GUARDIAN DUAL CABINET

MODEL GDN.C.48.M24

Integrated DC Power System & Battery

-48VDC / +24V | 360A / 250A | 19.2kW / 6kW

INDUSTRIES & APPLICATIONS

Telecom · Cable · Utilities · Government · Industrial

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

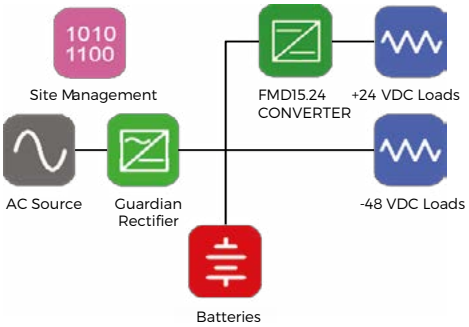
KEY FEATURES

- >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
- Floor Standing or Wall Mounting

SAFETY COMPLIANCE

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

THREE-YEAR WARRANTY



DESCRIPTION

Guardian Dual Cabinet 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 1.4m, 1.8m or 2m floor standing cabinets or an 18U high wall-mounted cabinet which also accommodate up to 3 battery strings. 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. An optional extension PDU module provides a further 24 load circuits. 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.

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SYSTEM SPECIFICATION & CAPABILITY GUIDE

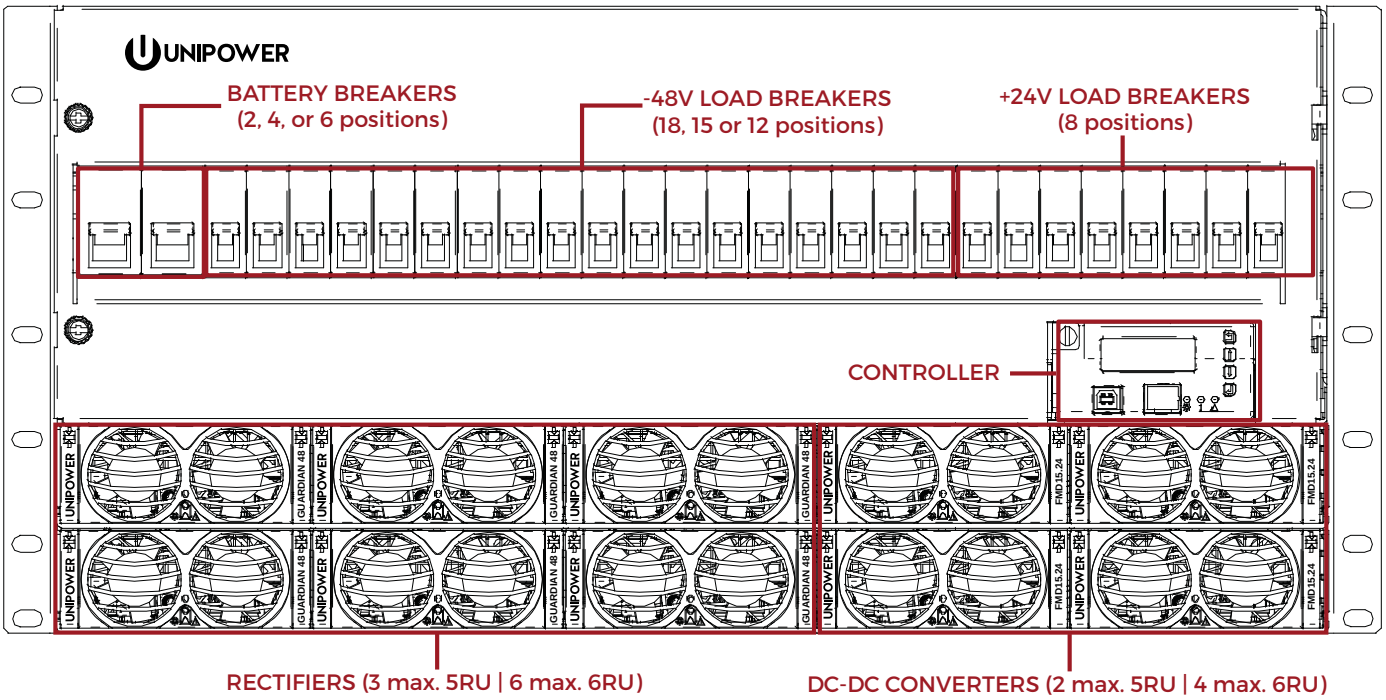
SYSTEM DESIGNATION	GUARDIAN DUAL CABINET - M00024G	
OUTPUT		
System Voltage	-48VDC nominal (53.5VDC float) / +24VDC	
Maximum Capacity @ 120VAC nominal	Load	190A | 250A
	Battery	190A / 250A discharge | s/w controlled charge
Maximum Capacity @ 230/400VAC nominal	Load	300A / 250A
	Battery	300A / 250A discharge | s/w controlled charge
No. Rectifier / DC-DC Converter Slots	5 or 10 (see configuration guide on page 5)	
DC DISTRIBUTION (see configuration guide on page 5)		
Loads Circuits	+24V -48V	up to 8 x 2A to 63A up to 18 x 2A to 63A + up to 24 x 2A to 25A with extension PDU
Battery Circuits	1 to 6 x (80A, 100A or 125A)	
INPUT		
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)	
MONITORING & CONTROL (ACX Advanced Controller)		
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)	
BATTERY MANAGEMENT		
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	
COMPLIANCE		
EMC	EN 300 386 ; EN61000-6-3 (Emission) ; EN61000-6-2 (Immunity)	
Safety	IEC60950-1:2005 2 Ed. +A1:2009	
ENVIRONMENTAL		
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 [7]		MAX. LOAD CURRENT 6RU [7]	
							-48VDC	+24VDC	-48VDC	+24VDC
RECTIFIERS	FMPe20.48G [2]	>96.0% [1]	85-180VAC	9.6A [3]	1100W [4]	20.6A [4]	61.8A [5]		123.6A [5]	
			180-275VAC	11.6A [3]	2000W	37.4A	112.2A [5]		224.4A [5]	
	FMP25.48G [2,6]	>92.5% [1]	85-180VAC	14.4A [3]	1400W [4]	26.2A [4]	78.6A [5]		157.2A [5]	
			180-275VAC	16.8A [3]	2500W	46.7A	140.1A [5]		280.2A [5]	
	FMPe30.48G [2]	>95.0% [1]	85-180VAC	15.7A [3]	1700W [4]	31.8A [4]	95.4A [5]		190.8A [5]	
			180-275VAC	17.0A [3]	2900W	54.2A	150.0A [5]		300.0A [5]	
CONVERTER	FMD15.24	90.5% typical	36-72VDC	53.8A	1500W	62.5A		125A		250A

