USER MANUAL
Betapack 4

This product must be earthed
Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.
Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan
Apparatet må tilkoples jordet stikkontakt
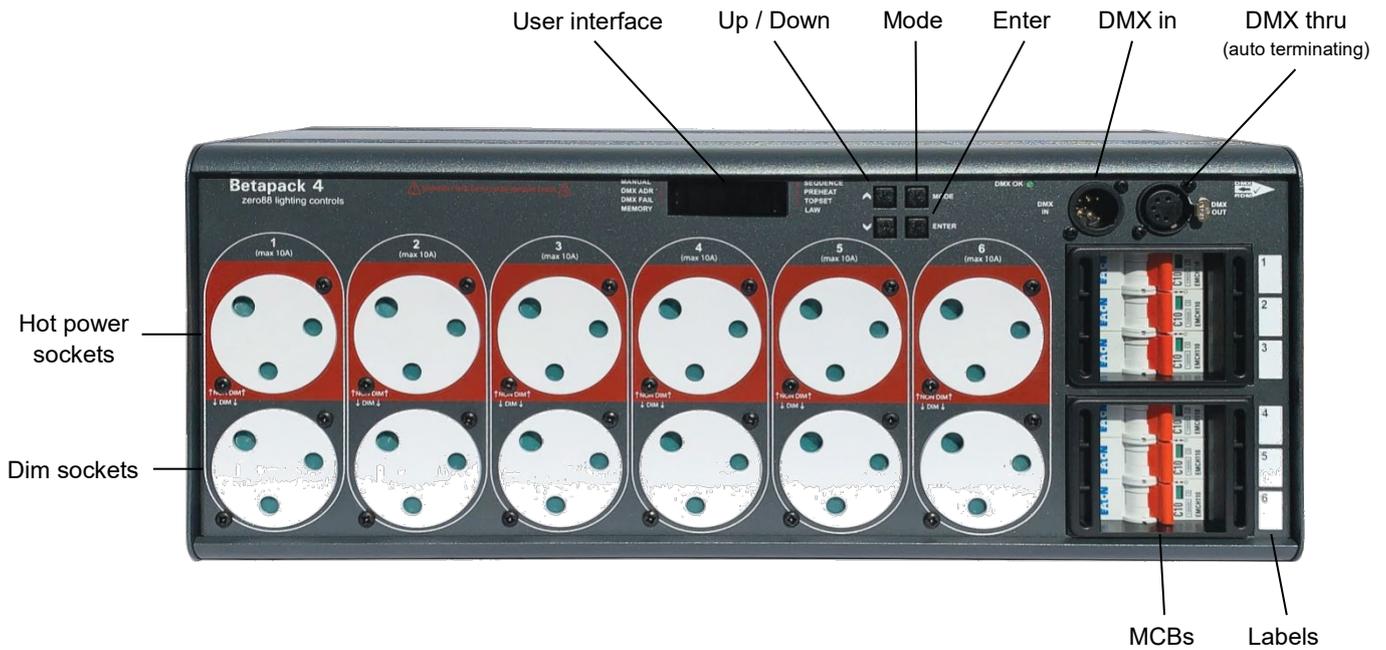Apparaten skall anslutas till jordat uttag

This equipment is designed for professional stage lighting control and is unsuitable for any other purpose. It should be used by, or under the supervision of, an appropriately qualified or trained person.

Contents

User interface   Up / Down   Mode   Enter   DMX in   DMX thru (auto terminating)

Hot power sockets

Dim sockets

MCBs   Labels

Introduction

Thank you!

Thank you for choosing Betapack 4 by Zero 88 to fulfil your lighting power needs. We sincerely hope that your new unit will bring you years of trouble free service. We make great efforts to build in reliability and serviceability at every stage of our development and production processes and include a three-year limited warranty - giving you peace of mind for your investment.

Our extensive dealer network can also provide you with technical service and sales support in your local language no matter where you are in the world. If you have any questions, comments or problems our contact details can be found at **zero88.com/support**

Once again, thank you for choosing Zero 88.

To remove the cover

<div style="border: 2px solid red; color: red; text-align: center;">

WARNING!
Do not remove the covers without first completely disconnecting Betapack 4 from the mains supply

</div>

Isolate and disconnect Betapack 4 from the mains supply.

