XR Series

Programmable DC Power Supply

CERTIFICATIONS



POWER	VOLTAGE	CURRENT	MODELS	SIZE
2 kW to 10 kW	2 Vdc to 10,000 Vdc	0.2 Adc to 600 Adc	39	2U

1 Description

The 2U XR Series complements the 1U SL Series by providing high voltage (greater than 1500 Vdc) and high current (greater than 250 Adc) models in a 2U package at 2 kW, 4 kW, 6 kW, 8 kW, and 10 kW. The XR Series features the highest voltage range in Magna-Power's product offering, up to 10,000 Vdc and high current models up to 600 Adc, all utilizing the company's signature current-fed power processing to deliver robust power conversion.

2 Key Features

- Compact 2U form factor
- 2000 Vdc to 10000 Vdc output voltage
- 310 Adc to 600 Adc output current
- SCPI Remote Programming API
- High Accuracy Measurements
- Programmable Protection Limits
- NI LabVIEW™ and IVI Driver

3 Integrated Options Available

+HS	High Slew Rate Output
+GPIB	IEEE-488 GPIB
+LXI	LXI TCP/IP Ethernet
+RUG	Ruggedized

4 Specifications

Specifications are subject to change without notice. Unless otherwise noted, all specifications measured at the product's maximum ratings.

4.1 AC Input Specifications

PARAMETER	VALUE	CONDITIONS
1Φ AC Input Voltage	208 Vac (operating range 187 - 229 Vac) 240 Vac (operating range 216 - 264 Vac)	1Φ, 2-wire + ground, Available on 2 kW models only
3Φ AC Input Voltage	208 Vac (operating range 187 to 229 Vac) 240 Vac (operating range 216 to 264 Vac) 380 Vac (operating range 342 to 440 Vac) 415 Vac (operating range 373 to 456 Vac) 440 Vac (operating range 396 to 484 Vac) 480 Vac (operating range 432 to 528 Vac)	3Φ, 3-wire + ground; Available on all models
Input Frequency	50 Hz to 400 Hz	
Power Factor	>0.92 at max power; models with 3Φ AC input 0.70 at max power; models with 1Φ AC input	
AC Input Isolation	±2500 Vdc, maximum input voltage to ground	

4.2 DC Output Specifications

PARAMETER	VALUE	CONDITIONS
Voltage Ripple	Model specific. Refer to chart of available models.	
Line Regulation	Voltage mode: ± 0.004% of full scale Current mode: ± 0.02% of full scale	
Load Regulation	Voltage mode: ± 0.01% of full scale Current mode: ± 0.04% of full scale	
Load Transient Response	2 ms to recover within ±1% of regulated output with a 50% to 100% or 100% to 50% step load change	
Stability	± 0.10% for 8 hrs. after 30 min. warm-up	
Efficiency	80% to 93% Model specific. Refer to chart of available models.	
Maximum Slew Rate	< 170 ms for a programmed output voltage change from 0 to 63% < 200 ms for a programmed output current change from 0 to 63%	Standard Models
Maximum Slew Rate	< 5 ms for a programmed output voltage change from 0 to 63% < 10 ms for an output current change from 0 to 63%	Models with High Slew Rate Output (+HS) Option
Bandwidth	3 Hz with remote analog voltage programming 2 Hz with remote analog current programming	Standard Models
Bandwidth	60 Hz with remote analog voltage programming 45 Hz with remote analog current programming	Models with High Slew Rate Output (+HS) Option
DC Output Isolation	±1000 Vdc, maximum output voltage to ground	Models Rated ≤1000 Vdc
DC Output Isolation	±(1500 Vdc + Vo/2), max output voltage to ground, where Vo is the max rated voltage	Models Rated >1000 Vdc and ≤3000 Vdc
DC Output Isolation	No output isolation, specify positive or negative output polarity at time of order	Models Rated >3000 Vdc

4.3 Programming Interface Specifications

PARAMETER	VALUE	CONDITIONS
Front Panel Programming	Stepless aluminum rotary knobs and keypad	

