

HP6

HP12

OPERATING

MANUAL

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1.0 Introduction

The JANDS HP12 is a high quality, rugged 12 channel, 2.4kVA per channel (10A/240V) dimmer rack specifically designed for demanding touring and theatre applications. Complementing the HP12 is the HP6, a six channel 6kVA per channel (25A/240V) dimmer rack.

The HP Series of dimmer racks feature microprocessor-based digital control. A keypad, rotary encoder, channel switches, LED indicators and a large alphanumeric display enable the user to monitor and select the numerous built-in functions available on the HP12 and HP6.

The user has the ability to select the DMX start number either by channel number or in banks of 12 channels, test selected channels while the remainder of the dimmer stays “on line”, select output voltage (ie: 110V) or ramp curves for designated channels, capture up to three non-volatile DMX “snapshots”, build two user-definable non-volatile scenes with the ability to import/select/set individual channel levels, and to select from six “factory” built-in scenes including chases/random/crossfades. Other functions also provided include dimmer “soft” start, channel by channel preheat function, the ability to monitor the status of the dimmer rack in relation to supply voltage, a bad (soft) neutral connection, over-temperature and other working parameters of the unit.

The dimmer rack will “wake-up” in the mode it was last programmed to run, an ideal function for stand alone applications. If no particular mode has been previously defined, the dimmer rack looks for DMX control. If the rack loses DMX control at any time while running, it defaults to the last received DMX command.

HP dimmers feature JANDS’ FerroDip™ chokes. These chokes provide a risetime in excess of 280 microseconds along with excellent rejection of high frequencies well into the MHz region, a feature lacking in conventional gapped iron-core chokes. This order of noise suppression is particularly important with the increasing number of radio microphones used in today’s productions.

The HP range of dimmers has been designed to allow for future optional upgrades to the operating system.

Control signal to the dimmers is via a standard DMX-512 front panel socket, while the dimmed outlets and three phase power entry are located on the rear panel.

Some other key features of the HP Series dimmers include:

- Circuit breaker protection of output devices
- Factory-wired and tested three phase tail and connector (export versions may vary)
- Front panel indication of three phase supply
- Low profile 3RU chassis with rack mounting front and rear
- Mains filters eliminate interference from tone-injection signals
- Selectable missing or failed neutral detection and shut-down
- Temperature-controlled cooling fan
- Temperature monitor and thermal cut-out if internal temperature exceeds 85°C
- DMX address selection by Channel or Bank
- Output voltage selection (110 or 240 volt) on a channel-by-channel basis

- Dimming curve selectable between “linear power” and “switched output” on a channel-by-channel basis
- Channel level test from zero to full
- LED mimic of channel status, control and output
- Selectable lamp preheat function for extended lamp life and to avoid circuit breaker nuisance tripping
- Preset “Snap”, “Scene” and “Chase” settings to facilitate setup and stand-alone dimming applications

2.0 Equipment Description

2.1 Front panel layout

Figure 2.1

1. Channel output circuit breakers: The circuit breakers are rated at 10 amps continuous for the HP12, and 25 amps continuous for the HP6. These breakers may trip when a channel is fully loaded and there is a sudden inrush current to cold lamp filaments, eg. when a Flash button is pressed on the control desk. If this nuisance tripping occurs, enable the Preheat option (see section 4.1.4.5). See also section 5.6 for a full explanation of nuisance tripping.

2. Display: A red four digit alpha-numeric display is used to show dimmer status and option menus.

3. LEVEL/FUNCTION encoder wheel: This detent action control knob is used to select items from the menus, and to select the channel levels or chase rate (depending on the operating mode).

4. DMX IN/LOOP connectors: A standard five pin AXR connector inputs control desk DMX-512 signals and outputs them to other dimmers via the Loop connector. See section 8.2 for wiring details.

5. DMX IN LED: A green LED indicates the presence of DMX signals.

6. Keypad: These switches are used to select different options and operating modes. A red LED is associated with each switch to indicate activation of selected function.

7. PHASE LEDs: Three green LEDs (one for each phase) indicate that the three phase mains supply is available.

8. Channel SELECT switch: These select or deselect options for each channel, or switch a channel between “on-line” and “off-line”. If a channel is “off-line”, it will not respond to the DMX input signals.

