powerbox
Powering Progress

PB356 Series:

PSU for Battery Backup System

FEATURES

- Ultra-low noise output
- Independent rectifier & battery charging current limiting
- Externally adjustable battery charging current limit
- Advanced monitoring and control
- 2 step float charger or 3 step fast charger switch selectable
- Automatic battery connections and fuse fail testing
- Automatic and manual battery condition testing (BCT)
- Two multifunction alarm/ status LEDs
- AC Mains & Rectifer Status. Battery and BCT Status
- Battery low voltage disconnect switch with internal electronic circuit breaker
- Optional battery temperature probe for battery float voltage temperature compensation
- Four form-C alarm relays AC Mains Status, Rectifier Status, Battery Status and Battery Fault
- Optional Ethernet interface with embedded HTML webpage server and SNMP

SPECIFICATIONS

MODEL			PB356-12CML	PB356-24CML
INPUT	Voltage [V]		AC190 - 265 1ø or DC190-400	
	Current [A]		1.4 max.	1.4 max.
	Frequency [Hz]		50/60 (45 - 65)	
	Efficiency [%]		83.5 typical	
	Inrush current [A]		15 max. (cold start)	
OUTPUT (AC Mains Operation)	Voltage [Vdc]*1,2		13.8	27.6
	Total Output Current [A]*3		8.0 / 10.0*4	4.0 / 5.0*4
	Rectifier Current Limit	> LVD Volts	Constant current: 12.5A typical	Constant current: 6.25A typical
		< LVD Volts	Foldback & hiccup	
	Battery Charging Current Limit [A]*5	Factory Setpoint	2.0	1.0
		Adjustment Range	0.5 - 8.0 / 0.5 - 10.0*4	0.5 - 4.0 / 0.5 - 5.0*4
	Line Regulation [%]		0.2 typ.	
	Load Regulation [%]		2.0 typ.	
	Ripple [mVp-p]*6		25 max.	45 max.
	Noise [mVp-p]*6		25 max.	45 max.
	Overvoltage Shutdown		15.5 - 19.5 (Latching)	31.5 - 39.0 (Latching)
	Output Short Circuit Protection		Indefinite (Autoresetting)	
	Battery Charger Short Circuit protection		Indefinite (Autoresetting)	
	Overtemperature Protection		Rectifier maximum temperature limiter reduces rectifier output power. Extreme overtemperature causes rectifier shutdown (Autoresetting).	

MODEL		PB356-12CML	PB356-24CML
OUTPUT (Battery Operation)	Voltage Drop Battery to Output [V]	0.4 typ.	0.2 typ.
	Low Voltage Disconnect [V]	< 10.5 typ. for > 10 seconds	< 21.0 typ. for > 10 seconds
	Output Overload Protection	Battery Electronic Circuit Breaker	
	Battery Reverse Polarity Protection	Internal Fuse	
DISPLAYS AND ALARMS	Relays	Four voltage-free form-C contacts, (32V,1A)	
	AC Mains Status Relay	OK / Fail	
	Rectifier Status Relay	OK / Fail or overtemperature	
		DIP Switch 3 = OFF (Default)	DIP Switch 3 = ON
	Battery Status Relay	Battery Low Voltage OK / Battery low voltage	Battery Status OK/ Battery low voltage, battery disconnected, battery overvoltage, battery overtemperature or BCT fail
	Battery Fault Relay	Battery Fault No fault / Battery disconnected, battery overvoltage, battery overtemperature or BCT fail	BCT Status BCT in progress / BCT not in progress
	Controls		
	External Shutdown	LED (Green) ON=OK, Voltage-free Changeover Contact (32V,1A) Alarm on battery low voltage or on failure of battery fuse.	
	Control Button	1 sec. push: Clear BCT fail or battery disconnected alarms 5 sec. push: Manually start or abort a BCT 10 sec. push: Reset microcontroller	
	LED's	Two green alarm / status LED's	
	Mains and Rectifier Status Led	ON: Mains and rectifier OK 2 flashes / sec: Rectifier fail, shutdown due to extreme overtemperature, or external shutdown 10 flashes / sec: Rectifier overtemperature power limiter operating OFF: Mains fail	
	Battery And BCT Status LED	ON: Battery OK, Charger Mode = float 1 flash / sec: Battery OK, Charger Mode = bulk 2 flashes / sec: Battery OK, Charger Mode = absorption 5 flashes / sec: Battery OK, BCT pending 10 flashes / sec: Battery OK, Battery connections test or BCT is occurring OFF: Battery Low voltage	
	Diagnostic Codes	1 -11 flashes in 5 seconds: Battery fault 1 flash: Battery disconnected, battery wiring fault, or battery fuse fail 2 flashes: Battery overvoltage 3 flashes: Battery overtemperature 4 flashes: BCT fail 5 - 11 flashes: Not used	