4.3 Programming Interface Specifications

PARAMETER	VALUE	CONDITIONS
Computer Interface	RS232, D-sub DB-9, female (Standard) LXI TCP/IP Ethernet RJ45 (Option +LXI) IEEE-488 GPIB (Option +GPIB)	
External User I/O Port	37-pin D-sub DB-37, female Referenced to Earth ground; isolated from power supply output See User Manual for pin layout	Analog and Digital Programming
Remote Sense Limits (Wired)	3% maximum voltage drop from output to load	Available for models ≤ 1000 Vdc

4.4 Accuracy Specifications

PARAMETER	VALUE	CONDITIONS
Voltage Programming Accuracy	± 0.075% of max rated voltage	
Over Voltage Trip Programming Accuracy	± 0.075% of max rated voltage	
Current Programming Accuracy	± 0.075% of max rated current	
Over Current Trip Programming Accuracy	± 0.075% of max rated current	
Voltage Readback Accuracy	± 0.2% of max rated voltage	
Current Readback Accuracy	± 0.2% of max rated current	

4.5 External User I/O Specifications

PARAMETER	VALUE	CONDITIONS
Analog Programming and Monitoring Levels	0-10 Vdc	
Analog Output Impedances	Voltage output monitoring: 100 Ω Current output monitoring: 100 Ω +10V reference: 1 Ω	
Digital Programming and Monitoring Limits	Input: 0 to 5 Vdc, 10 kΩ input impedance Output: 0 to 5 Vdc, 5 mA drive capacity	

4.6 Physical Specifications

PARAMETER	VALUE	CONDITIONS
Racking Standard	EIA-310	
Rear Support Rails	Included	
Size and Weight	2U 3.50" H x 19" W x 24" D (8.89 x 48.26 x 60.96 cm) 45 lbs (20.41 kg)	2 kW Models
Size and Weight	2U 3.50" H x 19" W x 24" D (8.89 x 48.26 x 60.96 cm) 47 lbs (21.32 kg)	4 kW Models
Size and Weight	2U 3.50" H x 19" W x 24" D (8.89 x 48.26 x 60.96 cm) 48 lbs (21.77 kg)	6 kW Models
Size and Weight	2U 3.50" H x 19" W x 24" D (8.89 x 48.26 x 60.96 cm) 48 lbs (21.77 kg)	8 kW Models
Size and Weight	2U 3.50" H x 19" W x 24" D (8.89 x 48.26 x 60.96 cm) 48 lbs (21.77 kg)	10 kW Models

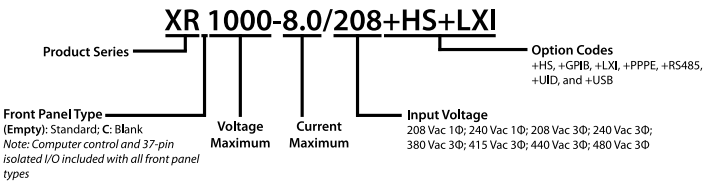
4.7 Environmental Specifications

PARAMETER	VALUE	CONDITIONS
Ambient Operating Temperature	-25°C to 50°C	
Storage Temperature	-25°C to +85°C	
Humidity	Relative humidity up to 95% non-condensing	
Temperature Coefficient	0.04%/°C of maximum output voltage 0.06%/°C of maximum output current	
Air Flow	Side air inlet, rear exhaust	

4.8 Regulatory Specifications

PARAMETER	VALUE	CONDITIONS
EMC	Complies with 2014/30/EU (EMC Directive) CISPR 22 / EN 55022 Class A	
Safety	Complies with EN61010-1 and 2014/35/EU (Low Voltage Directive)	
CE Mark	Yes	
RoHS Compliant	Yes	

5 Model Ordering Guide



6 Models

Max Voltage Vdc	2 kW	4 kW	6 kW	8 kW	10 kW	Ripple mVrms	Efficiency
	Max Current Adc						
5	375	600	—	—	—	50	80%
10	—	375	600	—	—	50	84%
16	—	—	375	500	600	50	84%
20	—	—	300	375	500	45	87%
25	—	—	—	320	400	45	88%
32	—	—	—	—	310	40	88%
2000	1	2	3	4	5	500	93%
3000	0.6	1.3	2	2.6	3.3	600	93%
4000	0.5	1	1.5	2	—	6500	93%
6000	0.33	0.66	1	1.33	—	7500	93%
8000	0.25	0.5	0.75	1	—	8500	93%
10000	0.2	0.4	0.6	0.8	—	9500	93%
AC Input Voltage Vac	Input Current Per Phase Aac						
208/240 Vac, 1Φ	17	—	—	—	—		
208/240 Vac, 3Φ	8	15	22	29	35		
380/415 Vac, 3Φ	5	9	12	16	19		
440/480 Vac, 3Φ	4	8	11	14	17		

7 Features

Fast, accurate power delivery with controls and options tailored to your needs

High-voltage and high-current performance in 2U

Precise, stable output for demanding loads.



