XR Series

Programmable DC Power Supply

认证



功率	电压	电流	型号	尺寸
2 kW to **10** kW	**2000** Vdc to **10,000** Vdc	**310** Adc to **600** Adc	**39**	**2**U

1 描述

2U XR 系列通过在 2 kW，4 kW，6 kW，8 kW，8 kW 和 10 kW 的 2U 封装中提供高电压（大于 1500 VDC）和高电流（大于 250 ADC）模型，从而补充了 1U SL 系列。 XR 系列具有 Magna-Power 产品产品中最高的电压范围，最多 10,000 VDC 和高电流型号高达 600 dC，所有这些型号都利用了公司的签名电流喂养的功率处理来提供强大的电源转换。此外，高精度编程和监视水平使电源测量值有信心，从而消除了对外部电力计的需求。

2 可用集成选件

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

3 产品规格

规格如有变更，恕不另行通知。除非另有说明，所有规格均在产品的最大额定值下测量。

3.1 AC Input Specifications

参数	值	条件
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	

3.2 DC Output Specifications

参数	值	条件
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

3.3 Programming Interface Specifications

参数	值	条件
Front Panel Programming	Stepless aluminum rotary knobs and keypad	

3.3 Programming Interface Specifications

参数	值	条件
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

3.4 Accuracy Specifications

参数	值	条件
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	

3.5 External User I/O Specifications

参数	值	条件
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	

3.6 Physical Specifications

参数	值	条件
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

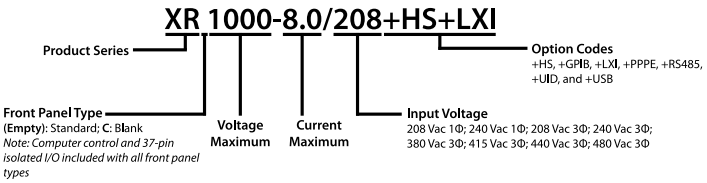
3.7 Environmental Specifications

参数	值	条件
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	

3.8 Regulatory Specifications

参数	值	条件
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	

4 型号订购指南



5 型号

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		

6 特点

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

2U 机箱实现高压大电流性能
为严苛负载提供精准、稳定的输出。



XR 系列是 1U SL 系列的扩展补充，提供 2–10 kW 的 2U 机型，支持高电压（从 2000 Vdc 到 10,000 Vdc）和大电流（从 375 Adc 到 600 Adc）——全部集成于紧凑的 2U 机箱中。在恒压或恒流模式下自动交叉切换，XR 系列具备快速瞬态恢复能力，电压和电流编程精度达±0.075%，测量精度达±0.2%——无需外部仪表即可实现可靠的控制与回读。

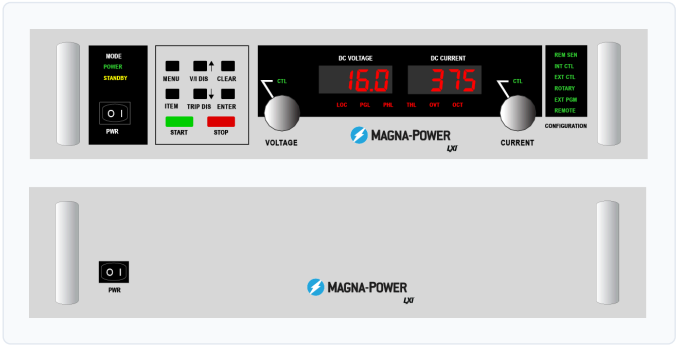
按订单配置，集成多种选项
丰富的标准功能，按需扩展。



XR 系列拥有强大的基础配置：SCPI over RS232、隔离式 37 针用户 I/O、LabVIEW 和 IVI 驱动程序以及远程接口软件均为标准配置。当应用需求更高时，全集成选项可定制性能、连接性和机械结构——无需外部设备或临时接线。

- 标准 SCPI 计算机控制、RS232、隔离式 37 针模拟/数字 I/O、LabVIEW 和 IVI 驱动程序、RIS 软件。
- 高摆率输出 (+HS)，提供更高带宽和更快的编程上升时间。
- 连接选项：LXI TCP/IP 以太网 (+LXI) 和 IEEE-488 GPIB (+GPIB)。
- 加固型 (+RUG)，符合 MIL-STD 冲击和振动标准

