

MSR

SERIES

6-2000 kVA

1-50 kVA

SERVO VOLTAGE STABILIZER

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



INDUSTRY



TRANSPORT



MEDICAL

3:3
PHASE

1:1
PHASE



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

- 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.

CERTIFICATES



Standart Electrical Features

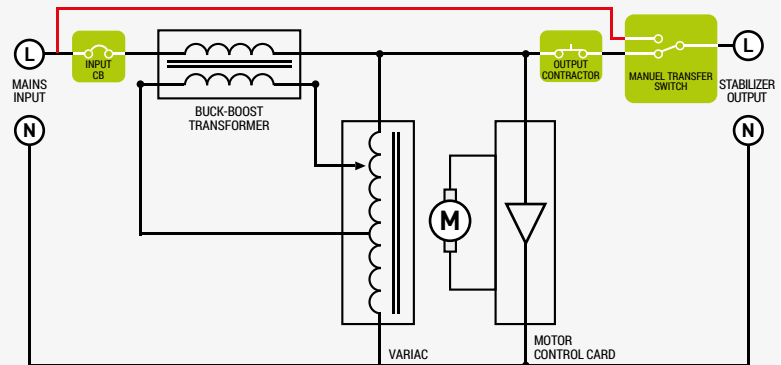
- Microprocessor Controlled
- Precise Output Voltage Correction Accuracy $\pm 1\%$
- High Efficiency $> 96\%$
- Overcurrent, High Temperature, High-Low Voltage and Short Circuit Protection
- At 100%-125% Load 1min, At Above 125% Load 10sec
- Input Voltage, Output Voltage-Current, % Load and Transformer 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

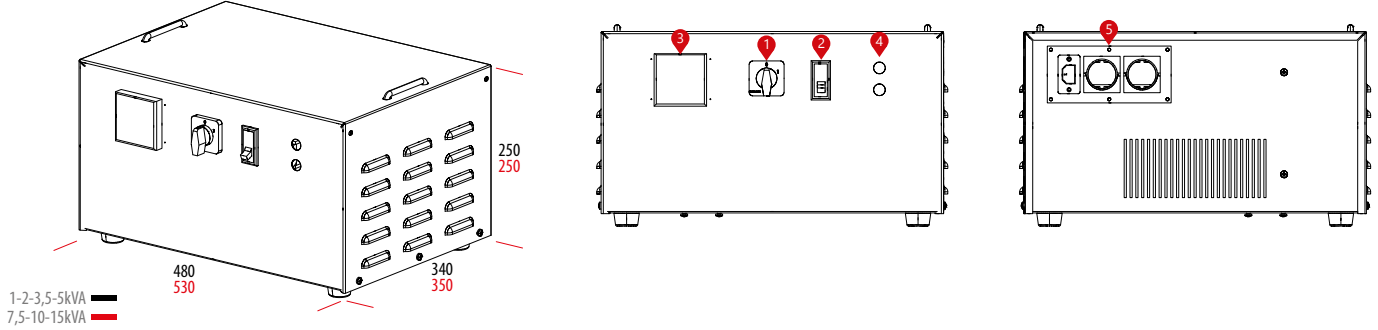
The MSR Series Servo Voltage Regulator transfers the electrical energy received from the grid to the output and continuously monitors the output voltage magnitude. If there is a deterioration in the output voltage according to the desired output voltage values, the microcontroller control unit immediately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

