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1. INTRODUCTION

The MXU DC UPS is designed to provide non-interrupted DC voltage to critical load. The converter accepts 96Vac to 264Vac universal main's input with PFC *(Power Factor Correction)* front end, and provides two output terminals. The Load output is for powering equipment, and the Battery I/O for connection to backup battery. On-board intelligent circuitry provides battery status detections, battery protections, as well as temperature compensated boost and float charging of the backup batteries. Two output versions are available for either 12V or 24V battery system.

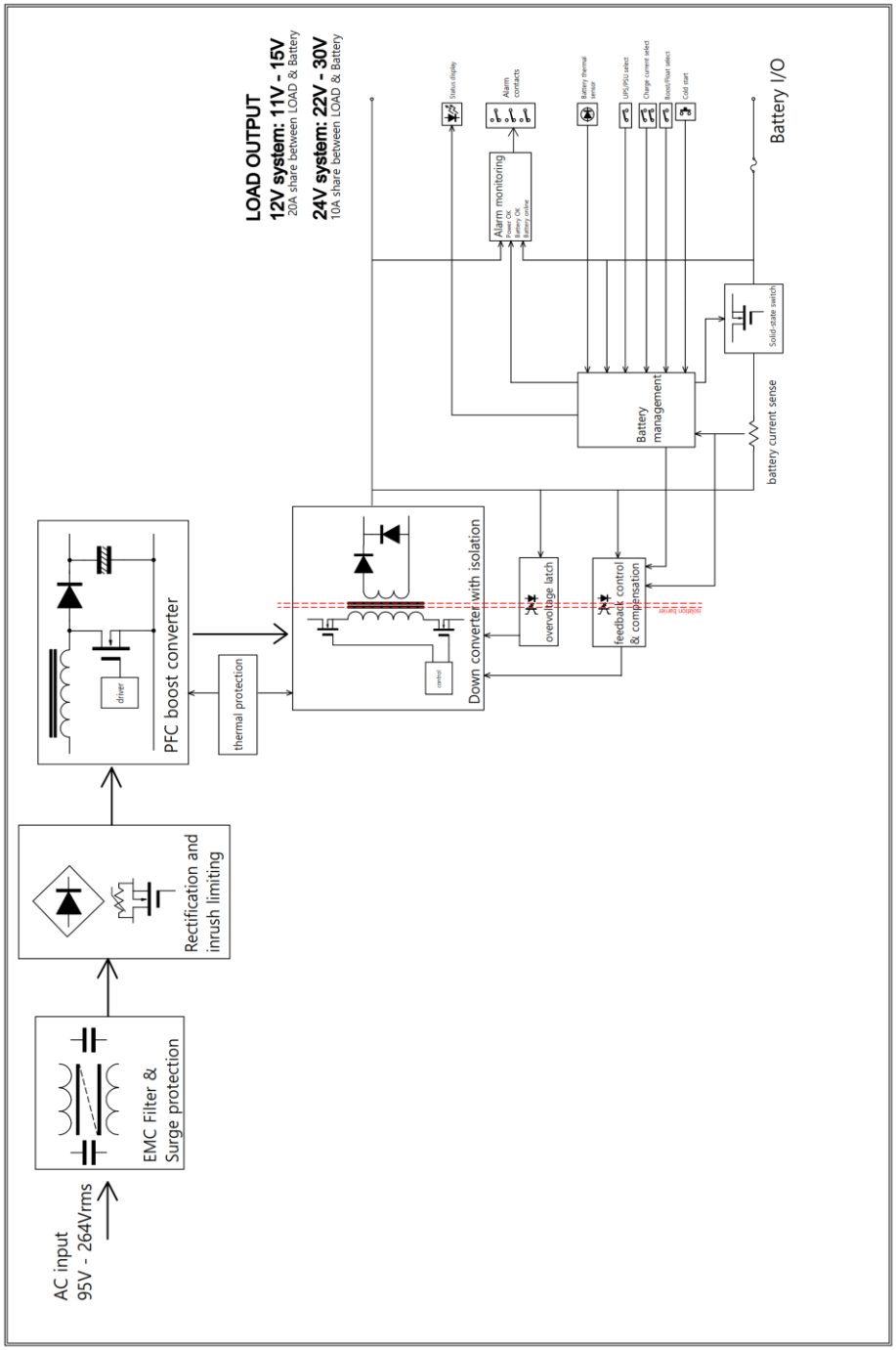
When main's voltage is present, MXU DC UPS supplies power to the equipment as well as charges the backup battery. The charge topology is user programmable for either constant float mode or auto 3-step boost mode. The charging capacity is also user programmable from 25% to 100% I_{rated} in 4 steps. During an AC blackout, the power to the equipment is supplied via the backup battery with glitch-free transition.

