

# GUARDIAN DUAL 23

MODEL GDN.C.48.M24

Integrated 23" Rack-Mount DC Power System  
-48VDC / +24V | 360A / 250A | 19.2kW / 6kW

## INDUSTRIES & APPLICATIONS



LVD2006/95/EC  
EMC2004/108/EC  
ROHS2011/65/EU

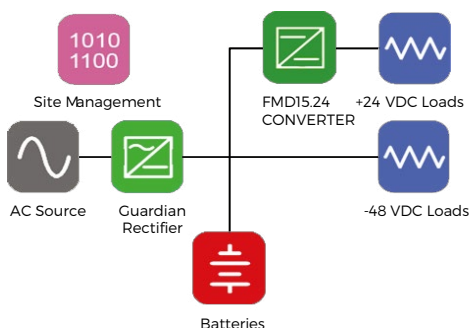
## KEY FEATURES

- ◆ >96% Efficiency Rectifiers
- ◆ Dual -48V | +24V Output
- ◆ 360A | 250A Total Capacity
- ◆ Remote Monitoring & Control
- ◆ Field Replaceable Controller
- ◆ Ethernet Comm. with SNMPv3
- ◆ 3 LED Alarm/Status Indicators
- ◆ Up to 10 Form-C Relay Alarms
- ◆ Up to 26 Load Breakers
- ◆ Up to 6 Battery Breakers
- ◆ LCD Display with Keypad
- ◆ 23" Rack Mounting

## SAFETY COMPLIANCE

UL60950-1 2nd Ed.  
CSA22.2 No. 60950-1 2nd Ed.  
EN60950-1 2nd Ed.

## THREE-YEAR WARRANTY



## DESCRIPTION

Guardian Dual 23 is an integrated DC power system providing outputs of -48VDC and +24VDC. The system can accommodate up to five or ten Guardian family high efficiency hot-swap rectifiers and dc-dc converters in a 23" 5RU or 6RU rack-mount chassis. A load current of 300A at -48V is available with battery charge current software controlled subject to an overall 360A while the secondary load is up to 250A at +24V. The rectifiers and dc-dc converters are internally fan cooled with speed control which is a function of load and temperature, keeping acoustic noise to a minimum.

The DC output circuits can provide up to 26 loads which utilize circuit breakers rated from 2A to 63A plus up to six 100A or 125A breakers that provide battery protection. A programmable 400A low voltage battery disconnect (LVBD) is standard while one or two partial load disconnects (PLD), rated at 125A, 200A or 400A and also programmable, can provide non-critical load shedding when operating on batteries.

The ACX Advanced remote access controller monitors system parameters, controls rectifier output, and provides alarms for system failures. The Controller Module is also pluggable for easy field replacement in case of failure. There are 2 LED alarm indicators which indicate failures, (RED) Alarm and (YELLOW) Message. A third green LED indicates the controller is working properly. As standard four form-C relay outputs provide the alarms for remote use. An additional 6 can be included as an option. Two digital inputs and outputs are also provided as well as a microSD card slot that accepts an up to 4GB card which is sufficient for more than 20 years data logging.

The system can be programmed by means of a remote PC web page display. Communication is by Ethernet LAN with SNMPv3 including alarm trapping. It also has provision for temperature compensated charging of an external battery using a supplied TC probe. An LCD Display/Touchpad is included for local metering, status, and setup.

The Guardian Access is compatible with UNIPOWER's free [PowCom™ software](#) which offers local and remote management through an advanced Windows GUI.

