturbance and expensive harmonic filters.
- Small footprint and easy maintenance

High Output Power Factor 1

- Output power factor of 1 (kVA=kW) rate provides up to 25% more active power than a traditional UPS.
- Suitable for modern power supply application with unit or capacitive power factor (e.g. new servers generation).
- No reduction in active power from 0,9 leading to 0,9 lagging.



LEVELUPS Output Power Factor Scheme

Maximum Availability

- Parallel configuration up to 8 units per redundancy (N+1) and power increase.
- Loop connection helps the UPS system to continue the operation when the connection cable is inturrupted.

Standard Electrical Features

- Parallel-Redundant (N+X) Systems
- Co-Aging
- Output Galvanic Isolation Transformer Embedded
- Dual Input
- Common Battery
- Frontal Access for Input/Output Cabling
- Backfeed Protection
- Cold Start (Optional)
- Advanced Battery Management
- Short Circuit and Overload Protection
- Parallel Ready
  Redundant Power Supply
- Power Walk-in for Progressive Rectifier Start-up when the
- Mains is Restored
  Battery Temperature Sensor
  Static & Manual Bypass Operation

Advanced Communication Features

- 1500 Real Time Event Log with Detailed Parameters
- User Friendly Multilingual 320x240 Graphic Display Provides Operation Information
- Monitoring and Shutdown Software
- RS232 Serial and RS485 Ports
- 2 Communication Slots
- ModBUS RTU / ModBUS TCP (Optional)
- Remote Emergency Power Off (Optional)
- Remote Display Panel (Optional)
- Dry Contact (Optional)
- SNMP (Optional)
- Profibus (Optional)

Flexibility

- Optional IP31, IP41, Protection degree for harsh environments.
- Optional tropicalization and anti-corrosion protection for electronic boards.
- Optional temperature sensor for external battery cabinets for extended runtimes.
- External battery cabinets for different sizes of batteries to provide extended runtimes.
- Adaptability to the mains without neutral.

MODEL							
Capacity		10kVA	15kVA	20kVA	30kVA	40kVA	60kVA
Power Watt		10kW	15kW	20kW	30kW	40kW	60kW
INPUT							
Voltage Range		380/400/415 VAC 3 Phase +N (Optional 220/380 VAC -37% +22% 3P+N+PE)					
Power Factor		At Full Load >0.99					
Frequency Range		45 - 65 Hz (Selectable)					
Total Harmonic Distortion (THDi)		<3%					
OUTPUT							
Voltage Range		380/400/415 VAC 3 Phase + N					
Voltage Tolerance		Static ±1, Dynamic ±3					
Efficiency		94.5%					
Frequency Tolerance		50Hz / 60Hz ±0,01% (Battery Mode)					
THD (THDv)		Linear Load <2%					
		Non-Linear Load <5%					
Crest Factor (CF)		3:1					
Overload Capacity*		At 125% Load 10min, at 150% Load 1min					
BATTERY							
Quantity (12V DC VRLA)		60					
Charge Capacity		12,5% of Active Power (Nominal 0,1 C10, Adjustable)					
ENVIRONMENTAL							
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C					
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C					
Protection Class		IP20					
Humidity		0-95% Without Condensation					
Altitude		<1000m, Correction Factor 1. <2000m, Correction Factor >0.92, <3000m; Correction Factor >0.84					
Noise Level		<53 dBA		<55 dBA		<60 dBA	
COMMUNICATION							
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option					
STANDARDS							
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB					
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)					
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report					
DIMENSIONS & WEIGHT		10kVA	15kVA	20kVA	30kVA	40kVA	60kVA
Cabinet Dimensions (mm)	Width	490		517	517		
	Depth	805		862	1130		
	Height	1190		1382	1630		
Net Weight (kg)		235	260	350	343	452	785
Packaging Dimensions (mm)	Width	600		670	620		
	Depth	900		900	1180		
	Height	1400		1630	1830		
Gross Weight (kg)		260	285	375	403	512	855

* under certain conditions.

LEVELUPS T4

SERIES

80-400 kVA 3:3 PHASE

ONLINE UPS

DATA CENTER | MEDICAL | TRANSPORT | INDUSTRY | EMERGENCY

VFI TYPE — UPS ONLINE

TOWER

PF= 0.9 — POWER FACTOR

Service — SERVICE

HIGHLIGHTS

- Built In Inverter Transformer for DC-AC Galvanic Protection
- DSP Vector Control at Input and Output
- Innovative Smart IGBT Control
- Programmable Input Power
- Entire Efficiency Control System

Highest Reliability and Robust Protection for Industrial Loads

• LEVELUPS T4 Series is a true VFI on-line double conversion, three-phase UPS system and engineered to provide high level of energy efficiency and reliable and robust protection for most demanding industrial and medical environments.

• DSP Vector Control Technology and Inverter Transformer makes LEVELUPS T4 Series one of the most reliable systems for data security and other critical applications.

BUREAU VERITAS Certification — The LEVELUPS Series is attested by Bureau Veritas with regard to performance (EN 62040-3)

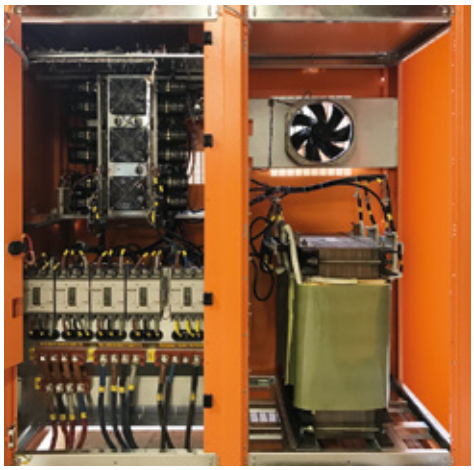
CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN® Uninterruptible Power Supplies

Compact Design

- Designed with an Integrated transformer on the inverter output ensuring galvanic isolation on the output for ultimate safe installation.
- Easy to install and service and can be integrated into harsh commercial and industrial environments.
- Compact footprint and matching battery cabinets.



Low Total Cost of Ownership

- Less energy consumption to supply the loads thanks to high efficiency.
- Reduced energy loss.
- Reduced electricity usage and air conditioning requirements.
- Reduction in operating cost of UPS.
- IGBT based power factor correction technology provides input power factor close to 1 (≥ 0,99). The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.
- Low input current total harmonic distortion (THDi) less than%3 helps to avoid the disturbance and expensive harmonic filters.
- Small footprint and easy maintenance

High Output Power Factor 0.9

- Output power factor of 0.9 rate.
- Suitable for modern power supply application with unit or capacitive power factor (e.g. new servers generation).
- No reduction in active power from 0,9 leading to 0,9 lagging.

Maximum Availability

- Intelligent parallel operation up to 8 units per redundancy (N+X) and power increase.

Standard Electrical Features

- Parallel-Redundant (N+X) Systems
- Co-Aging
- Transformer Based Technology
- Dual Input
- Common Battery
- Frontal Access for Input/Output Cabling
- Backfeed Protection
- Cold Start (Optional)
- Advanced Battery Management
- Short Circuit and Overload Protection
- Parallel Ready
  Redundant Power Supply (Optional)
- Power Walk-in for Progressive Rectifier Start-up when the
- Mains is Restored
  Battery Temperature Sensor
  Static & Manual Bypass Operation

Advanced Communication Features

- 1500 Real Time Event Log with Detailed Parameters
- User Friendly Multilingual 320x240 Graphic Display Provides Operation Information
- Monitoring and Shutdown Software
- RS232 Serial and RS485 Ports
- 2 Communication Slots
- ModBUS RTU / ModBUS TCP (Optional)
- Remote Emergency Power Off (Optional)
- Remote Display Panel (Optional)
- Dry Contact (Optional)
- SNMP (Optional)
- Profibus (Optional)

Flexibility

- Optional IP31, IP41, Protection degree for harsh environments.
- Optional tropicalization and anti-corrosion protection for electronic boards.
- Optional temperature sensor for external battery cabinets for extended runtimes.
- External battery cabinets for different sizes of batteries to provide extended runtimes.
- Adaptability to the mains without neutral.

MODEL								
Capacity		80kVA	100kVA	120kVA	160kVA	200kVA	300kVA	400kVA
Power Watt		72kW	90kW	108kW	144kW	180kW	270kW	360kW
INPUT								
Voltage Range		380/400/415 VAC 3 Phase (Optional 220/380 VAC -37% +22% 3P+PE)						
Power Factor		At Full Load >0.99						
Frequency Range		45 - 65 Hz						
Total Harmonic Distortion (THDi)		<3%						
OUTPUT								
Voltage Range		380/400/415 VAC 3 Phase + N						
Voltage Tolerance		Static ±1, Dynamic ±3						
Efficiency		91%						
Frequency Tolerance		50Hz / 60Hz ±0,01% (Battery Mode)						
THD (THDv)		Linear Load <2%						
		Non-Linear Load <5%						
Crest Factor (CF)		3:1						
Overload Capacity*		At 125% Load 10min, at 150% Load 1min						
BATTERY								
Quantity (12V DC VRLA)		62						
Charge Capacity		12,5% of Active Power (Nominal 0,1 C10, Adjustable)						
ENVIRONMENTAL								
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C						
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C						
Protection Class		IP20						
Humidity		0-95% Without Condensation						
Altitude		<1000m, Correction Factor 1. <2000m, Correction Factor >0.92, <3000m; Correction Factor >0.84						
Noise Level		<65 dBA			<72 dBA			
COMMUNICATION								
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option						
STANDARDS								
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB						
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)						
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report						
DIMENSIONS & WEIGHT		80kVA	100kVA	120kVA	160kVA	200kVA	300kVA	400kVA
Cabinet Dimensions (mm)	Width	1466	1510		1750		2355	
	Depth	771	818		868		820	
	Height	1593	1745		1832		1855	
Net Weight (kg)		860	935	996	1189	1258	2000	2450
Packaging Dimensions (mm)	Width	1580	1580		1930		2480	
	Depth	870	870		970		1080	
	Height	1980	1980		2120		2280	
Gross Weight (kg)		930	1005	1066	1269	1338	2110	2580

* under certain conditions.

BOXER
SERIES

10-1000 kVA 3:3 PHASE

10-30 kVA 3:1 PHASE

ONLINE UPS

DATA CENTER · MEDICAL · TRANSPORT · INDUSTRY · EMERGENCY

VFI TYPE — UPS ONLINE

TOWER

PF= 0.9 — POWER FACTOR

Service — SERVICE

HIGHLIGHTS

- IGBT PWM Rectifier & Inverter Technology
- Low Input Current THD (<3%)
- High Input Power Factor (>0.99)

DSP Power Factor Corrected IGBT Rectifier

- Equipped with its new IGBT rectifier BOXER Series keeps your critical loads protected while its space-saving compact design and front access for maintenance successfully reduce mean time to repair (MTTR).
- Thanks to the wide variety of accessories and options BOXER Series presents maximum flexibility advantage to users and optimizes total cost of ownership.

BUREAU VERITAS Certification — The BOXER Series is attested by Bureau Veritas with regard to performance (EN 62040-3)

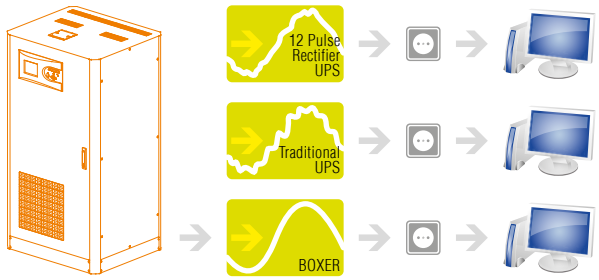
CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN® Uninterruptible Power Supplies

High Performance & Low Total Cost of Ownership

- IGBT based power factor correction technology provides input power factor close to 1 (≥ 0,99). The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.
- Low input current total harmonic distortion (THDi) less than 3% helps to avoid the disturbance and expensive harmonic filters.
- Small footprint and easy maintenance.



	THD	Power Factor
BOXER with IGBT Rectifier	<3%	<0.99
Traditional UPS with Input Filter	<10%	<0.95
UPS without Input Filter	<25%	<0.85

High Input Power Factor

- 0,99 Input power factor ensures clean and sinusoidal input current.
- The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.

Maximum Availability

- Parallel configuration up to 8 units per redundancy (N+1) and power increase.
- Loop connection helps the UPS system to continue the operation when the connection cable is inturrupted.

Standard Electrical Features

- Backfeed Protection
- Cold Start (Optional)
- Advanced Battery Management
- Short Circuit and Overload Protection
- Parallel Ready
- Redundant Power Supply
- Power Walk-in for Progressive Rectifier Start-up when the Mains is Restored.
- Battery Temperature Sensor
- Static & Manual Bypass Operation

Advanced Communication Features

- 1500 Real Time Event Log with Detailed Parameters
- User Friendly Multilingual 320x240 Graphic Display Provides Operation Information
- Monitoring and Shutdown Software
- RS232 Serial and RS485 Ports
- 2 Communication Slots
- ModBUS RTU / ModBUS TCP (Optional)
- Remote Emergency Power Off (Optional)
- Remote Display Panel (Optional)
- Dry Contact (Optional)
- SNMP (Optional)
- ProfiBUS (Optional)

Flexibility

- Temperature sensor for external battery cabinets for extended runtimes.
- External battery cabinets for different sizes of batteries to provide extended runtimes.
- Frequency converter mode.
- Isolation transformers to vary neutral connectivity in the event of separate power sources or for galvanic isolation between input and output.
- Compatible version with EN 50171 for supplying power to emergency lighting systems.

