



**MESA**  
POWER & COMMUNICATIONS

MESA TECHNICAL ASSOCIATES INC.  
478 West Main St, Cobleskill, NY 12043  
P: 866 287 6700 F: 518 234 3386

## MSR Series

### Stationary Battery Chargers and Rectifiers

For Utility, Industrial, and Communications Applications



#### The MSR Series Delivers High Performance and Reliability:

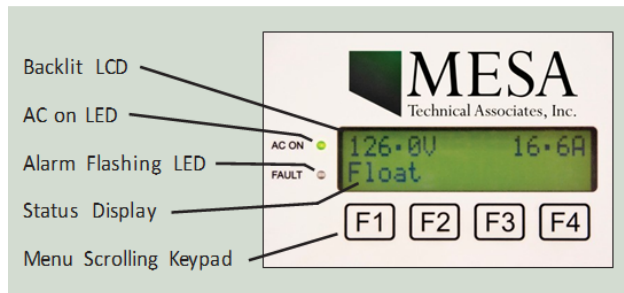
- Latest digital and power electronics technology
- Rugged industrial design
- User-definability control and alarm set-points
- New simplified control menu
- Simultaneous voltage and current readings
- CE safety and EMC standards tested and compliant
- Built to ISO 9000 QA standards
- NEMA PE-5 compliant

## METERING AND CONTROL

### Control Display

The Digital Display delivers all charger information at your fingertips. The display menu is user friendly and is the standard link between the operator and all monitoring control and alarms. All set points for control and alarm parameters are user-definable.

The MSR Series design is solid state using SCR phase control to provide regulated DC output and limited current via a smoothing filter, and it can operate with or without batteries.



### Standard Features

#### Alarm Menu Indicators

- Rectifier failure based on low volts and low output DC current
- High DC volts / Low DC volts
- Positive ground fault / Negative ground fault
- New ground fault isolation switch, standard
- AC fail

#### Alarm Menu Functions (Password-Protected)

- Adjustable alarm time delay
- Indications latch
- Alarm relay latch
- Alarm acknowledgement
- Alarm levels adjustment
- LED, LCD and relay test

#### Remote Indications

- Standard alarms are wired to a common voltage free N.O. and N.C. (form "C") dry contact

#### Metering and Timing

- Simultaneous 0.5% accuracy DC voltage and current metering +/-1 digit
- Remaining and elapsed equalize time

#### Control Modes

- Manual float/equalize toggle
- Software high voltage shutdown
- Automatic load sharing

#### Control Adjustments (Password-Protected)

- Float and equalize voltage
- Current limit
- Equalize period 0-9999 hrs.
- Float period 0-9999 hrs.
- Equalize mode termination based on voltage and/or time event(s)

#### Indicating LED's

- AC on green LED
- Common alarm flashing red LED

### Option List

Form C contacts for individual alarms  
RS232/485 isolated communication ports  
Modbus on serial ports, watchdog and major alarm  
DC output circuit breaker  
Battery circuit breaker  
Distribution panel  
High capacity interrupting current CBs  
Temperature compensation  
High temperature alarm and protection  
High voltage shutdown via the AC breaker trip  
AC input volts, amps and frequency readings  
High and low AC input voltage alarm  
Load sharing  
Power factor correction to 0.95 lagging  
Remote voltage sensing terminals  
Remote shutdown and equalize control  
Audible alarm  
Input harmonic filter to comply with CE  
50 Hz or 400Hz Input frequency  
Low DC volts load disconnect (load shedding)  
Battery high temperature alarm and shutdown  
Battery ammeter and voltmeter  
Ampere-hour meter reading battery capacity (either % or AH)  
Integrated battery/charger cabinets  
Oversized cabinets to fit batteries in separate compartments  
Special paint and NEMA/IP protection  
Seismic design  
Fungus proofing  
Special Wiring

## STANDARD ELECTRICAL SPECIFICATIONS

### Basic Design Features

- UL/ANSI 1012 Listed, CSA 22.2 107.1 Certified and applicable IEC standard compliant
- ISO 9002-1994 Quality control compliant
- SCR (Thyristor) based rectifier includes double wound isolation transformer
- Electronic control, current limiting and voltage regulation
- Modular construction using the latest power and microelectronic devices
- Color coded PVC copper stranded wire for control and signals

