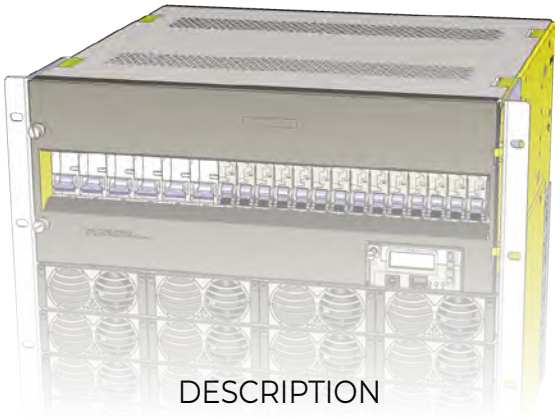
GUARDIAN M44 Hybrid

8U/10U Integrated Hybrid Power System
48VDC @ 60A to 700A



INDUSTRIES & APPLICATIONS

Telecom · Cable · Utilities · Government · Industrial

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

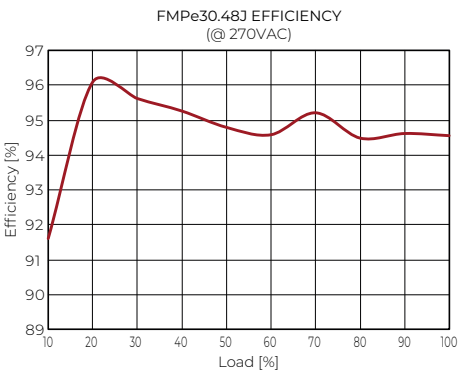
KEY FEATURES

- Fully Hybrid Solution
- 60A to 700A Capacity
- Remote Monitoring & Control
- Field Replaceable Controller
- Ethernet Comm. with SNMPv3
- 4 or 10 Form-C Relay Alarms
- Up to 23 Load Breakers
- Up to 6 Battery Breakers
- LCD Display/Keypad
- Easy Installation

SAFETY COMPLIANCE

CAN/CSA C22.2 No 62368-1:2014
UL 62368-1:2014
EN 62368-1:2014/A11:2017

THREE YEAR WARRANTY



DESCRIPTION

Guardian M44 Hybrid is a 8RU or 10RU high 19" rack-mounted, integrated hybrid power system providing an output of 48VDC. These systems can accommodate between eight 8 or 12 Guardian family FMPe30.48J hot-swap rectifiers plus an equal number of FPV30.48G hot-swap solar converters. Maximum load current is 700A with software controlled battery charge current, subject to a total 700A of load plus charge. The rectifiers / solar 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 23 loads which utilize circuit breakers with capacities from 4A to 150A plus up to six 100A to 300A breakers that provide battery protection. An optional programmable low voltage battery disconnect + shunt (LVBD) with 600A capacity is available for use with Lead Acid batteries; while an optional partial load disconnects (PLD), rated at 350A and also programmable, can provide non-critical load shedding when operating on batteries. When the LVBD option and battery breakers are not required the maximum number of available load breakers increases to 23.

The HCX Advanced remote access controller monitors system parameters, controls rectifier / solar converter output, and provides alarms for system failures. It 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 alarms for remote use, while 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 32GB card which is sufficient for more than 20 years data logging.

The HCX Advanced controller supports Green Cubes Guardian GBU Lithium ion battery modules as well as Lead Acid batteries. When the system is deployed with these modules the LVBD, current shunt and battery breakers are not included by default.

The system can be programmed by means of a remote PC web page display or UNIPOWER's free PowCom™ software which offers local and remote management through an advanced Windows GUI. Communication is by IPv4 or IPv6 Ethernet LAN with SNMP v2c and v3 including alarm trapping. It also has provision for temperature compensated charging of an external battery Lead Acid battery using a supplied TC probe. An LCD Display and Keypad are included for local metering, status, and setup.