XR Series complements the 1U SL Series by extending into 2–10 kW models for high voltage, from 2000 Vdc up to 10,000 Vdc and high current, from 375 Adc up to 600 Adc—all in a compact 2U package. In constant-voltage or constant-current mode with automatic crossover, the XR Series delivers fast transient recovery, ±0.075% programming accuracy for voltage and current, and ±0.2% measurement accuracy—supporting confident control and readback without external metering.

Configured-to-order with integrated options

Rich standard features, extended when needed.

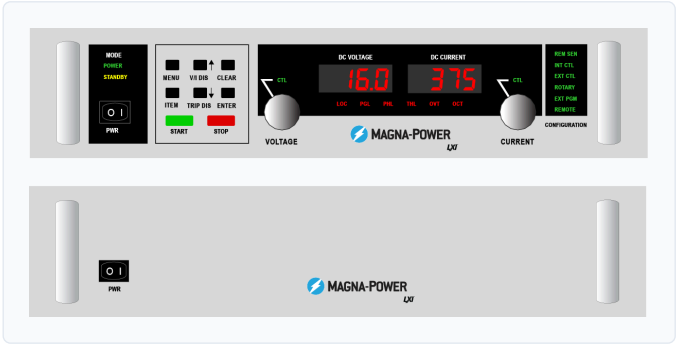


XR Series starts with a strong base: SCPI over RS232, isolated 37-pin user I/O, LabVIEW and IVI drivers, and Remote Interface Software included. When applications demand more, fully integrated options tailor performance, connectivity, and mechanics—without external boxes or ad-hoc wiring.

- Standard SCPI computer controls, RS232, isolated 37-pin analog/digital I/O, LabVIEW & IVI drivers, RIS software.
- High Slew Rate Output (+HS) for higher bandwidth and faster programmed rise times.
- Connectivity options LXI TCP/IP Ethernet (+LXI) and IEEE-488 GPIB (+GPIB).
- Ruggedized (+RUG) for MIL-STD shock & vibration

Stepless front-panel control with blank panel option

Hands-on where you want it, hidden where you don't.

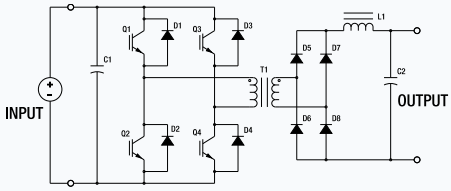


The standard XR front panel provides rotary and key-based control, bright digital metering, and clear status indicators, so operators can configure setpoints, start and stop the supply, and see system health at a glance. For OEMs and production tools, the optional blank (C-version) front panel removes local controls altogether while retaining full control via communication interfaces and rear 37-pin user I/O, keeping systems secure, clean, and operator-proof.

Rugged by design: safety + reliability, as you'd expect from Magna-Power.

Reliable current-fed power processing

Rugged by design: self-protecting topology for uptime.



MagnaDC power supplies utilize a high-frequency, current-fed architecture that adds a control stage beyond conventional voltage-fed designs. This topology inherently limits fault energy—avoiding fast-rising current spikes and magnetic core saturation so the supply self-protects and your load stays safe. Paired with state-of-the-art SiC power semiconductors, Magna DC power supplies delivers class-leading power density, efficiency, and reliability, including continuous full-power operation up to 50°C ambient.

- Current-fed architecture with an added control stage vs. voltage-fed.
- Inherent surge immunity—no current spikes or core saturation.
- Self-protecting behavior under fault conditions.
- SiC devices for high density and efficiency; full power to 50°C.

Layered safety, interlock & emergency stop

Standard programmable limits plus hardwired shutdown.