### Input

**Available Voltages** 110, 120, 208, 220, 240, 380, 400, 480, 550, 575, and 600 VAC

**Phases** 1O/ and / or 3 O/

**Frequency** 50 Hz or 60 Hz

**Power Factor** 0.75 (1 phase), 0.85 (3 phase) at full load when tested on battery and resistive load

**Efficiency at Full Load** Typical 90%

### Output

**Standard Nominal Voltages** 12, 24, 36, 48, 72, 125, 250, 380, 480 and 600 VDC

**Power** From 60 W to 200+ kW

#### AC Ripple Voltage, Per NEMA PE-5

- Unfiltered units: <2% RMS typical (1 ph) and 3 ph when charger is connected to a battery capacity 4 times its current output
- Filtered: 30mVrms for 24 + 48VDC models, 100mVrms for 125VDC models when charger is connected to a battery capacity 4 times its current output. Additional filtering available.
- Eliminator: All MSR chargers operate as a battery eliminator, when connected to a resistive load without a battery

**Static Regulation** <0.5% for simultaneous variations of +10/-12% input voltage, +/- 5% input frequency and 0-100% load

**Dynamic Regulation** +/-6% from 10% - 90% and 90% - 10% load variation ( t<300msec)



### Parallel Operation

- Random: Similar chargers can be operated in random parallel
- Load sharing

### EMC (CE Marked Units Only)

- Conducted (150kHz - 30MHz) and radiated (30MHz -1GHz): en55011 class A
- Electrostatic discharge EN61000-4 -2 level 2/3 (4kV contact, 8kV air)
- Radiated susceptibility: EN61000-4-3 level 3 annex D (80MHz- 1GHz @ 10V/m)
- Electrical fast transient: EN61000-4-4 level 3 (2kV)
- Surge immunity: EN61000-4-5 level 3 (1kV I/I, 2 kV L/GND)
- Conducted susceptibility: EN61000-4-6 level 3 (150kHz to 80MHz, 10v)
- Voltage interrupt: EN61000-4-11 (30, 60 & 90%- 10-10 & 5000 ms)

### Protection

#### Over-Current

- Soft start
- Automatic current limiting circuit, adjustable from 20% to 120% of nominal rating
- Input thermal-magnetic circuit breaker and DC output fuse standard

**Voltage Transients** Surge suppression on input and output reverse polarity

## STANDARD MECHANICAL SPECIFICATIONS

### Mechanical and Physical

#### Standard Enclosure

- CEMA/NEMA1 (IP20), 14GA (2mm) steel including hinged front access door
- Floor mounted models are provided with 3 in. (75 mm) clearance at the bottom to facilitate handling by lifting truck, pallet truck or slings
- Enclosure Options: All NEMA Standards

**Finish** Standard powder baked ASA61, light gray

**Cooling** Natural convection cooling up to 130A output current



### Environmental

**Audible Noise** 45 to 65 dBa at 3 ft (1 m) rating dependent

**Operating Temperature Range** 32°F to + 122°F (0°C to 50°C)

**Storage Temperature Range** -40°F to 185°F (-40°C to 85°C)

**Temperature De-Rating** 0.83% / °F from 122°F to 140°F (1.5% / °C from 50°C to 60°C)

**Operating Humidity** Up to 95% (non-condensing)

**Altitude De-Rating** 0% for first 3300ft (1000m), 7% per 3300ft (1000m) over 3300ft (1000m)

### Charger Standard Adjustment Range

	12V	24V	48V	125V	250V
<b>Float</b>	10 -15	20 -30	40 - 60	100 -145	200 -290
<b>Equalize</b>	10 -16	20 -32	40 - 65	100 -150	200 -300
<b>Single Level</b>	10 -16	20 -32	40 - 65	100 -150	200 -300