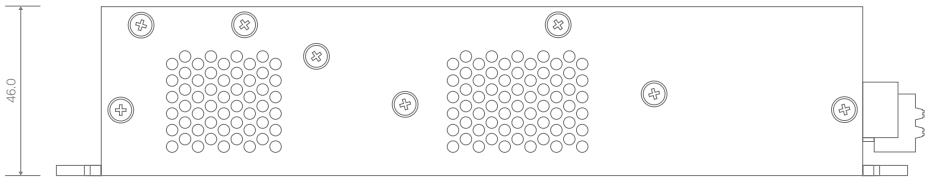
MODEL			PB356-12CML	PB356-24CML
BATTERY MANAGEMENT	Battery Connections Test		Battery connections and battery fuse tested automatically every five minutes.	
	Battery Charger		2 or 3 step charger selected by DIP switch	
		2 Step Charger	Bulk / float modes	
		3 Step Charger	Bulk / absorption / float modes	
	Parameters:	Float Voltage[V@Tbattery = 25°C]	13.80	27.60
		Absorption Voltage [V@Tbattery = 25°C]	14.40	28.80
		Maximum Absorption Time [Hours]	2	2
		Absorption Taper Current [A]	0.4	0.2
		Absorption Enable Threshold [V]	12.0	24.0
	Battery Condition Test (BCT)		Enabled / disabled by DIP switch. State of battery tested by allowing battery to power the load for a period of time while monitoring battery voltage.	
	Parameters:	Automatic BCT interval [Weeks]	1	
		BCT duration [Minutes]	60	
		BCT fail threshold [V]	12.24	24.48
		Float time before BCT [Hours]	24 minimum	
	Battery Overtemperature Alarm [°C]		50	
	Battery Overvoltage Alarm	[V@Tbattery = 25°C]	15.0	30.0
	Battery Low Voltage Alarm [V]	Factory Setpoint	10.8	21.6
		Internal Adjustment Range*7	9.0 - 13.0	18.0 - 26.0
ISOLATION	Input - Output		4242 VDC, 1 minute	
	Input - Ground		2121 VDC, 1 minute	
	Output - Ground		707 VDC, 1 minute	
SAFETY AND EMC	Safety		AS/NZS 60950.1, Class I	
	EMC	RF Emissions	AS/NZS CISPR11 Group1, Class B	
		Harmonic Current	AS/NZS61000.3.2	
ENVIRONMENT AND OTHERS	Operating Temp And Humidity		0 to 60°C, 5 to 90%RH (Non condensing) (Refer to DERATING CURVE)	
	Case Size / Weight		235 x 93 x 46mm (LxWxH) / 900g	
	Cooling Method		Natural Convection	
OPTIONS	Battery Temperature Probe		Provides -3.3mV/°C/cell temperature compensation of float voltage, absorption voltage and battery overvoltage alarm threshold. Add -T to model for 2.5m cable. Add -T5 to model for 5m cable.	
	Ethernet Interface (Future)		Internal card providing 10BaseT / 100BaseTx Ethernet interface supporting an embedded HTML webserver and SNMP V1. Add -N to model number.	

*1 WARNING: Do not apply voltages higher than the output voltage to the unit output or serious damage to the unit can occur!
*2 Float voltage at TBATTERY = 25°C with battery temperature probe option.
*3 Sum of load + battery charging current; example, 2A charging + 8A load = 10A
*4 To operate at maximum output current, these models must be attached to a heatsink (300 x 300 x 2mm Aluminium plate or equivalent heatsink).
*5 This feature limits battery charging current but not load current.
*6 Using a 20MHz oscilloscope at the output terminals.
*7 Contact Powerbox for adjustment of battery low alarm threshold.

