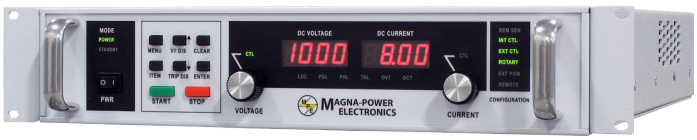
XR Series: 2 kW to 10 kW



XR Series 2 kW, 4 kW, 6 kW, 8 kW, and 10 kW

Product Name:	XR Series
Number of Models:	126
Power Levels:	2 kW, 4 kW, 6 kW, 8 kW, and 10 kW
Voltage Range:	Models from 0-5 Vdc to 0-10000 Vdc
Current Range:	Models from 0-2.0 Adc to 0-600 Adc
Enclosure	Rack-mount, 2U

Overview

Magna-Power Electronics XR Series was designed from the ground up for high reliability and industry leading 2U (3.5" height) rack-mount power density, with output isolation for units rated up through 2000 Vdc. This product series utilizes Magna-Power Electronics signature current-fed power processing, delivering robust power conversion with a high power factor—greater than 0.92 for 3Φ units. Soft-start circuitry on the input minimizes in-rush current to levels below the rated input current. High accuracy programming and monitoring levels allow confidence in power supply measurements, eliminating the need for external power meters.

All XR Series power supplies come standard with isolated 37-pin external I/O, RS232, Remote Interface Software, IVI drivers for integration into a variety of programming environments, and modulation capabilities for non-linear output profile emulation. Two front panel types are available for different application requirements. The standard XR Version front panel (pictured in the image above) provides front panel control knobs and calibration, start and stop buttons, and a digital display for voltage and current. The C Version front panel provides a blank display panel, allowing control only from the computer or isolated 37-pin I/O connection.

Available Options

- 208/240 Vac Single-Phase Input (SP) (2 kW Only)
- Cabinet and Integrations (+CAB1, +CAB2, +CAB3)
- High Slew Rate Output (+HS)
- IEEE-488 GPIB Interface (+GPIB)
- LXI TCP/IP Ethernet Interface (+LXI)
- Photovoltaic Power Profile Emulation (+PPPE)
- RS-485DSS Interface (External) (+RS485)
- UID47: Universal Interface Device (+UID)
- USB Edgeport Interface (External) (+USB)

(15) XR Series Power Supplies with +CAB3 Option

2U Programmable DC Power Supplies

XR Series Specifications

Input Specifications	
Nominal Voltage **3 phase, 3 wire + ground**	208 Vac, 3Φ (operating range 187 - 229 Vac) 240 Vac, 3Φ (operating range 216 - 264 Vac) 380 Vac, 3Φ (operating range 342 - 418 Vac) 415 Vac, 3Φ (operating range 373 - 456 Vac) 440 Vac, 3Φ (operating range 396 - 484 Vac) 480 Vac, 3Φ (operating range 432 - 528 Vac)
1 phase, 2 wire + ground **(2 kW Models Only)**	208 Vac, 1Φ (operating range 187 - 229 Vac) 240 Vac, 1Φ (operating range 216 - 264 Vac)
Frequency	50 Hz - 400 Hz (operating range 45 - 440 Hz)
Power Factor	> 0.92 at maximum power for 3Φ units > 0.70 at maximum power for 1Φ units

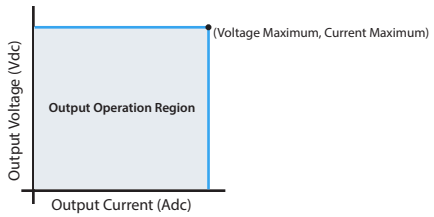
Output Specifications	
Ripple	(See Models Chart)
Line Regulation	Voltage Mode: ± 0.004% of full scale Current Mode: ± 0.02% of full scale
Load Regulation	Voltage Mode: ± 0.01% of full scale Current Mode: ± 0.04% of full scale
Load Transient Response	2 ms to recover within ±1% of full scale output, with a 50% to 100% or 100% to 50% step load change
Efficiency	≥ 86% at full load (See Model Charts)
Stability	± 0.10% for 8 hrs. after 30 min. warmup
Isolation	User inputs and outputs: referenced to earth ground Maximum input voltage to ground: ±2500 Vac Maximum output voltage to ground: • Models ≤1000 Vdc: ±1000 Vdc • Models >1000 Vdc and ≤2000 Vdc: ±(2000 Vdc + Vo/2) • Models >2000 Vdc: No output isolation, specify positive or negative output polarity
Maximum Slew Rate	Standard Models,1000 Vdc and below: 100 ms for output voltage change from 0 to 63% 100 ms for output current change from 0 to 63% With High Slew Rate Option (+HS) and models >1000 Vdc: 4 ms for output voltage change from 0 to 63% 8 ms for output current change from 0 to 63%
Bandwidth	Standard Models,1000 Vdc and below: 3 Hz for remote analog voltage programming 2 Hz for remote analog current programming With High Slew Rate Option (+HS) and models >1000 Vdc: 60 Hz for remote analog voltage programming 45 Hz for remote analog current programming

Note: Specifications are subject to change without notice. For three-phase configurations, input specifications are line-to-line. Unless otherwise noted, input voltages and currents are specified for three-phase configurations.