The mains supply terminals (and output terminals on the hardwire version) are located under the top cover. To remove the top cover, remove the four screws "A" in Diagram 5 from the side plates.

The Triacs (type BTA40-600A/B) are located under the bottom cover. To remove the bottom cover, remove the four screws "B" in Diagram 5 from the side plates.
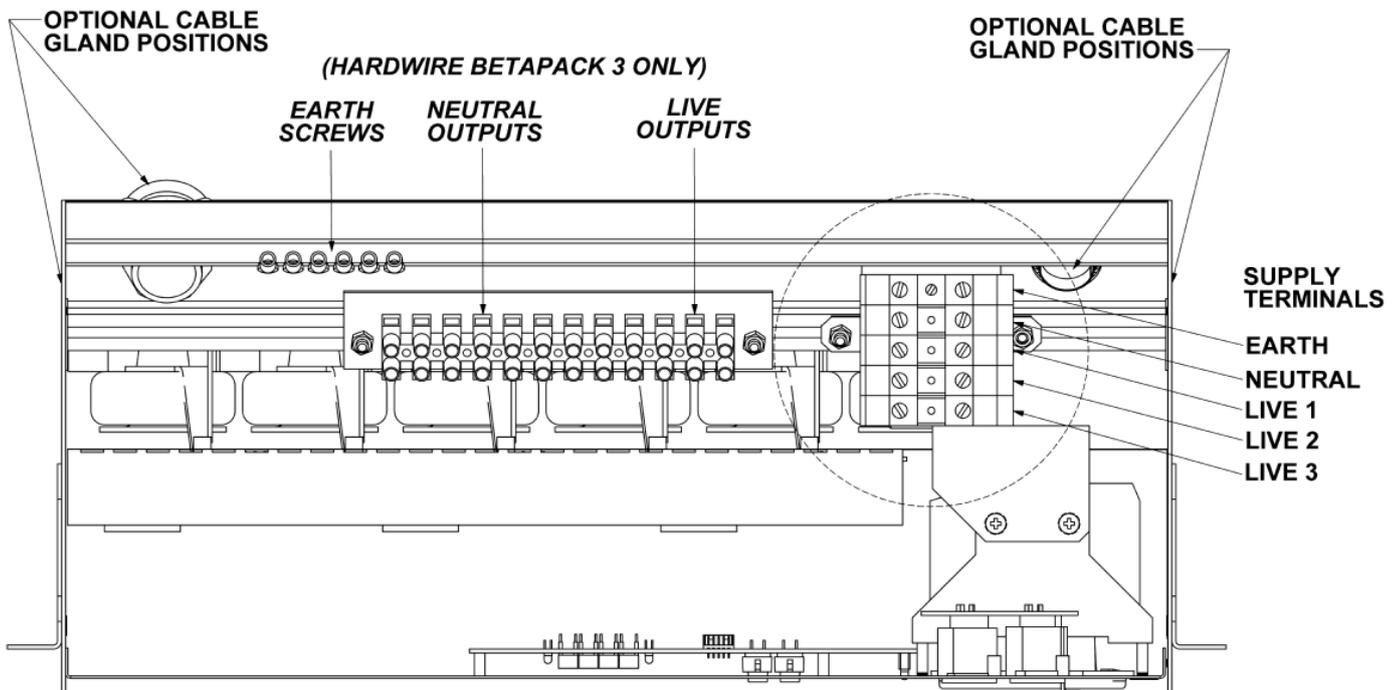
.

Diagram 1

Connecting the mains

✓ A separate isolator and secure mains earth connection are required.

✓ Phase to Neutral voltage must not exceed 255VAC.

✓ All wiring entering Betapack 4 must be rated to +85°C, H07RN-F cable is recommended.

✓ Cut outs are provided on the ends and rear for PG21 glands; one is supplied.

✓ Supply terminals will accept wire sizes between 1.5mm^2 and 16mm^2. Tightening torque is between 1.2Nm and 2.4Nm.

✓ Hardwire Live/Neutral output terminals will accept wire sizes up to 6mm^2.

✓ Hardwire Earth output ring-tags (blue crimp) will accept wire sizes between 1.0mm^2 and 2.5mm^2. These may be replaced if larger diameter wiring is installed.