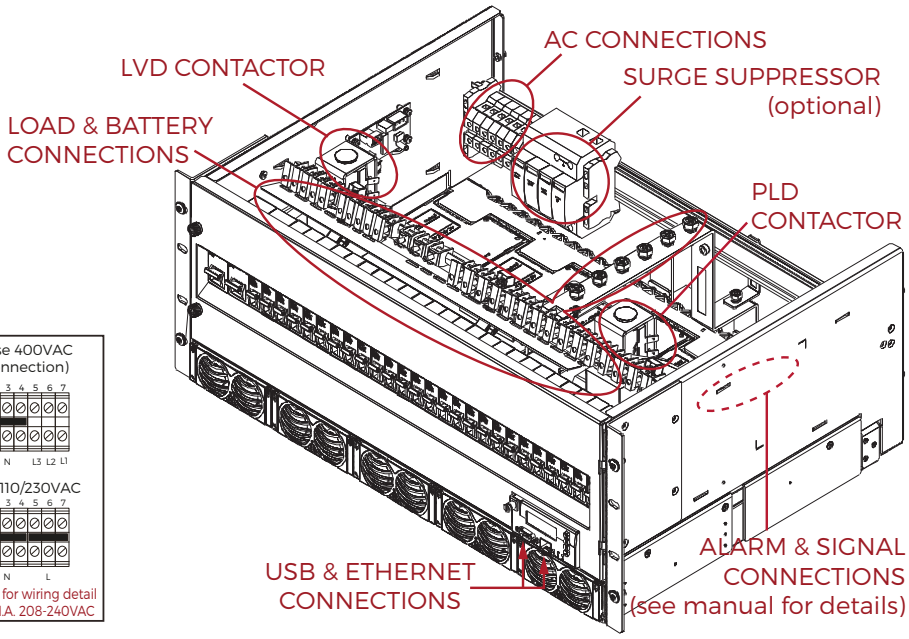
Notes:
1. When operating at 230VAC.
2. Will operate over the full range, automatically limiting output current/power according to the actual input voltage range applied.
3. Input currents shown are expected maximums at 85VAC/180VAC as appropriate
4. Figures quoted are at 110VAC input. Derating is linear from 180VAC to 85VAC. See separate rectifier datasheets for details.
5. May required 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.

