# Serie ML

## Programmable DC Power Supply

CERTIFICAZIONI



| POTENZA | TENSIONE | CORRENTE | MODELLI |
|---|---|---|---|
| **500** kW to **10** MW+ | **100** Vdc to **6000** Vdc | **83** Adc to **5000** Adc (per unit) | **38** |

## 1 Descrizione

La Serie ML di Magna-Power Electronics è stata progettata da zero per stabilire un nuovo standard in densità di potenza e prestazioni. Sfruttando la tecnologia avanzata di raffreddamento ad acqua, i modelli della Serie ML da 500 kW e 1.000 kW raggiungono un aumento della densità di potenza quasi quadruplicato rispetto ai modelli raffreddati ad aria di Magna-Power. Con la possibilità di collegarsi in configurazioni parallele master-slave, la Serie ML può raggiungere livelli di potenza superiori a 10 MW. Basati sull'affidabile topologia di elaborazione della potenza alimentata a corrente di Magna-Power e sulla tecnologia innovativa di neutralizzazione armonica, gli alimentatori della Serie ML offrono una conversione di potenza affidabile ed efficiente con bassa distorsione armonica. Progettati e fabbricati a Flemington, New Jersey, gli alimentatori della Serie ML incarnano l'impegno di Magna-Power per la qualità, l'affidabilità e l'ingegneria avanzata.

## 2 Caratteristiche principali

- Modelli da 500 kW e 1.000 kW; espandibile fino a 10 MW
- Controllo di precisione a 12 bit
- Programmazione remota tramite comandi SCPI
- Funzioni di protezione programmabili
- Blocco di sicurezza per arresto di emergenza esterno
- Driver LabVIEW
- Funzionamento continuo a piena potenza fino a 50°C di temperatura ambiente
- Porta utente I/O analogico-digitale a 37 pin
- Solenoide integrato per il controllo della condensa
- Master-slave ad alte prestazioni
- Rilevamento della tensione locale, remoto e senza piombo
- Opzioni di comunicazione standard RS232 e LAN TCP/IP Ethernet disponibili
- Piattaforma software RIS Panel inclusa
- Prodotto negli Stati Uniti

## 3 opzioni integrate disponbili

| | |
|---|---|
| **+ISO** | High Isolation Output |
| **+HS** | High Slew Rate Output |
| **+GPIB** | IEEE-488 GPIB |
| **+BD** | Integrated Blocking Diode |
| **+LXI** | LXI TCP/IP Ethernet |

# 4 Specificazioni

Le specifiche sono soggette a modifiche senza preavviso. Salvo diversa indicazione, tutte le specifiche sono misurate ai valori nominali massimi del prodotto.

## 4.1 AC Input Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Input Voltages Available** | 440 Vac, 3-phase<br>480 Vac, 3-phase | AC Input voltage specified at time of order and cannot be modified |
| **Input Voltage Tolerance** | ± 10% | |
| **Input Voltage Frequency** | 50-60 Hz | |
| **Power Factor** | > 0.96 | Measured at max power |
| **Input Isolation** | ± 2000 Vdc | Measured line-to-ground |
| **AC Circuit Protection** | UL/CSA listed circuit breaker | |

## 4.2 DC Output Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Voltage Ripple** | Model specific. Refer to models table. | |
| **Line Regulation** | Voltage control: ± 0.04% of rated voltage<br>Current control: ± 0.03% of rated current | |
| **Load Regulation** | Voltage control: ± 0.02% of rated voltage<br>Current control: ± 0.06% of rated current | |
| **Stability** | ± 0.10% | FWHM, measured at 25ºC over 8 hrs after 30 min warm-up |
| **Temperature Coefficient** | Voltage control: 0.04%/°C of rated voltage<br>Current control: 0.06%/ºC of rated current | |
| **Efficiency** | Up to 96%. Model specific. Refer to Models table. | |
| **Slew Rate** | < 170 ms, output voltage change from 0 to 63%<br>< 200 ms, output current change from 0 to 63% | Standard Models |
| **Slew Rate** | < 5 ms, output voltage change from 0 to 63%<br>< 10 ms, output current change from 0 to 63% | Models with High Slew Rate (+HS) Option |
| **Output Isolation** | ± 1500 Vdc | Measured output-to-ground, models rated ≤ 1000 Vdc |
| **Output Isolation** | ± 6000 Vdc | Measured output-to-ground, models rated > 1000 Vdc or models with High Isolation Output (+ISO) option |

## 4.3 Programming Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Resolution, Digital Programming** | 12-bit, 0.025% of rated voltage, current or power | Front panel or communication interfaces |
| **Accuracy, Programming** | Voltage: ± 0.075% of rated voltage<br>Current: ± 0.075% of rated current | Output value to set point value |
| **Accuracy, Measurement** | Voltage: ± 0.20% of rated voltage<br>Current: ± 0.20% of rated current | Output value to returned value |
| **Trip Settings Range** | Over Voltage: 10% to 110% of rated voltage<br>Over Current: 10% to 110% of rated current | |
| **Computer Command Protocol** | Standard Commands for Programmable Instruments (SCPI) (ASCII-based commands) | |
| **Remote Sense Limits** | 3% maximum voltage drop from output to load | Wired; Available on Models Rated ≤ 1000 Vdc |