无级前面板控制，可选空白面板
需要操控时触手可及，无需时隐于无形。

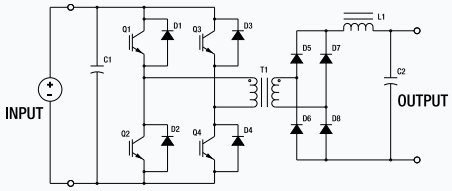


标准 XR 前面板配备旋钮和按键控制、高亮数字仪表及清晰的状态指示灯，操作人员可轻松配置设定值、启停电源并一目了然地查看系统状态。针对 OEM 和生产设备，可选的空白面板（C 版本）完全移除了本地控制功能，同时通过通信接口和后部 37 针用户 I/O 保留完整的远程控制能力，确保系统安全、整洁且防误操作。

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

可靠的电流馈电功率处理

坚固耐用的设计：自保护拓扑结构，确保持续运行。



The SLx Series uses 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, SLx 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.

多层安全保护、联锁与紧急停机

标准可编程限制加硬接线停机保护。



软启动阶段将浪涌电流控制在稳态电流以下，内置诊断功能持续监控线路、温度和内部状态。发生故障时，单次触发（OSHT）保护立即停止逆变器运行。故障信息显示在前面板状态显示屏上，并通过 SCPI/Modbus 输出，便于快速排查。

- 软启动限制浪涌电流；交流电流保持在满载电流以下。
- 可编程保护：过压、过流、过功率。
- 散热器和输出电容器温度监控。
- 5V 联锁输入，支持干接点锁定抑制（控制电源保持供电）。
- 24 V 紧急停机绕过逻辑直接切断交流电源；执行完全硬件停机。

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

轻松实现软件集成

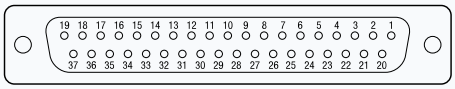
可读命令，快速响应——兼容任何编程语言。

MagnaDC 电源提供清晰的文本 API 接口，支持原生 SCPI———一种通过套接字通信发送的 ASCII 命令语言。超过 40 条详细文档化的命令涵盖启动/停止、电压和电流设定值、高精度测量以及完整配置——让您的脚本和系统从概念验证快速迈向生产部署。

- SCPI 命令集，行为一致可靠。
- 启动/停止与保护功能：启用输出、设置跳闸限值、查询状态。
- 高精度读取：电压、电流、功率及检测反馈。
- 面向开发者的文档与示例。

用于 PLC 控制或 PHIL 仿真的外部用户 I/O

像 I/O 模块一样接线——无需额外隔离。



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.

高性能主从操作

在不牺牲性能的前提下扩展电压或电流。

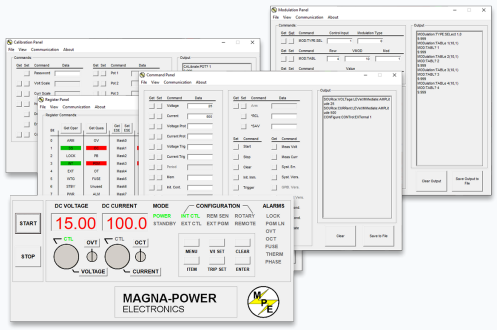


All MagnaDC supplies support master-slave operation, using gate-drive signals from the master when configured for parallel, so the whole stack behaves like a single supply—with one control loop and no noisy long analog references. The optional UID47 accessory simplifies wiring for series or parallel 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 软件、LabVIEW 和 IVI 驱动程序

从虚拟前面板到全自动化——开箱即用。



每台 MagnaDC 电源均包含 IVI 驱动程序和 NI LabVIEW 驱动程序，提供完整的 VI 集以及示例程序，让您在几分钟内即可与硬件通信。如需通过 PC 进行直接的前面板式控制，Magna-Power 远程接口软件可提供电源的全面视图——从命令和寄存器到校准和固件。

- 随附 IVI 和 NI LabVIEW 驱动程序及完整 VI 集。
- 示例程序助您快速启动集成和测试。
- 远程接口软件包含：
  - 虚拟前面板，用于手动控制
  - 命令面板，用于浏览和发送命令
  - 寄存器面板，用于实时状态监控
  - 校准面板，用于内部数字电位器
  - 固件面板，用于就地升级
  - 调制面板，用于模拟非线性曲线
- 所有通信接口在软件和驱动程序中均受支持，提供一致的编程体验。