Three phase

Betapack 4 is supplied configured for three-phase star operation as shown in Diagram 2:
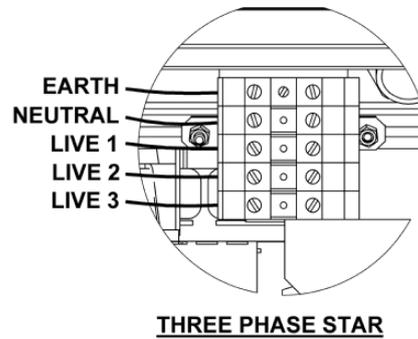
THREE PHASE STAR

Diagram 2

Single phase

For single-phase operation, fit the supplied linking bar between the L1, L2 and L3 terminals as shown in Diagram 3:
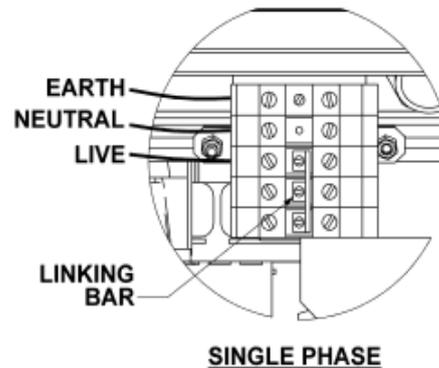

SINGLE PHASE

Diagram 3

Three phase delta

For three-phase delta operation, the 6 neutral wires must be removed from the terminal block, and the crimped ferrules must be cut off. Strip the ends of these 6 wires, and reconnect as shown in Diagram 4:
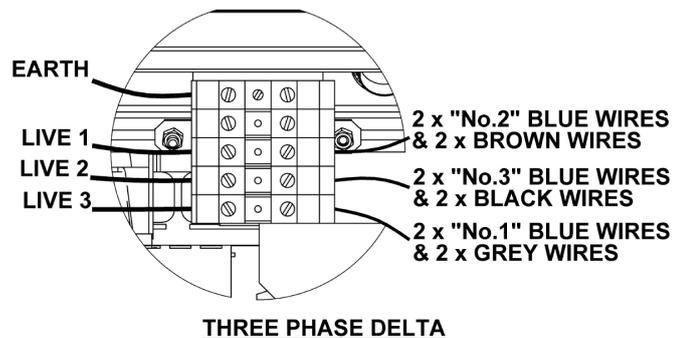

THREE PHASE DELTA

Diagram 4

Mounting / Installation

<div style="border:1px solid red">

WARNING!
Betapack 4 is designed for indoor use only.

</div>

In a 19" Rack

Betapack 4 is supplied with side brackets fitted for rack mounting.

On a wall

Undo the four screws 'X' to remove the brackets, replace the screws in the holes for future use. Stand Betapack 4 on one end. Remove the two screws 'Y' (see Diagram 5), fit the brackets as shown and replace screws 'Y'. Fit the other bracket on the other end.

The wall drilling positions are shown in Diagram 6. WARNING Completely fit one bracket at a time. Removal of all four screws 'Y' at the same time can allow the heatsink assembly to fall out! Allow a minimum vertical spacing of 130mm between packs, and between packs and other equipment. A spacing of 180mm is recommended for ease of wiring and servicing.

For Portable Use

The 'Easicarry' Kit, consisting of a handle and four feet, is included with Betapack 4. To fit, remove the brackets. Fit the handle using the screws supplied and holes 'Z'. Fit the four feet to the other end using the holes 'X' and 'Y'. See Diagram 5.

Ventilation

Betapack 4 is convection cooled with air flowing over the rear mounted heatsink.