9. Channel STATUS LED: A bi-colour LED indicates channel status, ie.

Red	=	channel set for 110V output
Green	=	channel set for 240V output
Off	=	channel disabled
Orange	=	voltage change selected but not yet confirmed
Flashing	=	channel selected for changes to be made

10. DRIVE LED: This green LED indicates a control signal is being applied to that channel.

11. LOAD LED: This red LED serves two functions. In normal operation, it acts as an output mimic. When the channel drive is at zero, it indicates whether that channel's load is disconnected (or open-circuit).

To check a load, set the channel drive to zero. The **LOAD LED** will turn ON if there is no load.

For levels above zero, the **LOAD LED** will mimic the channel output whenever a load is connected.

Note that the channel circuit breaker must be ON for the **LOAD LED** circuitry to work.

BREAKER	LOAD	CHANNEL DRIVE	LOAD LED STATUS
on	not connected	off	ON
on	connected	on	OUTPUT MIMIC
off	doesn't matter	doesn't matter	OFF

3.0 Getting Started

In this manual references to individual front panel controls and LEDs will be in uppercase bold text, eg. **MODE**, while references to display messages will be in quotation marks, eg. “**OK**”.

3.1 Connecting power

The HP Series dimmers are supplied with a two metre power cable fitted with a Clipsal three phase plug - a 56P532 32 amp plug for the HP12 and a 56P550 50 amp plug for the HP6 (export models may differ from this configuration).

The plug should be connected to an appropriately rated socket and the retaining lock ring (if present) screwed home.

WARNING

DAMAGE TO THE PLUG MAY OCCUR IF THE RETAINING LOCK IS NOT PROPERLY SECURED.

Turn on the power and check that the three **PHASE** indicator LEDs and the alpha-numeric display on the front panel are on before connecting any loads. If the **PHASE** LEDs or the display indicate a fault condition, power down and remedy the fault before trying again. See section 5.5 regarding phase faults.

After initialisation, the display will scroll a message “**DMX START CHANNEL xxx**”, where xxx is the last programmed DMX Start Channel (between 1 and 512). After this the display will show “**OK**” to indicate the dimmer is now in normal operating mode.

If all is well, power down and connect loads before re-powering.

3.2 Connecting loads

The HP12 output options are:

- Twelve Clipsal 415P 10 amp three pin sockets
- Two 19 pin Socapex sockets
- Four 19 pin Socapex sockets (series-wired)
- Three 10 pin Wieland sockets
- DIN-rail mounted terminal blocks

Export models may differ from these configurations.

The HP6 output options are:

- Twelve Clipsal 20MLB 20 amp three pin sockets
- DIN-rail mounted terminal blocks

Export models may differ from these configurations.

See section 8.1 for details of pin connections.

3.3 Connecting DMX-512 input

The dimmer input signal should conform to the USITT DMX-512 (1990) specification. The DMX input connects to the DMX IN socket on the front panel. The DMX signal may be daisy-chained to the next dimmer via the **LOOP** socket. The green **DMX IN** LED indicates the presence of DMX signals. See section 8.2 for connector wiring details.

Note

To ensure reliable DMX operation, the last dimmer in the chain should be fitted with a terminating plug in the Loop socket. The terminating plug is a 5-pin XLR connector with a 120 ohm resistor soldered between pins 2 and 3 as shown in Figure 3.1 below.