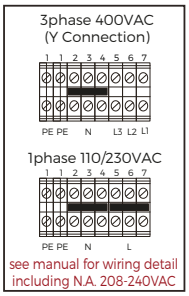
SYSTEMS MODULE FRONT PANEL DESCRIPTION



SYSTEM MODULE PERSPECTIVE FRONT VIEW (5U version shown)

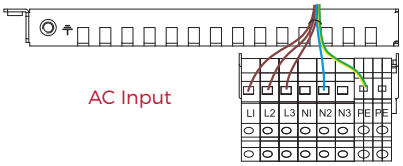
Note that the exact positioning of system components will vary for different configurations.

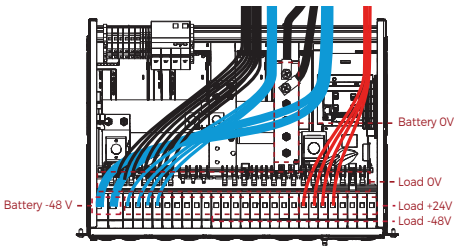




EXTENSION PDU

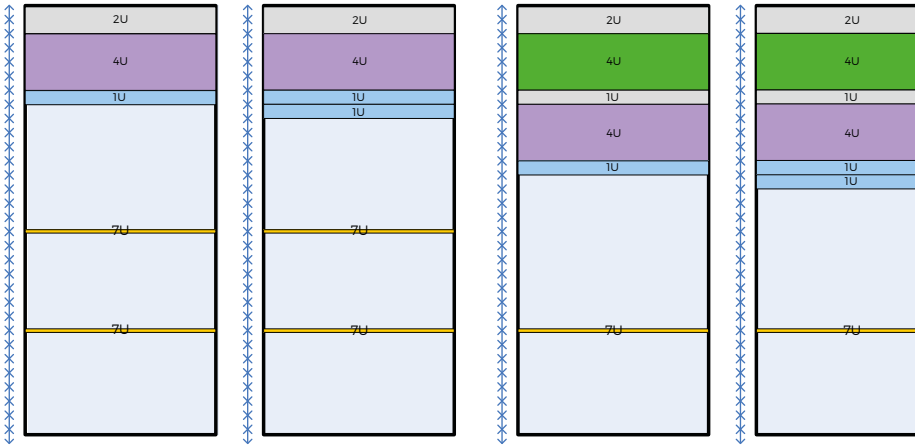