The backup battery is fully protected against overcharge, overcurrent overtemperature, and over-discharge event. Status alarms (solid state volt-free) DC OK, Batt OK and Batt off-line are available for remote monitoring of the status of the converter.

The *MXU DC UPS* is also equipped with user-selectable *'PSU-only'* and *'cold-boot'* facilities.

The product complies with the stringent C-tick Level B requirement and the AS/NZS60950 safety standard.

1.1 Function block diagram



2. 3-STEP CHARGING

3-step charging is a topology used for rapid return of full charge to Sealed-Lead Acid (SLA) Batteries without compromising battery life.

When the charger is first switch-on, automatic boost mode is enable (15V max for 12V battery, and 30V max for 24V battery). Initially when the battery is near flat, it will demand full current from the charger (at the selected current limit) for the bulk charge return. When the battery has received approx 80% of its charge, its terminal voltage will start to raise to the boost voltage and the charge current decays.

Once the charge current decay to its transition value set by the charger, the charger will switch to float mode (13.8V for 12V battery, and 27.6V for 24V battery).

At this stage, the battery is fully charged.

To further enhance battery life, temperature compensation is used to adjust charge voltage according to the battery temperature.

3. ELECTRICAL SPECIFICATION

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3.1 Input

Parameter	min	typ	max	unit
AC INPUT				
Input voltage	**96**		**265**	**$V_{ac\ rms}$**
Max surge voltage (1s) 230V setting			**275**	**$V_{ac\ rms}$**
Input current (max @ 96Vac)			**5**	**A_{rms}**
Inrush current (@230Vi/p, duration <10ms)			**13**	**A**
Power Factor		**0.95**		
Frequency	**46**		**66**	**Hz**

3.2 Output

Parameter	min	typ	max	unit
OUTPUT				
Boost mode	**2.45**	**2.5**	**2.55**	**V/cell**
Float mode	**2.25**	**2.3**	**2.35**	**V/cell**
Combined rated Current (I_{rated}) Model 1220 **Model 2410**			**20** **10**	**A** **A**
Temperature compensation		**-3.9**		**mV/cell**
Boost to float charge transition: **Charge current taper (falling current)**	**8**	**10**	**12**	**$\%I_{charge\ max}$**
Load regulation (0A to I_{rated})		**0.4**	**0.7**	**$\pm\%V_{nominal}$**
Line regulation (full input range)		**0.1**	**0.3**	**$\pm\%V_{nominal}$**
Output noise: switching frequency ripple **high frequency spike (30MHz BW)** **Note: Measured at the output connector with 100n ceramic decoupling capacitor across output.**			**0.5** **1**	**$\pm\%V_{p-p}$** **$\pm\%V_{p-p}$**
Current limit	**101**	**106**	**115**	**$\pm\%I_{rated}$**
Overload protection	Trip and restart, approx. 0.3s on, 3s off.			

Efficiency at full load		**87**		**%**
Overvoltage protection (unit latchoff, reset by recycle input power)	**2.65**	**2.7**	**2.8**	**V/cell**

2.5 Isolation & EMC

ISOLATION				
AC Input to Output	**3.0**			**KVac**
AC Input to GND	**1.5**			**KVac**
Output to GND	**500**			**Vdc**
Safety Approval	**AS/NZS60950.1:2011**			
EMC Approval	**AS/NZS CISPR22:2009 + A1:2010**			

2.6 Environmental, interface and others

ENVIROMENT				
Operating ambient temperature (no derating)*	**-20**		**55**	**°C**
Estimated chassis temperature rise (above ambient, full load)*		**40**		**°C**
Humidity			**95**	**%**
Altitude			**2000**	**metres**
Cooling**	**Free air convection cooling, heatsink fins in vertical or horizontal position.**			
MTBF (G_b, T_{amb}=25°C)	**>200Khours (estimated)**			

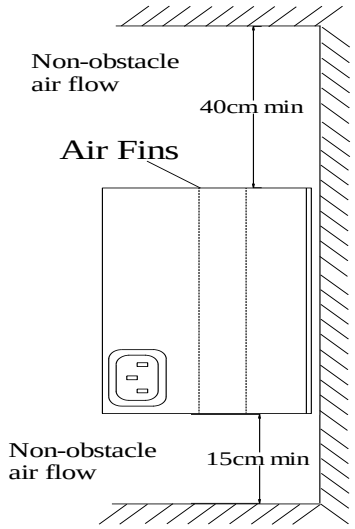
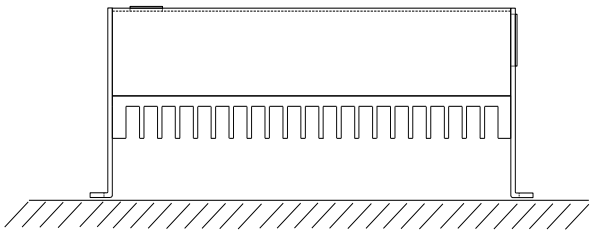
*** refer to table 1**
****derating must be applied for horizontal position, please refer to table 1**