A soft-start stage keeps inrush below steady-state draw, while built-in diagnostics watch line, thermal, and internal conditions. On a fault, an immediate one-shot (OSHT) trip halts the inverter. Faults are reported on the front-panel status display and via SCPI/Modbus for fast troubleshooting.

- Soft-start caps inrush; AC draw stays below full-load current.
- Programmable trips: over-voltage, over-current, over-power.
- Thermal monitoring on heatsink and output capacitors.
- Integrated electronic bleeder to discharge output capacitors.
- 5V interlock input for dry-contact, latching inhibit (control power maintained).
- 24 V emergency stop bypasses logic to interrupt AC; full hardware shutdown.

From lab scripts to factory PLCs, flexible programming & integration.

Software integration made easy

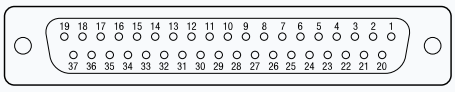
Readable commands, quick results—works with any language.

MagnaDC power supplies exposes a clear, text-based API with native SCPI, an ASCII-based command language sent over socket communications. Over 40 well-documented commands cover start/stop, set points for voltage, current, high-accuracy measurements, and full configuration—so your scripts and systems go from proof-of-concept to production fast.

- SCPI command sets with consistent behavior.
- Start/stop & protections: enable output, set trip limits, query status.
- High-accuracy reads: voltage, current, power, and sense feedback.
- Developer-driven documentation & examples.

External User I/O for PLC control or PHIL simulation

Wire it like an I/O module—no extra isolation needed.



Via the included rear 37-pin User I/O connector, MagnaDC supplies can be fully driven and monitored by external signals or a PLC. Voltage, current, OVT, and OCT set points are programmed with 0–10 V analog inputs, while each diagnostic condition has its own +5V digital status pin. Built-in +2.5V, +5V, and +10V reference rails let you use dry contacts without adding external supplies. All I/O is isolated from the output and referenced to earth ground as standard.

- 0–10 V analog programming for V, I, OVT, and OCT.
- Per-fault digital outputs: each diagnostic has its own +5V pin.
- Isolated user I/O referenced to earth ground—no extra isolators.
- With High Slew Rate Output (+HS), high-bandwidth response and fast rise times support HIL/PHIL simulation applications.

High-performance master-slave operation

Scale voltage or current without sacrificing performance.

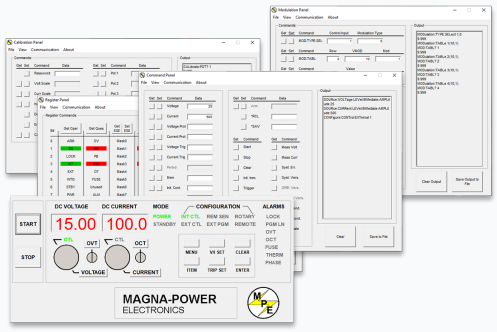


All MagnaDC supplies support master-slave operation, using gate-drive signals from the master when configured for parallel, so the whole stack behaves like a single supply—with one control loop and no noisy long analog references. The optional UID47 accessory simplifies wiring for series or parallel sets with near-equal sharing.

- Single control loop parallel operation: Master gate-drive to slaves for consistent dynamics.
- Plug & play with the UID47, enabling parallel or series stacks with current/voltage sharing.
- Series up to the DC isolation rating without added hardware.
- No additional ORing diodes required for parallel operation.

Magna-Power software, LabVIEW & IVI drivers

From virtual front panel to full automation—out of the box.



Every MagnaDC supply includes an IVI driver and NI LabVIEW driver with a full set of VIs, plus example programs so you can get talking to the hardware in minutes. For direct front-panel-style control from a PC, Magna-Power's Remote Interface Software provides a rich view into the supply—from commands and registers to calibration and firmware.

- IVI & NI LabVIEW drivers included with full VI set.
- Example programs to jump-start integration and testing.
- Remote Interface Software with:
  - Virtual front panel for manual control
  - Command panel to explore and send commands
  - Register panel for live status monitoring
  - Calibration panel for internal digital potentiometers
  - Firmware panel for in-place upgrades
  - Modulation panel to emulate non-linear profiles
- All communication interfaces supported across software and drivers for a consistent programming experience.

State-of-the-art USA manufacturing with worldwide support

Made in the USA

Vertically integrated manufacturing for full quality control.