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SYSTEM SPECIFICATION & CAPABILITY GUIDE

SYSTEM DESIGNATION		GUARDIAN M44 - M00044	
OUTPUT			
System Voltage		48VDC nominal | 53.5VDC float (factory default, user adjustable via controller)	
Maximum Capacity @ 230/400VAC nominal		Load	600A with LVBD | 700A without LVBD
		Battery	600A discharge with LVBD & Shunt 700A discharge without LVBD & Shunt s/w controlled charge
No. Rectifier / Solar Converter Slots		8RU - 8 x Rectifier + 8 x Solar Converter | 10RU - 12 x Rectifier + 12 x Solar Converter	
DC DISTRIBUTION			
Loads Circuits		up to 23 (4A to 150A - see configuration guide on page 5)	
Battery Circuits[1]		2, 4 or 6 x (100A, 125A, 200A, 250A or 300A)	
INPUT		RECTIFIERS	SOLAR CONVERTERS
Rating	1 input, 8 rectifiers 1 input, 12 rectifiers	230Vac/400Vac, 3W+N+PE, 42A, 50/60Hz 230Vac/400Vac, 3W+N+PE, 56A, 50/60Hz	Nominal MPPT: 160-300 V DC
Frequency		47-63Hz	-
Maximum Input Current	1 input, 8 rectifiers 1 input, 12 rectifiers	52.5A per phase @ 185-276VAC 70A per phase @ 185-276VAC	17.6A, 1 input each modulr
Rectifier Power Factor		>0.98 (typical)	-
Surge Protection		Optional (see configuration guide on page 5)	not available
MONITORING & CONTROL (HCX Advanced Controller)			
Alarm Relays		10 standard, option for 4 only	
Local Interface		4 x 20 LCD, 4-key menu, USB / RS232, microSD card slot (32GB max,) for data logging	
Remote Interface		Ethernet / Modem using PowCom™ software package Ethernet port allows monitoring and control over a IPv4 or IPv6 TCP/IP network. Web browser support + SNMP v2c and v3	
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[2]			
Symmetry Inputs		6 or 12 (can be redefined as analog inputs up to 100VDC)	
Low Voltage Battery Disconnect (LVBD)		1 x 600A Programmable (Optional)	
Partial Load Disconnect (PLD)		1 x 350A Programmable (Optional)	
Temperature Compensated Charging		Programmable	
COMPLIANCE			
EMC		EN 300 386 ; EN61000-6-3 (Emission) ; EN61000-6-2 (Immunity)	
Safety		CAN/CSA C22.2 No 62368-1:2014 | UL 62368-1:2014 | EN 62368-1:2014/A11:2017	
ENVIRONMENTAL			
Operating Temperature		-40°C to +55°C	
Storage Temperature		-40°C to +85°C	