<div style="border:1px solid red">

When one or more Betapack 4 units are mounted in an enclosed rack, a fan MUST be fitted to ensure that adequate cool air is circulated. Up to three Betapack 4s may be stacked in free air.
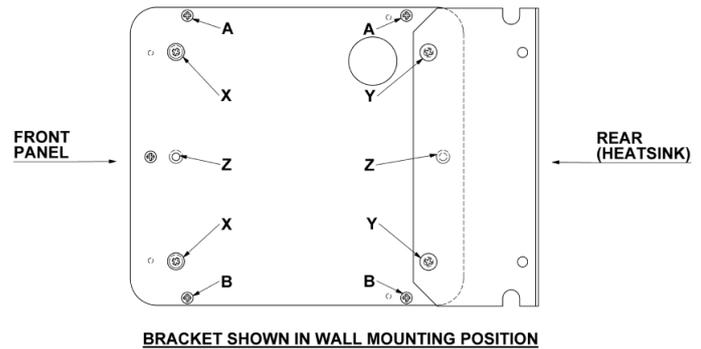
</div>
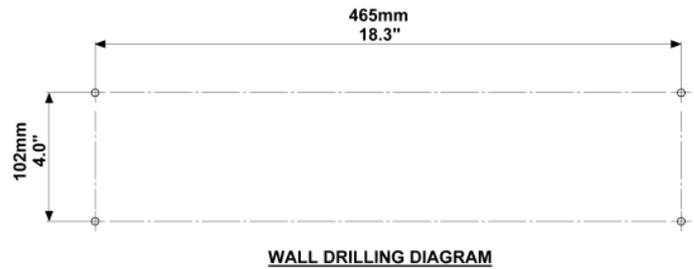

BRACKET SHOWN IN WALL MOUNTING POSITION

Diagram 5

WALL DRILLING DIAGRAM

Diagram 6

Configuration & settings

> **WARNING!**
> Configuration & settings affect the "Dim" sockets only. The "hot power" sockets will be unaffected by these settings.

Introduction

Betapack 4 distributes both dimming and "hot power" to a mixed rig of both tungsten and LED fixtures. Each of the six channels are capable of driving up to 10Amp loads.

Betapack 4 features MCBs as standard. When dimming, there are preheat, topset and 3 laws per channel, 12 memories, 3 99-step sequences, local control and DMX patch per channel.

An isolated DMX512-A input and loop-through allow for remote operation. When the loop-through plug is not inserted, the DMX line is automatically terminated.

The DMX control port supports RDM (Remote Device Management) functionality.

Control interface

The main display consists of four seven-segment displays; the data displayed is dependent on the set-up mode of Betapack 4. Around the outside of these displays are eight red LEDs which indicate the current set-up mode of Betapack 4. An additional green LED is used for DMX indication.

Betapack 4 has a default mode for operation. In this mode none of the set-up mode LEDs will be lit, and the main display will show the DMX address(es).

Mode button

The Mode button is used to cycle through the different set-up modes. They are;

- Manual control
- DMX address
- DMX fail
- Memory
- Sequence
- Preheat
- Topset
- Law

Enter button

The Enter button is used to confirm actions.

Up & Down Buttons

These are used to adjust the values shown in the main display. Pressing both buttons together will reset the display to the default values.

Default mode

If a block patch has been set (see 'DMX Address' below), then the display will show the DMX start address of the block.

If individual DMX addresses have been set for each channel, then the 'Up & Down' Arrows can be used to select which DMX address to display, or alternatively if 'Auto' is selected, then the display will cycle through all six DMX addresses. In either case, the DMX address is prefixed by the channel number.

Holding down the 'Enter' button in default mode will change the display to 'Out', and the top 6 setup LEDs (numbered) will change to displaying an indication of the current output levels. Each LED will be lit if the current output level for that channel is greater than 20%.

Channel test

While keeping the 'Enter' button held down in Default Mode, use the 'Up & Down' Arrows to set a level of 100% on a single channel. Release the 'Enter' button to remove this level.

Setup modes

Manual control

The Manual Control Mode allows you to set-up a look on Betapack 4 without using an external controller.

Select 'Manual' mode using the 'Mode' button. The display will show C.LLL, where C is the channel number and LLL is the level. Select the channel you require or 'A' for all channels, using the 'Up & Down' Arrows and press 'Enter'. Now set the level you require using the 'Up & Down' Arrows and press 'Enter' again to confirm and move back to the channel selection.

The Manual Control levels are reset to zero if power to Betapack 4 is lost.

DMX Address

There are 2 ways that Betapack 4 can be patched – a single DMX start address can be set for the block of 6 channels (block patch), or each channel can be given a different DMX start address.

For block patch, the range of DMX start addresses is 001 – 507. For individual patch, the range of DMX start addresses is 001 – 512

Select 'DMX ADR' using the 'Mode' button, the display will show C.AAA, where C is the channel number and AAA is the current DMX address for that channel. Select the channel you require (1-6), or 'A' for all channels (block patch), using the 'Up & Down' Arrows and press 'Enter'. Now set the address you require using the 'Up & Down' Arrows and press 'Enter' again to confirm and move back to the channel selection.