## 4.3 Programming Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Analog I/O** | Analog programming inputs: 0-10 V<br>Analog programming impedance: 10 kΩ<br>Analog measurement outputs: 0-10V, 5 mA capacity<br>Analog measurement impedance: 100 Ω<br>Analog reference signal: 10 V, 5 mA capacity, 1 Ω | 4 analog programming inputs, 2 analog measurement outputs, Reference signal provided |
| **Digital I/O** | Digital control inputs: 5 V<br>Digital control inputs impedance: 10 kΩ<br>Digital monitoring outputs: 5 V, 5 mA capacity<br>Digital reference signal: 5 V, 25 mA capacity | 5 digital control inputs, 15 digital monitoring outputs, Reference signal provided |

## 4.4 Interace Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Front Panel Programming** | Two machined aluminum 10-turn knobs and keypad | |
| **Communication Interfaces** | RS232: D-sub DB-9, Female | Standard |
| **Communication Interfaces** | LXI TCP/IP Ethernet (+LXI): RJ-45 | Optional |
| **External User I/O Port** | 37-pin D-sub DB-37, female<br>Referenced to ground; isolated from the DC output<br>See User Manual for pin layout | Standard |

## 4.5 Physical Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Size & Weight** | 76.4” H x 72” W x 31.5” D (194.1 x 182.9 x 80.0 cm)<br>6800 lbs (3084 kg) | 500 kW models |
| **Size & Weight** | Ships as two components:<br>1000 kW Power Supply<br>76.4” H x 72” W x 31.5” D (194.1 x 182.9 x 80.0 cm)<br>4750 lbs (2155 kg)<br>1000 kW Harmonic Neutralizer<br>76.4” H x 48” W x 31.5” D (194.1 x 121.9 x 80.0 cm)<br>4350 lbs (1973 kg) | 1000 kW Models |

## 4.6 Environmental Specifications

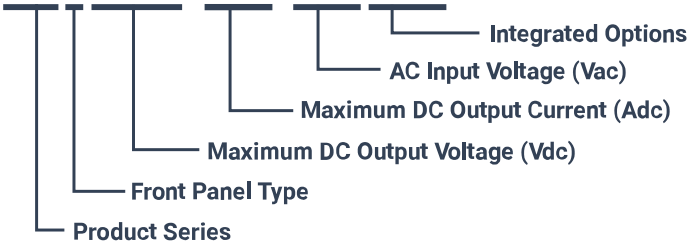
| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **Ambient Operating Temperature** | 0°C to 50°C | |
| **Storage Temperature** | -40°C to +85°C | |
| **Humidity** | Relative humidity up to 95% non-condensing | |
| **Air Flow** | Bottom air inlet, top exhaust | To ensure even heat distribution for water cooling system |
| **Water Coolant Supply** | Maximum inlet temperature: 25ºC<br>Maximum inlet pressure: 80 psi<br>Inlet and outlet fittings provided: 1” Female NPT<br>Materials in coolant path: Copper pipe, PEX tubing, brass solenoid & fittings | Requirement for supplied coolant |
| **Minimum Coolant Flow Rate** | 9 GPM | 500 kW models |
| **Minimum Coolant Flow Rate** | 15 GPM | 1000 kW models |

## 4.7 Regulatory Specifications

| PARAMETRO | VALORE | CONDIZIONI |
|---|---|---|
| **EMC** | Complies with 2014/30/EU (EMC Directive)<br>CISPR 22 / EN 55022 Class A | |
| **Safety** | Complies with EN61010-1 and 2014/35/EU (Low Voltage Directive) | |
| **CE Mark** | Yes | |

## 5 Guida all'ordinazione dei modelli

**MLD1250-800/480+LXI**




## 6 Modelli

| Max Voltage | 500 kW | 1000 kW | Ripple | |
|---|---|---|---|---|
| Vdc | Max Current Adc | | mVrms | Efficiency |
| **100** | 5000 | – | 100 | 91% |
| **125** | 4000 | – | 100 | 91% |
| **160** | 3125 | – | 120 | 92% |
| **200** | 2500 | 5000 | 125 | 92% |
| **250** | 2000 | 4000 | 130 | 92% |
| **300** | 1666 | 3333 | 160 | 93% |
| **375** | 1333 | 2666 | 170 | 93% |
| **400** | 1250 | 2500 | 180 | 95% |
| **500** | 1000 | 2000 | 220 | 95% |
| **600** | 833 | 1666 | 300 | 95% |
| **800** | 625 | 1250 | 400 | 96% |
| **1000** | 500 | 1000 | 500 | 96% |
| **1250** | 400 | 800 | 500 | 96% |
| **1600** | 312 | 625 | 600 | 96% |
| **2000** | 250 | 500 | 800 | 96% |
| **2500** | 200 | 400 | 900 | 96% |
| **3000** | 166 | 333 | 1000 | 96% |
| **4000** | 125 | 250 | 1100 | 96% |
| **5000** | 100 | 200 | 1500 | 96% |
| **6000** | 83 | 166.6 | 2000 | 96% |