CABLE ROUTING



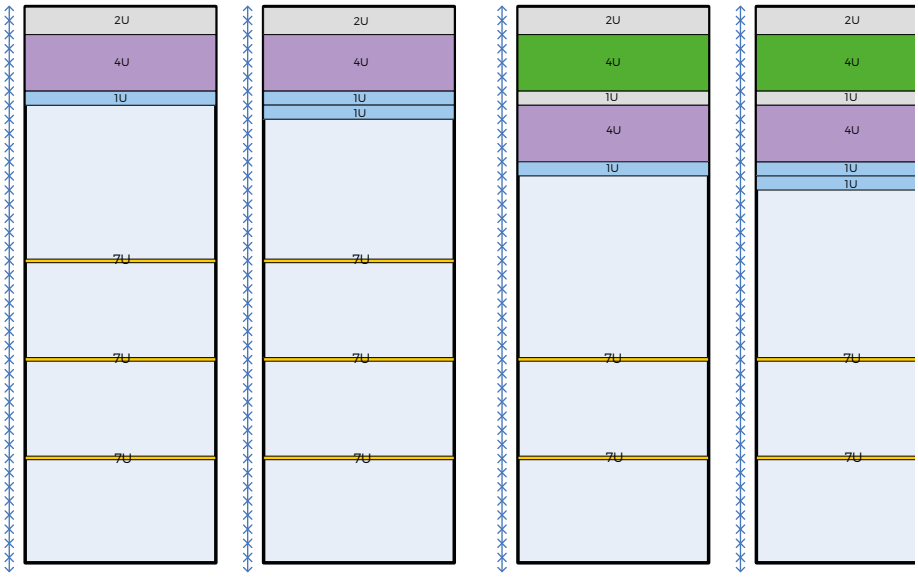


FLOOR STANDING CABINET CONFIGURATIONS - 7U BATTERY SPACING

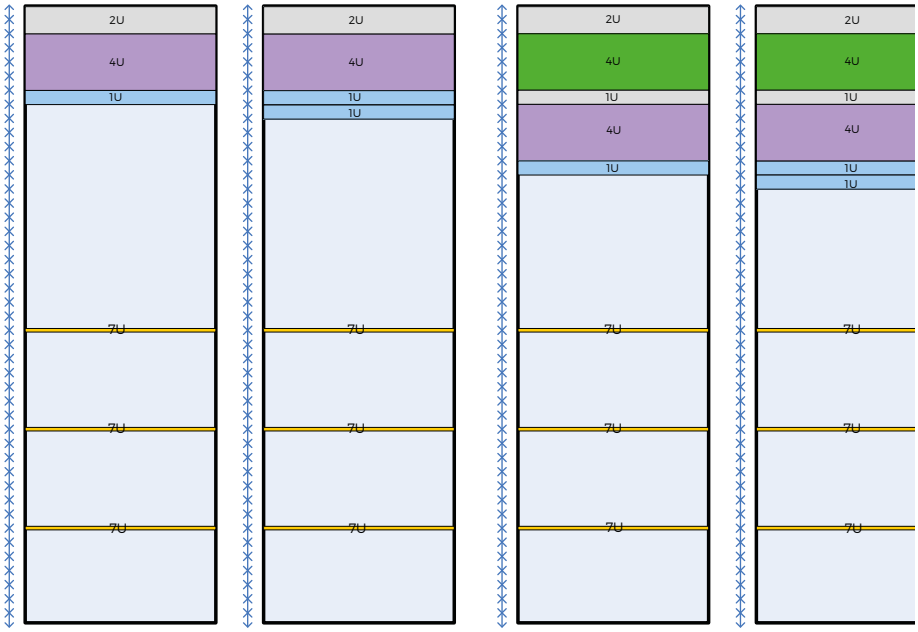
55.5"/1.4m x 23.6"/600mm x 23.6"/600mm - 30RU internal



70.9"/1.8m x 23.6"/600mm x 23.6"/600mm - 39RU internal



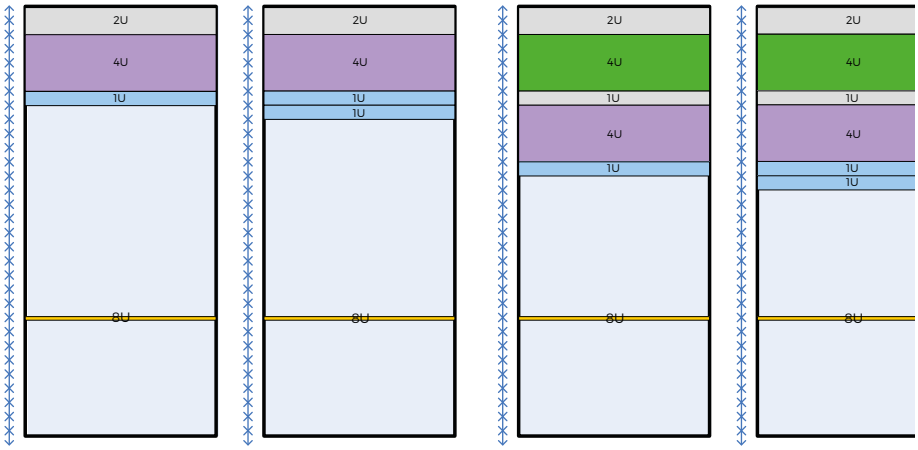
78.7"/2.0m x 23.6"/600mm x 23.6"/600mm - 43RU internal