DMX Fail

There are four DMX fail modes available – 'hold DMX', 'fade to black', 'fade to memory' and 'fade to sequence'.

Select 'DMX Fail' using the 'Mode' button. Using the 'Up & Down' Arrows select your preferred choice from the list below;

Fail Mode	Main Display
Hold Last State	Hold
Fade to Zero	F 00
Fade to Memory 1 - 12	F 01 – F 12
Fade to Sequence 1 - 3	S 01 – S 03

If there is no DMX present, the selected memory/sequence will be re-called immediately.

Memories

Betapack 4 will store 12 memories for standalone operation, these can only be re-called if there is no DMX present.

1. Set-up the scene using the 'Manual' control function or a DMX controller.
2. Select 'Memory' using the 'Mode' button.

Using the 'Up & Down' Arrows select the required memory number and press the 'Enter' button to confirm. A 'p' should appear next to the memory to signify that it has been programmed.

Holding both the 'Up & Down' Arrows for 1 second will clear the selected memory. If these buttons are held for 5 seconds, ALL memories will be cleared.

If memories are cleared which are used in sequences, they will be removed automatically from those sequences.

Sequences

Betapack 4 will store 3 sequences of up to 99-steps each. Each step is a link to one of the 12 programmed memories. Sequences can only be replayed if there is no DMX present.

Each sequence can have a fade time (0-60s) and dwell time (1-60s) programmed. It is only possible to add steps to or remove steps from the end of a sequence.

1. Program the required looks using the 'Memories' function (see above).
2. Select 'Sequence' using the 'Mode' button.
3. Use the 'Up & Down' Arrows to select the required sequence (the number of steps already programmed in each sequence is shown after the sequence number on the display) and press the 'Enter' button to confirm.
4. The display will now change to show the current step number, followed by the memory currently programmed in that step. Use the 'Up & Down' Arrows to select the required step number (or Fade time 'F' or dwell time 'd') and press the 'Enter' button to confirm.
5.
   a. **For steps:** If there is no DMX present, the selected memory will be immediately re-called. Use the 'Up & Down' Arrows to select the memory for that step and press the 'Enter' button to confirm. Only programmed memories may be selected. If the step is at the end of the sequence, then the step number will automatically increment, and further steps may now be programmed in the same way. Otherwise the display will return to step number selection mode.
   b. **For fade and dwell times**: If there is no DMX present, the sequence will now run. Use the 'Up & Down' Arrows to change the time and press the 'Enter' button to confirm.

When done, or to return to sequence selection mode (step 3 above) at any point, press and hold the 'Enter' button for 1s.

At step 3 above, holding both the 'Up & Down' Arrows for 1 second will clear the selected sequence. If these buttons are held for 5 seconds, ALL sequences will be cleared.

At step 5 above, if the selected step is at the end of the sequence, holding both the 'Up & Down' Arrows will clear the selected step.

Preheat

Preheat can be selected on a per channel or all channel basis. The preheat level is 5% and cannot be adjusted.

Select 'Preheat' by cycling through the modes using the 'Mode' button.

Select required channel or 'A' for all channels, using the 'Up & Down' Arrows and press 'Enter', to confirm.

Now select on/off using the 'Up & Down' Arrows. Press 'Enter' to confirm and return to the channel selection.

Note that Preheat is only applied if there is a DMX input present, and the law is not set to 'Switch'.

Topset

Topset can be selected on a per channel or all channel basis. On Betapack 4, Topset is applied as a limiting (not scaling) value.

Select 'Topset' by cycling through the modes using the 'Mode' button.

Select required channel or 'A' for all channels, using the 'Up & Down' Arrows and press 'Enter', to confirm.

Now select the topset level you require, again using the 'Up & Down' Arrows and press 'Enter' to confirm and return to the channel selection.

Note that if the law is set to 'Switch', the setting in Topset will instead be used to determine the switchpoint. The 'Topset' LED will flash in this case, to indicate the setting being made.

Dimmer laws

Three dimmer laws are available, which can be selected per channel.

Select 'Law' mode using the 'Mode' button. Using the 'Up & Down' Arrows select the channel required, or 'A' for all channels. Press 'Enter' to confirm. Now select the law you require, again using the 'Up & Down' Arrows and press 'Enter' to confirm and return to the channel selection.