Physical Specifications		
Power	**Size (H" x W" x D")**	**Weight**
2 kW	3.50 x 19 x 24 in (8.89 x 48.3 x 61.0 cm)	45 lbs (20.41 kg)
4 kW	3.50 x 19 x 24 in (8.89 x 48.3 x 61.0 cm)	47 lbs (21.32 kg)
6 kW	3.50 x 19 x 24 in (8.89 x 48.3 x 61.0 cm)	48 lbs (21.77 kg)
8 kW	3.50 x 19 x 24 in (8.89 x 48.3 x 61.0 cm)	48 lbs (21.77 kg)
10 kW	3.50 x 19 x 24 in (8.89 x 48.3 x 61.0 cm)	48 lbs (21.77 kg)

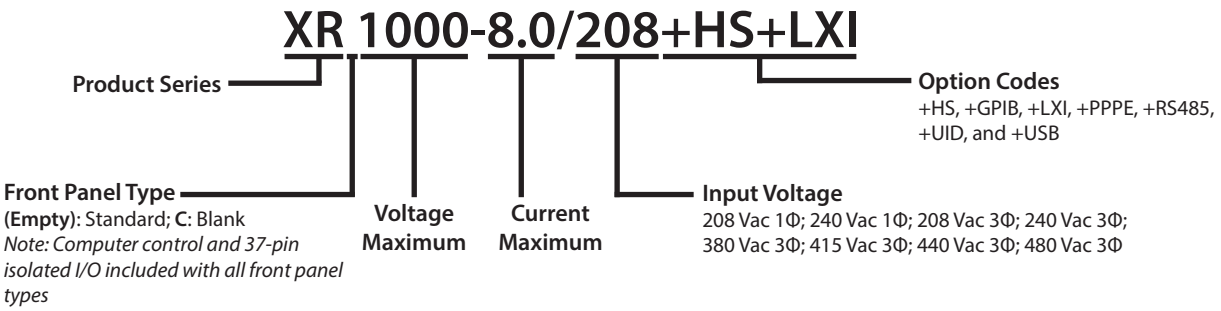
Control Specifications	
Voltage Programming Accuracy	± 0.075% of full scale voltage
OVT Programming Accuracy	± 0.075% of full scale voltage
Current Programming Accuracy	± 0.075% of full scale current
OCT Programming Accuracy	± 0.075% of full scale current
Voltage Readback Accuracy	± 0.2% of full scale voltage
Current Readback Accuracy	± 0.2% of full scale current
External Analog Programming and Monitoring Levels	0 - 10 Vdc
External Analog Output Impedances	Voltage output monitoring: 100 Ω Current output monitoring: 100 Ω +10 Vdc reference: 1 Ω
External Digital Programming and Monitoring Limits	Input: 0 to 5 Vdc, 10k input inpedance Output: 0 to 5 Vdc, 5 mA drive capacity
Remote Sense Limits	3% maximum voltage drop from output to load No remote sense on models above 1000 Vdc

Environmental Specifications	
Ambient Operating Temperature	0 °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



XR Series Models

Model Ordering Guide



Models Chart

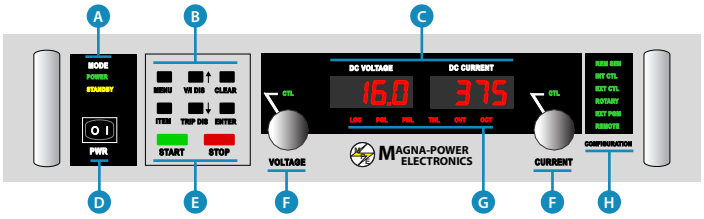
The following chart details the available standard XR Series models. The Current Maximum (Adc) column is separated by the available power levels. To determine the appropriate model, first select your output Voltage Maximum (Vdc) to find appropriate row. Next, select one desired Current Maximum from the row that contains your desired Voltage Maximum. Then, construct you model number according to the model ordering guide, above. Non-standard voltage and current configurations are available.

	2 kW	4 kW	6 kW	8 kW	10 kW		
Voltage Maximum (Vdc)	**Current Maximum (Adc)**					**Ripple (mVrms)**	**Efficiency (%)**
5	375	600	N/A	N/A	N/A	50	86
10	200	375	600	N/A	N/A	50	86
16	125	250	375	500	600	50	86
20	100	200	300	375	500	45	86
32	62	124	186	250	310	40	86
40	50	100	150	200	250	40	87
50	40	80	120	160	200	50	87
80	25	50	75	100	125	60	87
100	20	40	60	80	100	60	87
125	16	32	48	64	80	100	87
160	12	24	36	50	60	120	87
200	10	20	30	40	50	125	87
250	8	16	24	32	40	130	88
375	5.3	10.6	15.9	21.3	26.5	170	88
400	5.0	10.0	15.0	20.0	25	180	88
500	4.0	8.0	12.0	16.0	20	220	88
600	3.3	6.6	9.9	13.3	16.5	250	88
800	2.5	5.0	7.5	10.0	12.5	300	88
1000	2.0	4.0	6.0	8.0	10	350	88
1250	1.6	3.2	4.8	6.4	8.0	375	88
1500	1.3	2.6	4.0	5.3	6.6	400	88
2000	1.0	2.0	3.0	4.0	5.0	450	88
4000	0.50	1.00	1.50	2.00	N/A	6500	88
6000	0.30	0.66	1.00	1.33	N/A	7500	88
8000	0.25	0.50	0.75	1.00	N/A	8500	88
10000	0.20	0.40	0.60	0.80	N/A	9500	88
	Input Current Per Phase (Aac)						
208/240 Vac, 1Φ	16	N/A	N/A	N/A	N/A		
208/240 Vac, 3Φ	8	15	22	29	36		
380/415 Vac, 3Φ	5	9	13	17	21		
440/480 Vac, 3Φ	4	8	11	15	18		