## SYSTEM SPECIFICATION & CAPABILITY GUIDE

SYSTEM DESIGNATION	GUARDIAN DUAL 23 - 1-M00024G	
<b>OUTPUT</b>		
System Voltage	-48VDC nominal (53.5VDC float) / +24VDC	
Maximum Capacity @ 120VAC nominal	Load	190A   250A
	Battery	190A / 250A discharge   s/w controlled charge
Maximum Capacity @ 230/400VAC nominal	Load	300A / 250A
	Battery	300A / 250A discharge   s/w controlled charge
No. Rectifier / DC-DC Converter Slots	5 or 10 (see configuration guide on page 5)	
<b>DC DISTRIBUTION (see configuration guide on page 5)</b>		
Loads Circuits	+24V -48V	up to 8 x 2A to 63A up to 18 x 2A to 63A
Battery Circuits	1 to 6 x (80A, 100A or 125A)	
<b>INPUT</b>		
Voltage (nominal)	1-phase 100-120/200-240VAC (L + N + PE) 3-phase 230/400VAC (L1 L2 L3 + N + PE)	
Frequency	47-63Hz	
Maximum Input Current	200A @ 100-120VAC   169A @ 200-240VAC   56A per phase @ 400/230VAC	
Rectifier Power Factor	>0.98 (typical)	
Surge Protection	Optional (see configuration guide on page 5)	
<b>MONITORING &amp; CONTROL (ACX Advanced Controller)</b>		
Alarm Relays	4 standard, option for 10	
Local Interface	4 x 20 LCD, 4-key menu, USB / RS232, microSD card slot (4GB max.) for data logging	
Remote Interface	Ethernet / Modem using PowCom™ software package Ethernet port allows monitoring and control over a TCP/IP network. Web browser support + SNMPv3	
LED Indications	Green - System ON; Yellow - Message(s); Red LED - Alarm(s)	
External Digital I/O	2 x Inputs, 2 x Outputs (Open Collector)	
<b>BATTERY MANAGEMENT</b>		
Symmetry Inputs	6 or 12 (can be redefined as analog inputs up to 100VDC)	
Low Voltage Battery Disconnect (LVBD)	1 x 400A Programmable	
Partial Load Disconnect (PLD)	1 or 2 x 125A, 200A or 400A Programmable (Optional)	
Temperature Compensated Charging	Programmable	
<b>COMPLIANCE</b>		
EMC	EN 300 386 ; EN61000-6-3 (Emission) ; EN61000-6-2 (Immunity)	
Safety	IEC60950-1:2005 2 Ed. +A1:2009	
<b>ENVIRONMENTAL</b>		
Operating Temperature	-40°C to +55°C	
Storage Temperature	-40°C to +85°C	

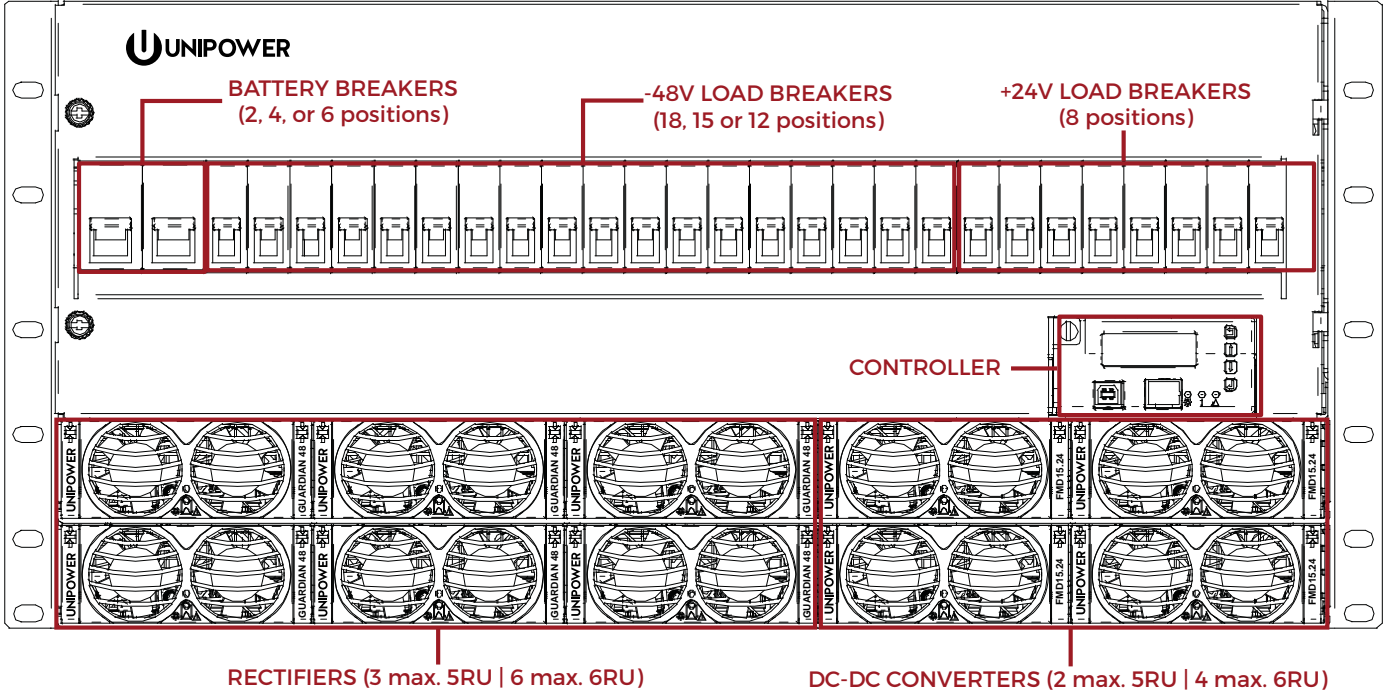
### RECTIFIER & DC-DC CONVERER MODULES vs. SYSTEM CAPACITIES