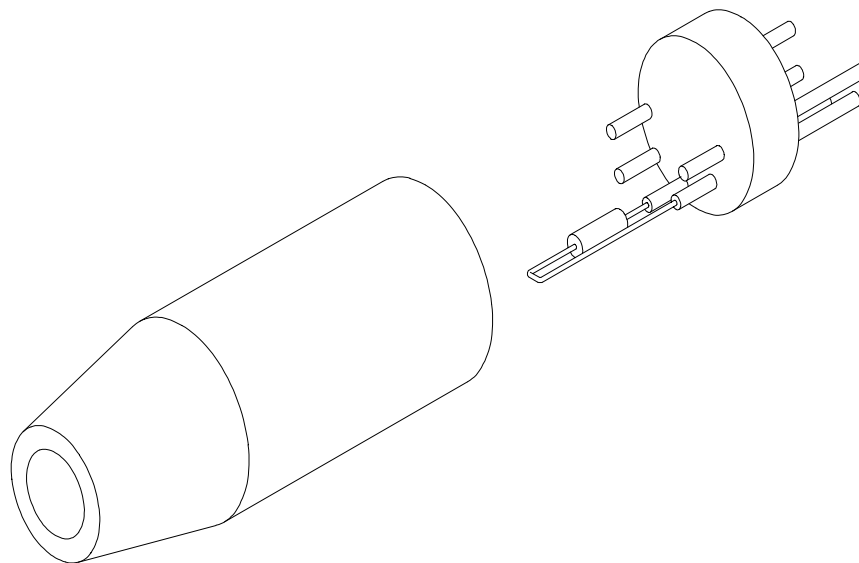


Figure 3.1 DMX terminating plug with 120 ohm resistor between pins 2 and 3

3.4 Power-up sequence

When powering up, the following sequence should be used:

1. Power up the control desk.
2. Power up any softpatches and/or DMX receivers.
3. Power up the dimmers last, preferably one at a time starting from the first dimmer rack in the DMX loop.

This procedure minimises the risk of producing the lighting equivalent of an audio “thump” and prevents damage to lamps, dimmers, and other controlled devices.

Use the reverse procedure when powering down.

4.0 Dimmer Operation

This section assumes the dimmer has been correctly connected to three phase power and a source of DMX input signals as described in section 3.0.

4.1 Menu structure

The HP Series dimmers feature a “tree” menu structure. This means that an option is chosen from the display with the **LEVEL/FUNCTION** encoder wheel, and the **ENTER** keypad button is then pressed to confirm the selection.

The encoder wheel is then used to select the next level of options, the **ENTER** button is pressed to confirm the selection, and so on.

After all the options have been selected, the display reverts to “**OK**” to indicate the dimmer is now back in normal operating mode.

Whenever an option is available for selection, it will flash on the display.

4.1.1 ENTER

The **ENTER** keypad button is always pressed to confirm a menu or channel selection.

4.1.2 NORMAL

The **NORMAL** keypad button cancels the current menu selection and allows the operator to start again in the event of an error. The display shows “**OK**” and the dimmer is ready to receive DMX control signals.

4.1.3 CLEAR

The **CLEAR** keypad button is used to go back one menu level if an option is incorrectly selected.

4.1.4 MODE menu

Figure 4.1

Select the **MODE** button on the keypad. The display will then “flash” showing one of the **MODE** options, which are:

- “**VOLT**” - output voltage selection
- “**TEMP**” - heatsink temperature monitor
- “**VERS**” - software version
- “**LAW**” - dimmer law
- “**PREH**” - filament preheat
- “**N. DET**” - bad neutral detection

To select an option, rotate the **FUNCTION** encoder wheel until the desired option is displayed, then press the **ENTER** keypad button to confirm the selection.

4.1.4.1 “VOLT” - Voltage selection

Figure 4.1

Any or all of the dimmer channels may be customised to give either 110 volt or 240 volt output. This feature is useful for controlling individual 110 volt loads, such as PAR 64 (110) lamps, Leko (FEL) or other 110 volt lamps.

- Once the **VOLT** option has been selected, use the **FUNCTION** encoder wheel to select either “**240V**” or “**110V**” and press **ENTER**.
- If “**240V**” is selected, the display will stop flashing and will scroll the following message: “**SELECT CHANS FOR 240V. STATUS LED RED IS 110V**”.
- If “**110V**” is selected, the display will stop flashing and will scroll the following message: “**SELECT CHANS FOR 110V. STATUS LED GREEN IS 240V**”.
- Press the **SELECT** button on the channel to be changed. The **STATUS LED** of the channel(s) selected will change colour to orange.
- Once all the required channels are selected, press **ENTER** to make the changes. The channel **STATUS LED(s)** will show green for those channel(s) set to 240 volt output, and red for those channel(s) set to 110 volt output.
- The display will then show “**OK**” to indicate the dimmer is now in normal operating mode with the selected changes implemented.