MODEL															
Capacity		10kVA	15kVA	20kVA	10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	80kVA	100kVA	120kVA
Power Watt		9kW	13,5kW	18kW	9kW	13,5kW	18kW	27kW	36kW	54kW	72kW	90kW	108kW	72kW	90kW	108kW
INPUT																
Nominal Voltage		380/400/415 VAC 3 P+N (Optional 220/380 VAC -37% +22% 3 P+N+PE)														
Voltage Tolerance		-20% +15%														
Frequency Tolerance		50 / 60 Hz ±10% (Selectable)														
Power Factor		>0.99														
Total Harmonic Distortion (THDi)		<3%														
OUTPUT																
Power Factor		1														
Nominal Voltage		380/400/415 VAC 3 P+N														
Voltage Tolerance		Statik ±1, Dynamic ±3														
Frequency Tolerance		50 / 60 Hz ±0,01% (Battery Mode)														
Output THD		Linear Load <1% / Non-Linear Load <3%														
Crest Factor		3:1														
Overload Capacity*		At 125% Load 10min, At 150% Load 1min														
Efficiency (Online Mode)		Up to 92%														
Efficiency (Eco Mode)		Up to 99%														
BYPASS																
Nominal Voltage		380/400/415 VAC 3 P+N														
Voltage Tolerance		%15 (Configurable from 10% to 30%)														
Frequency Tolerance		±5 (Selectable)														
BATTERY																
Type		VRLA / GEL														
Quantity (12V DC VRLA)		62														
Charge Capacity		25% of Active Power (Nominal 0,1 C10, Adjustable)														
Recharge Time		6-8 hours														
Internal Battery		62 x 7Ah or 9Ah			60 x 7Ah or 9Ah			External Battery								
ENVIRONMENTAL																
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C														
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C														
Protection Class		IP20														
Humidity		0-95% (Without Condensation)														
Altitude		<1000m: Correction Factor 1, <2000m: Correction Factor >0.92, <3000m: Correction Factor >0.84														
Noise Level		<53dBA			<53dBA		<55dBA		<60dBA		<65dBA			<65dBA		
COMMUNICATION																
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option														
STANDARDS																
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB														
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)														
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report														
DIMENSIONS & WEIGHT		10kVA	15kVA	20kVA	10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	80kVA	100kVA	120kVA
Cabinet Dimensions (mm)	Width	370			490						530			763	810	
	Depth	660			805						780			771	820	
	Height	850			1190						1290			1555	1705	
Net Weight (kg)		85	85	85	125	126	131	145	173	323	222	231	240	331	353	368
Packaging Dimensions (mm)	Width	500			600						650			900	900	
	Depth	760			900						900			970	970	
	Height	1000			1400						1400			2040	2040	
Gross Weight (kg)		105	105	105	145	146	151	166	193	353	253	261	270	361	383	398

* under certain conditions.
3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

MODEL										
Capacity		160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA
Power Watt		144kW	180kW	225kW	270kW	360kW	450kW	540kW	720kW	900kW
INPUT										
Nominal Voltage		380/400/415 VAC 3 P+N (Optional 220/380 VAC -37% +22% 3 P+N+PE)								
Voltage Tolerance		-20% +15%								
Frequency Tolerance		50 / 60 Hz ±10% (Selectable)								
Power Factor		>0.99								
Total Harmonic Distortion (THDi)		<3%								
OUTPUT										
Power Factor		1								
Nominal Voltage		380/400/415 VAC 3 P+N								
Voltage Tolerance		Statik ±1, Dynamic ±3								
Frequency Tolerance		50 / 60 Hz ±0,01% (Battery Mode)								
Output THD		Linear Load <1% / Non-Linear Load <3%								
Crest Factor		3:1								
Overload Capacity*		At 125% Load 10min, At 150% Load 1min								
Efficiency (Online Mode)		Up to 92%								
Efficiency (Eco Mode)		Up to 99%								
BYPASS										
Nominal Voltage		380/400/415 VAC 3 P+N								
Voltage Tolerance		15% (Configurable from 10% to 30%)								
Frequency Tolerance		±5 (Selectable)								
BATTERY										
Type		VRLA / GEL								
Quantity (12V DC VRLA)		62								
Charge Capacity		25% of Active Power (Nominal 0,1 C10, Adjustable)								
Recharge Time		6-8 hours								
Internal Battery		External Battery								
ENVIRONMENTAL										
Operating Temperature		For UPS 0°C/+40°C For Battery +15°C/+25°C								
Storage Temperature		For UPS -15°C/+45°C For Battery 0°C/+30°C								
Protection Class		IP20								
Humidity		0-95% (Without Condensation)								
Altitude		<1000m: Correction Factor 1, <2000m: Correction Factor >0.92, <3000m: Correction Factor >0.84								
Noise Level		<72dBA					<74dBA			<75dBA
COMMUNICATION										
Communication Port		RS232 Standart, RS485 and SNMP Adapter Option								
STANDARDS										
Quality		ISO 9001, ISO 14001, ISO 45001, ISO 10002, CE, TSE, TSE-HYB								
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)								
EMC/LVD		EN62040-2, EN62040-1, TS EN ISO/IEC 17025 Acredited Test Report								
DIMENSIONS & WEIGHT		160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA
Cabinet Dimensions (mm)	Width	830			1200			2000		
	Depth	870			825			870		
	Height	1800			1854			2050		
Net Weight (kg)		475	490	553	830	840	850	1510	1740	1740
Packaging Dimensions (mm)	Width	900			1370			2100		
	Depth	970			845			950		
	Height	2040			2040			2250		
Gross Weight (kg)		505	520	583	870	880	890	1590	1820	1820

* under certain conditions.
3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

BOXER S
SERIES

10/15/20 kVA 3:3 PHASE
ONLINE UPS

DATA CENTER · EMERGENCY · MEDICAL · INDUSTRY · TRANSPORT

VFI TYPE — UPS ONLINE
TOWER
PF= 0.9 — POWER FACTOR
Service — SERVICE

FEATURES

- High Frequency and True Double-Conversion
- DSP (Digital Signal Processors) Technology
- Input Power Factor Correction (PFC)
- Wide Input Voltage Range (110~300V)
- Output Power Factor 0.9
- Cold Start
- Auto Sensing Frequency
- ECO Mode Operation for Energy Saving
- Selectable Output Voltage via LCD
- 50Hz/60Hz Frequency Converter Mode Available
- Selectable Battery Low Voltage via LCD
- Power-On Self Test
- Advanced Battery Management (ABM)
- Short Circuit and Overload Protection
- Automatically Charging Battery at UPS Off Mode
- Fan Speed Auto Control when Load Varies
- Generator Compatible
- Emergency Power Off (EPO)
- Standard RS232 Communication Port
- USB/SNMP Communication Port *(Optional)*
- Extension Battery Bank *(Optional)*
- Manual Bypass *(Optional)*

BUREAU VERITAS Certification — The BOXER Series is attested by Bureau Veritas with regard to performance (EN 62040-3)

CE TSE TSE-HYB

MODEL				
Capacity		**10**kVA / **9**kW	**15**kVA / **13,5**kW	**20**kVA / **18**kW
INPUT				
Related Voltage		380 / 400 / 415 VAC, (3Ph+N+PE) -20% +15%		
Voltage Range		208 - 478 VAC		
Frequency		50 Hz: 45-55 Hz; 60 Hz: 54-66 Hz (Auto Sensing)		
Power Factor		≥0,99		
Bypass Frequency Range		50-60 Hz ±10%		
Harmonic Distortion		≤3% (100% Non-Linear Load)		
ECO Range		Max. Voltage: 220V: +25% (Optional +10%, +15%, +20%), 230V: +20% (Optional +10%, +15%), 240V: +15% (Optional +10%)		
		Min. Voltage: -45% (Optional -20%, -30%)		
Generator		Compatible		
OUTPUT				
Voltage Range		380V / 400V / 415 VAC (3Ph+N+PE)		
Power Factor		0.9		
Voltage Regulation		±1%		
Frequency	AC Mode	±1%, ±2% , ±4%, ±5%, ±10% (Optional)		
	Battery Mode	50-60 ± 0.1 Hz		
Waveform		Pure Sinewave		
Crest Factor		3:1		
Harmonic Distortion		≤2% (Linear Load) ≤5% (Non-Linear Load)		
Transfer Time		Battery Mode to Inverter Mode 0ms, Inverter to Bypass Mode 0ms		
Output Dynamic Tolerance		At 100% Load ±5%		
Overload Capability	AC Mode	≤110%: 60min.; ≤125%: 10min.; ≤150%: 1min. ≥150% turn to Bypass Mode Immediately		
	Battery Mode	>150% Bypass Mode		
Parallel Operation		Optional		
EFFICIENCY				
AC Mode		93,5%	94,5%	
Battery Mode		92,5%	93,5%	
ECO Mode		98%		
BATTERY				
DC Voltage		±120 VDC	±180 VDC	±240 VDC
Inbuilt Battery		60x12V 7/9Ah	60x12V 7/9Ah	40x12V 7/9Ah
Charge Current		5A		
Typical Recharge Time		8 hour		
PROTECTION				
Full Protection		Overload, Short Circuit ve Battery Charge-Discharge Protection, RFI/EMI Filtre, IP20		
SYSTEM FEATURES				
Charge Current		Smart Charging System		
Over-temperature		Line Mode: Turn to Bypass; Backup Mode: Shut Down UPS Immediately		
Intelligent Alarm System		Line Failure, Low Battery, Overload, System Failure		
LED&LCD Monitor		Line Mode, Battery Mode, Bypass Mode, Battery Low, Overload & UPS Fault		
ALARM				
Utility Failure		Line Mode, Low Battery, Overload, System Fault		
Battery Low		Alarm and Shut Down		
Overload		Overload		
UPS Fault		System Fault		
ENVIRONMENTAL				
Operation Temperature		0°C~40°C		
Storage Temperature		-25°C~55°C		
Humidity		0%~90%		
Altitude		<1500 m		
Noise Level		<50 dB		
COMMUNICATION				
Communication Interface		USB, RS232, RS485, Parallel Port, Dry Contact, Smart Port, SNMP Card (Optional), Relay Card (Optional)		
Software		Muser4000, Sofeware		
Emergency Power Off		Dry Contact (Optional)		
STANDARDS				
Safety		IEC/EN62040-1, IEC/EN60950-1		
EMC		IEC/EN62040-2, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8		
DIMENSIONS & WEIGHT		**10**kVA	**15**kVA	**20**kVA
Dimensions WxDxH (mm)		342 x 860 x 827		
Net Weight (kg)				

PM
SERIES

10-2080 kVA 3:3 PHASE

MODULAR ONLINE UPS

DATA CENTER · MEDICAL · TRANSPORT · INDUSTRY · EMERGENCY

kW=kVA

96% Efficiency

VFI TYPE — UPS ONLINE

MODULAR SYSTEM

PF= 1.0 — POWER FACTOR

Service — SERVICE

HIGHLIGHTS

- High Performance, Modular 3-Phase Power Protection
- Scalable up to 2080kVA, with 96% High Efficiency

Modular UPS Design for High Density Data Centers

- PM Series is a scalable, redundant Modular UPS system designed to cost effectively provide high level availability for high density data centers and critical applications.
- True Online Double Conversion and advanced DSP control technology.
- Modular Architecture can scale power and runtime as demand grows or as higher levels of availability required.
- Combines the modular design with the N+X parallel redundancy technology.
- The maximum capacity of a single cabinet is 520kVA. Cabinets can operate in parallel configuration to build a system of up to 2080kVA.

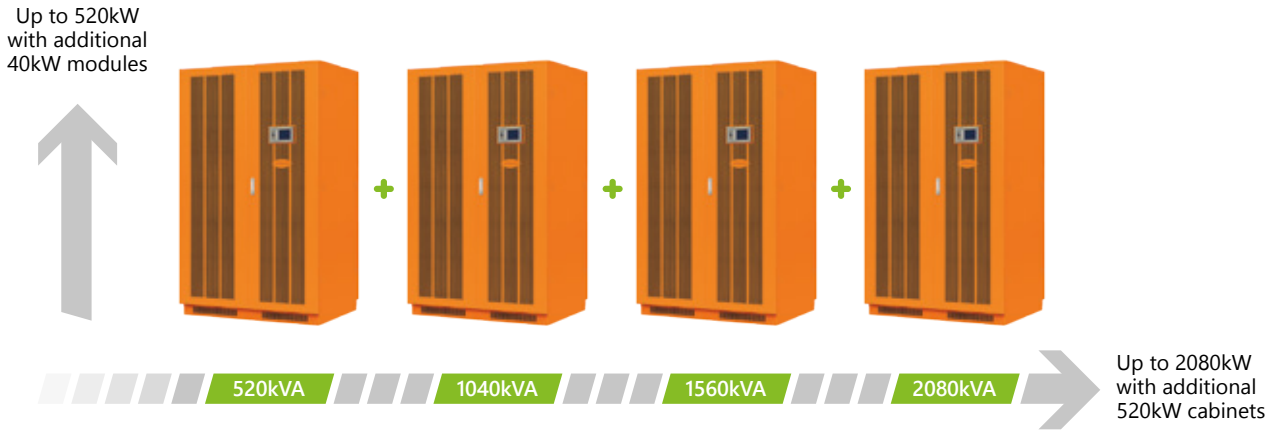
Higher Level of Efficiency than the EU CoC for AC UPS · CE · TSE · TSE-HYB

Scalable Modular Architecture

Scalable up to the highest active power rating available through two dimensional modularity: Vertical and Horizontal.