Note: Models above 2000 Vdc have high slew rate output. For models 2000 Vdc and below with the High Slew Rate Output Option (+HS), ripple will be higher.

XR Series Diagrams

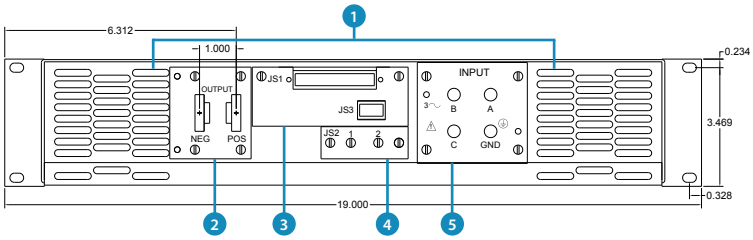
XR Front Panel (Standard)



C Version Front Panel

- **A** MODE
  POWER: Indicates power output
  STANDBY: Indicates control power only
- **B** FUNCTION KEYS
  MENU: Selects function
  ITEM: Selects item within function
  V/I DIS: Displays voltage/current settings
  TRIP DIS: Displays OVT and OCT settings
  CLEAR: Clears setting or resets fault
  ENTER: Selects item
- **C** Meters display output voltage, output current, voltage set point, current set point, over voltage trip, and over current trip
- **D** Power switch energizes control circuits without engaging main power
- **E** Engages and disengages main power
- **F** Stepless rotary knob to set voltage/current
- **G** DIAGNOSTIC ALARMS
  LOC: Interlock
  PGL: External input voltage beyond limits
  PHL: Indicates under-voltage AC input
  THL: Indicates over-temperature condition
  OVT: Over-voltage protection has tripped
  OCT: Over-current protection has tripped
- **H** CONFIGURATION
  REM SEN: Remote sense enabled
  INT CTL: Front panel start/stop/clear enabled
  EXT CTL: External start/stop/clear enabled
  ROTARY: Front panel control
  EXT PGM: External voltage/current control
  REMOTE: Computer control

Rear View



DC Output Bus Connections

Standard Output Bus:
Models ≤1000 Vdc

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

Very High Voltage Output Bus
Models >2000 Vdc

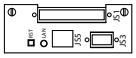
83-1R Receptacle High Voltage
Mating Cable Provided

High Voltage Output Bus
Models >1000 Vdc and ≤2000 Vdc

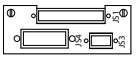
1/4-28 Bolt, 2 PLC's

Optional External Controls

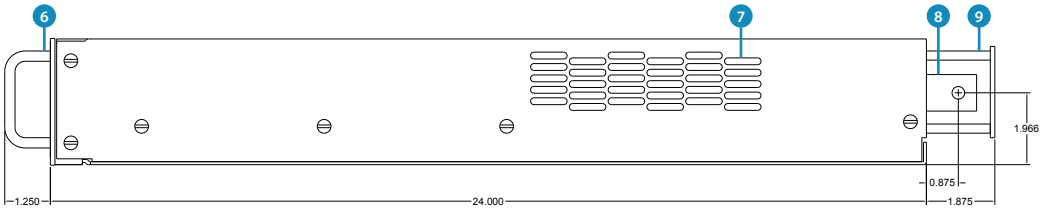
Optional (+LXI) Interface



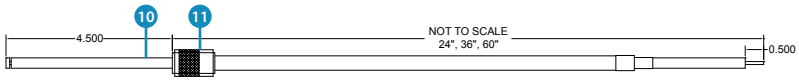
Optional (+GPIB) Interface



Side View



High Voltage Output Cable (Included, Models Above 2000 Vdc)



1. Rear Air Exhaust
2. Output DC Connections (Front View)
3. Computer and External Control Connections
4. Remote Sensing Connector
   Models ≤1000 Vdc Only
5. Input AC Connections
   10-32 Threaded Insert, Qty (4)
6. Front Panel Handles
7. Side Air Intake
8. Output DC Connections (Side View)
   Connection Varies By Rated Output Voltage
   Refer to "DC Output Bus Connections"
9. Included Rear Protective Metal Cover
10. RG-8/U Coaxial Cable
11. PL-259 Connector