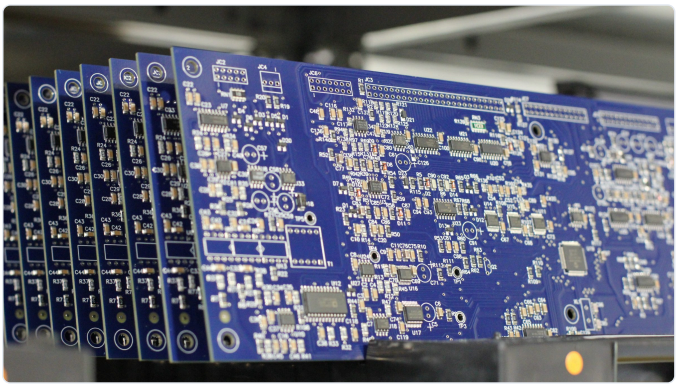


Magna-Power products are designed, built, tested, and serviced at Magna-Power's 73,500 sq-ft headquarters in Flemington, New Jersey, where metalwork, magnetics, PCB assembly, and burn-in are all done in-house for tight control over quality, cost, and lead-time.

- USA-built: Engineering, manufacturing, and service under one roof.
- In-house production: Metalwork, magnetics, SMT PCBs, and finishes.
- Proven reliability: Every unit fully tested, calibrated, and burned in.

Worldwide service & OEM parts support

Factory expertise, local response.

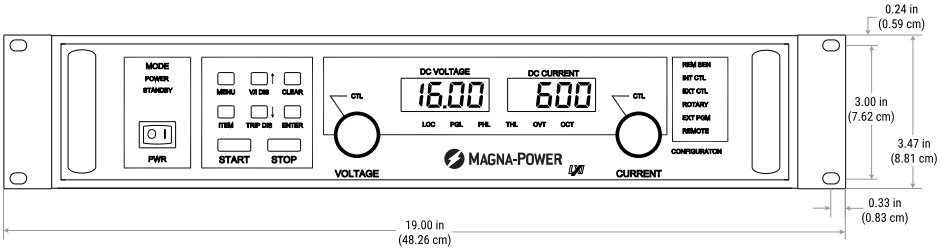


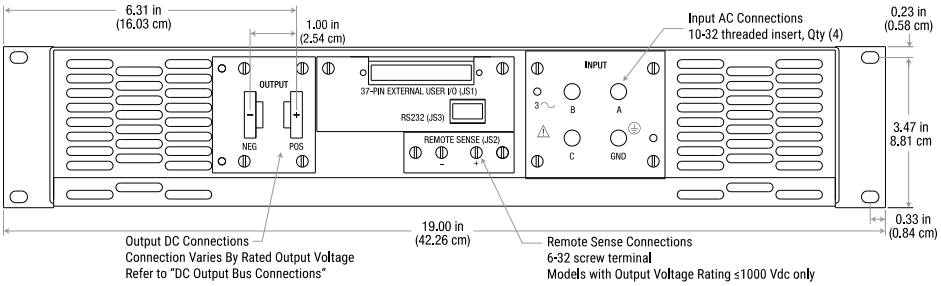
Magna-Power backs its products with factory and authorized service centers across North America, Europe, the UK, Asia-Pacific, East Asia, and South America—using factory procedures and genuine parts to restore units to original specifications, in or out of warranty.

- Global coverage: HQ in New Jersey plus regional authorized service centers.
- Consistent repairs: Factory diagnostics, work instructions, and system diagrams.
- Genuine OEM parts: Tested replacement assemblies for predictable, low-downtime service.

