

# 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



POWER FACTOR



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.



POWER  
FORLIFE

**Aytemiz**  
**MAKELSAN**  
Uninterruptible Power Supplies

## Standart Electrical Features

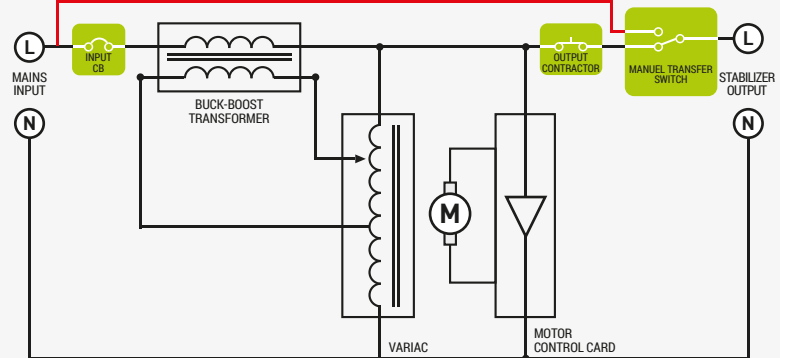
- Microprocessor Controlled
- Precise Output Voltage Correction Accuracy  $\pm 1\%$
- High Efficiency  $> 96\%$
- Overcurrent, High Temperature, High-Low Voltage and Short Circuit Protection
- At 100%-125% Load 1min, At Above 125% Load 10sec
- Input Voltage, Output Voltage-Current, % Load and Transformer 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  $\pm 1\%$  to  $\pm 5\%$ .
- Output voltage can be adjusted by the LCD panel.
- Functionable with 50Hz and 60Hz.
- Optional CB can be added to the output to provide additional 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

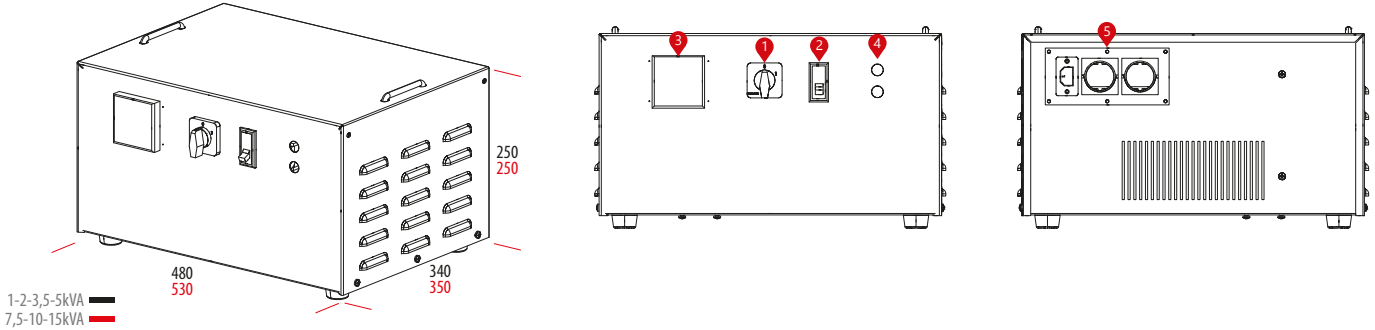
The MSR Series Servo Voltage Regulator transfers the electrical energy received from the grid to the output and continuously monitors the output voltage magnitude. If there is a deterioration in the output voltage according to the desired output voltage values, the microcontroller control unit immediately 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