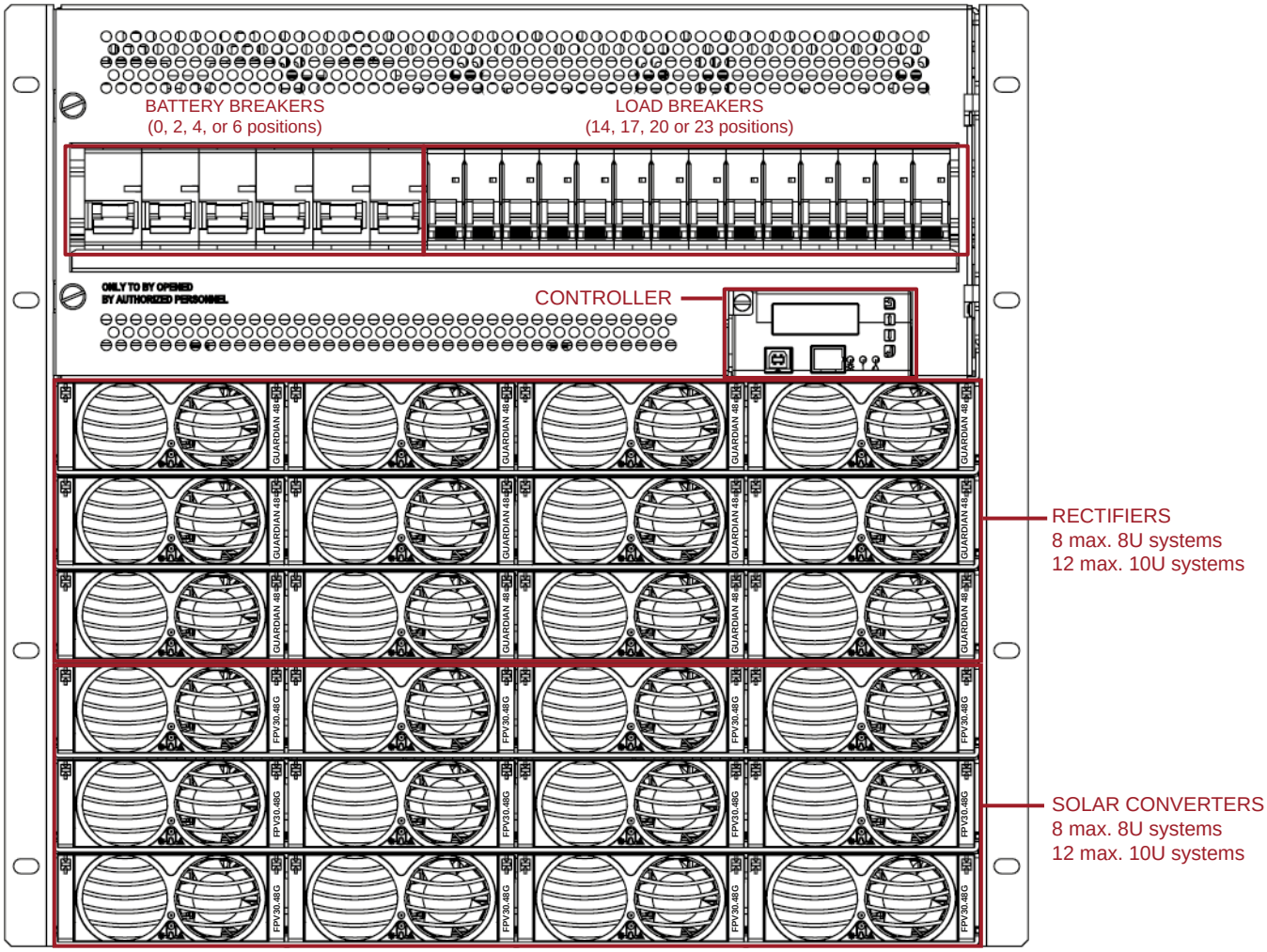
Notes:
1. Not available when installed with Green Cubes Lithium Ion battery backup units as these include their own isolation breakers.
2. Not available when installed with Green Cubes Lithium Ion battery backup units as these include their own management system.

RECTIFIER / SOLAR CONVERTER MODULES vs. SYSTEM CAPACITIES

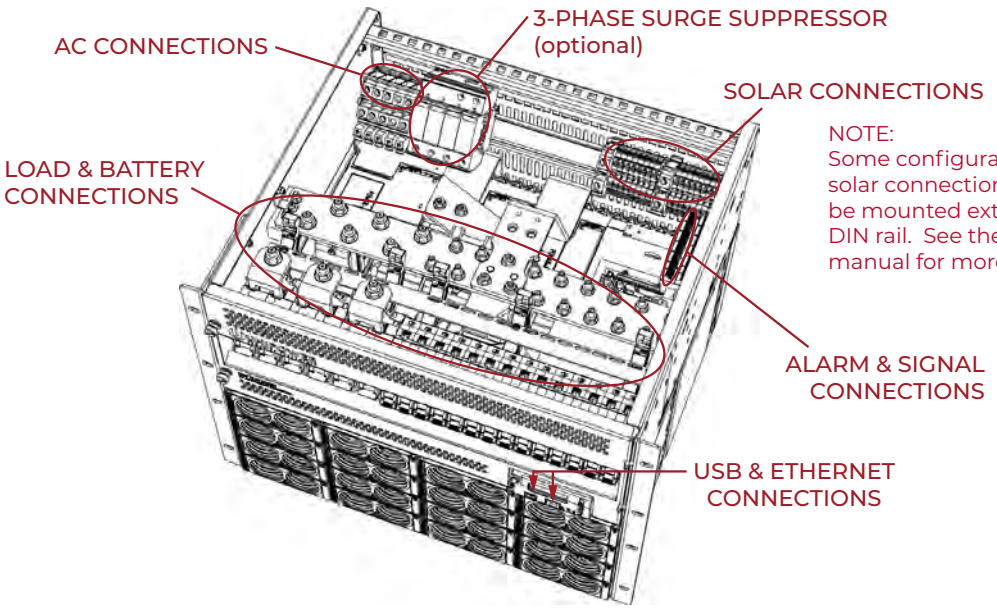
RECTIFIER MODULES						SYSTEM CAPACITY @ FLOAT[4,5]				
MODEL NUMBER	EFFICIENCY[1]	INPUT VOLTAGE[2]	INPUT CURRENT[3]	OUTPUT POWER	OUTPUT CURRENT 48V / 53.5V	MAX. LOAD CURRENT 8RU		MAX. LOAD CURRENT 10RU		OVERALL CURRENT
						TOTAL	8+1	TOTAL	10+2	TOTAL
FMPe30.48J	>95%	185-275VAC	18.5A	3000W	62.5A / 56.1A	448.8A	392.7A	600A	600A	600A COMBINED
FPV30.48G	95% peak	180-300VDC	17.6A	2900W	60.0A / 54.2A	433.6A	379.4A	600A	600A	