CAUTION

SELECTING A 110 VOLT LAMP TO 240 VOLT OPERATION WILL CAUSE SERIOUS DAMAGE TO A LAMP!

4.1.4.2 “TEMP” - Temperature monitor

Figure 4.1


The internal heatsink temperature may be monitored by selecting “**TEMP**”. The display shows the temperature in degrees Celsius, eg “**24°C**”. Normal DMX operation of the dimmer is unaffected by selecting this function. Pressing the **NORMAL** button on the keypad will clear the display to “**OK**”.

If the heatsink temperature rises above 65°C, the display will automatically show the current temperature as a warning that the dimmer is becoming hot.

Note

The HP Series dimmers are designed to be installed in standard 19-inch wide racks. These racks should have adequate ventilation allowing for the side-to-side airflow of the dimmers. Fully enclosed racks that obstruct side-to-side ventilation may cause overheating problems.

4.1.4.3 “VERS” - Software version


 Figure 4.1

Selecting “**VERS**” displays the current software version. The version number will scroll across the display. eg. “**V1.1E/01 07-JUL-95**”.

Pressing the **NORMAL** button on the keypad will change the display to “**OK**” to indicate the dimmer is now in normal operating mode.

Normal DMX operation of the dimmer is unaffected by selecting this function.

4.1.4.4 “LAW” - Dimmer law


 Figure 4.1

Selecting “**LAW**” gives the option of either a linear power curve - “**Lin P**” - or a switch curve - “**Swch**”. The linear power curve gives even fade characteristics for lamps, while the switch curve may be used for switching other devices (eg. fans, strobes, motors, etc) on or off, with the switching points set at 55% for upfades and 45% for downfades.

- Use the **FUNCTION** encoder wheel to change the law, and press **ENTER** to select.
- Next press the channel **SELECT** buttons to select the channels to be changed. The channel **STATUS** LEDs will flash. Press **ENTER** to make the changes.
- The display will change to “**OK**” to indicate the dimmer is now in normal operating mode with the selected changes implemented.

Normal DMX operation of the dimmer is unaffected by selecting this function.

4.1.4.5 “PREH” - Filament preheat

 Figure 4.1

If a channel is fully loaded, there is a possibility that cold filament inrush current may cause nuisance tripping of the circuit breakers. If this is a problem, the preheat - “**PREH**” - option may be used to increase the filament resistance. When preheated, the filaments may show a barely perceptible dull orange glow.

Preheat has no effect when the lamp is being driven above the preheat level. See section 5.6 for an explanation of cold filament inrush current.

- Selecting “**PREH**” gives the options of “**ON**” or “**OFF**”. Use the **FUNCTION** encoder wheel to choose the option and press **ENTER** to confirm selection.
- Press the channel **SELECT** button(s) to select preheat for the desired channel(s).
- The channel **STATUS** LED(s) will “flash” when that channel is selected. Press **ENTER** to make the change(s).
- The display will change to “**OK**” to indicate the dimmer is now in normal operating mode with the selected change implemented.

Normal DMX operation of the dimmer is unaffected by selecting this function.

4.1.4.6 “N. DET” - Bad neutral detect

Figure 4.1

The HP Series dimmers will detect voltage problems such as phase load imbalance and a poor or missing neutral connection. A poor (resistive) neutral connection can cause arcing and overheating of the connector and also allows the phase-to-neutral voltages to vary, causing overvoltage damage to components. Section 5.1.3 gives a more in-depth explanation of this facility.

In some venues the three phase power supply may be less than ideal, with considerable differences between the phase voltages under load conditions. For this reason it is possible (BUT NOT RECOMMENDED) to turn off the neutral detect facility (the show must go on) if experiencing problems with the power supply. ALWAYS check first that the problem is not a dropped neutral in either of the three phase connectors.

WARNING

IF THE NEUTRAL DETECT FACILITY IS DISABLED, IT IS POSSIBLE FOR LAMPS TO BE DRIVEN BY HIGHER VOLTAGES THAN INTENDED. DAMAGE TO THE LAMPS MAY RESULT.