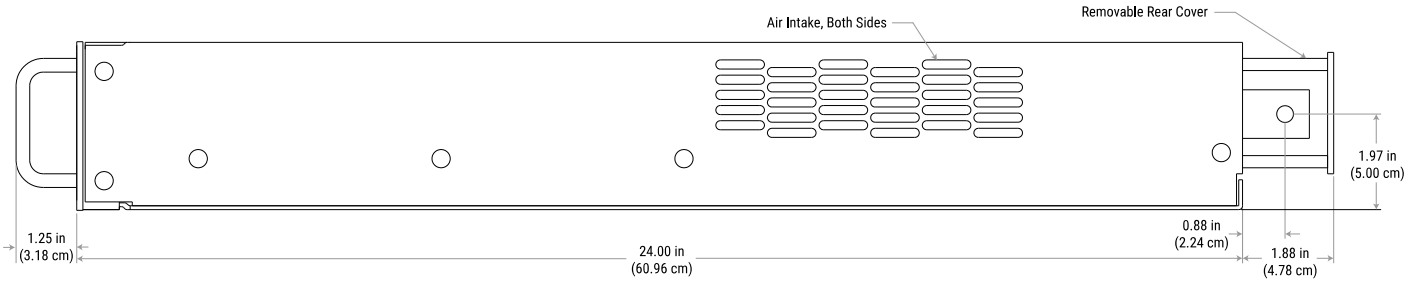
8 Diagrams

Front Panel



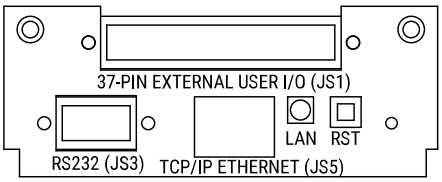


Side Panel



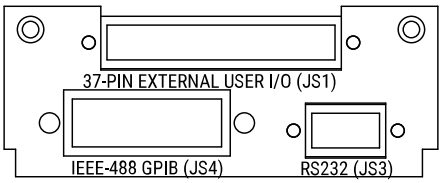
Communications Interface

LXI TCP/IP Ethernet Option (+LXI)



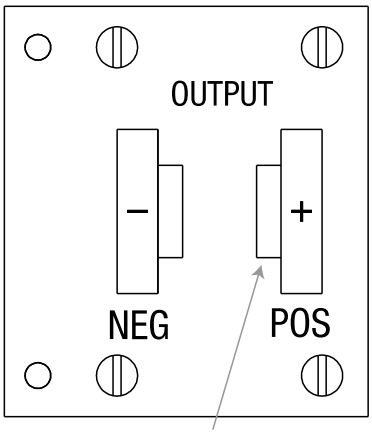
Communications Interface

IEEE-488 GPIB Option (+GPIB)



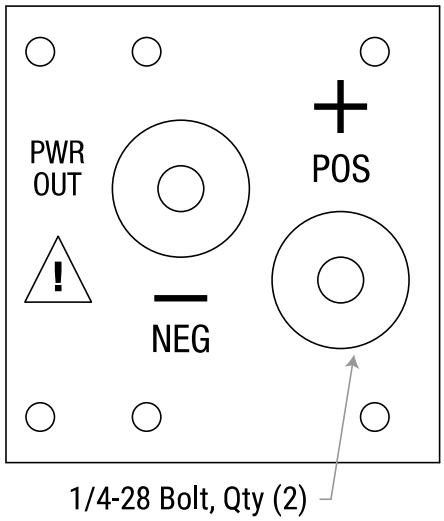
Standard Output Bus

Models ≤1000 Vdc

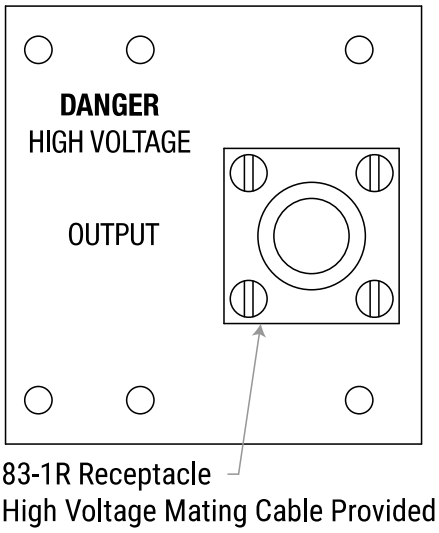


0.250 x 1.000 Tin Plated Copper Bus
3/8-16 Threaded Insert, Qty (2)

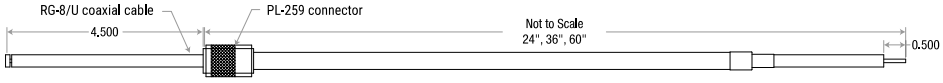
High Voltage Output Bus
Models >1000 Vdc and ≤3000 Vdc



Very High Voltage Output Bus
Models >3000 Vdc



Very High Voltage Output Cable
Included, Models >3000 Vdc



9 Integrated Options Available

+HS High Slew Rate Output
A hardware and control modification that replaces the standard output stage with one of low capacitance film and/or high RMS current rated aluminum electrolytic capacitors. This option provides higher bandwidth with faster output rise and fall times.

