



# **POWER STATION**

FOR V-LOCK LITHIUM ION BATTERIES ONLY

Model

**PWS4**

## **OPERATING INSTRUCTIONS**

Revision 1.2

## **Please read these instructions concerning your safety**

BLUESHAPE POWER STATIONS have been designed to provide a superior performance by efficiently managing a high power output during their operation without overheating or becoming unstable.

With the high output power capability of the PWS4, it is expected and very normal that the internal electronics generate some heat and the internal temperature rises to a controlled extent. It is however, very important to keep the ventilation openings of the enclosure unobstructed.

Moreover, please follow the safety instructions below.

- Protect the equipment from humid environments. Avoid any contact with water or other fluids. Do not use if any liquid has been accidentally spilled inside the equipment .Contact qualified service personnel for inspection or repair
- Clean only by using a dry cloth
- Remove on-board batteries when not in use
- Read the supplied instructions thoroughly and keep handy
- Avoid setting up near heat sources such as fire places, radiators, stoves or other heat generating equipment
- If the equipment develops a fault, have it repaired by qualified service personnel only
- NEVER block the ventilation openings or obstruct cooling fan air flow
- Use only as instructed by the manufacturer
- Do not remove cover or dismantle the apparatus. No user-serviceable parts inside



### **IT IS STRONGLY RECOMMENDED TO USE BLUESHAPE V-LOCK BATTERIES TO OPERATE THIS UNIT**

Although this unit can also run on 3<sup>rd</sup> party batteries, it is not advisable to use any of these since:

1. Only BLUESHAPE batteries are able to communicate and dialogue with the unit. The unit was designed for the BLUESHAPE battery protocol
2. BLUESHAPE batteries are renowned for their high discharge capabilities and can guarantee:
  - Up to 9A for the standard BV series
  - Up to 12A for the HD series

## Package contents

- PWS4 four position Power Station

- Operating manual

## CAUTION

**The unit IS NOT waterproof and not intended for usage in humid or wet environments**

## PWS4 graphic description – Front/left side



1. Back lit LCD display (20 columns x 4 rows)
2. Top output 28V, 560W max (in combination with bottom output)
3. Top output 14V, 280W max (in combination with bottom output)
4. Bottom output 28V, 560W max (in combination with top output)
5. Bottom output 14V, 280W max (in combination with top output)
6. V-Lock Battery position #1
7. V-Lock Battery position #1

## PWS4 graphic description – Rear/right side



1. Ventilation outlets (2 slow running, low noise fans)
2. Data connector
3. Illuminated power On/Off switch. The unit needs to be switched on to start operating and can be switched off even if the batteries are left mounted in the V-locks
4. V-Lock Battery position #3
5. V-Lock Battery position #4

### Note:

- The ventilation inlets are on the topsides of the unit.
- A carrying handle has been provided
- The 4 channels are identical

## Introduction

The BLUESHAPE Power Station concept is a convenient system to integrate the power of multiple V-lock batteries into a unique source that can be tapped anywhere, anytime as a simultaneous dual DC voltage output.

Depending on which batteries are installed, the quad PWS4 system can supply power as follows:

- Up to 560W out with 4 x BV HD models
- Up to 490 W out with 4 x BV standard models

The internal electronics are highly efficient operating at not less than 92% even when delivering full loads. Such efficiency permits the PWS4 to remain cool even after hours of continuous operation. This feature ensures a safe and prolonged system reliability and lifetime.

The batteries on channels 1-4 are hot-swappable and enable the unit to provide uninterrupted power even when a battery becomes empty. The user will just need to monitor the capacity decrease of the batteries through the LCD display provided and replace as necessary without needing to switch of the unit.

Power is available SIMULTANEOUSLY from 4 x XLRs:

- 2 x 3 pin female XLRs for 28V/ 560W max output (20A)
- 2 x 4 pin XLRs for 14V 280W max output (20A)

The display on the PWS4 will show each battery's individual state of charge and the total real time power being generated by the unit. This display makes it therefore, very easy to monitor the unit during operation and understand what output, it is delivering.