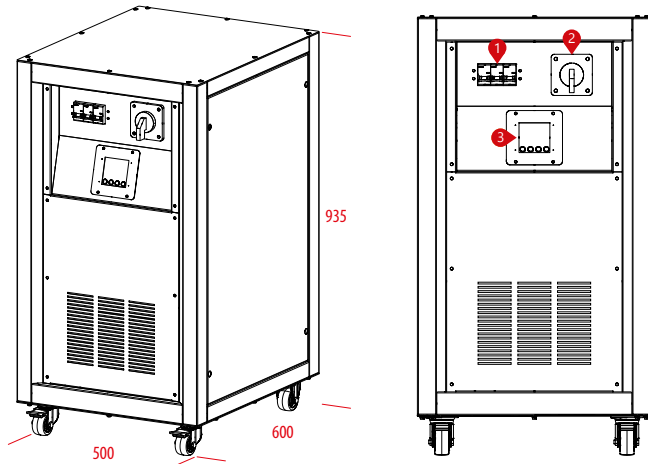
DETAILS

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

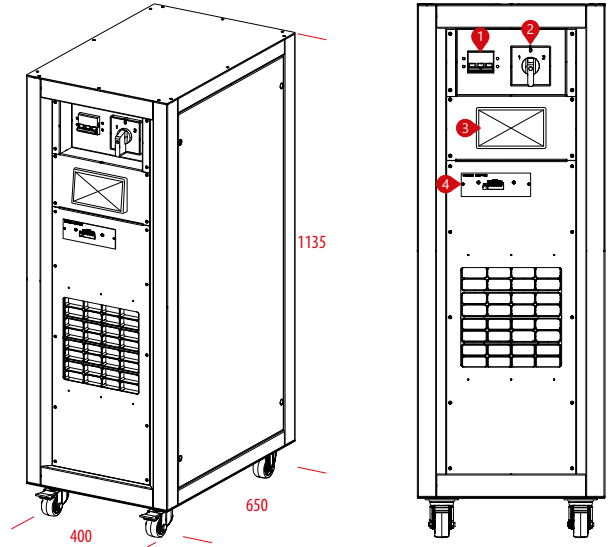


MSR SERIES 20-25-30-40-50 kVA 1:1F

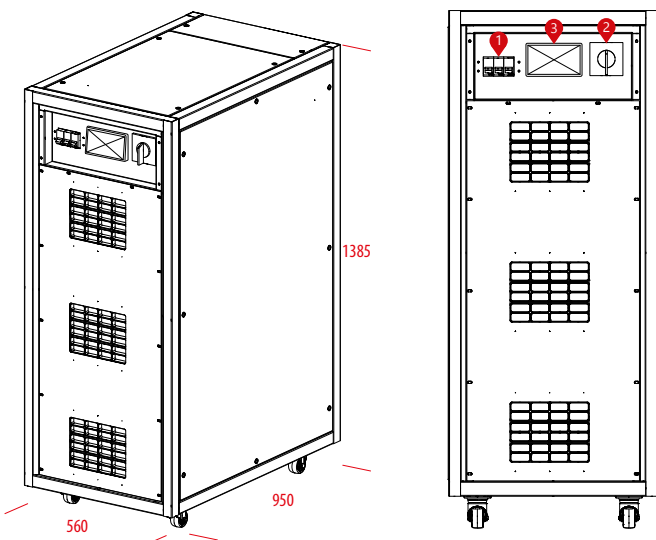
1. Input Switch
2. Bypass Switch
3. User Panel
4. Optional Card Slot
5. Connection Terminal (Rear Panel)



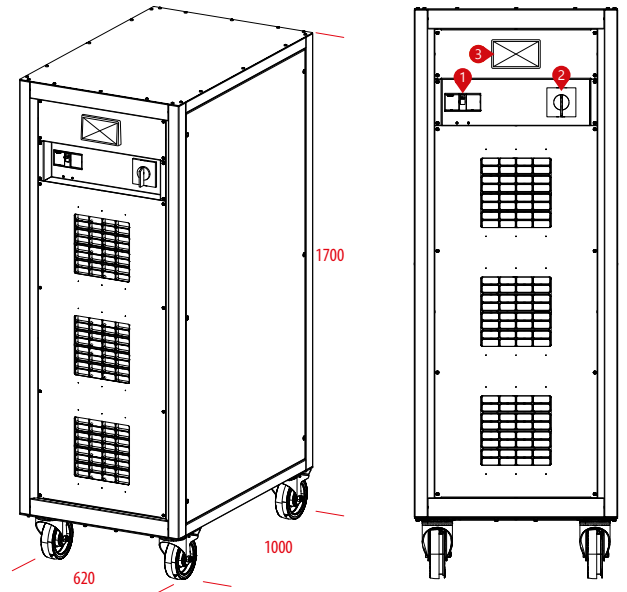
MSR SERIES 6-10,5-15-22,5-30-45 kVA 3:3F



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

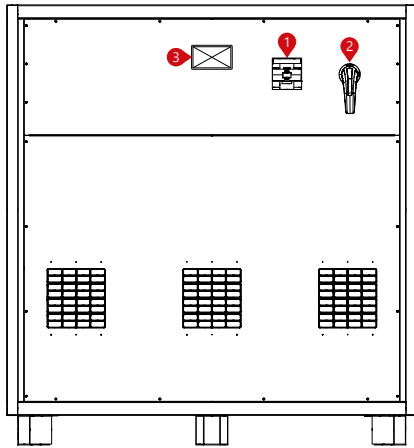
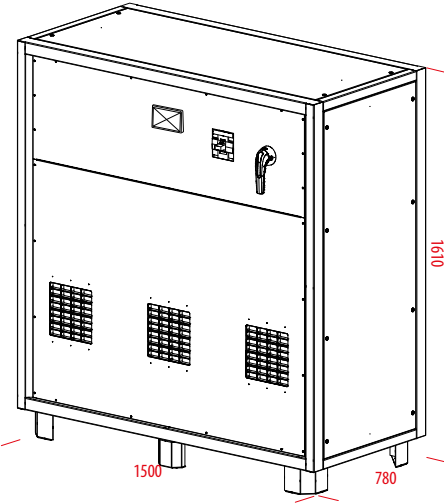