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

美国制造

垂直整合制造，实现全面质量管控。

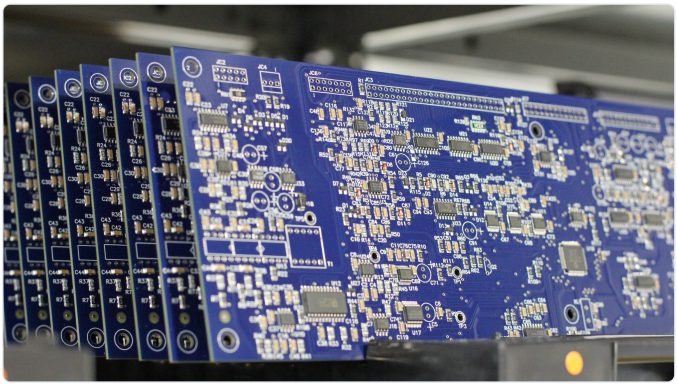


Magna-Power 产品的设计、制造、测试和售后服务均在位于新泽西州弗莱明顿的 Magna-Power 总部完成，总部面积达 73,500 平方英尺。金属加工、磁性元件制造、PCB 组装和老化测试均在内部完成，从而严格把控质量、成本和交货周期。

- 美国制造：工程设计、生产制造和售后服务集于一处。
- 内部生产：金属加工、磁性元件、SMT PCB 和表面处理。
- 可靠性验证：每台设备均经过全面测试、校准和老化试验。

全球服务与 OEM 零部件支持

工厂级专业技术，本地化响应。

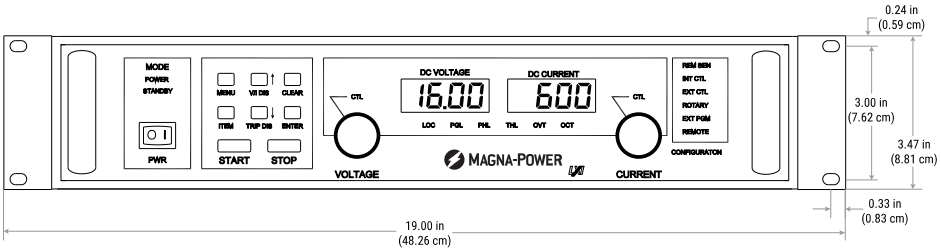


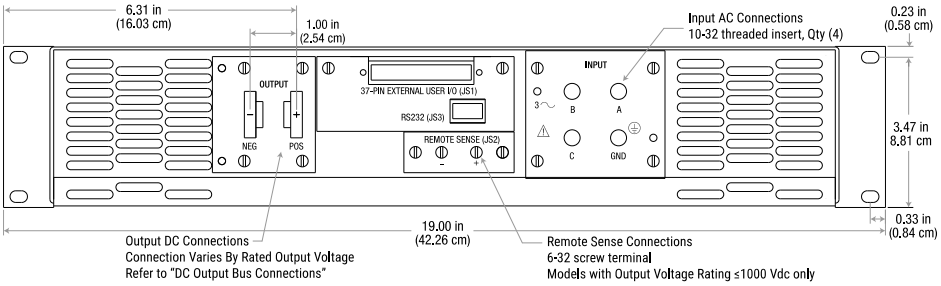
Magna-Power 以工厂及授权服务中心为其产品提供全面支持，服务网络覆盖北美、欧洲、英国、亚太、东亚及南美地区。无论是否在保修期内，均采用工厂标准流程和原厂零部件，将设备恢复至出厂规格。

- 全球覆盖：总部位于新泽西州，并设有多个区域授权服务中心。
- 一致的维修标准：采用工厂诊断流程、作业指导书和系统图纸。
- 原厂 OEM 零部件：经过测试的替换组件，确保可靠、高效的维修服务，最大限度减少停机时间。