## Properties of the PWS4

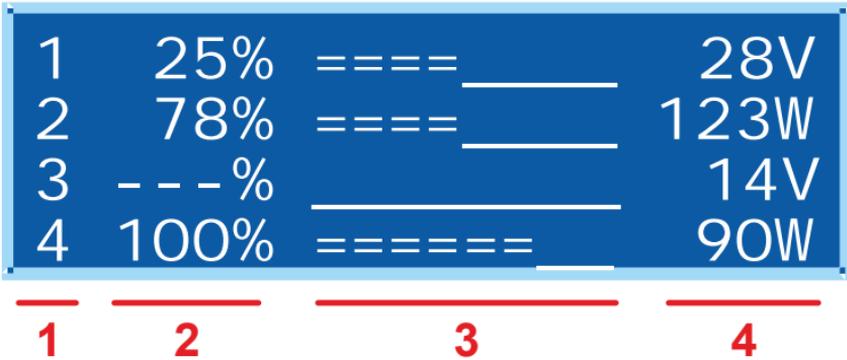
- Powerful 28V, 20A and 14V, 20A continuous output capability
- Elegant but rugged design. Ideal for indoor and outdoor use (but not in humid or wet conditions).
- Sophisticated internal electronics with highly efficient DC-DC converters and the acclaimed BLUESHAPE 'QUICKCHANGER' technology feature on all 4 channels for hot swapping of batteries.
- Can operate with as little as one battery on board (though not recommended since the unit will not be able to reach its full performance capabilities).
- Accurate data display obtained by the direct dialogue between unit and the batteries (BLUESHAPE BV only)
- Data communication outlet (useful for firmware upgrade/ testing and calibration purposes at factory or even for future user software applications)

## Interpretation of the Display

Upon switch on (at least one battery on any channel must be present), the display lights showing the installed Firmware versions.

From then onwards, the screen will interchange between 2 different data displays. The interval between screen interchanges is approximately 3 seconds.

The first screen will display as follows:



Column #1	Battery no. (1 through 4)
Column #2	Battery remaining capacity in percentage (100%=full, 0%=empty)
Column #3	8 bar current contribution meter The bars represent the PERCENTAGE contribution of the channel versus a maximum possible of 10A for that channel
Column #4	Power outputs for 24V and 14V supplies simultaneously

The state of charge of each installed battery is shown in percentage.

When BLUESHAPE BV batteries are powering the unit, this value is very accurate and is read and updated in real time through the dialogue between the battery and the unit since they are using the same protocol. It therefore represents a true value of the remaining capacity.

When 3rd party batteries are in use, the capacity value may not be as accurate since this is an estimation that unit makes based on the battery voltage

The second screen will display as follows:

1	15. 45V	2. 65A	28V
2	15. 80V	2. 50A	123W
3	---	--	14V
4	16. 50V	0. 88A	90W

**1**

**2**

**3**

**4**

Column #1	Battery no. (1 through 4)
Column #2	Battery Voltage
Column #3	Current demand per battery
Column #4	Power outputs for 24V and 14V supplies simultaneously

**Notes:**

1. If an on-board battery is:

< 10% state-of-charge (for battery types that are communicative)

or

Its voltage is less than 13 Volts (for batteries that do not communicate

then,

**8** column 2 flash in the appropriate row of the battery in caption

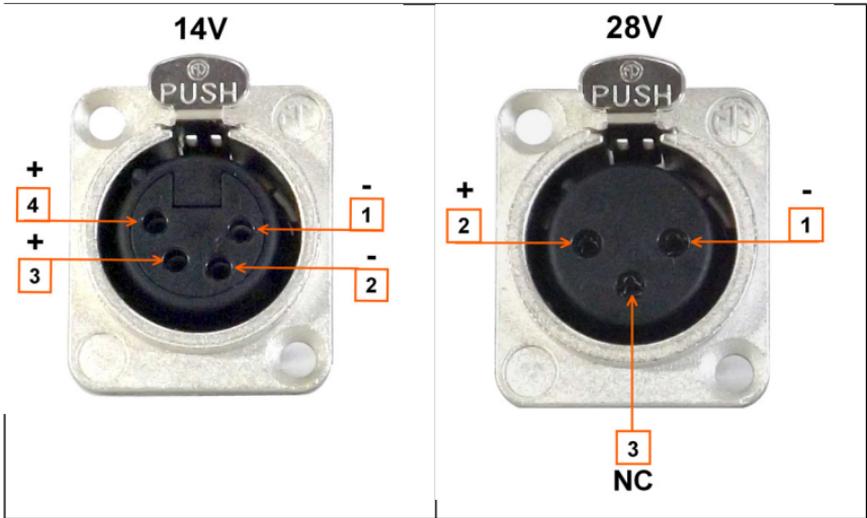
2. If a battery on any station is missing (not installed), the appropriate row will show blanks.