- Selecting “N.DET” gives the options of “ON” or “OFF”. Use the **FUNCTION** encoder wheel to choose the option and press **ENTER** to confirm selection.
- The display will change to “OK” to indicate the dimmer is now in normal operating mode with the selected change implemented.

Normal DMX operation of the dimmer is unaffected by selecting this function.

4.1.5 DMX CHannel menu

Figure 4.2

The dimmer's DMX start channel can be selected anywhere from channel 1 to channel 512. By selecting DMX start channel 1, the dimmer will respond to DMX channels 1 through 12 inclusive (channels 1 through 6 for HP6). When using racks of looped dimmers, the next dimmer should start at channel 13, the next at channel 25, and so on.

- To select a DMX start channel press the **DMX CH** button on the keypad.
- The display will change to show the currently assigned DMX start channel.
- Using the **FUNCTION** encoder wheel, the DMX start channel may be incremented or decremented to the desired DMX channel start number.
- To select the DMX start channel press the **ENTER** button on the keypad.
- The display will then show “**OK**” to indicate the dimmer is now in normal operating mode.

4.1.6 DMX BANK menu

Figure 4.2

To make DMX start channel selection easier, the HP Series dimmers can select a bank of twelve channels (six for HP6) from the DMX input signal. There are a total of 42 sequential banks of twelve channels and one last bank of eight channels in the 512 channels available from the DMX-512 source. See section 8.2 for a list of banks and their corresponding channels.

By selecting DMX start bank 2, the dimmer will respond to DMX channels 13 through 24 inclusive (channels 13 through 18 for HP6).

- To select a DMX bank press the **DMX BANK** button on the keypad.
- The display will change to show the currently assigned DMX bank number.
- Using the **FUNCTION** encoder wheel, DMX bank numbers may be incremented or decremented to the desired bank number.
- To select the DMX bank number press the **ENTER** button on the keypad.
- The display will then show “**OK**” to indicate the dimmer is now in normal operating mode.

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4.1.7 BUILD menu

 Figure 4.3

The **BUILD** menu is used to record DMX Snapshots or user-defined Scenes.

- Press the **BUILD** keypad button.
- Select a flashing Snapshot number (“**SP1 - SP3**”) or a Scene number (“**SC1 - SC2**”) to record, using the **FUNCTION** encoder wheel.
- Press **ENTER** to confirm the selection.

4.1.7.1 Snapshot

 Figure 4.3

Once a **SNAPSHOT** number is selected (“**SP1**”, “**SP2**” or “**SP3**”), the display will scroll the message: “**PRESS ENTER TO STORE DMX VALUE**”.

- On pressing **ENTER**, the dimmer will store the current DMX values for the twelve dimmer channels (six channels for the HP6) in the currently selected bank.
- The display will change to “**OK**” to indicate the dimmer is now in normal operating mode.

4.1.7.2 Scene

 Figure 4.3

Once a Scene (“**SC1**” or “**SC2**”) is selected, the display will scroll the message: “**PRESS SELECT AND HOLD WHILE CHANGE LEVEL FOR EACH CHAN**”.

- For each channel required to Build the Scene, press and HOLD the **SELECT** button.
- The display will initially show the last recorded level for that channel, which may then be changed by rotating the **LEVEL/FUNCTION** encoder wheel.
- Once all the required channels have been changed, press **ENTER** to confirm the changes.
- The display will change to “**OK**” to indicate the dimmer is now in normal operating mode.

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4.1.8 RUN menu

Figure 4.4

The HP Series dimmers offer a range of pre-recorded Snapshots, Scenes and Chases that may be used for testing purposes or for when the dimmer rack is used in stand-alone (no control desk) applications.

The Snapshots and Scenes must be recorded via the Build menu (see section 4.1.7). The Chase patterns are factory-set and cannot be changed. The output levels of Snapshots and Scenes may be varied with the **LEVEL/FUNCTION** encoder wheel, which becomes a master level control. During chases the encoder wheel becomes a chase rate control.

In all cases, individual channel levels may be changed. Once changed, however, they remain at the new level regardless of the setting of the master level control.