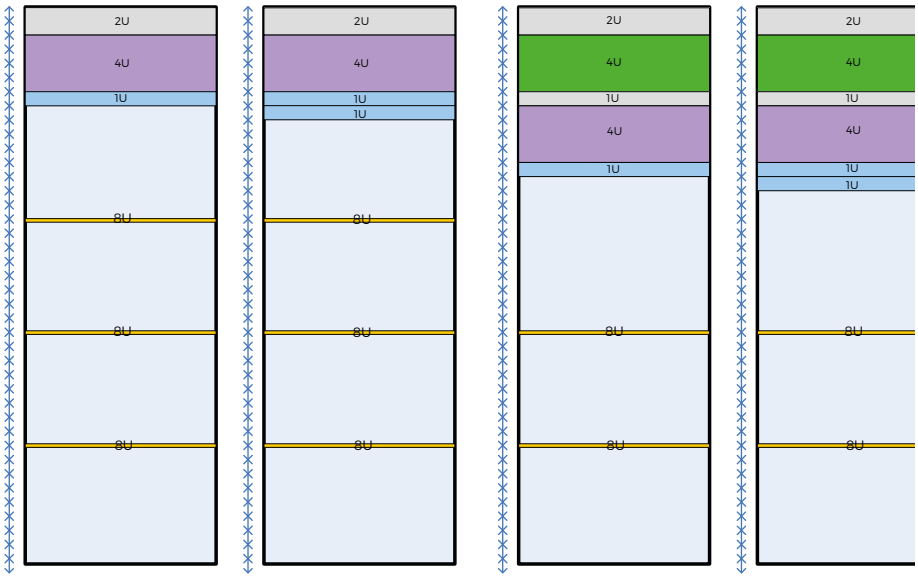
NOTE: For applications requiring more battery strings than the desired cabinet will accommodate please select a suitable matching battery cabinet when completing the ordering guide.

FLOOR STANDING CABINET CONFIGURATIONS - 8U BATTERY SPACING

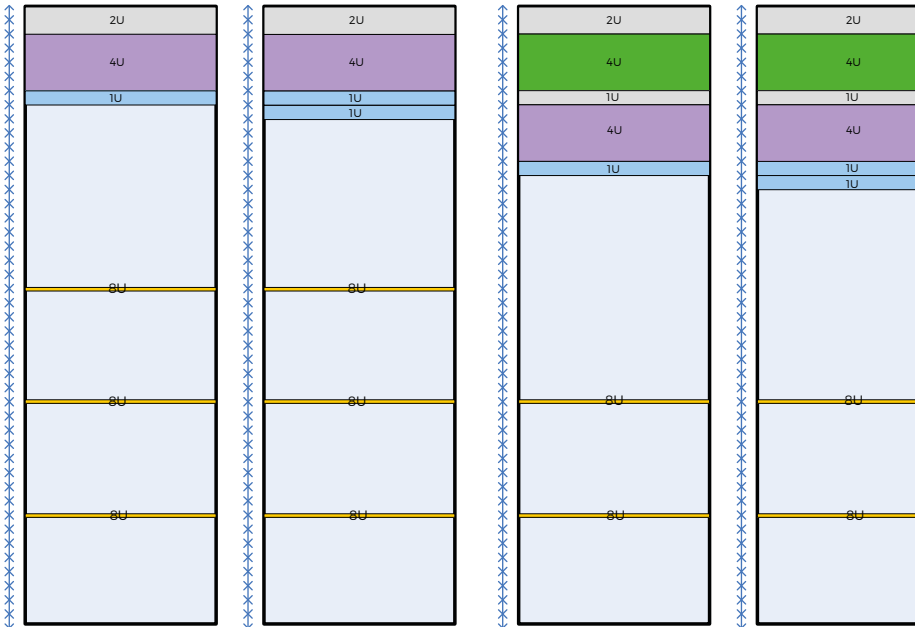
55.5”/1.4m x 23.6”/600mm x 23.6”/600mm - 30RU internal