- Capacity of single power module is 10-15-20-25-30-40-50kVA
- The height of single hot swappable power module is 3U
- Standard 1.4m cabinet can hold up to 5 of power modules
- Standard 2m cabinet can hold up to 13 of power modules
- The single UPS cabinet capacity can reach 520KVA and UPS cabinets can operate in parallel configuration to build a system of up to 2080kVA

Modules	Output Power	Dimensions (WxHxD)	Weight
PM 3310-RM	10kVA 3/3 Module	443x131x580mm 3U	26kg
PM 3315-RM	15kVA 3/3 Module	443x131x580mm 3U	30kg
PM 3320-RM	20kVA 3/3 Module	443x131x580mm 3U	31kg
PM 3325-RM	25kVA 3/3 Module	443x131x580mm 3U	31kg
PM 3330-RM	30kVA 3/3 Module	443x131x580mm 3U	32kg
PM 3340-RM	40kVA 3/3 Module	443x131x580mm 3U	33kg
PM 3350-RM	50kVA 3/3 Module	443x131x625mm 3U	34kg



"Size What You Need Now and Pay as You Grow"

Standart Electrical Features

- Output Power Factor: 0.9 (Optional 1.0)
- Hot Swappable Maintenance (UPS & Battery)
- Separated Bypass
- Maintenance Bypass
- Parallelable up to 4 Cabinets
- Common Battery
- Control of On/Off State of each Module
- Freely Set the Charge Current
- Intelligent Charging
- Mid or Small Power Distributing System
- Selectable Battery Voltage 3 Input 3 Output ±216VDC/±228VDC/±240VDC (32/34/36/38/40pcs)

Advanced Communication Features

- RS232 (USB)
- RS485 Communication Interface
- SNMP Card (Optional)
- Relay Card (Optional)
- Centralized Monitor Module that is Hot Swappable
- Single Module LCD Display
- Control Monitoring with 5" Color LCD Graphic Display

UPS Cabinet Control Panel

Module Control Panel

Hot Swappable Battery Modules

Plug and play battery modules ensures uninterrupted power to protected equipment while batteries are being replaced. Allows quick and easy battery replacement.

- Each Battery Module Consists of 18 pcs 7Ah/9Ah
- Only 3U Height
- Simply Plug into UPS System

3 U Battery Box Optional

19"Matching Battery Cabinets (Optional)

N+X Parallel Redundancy

PM series UPS adopts N+X parallel redundancy design, users can set different redundancy according to the importance of the load. While the number of redundancy modules are more than two, the availability of UPS system will achieve 99.999% and the MTBF will be more than 15,000,000 hours which can satisfying the reliability requirement of critical load. The UPS redundancy degree can be set through the LCD, when the load exceeds the set value, the UPS will alarm in time.

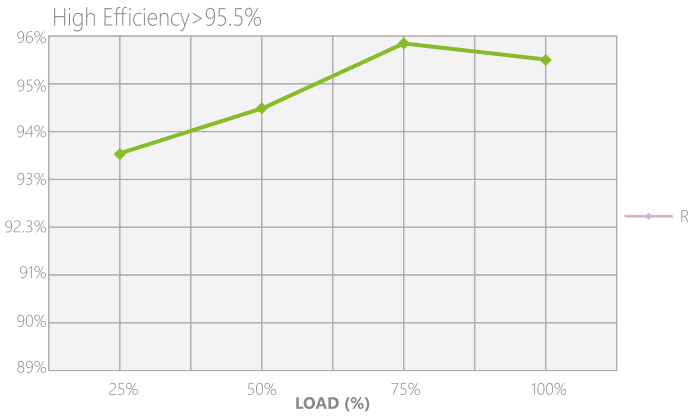
Independent Control System

Every power module is equipped independent control system, and control itself independently according to the sharing message, and the fault module separates from the system automatically.

High Efficiency and Low Total Cost of Ownership

PM Designed for highly economical energy consumption and is a perfect fit in your data center and server room. Offering efficiency of up to 96%, THDi of 2% and unity Input Power Factor without harmonic filters PM delivers:

- Significant energy savings
- Lower cooling costs
- Smaller generator sizing



- High input power factor (>0.99) and low input Total Harmonic Distortion (THDi<2%) minimizes installation costs by enabling the use of smaller generators and cabling.
- Fully-rated power kVA equals kW feature option reduces cost by eliminating the need for an oversized UPS for Power Factor Corrected (PFC) loads.

10kVA/15kVA/20kVA/25kVA/ 30kVA 3:3 phase

40kVA 3:3 phase

MODEL												
CAPACITY												
UPS Cabinet		10~100 kVA	20~100 kVA	20~200 kVA	25~250 kVA	30~150 kVA	30~300 kVA	40~200 kVA	40~320 kVA	40~520 kVA	40~800 kVA	40~1040 kVA	40~1560 kVA
Paralleling		Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 6 Frame	Up to 4 Frame	Up to 2 Frame	Up to 2 Frame	Up to 1 Frame
PM Module		10kVA/10kW, 15kVA/15kW, 20kVA/20kW, 25kVA/25kW, 30kVA/30kW, 40kVA/40kW, 50kVA/50kW											
INPUT												
Phase		3 Phase 4 Wires and Ground											
Rated Voltage		380/400/415 VAC											
Voltage Range		208~478 VAC or 120 VAC~276 VAC											
Frequency Range (Hz)		40~70 Hz											
Power Factor		>0.99											
Bypass Voltage Range		Max. Voltage: +15% (Optional +5%, +10%, +25%) Min. Voltage: -45% (Optional -20%, -30%)											
		Frequency Protection Range: ±10%											
Current Harmonic		<2% (100% Non-Linear Load)											
Generator Input		Support											
OUTPUT												
Phase		3 Phase 4 Wires and Ground											
Rated Voltage		220/240 VAC 380/400/415 VAC											
Power Factor		1											
Voltage Precision		±1%											
Output Frequceny		(50/60±0.1%) Hz											
Crest Factor		3:1											
THD		≤1% With Linear Load ≤4% With Non-Linear Load											
Efficiency		96%											
COMMUNICATION												
UPS Cabinet		RS232, RS485, Intelligent Slot x 2 (SNMP Card, Relay Card, Dry Contact Optional)											
INTERFACE												
PM Series UPS Module		RS232											
BATTERY												
Voltage		±192V / ±204V / ±216V / ±228V / ±240V DC; Battery Quantity (Optional)											
Charge Current (A)	UPS Cabinet	60A Max	30A Max	60A Max	60A Max	50A Max	100A Max	50A Max	80A Max	130A Max	200A Max	260A Max	390A Max
	Module	6A/10A/(20A Optional) Max (Charge Current can be Set According to Battery Capacity Installed)											
Crest Factor Backup Time		Depends on the Capacity of External Batteries											
THD Transfer Time		Utilty to Battery : 0ms; Utily to Bypass: 0ms											
PROTECTION												
Overload	Normal Mode	Load ≤110%: Last 60min, ≤125%: Last 10min, ≤150%: Last 1min, ≥150% Shut Down UPS Immediately											
	Battery Mode	Load ≤110%: Last 10min, ≤125%: Last 1min, ≤150%: Last 1s ≥150% Shut Down UPS Immediately											
ENVIRONMENTAL												
Operating Temperature		0°C ~ 40°C											
Storage Temperature		-25°C ~ 55°C											
Humidity		0 ~ 95% Non-Condensing											
Noise	Number of Modules ≤5	<55 dBA (1m)											
	Number of Modules >5	<65 dBA (1m)											
Altitude		<1500m											
DIMENSIONS & WEIGHT		10~100 kVA	20~100 kVA	20~200 kVA	25~250 kVA	30~150 kVA	30~300 kVA	40~200 kVA	40~320 kVA	40~520 kVA	40~800 kVA	40~1040 kVA	40~1560 kVA
Unit Dimensions WxDxH (mm)	UPS Cabinet	600x840 x1400	600x840 x1400	600x1100 x2000	600x1100 x2000	600x840 x1400	600x1100 x2000	860x600 x2000	860x600 x2000	860x1200 x2000	860x1800 x2000	860x3000 x2000	1100x4800 x2000
	Module	443 x 580 x 131 (3U)											
Weight (kg)	UPS Cabinet	170	170	270	275	152	280	205	310	514	1600	1810	2800
	Module	10kVA: 26kg; 15kVA: 30kg; 20kVA: 31kg; 25kVA: 31kg; 30kVA: 32kg; 40kVA: 33kg											
INDUSTRY STANDARD		CE, IEC 62040-2, IEC 62040-1, IEC 62040-3, IEC61000-4, IEC60950-1											

LION
SERIES

650-2200 VA
LINE INTERACTIVE UPS

HOME/OFFICE

VI TYPE
UPS LINE INTERACTIVE

TOWER

PLUG & PLAY

USB

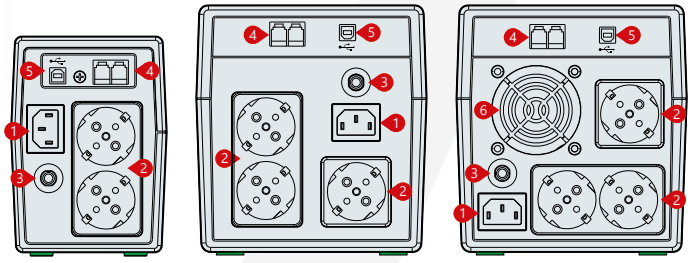
LCD
LCD DISPLAY (1200-1500-2200VA)

FEATURES

- LED Display (650-850)
- LCD Display (1200-1500-2200)
- Voltage Range, Operation Mode, Battery Charge and Load Quantity Monitoring via LCD Display (1200-1500-2200)
- Microprocessor-Based Digital Control
- Automatic Voltage Stabilization
- Automatic Breaker
- Frequency Adaptive
- User Friendly Alarm System
- Cold Start
- Auto Restart while AC is Recovering
- Simulated Sine Wave Output
- Intelligent Battery Management
- Short Circuit and Over Discharged Protection
- Automatically Charging Battery at UPS Off Mode
- USB Communication Port
- RJ11/RJ45 Protection

DETAILS

1. AC Input
2. Outlet
3. Breaker
4. RJ11/RJ45
5. USB
6. Fan



Rear Panel 650-850 VA

Rear Panel 1200-1500 VA

Rear Panel 2200 VA

CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN
Uninterruptible Power Supplies

MODEL					
Capacity	**650**VA / **390**W	**850**VA / **510**W	**1200**VA / **720**W	**1500**VA / **900**W	**2200**VA / **1320**W
INPUT					
Related Voltage	230 VAC				
Voltage Range	170-280 VAC (±%5)				
Frequency	50 Hz (±%10)				
OUTPUT					
Voltage Range	220 VAC				
Voltage Precision	±10% (Battery Mode)				
Frequency	50 Hz ±%1 (Akü Modu)				
Transfer Time	2-6ms Typical, 10ms max.				
Waveform	Modified Sine Wave (Battery Mode)				
EFFICIENCY					
Line Mode	Normal Mode: >95%, AVR Mode: >88%				
Battery Mode	>60%				
BATTERY					
Battery Configuration	1 x 12V/7Ah	1 x 12V/9Ah	2 x 12V/7Ah	2 x 12V/9Ah	2 x 12V/9Ah
Charge Current	1A				
Recharge/Charging Time	6-8 hours for Recharging up to 90% Capacity				
Backup Time	~16 min.	~20 min.	~30 min.	~50 min.	~50 min.
PROTECTION					
Full Protection	Overload, Short Circuit, Battery Charge-Discharge Protection				
INDICATION					
Display	LED		LCD		
ALARM					
Battery Mode	Sounding every 10 seconds				
Low Battery	Sounding every 1 seconds				
Overload	Sounding every 0.5 seconds				
Fault	Continuously Sounding				
ENVIRONMENTAL					
Operating Temperature	0 ~ 40ºC				
Storage Temperature	-20ºC ~ 55ºC				
Relative Humidity	0 - 95ºC (Non Condensing)				
Audible Noise (at 1m)	≤40 dB				
COMMUNICATION					
Communication Port	USB				
Software	Windows Family / Linux / Mac				
DIMENSIONS & WEIGHT	**650**VA	**850**VA	**1200**VA	**1500**VA	**2200**VA
Dimensions WxDxH (mm)	101 x 298 x 142		150 x 353 x 162		
Packaging Dimensions WxDxH (mm)	142 x 332 x 213		192 x 405 x 235		