Note that any previously disabled channels will remain disabled when in RUN mode, with chase sequences abbreviated to avoid visible gaps.

- To run a Snapshot, Scene or Chase, press the **RUN** keypad button.
- Select either a Snapshot (“**SP1**”, “**SP2**”, or “**SP3**”), a Scene (“**SC1**” or “**SC2**”), or a Factory Preset Chase (“**PR1**”, “**PR2**”, “**PR3**”, “**PR4**”, “**PR5**”, or “**PR6**”) with the **FUNCTION** encoder wheel.
- Press **ENTER** to confirm the selection.

4.1.8.1 Snapshot

Figure 4.4

If Snapshot 2 (“**SP2**”) is selected, the display will scroll with the message “**SP2 ON LEVEL 100**”.

- The output level may be altered with the **LEVEL/FUNCTION** encoder wheel and the display will indicate a level between 100% and 0%.
- Pressing a channel **SELECT** button will isolate that channel from the master level control. The **STATUS LED** will flash to show the channel is isolated. Pressing the **SELECT** button again will re-connect the channel to the master level control.
- By pressing and **HOLDING** a channel **SELECT** button, and rotating the encoder wheel, that channel level may be modified.

Note

The master level control no longer has any effect on the level of a modified channel; ie. once a channel has been modified, it remains at that level while still in RUN mode (regardless of the master level). The channel SELECT button must be pressed again to re-connect that channel to the master level control.

- Once the **SELECT** button is released, the encoder wheel becomes the master level control once more.

4.1.8.2 Scene

Figure 4.4

If Scene 1 (“**SC1**”) is selected, the display will scroll with the message “**SC1 ON LEVEL 100**”.

- The overall output level may be altered with the **LEVEL/FUNCTION** encoder wheel and the display will indicate a level between 100% and 0%.
- Pressing a channel **SELECT** button will isolate that channel from the master level control. The **STATUS LED** will flash to show the channel is isolated. Pressing the **SELECT** button again will re-connect the channel to the master level control.
- By pressing and **HOLDING** a channel **SELECT** button, and rotating the encoder wheel, that channel level may be modified.

Note

The master level control will no longer have any effect on the level of the modified channel; ie. once a channel has been modified, it remains at that level while still in RUN mode (regardless of the setting of the master level). The channel SELECT button must be pressed again to re-connect that channel to the master level control.

- Once the **SELECT** button is released, the encoder wheel becomes the master level control once more.

4.1.8.3 Preset chases

Figure 4.4

If Preset Chase 4 (“**PR4**”) is selected, the display will scroll with the message “**PR4 RUN 100 b.P.M.**”.

- The chase rate may be altered with the **FUNCTION** encoder wheel and the display will indicate a rate between 6 and 600 beats per minute.
- By pressing and **HOLDING** a channel **SELECT** button, and rotating the encoder wheel, that channel level may be edited.
- Once the **SELECT** button is released, the encoder wheel becomes the chase rate control once more. There is no master level control for this function.

The factory Preset Chase patterns for HP12 [HP6] are as follows:

PR1 Channels 1 to 12 [6] in sequence (12 [6] step chase)

PR2 Channels 12 [6] to 1 in sequence (12 [6] step reverse chase)

PR3 Channels 1 to 12 [6] in sequence (12 [6] step shadow chase) ie. chase channel off

PR4 12 [6] Channel Random chase

PR5 Channels 1 & 2 crossfade to Channels 3 & 4....(6 [3] step 2-channel x-fade)

PR6 Channels 1, 2, 3 crossfade to Channels 4, 5, 6....(4 step 3-channel x-fade)

[**PR6** Channels 1 to 6 crossfading in sequence (6 step x-fade)]

4.1.9 TEST function

Figure 4.2

Each channel may be tested individually, or as a group, by fading them from 0 to 100%. Any previously disabled channel may be selected and tested.