The high slew rate option solves several limitations inherent in switching power supply design. Rapid voltage transitions require internal electronics to supply the energy to charge and discharge output capacitors. Peak currents internal to the power supply define slew rate; utilizing less capacitance enables voltage transitions in shorter time periods. Additionally, less capacitance reduces requirements for discharge demands during open circuit conditions.

The standard output stage Magna-Power Electronics power supplies has been designed to provide the lowest possible output ripple voltage within the constraints of available components, size, and cost. Part of the output stage consists of a bank of aluminum electrolytic capacitors which has the desired electrical properties to provide this function. These components require bleed resistors to discharge any voltage when the power supply has no load and is disabled. While the presence of these components and the resulting performance are normally industry accepted, there are applications where lower output capacitance and lower loss bleed resistors are extremely desirable and higher ripple voltage is acceptable. To meet this need, a high-slew rate option is available which has an output stage consisting of low capacitance film and aluminum electrolytic capacitors and lower loss bleed resistors. Applications for the high-slew rate option include battery charging, photovoltaic emulation, power waveform generation, and medium speed power pulsing. These applications all benefit from higher bandwidth and in many cases, can tolerate increased ripple voltage.

Key Applications

For **battery charger applications**, output capacitance and internal bleed resistors present themselves as a load to the connecting batteries. One common practice is to use a series diode to block reverse current flow with the sacrifice of increased cost and lower efficiency. The high slew rate option, with its lower output capacitance and lower loss bleed resistors, enables direct connection to batteries without series blocking diodes.

For **photovoltaic emulation applications**, higher bandwidth and lower output capacitance enable improved performance with higher speed, maximum power tracker algorithms. Maximum power tracker circuitry deviates the operating point of photovoltaic arrays to determine maximum power output. Slow responding emulation sources can present a problem when the speed of the algorithm exceeds that of the source. Furthermore, with lower output capacitance, changes in the operating point and transients, caused by shorting the solar inverter input, produce lower unwanted input currents.

The high-slew rate option enables the power supply to operate as a **low frequency, power pulse generator**. With the special capacitors selected for this option, it is possible to superimpose waveforms or produce a medium speed pulse on top of the dc output and expect normal capacitor life. It is

important to note that the power supply output is single quadrant; that is, the output voltage or current cannot reverse.

Specifications

SL Series Output Stage Ratings with the High Slew Rate Output Option Integrated

Voltage Maximum Rating (Vdc)	Output Capacitance (uF)	Output Voltage Ripple (Vrms)
5	4235	0.5
10	1740	0.6
16	1740	0.6
20	775	0.6
25	775	0.8
32	775	0.8
40	760	1.5
50	760	1.5
60	760	2.0
80	110	1.5
100	110	1.6
125	70	1.7
160	70	1.8
200	70	1.8
250	70	1.8
300	70	1.8
375	70	1.8
400	70	1.8
500	40	2.0
600	40	2.2
800	30	2.5
1000	30	3.4
1250	—	3.4
1500	—	4.0

XR Series Output Stage Ratings with the High Slew Rate Output Option Integrated

Voltage Maximum Rating (Vdc)	Output Capacitance (uF)	Output Voltage Ripple (Vrms)
5	13200	1.5
10	4080	1.6
16	4080	1.7
20	2340	1.8
25	1170	1.8
32	1170	1.8
40	240	1.8
50	240	1.8
60	240	2.0
80	240	2.2
100	160	2.5
125	160	3.0
160	160	2.8
200	160	4.0
250	160	1.6
300	160	1.8
375	160	1.8
400	160	1.8
500	56	3.0
600	56	3.0
800	52	3.0
1000	52	3.0
1250	18	3.5
1500	18	3.5
2000	18	5.0
3000-10000	—	—