POWERPACK SE SERIES

1/2/3/6/10 kVA

1:1 PHASE

ONLINE UPS

HOME/OFFICE · DATA CENTER · MEDICAL · INDUSTRY · TRANSPORT · EMERGENCY

VFI TYPE — UPS ONLINE

TOWER

PF= 0.9 — POWER FACTOR

PLUG & LAY — PLUG & PLAY 1/2/3kVA

Service — SERVICE 6/10kVA

FEATURES

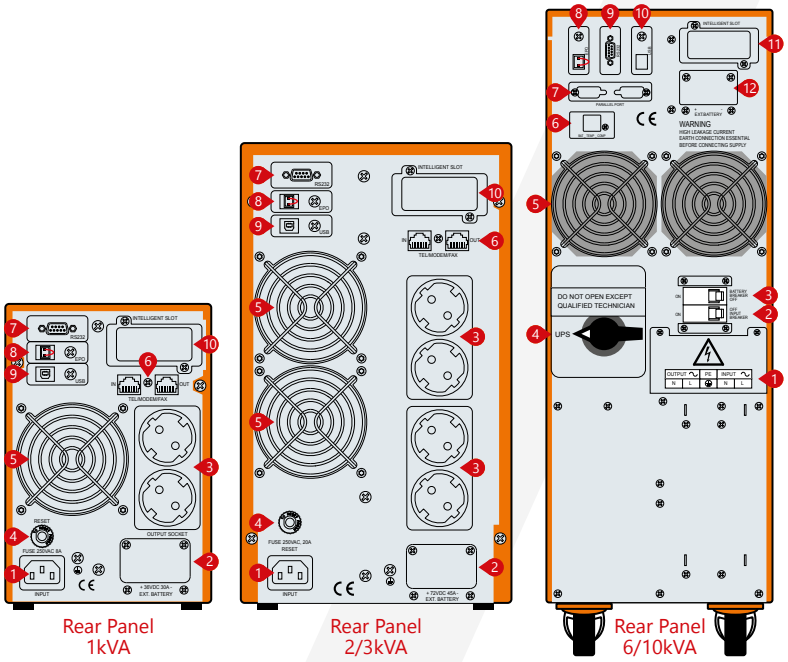
- **1/2/3/6/10kVA** FEATURES
  - High Frequency and True Double-Conversion
  - DSP (Digital Signal Processors) Technology
  - Input Power Factor Correction (PFC)
  - Wide Input Voltage Range (110~300V)
  - Output Power Factor 0.9
  - Cold Start
  - Auto Sensing Frequency
  - ECO Mode Operation for Energy Saving
  - Selectable Output Voltage via LCD
  - Output Bypass Settable via LCD
  - Power-On Self Test
  - Advanced Battery Management (ABM)
  - Short Circuit and Overload Protection
  - Automatically Charging Battery at UPS Off Mode
  - Fan Speed Auto Control when Load Varies
  - Standard RS232 Communication Port
  - USB/SNMP Communication Port *(Optional)*
  - Emergency Power Off (EPO) *(1/2/3kVA Optional)*
  - Extension Battery Bank *(Optional)*
- **+ 1/2/3kVA** FEATURES
  - RJ45 Protection
- **+ 6/10kVA** FEATURES
  - Manual Bypass
  - N+X Redundancy Parallel *(Optional)*

1/2/3kVA DETAILS

1. AC Input
2. DC Input
3. Outlet
4. Breaker
5. Fan
6. Modem/Tel/Fax
7. RS232
8. USB (Optional)
9. EPO (Optional)
10. SNMP/AS400 (Optional)

6/10kVA DETAILS

1. Input-Output Terminal
2. Input Breaker
3. Battery Breaker
4. Maintenance Switch
5. Fan
6. Battery Temperature Sensor
7. Parallel Card (Optional)
8. EPO
9. RS232
10. USB (Optional)
11. SNMP/AS400 (Optional)
11. BAT_NTC (Optional)



Rear Panel 1kVA — Rear Panel 2/3kVA — Rear Panel 6/10kVA

CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN Uninterruptible Power Supplies

MODEL												
CAPACITY		1kVA / 900W			2kVA / 1800W			3kVA / 2700W			6kVA / 5400W	10kVA / 9000W
INPUT												
Related Voltage		208 / 220 / 230 / 240 VAC										
Voltage Range		110 ~ 176 VAC (Linear Derating Between 50% and 100% Load); 176 ~ 280 VAC (No Derating); 280 ~ 300 VAC (Derating 50%)									Half Load (110-300) ±5 VAC, Full Load (160-300) ±5 VAC	
Frequency		40 ~ 70 Hz (Auto Sensing)										
Power Factor		≥0.99										
Bypass Voltage Range		-25% ~ +15% (Settable)									160V - Rated Output Voltage +32V	
OUTPUT												
Voltage Range		208 / 220 / 230 / 240 VAC (Settable via LCD)										
Power Factor		0.9										
Voltage Regulation		±%1										
Frequency		45 ~ 55 Hz or 55 ~ 65 Hz (Synchronized Range); 50 / 60 Hz ±0.1 Hz (Battery Mode)										
Waveform		Sinusoidal										
Crest Factor		3:1										
Harmonic Distortion		≤2% (Linear Load); ≤5% (Non-Linear Load)										
Transfer Time		Mains Mode to Battery Mode: 0ms Inverter Mode to Bypass Mode: 4ms (Typical)									AC Mode to Battery Mode: 0ms Inverter Mode to Bypass Mode: 0ms	
Overload		105% ~ 125%: Transfer to Bypass in 1min 125% ~ 150%: Transfer to Bypass in 30s >150%: Transfer to Bypass in 300ms									105% ~ 125%: Transfer to Bypass after 3min 125% ~ 150%: Transfer to Bypass after 30sec >150%: Transfer to Bypass after 100ms	
EFFICIENCY												
Mains Mode		≥%90			≥%91			≥%92			≥%92	≥%92
Battery Mode		≥%85			≥%86			≥%87			≥%91	≥%91
ECO Mode		≥%95			≥%96			≥%97			≥%98	≥%98
BATTERIES												
DC Voltage		12V	36V	36V	48V	72V	72V	72V	96V	96V	192V-240V	
Inbuilt Battery		2x7Ah	3x7Ah	External	4x7Ah	6x7Ah	External	6x7Ah	8x7Ah	External	16-20 x 7-9Ah	
Charging Current	Standard Model	1A	1A	6A	1A	1A	6A	1A	6A	6A	3.5A	
	Long Time Model										1A / 3.5A / 7A	
Recharge Time		8 hour										
ALARMS												
Utility Failure		Beep / 4sec										
Low Battery		Beep / 1sec										
Overload		Beep Twice / 1sec										
UPS Fault		Long Beep										
ENVIRONMENTAL												
Operating Temperature		0 ~ 40°C										
Relative Humidity		0 ~ 90% (Non-Condensing)									20-%90 RH @ 0-40°C (Non-Condensing)	
Noise Level		≤45 dB (1m)									≤50 dB (1m)	
COMMUNICATION												
RS232 (Standard)/USB (Optional)		Windows®98/2000/2003/XP/Vista/2008/Windows®7/8/10										
SNMP (Optional)		Power Management from SNMP Manager and Web Browser										
STANDARDS												
Safety		CE LVD										
EMC		CE EMC										
DIMENSIONS & WEIGHT		1kVA			2kVA			3kVA			6kVA	10kVA
Dimensions WxDxH (mm)		144x336 x214	144x336 x225	144x336 x214	191x418x335			191x418 x335	191x464 x335	191x418 x335	191x487x715	
Packaging Dimensions WxDxH (mm)		232x417 x318	230x440 x330	232x417 x318	318x533x471			318x533 x471	320x573 x471	318x533 x471	286x614x780	
Net Weight (kg)		9.5	13	6	18	25.7	10.5	27.2	32	11	64.1	70.8
Gross Weight (kg)		10.5	14.2	7	19.5	27.4	12	29	34	12.5	72.2	78.9

POWERPACK SE SERIES

10/15/20 kVA

3:1 PHASE

ONLINE UPS

HOME/OFFICE · EMERGENCY · MEDICAL · INDUSTRY · DATA CENTER · TRANSPORT

VFI TYPE — UPS ONLINE

TOWER

PF= 0.9 — POWER FACTOR

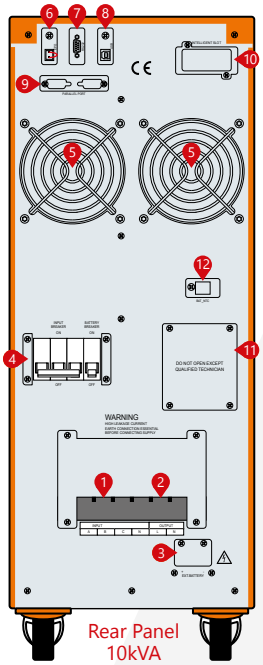
Service — SERVICE

FEATURES

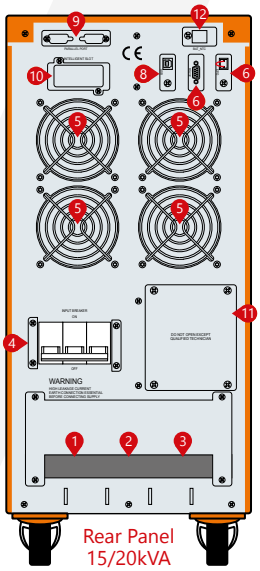
- High Frequency and True Double-Conversion
- DSP (Digital Signal Processors) Technology
- Input Power Factor Correction (PFC)
- Wide Input Voltage Range (110~300V)
- Output Power Factor 0.9
- Optimized Battery Configuration: 192V / 240V
- Cold Start
- Auto Sensing Frequency
- ECO Mode Operation for Energy Saving
- 50Hz/60Hhz Frequency Conversion Mode
- Selectable Output Voltage via LCD
- Selectable Battery Shutdown Voltage (Eod) via LCD
- Selectable Input Mode via LCD (3:1 or 1:1)
- Power-On Self Test
- Advanced Battery Management (ABM)
- Short Circuit and Overload Protection
- Automatically Charging in Off Mode
- Fan Speed Auto Control when Load Temperature Varies
- Generator Compatible
- Standard RS232/USB Communication Port
- Standard Emergency Power Off (EPO)
- RS485/SNMP/AS400 Communication Port *(Optional)*
- Extension Battery Bank *(Optional)*
- Manual Bypass
- N+X Redundancy Parallel *(Optional)*

DETAILS

1. AC Input
2. Output
3. Ext. Battery
4. Breaker
5. Fan
6. EPO
7. RS232
8. USB
9. Parallel Card *(Optional)*
10. SNMP/AS400 *(Optional)*
11. Manual Bypass
12. BAT_NTC *(Optional)*



Rear Panel 10kVA



Rear Panel 15/20kVA

CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN® Uninterruptible Power Supplies

MODEL				
Power Watt		**10**kVA / **9**kW	**15**kVA / **13.5**kW	**20**kVA / **18**kW
INPUT				
Related Voltage		3 : 1 : 360V / 380V / 400V / 415 VAC 1 : 1 : 208V / 220V / 230V / 240 VAC (Settable via LCD)		
Voltage Range		3 : 1 : Half Load (190 ~ 520) ±5 VAC, Full Load (277 ~ 520) ±5 VAC		
Frequency		40 ~ 70 Hz (Auto Sensing)		
Power Factor		3 : 1 ≥ 0.95; 1 : 1 ≥ 0.99		
BYPASS				
Voltage Range		160V Rated Output Voltage +32V		
Frequency		50 / 60 Hz ±5 Hz		
OUTPUT				
Voltage Range		208V / 220V / 230V / 240 VAC (Settable via LCD)		
Voltage Regulation		±1%		
Frequency		Synchronized with Utility in Mains Mode; 50 / 60 ±0.2 Hz in Battery Mode		
Waveform		Sinusoidal		
Crest Factor		3:1		
Harmonic Distortion		≤2% (Linear Load); ≤5% (Non-Linear Load)		
Transfer Time		0 ms		
Overload Capability		105% ~ 125%: Transfer to Bypass in 3min 125% ~ 150%: Transfer to Bypass in 30sec >150%: Transfer to Bypass in 1sec		
EFFICIENCY				
Mains Mode		≥92%		
Battery Mode		≥91%		
ECO Mode			≥98%	
BATTERIES				
DC Voltage		192 VDC / 240 VDC		
Inbuilt Battery		20 x 7Ah (16 Opt.)	-	-
Charge Current	Standard Model	3.5A	-	-
	Long Time Model	1A / 3.5A / 7A		
Recharge Time		8 hour		
ALARMS				
Utility Failure		Beep / 4sec		
Low Battery		Beep / 1sec		
Overload		Beep Twice / 1sec		
UPS Fault		Long Beep		
ENVIRONMENTAL				
Humidity		20-90% RH @ 0-40ºC (Non-Condensing)		
Noise Level		≤55 dB (1m)	≤60 dB (1m)	
COMMUNICATION				
RS232 (Standard) / USB (Optional)		Supports Windows® 98/2000/2003/XP/Vista/2008/Windows® 7/8/10		
SNMP (Optional)		Power Management from SNMP Manager and Web Browser		
DIMENSIONS & WEIGHT		**10**kVA	**15**kVA	**20**kVA
Dimensions WxDxH (mm)		262 x 580 x 732 (S)	262 x 580 x 628 (H)	
Packaging Dimensions WxDxH (mm)		359 x 687 x 937 (S)	359 x 687 x 832 (H)	
Net Weight (kg)		25.5 (H), 74.0 (S)	38.5 (H)	39.0 (H)
Gross Weight (kg)		29.0 (H), 83.5 (S)	47.0 (H)	47.5 (H)

• (S) means standard model, (H) means long time model.