- Press the **TEST** keypad button and the display will show “**TEST**”.
- Next press the desired channel **SELECT** buttons. This will take the selected channel(s) off-line from the DMX input. The remaining channel(s) will stay on-line.
- The **STATUS** LED(s) will flash to indicate which channel(s) are under test. As the **LEVEL/FUNCTION** encoder wheel is rotated, the channel level(s) will change from their current level.
- When all tests are completed, press the **NORMAL** button. The display will change to “**OK**” to indicate the dimmer is now back in normal operating mode and all channels are once again on-line to the DMX input control signal.

4.2 Deep clear

Figure 4.2

In the unlikely event of a software “lockup” or error message (see section 5.2), the HP Series dimmers have a facility that enables them to be Deep Cleared.

CAUTION

THIS FUNCTION WILL ERASE THE CURRENT SETTINGS IN MEMORY AND REQUIRES RE-INITIALISING OF THE OUTPUT VOLTAGE AND NUMBER OF CHANNELS. ENSURE THAT THE VOLTAGE IS SET TO 110 VOLTS IF RUNNING ANY 110 VOLT LAMPS, OR DAMAGE TO THE LAMPS MAY RESULT.

- Hold down the **MODE** and **DMX BANK** buttons while turning off and then restoring power to the dimmer.
- Use the **FUNCTION** encoder wheel to select either “**110V**” output or “**240V**” output on the display and press **ENTER**. Individual channel output voltage may be changed later via the **MODE** menu (see section 4.1.4.1).
- Next use the encoder wheel to select “**12ch**” output (for HP12) or “**6ch**” output (for HP6), and press **ENTER**.
- The display will change to “**OK**” to indicate the dimmer is now back in normal operating mode.

4.3 Channel disable

When the dimmer is in normal operating mode (“**OK**” showing on the display), any channel may be taken off-line by pressing a channel **SELECT** button. Pressing the button a second time will bring that channel back on-line.

The **STATUS** LED will be on (red or green) for all active channels, and be off for all disabled channels.

Any disabled channel(s) may still be selected and tested with the **TEST** function (see section 4.1.9). Once the tests are complete and the dimmer is back in normal operating mode, the channel(s) will resume their status prior to being tested.

5.0 Fault Diagnosis

NOTE

Contact your authorised JANDS Distributor for repairs or servicing.

In Australia refer all repairs to an authorised JANDS service agent or return the faulty unit in suitable packaging to:

JANDS ELECTRONICS Service Dept,

40 Kent Rd

Mascot NSW 2020

Australia

Phone: +61-2-9582-0909

Fax: +61-2-9582-0999

5.1 Protection

The HP Series dimmers feature several types of protection. These can be generally classified as:

- Output protection
- Thermal protection
- Overvoltage protection

5.1.1 Output protection

Output protection consists of fast-acting magnetic circuit breakers. These devices are designed to pass the rated current, but will disconnect the output circuit for any overload condition; the larger the overload, the quicker the disconnection.

The design criteria is to protect the dimmer's output devices from short-circuit loads and faulty wiring looms, and save on expensive dimmer repairs. At the same time, the tripped circuit breaker indicates a load fault that requires immediate attention.

5.1.2 Thermal protection

The HP Series dimmers feature temperature-controlled fan cooling. As the internal temperature of the dimmer increases, the fan speed also increases. For internal temperatures above 50°C the fan will operate at maximum speed.

The internal heatsink temperature is constantly monitored by the dimmer. If the heatsink temperature rises above 65°C, the display will automatically show the current temperature as a warning that the dimmer is becoming too hot. Once the heatsink cools down to 60°C, the display will show "OK" once more.

If the heatsink temperature rises above 85°C, the dimmer will automatically shut down the output drive until the temperature drops to around 80°C, at which time it will restart. The fan will continue to cool the heatsink during the shut down period. The display will continue to show the current temperature until it drops below 60°C.

5.1.3 Overvoltage protection

The HP Series dimmers will detect voltage problems such as phase load imbalance and a poor or missing neutral connection. A poor (resistive) neutral connection can cause arcing and overheating of the connector, and also allows the phase-to-neutral voltages to vary, causing overvoltage damage to components.

Bad neutral connections account for many lamp and dimmer failures. While the internal electronics of HP Series dimmers can tolerate these fault conditions, fragile lamp filaments generally cannot.