# 7 Caratteristiche

## High power density, water cooled megawatt-scale DC power systems

### Prestazioni ad alta densità con raffreddamento a liquido

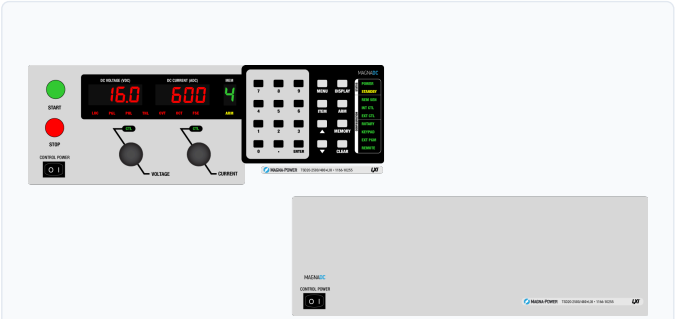
Uscita pulita e precisa da 500 kW a oltre 10 MW.



Gli alimentatori DC programmabili della Serie ML sfruttano piastre di raffreddamento a liquido avanzate e collettori interni per erogare 500 kW e 1.000 kW per cabinet con un'efficienza fino al 96%, raggiungendo una densità di potenza quasi quattro volte superiore rispetto ai modelli comparabili raffreddati ad aria, operando a piena potenza nominale fino a 50°C di temperatura ambiente. Basata sulla topologia current-fed di MagnaDC, la Serie ML offre una risoluzione di programmazione a 12 bit (0,025%), una regolazione linea/carico precisa e un'accuratezza di programmazione in tensione e corrente di ±0,075% con basso ripple, portando prestazioni di livello laboratorio a sistemi di test e di processo multi-megawatt.

### Controllo continuo dal pannello frontale con opzione pannello cieco

Operativo dove serve, nascosto dove non serve.



The standard SL 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.

## Configurato su ordinazione con opzioni integrate

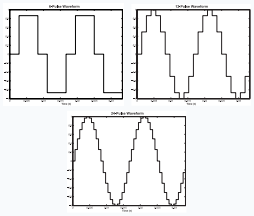
Funzionalità standard complete, estendibili quando necessario.



Like the rest of the MagnaDC line, MT Series supplies start with a strong control base: SCPI over RS232, isolated rear User I/O, LabVIEW and IVI drivers, and Remote Interface Software included. From there, integrated options let you tailor each system for its role—High Isolation Output (+ISO) for extended series stacking, High Slew Rate Output (+HS) for faster dynamics, LXI TCP/IP Ethernet (+LXI) and IEEE-488 GPIB (+GPIB) for additional communications, plus protection and mechanical options such as an Integrated Blocking Diode (+BD) and Pedestal Base (+PB) for fixed installations.

## Neutralizzatori di armoniche per sistemi ad alta potenza più puliti

Riduci il THD alla sorgente per una conformità più semplice alla qualità dell'energia.



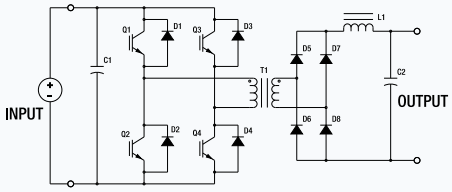
Le armoniche della corrente di ingresso sono un sottoprodotto intrinseco dei raddrizzatori trifase: un front-end standard a 6 impulsi produce correnti armoniche a 1, 5, 7, 11, 13… volte la fondamentale, con le sole componenti 5ª e 7ª rispettivamente al 20% e al 14% circa della fondamentale. Queste correnti possono eccitare carichi sensibili—come reattori per illuminazione con condensatori/induttori in serie—e rendere più difficile il rispetto delle linee guida sulla qualità dell'energia come IEEE 519. Il modo più affidabile per ridurre al minimo i problemi di armoniche è eliminare la corrente armonica alla sorgente.

Per i sistemi ad alta potenza, Magna-Power produce Neutralizzatori di Armoniche con avvolgimenti speciali che moltiplicano il numero delle fasi di ingresso e riducono drasticamente il THD della corrente di ingresso, in modo passivo. Gli alimentatori Magna-Power standard da 1,5–150 kW generano una forma d'onda a 6 impulsi, mentre i modelli MT Series da 250 kW e ML Series da 500 kW integrano un Neutralizzatore di Armoniche a 12 impulsi e i modelli ML Series da 1000 kW integrano un Neutralizzatore di Armoniche a 24 impulsi—in modo trasparente per l'utente.