MSR SERIES 120-150 kVA 3:3F

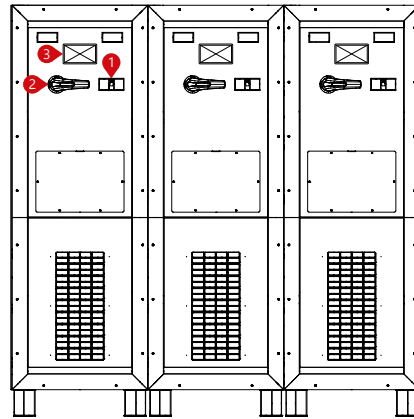
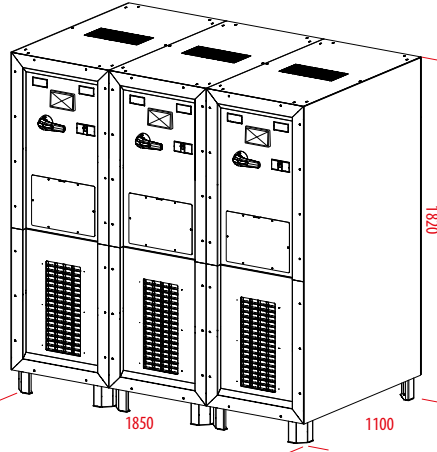


DETAILS

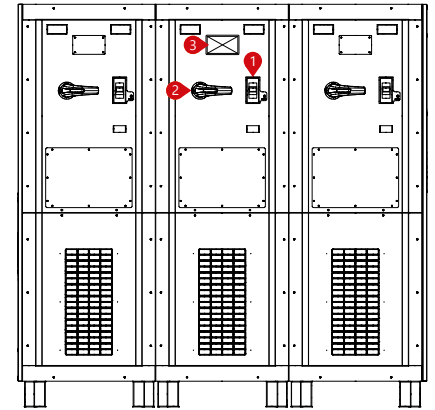
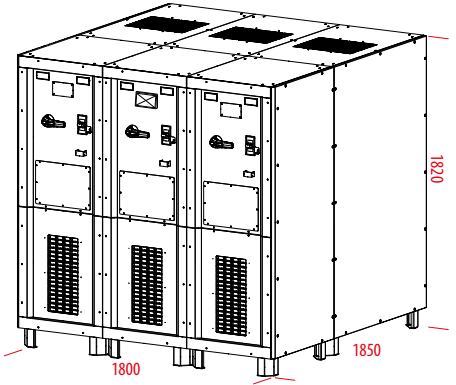
MSR SERIES
200-250-300 kVA 3:3F



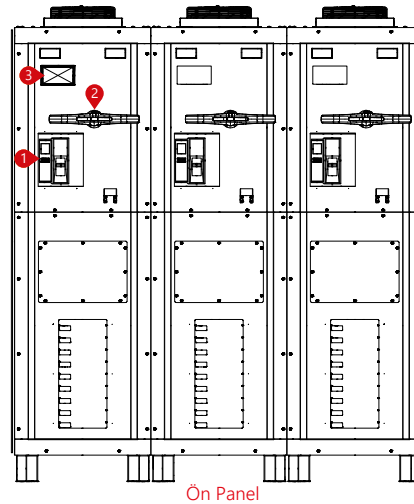
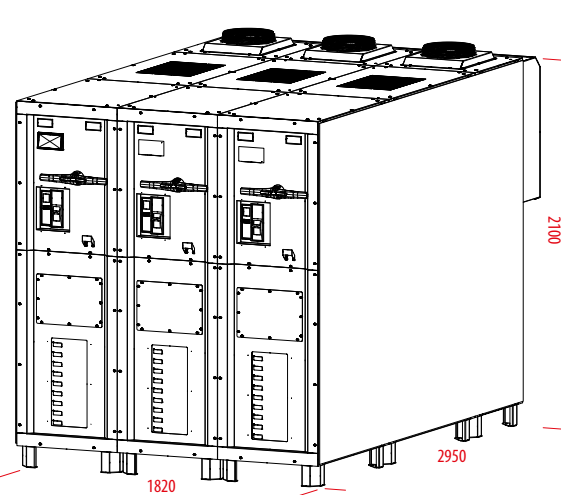
MSR SERIES
400-500-600 kVA 3:3F



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)

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																									

Makelsan reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Makelsan products previously or subsequently sold. Makelsan does not guarantee the items of the accuracy and completeness.