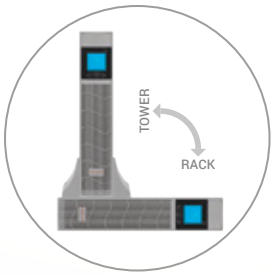
POWERPACK SE RT SERIES

1/2/3/6/10 kVA

1:1 PHASE

ONLINE UPS

HOME/OFFICE · DATA CENTER · MEDICAL · INDUSTRY · TRANSPORT · EMERGENCY



VFI TYPE — UPS ONLINE

RACK/TOWER

PF= 0.9 — POWER FACTOR

PLUG & LAY — PLUG & PLAY 1/2/3kVA

Service — SERVICE 6/10kVA

FEATURES

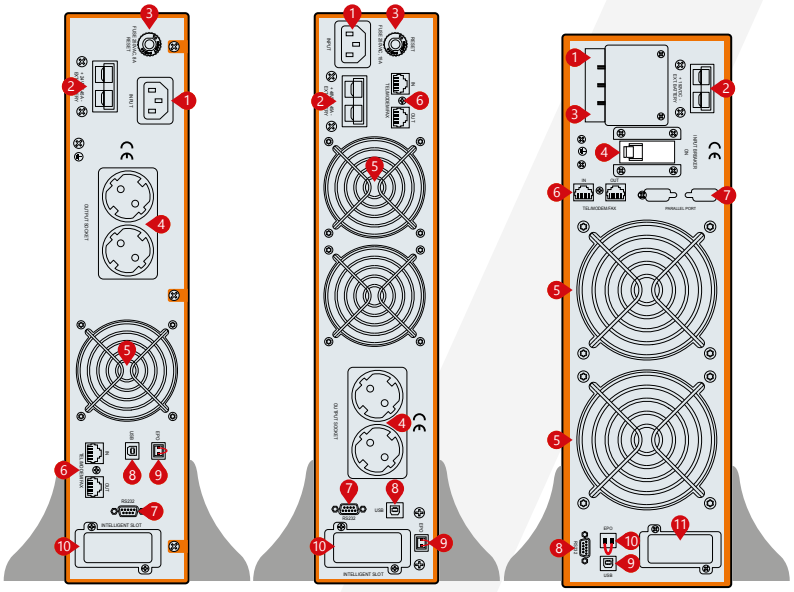
- **1/2/3/6/10kVA** FEATURES
  - High Frequency and True Double-Conversion
  - DSP (Digital Signal Processors) Technology
  - Input Power Factor Correction (PFC)
  - Wide Input Voltage Range (110~300V)
  - Output Power Factor 0.9
  - Cold Start
  - Auto Sensing Frequency
  - ECO Mode Operation for Energy Saving
  - Selectable Output Voltage via LCD
  - Output Bypass Settable via LCD
  - Power-On Self Test
  - Advanced Battery Management (ABM)
  - Short Circuit and Overload Protection
  - Automatic Charging in Off Mode
  - Auto Control Fan Speed when Loads Varies
  - Standard RS232 Communication Port
  - RJ45 Protection
  - USB/SNMP Communication Port *(Optional)*
  - Emergency Power Off (EPO) *(Optional)*
  - Extension Battery Bank *(Optional)*
  - Built-In Isolation Transformer *(Optional)*
- **+ 1/2/3/6/10kVA** FEATURES
  - Emergency Power Off (EPO)

1/2/3 DETAILS

1. AC Input
2. DC Input
3. Breaker
4. Outlet
5. Fan
6. Modem/Tel/Fax
7. RS232
8. USB (Optional)
9. EPO (Optional)
10. SNMP/AS400 (Optional)

6/10 DETAILS

1. AC Input
2. DC Input
3. Output
4. Breaker
5. Fan
6. Modem/Tel/Fax
7. Parallel Card (Optional)
8. RS232
9. USB (Optional)
10. EPO
11. SNMP/AS400 (Optional)



Rear Panel 1kVA · Rear Panel 2/3kVA · Rear Panel 6/10kVA

CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN Uninterruptible Power Supplies

MODEL																
CAPACITY		**1kVA / 900W**			**2kVA / 1800W**			**3kVA / 2700W**				**6kVA / 5400W**			**10kVA / 9000W**	
INPUT																
Rated Voltage		208 / 220 / 230 / 240 VAC														
Voltage Range		110~176 VAC (Linear Derating Between 50% and 100% Load); 176~280 VAC (No Derating); 280~300 VAC (Derating 50%)										Half Load (115-295) ±5 VAC, Full Load (165-295) ±5 VAC				
Frequency Range		45 ~ 70 Hz (Auto Sensing)										40 ~ 70 Hz (Auto Sensing)				
Power Factor		≥0.99														
Bypass Voltage Range		-25% ~ +15% (Settable)										160V - Rated Output Voltage +32V				
OUTPUT																
Voltage Range		208 / 220 / 230 / 240 VAC (Settable via LCD)														
Power Factor		0.9														
Voltage Regulation		±%1														
Frequency Range		45 ~ 55 Hz or 55 ~ 65 Hz (Synchronized Range); 50 / 60 Hz ± 0.1 Hz (Battery Mode)										Synchronized with Utility in Mains Mode: 50 / 60 Hz ±0.2 Hz (Battery Mode)				
Waveform		Sinusoidal														
Crest Factor		3:1														
Harmonic Distortion		≤2% (Linear Load); ≤5% (Non-Linear Load)														
Transfer Time		Mains Mode to Battery Mode: 0ms Inverter Mode to Bypass Mode: 4ms (Typical)										Mains Mode to Battery Mode: 0ms Inverter Mode to Bypass Mode: 0ms				
Overload Capability		105% ~ 125%: Transfer to Bypass in 1min; 125% ~ 150%: Transfer to Bypass in 30s; >150%: Transfer to Bypass in 300ms										105% ~ 125% for 3min 125% ~ 150% for 30s >150% for 1s				
EFFICIENCY																
Mains Mode		≥%90			≥%91			≥%92				≥%92			≥%92	
Battery Mode		≥%85			≥%86			≥%87				≥%91			≥%91	
ECO Mode		≥%95			≥%96			≥%97				≥%98			≥%98	
BATTERIES																
DC Voltage		24V	36V	36V	48V		72V	72V	96V	96V		192				
Inbuilt Battery		2x7Ah	3x7Ah	External	4x7Ah		External	6x7Ah	8x7Ah	External		16x7Ah			16x9Ah	
Charging Current	Standard Model	1A		6A	1A		6A	1A		6A		3,5A				
	Long Time Model											1A / 3A / 5A / 8A				
Recharge Time		8 hour														
ALARM																
Utility Failure		4s Per Beep														
Low Battery		1s Per Beep														
Overload		1s Twice Beep														
UPS Fault		Long Beep														
ENVIRONMENTAL																
Operating Temperature		0 ~ 40°C														
Relative Humidity		0 ~ 90% (Non-Condensing)										20-90% RH @ 0-40°C (Non-Condensing)				
Noise Level		≤50 dB (1m)										≤55 dB (1m)				
COMMUNICATIONS																
RS232 (Standard)/USB (Optional)		Windows®98/2000/2003/XP/Vista/2008/Windows®7/8/10														
SNMP (Optional)		Power Management from SNMP Manager and Web Browser														
STANDARDS																
Safety		CE LVD														
EMC		CE EMC														
DIMENSIONS & WEIGHT		**1kVA**			**2kVA**			**3kVA**				**6kVA**			**10kVA**	
Standard Model	Dimensions WxDxH (mm)	440x468x88 (2U)			440x658x88 (2U)		440x468x88 (2U)	440x658x88 (2U)	440x468x88 (2U) UPS 440x440x88 (2U) BAT	440x468x88 (2U)		440x555x132 (UPS), 440x555x132 (BAT) (3U)				
	Packaging Dimensions WxDxH (mm)	545x592x198			545x782x198		545x592 x198	545x782 x198	545x592x198 UPS 590x580x200 BAT	545x592 x198		535x660x215 (UPS), 540x685x235 (BAT)				
	Net Weight (kg)	12.26	13.78	7.58	22.73	25.86	9.66	29.26	9.45 UPS 27.2 BAT	10.04		16.4			17.1	
	Gross Weight (kg)	15.78	17.3	11.1	26.63	29.76	13.18	33.16	12.97 UPS 30.2 BAT	13.56		20.7			21.4	
Long Time Model	Dimensions WxDxH (mm)											440x555x132 (UPS), 440x555x132 (BAT) (3U)				
	Pack.Dimensions WxDxH (mm)											535x660x215 (UPS), 540x685x235 (BAT)				
	Net Weight (kg)											16.4 (UPS), 43.6 (BAT)			17.1 (UPS), 49.6 (BAT)	
	Gross Weight (kg)											20.7 (UPS), 47.1 (BAT)			21.4 (UPS), 53.1 (BAT)	

MST
SERIES

10-2000 kVA 3:3 PHASE

1-30 kVA 1:1 PHASE

STATIC VOLTAGE STABILIZER

INDUSTRY TRANSPORT MEDICAL

TOWER POWER FACTOR SERVICE

HIGHLIGHTS

- Microprocessor Controlled Voltage Stabilisation
- Precise Output Voltage Accuracy
- True Static-Modular Design with Thyristor Technology
- High Voltage Regulation Speed
- Maintenance Free

Highly Reliable and Endurable Static Design

- Microprocessor controlled Static design stabilizers automatically regulate and protect the loads against dangerous voltage changes.

- Compatible with all load types and offering independent phase control, they deliver ultra-fast response times in correcting under / over voltages, sags and surges - making them ideal for highly sensitive / mission critical loads and applications.

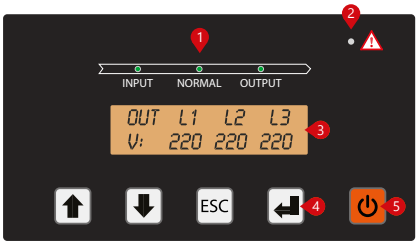
CE TSE TSE-HYB

POWER FORLIFE

Aytemiz MAKELSAN Uninterruptible Power Supplies

Standart Electrical Features

- Wide Input Voltage Range
- Precise Output Voltage Accuracy ±1% to ±5%
- Ultra Fast Voltage Regulation (500V/s)
- True 32-bit Microcontroller Controlled
- High Efficiency >97%
- Independent Phase Regulation to Correct Voltage aand Load Imbalance
- Electronic Protection Against to Over Load, Low Voltage, High Voltage, Over Temperature, Over Current and Short Circuit
- Overload Protection up to 150%
- Fast Responsive to Voltage Surges
- User Friendly, Easy and Comprehensive LCD Display and Mimic Diagram



1. Input Led
   Bypass Led
   Normal Led
   Output Led
2. Alarm/Warning Led
3. LCD Display
4. Menu Keys
5. On/Off Button

- Advanced Alarm Menu
- Manual Bypass
- Auto Restart when Mains Available
- Full Electronic Static Structure with No Moving Parts, Delivering a 'Maintenance Free' Voltage Regulation Solution
- Compact Design with High Quality Material and Minimum Malfunction Hazard
- Designed, Manufactured and Supplied to Comply with
- Fully CE Compliant and Labelled

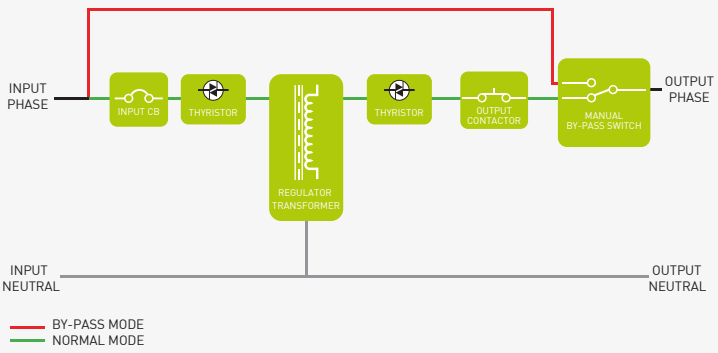
Flexibility

- Available at any required input voltage value and range.
- Available at any required output voltage value and tolerance from ±1% to ±5%.
- Output voltage can be adjusted by the LCD panel.
- Functionable with 50Hz and 60Hz.
- Optional MCCB can be added to the output to provide additonal protection.
- Isolation transformer or voltage changing auto-transformer can be added for both input and output.
- Indoor and outdoor special cabinets with various IP protection classes can be provided.
- Optional EMC-filters at both input and output.
- Optional high-voltage protection and surge arrester.
- Optional Modbus.

MICROPROCESSOR CONTROLLED THYRISTOR TECHNOLOGY

Based on high speed semiconductor (Thyristor) technology and all digital microprocessor control, MST Series Static Voltage Stabilizers continuously monitor the incoming supply. Should the incoming voltage rise or drop, the stabilizers will automatically control the output to ensure the voltage reaching the load equipment always remains constant at the requisite voltage.

Inbuilt spike protection ensures the load is continuosly protected against harmful mains born high energy spikes and surges.