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

### Elaborazione di potenza affidabile a corrente impressa

Robusto per design: topologia autoprotettiva per la massima operatività.




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.

### Caratteristiche di sicurezza e interlock

Avvio graduale, protezione programmabile e disconnessione meccanica della linea per una sicurezza reale.



MagnaDC supplies start gently and watch continuously. A soft-start stage keeps inrush below steady-state draw, while built-in diagnostics monitor line, thermal, and control conditions. In standby or on a diagnostic fault, an embedded AC contactor mechanically disconnects the mains, assuring the unit only processes power when intended. Faults are shown on the front-panel status display, through 5V digital outputs, and are queryable via SCPI.

- Programmable trips: Over voltage (OVT) and over current (OCT)/
- Control integrity: Program-line over-voltage detection.
- Thermal protection: Over temperature on internal heatsinks.
- Interlock/E-stop fault monitoring as a standard diagnostic.
- Field integration: 5V interlock input (with 5V reference) for a dry-contact, latching inhibit with control power maintained.

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

### Integrazione software semplificata

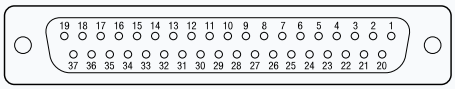
Comandi leggibili, risultati rapidi—funziona con qualsiasi linguaggio.

Gli alimentatori MagnaDC offrono un'API testuale chiara con SCPI nativo, un linguaggio di comando basato su ASCII inviato tramite comunicazioni socket. Oltre 40 comandi ben documentati coprono avvio/arresto, set point per tensione, corrente, misurazioni ad alta precisione e configurazione completa—così i vostri script e sistemi passano rapidamente dal proof-of-concept alla produzione.

- Set di comandi SCPI con comportamento coerente.
- Avvio/arresto e protezioni: abilitazione dell'uscita, impostazione dei limiti di intervento, interrogazione dello stato.
- Letture ad alta precisione: tensione, corrente, potenza e feedback di sensing.
- Documentazione ed esempi orientati allo sviluppatore.

### User I/O esterno per controllo PLC o simulazione PHIL

Collegalo come un modulo I/O—non è necessario alcun isolamento aggiuntivo.




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.

## Funzionamento master-slave ad alte prestazioni

Scala tensione o corrente senza sacrificare le prestazioni.

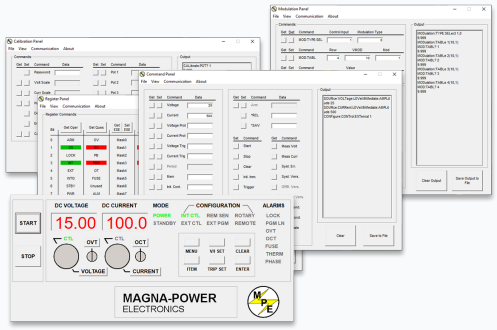



All MagnaDC supplies support master-slave operation, using gate-drive signals from the master when configured for parallel, so the whole stack behaves like a single supply—with one control loop and no noisy long analog references. The optional UID47 accessory simplifies wiring for series or parallel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

## Software Magna-Power, driver LabVIEW e IVI

Dal pannello frontale virtuale all'automazione completa, pronti all'uso.




Ogni alimentatore MagnaDC include un driver IVI e un driver NI LabVIEW con un set completo di VI, oltre a programmi di esempio per comunicare con l'hardware in pochi minuti. Per il controllo diretto in stile pannello frontale da PC, il Remote Interface Software di Magna-Power offre una visione completa dell'alimentatore: dai comandi e registri alla calibrazione e al firmware.

- Driver IVI e NI LabVIEW inclusi con set completo di VI.
- Programmi di esempio per avviare rapidamente integrazione e test.
- Remote Interface Software con:
  - Pannello frontale virtuale per il controllo manuale
  - Pannello comandi per esplorare e inviare comandi
  - Pannello registri per il monitoraggio dello stato in tempo reale
  - Pannello calibrazione per i potenziometri digitali interni
  - Pannello firmware per aggiornamenti in loco
  - Pannello modulazione per emulare profili non lineari
- Tutte le interfacce di comunicazione supportate su software e driver per un'esperienza di programmazione coerente.

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

### Made in the USA

Produzione verticalmente integrata per un controllo qualità completo.