### MSR Typical Cabinet Dimensions

Cabinet	Height	Width	Depth	Mounting*
300	20 in 508 mm	17 in 431.8 mm	13 in 331 mm	wall, relay rack, floor
400	30 in 762 mm	21 in 533.4 mm	15 in 361 mm	wall, relay rack, floor
500	39 in 991 mm	24 in 610 mm	20 in 508 mm	wall, floor
650	51 in 1295	24 in 610 mm	20 in 508 mm	wall, floor
700	60 in 1524 mm	36 in 914 mm	25 in 635 mm	floor

## CAPACITIES, DIMENSIONS, & WEIGHTS

Single Phase, 48 - Volt Output								
Model	Input Volts	AC amps	DC amps	Cabinet	Recommended DC cable size AWG	DC Circuit Breaker	approx. ship. wt.	
							lbs.	kgs.
MSRX 48 1A 5F	120	6	5	300	10	10	85	39
MSRX 48 1B 5F	208	4	5	300	10	10	85	39
MSRX 48 1C 5F	240	3	5	300	10	10	85	39
MSRX 48 1A 10F	120	10	10	300	10	15	96	44
MSRX 48 1B 10F	208	6	10	300	10	15	96	44
MSRX 48 1C 10F	240	5	10	300	10	15	96	44
MSRX 48 1A 15F	120	15	15	400	10	20	141	64
MSRX 48 1B 15F	208	8	15	400	10	20	141	64
MSRX 48 1C 15F	240	7	15	400	10	20	141	64
MSRX 48 1A 20F	120	21	20	400	10	30	161	73
MSRX 48 1B 20F	208	12	20	400	10	30	161	73
MSRX 48 1C 20F	240	10	20	400	10	30	161	73
MSRX 48 1A 25F	120	25	25	400	10	40	177	80
MSRX 48 1B 25F	208	14	25	400	10	40	177	80
MSRX 48 1C 25F	240	13	25	400	10	40	177	80
Single Phase, 125 - Volt Output								
Model	Input Volts	AC amps	DC amps	Cabinet	Recommended DC cable size AWG	DC Circuit Breaker	Approx. ship. wt.	
							lbs.	kgs.
MSRX 125 1A 5F	120	13	5	300	10	10	104	47
MSRX 125 1B 5F	208	7	5	300	10	10	104	47
MSRX 125 1C 5F	240	6	5	300	14	10	104	47
MSRX 125 1A 10F	120	23	10	400	10	15	172	78
MSRX 125 1B 10F	208	13	10	400	10	15	172	78
MSRX 125 1C 10F	240	11	10	400	10	15	172	78
MSR 125 1A/B/C 15F	120/208/240	35/20/18	15	400	10	20	243	110
MSR 125 1A/B/C 20F	120/208/240	42/26/23	20	400	10	30	248	113
MSR 125 1A/B/C 25F	120/208/240	63/36/31	25	500	10	40	322	146
MSRX 125 1B 30F	208	40	30	500	10	40	339	154
MSRX 125 1C 30F	240	34	30	500	10	40	339	154
MSRX 125 1E 30F	480	17	30	500	10	40	339	154
MSRX 125 1B 40F	208	53	40	500	8	60	368	167
MSRX 125 1C 40F	240	46	40	500	8	60	368	167
MSRX 125 1E 40F	480	23	40	500	8	60	368	167
MSR 125 1B/C 50F	208/240	67/58	50	500	8	63	405	184
MSR 125 1E 50F	480	29	50	500	8	63	405	184
Three Phase, 125 - Volt Output								
Model	Input Volts	AC amps	DC amps	Cabinet	Recommended DC cable size AWG	DC Circuit Breaker	Approx. ship. wt.	
							lbs.	kgs.
MSRX 125 3 B 40F	208	25	40	500	8	60	426	194
MSRX 125 3 E 50F	480	13	50	500	8	Optional	467	212
MSRX 125 3 E 75F	480	20	75	650	4	Optional	622	283
MSRX 125 3 E 100F	480	26	100	650	3	Optional	647	294
MSRX 125 3 E 125F	480	34	125	700	2	Optional	730	332
MSRX 125 3 E 150F	480	40	150	700	1	Optional	780	355



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