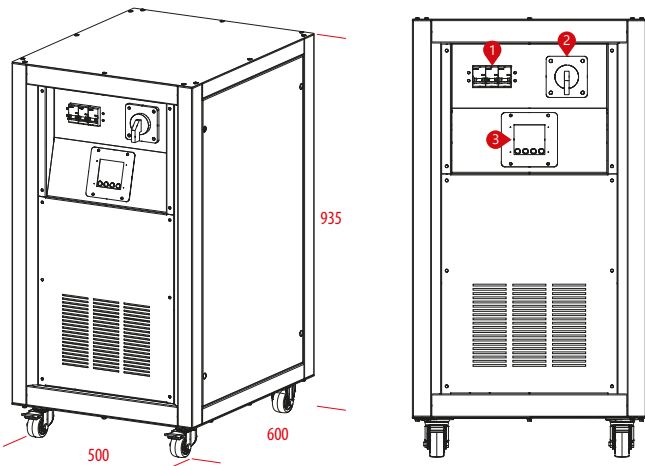
DETAILS

**MSR** SERIES 1-2-3,5-5-7,5-10-15 kVA 1:1F

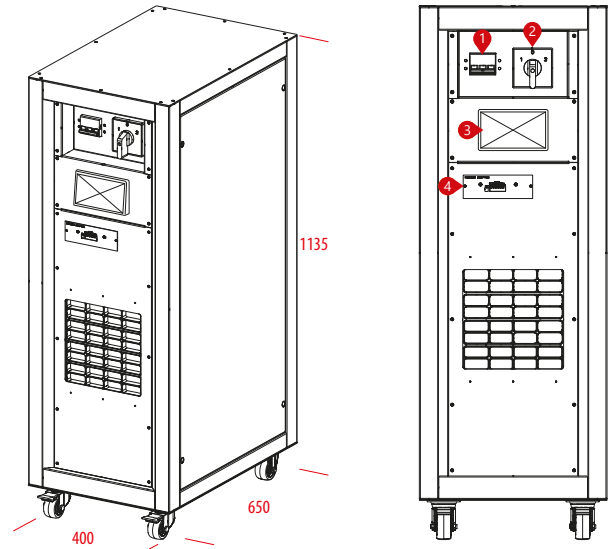


**MSR** SERIES 20-25-30-40-50 kVA 1:1F

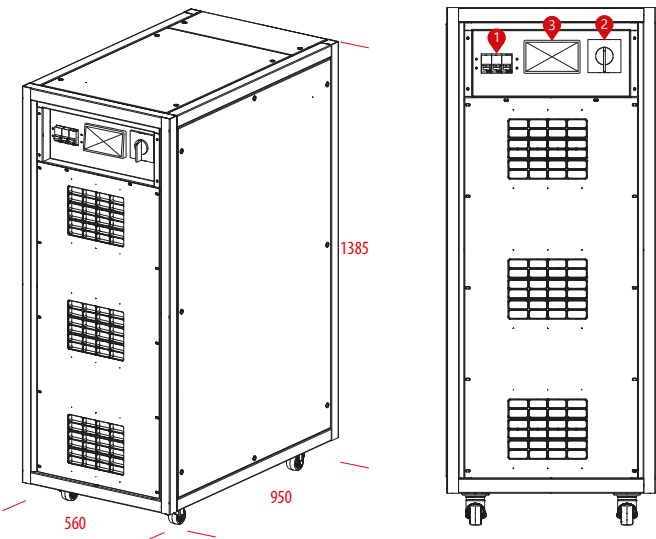
- 1. Input Switch
- 2. Bypass Switch
- 3. User Panel
- 4. Optional Card Slot
- 5. Connection Terminal (Rear Panel)



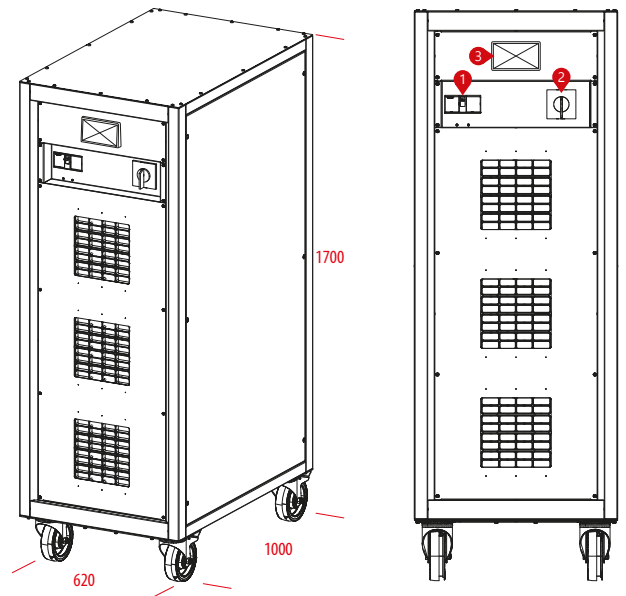
**MSR** SERIES 6-10,5-15-22,5-30-45 kVA 3:3F