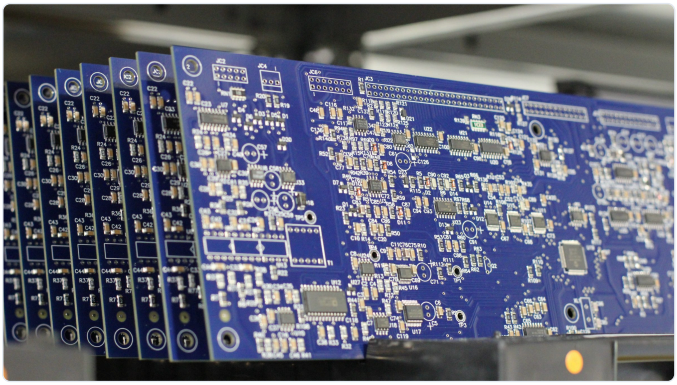


I prodotti Magna-Power sono progettati, costruiti, testati e assistiti presso la sede centrale di Magna-Power di 73.500 sq-ft a Flemington, New Jersey, dove lavorazioni metalliche, componenti magnetici, assemblaggio PCB e rodaggio vengono eseguiti internamente per un controllo rigoroso su qualità, costi e tempi di consegna.

- Prodotto negli USA: ingegneria, produzione e assistenza sotto un unico tetto.
- Produzione interna: lavorazioni metalliche, componenti magnetici, PCB SMT e finiture.
- Affidabilità comprovata: ogni unità completamente testata, calibrata e sottoposta a rodaggio.

### Assistenza mondiale e supporto ricambi OEM

Competenza di fabbrica, risposta locale.



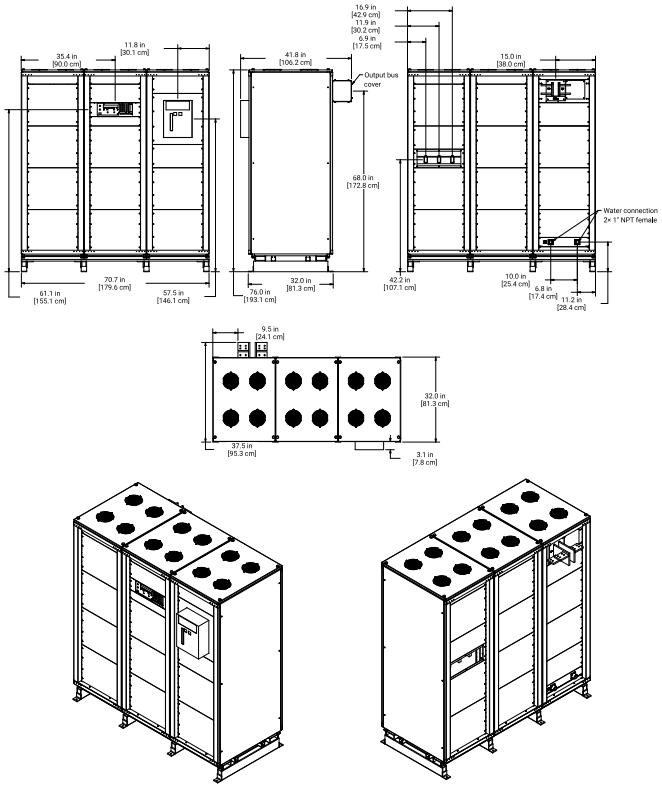
Magna-Power supporta i propri prodotti con centri di assistenza di fabbrica e autorizzati in Nord America, Europa, Regno Unito, Asia-Pacifico, Asia orientale e Sud America, utilizzando procedure di fabbrica e ricambi originali per ripristinare le unità alle specifiche originali, in garanzia e fuori garanzia.

- Copertura globale: sede centrale nel New Jersey e centri di assistenza autorizzati regionali.
- Riparazioni uniformi: diagnostica di fabbrica, istruzioni operative e schemi di sistema.
- Ricambi OEM originali: gruppi di ricambio testati per un servizio prevedibile e con tempi di fermo ridotti.