INTERFACE	
AC Input	**IEC rear panel**
DC Output & Battery I/O	**7.62mm pluggable terminal block Dinkle ECH762 series (or equivalent)** ***(mating half supplied with unit)***
Thermal Sensor	**2.5mm JST XA series** ***(fitted with thermal sensor supplied unit)***
User selectable options: A four-way DIP switch provide user-selectable options**.** Position **3** & **4** Position **2** Position **1**	 **I_{charge} maximum setting from 25% to 100% in 4 steps** **Boost mode select** **UPS/PSU* mode select**
'Cold start'switch	**Momentary switch, hold down 5s for cold start from Battery (in UPS mode).**
Alarm contact Outputs	**3.81mm pluggable terminal block Dinkle ECH381 series (or equivalent)** ***(mating half supplied with unit)***
Alarm contacts: Three solid-state alarm contacts are available. All contacts are normally closed when 'OK' status. **Power_OK** **Batt_OK** **Batt_online**	**Contact rating 60V 0.1A** **AC present and converter running.** **AC present and converter running, and Battery on-line. During backup mode Batt≥1.85V/cell.** **1.70≤Batt≤2.55V/cell, and pass periodic health check.**

**When PSU mode is selected, all Battery management system and Alarms will be disabled.*

DISPLAY	
Indication: A bi-colour LED indicates the status of the Converter.	
Solid **RED**	**Fault condition, initialisation fails.**
Slow blink **AMBER**	**Initialisation at powerup.**
Solid **GREEN**	**UPS mode selected and Battery healthy, normal operation.**
Solid **AMBER**	**Boost charging battery.**
Slow blink between **RED** & **GREEN**	**Converter running but Battery off-line (failed health check or disconnected).**
Slow blink **GREEN**	**Converter in backup mode, Battery is above 1.85V/cell.**
Fast blink **GREEN**	**Converter in backup mode, Battery is below 1.85V/cell but above 1.75V/cell.**
GREEN with short **AMBER** blink	**Converter in PSU mode.**

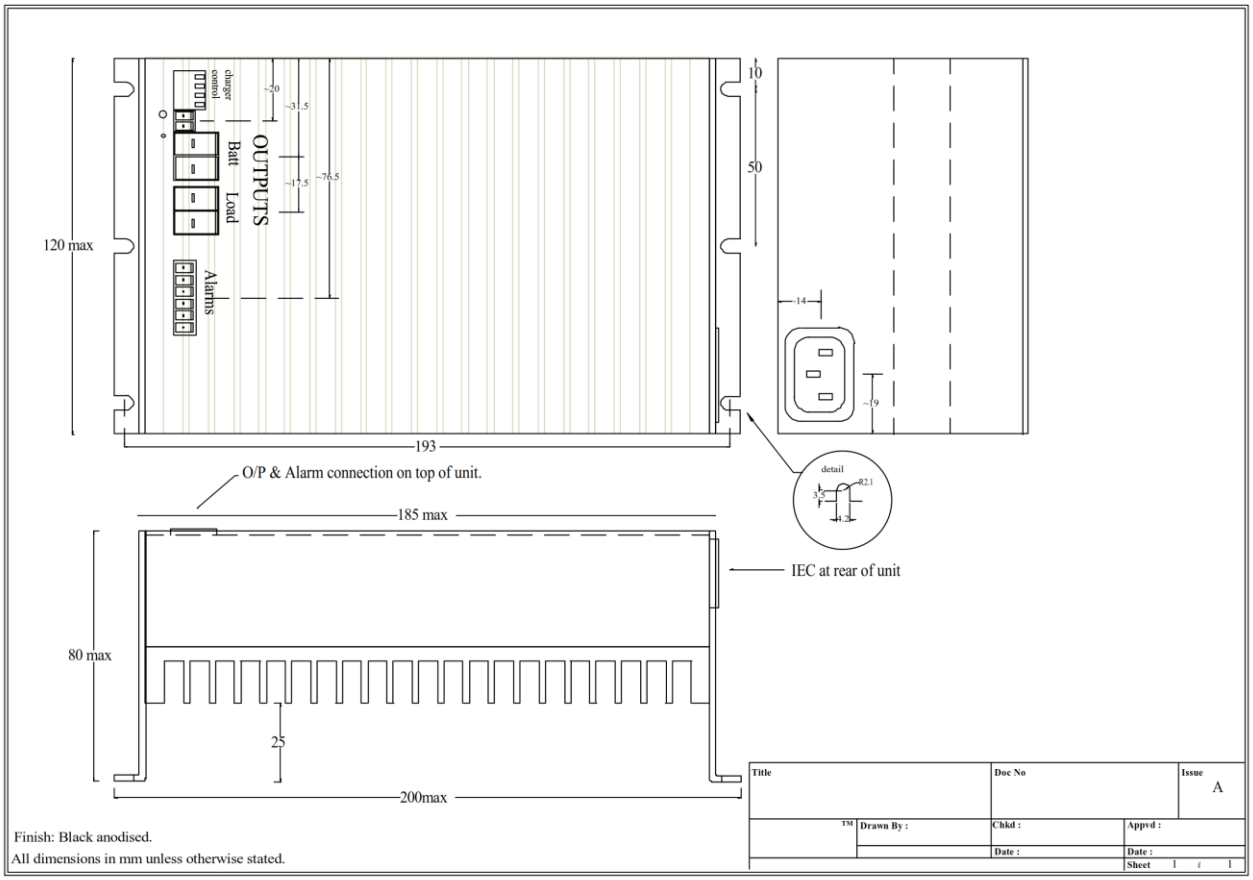
Table 1:

Mounting Orientation	Maximum Ambient temp. at 300W
1.Vertical Mount: 	**55°C @ 230V_{rms} input** **50°C @ 115V_{rms} input**
2.Horizontal Mount: 	**45°C @ 230V_{rms} input** **40°C @ 115V_{rms} input**

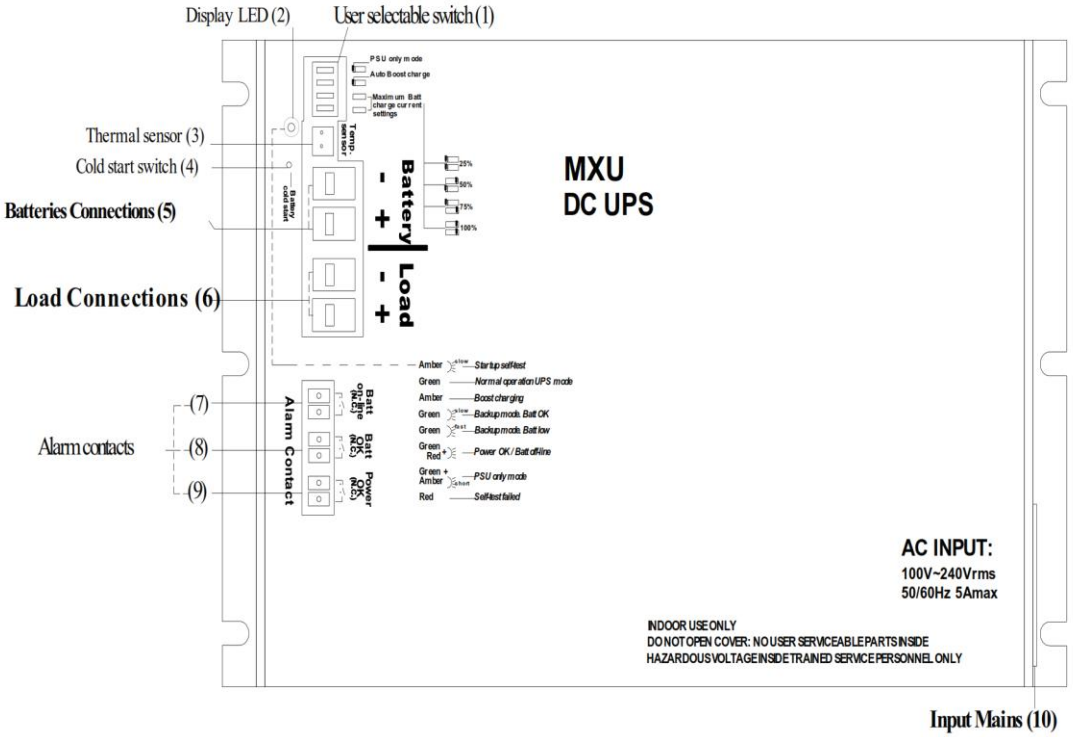
4. MECHANICAL SPECIFICATION

MECHANICAL	
Outside dimension (mm)	**120x185x80**
Casing	**Black anodised base with Powder coat APO grey covers.**
Operating Orientation	**Stand-alone unit. Heatsink fins in vertical position unrestricted airflow. Derating applies otherwise**
Weight	**0.7Kg (estimated)**

4.1 Mechanical outline



4.1 Pinout Diagram



4.3 MXU Picture