Notes:
1. When operating at peak 230VAC.
2. Derated output available below 185VAC or 180VDC respectively. See individual datasheets for details.
3. Input currents shown are expected maximums at 185VAC or 180VDC respectively.
4. Factory set to 53.5V. Adjustable via system controller.
5. Maximum load current of 700A available when LVDB not included, subject to total rectifier or solar converter capacity.

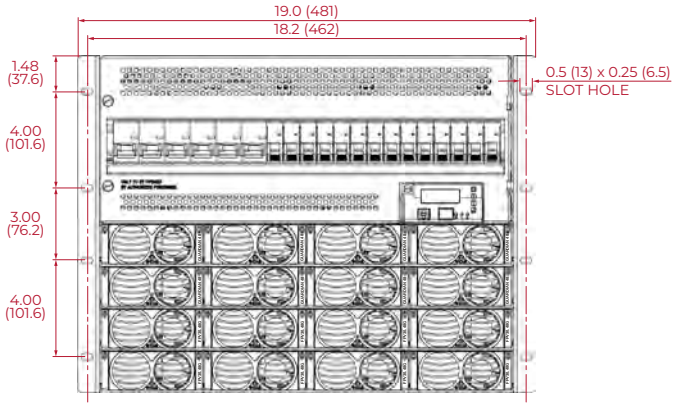
FRONT PANEL DESCRIPTION

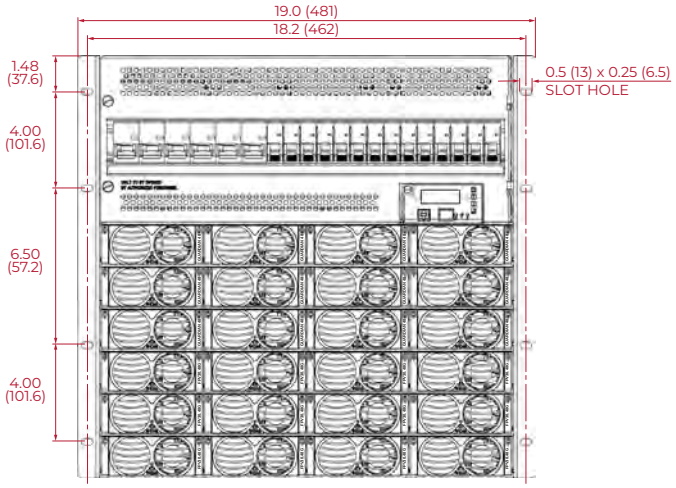


PERSPECTIVE FRONT VIEW

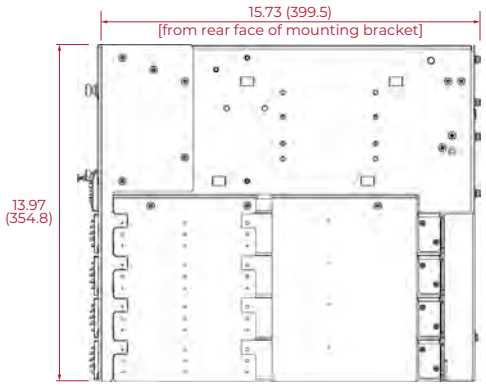


DETAILED DIMENSIONS

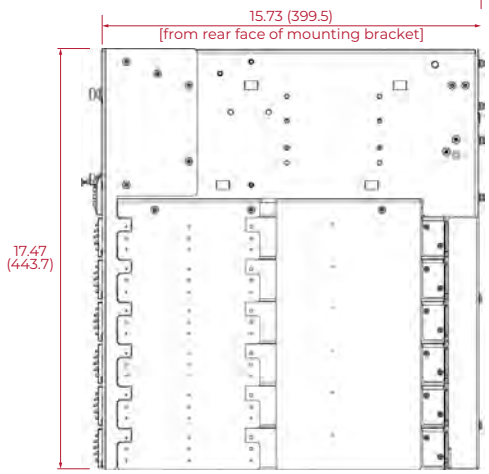




8RU CONFIGURATION



10RU CONFIGURATION



WEIGHTS & DIMENSIONS

UNIT TYPE	UNIT				PACKAGED				
	Width	Height	Depth	Weight	Width	Height	Depth	Weight	# in box
System Unit	18.9 (481)	8RU 10RU	16.0 (406)	57.2 lbs (26 kg) max.	23.4 (595)	17.9 (455)	19.1 (485)	61.6 lbs (28 kg) max.	1
Rectifier Module	4.2 (107)	1.6 (41)	14.0 (355)	4.6 lbs (2.1 kg)	15.5 (394)	2.3 (58)	8.2 (208)	4.8 lbs (2.2 kg)	1

Dimensions in inches (mm)

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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: _____	Contact Name: _____
Address: _____	Email Address: _____
_____	Telephone: _____
Zip Code: _____ Country: _____	Quantity for quotation: _____

STEP 2 - CHASSIS TYPE - Choose one version

8 Rectifiers + 8 Solar Converters (8RU) - Internal PV Connections	1 x 3-Phase 400V ☐ [PV terminals internal to system]
OR 8 Rectifiers + 8 Solar Converters (8RU) - External PV Connections	OR 1 x 3-Phase 400V ☐ [PV terminals on 3U DIN rail external to system]
OR 12 Rectifiers + 12 Solar Converters (10RU) - Internal PV Connections	OR 1 x 3-Phase 400V ☐ [PV terminals internal to system]
OR 12 Rectifiers + 12 Solar Converters (10RU) - External PV Connections	OR 1 x 3-Phase 400V ☐ [PV terminals on 3U DIN rail external to system]

STEP 3 - RECTIFIER / SOLAR CONVERTER MODULES - Enter quantity between 1 and 8 or 1 and 12 - dummies will be inserted into unused slots

FMPe30.48J - 3000W / 62.5A + FMV30.48G - 2900W / 60A	FMPe30.48J Quantity ____ FPV30.48G Quantity ____

STEP 4 - ALARM INTERFACE - Select desired alarm interface

Alarm Interface - 4 Relays or 10 Relays	4 Relays ☐ OR 10 Relays ☐

STEP 5 - LOW VOLTAGE BATTERY DISCONNECT (LVBD) - Select none, 2, 4 or 6 battery breaker positions

No LVBD or battery breakers (23 load breaker positions available)	None ☐ **[Select when using Lithium Ion GBUs]**
2 battery breaker positions (20 load breaker positions available)	OR 2 positions ☐
4 battery breaker positions (17 load breaker positions available)	OR 4 positions ☐
6 battery breaker positions (14 load breaker positions available)	OR 6 positions ☐

STEP 6 - BATTERY BREAKERS - Choose rating and quantity based on step 5 choice (Breakers MUST be identical rating)

