Model: MXR-800

820A@ 10VDC

Super-conducting Magnet Ramp Power Supply

THE CHALLENGE

Provide stable, controlled current to the coil of a super-conducting magnet during ramp up and discharge procedures

Auto-Park Technology

The MXR ramp power supply is designed to charge superconducting magnets. It has an optional NMR spectrometer installed to measure the field while ramping. As the magnet approaches the set frequency, the MXR will ramp and park the magnet automatically.

FLEXIBLE CONTROLS

The user interface is made up of an easy to use web – page. Connections and leads are keyed via different bolt sizes to deter misconnections

- Up to 1000A of available current at 10V
- Web based user interface for easy control and remote interfacing
- Ruggedized Structure for Repeated Shipping

Built-in Features:

- Persistent Current Switch Supplies
- Quench Detector
- Energy Absorption Unit for Discharge
- 4U Storage Drawer for Instrumentation Cabling
- Magnet and Power Leads Voltage Monitoring
- Ramp Profile Data Logging

SYSTEM OVERVIEW:

The MXR-800 is a superconducting magnet ramp power supply used in the charging and discharging of superconducting magnets. It is comprised of the following parts integrated in a single, mobile, ruggedized cabinet: constant current supply, quench detector, heater power supplies for persistent current switches, control/monitoring system, and the energy absorption unit used for discharging the magnet. The control and monitoring system is comprised of master and slave control modules. This system monitors all voltages available to ensure it is safe to charge the magnet. The ramping algorithm is also contained in this control system. The system is controlled via a web page user interface.

Careful consideration of these controls allows the user to program the system for specific ramp profiles and can stop or start the ramp at any time. These simple web based controls make it easy for the user to park the magnet and go persistent all while monitoring the voltages on the magnet and power leads thus ensuring safe operation. The system has the ability to safely discharge the magnet under controlled conditions, even in the event of a power outage.

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Specifications

INPUT CHARACTERISTICS	
Input Voltage/freq	3-Phase, 480, 50/60Hz (4 conductor) or 3-Phase, 400/230VAC, 50/60Hz (5 conductor)
Input Current	25A
OUTPUT CHARACTERISTICS	
Maximum current output	1000A (system optimized for 820A)
Maximum voltage output	+10V / -4V
Rated Output Power	10kW
Current Regulation	Less than 1x 10^{-4}/10 min in 800 A output
Current setting resolution	100mA
Main switch heater output (PCS)	Programmable Up to 500mA at 56V
Shield switch heater output	Programmable up to 100mA at 28V
PCS current setting resolution	1mA
LOAD SPECIFICATION	
Inductance Range	<40H
COMMUNICATION	
Setup control	Ethernet
Data-Logging	USB
Temperature monitoring	USB
User Interface	Web Page
RAMPING	
Current sweep rate (leads ramping)	Ramp rates adjustable up to 200A/min in 0.2A/min increments
Current sweep rate (Discharge)	Ramp rates adjustable up to 12A/min in 0.2A/min increments
Sweep linearity	Better than 2%
Accuracy of sweep speed	Better than 5%
Sweep Mode	START – Ramp up or down to set current value in a set sweep time STOP – Temporarily hold current during the sweep
THERMAL MANAGEMENT	
Cooling	Forced Air via internal fans
Thermal stability	Max 50 ppm/degree C (after start-up)
MECHANICAL	
Width (inches / millimeters):	30.25" / 768 mm
Depth:	39.00" / 991 mm
Height:	46.00" / 1168 mm
Weight: (lbs/kg)	780 / 354
APPROVALS	
Regulatory compliance	Compliant but not certified to UL/EN/IEC/CSA C22.2 60601
OPTIONS	
NMR Spectrometer	Field Acquiring System for Parking Magnet
Probes	Multiple Probes in transverse and axial direction available for wide range of frequencies