**MSR** SERIES 60-75-100 kVA 3:3F

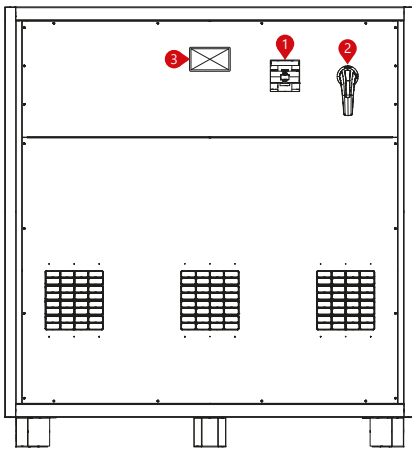
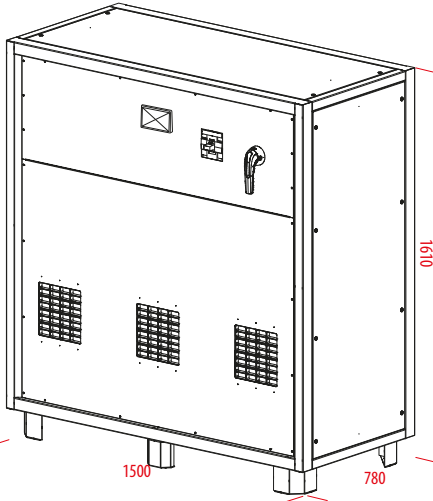


**MSR** SERIES 120-150 kVA 3:3F

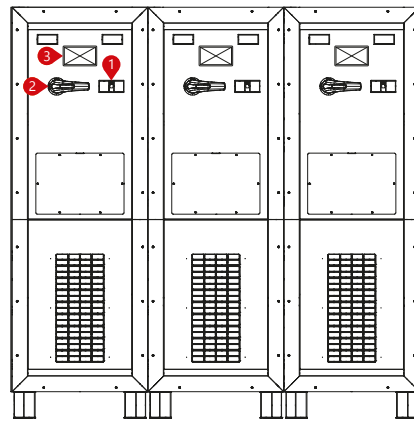
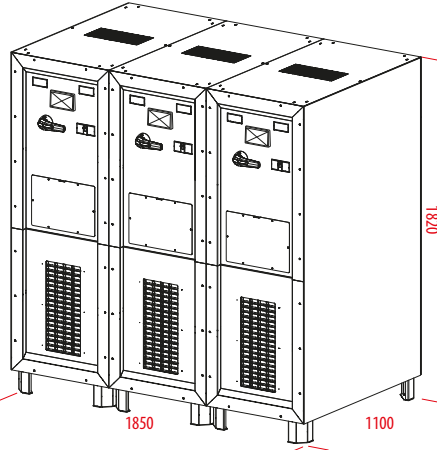


DETAILS

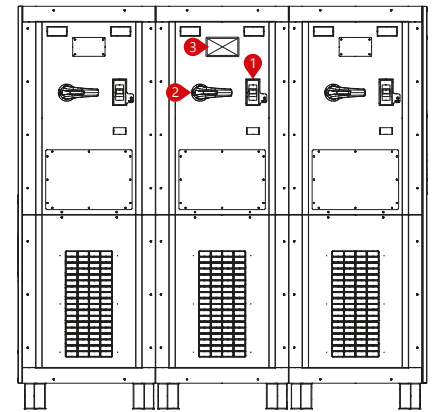
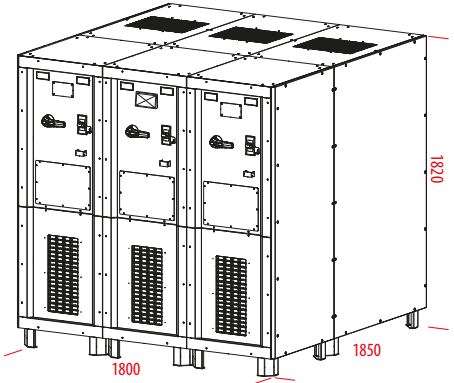
**MSR SERIES**  
200-250-300 kVA 3:3F