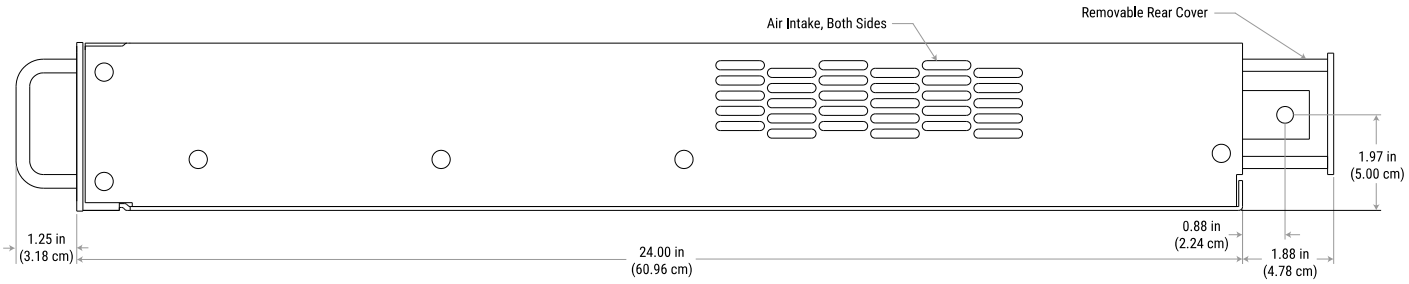
7 图纸

Front Panel



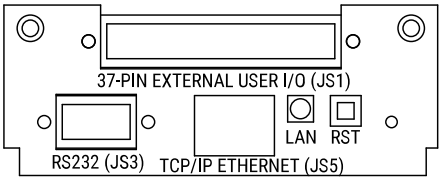


Side Panel



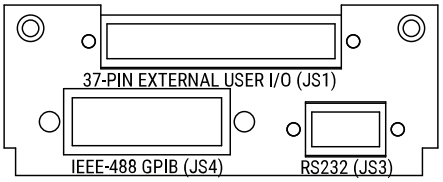
Communications Interface

LXI TCP/IP Ethernet Option (+LXI)



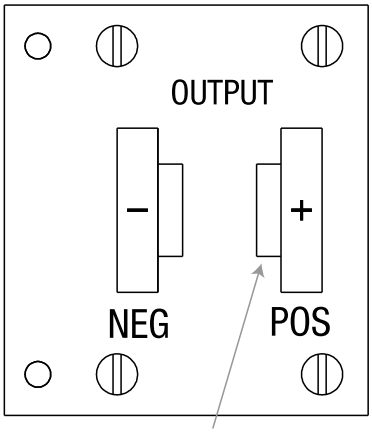
Communications Interface

IEEE-488 GPIB Option (+GPIB)



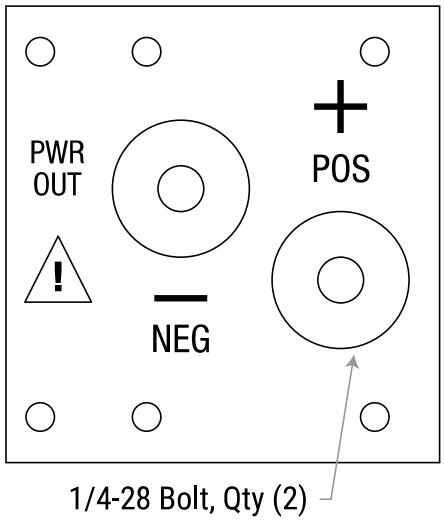
Standard Output Bus

Models ≤1000 Vdc

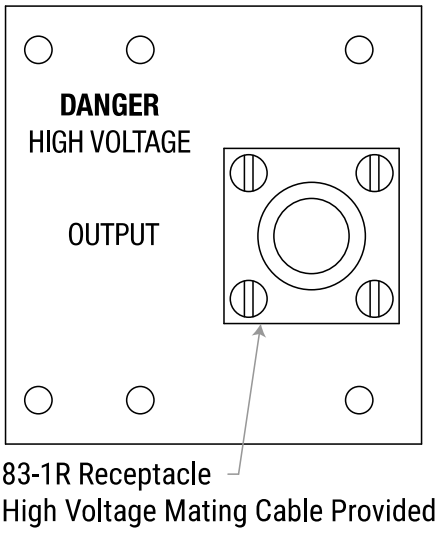


0.250 x 1.000 Tin Plated Copper Bus
3/8-16 Threaded Insert, Qty (2)

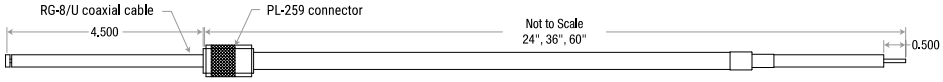
High Voltage Output Bus
Models >1000 Vdc and ≤3000 Vdc



Very High Voltage Output Bus
Models >3000 Vdc



Very High Voltage Output Cable
Included, Models >3000 Vdc



8 可用集成选件

+HS High Slew Rate Output

一种硬件和控制修改方案，将标准输出级替换为低电容薄膜电容器和/或高均方根电流额定铝电解电容器。此选项可提供更高带宽以及更快的输出上升和下降时间。

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 通用接口总线（GPIB）通信接口，提供完整的命令支持，并与其他 GPIB 设备兼容

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 以太网通信协议及单个 RJ-45 接口，符合 LXI C 类标准认证，适用于通过传统计算机网络进行套接字通信

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

内部产品加固处理，已经过独立测试，符合特定的 MIL-STD-810G 和 RTCA DO-160 冲击与振动规范。

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.

9 产品图片





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

10 下载

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

11 联系

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