100A (1 pole) - 2, 4 or 6 max.	Qty 1 ☐ OR Qty 2 ☐ OR Qty 3 ☐ OR Qty 4 ☐ OR Qty 5 ☐ OR Qty 6 ☐
OR 125A (1 pole) - 2, 4 or 6 max.	OR Qty 1 ☐ OR Qty 2 ☐ OR Qty 3 ☐ OR Qty 4 ☐ OR Qty 5 ☐ OR Qty 6 ☐
OR 200A (2-pole) - 1, 2 or 3 max.	OR Qty 1 ☐ OR Qty 2 ☐ OR Qty 3 ☐
OR 250A (2-pole) - 1, 2 or 3 max.	OR Qty 1 ☐ OR Qty 2 ☐ OR Qty 3 ☐
OR 300A (3-pole) - 1 or 2 max. (Not available in EMEA region)	OR Qty 1 ☐ OR Qty 2 ☐

STEP 7 - PARTIAL LOAD DISCONNECT (PLD) - Select YES or NO

350A (non-critical load / load shed disconnect)	YES ☐ OR NO ☐

STEP 8 - LOAD BREAKERS - Choose quantity for desired ratings, total 23, 20, 17 or 14 positions based on step 5 selection. When the PLD option is not selected populate only the LVBD 'critical' circuits column. When the PLD option is selected the maximum number of 'critical' circuits is reduced to 12, 9, 6 or 3 respectively. The maximum allowed PLD breakers is always 7. [Configuration will be checked by UNIPOWER]

Two and three pole options are configured to support a single load at the load capacity indicated.	LVBD CIRCUITS (Critical)	PLD CIRCUITS (non-Critical)
4A single pole (1 position) [load capacity 4A]	Quantity ____	Quantity ____
6A single pole (1 position) [load capacity 6A]	Quantity ____	Quantity ____
10A single pole (1 position) [load capacity 10A]	Quantity ____	Quantity ____
16A single pole (1 position) [load capacity 16A]	Quantity ____	Quantity ____
20A single pole (1 position) [load capacity 20A]	Quantity ____	Quantity ____
25A single pole (1 position) [load capacity 25A]	Quantity ____	Quantity ____
32A single pole (1 position) [load capacity 32A]	Quantity ____	Quantity ____
40A single pole (1 position) [load capacity 40A]	Quantity ____	Quantity ____
50A single pole (1 position) [load capacity 50A]	Quantity ____	Quantity ____
63A single pole (1 position) [load capacity 63A]	Quantity ____	Quantity ____
50A two pole (2 positions) [load capacity 80A]	Quantity ____	Quantity ____
63A two pole (2 positions) [load capacity 100A]	Quantity ____	Quantity ____
50A three pole (3 positions) [load capacity 120A]	Quantity ____	Quantity ____
63A three pole (3 positions) [load capacity 150A]	Quantity ____	Quantity ____

STEP 9 - TEMPERATURE SENSOR - available for battery and ambient temperature measurement **[battery sensor not required with Li Ion GBUs]**

None	NONE ☐
OR 3.0m (~10ft) [Preferred]	OR Qty 1 ☐ OR Qty 2 ☐
OR 6.0m (~20ft)	OR Qty 1 ☐ OR Qty 2 ☐

STEP 10 - SYMMETRY CABLES - choose none or type and length as desired. Quantity will be matched to battery breakers installed.

None	NONE ☐ **[Select when using Li Ion battery units]**
OR - End Measure (3-wire 4 block) 3.0m (~ 10ft) [Preferred]	OR End Measure 3.0m ☐
OR - End Measure (3-wire 4 block) 6.0m (~20ft)	OR End Measure 6.0m ☐
OR - Mid Measure (1-wire 2 block) 3.1m (~ 10ft) [Preferred]	OR Mid Measure 3.1m ☐
OR - Mid Measure (1-wire 2 block) 6.0m (~ 20ft)	OR Mid Measure 6.0m ☐

STEP 11 - AC SURGE PROTECTION - choose none or type desired.

Yes OR No	Yes ☐ OR No ☐

STEP 12 - COVER KIT - includes top cover, rear cover and fitting accessories.

Yes OR No	Yes ☐ OR No ☐

STEP 12 - SUBMIT COMPLETED FORM TO UNIPOWER FOR CHECKING AND ALLOCATION OF CONFIGURATION PART NUMBER

Configuration Part Number: M00044G_____ (leave blank for completion by UNIPOWER)

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