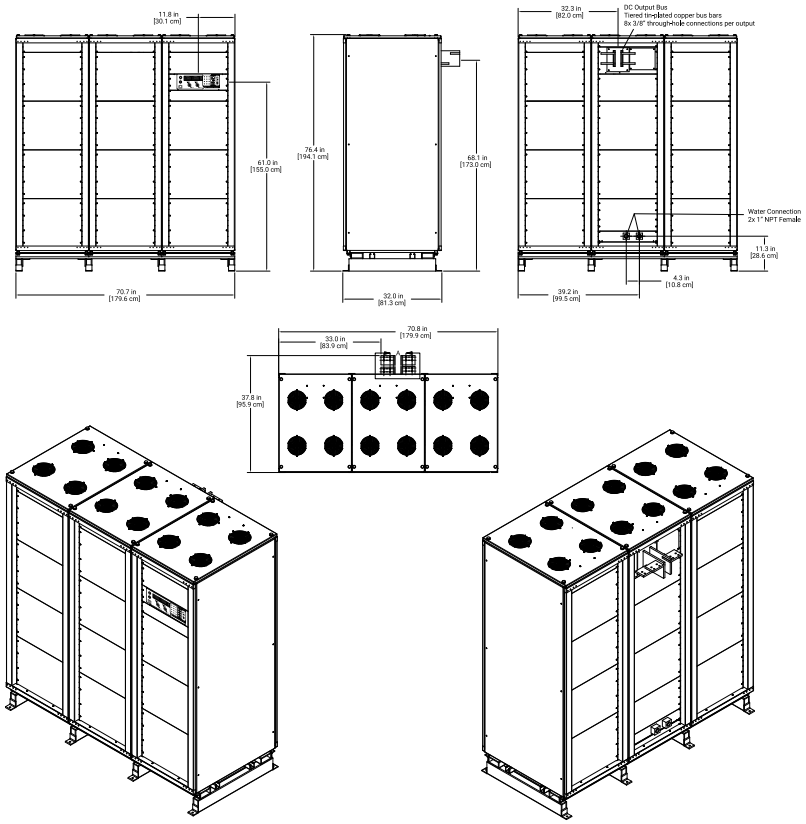
# 8 Diagrammi

## 500 kW Power Supply

12-pulse harmonic neutralizer integrated

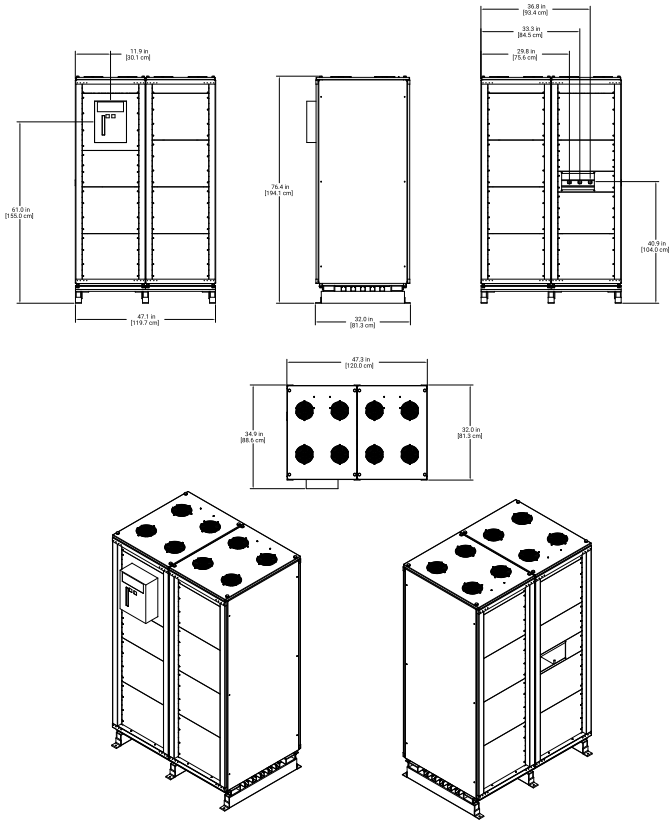


## 1000 kW Power Supply

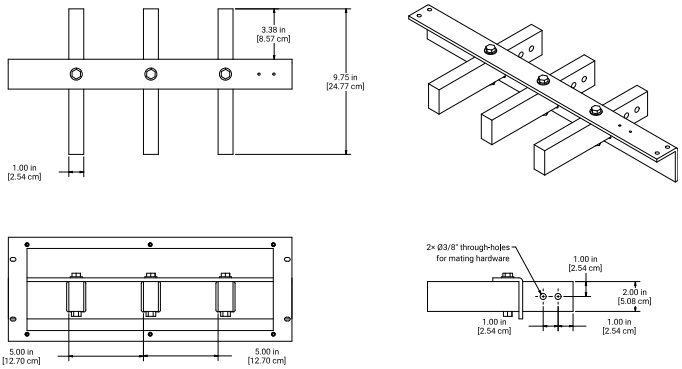



## 1000 kW Harmonic Neutralizer

24-pulse, integrated with power supply at install

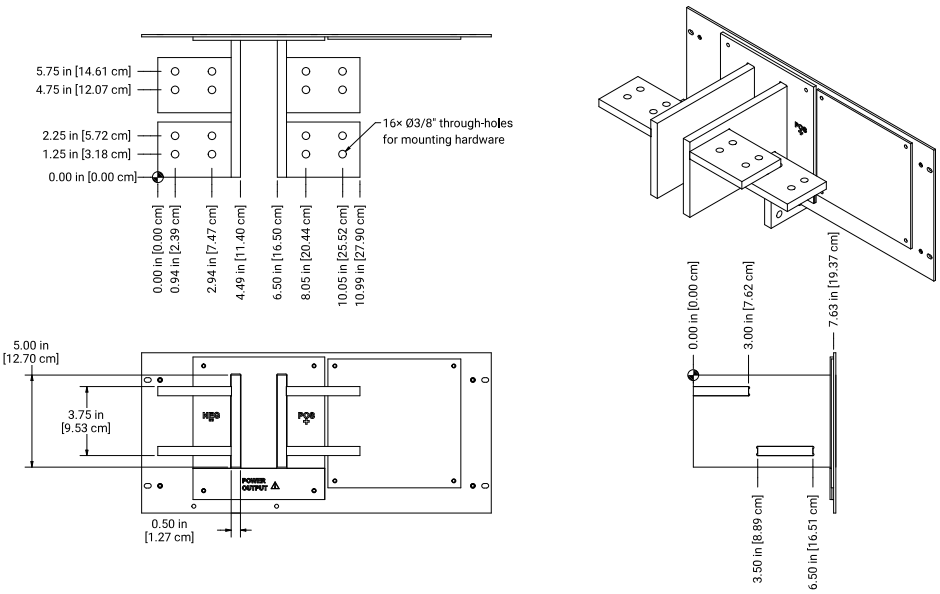


## AC Input Bus



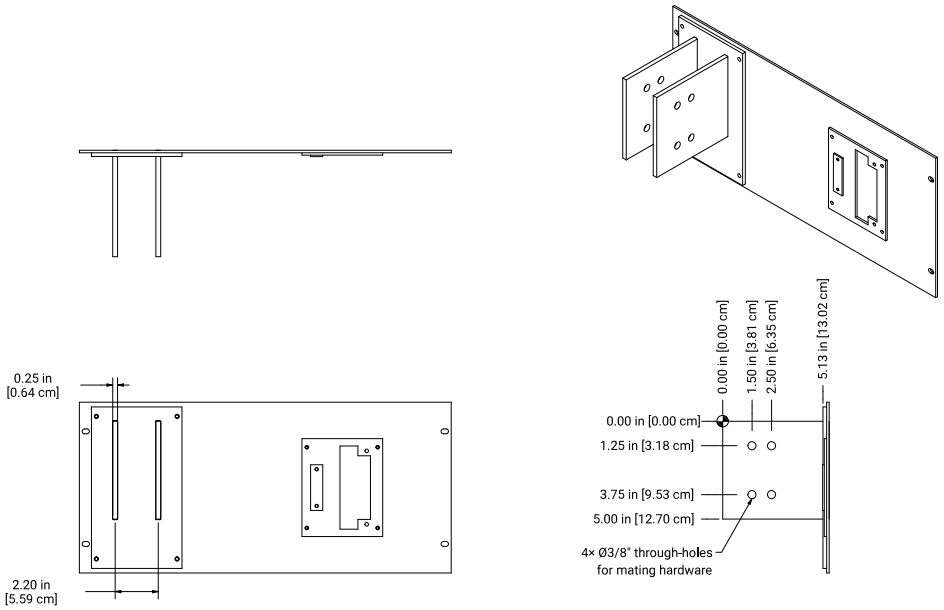

## DC Output Bus

Models with Maximum DC Output Voltage ≤ 500 Vdc



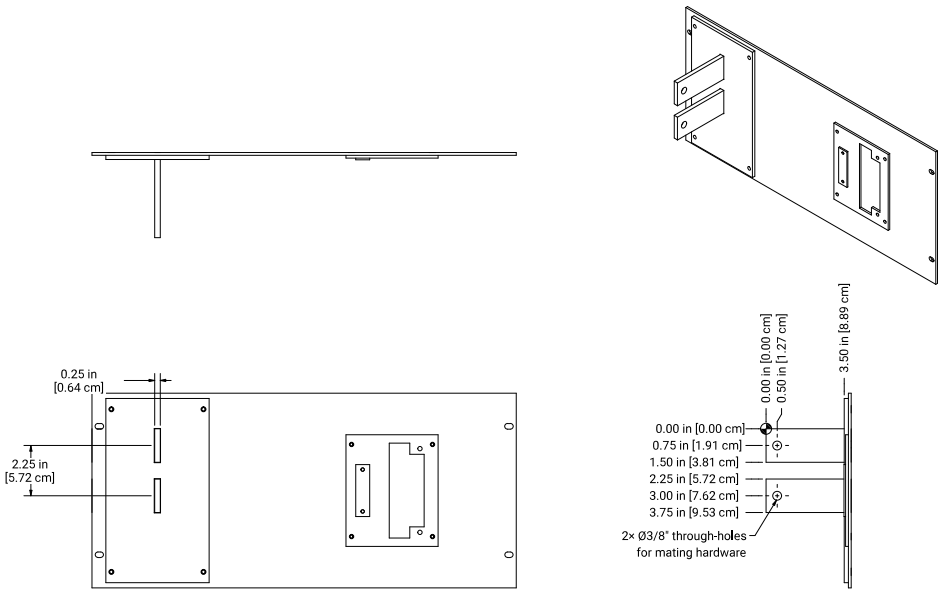
### DC Output Bus

Models with Maximum DC Output Voltage > 500 Vdc, ≤ 2000 Vdc




### DC Output Bus

Models with Maximum DC Output Voltage > 2000 Vdc, ≤ 6000 Vdc




## 9 opzioni integrate disponbili

### +ISO High Isolation Output

Disponibile per modelli con tensione nominale da 250 Vdc a 1000 Vdc, l'opzione +ISO aumenta notevolmente l'isolamento in uscita, utilizzata quando l'applicazione richiede il funzionamento flottante o il collegamento di unità in serie oltre la classificazione standard di isolamento in uscita di ±1000 Vdc.