70.9”/1.8m x 23.6”/600mm x 23.6”/600mm - 39RU internal

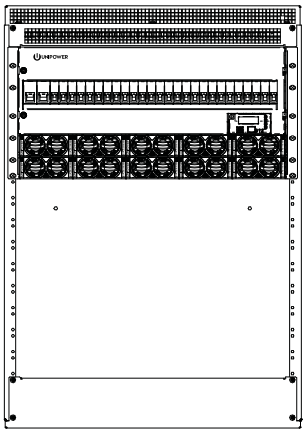


78.7”/2.0m x 23.6”/600mm x 23.6”/600mm - 43RU internal

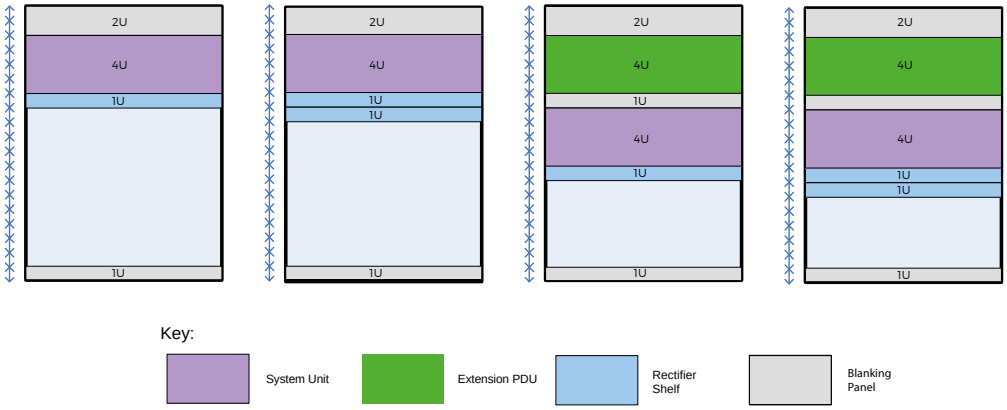


NOTE: For applications requiring more battery strings than the desired cabinet will accommodate please select a suitable matching battery cabinet when completing the ordering guide.

WALL-MOUNT CABINET CONFIGURATIONS



33.6”/854mm x 23.6”/600mm x 15.4”/390mm - 18RU internal



NOTE: Due to the overall depth of 15.4”/390mm, this cabinet will not accommodate large capacity (>60Ah typical) front terminal batteries. If larger batteries are going to be used please select a suitable battery cabinet when completing the ordering guide.

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)		
STEP 1 - CUSTOMER DETAILS		
Company: _____ Address: _____ _____ Zip Code: _____ Country: _____	Contact Name: _____ Email Address: _____ Telephone: _____ Quantity for quotation: _____	
STEP 2 - CHASSIS TYPE - Choose one version		
5RU - 3 Rectifier and 2 Converter Positions OR 6RU - 6 Rectifier and 4 Converter Positions	5RU chassis ☐ OR 6RU chassis ☐	
STEP 3a - RECTIFIER MODULES - Choose one type of rectifier module and enter quantity up to 3 for 5U chassis or 6 for 6U. STEP 3b - CONVERTER MODULES - Enter quantity of FMD15.24 converter modules - dummies will be inserted into unused slots		
FMP20.48 - 2000W - >92.5% Efficiency (APAC region only) FMPe20.48G - 2000W - >96% Efficiency FMP25.48G - 2500W - >92% Efficiency FMPe30.48G - 2900W - >95% Efficiency	FMP20.48 ☐ OR FMPe20.48G ☐ OR FMP25.48G ☐ OR FMPe30.48G ☐ Quantity _____	FMD15.24 Quantity _____
STEP 4 - ALARM INTERFACE - Select desired alarm interface		
Alarm Interface - 4 Relays or 10 Relays or 10 Relays + PLD2	4 Relays ☐ OR 10 Relays ☐ OR 10 Relays + PLD2 ☐	
STEP 5 - LOW VOLTAGE BATTERY DISCONNECT (LVBD) Select with 2 battery breakers, 4 battery breakers or 6 battery breakers		
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.	
STEP 6 - BATTERY BREAKERS - Choose rating and quantity based on step 5 choice or NONE (Breakers MUST be identical rating)		
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 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 ☐	
STEP 7 - PARTIAL LOAD DISCONNECT (PLD) - Select 125A or 200A or NO (default) - PLD2 may only be selected with correct Alarm Interface		
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 ☐	

CONTINUE ON NEXT PAGE

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]

	LVBD CIRCUITS (Critical)		PLD CIRCUITS (non Critical -48V)	
	-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 ____

STEP 9 - EXTENSION PDU for -48V loads - Provides additional 25 load breaker positions - Choose quantity for desired ratings.
This option should only be selected if the total number of desired LVBD circuits exceeds the number available after making selections in steps 5 and 7.