Static Voltage Stabilizer Single Line Diagram

MODEL																						
Capacity (kVA)	10	15	22,5	30	45	60	75	100	120	150	200	250	300	400	500	600	800	1000	1250	1600	2000
INPUT																					
In. Vol. Correct. Interval	275~450 VAC (Optional: 190V~485V)																				
Operation Frequency	50~60 Hz (±10%)																				
Line Input Protection	Overcurrent Thermic Fuse																				
OUTPUT																					
Output Voltage	380 VAC RMS ±3% (Std.)				380 VAC RMS ±5% (Optional 1% to 5%)																
Overloading	10min 125% Load, 1min 150% Load, 10sec 200% Load, 20ms 500% Load																				
Correction Speed	500 Volt/sec																				
Upturn Period	20ms																				
Output Protection	Short Circuit, Overload, Overtemperature, Over and Low Voltage Protections																				
WORKING PRINCIPLE	Microprocessor Controlled, Full Automatic, Static, Semi Conductor Electronic Structure Maintenance Free																				
CONTROL PANEL																					
Display and Buttons	Load Level, Input-Output Voltage																				
Alert Message	Input Low/High, Output Low/High, Overtemperature																				
GENERAL																					
Efficiency	>97% (Full Load)																				
Mechanical Bypass	"Manually Controlled Line - PAKO SWITCH Selects Voltage Regulator" Switch Turn On/Off																				
Protection Level	IP20																				
Standard	TS EN 61000-6-2:2006, TS EN 61000-6-3:2007 (EMC), IEC60204-1+A1:2008 (LVD)																				
ENVIRONMENTAL																					
Operating Temperature	-10ºC~50ºC																				
Storage Temperature	-25ºC~60ºC																				
Relative Humidity	<90%, DIN (40040)																				
Altitude	<2000m																				
Noise Level	<50 dB				<55 dB			<58 dB			<58 dB					<63 dB					
DIMENSIONS & WEIGHT	10	15	22,5	30	45	60	75	100	120	150	200	250	300	400	500	600	800	1000	1250	1600	2000
Cabinet Dimensions (mm) Width	400				500			555			1400					2280				2430	
Cabinet Dimensions (mm) Depth	600				650			825			850					1110				1520	
Cabinet Dimensions (mm) Height	1187				1333			1559			1637					1730				1905	
Weight (Kg)	80	95	112	120	175	203	233	277	320	369	639	705	775	857	930	1670	1800	1890	2110	2820	3150

MODEL										
Capacity (kVA)		1	2	3	5	7,5	10	15	20	30
INPUT										
In. Vol. Correct. Interval		120~230 / 145~245 / 160~250 VAC								
Operation Frequency		50~60 Hz (±10%)								
Line Input Protection		Overcurrent Thermic Fuse								
OUTPUT										
Output Voltage		220 VAC RMS ±3% (Std.)		220 VAC RMS ±5% (Optional 1% to 5%)						
Overloading		10min 125% Load, 1min 150% Load, 10sec 200% Load, 20ms 500% Load								
Correction Speed		500 Volt/sec								
Upturn Period		20ms								
Output Protection		Short Circuit, Overload, Overtemperature, Over and Low Voltage Protections								
WORKING PRINCIPLE		Microprocessor Controlled, Full Automatic, Static, Semi Conductor Electronic Structure Maintenance Free								
CONTROL PANEL										
Display and Buttons		Load Level, Input-Output Voltage								
Alert Message		Input Low/High, Output Low/High, Overtemperature								
GENERAL										
Efficiency		>97% (Full Load)								
Mechanical Bypass		"Manually Controlled Line - PAKO SWITCH Selects Voltage Regulator" Switch Turn On/Off								
Protection Level		IP20								
Standard		TS EN 61000-6-2:2006, TS EN 61000-6-3:2007 (EMC), IEC60204-1+A1:2008 (LVD)								
ENVIRONMENT										
Operating Temperature		-10ºC~50ºC								
Storage Temperature		-25ºC~60ºC								
Relative Humidity		<90%, DIN (40040)								
Altitude		<2000m								
Noise Level		<50 dB								
DIMENSIONS & WEIGHT		1	2	3	5	7,5	10	15	20	30
Dimensions (mm)	Width	192		260				430		
	Depth	361		453				596		
	Height	352		416				777		

MSR
SERIES

6-2000 kVA 3:3 PHASE

1-50 kVA 1:1 PHASE

SERVO VOLTAGE STABILIZER

IP20, IP21, IP31, IP44, IP54,
Versions Available

INDUSTRY TRANSPORT MEDICAL

TOWER PF= 0.8 POWER FACTOR Service SERVICE

HIGHLIGHTS

- Servo Motor
- Microcontroller Controlled Voltage Regulation
- Precision Output Voltage Control
- Full Automatic

Reliable Solution for All Electrical Devices Requiring Precise and Fast Adjustment

- Aytemiz-Makelsan Servo Voltage Stabilizer comprise of variac, transformer, servo motor and microprocessor control circuit.

- Measuring the mains voltage with microprocessor electronic card, can arrange the position of servo motor and provide the output voltage 220/230/240/380/400 or 415VAC.

- It can be used initially in military and industrial, especially in main machines that require precise and fast adjustment, lifts and facilities with inrush current problems.

CE TSE TSE-HYB

Standart Electrical Features

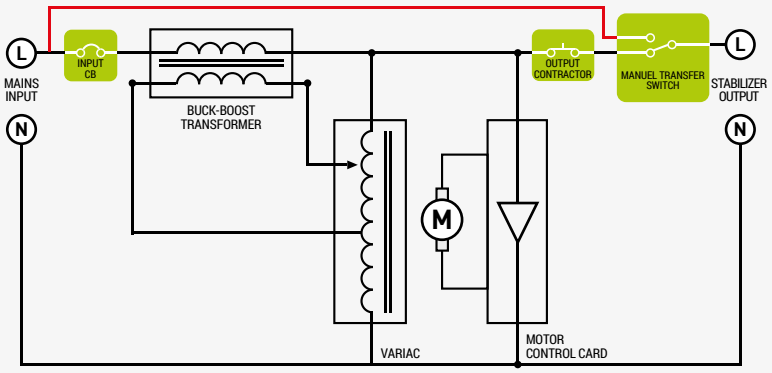
- Microprocessor Controlled
- Precise Output Voltage Correction Accuracy ±1%
- High Efficiency >96%
- Overcurrent, High Temperature, High-Low Voltage and Short Circuit Protection
- At 100%-125% Load 1min, At Above 125% Load 10sec
- Input Voltage, Output Voltage-Current, % Load and Transformer Temperature via User Friendly Panel
- Advanced Alarm Menu
- Manual Bypass
- Unaffected Chassis Technology by Dust, Moisture, Vibration
- Fan Cooling System
- Compact Design with High Quality Materials
- Minimum Fault Risk
- User Friendly LCD Display and Mimic Diagram
- CE Certified

Flexibility

- Available at any required input voltage value and range.
- Available at any required output voltage value and tolerance from ±1% to ±5%.
- Output voltage can be adjusted by the LCD panel.
- Functionable with 50Hz and 60Hz.
- Optional CB can be added to the output to provide additonal protection.
- Isolation transformer can be added for both input and output.
- Indoor and outdoor special cabinets with various IP protection classes can be provided.
- High voltage or lightning protection to input or output units can be added.

MICROPROCESSOR CONTROLLED SERVO TECHNOLOGY

The MSR Series Servo Voltage Regulator transfers the electrical energy received from the grid to the output and continuously monitors the output voltage magnitude. If there is a deterioration in the output voltage according to the desired output voltage values, the microcontroller control unit immediately changes the position of the variac with the help of the motor and ensures that the output voltage remains within the appropriate values. Thus, the Servo Voltage Regulator (Servo) obtains a voltage magnitude between the desired values at the output by adding (or subtracting) the voltage magnitude of the appropriate additional energy generated by the electrical energy it receives from the network to the voltage magnitude of the grid.



Servo Voltage Stabilizer Block Diagram

MODEL (3:3 Phase)																						
Capacity (kVA)		6	10,5	15	22,5	30	45	60	75	100	120	150	200	250	300	400	500	600	800	1000	1250	1600	2000
DIMENSIONS & WEIGHT																							
Cabinet Dimensions (mm)	Width	400						560			620		1500			1850			1800			610	
	Depth	650						950			1000		780			1100			1850			2890	
	Height	1135						1385			1700		1610			1820			1820			2080	
Net Weight (Kg)		65	120	135	154	183	237	330	356	456	545	565	1050	1150	1250	1500	2000	2500	2750	3500	3750	4500	5500
Noise Level		<50 dB																					

MODEL (1:1 Phase)													
Capacity (kVA)		1	2	3,5	5	7,5	10	15	20	25	30	40	50
BOYUTLAR & AĞIRLIK													
Cabinet Dimensions (mm)	Width	480				530			500				
	Depth	340				350			600				
	Height	250				250			935				
Net Weight (Kg)		15	20	29	40	47	55	75	90	110	130	165	185
Noise Level		<50 dB						<54 dB					

INPUT	
In. Vol. Correction Interval	**1:1 Phase:** 160~260 VAC • **3:3 Phase:** 275~450 VAC (Standard), 215~415 VAC (Optional)
Operation Frequency	47~65 Hz
Line Input Protection	Overcurrent, Low and High Voltage Protection (Optional)
OUTPUT	
Output Voltage	**1:1 Phase:** 220 VAC RMS ±2% • **3:3 Phase:** 380 VAC RMS ±1%
Overloading	At 100%-125% Load 1min, At Above 125% Load 10sec
Correction Speed	~90 Volt/sec
Upturn Period	~90 Volt/sec (160 VAC~250 VAC)
Output Protection	Short Circuit - Overcurrent Protection, Overvoltage Protection (Optional)
WORKING PRINCIPLE	Servo Motor, Microprocessor Controlled, Full Automatic
GENERAL	
Cooling	Smart Fan System
Measured Value Monitor	Monitoring Input Voltage, Output Voltage-Current,% Load and Transformer Temperature Values via MSR Panel
Total Efficiency	**1:1 Faz:** >96% • **3:3 Faz:** >96%
Mechanical Bypass	"Manually Controlled Line - PAKO SWITCH Selects Voltage Regulator" Switch Turn On/Off
Protection Level	IP 20
ENVIRONMENTAL	
Operating Temperature	-10°C~50°C
Storage Temperature	-25°C~60°C
Relative Humidity	<90%, DIN (40040)
Altitude	<2000m

CUSTOMIZED
POWER SOLUTIONS

OUTDOOR TRANSPORT INDUSTRY EMERGENCY

A full range of custom and rugged AC&DC Power Solutions to meet with your specific requirements and where a standard UPS will not be suitable.

SOLUTIONS

- Containerised Power Systems
- Outdoor AC&DC Power Systems
- Marine/Offshore AC&DC Power Systems
- Defence Power Systems
- Custom DC Systems/Chargers
- Standalone or Modular Design Tailored to the Requirements

CONTAINERISED POWER SYSTEMS

• Aytemiz-Makelsan's containerised solutions integrates Aytemiz-Makelsan UPS and Generator together where the UPS supports critical loads without interruption until the generator kicks in. With the "True no break power solution", business continuity without costly downtime is ensured.

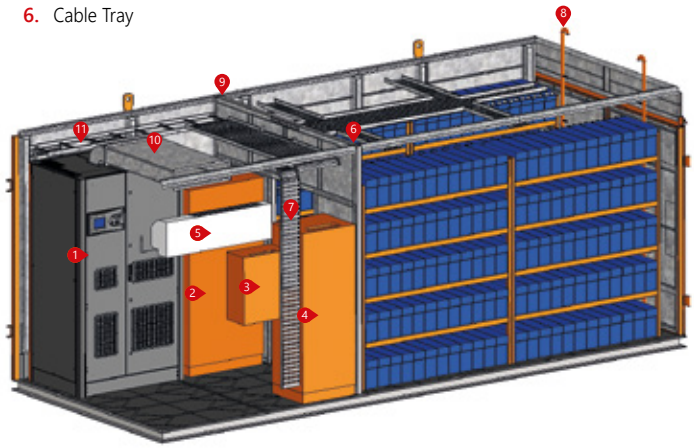
• Cost effective and energy saving - all in one solution. It features high reliability and security, fast deployment, best mobility, energy saving and is suitable for a wide variety of applications and also applicable to special mobile scenarios.

Telecom Marine ITS Traffic Military/Defence Power Distribution Oil and Gas Railway Alternative Power

Features

- Complete containerised UPS system up to 1000kVA 3Phase
- Up to 96% efficiency
- Integrated transfer and bypass switches
- Fully bunded ISO container
- Personnel and maintenance access doors
- Digital controls for UPS and switchgear
- Fire detection and protection
- Air conditioned UPS and battery compartments
- Environment control system.