RECTIFIER MODULES (float voltage 53.5V) / DC-DC CONVERTER MODULE (24V)							SYSTEM CAPACITY (400A LVD)			
MODEL NUMBER	EFFICIENCY	INPUT VOLTAGE	INPUT CURRENT	OUTPUT POWER	OUTPUT CURRENT	MAX. LOAD CURRENT 5RU <sup>7</sup>		MAX. LOAD CURRENT 6RU <sup>7</sup>		
						-48VDC	+24VDC	-48VDC	+24VDC	
RECTIFIERS	FMPe20.48G <sup>2</sup>	85-180VAC	9.6A <sup>3</sup>	1100W <sup>4</sup>	20.6A <sup>4</sup>	61.8A <sup>5</sup>	123.6A <sup>5</sup>	224.4A <sup>5</sup>	157.2A <sup>5</sup>	
		180-275VAC	11.6A <sup>3</sup>	2000W	37.4A					112.2A <sup>5</sup>
	FMP25.48G <sup>2,6</sup>	85-180VAC	14.4A <sup>3</sup>	1400W <sup>4</sup>	26.2A <sup>4</sup>	78.6A <sup>5</sup>	140.1A <sup>5</sup>	190.8A <sup>5</sup>	300.0A <sup>5</sup>	
		180-275VAC	16.8A <sup>3</sup>	2500W	46.7A					150.0A <sup>5</sup>
	FMPe30.48G <sup>2</sup>	85-180VAC	15.7A <sup>3</sup>	1700W <sup>4</sup>	31.8A <sup>4</sup>	95.4A <sup>5</sup>	125A	250A		
		180-275VAC	17.0A <sup>3</sup>	2900W	54.2A					
CONVERTER	FMD15.24	90.5% typical	36-72VDC	53.8A	1500W	62.5A				

Notes:

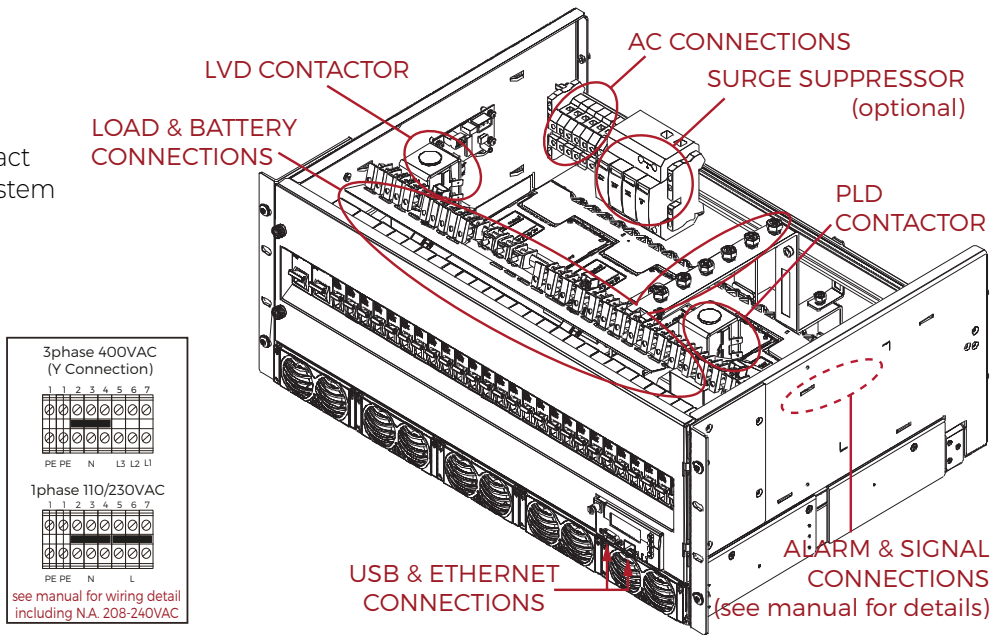
1. When operating at 230VAC.
2. Will operate over the full range, automatically limiting output current/power according to the actual input voltage range applied.
3. Input currents shown are expected maximums at 85VAC/180VAC as appropriate
4. Figures quoted are at 110VAC input. Derating is linear from 180VAC to 85VAC. See separate rectifier datasheets for details.
5. May require reduction in maximum charge current when batteries not fully charged.
6. Rectifier model FMP25.48G is not a preferred model for new requirements. It remains available for existing programmes.
7. Assumes 3 rectifiers and 2 DC-DC converters in 5U configuration, 6 rectifiers and 4 DC-DC converters in 6U configuration. Other configurations are available, see configuration guide. Each DC-DC converter consumes up to 53.8A from the -48V total capacity.

SYSTEMS MODULE FRONT PANEL DESCRIPTION

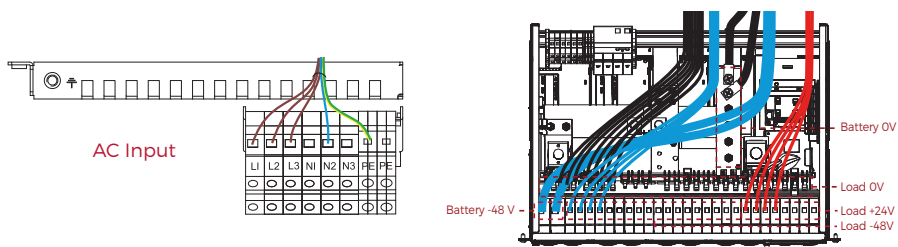


SYSTEM MODULE PERSPECTIVE FRONT VIEW (5U version shown)

Note that the exact positioning of system components will vary for different configurations.



