



# DATA SHEET

## MAGNET RAMP POWER SUPPLY MODEL MXR-800

OCTOBER 2015

---

6 Cook Street, Suite 4 Pinehurst Business Park – Billerica – MA – 01821

Phone: (978) 671-0811 fax: (978) 663-0483 E-mail: [rricorp@rricorp.com](mailto:rricorp@rricorp.com)

---



## Applications

---

The MXR-800 Magnet Ramp Power Supply System is designed to perform the following operations:

1. Provide controlled current to the coil of super-conducting magnet during ramp up procedure
2. Energize the Persistent Current Switch Heater (PCS) switch circuit and secondary PCS
3. Discharge (ramp down) of super-conducting magnet

## Highlights

---

- Weight and dimensions as reduced as possible
- Withstand repeated shipping, rough handling and vibration
- Capable of operating in magnetic fields of up to 100 gauss
- Components and subsystems have extensive self-test function and quality control before being used in the system
- Documentation with operation instructions, schematics for troubleshooting is supplied on CD's and in hard copies
- Compliant but will not be certified with the following regulations and standards: CISR11, EN50082, IC1010 and UL 1012 (design for class B, with no emissions compliance).

## Specifications

---

The ramp power supply consists of the following parts, integrated in a single cabinet:

- Constant current power supply
- Quench detector
- Heater power supply for permanent current switch
- User interface

Constant current power supply

AC input voltage	3-phase, 400 or 480V +/-10%, 50/60 Hz (4 conductor)	
Output current	0 to 800 A	
Output voltage	+12.1 V to 0 to -6V	
Current regulation	Less than $1 \times 10^{-4}$ over 8 hours @ 800 A output*	
Current setting resolution	20 mA	
Current Ripple	60 mA	
Current sweep time (for 800 A)	Ramp rates adjustable up to 120 A/min in 1 A/min increments	
Sweep linearity	Better than 2%	
Accuracy of sweep speed	Better than 5%	
Sweep mode	SET	Goes up or down to a set current value in a set sweep time
	HOLD	Temporarily holds the current in the half way of sweep
	DOWN	Goes down to 0A in a set sweep time
Load requirements	Less than 40 Henry	
Control system	Computer generated control with safety interlocks and over-ride	
Cooling system	Forced air	

\* Drift including line regulation and load regulation. In reaching set value, hold mode excluded (in hold, less than  $5 \times 10^{-4}/10$  min)

Heater power supply for permanent current switch

The main persistence switch is a programmable current source with and On/Off switch installed on the front panel.

(Typical)

PCS 1	
Output current	0 to 500 mA DC
Output voltage	0 to 50 V DC
Adjustable range of output current	5 to 100%
Current regulation	Better than $1 \times 10^{-2}/10$ min

PCS 2	
Output current	0 to 250 mA DC
Output voltage	0 to 30V DC
Adjustable range of output current	5 to 100%
Current regulation	Better than $1 \times 10^{-2}/10$ min

#### Quench protection circuit

Magnet quenching is prevented by the quench detection circuit, the protection diode and output breaker.

Detection system	3 point detection system
Detection voltage	10 V (variable through switches on the printed circuit board)
Detection time	100 mS (variable through switches on the printed circuit board)
Other	Test switch is provided inside of the door, with a switch guard
Protection circuit	900 A rated protection diodes (5 in series) installed at the output terminal
	The output shut-off passive semi-conductive device is provided with a 500 V DC specification

#### Safety circuits

- Fail-safe discharge capability in the event of complete power failure
- Massive heat absorption capacity in excess of 1 MJ
- Thermal protection of the main power system and the energy absorber

#### Grounding terminal

M6 bolt terminal is provided.

#### Connectors

Input terminal	480V AC NEMA Standard L-16-30
Quench detection	TBD
Heater output	TBD

#### Cabinet

- Cabinet equipped with 100 mm high casters and floor levelers
- Optional eyebolts can be installed on the side panel
- Connectors for the constant current power supply, quench detector and heater power supply for permanent current switch installed on the bottom of the rear panel.