Output Law	Main Display
Normal	n
Switch	S
Linear	L

Note that if the law is set to Switch, the switchpoint can be set in the 'Topset' menu.

Super user

Betapack 4 has a number of hidden functions, located in the Super User Menu. The super user menus can only be accessed from the Default mode (no LEDs lit). To enter Super User press and hold the 'Up & Down' Arrows together and press and hold the 'Mode' button for 5 seconds. All the mode LEDs will flash to indicate Betapack 4 is in super user mode.

The 'Up & Down' Arrows are used to cycle through the various super user functions. Pressing the 'Mode' button at any point will revert to normal operation. If no buttons are pressed after 20 seconds the unit will automatically revert to normal operation.

Lock/Unlock

Press the 'Up & Down' Arrows until the display shows "LOC". Press 'Enter' to confirm this action. Betapack 4 will revert to the Default mode. Pressing the 'Mode' button now will only cycle between Manual Control and Default Mode.

If Super User is entered when Betapack 4 is locked, only the unlock function will be available. The display will show "UNL". To unlock Betapack 4, press and hold the 'Enter' button for 5 seconds. Betapack 4 will unlock and exit super user returning to the Default mode.

Resetting Betapack 4

Press the 'Up & Down' Arrows until the display shows "rset". Press 'Enter' to confirm. The display will flash briefly to confirm this action. Betapack 4 will be reset to its default settings, shown in the table below:

Set Up Parameter	State
Manual Control Levels	All Off
DMX Addresses	Block patch at 001
DMX Fail Mode	Hold Last State
Memory	All Memories Cleared
Sequence	All Sequences Cleared
Preheat	Off (0%) for all channels
Topset	100% for all channels
Law	Normal law for all channels
Switch law switch point	50% for all channels
RDM	Enabled

Firmware Version

To identify which version of firmware is loaded in Betapack 4, press the 'Up & Down' Arrows until the firmware version is shown in the display (e.g. 02.00) Press and hold the 'Enter' button for 1s, and Betapack 4's CPU serial number will be displayed. Press the 'Enter' button again to return to the version display. Note that the firmware version will also be shown briefly on start up.

Internal Temperature

Press the 'Up & Down' Arrows until the temperature is shown in the display, shown as xxxC, where xxx is the temperature in Centigrade. The 'Enter' button has no function in this mode.

RDM Enable/Disable

To enable or disable RDM (Remote Device Management) functionality on the DMX control port, press the 'Up & Down' Arrows until "ron" or "rof" is displayed. The 'Enter' button toggles this setting between "ron" (RDM enable) and" rof" (RDM disabled).

Electrical

<table>
<tr><td>**WARNING!**
Do not remove the covers without first completely disconnecting Betapack 4 from the mains supply</td></tr>
</table>

Betapack 4 is designed to operate on 230VAC +10% - 15% at 50-60Hz (auto sensing). The pack may not operate satisfactorily outside this specification.

The packs may be wired:

- Single Phase: 60A 1 phase 2-wire 230V
  (255V max phase to neutral)
  Earth leakage less than 1mA

- Three Phase Star: 20A 4-wire 230/380V
  (255V max phase to neutral)
  Earth leakage less than 1mA

- Three Phase Delta: 30A 3-wire 230V
  (255V max phase to phase)
  Earth leakage less than 4mA

✓ Max total load: 13.9kW @ 230V
✓ Load per channel: 0.1A Min; 10A Max
✓ No load consumption: 10W
✓ Rise Time: 80uS
✓ Triac Type: BTA40-600A/B

If used in conjunction with MCBs, to avoid nuisance tripping use high inrush current (Type K) MCBs.

The "dim" sockets allow for lighting loads which are resistive or inductive, including tungsten, transformer driven low voltage (e.g. pinspots), and quartz halogen. Electronic transformers plugged into the "dim" socket must be suitable for leading edge dimming.

Portable Appliance Testing

<table>
<tr><td>**WARNING!**
Betapack 4 will fail the portable appliance high voltage test as it has capacitors connected between Live 1/2/3 and Earth, and between Neutral and Earth, to enable it to comply with CE regulations.</td></tr>
</table>

DMX Connections

Conforms to USITT DMX512-A (isolated).