Certain applications require floating the output voltage to values beyond the power supply isolation rating. Magna-Power's High Isolation Output Option (+ISO) enables any TS Series or MT Series model with a peak output voltage rating of 250 Vdc through 1000 Vdc to be rated for a higher voltage output isolation. Improved isolation is achieved by a novel output stage with improved controller isolation. In addition to being able to float the power supply to a higher output voltage, this option also enables lower voltage units to be tied together in series up to its new higher isolation rating, in accordance with the table below.

### Availability

The +ISO option is available for models with maximum output voltage rating from 250 Vdc to 1000 Vdc from the following product series:

- TS Series
- MT Series
- ML Series

The +ISO option cannot be combined with the +BD or +WC options. Addition of the +ISO option will cause the product's wired remote sense feature to be removed.

### Specifications

The output isolation for Magna-Power Electronics TS Series and MT Series programmable DC power supplies is as follows, where Vo is output voltage rating of the particular model:

| Product Series | DC Output Isolation (Standard) (Models Rated Up to 1000 Vdc) | DC Output Isolation (With +ISO Option) (Models Rated Up to 1000 Vdc) |
|---|---|---|
| TS Series | ±1000 Vdc, max output voltage to ground | ±(3000 Vdc + Vo/2), max output voltage to ground, where Vo is the max rated voltage |
| MT Series | ±1000 Vdc, max output voltage to ground | ±6000 Vdc |
| ML Series | ±1500 Vdc, max output voltage to ground | ±6000 Vdc |

## +HS High Slew Rate Output

Una modifica hardware e di controllo che sostituisce lo stadio di uscita standard con uno composto da condensatori a film a bassa capacità e/o condensatori elettrolitici in alluminio ad alto valore RMS. Questa opzione offre una larghezza di banda maggiore con tempi di salita e discesa dell'uscita più rapidi.

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 |

| Voltage Maximum Rating (Vdc) | Output Capacitance (uF) | Output Voltage Ripple (Vrms) |
|---|---|---|
| 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

Interfaccia di comunicazione IEEE-488 General Purpose Interface Bus (GPIB) con supporto completo dei comandi e compatibilità con altri dispositivi GPIB

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.

## +BD Integrated Blocking Diode

Un diodo di protezione con dissipatore termico interno sul terminale di uscita positivo di un alimentatore DC programmabile MagnaDC, per proteggere l'uscita del prodotto da tensioni inverse che superano di gran lunga la tensione nominale di uscita del prodotto.

The Integrated Blocking Diode Option (+BD) provides an internally heat-sunk protection diode on the positive output terminal of a MagnaDC programmable DC power supply. This diode protects the product's output from reverse voltage up to 1200 Vdc. All voltage sensing is performed after the protection diode—at the product's output terminals—making the diode's operation completely transparent to the performance of the power supply.

The +BD option is recommended for applications where there is significant back-emf or the possibility of a DC output voltage that could exceed the power supply's output voltage rating, such as:

- DC motor drives

- Battery and capacitor charging
- Large electromagnets

In these applications, the integrated blocking diode can be used to prevent back-emf from the energy stored in the load into the power supply's output. Furthermore, the integrated blocking diode will prevent the power supply's internal bleed resistance from discharging the energy storaged in the load when the power supply is off or in standby.

### Availability

The +BD option is available for models with maximum output voltage rating as specified for the following product series:

- TS Series, models rated from 40 Vdc to 1000 Vdc
- MT Series, models rated from 125 Vdc to 1000 Vdc
- ML Series, models rated from 250 Vdc to 1000 Vdc

The +BD option cannot be combined with the +ISO option.

### Specifications

Table 1. Specification for Integrated Blocking Diode (+BD) option

| | |
|---|---|
| **Reverse Voltage Rating**<br>Models Rated 125 Vdc to 1000 Vdc | 1200 Vdc |
| **Reverse Voltage Rating**<br>Models Rated Below 125 Vdc | 200 Vdc |
| **Additional Losses**<br>Models Rated 125 Vdc to 1000 Vdc | Up to 1.4% |
| **Additional Losses**<br>Models Rated Below 125 Vdc | Up to 2.5% |

## +LXI LXI TCP/IP Ethernet

Protocollo di comunicazione TCP/IP Ethernet e interfaccia RJ-45 singola, certificata secondo lo standard LXI Class C, per comunicazioni socket tramite reti informatiche convenzionali

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.**

## 10 Immagini dei prodotti









1 MW ML Series programmable DC power supply

## 11 Download

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

## 12 Contatto

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