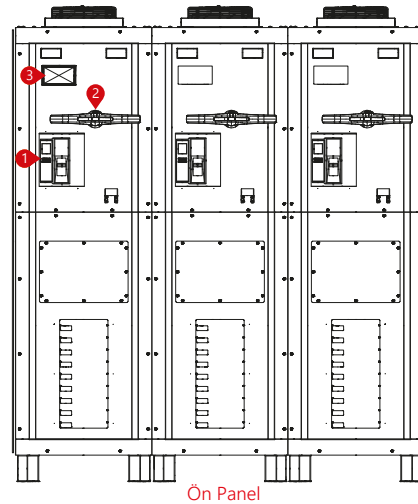
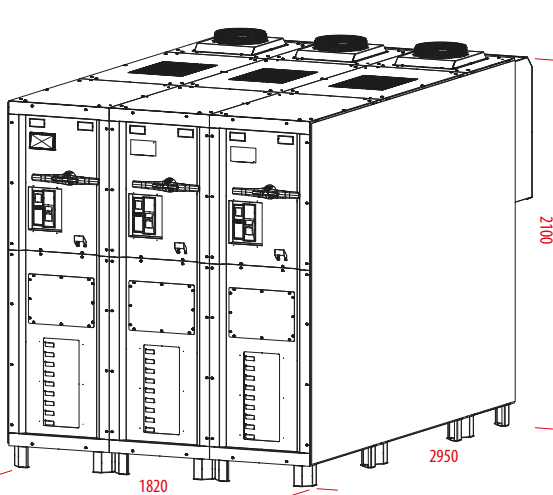
**MSR SERIES**  
400-500-600 kVA 3:3F



**MSR SERIES**  
800-1000-1250 kVA 3:3F



**MSR SERIES** 1600-2000 kVA 3:3F



- 1. Input Switch
- 2. Bypass Switch
- 3. User Panel
- 4. Optional Card Slot
- 5. Connection Terminal (Rear Panel)

<b>MODEL (3:3 Phase)</b>																																				
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													
<b>DIMENSIONS &amp; WEIGHT</b>																																				
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																																		
<b>MODEL (1:1 Phase)</b>																																				
Capacity (kVA)		1	2	3,5	5	7,5	10	15	20	25	30	40	50																							
<b>BOYUTLAR &amp; AĞIRLIK</b>																																				
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																												
<b>INPUT</b>																																				
In. Vol. Correction Interval		<b>1:1 Phase:</b> 160~260 VAC • <b>3:3 Phase:</b> 275~450 VAC (Standard), 215~415 VAC (Optional)																																		
Operation Frequency		47~65 Hz																																		
Line Input Protection		Overcurrent, Low and High Voltage Protection (Optional)																																		
<b>OUTPUT</b>																																				
Output Voltage		<b>1:1 Phase:</b> 220 VAC RMS ±2% • <b>3:3 Phase:</b> 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)																																		
<b>WORKING PRINCIPLE</b>		Servo Motor, Microprocessor Controlled, Full Automatic																																		
<b>GENERAL</b>																																				
Cooling		Smart Fan System																																		
Measured Value Monitor		Monitoring Input Voltage, Output Voltage-Current,% Load and Transformer Temperature Values via MSR Panel																																		
Total Efficiency		<b>1:1 Faz:</b> >96% • <b>3:3 Faz:</b> >96%																																		
Mechanical Bypass		"Manually Controlled Line - PAKO SWITCH Selects Voltage Regulator" Switch Turn On/Off																																		
Protection Level		IP 20																																		
<b>ENVIRONMENTAL</b>																																				
Operating Temperature		-10°C~50°C																																		
Storage Temperature		-25°C~60°C																																		
Relative Humidity		<90%, DIN (40040)																																		
Altitude		<2000m																																		

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