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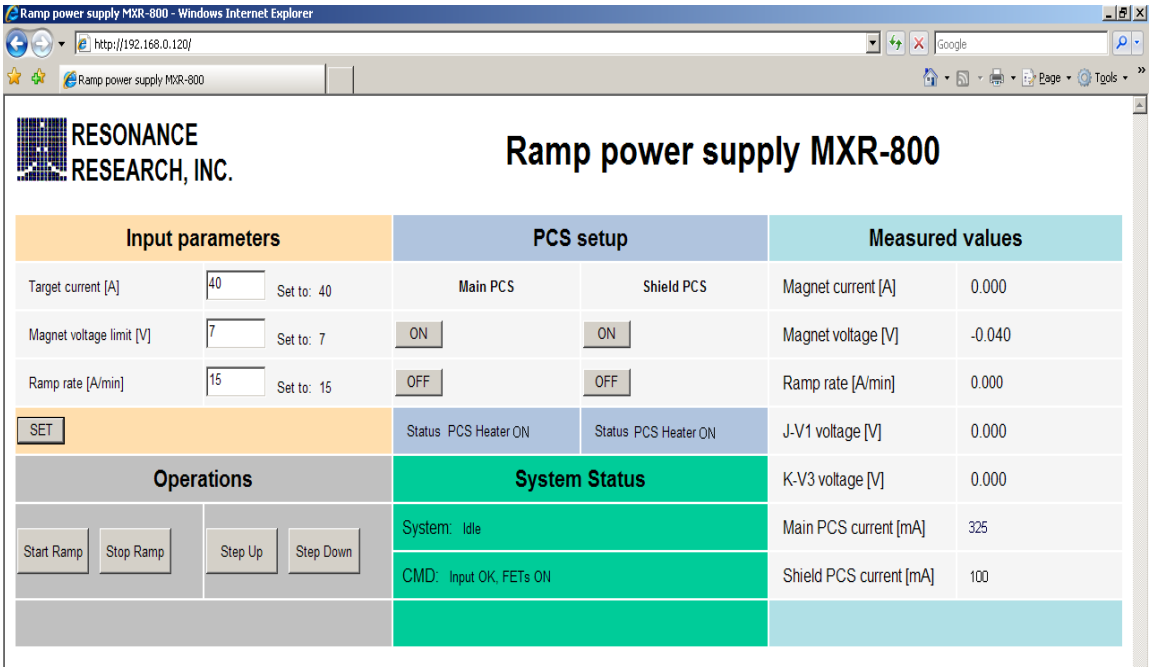
Indicators

Indicators	
LEDs	The following LEDs are present on the front faceplates of the system
DC-DC Converter Unit Control/Monitor Unit	Green: VIN, CH enabled
SLAVE:	Green: Aux DC
MASTER:	RED: Quench, Supply Fault, System Fault, EAU Overtemp, ERD Green: DCCT OK, Lie Leads, UI Active, GO, PCS OK
PCS:	Green: Main PCS Enabled, Shield PCS Enabled, DC Voltage Rails
Main Current Source	Digital Display: Current/Voltage

Display	
Control Display	Magnet voltages, Current, Ramp Rate, PCS current, Via Web-Page
Data Log	Magnet Voltages, Current, Ramp Rate continuously printed to USB
Temperature Log	3 critical temperature points continuously printed to USB
Hour meter	Displays time since last calibration or service



Web Page Control Screen

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System Protection

Error reporting	
All errors are displayed on screen or indicated via LED	
System Status	Quench, ERD, Out of Range data, PCS Status, Ramping, Target Obtained, etc
Interlocks	
PCS controls	PCS controls are locked during ramping
EMO	Power switch available on front of system for quick power down of current source
Emergency Ramp Down	
Quench Detect	Continuously monitors for quench and shuts the system down
Fan Drive	Fans are driven by DC/DC converters to cool EAU even during a power outage

Connections

Current Output	
Power Leads	Positive – 2 x M10 Nut Plate Negative – 2x M8 Nut Plate
Instrumentation I/O	
37P	AMP PN: 208473-1
36P Loopback	Amphenol PN: 97-3102A-36-10P
Power	
MAIN AC IN	NEMA Twist Lock L16-30
110VAC Out	NEMA 5-15
Communication	
Ethernet	RJ-45, cat 5

Resonance Research, Inc. strives to conduct its business with a total commitment to our customers and their requirements. We define quality as conformance to our customer's needs, both internal and external; and full compliance to all Quality Management System requirements.

We at Resonance Research understand that in order to achieve this goal, we need the cooperation and effort of the entire company. We must function as a team in our efforts to give our customers what they need every time.

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