One male and one female 5 pin XLR connector. DMX line is automatically terminated when the loop-through plug is not inserted. The pin assignment is:

Pin 1   0V
Pin 2   DMX- (RS485 B line)
Pin 3   DMX+ (RS485 A line)
Pin 4   Reserved
Pin 5   Reserved

DMX indication

Status	Description
On	DMX data (start byte of 00) being received OK.
Flash Fast	Data being received, but not DMX data (start byte of 00)
Flash Slow	DMX data errors occurring.
Off	No DMX data being received.

RDM support

Protocol Version	1.0
Device Model ID	307 (0x0133)
Supported Parameters	DMX_START_ADDRESS, SENSOR_DEFINITION, SENSOR_VALUE, DEVICE_LABEL, MANUFACTURER_LABEL, DEVICE_MODEL_DESCRIPTION
Sub Devices	6 (one per channel)

Mechanical

- Height: 175mm
- Width: 440mm
- Depth: 195mm
- Weight: 8.0kg (17.6lb)
- IP Rating: IP2X (indoor use only)

Cooling

Ambient Temperature: +5ºC to +40ºC.

Relative Humidity: 5% to 95% non-condensing.

Betapack 4 is convection cooled and includes a temperature sensor which monitors the internal temperature. If the temperature rises above the normal operating level the outputs are first reduced, then switched off altogether until the temperature falls back to a safe level.

The table below shows how Betapack 4 will react under these conditions. (Note: The temperature shown on the display will be the actual temperature not the rounded figures given below).

Temperature	Output Levels (% of control)	Main display
<75ºC	100%	normal
75ºC→80ºC	100%	"075c"
80ºC→85ºC	80%	"080c"
85ºC→90ºC	60%	"085c"
90ºC→95ºC	40%	"090c"
>95ºC	0%	"hot"
sensor fault	100%	"err"

Compliance & Standards

Betapack 4 complies with the following standards:

EN 55015:2013 + A1:2015
Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

EN 61547:2009
Equipment for general lighting purposes - EMC Immunity requirements

EN 61439-1:2011
Low-voltage switchgear and controlgear assemblies.
Part 1: General Rules

EN 61439-2:2011
Low-voltage switchgear and controlgear assemblies.
Part 2: Power switchgear and controlgear assemblies

EN 50581:2012
Assessment of products with respect to RoHS II

Troubleshooting

If you are experiencing problems with Betapack 4, please check the list below for common causes and solutions.

<div style="border: 2px solid red; color: red; text-align: center; padding: 10px;">

WARNING!
These checks should ONLY be carried out by a qualified electrician

</div>

If you are unsure how to make any of the checks, please contact Zero 88 technical support for advice or assistance.

Symptoms	Solutions
Betapack 4 does not power up when power is applied.	1. Check there is a mains voltage on the incoming supply terminal. 2. Check the incoming supply terminals are all adequately tightened. 3. Check the link cable between the control PCB on the front panel and the power PCB has not been disconnected or damaged.
Betapack 4 is powering up but some or all of the channels are either not working or will not go to full output.	1. Check the channel breakers are in the 'on' position. 2. Check the channels have not had a Topset applied to them. Please see "Topset" for further details. 3. If Betapack 4 is wired single phase check that the single-phase link bar has been fitted. If it is fitted check the screws are adequately tightened. Please see "diagram 3" for further details.
Channels will switch on and off but are not able to be dimmed.	1. The channel law has been set to switch. Please see "Dimmer Laws" for further information.
The display is outputting a sequence of numbers after the Betapack 4 has been powered up.	1. Channels have been soft patched. 2. Please see "DMX Address" for further details.
Unable to access any of the Betapack 4 functions.	1. Betapack 4 has been locked. 2. Please see "Lock/Unlock" for further details.
Channel is remaining on all the time, even after disconnecting the controller and power cycling the Betapack 4.	1. Triac has failed. Please contact your local service centre or contact Zero 88 technical support for further information

Reporting a problem

Support requests can be submitted through our support forum at **zero88.com/forum** or via email to support@zero88.com

For more urgent requests, please contact Zero 88 by telephone on +44 (0)1633 838088 – 24 hour answer service available.

If you have reported a problem by email or on the forum, please bear with us as our response may take a few days if your problem is complex. It is also worth checking other posts on the forum to see if the fault is already reported / fixed before contacting Zero 88.