The above is applicable for both screen 1 and screen 2.

## Usage with BLUESHAPE BV batteries

PWS4 Recommendations							
BATTERY MODEL	Capacity (Wh)	Max. Discharge (A)	Recommended 1 = least 5 = most				
			1	2	3	4	5
BV065	65Wh	7A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
BV090	90Wh	7A		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
BV100HD	94Wh	12A				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BV100HD (SPLASH)	94Wh	12A				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BV150	150Wh	9A			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
BV180	180Wh	9A			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
BV190HD	190Wh	12A					<input checked="" type="checkbox"/>
BV190HD (SPLASH)	190Wh	12A					<input checked="" type="checkbox"/>
BV225	225Wh	9A				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BV270HD	270Wh	12A					<input checked="" type="checkbox"/>
BV270HD (SPLASH)	270Wh	12A					<input checked="" type="checkbox"/>

## XLR Polarity



### Accessories

A number of cable accessories are available for connecting the PWS4 with the most popular cameras on the market.

Examples:

PWC33: XLR 3 pole to XLR 3 pole

PWC34: XLR 3 pole to XLR 4 pole

PWC44: XLR 4 pole to XLR 4 pole

PWCAL: XLR 3 pole to Fisher 2 pole for ARRI® ALEXA

Please visit the BLUESHAPE website for more details:

[www.blueshape.net](http://www.blueshape.net)



PLEASE NOTE THAT THE MAXIMUM OUTPUT POSSIBILITY IS SHARED BETWEEN THE TWIN XLRs FOR EACH OUTPUT VOLTAGE

- The maximum power output for the 28V supply is 560W total
- The maximum power output for the 14V supply is 280W total

## Technical specifications:

Parameter	Value
Output Voltage #1	28V
Outlet	2 x 3pin female XLR (+/- 1% on no load)
Maximum output #1	560W (outputs from both 28V XLRs combined)
Output Voltage #2	14V (+/- 1% on no load)
Outlet	2 x 4pin female XLR
Maximum output #2	280W (outputs from both 14V XLRs combined)
Over current protection of outputs	Available on all outlets
Short circuit protection of outputs	Available on all outlets
Over temperature protection	Available
Display	20 column x 4 rows backlit white characters/ blue background
Number of battery positions (channels)	4 (1 to 4)
Position type	Hot-swappable on all 4 channels
Conversion efficiency of DC-DC converters	>= 92%
Operating temperature range	0°C - 60°C (32°F - 140°F)
Storage temperature range	-20°C - 65°C (-4°F - 149°F)
Dimensions (metric)	170 x 150 x 280 mm
Dimensions (Imperial)	6.4 x 5.9 x 11.0 inches
Weight (metric)	2.2Kg
Weight (Imperial)	4.86 lbs

CE certification is pending.

## **Warranty**

BLUESHAPE Power Stations are warranted to be free from defects in materials, workmanship and functionality for a period of 18 months commencing from the date of purchase.

This warranty shall not apply to any products or parts of, that have been subjected to misuse, negligence, accidental or abnormal conditions of operation.

The buyer should always contact the place of purchase for any return of defective product. It is important that the buyer provides us with as much information as possible about the failure being claimed.

In the event of product failure for which warranty applies, we will repair or replace the product free of charge. In these cases, all expenses including transport charges will be borne by us.

In the case where the failure has been caused by one of the causes explained above, repairs should be billed at a nominal cost. Prior to the carrying out of any repairs, we will inform the customer of the estimated costs of these repairs.

These warranty conditions are the only ones applicable to our products and overrule any other expressed or implied warranties. We shall not be held liable for any damages resulting from warranty statements other than those contained in this declaration. In all warranty claims, the buyer must reproduce the original purchase invoice.



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