1. Active Power Unit: UPS/ Power Converter/Freq. Converter etc.
2. Main AC In/Out Electrical Panel
3. Internal AC Distribution Electrical Panel
4. Battery Breaker Panel
5. AC Aircon
6. Cable Tray
7. Cable Tray
8. Hyrdojen Gas Release
9. Active Power Unit/ Battery Compartments Seperation
10. Air Baffle
11. Cables Conduit



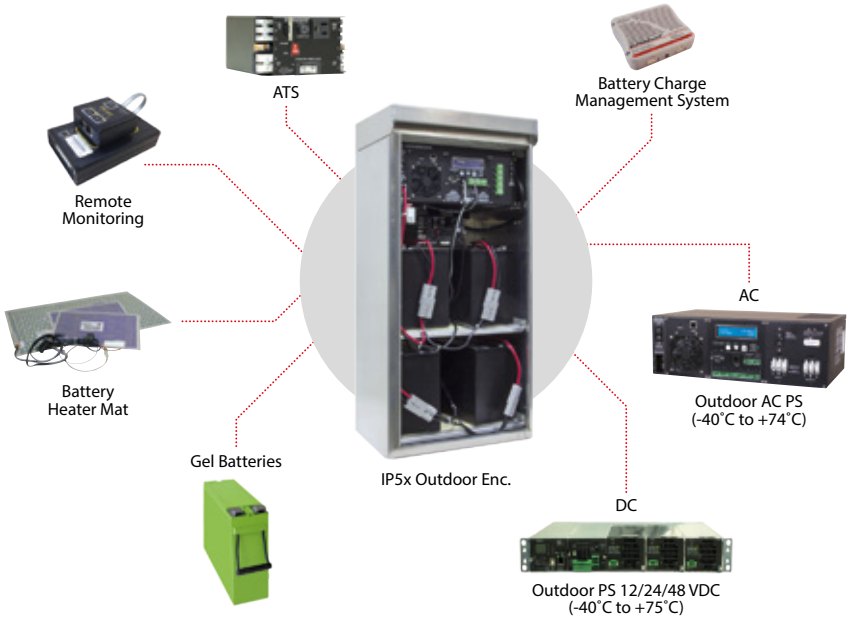
OUTDOOR AC&DC POWER SYSTEMS

Features

- Designed to operate under extreme temperature conditions (-40C to +74C)
- Made of rugged electric and electronic components
- Due to fact that the UPS is designed for extreme conditions, the elements that maket he UPS are also designed for extreme conditions
- Conformal coated PCB's protect against exposure to moisture and high humidity environment
- Thermostatically controlled battery heater mats available
- Temperature compensation utilized to effectively manage the battery charge voltage based on temperature
- Remote monitoring via SNMP web based communication
- Built in AVR (Automatic Voltage Regulation) allows for a wider input voltage range for World-wide use
- Enhanced surge protection capability (TVSS- Transient
- Voltage Surge Suppressor, LAP (Lighting Arrestor Protection)
- Enclosures meet specific ingress protection (IPXX) standard for extreme environments (Zone 4 earthquake, rain test, dust, impact test, etc)

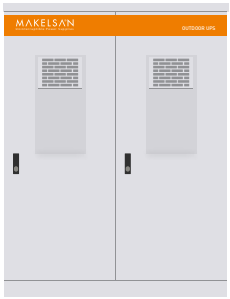
Applications

- Intelligent Transportation Systems
- Security Applications (Sea/Land/Airport)
- Telecom Applications
- Defence/Military Backup Systems
- Railway Applications
- Marine/Offshore Applications
- Industrial Applications



Outdoor AC&DC UPS Systems for Intelligent Transportation/Traffic/Security Sytems

Customized Railway UPS System can take Inputs from both a 25kV Overhead Line as well as a 400VAC Mains Supply. Available in Single Phase and Three Phase



IP 65 AC Standalone UPS Systems 1-20kVA with Built-in Batteries

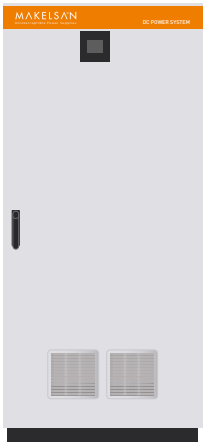
IP 31-41 High Reliable and Robust 3 Phase AC Standalone Aytemiz-Makelsan UPS Designed for Most Harsh Industrial Processes

CUSTOM DC SYSTEM/CHARGERS

Aytemiz-Makelsan offers a comprehensive range of DC power protection products available in standalone or 19" rack, modular configurations.

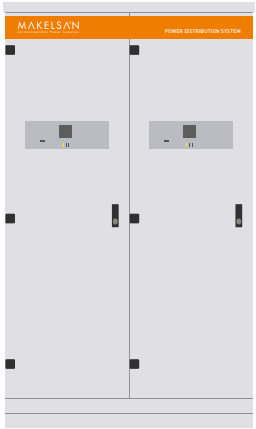
- Chargers - Single or Three Phase. 12/24/48/110/220VDC
- Power Supplies 12/24/48/110/220VDC
- DC UPS - 12-220VDC / 10A-10000A
- DC Rectifiers
- DC-AC Industrial Single/Three Phase Modular Inverters
- DC Load Distribution Panels

110VDC/200A, Hotswappable/Upgradable DC System in IP41 Cabinet with 2 Groups of 12V FT Batteries and Remote Access



110VDC/40-10000A DC Power System

8X2V3000Ah Battery Change Over System Easy Change Over of 2V 1000-3000Ah Telco Batteries for Test/Maintenance Purposes



48VDC Power Distribution Panel with Remote Monitoring of DC Voltage and Currents

MSW
SERIES

1 PHASE

12/24VDC: 10A-300A

SWITCH MODE (HF) BATTERY CHARGER

Usage Areas:
- Vessels and Yachts
- Shipyards
- Rail Systems
- Hydroelectric Power Plants
- Solar Power Plants
- Automobile Services
- Electrical Devices

HIGHLIGHTS

- Switch Mode Technology
- Voltage Controlled Automatic Charging
- Can Be Used as DC Power Supply
- 1 Phase & 3 Phase Wide Power Range
- High Efficiency and Reliability
- Electronic Protections
- Up to 30% Energy Saving

New Generation Switch Mode Charging Rectifiers

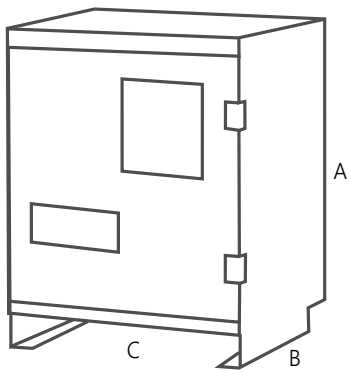
- Aytemiz-Makelsan Switch Mode Charging Rectifiers are designed with the state of the art technology for charging batteries and DC energy needs of devices supplied by direct current.

- Batteries would be charged much safer with the improved software and special charging program. Non-complex structure, easy maintenance properties, user friendly program and other superior features will meet all requirements.

- The most important feature of the device is it can be used as supply source as well as a battery charger. Besides low ripple factor increases the battery life. It's an ideal solution for where device weight and dimensions are problem.

CE TSE TSE-HYB

MODEL	
INPUT	
Input Phase	1 Phase - 2 Phase - 3 Phase (Special Design)
Input Voltage Tolerance	±10%
Input Frequency	50 - 60 Hz
Power Factor	0.98
THDi	<%10
OUTPUT	
Output Current	10A - 300A
Output Voltage	12V - 24V
Ripple	≤1 Ripple
GENERAL	
Cooling	Air Cooling
Isolation Voltage	1500 VAC Input / Chassis Bridge, 500 VAC Output / Chassis Bridge, 500 VAC Between Input and Output
Insulation Class	IP 20 - RAL 7032 (Special Design)
Efficiency	90%
Operating Temperature	-20/50°C
Operating	Ability to set Charge Mode for all Battery Types
Input / Output Connections	Serial Connector - W Otomation
PROTECTION	
Heat Protection	Input / Output Overtemperature Protection
Measure	Output Overcurrent Protection - DC High Low - DC Leakage - Mains Failure
TECHNOLOGY	
IGBT	Switch Mode Technology
Standard	ISO 9001 - LVD - EN 62040 -1 - EMC
INDICATORS	
LCD Panel	2 x 16 - 4 x 16 Line
PLC	S71200 - S7300
Otomation	Modbus / Profibus / ProfiNET / RS 232 / RS 485



DIMENSIONS

CODE	A (mm)	B (mm)	C (mm)
MKL 1	340	240	150
MKL 2	340	240	200
MKL 3	290	260	370
MKL 4	340	280	400
MKL 5	400	320	450
MKL 6	580	390	500

OPTIONS

- DC +/- Ground Leakage Protection
- Modbus RTU Communication
- Individual Outputs for Battery and Load
- Deep Discharge Protection (LVD)
- Output Dropper Diode
- Additional Battery Fuse
- Temperature Comp. Battery Charge Voltage
- Power Fault Detection Dry Contact
- Battery Management, Test
- Rackmounted Chassis/Integrated Battery Racks / (IP31/IP42/IP54/IP65)
- Input Isolation Transformer / 6 Pulse Structure

MTT
SERIES

3 PHASE 12VDC: 50A-200A, 24VDC: 30A-300A
48VDC: 30A-150A, 110/220VDC: 30A-200A

1 PHASE 12/24VDC: 10A-300A, 36/48VDC: 10A-150A
110VDC: 10A-200A, 220VDC: 10A-100A

THYRISTOR CONTROLLED BATTERY CHARGER

Usage Areas:

- Transformer Centers
- Vessels and Yachts
- Shipyards
- Rail Systems
- Solar Power Plants
- Automobile Services
- Hospitals
- Electrical Devices
- Energy Generation
- Transmission and Distribution Centers
- Petroleum and Natural Gas Industry
- Mining Industry

HIGHLIGHTS

- Thyristor Controlled, Full Automatic System with Isolation Transformer
- Available for Using as DC Current Supply
- All Operating Values Adjustable
- Excess/Low Voltage, Over Current, Short Circuit Protection

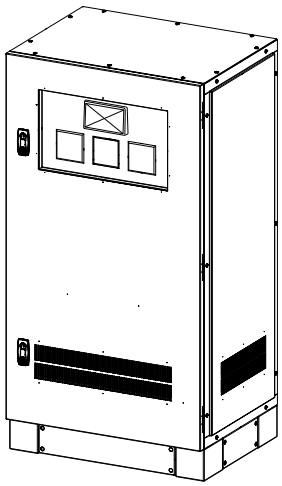
Thyristor Controlled Transformer Battery Charging Rectifier

- Transformer battery charging devices are AC/DC rectifiers with automatic constant voltage and constant current properties. The isolation transformer and the load and batteries are completely isolated from the grid system.

- Thyristor control ensures fast regulation and voltage distortions in the mains do not affect the batteries and loads. With the L-C filters on the output, the AC output fluctuation on the DC is less than 1%, helping to maximize the life of the charged battery pack.

CE TSE TSE-HYB

MODEL		
INPUT		
Phase	3 Phase	1 Phase
Voltage	380 V, 400 V, 415 V	220 V, 230 V, 240 V
Voltage Tolerance	±20%	
Frequency	50/60Hz (±5%)	
Power Factor	>0.8	
THDi	<30%	
OUTPUT		
Voltage	12 / 24 / 48 / 110 / 220 VDC	
Voltage Tolerance	±1%	
Current	Up to 300A	
Fast Charging (Boost) Voltage	Up to 120% of the Float Voltage	
Ripple	±1% RMS AC	
Dynamic Response	±2%	
Output Protection	Electronic Short Circuit / Over Voltage / Over Temperature / Over Current	
	Reverse Voltage (Reverse Connection) Protection	
INDICATOR/COMMUNICATIONS		
LCD Indicator	Voltage, Current, Temperature and Status Information	
LED Indicator	Mains, Normal, Output, Fault	
Alarm	Mains Out of Limit, Fault (Adjustable)	
Communication	RS485 / Modbus Communication Feature	
NTC Input	Battery Temperature Compensation	
Parallel	Redundant Operation with Active or Passive Load Sharing Option	
Programmed Operation	Special Process is Applied for Each Process	
Input / Output Connection	Thermic Magnetic Switch / Copper Bus Bar	
GENERAL		
Topology	Isolation Transformer, Thyristor Phase Angle Controlled	
Electrical Standards	EN60146-1-1, EN60335-1 / EN60335-2-29/A2(LVD)	
	EN61000-6-2 / EN61000-6-4 (EMC)	
Cooling	Forced (Fan)	
Isolation Voltage	2500VAC Output/Chassis Bridge	
Efficiency	>85%-92%	
Operating Temperature	0-50°C	
Humidity	5%-90%	
Protection Class	IP20-IP54	
Altitude	Max. 2000m	



OPTIONS

- Individual Outputs for Battery and Load
- Additional LVD Contactor Separating Load and Battery from each other
- Battery Racks Integrated into the Rectifier
- Chassises with Different Protection Class (IP31/IP42/IP54/IP65)
- DC +/- Ground Leakage Protection
- Redundant Operation with Active or Passive Load Sharing Option
- Battery Monitoring / Management System (BMS)
- Analog Hand Measuring Instruments
- Battery Charge Temperature Compensation
- ModBUS Communication

ISOLATION TRANSFORMERS

SERIES

5-1200 kVA 3 PHASE

1-25 kVA 1 PHASE

MEDICAL INDUSTRY TRANSPORT

Usage Areas:

- UPS Systems
- Medical Devices
- CNC Machines
- Ships and Boats
- Shipyards
- Metal Processing Plants
- Rectifier and Battery Chargers
- Industrial Machines Power Supply Units

HIGHLIGHTS

- Reliable, Electrical Isolation
- Suppresses Electrical Noise
- Ensures Complete Safety of Equipment

Excellent Protection & High Level of Isolation

- An isolation transformer is the best way to establish a new neutral-ground bond, in order to correct common mode and other grounding problems.

- Isolation transformer provides excellent protection from all types of N-G disturbances (impulses, RMS voltage, and high frequency noise).

CE TSE TSE-HYB

FEATURES

- Input Voltage : 230 VAC Ph+N / 400 VAC Ph-Ph (Three Phase)*
  220 VAC Ph+N (Single Phase)*
- Output Voltage : 230 VAC Ph+N / 400 VAC Ph-Ph (Three Phase)*
  110 VAC Ph+N (Single Phase)*
- Frequency : 50 - 60 Hz
- Windings : Aluminum or Copper
- Connections : Star, Delta, Zig-Zag
- Protection Class : Standard**
- Isolation Class : Standard***
  Varnish Under Vacuum According to Isolation Class
- Cooling : Natural**
- Ambient Temparature : -10°C+40°C
- Storage Conditions : -20°C+70°C
- Connections : As Per to Customer Requirements:
  All Types of Terminals and Lugs

* It can be produced in different voltages and powers as requested.
** Can be changed upon request.
*** Can be produced in H (180°C) class upon request.