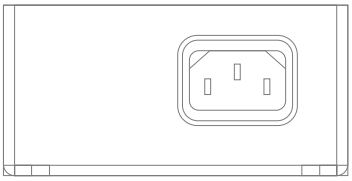
TECHNICAL DRAWINGS

PB356 Series:

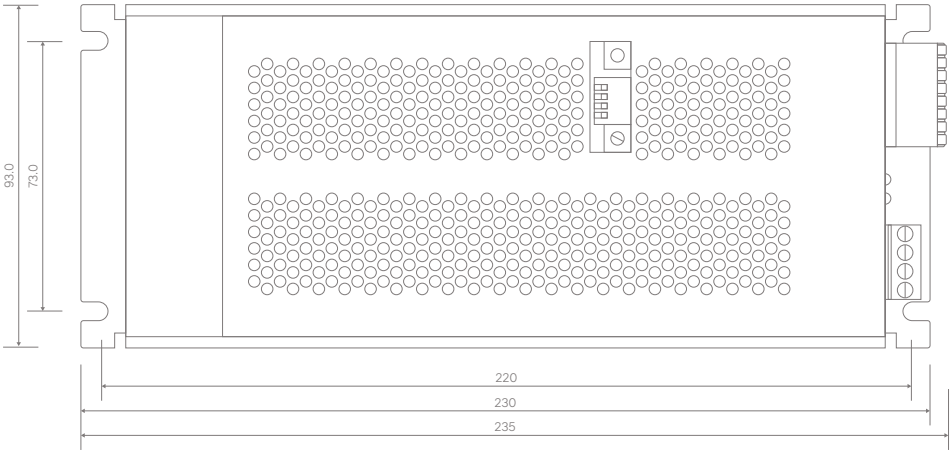
FRONT VIEW



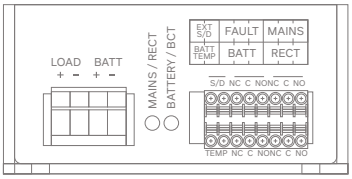
LEFT SIDE VIEW



TOP VIEW



RIGHT SIDE VIEW

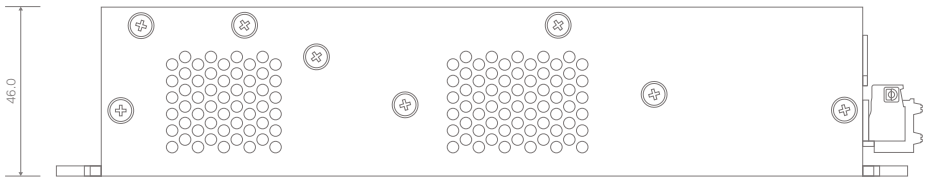


NOTES:

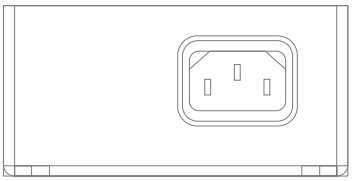
1. Mounting Centres:
   - 220 x 73mm
   - Suitable for M4 Hardware
2. AC Mains:
   - 10A Class 1 IEC60320 power inlet
3. Output and Battery:
   - 4W Pluggable Screw Terminal Block
   - Suitable for up to 1.5 sq. mm wire
4. Alarms:
   - 16W Pluggable Cage Clamp Terminal Block
   - Suitable for up to 1.5 sq. mm wire

PB356 Series with Network Card Option:

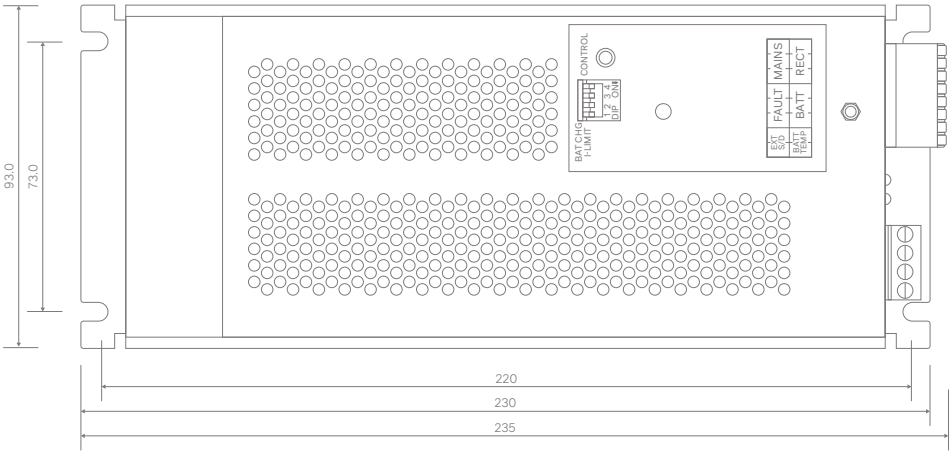
FRONT VIEW



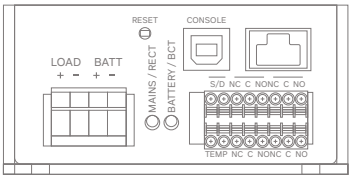
LEFT SIDE VIEW



TOP VIEW



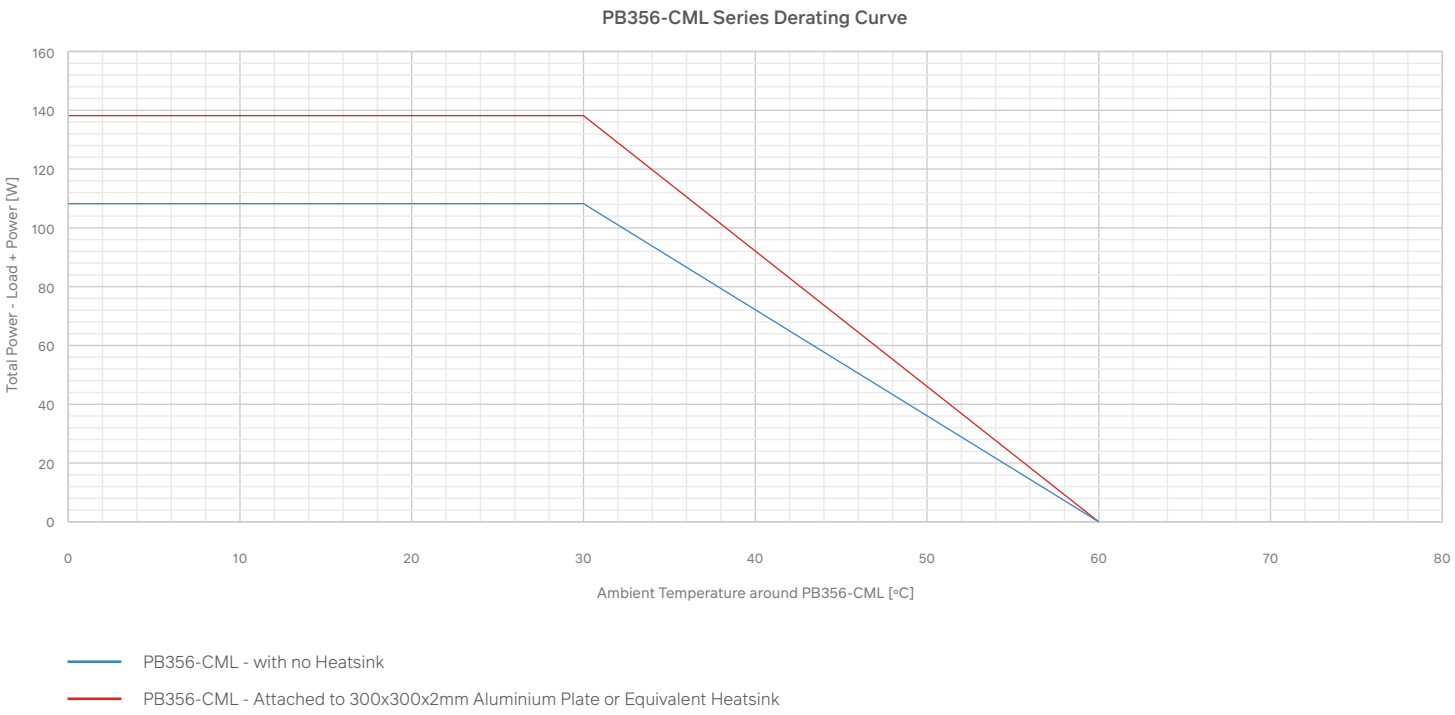
RIGHT SIDE VIEW



NOTES:

1. Mounting Centres:
   - 220 x 73mm
   - Suitable for M4 Hardware
2. AC Mains:
   - 10A Class 1 IEC60320 power inlet
3. Output and Battery:
   - 4W Pluggable Screw Terminal Block
   - Suitable for up to 1.5 sq. mm wire
4. Alarms:
   - 6W Pluggable Cage Clamp Terminal Block
   - Suitable for up to 1.5 sq. mm wire

DERATING CURVES



Sizing Example

The sum of the battery charge current limit and the load current must be kept less than or equal to the rated output current of the rectifier at the required maximum ambient temperature.

For example: An installation must supply a 13.8V load of 4A and charge a 20Ah backup battery in a maximum ambient temperature of 40°C. The battery requires a maximum charging current of 2A (0.1C). The sum of the load current and maximum battery charging current is 4A +2A = 6A. Multiplying by the float voltage gives a maximum output power of 13.8V x 6A = 82.8W. Referring to the derating curve, model PB356-12CML has a maximum rated output power of 93.3W at 40°C so it is suitable for this application.

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