CONCENTRIC
Engineering Uptime.

MsR6 Series

Stationary Battery Chargers & Rectifiers

for Utility, Industrial, and Communications Applications

The MSR6 Series Delivers High Performance and Reliability:

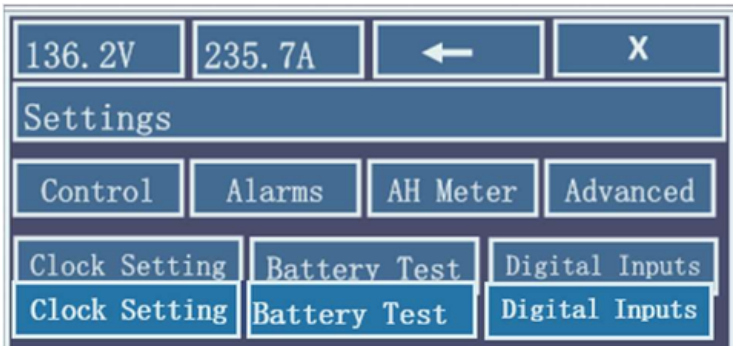
- Latest digital and power electronics technology
- Rugged industrial design
- User-definability control and alarm set-points
- New simplified control menu
- Simultaneous voltage and current readings
- CE safety and EMC standards tested and compliant
- Built to ISO 9000 QA standards
- NEMA PE-5 compliant

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 400 Hz 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 1 O/ 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 l/l, 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 ANSI61, light gray

Cooling Natural convection cooling up to 100A output current

Enviornmental

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
Float	10 -15	20 -30	40 - 60	100 -145	200 -290
Equalize	10 -16	20 -32	40 - 65	100 -150	200 -300
Single Level	10 -16	20 -32	40 - 65	100 -150	200 -300

MSR6 Typical Cabinet Dimensions

Cabinet	Height	Width	Depth	Mounting*
350	30 in 762 mm	17 in 431.8 mm	12 in 304.8 mm	wall, relay rack, floor
500	39 in 991 mm	24 in 609.6 mm	20 in 508 mm	wall, relay rack, floor
650	51 in 1295 mm	24 in 610 mm	20 in 508 mm	wall, floor
700	60 in 1524 mm	36 in 914 mm	25 in 635 mm	wall, floor

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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.
MSR6 48 1A 5F	120	6	5	350	10	10	85	39
MSR6 48 1B 5F	208	4	5	350	10	10	85	39
MSR6 48 1C 5F	240	3	5	350	10	10	85	39
MSR6 48 1A 10F	120	10	10	350	10	15	96	44
MSR6 48 1B 10F	208	6	10	350	10	15	96	44
MSR6 48 1C 10F	240	5	10	350	10	15	96	44
MSR6 48 1A 15F	120	15	15	350	10	20	141	64
MSR6 48 1B 15F	208	8	15	350	10	20	141	64
MSR6 48 1C 15F	240	7	15	350	10	20	141	64
MSR6 48 1A 20F	120	21	20	350	10	30	161	73
MSR6 48 1B 20F	208	12	20	350	10	30	161	73
MSR6 48 1C 20F	240	10	20	350	10	30	161	73
MSR6 48 1A 25F	120	25	25	350	10	40	177	80
MSR6 48 1B 25F	208	14	25	350	10	40	177	80
MSR6 48 1C 25F	240	13	25	350	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.
MSR6 125 1A 5F	120	13	5	350	10	10	104	47
MSR6 125 1B 5F	208	7	5	350	10	10	104	47
MSR6 125 1C 5F	240	6	5	350	14	10	104	47
MSR6 125 1A 10F	120	23	10	350	10	15	172	78
MSR6 125 1B 10F	208	13	10	350	10	15	172	78
MSR6 125 1C 10F	240	11	10	350	10	15	172	78
MSR6 125 1A/B/C 15F	120/208/240	35/20/18	15	350	10	20	243	110
MSR6 125 1A/B/C 20F	120/208/240	42/26/23	20	350	10	30	248	113
MSR6 125 1A/B/C 25F	120/208/240	63/36/31	25	350	10	40	322	146
MSR6 125 1B 30F	208	40	30	500	10	40	339	154
MSR6 125 1C 30F	240	34	30	500	10	40	339	154
MSR6 125 1E 30F	480	17	30	500	10	40	339	154
MSR6 125 1B 40F	208	53	40	500	8	60	368	167
MSR6 125 1C 40F	240	46	40	500	8	60	368	167
MSR6 125 1E 40F	480	23	40	500	8	60	368	167
MSR6 125 1B/C 50F	208/240	67/58	50	500	8	63	405	184
MSR6 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.
MSR6 125 3 B 40F	208	25	40	500	8	60	426	194
MSR6 125 3 E 50F	480	13	50	500	8	Optional	467	212
MSR6 125 3 E 75F	480	20	75	650	4	Optional	622	283
MSR6 125 3 E 100F	480	26	100	650	3	Optional	647	294
MSR6 125 3 E 125F	480	34	125	700	2	Optional	730	332
MSR6 125 3 E 200F	480	54	200	700	1	Optional	1037	470

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over 25 years

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