3 PHASE ISOLATION TRANSFORMERS				
Power	Chassis Dims. (WxHxD)	Chassis Weight	Connection	Wire
5kVA	630 x 715 x 332	70	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
10kVA	805 x 700 x 665	110	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
15kVA	650 x 459 x 564	120	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
20kVA	800 x 800 x 647	200	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
30kVA	800 x 800 x 647	240	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
40kVA	800 x 800 x 647	285	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
60kVA	905 x 1000 x 780	355	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
72kVA	905 x 1000 x 780	385	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
80kVA	905 x 1000 x 780	410	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
100kVA	905 x 1000 x 780	430	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
120kVA	905 x 1000 x 780	470	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
150kVA	905 x 1000 x 780	550	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
200kVA	1120 x 1000 x 842	690	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
250kVA	1120 x 1000 x 842	790	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
300kVA	1200 x 1100 x 800	900	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
450kVA	1200 x 1100 x 800	1100	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
500kVA	1200 x 1100 x 800	1280	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
720kVA	1285 x 1505 x 1070	1850	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
800kVA	1510 x 1690 x 1380	2100	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
1000kVA	1510 x 1690 x 1380	2500	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM
1200kVA	1510 x 1690 x 1380	2750	Y-Y/Δ-Y/Y-Δ/Δ-Δ	COPPER/ALUMINIUM

1 PHASE ISOLATION TRANSFORMERS				
1kVA	306 x 290 x 340	20	1 Phase	COPPER/ALUMINIUM
2kVA	306 x 290 x 340	24	1 Phase	COPPER/ALUMINIUM
5kVA	625 x 800 x 495	75	1 Phase	COPPER/ALUMINIUM
10kVA	625 x 800 x 495	105	1 Phase	COPPER/ALUMINIUM
15kVA	625 x 800 x 495	120	1 Phase	COPPER/ALUMINIUM
25kVA	600 x 700 x 638	180	1 Phase	COPPER/ALUMINIUM

ROTABLOC® RBT
SERIES

400-2000 kVA
DYNAMIC UPS

DATA CENTER · MEDICAL · TRANSPORT · INDUSTRY · EMERGENCY

97% Efficiency

UPS ROTARY TYPE · PF= 0.8 POWER FACTOR · Service SERVICE

HIGHLIGHTS

- Total Power Failure Protection
- Outstanding Voltage Conditioning
- Unrivaled Lowest Total Cost of Ownership
- Electrical Coupling with Existing or New Genset

Robust Rotary Technology

- The RBT system consists of a standard synchronous generator with no special windings and a simple steel flywheel. The low speed shaft extends bearing life and reduces maintenance.
- The ROTABLOC® machine is very robust as critical functions do not use fragile components such as power electronics, power capacitors, electro-chemical batteries, active magnetic bearings, electro-mechanical or mechanical friction clutches.

CE UL

Standard Features

- Input / Output Power Measurement
- Fully Automatic Operation
- Voltage-free Interface Signals
- Automatic By-pass

Options

- Automatic Lubrication System
- Plug & Run Parallel Working
- Supervision Software
- Containerized Solution
- Bearing Monitoring
- Customized Switchgear (Form 4, NEMA)
- Soundproof Enclosure
- Tropical Conditions

Green Technology

Our highly efficient UPS supports your aims to minimize your environmental impact and mitigate the efects of rising energy costs in the future. Our ROTABLOC® design, almost all steel and copper, ensures that it is over 99.97% recyclable.

- No batteries - no need for expensive replacement cycle / no costly disposal of hazardous materials.
- No air conditioning required - providing a/c for battery rooms is a significant cost and impacts the environment.
- Dynamic Autonomy Control (DAC): Automatic speed adaptation for optimum eciency at partial load with FULL critical load protection.
- 91% of all voltage interruptions last less than 1 second (European urban locations) the RBT protects the load without generator starts*.

*This is configurable to maximize RBT power output or compensate for short interruptions.

ROTABLOC® RBT Range

TYPE		POWER	
50 Hz or 60 Hz		kVA	kW
RBT-400	50/60	400	320
RBT-500	50/60	500	400
RBT-500 HP (PF:1)	50/60	500	500
RBT-630	50/60	630	504
RBT-800	50/60	800	640
RBT-1000	50/60	1000	800
RBT-1250 TW	50/60	1250	1000
RBT-1600 TW	50/60	1600	1280
RBT-1750 TW	50/60	1750	1400
RBT-2000 TW	50/60	2000	1600

Normal Operation

- In normal operation the RBT protects the electrical load from power quality problems eliminating harmonics, flicker, voltage spikes and sags. This power quality protection prevents wear on your facilities infrastructure – including damage to motors and pumps, and reduces the maintenance downtime necessary to repair or replace such assets. These issues can be over 95% of power problems faced by your facility each year.

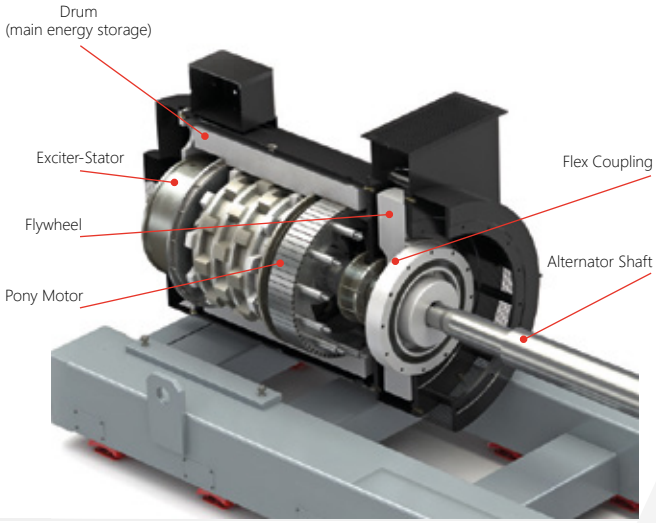
Mains Failure

- During mains failure the RBT protects the load and maintains the power supply at the precise voltage and frequency by supplying energy to the alternator from the Accumulator without need for electronic power conversion.
- Whilst these 'blackout' events are fewer in number, for organizations where power is always required during operation, interruption of mains electricity leading to loss of production (including restart time), wastage of part processed materials and a dented reputation could be very costly.

Extended Mains Failure

- Under extended mains failure, the load is automatically transferred to your chosen back-up energy source, usually a diesel genset. Once a stable mains supply returns the RBT will safely transfer the load back and be ready to act again.

Twin Rotabloc 1600kW



Simply Reliable Solutions to Power Quality Issues

Data Centres, Banking, Telecommunications, Airports, Healthcare, Industrial, Manufacturing, Government, Defense, Water, Treatment, Alternative Energy, Stadiums, Research, in fact all installations where continuous running is required, demand a filtered, continuous and sustainable power supply solution.

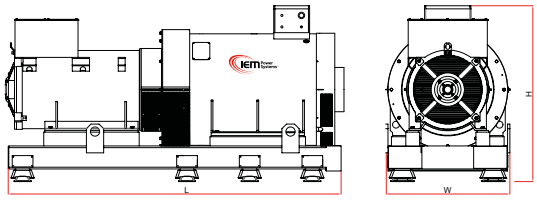
Features	Benefits
Outstanding voltage conditioning	• Protects equipment against mains voltage fluctuations, sags and microcuts • Naturally compensates power factor without need for PFC equipment • Filters load harmonics and voltage harmonics from mains • Eliminates flicker
Total power failure protection	• Sustainable continuous power supply • Ride-through mode covers 90% of mains failures without genset start • Flexible DRUPS solution when configured with standard genset
Robust rotary technology	• Conventional electrical / mechanical machine • High reliability • Low cost maintenance
High efficiency	• Energy saving • Unrivaled low Total Cost of Ownership (TCO) • Green technology
High short-circuit power	• Fast fault-clearing capacity ensuring protections selectivity • Suitable for high peak currents (motors and mechanical loads) • Suitable for high crest factors (non-linear loads)
Modular and resilient “Plug & Run” paralleling	• Flexibility from day one • Scalability for future extension • High resilience thanks to full redundancy without single point of failure • Ideal for Tier III / Tier IV applications (Uptime Institute)
Easy interfacing	• User-friendly digital display (HMI) • Basic interface via simple contacts • Powerful communication features : - SCADA / BMS interface via MODBUS RTU/TCP - Internet access - PC supervision - Remote monitoring, alarming and paging features
Low maintenance	• Simple maintenance operations • Unaffected up-time: no need to stop UPS during maintenance • Automatic Lubrication System for maximum reliability and lowest TCO

Medium Voltage

- Recognition of the advantages of Medium Voltage (MV) systems in facilities with high power requirements is growing. The benefits include: ease of power distribution, lower TCO, improved safety, reduced maintenance / greater reliability, enhanced flexibility in current and future power infrastructure and improved green credentials with lower embodied energy and lower energy usage.
- Aytemiz-Makelsan can provide DRUPS systems that will support MV in your facility, delivering high quality, continuous MV power to your operation.
  We are experts in Medium Voltage and can utilize Vesta-AR arc-resistant metal-clad switchgear, is the leading MV solution for distributing power safely and eciently throughout your building.

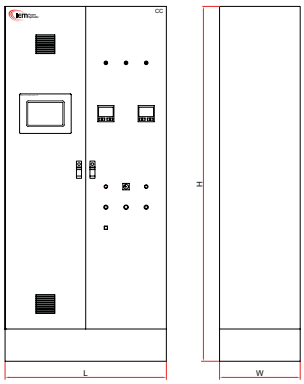
DETAILS

ROTABLOC® RBT SERIES 400 kVA



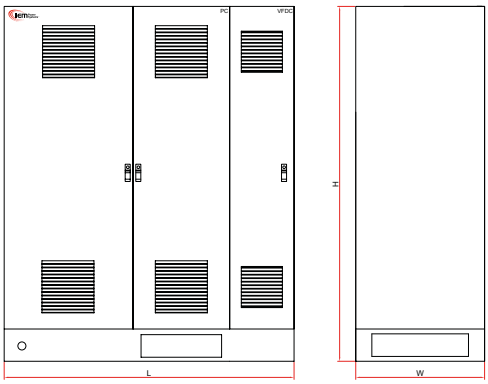
L x W x H 2895 x 1080 x 1529 mm
Net weight 7850 kg
Protection IP23

Control Cabinet



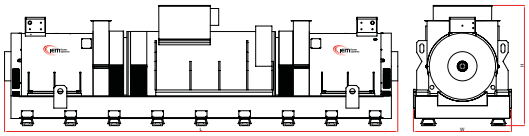
L x W x H 1000 x 500 x 2200 mm
Net weight 305 kg
Protection IP43

Power Cabinet



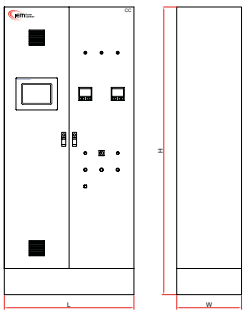
L x W x H 1800 x 800 x 2200 mm
Net weight 1575 kg
Protection IP43

ROTABLOC® RBT SERIES 2000 kVA



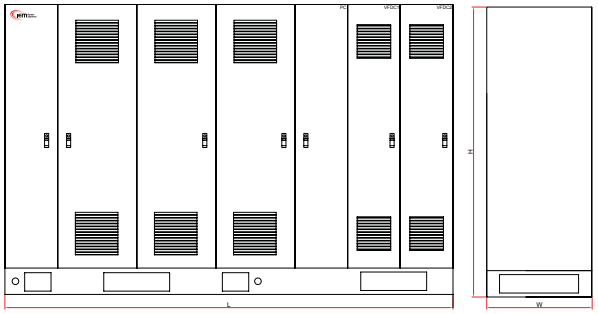
L x W x H 6058 x 1510 x 1852 mm
Net weight 22340 kg
Protection IP23

Control Cabinet



L x W x H 1000 x 500 x 2200 mm
Net weight 305 kg
Protection IP43

Power Cabinet



L x W x H 4200 x 800 x 2200 mm
Net weight 4590 kg
Protection IP43

Performances and Characterisitics

MODEL	RBT-400	RBT-500	RBT-500HP	RBT-630	RBT-800	RBT-1000	RBT-1250TW	RBT-1600TW	RBT-1750TW	RBT-2000TW
Voltage	3 x 400 / 480 V									
Frequency	50 / 60 Hz									
Nominal Phase Current	577 A	722 A	722 A	909 A	1155 A	1443 A	1804 A	2309 A	2526 A	2887 A
Protection by Upstream Breaker	630 A	800 A	1000 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	3200 A
Nominal Apparent Power	400 kVA	500 kVA	500 kVA	630 kVA	800 kVA	1000 kVA	1250 kVA	1600 kVA	1750 kVA	2000 kVA
Nominal Active Power	320 kW	400 kW	500 kW	504 kW	640 kW	800 kW	1000 kW	1280 kW	1400 kW	1600 kW
Nominal cos	0.9 Leading to 0.8 Lagging									
Efficiency at Nominal Load	95.3%	95.8%	96.5%	95.5%	96.4%	96.8%	95.5%	96%	95.5%	96%
Autonomy (Adjustable)	12s				11.3s	10s	12s	11.3s	11.4s	10s
Maximum Energy Storage	7.2 MJ					8.0 MJ	14.4 MJ	14.4 MJ	16 MJ	
Ambient Temperature	0-40°C / 32-104°C									
Max Power Dissipation for Ventilation Design	25 kW	30 kW	30 kW	35 kW	40 kW	50 kW	70 kW	80 kW	90 kW	100 kW
Altitude (Without de-rating)	≤1000 m / 3280 ft									
Humidity	≤90%									

FORLIFE

Aytemiz
MAKELSAN®
Uninterruptible Power Supplies/Generator

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AYTM

HEADQUARTER & UPS FACTORY

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