CABLE ROUTING



## CONFIGURATION GUIDE

PLEASE COMPLETE THE BELOW TABLE AND SUBMIT TO UNIPOWER FOR VERIFICATION AND CONF. NO. ALLOCATION (This form is fully interactive and may be completed electronically OR it can be printed and complete by hand)					
<b>STEP 1 - CUSTOMER DETAILS</b>					
Company: _____ Address: _____ Zip Code: _____ Country: _____		Contact Name: _____ Email Address: _____ Telephone: _____ Quantity for quotation: _____			
<b>STEP 2 - CHASSIS TYPE - Choose one version</b>					
5RU - 3 Rectifier and 2 Converter Positions OR 6RU - 6 Rectifier and 4 Converter Positions		5RU chassis    OR 6RU chassis			
<b>STEP 3a - RECTIFIER MODULES - Choose one type of rectifier module and enter quantity up to 3 for 5U chassis or 6 for 6U.</b>					
<b>STEP 3b - CONVERTER MODULES - Enter quantity of FMD15.24 converter modules - dummies will be inserted into unused slots</b>					
FMP20.48 - 2000W - >92.5% Efficiency (APAC region only) FMPe20.48G - 2000W - >96% Efficiency FMP25.48G - 2500W - >92% Efficiency FMPe30.48G - 2900W - >95% Efficiency FMPe30.48C - 2900W - >95% Efficiency (APAC region only)		FMP20.48 OR FMPe20.48G OR FMP25.48G OR FMPe30.48G OR FMPe30.48C		Quantity ____    FMD15.24 Quantity ____	
<b>STEP 4 - CONTROLLER &amp; ALARM INTERFACE - Select desired controller and alarm interface</b>					
ACX Advanced with SD Card (default configuration) ACX Advanced without SD Card		WITH SD card    OR    WITHOUT SD card			
Alarm Interface - 4 Relays or 10 Relays or 10 Relays + PLD2		4 Relays    OR    10 Relays    OR    10 Relays + PLD2			
<b>STEP 5 - LOW VOLTAGE BATTERY DISCONNECT (LVBD) Select with 2 battery breakers, 4 battery breakers or 6 battery breakers</b>					
2 battery breaker positions (21 load breaker positions) 4 battery breaker positions (18 load breaker positions) 6 battery breaker positions (12 load breaker positions)		2 positions    OR    4 positions    OR    6 positions  Note that the 6 position option is not available when PLDs are included.			
<b>STEP 6 - BATTERY BREAKERS - Choose rating and quantity based on step 5 choice or NONE (Breakers MUST be identical rating)</b>					
OR 80A 1 pole x 1 or x 2 or x 3 or x 4 or x 5 or x 6 (APAC only) OR 100A 1 pole x 1 or x 2 or x 3 or x 4 or x 5 or x 6 OR 125A 1 pole x 1 or x 2 or x 3 or x 4 or x 5 or x 6 OR 80A 2 pole x 1 or x 2 or x 3 (APAC only) OR 100A 2 pole x 1 or x 2 or x 3 (APAC only) OR 125A 2 pole x 1 or x 2 or x 3 OR 100A 3 pole x 1 or x 2 (APAC only)		OR Qty 1    OR Qty 2    OR Qty 3    OR Qty 4    OR Qty 5    OR Qty 6 OR Qty 1    OR Qty 2    OR Qty 3    OR Qty 4    OR Qty 5    OR Qty 6 OR Qty 1    OR Qty 2    OR Qty 3 OR Qty 1    OR Qty 2    OR Qty 3 OR Qty 1    OR Qty 2    OR Qty 3 OR Qty 1    OR Qty 2			
<b>STEP 7 - PARTIAL LOAD DISCONNECT (PLD) - Select 125A or 200A or NO (default) - PLD2 may only be selected with correct Alarm Interface</b>					
125A or 200A PLD1 (non-critical -48V load / load shed disconnect) 125A or 200A PLD2 (non-critical -48V load / load shed disconnect)		125A    OR 200A    OR NO 125A    OR 200A    OR NO			
<b>STEP 8 - LOAD BREAKERS - Choose quantity for desired ratings, total 18, 15 or 12 positions for -48V plus 8 for +24V based on step 5 selection. When the PLD options are not selected populate only LVBD 'critical' circuits column. The maximum total allowed PLD breakers is 12. These are shared 6 each when two PLDs are specified. [Configuration will be checked by UNIPOWER]</b>					
		<b>LVBD CIRCUITS (Critical)</b>		<b>PLD CIRCUITS (non Critical -48V)</b>	
		-48V                      +24V		PLD #1                      PLD #2	
2A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
4A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
6A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
10A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
16A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
20A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
25A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
32A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
40A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
50A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
63A single pole (1 position)		Quantity ____    Quantity ____		Quantity ____    Quantity ____	
<b>STEP 19 - TEMPERATURE SENSOR - available for battery and ambient temperature measurement</b>					
Temperature Sensors - 3m (~10ft) (1 x battery   1 x ambient)		NONE    OR    1    OR    2			
<b>STEP 10 - SYMMETRY CABLES (Choose maximum 4 total end measure OR 3 mid measure)</b>					
Symmetry Cable - 1.9m (~6ft) - end measure OR - 3.0m (~10ft) - end measure OR - 2.3m (~7.2ft) - mid measure		NONE    Qty 1    Qty 2    Qty 3    Qty 4 OR NONE    Qty 1    Qty 2    Qty 3    Qty 4 OR NONE    Qty 1    Qty 2    Qty 3			
<b>STEP 11 - OPTIONS &amp; ACCESSORIES (Select required items)</b>					
Surge Protection Kit (factory fit) AC Monitoring Kit		NO    OR    1-phase    OR    3-phase NO    OR    YES			
<b>STEP 12 - SUBMIT COMPLETED FORM TO UNIPOWER FOR CHECKING AND ALLOCATION OF CONFIGURATION PART NUMBER</b>					
Configuration Part Number: _____ (leave blank for completion by UNIPOWER)					