TS Series Output Stage Ratings with the High Slew Rate Output Option Integrated

Voltage Maximum Rating (Vdc)	Output Capacitance (uF)	Output Voltage Ripple (Vrms)
5	13200	0.5
8	9000	0.5
10	9000	0.5
16	4080	0.5
20	2340	0.8
25	2340	0.8
32	1170	0.8
40	1170	0.8
50	1170	0.8
60	300	1.2
80	300	1.2
100	200	1.6
125	200	1.6
160	200	1.6
200	200	2.0
250	200	2.0
300	200	2.2
375	200	2.2
400	200	2.4
500	200	2.7
600	120	2.6
800	70	2.6
1000	60	3.5
1250	18	3.5
1500	18	4.3
2000	18	3.8
3000	9	7.2
4000	9	4.0

Note:
For 20 to 30 kW models, multiply capacitance by 2
For 40, 50, 75, and 100 kW models, contact Magna-Power support

For MT Series and ML Series output stage ratings with the high slew rate output option, please inquire with your local sales partner regarding the specific model.

+GPIB IEEE-488 GPIB

IEEE-488 General Purpose Interface Bus (GPIB) communication interface providing full command support and compatibility with other GPIB devices

The IEEE-488 interface, sometimes called the General Purpose Interface Bus (GPIB), is a general purpose digital interface system that can be used to transfer data between two or more devices. It is particularly well-suited for interconnecting computers and instruments. Some of its key features are:

- Up to 15 devices may be connected to one bus
- Total bus length may be up to 20 m and the distance between devices may be up to 2 m

- Communication is digital and messages are sent one byte (8 bits) at a time
- Message transactions are hardware handshaked
- Data rates may be up to 1 Mbyte/sec

The IEEE-488 GPIB interface in integrated with the power supply's rear communication ports. The IEEE 488 interface offers full compatibility with Magna-Power provided drivers, software and SCPI command set.

+LXI LXI TCP/IP Ethernet

TCP/IP Ethernet communication protocol and single RJ-45 interface, certified to the LXI Class C standard, for socket communications using conventional computer networks

Certified to the LXI Standard (Class C), version 1.4, this option allows the product to be fully controlled over an integrated TCP/IP Ethernet interface. LXI is an instrumentation platform based on industry standard Ethernet technology designed to provide modularity, flexibility, and performance to small- and medium-sized systems. All of the product's standard SCPI commands are supported over the +LXI option, along with all provided software and drivers.

LXI's advantages are exemplified in its compact, flexible package providing high-speed I/O and reliable measurements. The Magna-Power Electronics LXI TCP/IP Ethernet option includes an embedded web-server, allowing web browser power supply control and monitoring from virtually anywhere.

Note: For xGen products, only the SCPI command protocol is available when LXI TCP/IP Ethernet interface is installed. Modbus communication protocol is not available through any interface when the LXI TCP/IP Ethernet interface is installed.

+RUG Ruggedized

Internal product ruggedization, which has been independently tested to comply with select MIL-STD-810G and RTCA DO-160 shock and vibration specifications.

The Ruggedized Option (+RUG) provides additional mechanical security for large power components and sub-assemblies within SLx Series, SL Series, and XR Series products.

SLx Series, SL Series, and XR Series units with the Ruggedized Option have been independently tested to comply with the following MIL-STD-810G shock and vibration specifications:

- MIL-STD-810G CHG1 Method 516.7 Functional Shock, Procedure I; which subjects the product to 40G, 11 ms terminal saw tooth pulse; three shocks in each direction along three mutually perpendicular axes
- MIL-STD-810G CHG1 Method 514.7 Vibration; which subjects the product to two hours of vibration per axis along three mutually perpendicular axes

In addition to the specifications listed above, the air cooled SLx Series products with the Ruggedized Option have also been independently tested to comply with RTCA/DO-160G Section 8.0 Vibration, Profile B4 with its associated total energy of 2.2 G_{rms} for equipment installed in Fixed Wing aircrafts with Turbojet or Turbofan engines.

With the Ruggedized Option, SL Series and XR Series products maintain ambient operating temperatures from -25°C to 50°C, while SLx Series products maintain ambient operating temperatures from 0ºC to 50ºC. Storage temperature for all products is rated from -40°C to +85°C.

10 Product Images





Qty (4) XR Series 10 kW units mounted in a 12U CAB1

11 Downloads

https://magna-power.com/products/magnadc/xr#downloads

12 Contact

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