2A single pole (1 position)	Quantity ____
4A single pole (1 position)	Quantity ____
6A single pole (1 position)	Quantity ____
10A single pole (1 position)	Quantity ____
16A single pole (1 position)	Quantity ____
20A single pole (1 position)	Quantity ____
25A single pole (1 position)	Quantity ____

STEP 10 - SYSTEM CABINET - Choose one option from the below.
This selection will determine the number of battery cables that are installed subject to sufficient positions being selected in step 5

1.4m x 600 x 600 - Floor Standing (3 battery strings max.)	1 Shelf ☐ OR 2 Shelves ☐
1.8m x 600 x 600 - Floor Standing (4 battery strings max.)	OR 1 Shelf ☐ OR 2 Shelves ☐ OR 3 Shelves ☐
2.0m x 600 x 600 - Floor Standing (5 battery strings max.)	OR 1 Shelf ☐ OR 2 Shelves ☐ OR 3 Shelves ☐ OR 4 Shelves ☐
18U x 600 x 400 - Wall Mounting (1 <60Ah battery strings max.)	OR 0 Shelves ☐

STEP 11 - DOORS, BATTERY COVERS & BLANKING PANELS (only available for 1.8m and 2m floor standing cabinets.)
Select ONE only if required.

Door - DIN Lock - L/R mount	☐
Door - 331 Lock - L/R mount	OR ☐
Lower battery cover with 2 x 2U dummy panel	OR ☐
Lower battery cover with 1 x 5U dummy panel	OR ☐
Battery blank panel kit 2U	OR ☐
Battery blank panel kit 3U	OR ☐

STEP 12 - BATTERY CABINET - Choose one based on number of battery strings that need to be accommodated external to the system cabinet.
In the case of 1.8m and 2m cabinets the option chosed in step 12 will be applied to ensure the cabinets match aesthetically.

1.4m x 600 x 600 - Floor Standing	1 Shelf ☐ OR 2 Shelves ☐
1.8m x 600 x 600 - Floor Standing	OR 1 Shelf ☐ OR 2 Shelves ☐ OR 3 Shelves ☐
2.0m x 600 x 600 - Floor Standing	OR 1 Shelf ☐ OR 2 Shelves ☐ OR 3 Shelves ☐ OR 4 Shelves ☐

STEP 13 - TEMPERATURE SENSOR - available for battery and ambient temperature measurement

Temperature Sensors - 3m (~10ft) (1 x battery | 1 x ambient)	NONE ☐ OR 1 ☐ OR 2 ☐

STEP 14 - SYMMETRY CABLES (Choose maximum 4 total end measure OR 3 mid measure)

Symmetry Cable - 1.9m (~6ft) - end measure	NONE ☐ Qty 1 ☐ Qty 2 ☐ Qty 3 ☐ Qty 4 ☐
OR - 3.0m (~10ft) - end measure	OR NONE ☐ Qty 1 ☐ Qty 2 ☐ Qty 3 ☐ Qty 4 ☐
OR - 2.3m (~7.2ft) - mid measure	OR NONE ☐ Qty 1 ☐ Qty 2 ☐ Qty 3 ☐

STEP 15 - OPTIONS & ACCESSORIES (Select required items)

Shelf Support Kit	NO ☐ OR YES ☐
23" Wall-Bracket Kit (for wall-mount cabinet only)	NO ☐ OR YES ☐
Surge Protection Kit (factory fit)	NO ☐ OR 1-phase ☐ OR 3-phase ☐
AC Monitoring Kit	NO ☐ OR YES ☐

STEP 16 - SUBMIT COMPLETED FORM TO UNIPOWER FOR CHECKING AND ALLOCATION OF CONFIGURATION PART NUMBER

Configuration Part Number: _____ (leave blank for completion by UNIPOWER)

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