For a 10% phase voltage difference, the display scrolls the warning message: **“MAINS OVERVOLTAGE WARNING. PRESS NORMAL”**. Pressing **NORMAL** will reset the display to **“OK”**. The operator **SHOULD** then check all the neutral connections and the load distributions on each phase, correcting where necessary.

For a phase voltage difference of more than 20%, the dimmer outputs are turned **OFF** and the following message scrolls across the display: **“MAINS OVERVOLTAGE. PRESS NORMAL TO REACTIVATE”**. When the overvoltage condition is removed, press the **NORMAL** button to reactivate the dimmer. The outputs will restart according to the previous settings.

If the overvoltage condition is not remedied, the dimmer will allow three (3) attempts to reactivate before shutting down. After this the power must be turned off and then on again before normal operation is again possible.

In some venues the three phase power supply may be less than ideal, with considerable differences between the phase voltages under load conditions. For this reason it is possible (**BUT NOT RECOMMENDED**) to turn off the neutral detect facility (the show must go on) if experiencing problems with the power supply. **ALWAYS** check first that the problem is not a dropped neutral in the three phase plug or socket.

The neutral detect facility may be disabled via the **MODE** menu. See section 4.1.4.6 for details.

WARNING

IF THE NEUTRAL DETECT FACILITY IS DISABLED, IT IS POSSIBLE FOR LAMPS TO BE DRIVEN BY HIGHER VOLTAGES THAN INTENDED. DAMAGE TO THE LAMPS MAY RESULT.

5.2 Output faults

If a short-circuit lamp or output cable is plugged into the dimmer, the circuit breaker will act within milliseconds to disconnect the fault from the dimmer. In nearly all circumstances, this is quick enough to prevent damage to the output devices.

In some instances however, a triac failure may be experienced, although these devices are usually quite reliable and robust. If a triac does fail, it will either turn a channel on to full (triac short-circuit), or turn it off (triac open-circuit). If a triac fault should occur, that channel may be isolated with it's circuit breaker.

The channel **LOAD LED** may be used to aid in troubleshooting. This red LED serves two functions. In normal operation, it acts as an output mimic. When the channel drive is at zero, it indicates whether that channel's load is disconnected (or open-circuit).

To check a load, set the channel drive to zero. The **LOAD LED** will turn ON if there is no load.

For levels above zero, the **LOAD LED** will mimic the channel output whenever a load is connected.

Note that the channel circuit breaker must be ON for the **LOAD LED** circuitry to work.

BREAKER	LOAD	CHANNEL DRIVE	LOAD LED STATUS
on	not connected	off	ON
on	connected	on	OUTPUT MIMIC
off	doesn't matter	doesn't matter	OFF

5.3 Operating faults

If a message should appear scrolling across the display: “**ADDRESS EXCEPTION ERROR XXXXXXXX XXXXXXXX XXXXXXXX**” where the Xs represent different characters, write down the characters and contact JANDS Service Department or your local JANDS Distributor, giving details of the dimmer’s operating conditions that caused the error, and software version (see section 4.1.4.3). In the meantime, doing a Deep Clear (see section 4.2) should get the dimmer working again.

5.4 DMX faults

The HP Dimmers feature a Last Hold facility that remembers the last received DMX message. In the event of a DMX signal cable being unplugged or severed, the dimmers will continue to output the “Held” DMX levels until a new DMX message is provided, or a Snapshot, Scene or Chase function is selected.

The **DMX IN** LED will light if there is a DMX signal.

5.5 Phase fault indication

The three green **PHASE** LEDs will light when all three power input phases are present.

WARNING

IF ONE OR MORE PHASE LEDS IS OFF, IMMEDIATELY DISCONNECT POWER TO THE DIMMER AND CHECK THE MAINS SUPPLIES AND WIRING BEFORE RE-CONNECTING POWER.

5.6 Cold lamp filaments

Cold lamp filaments consume considerably more power than warm filaments. This means that the first time the lamp is turned on to full, the surge current can be several times greater than the rated current for the lamp.

This cold surge current may be enough to trip the output circuit breakers. If this nuisance-tripping of the circuit breakers is a problem, the filament Preheat facility may be utilised. See section 4.1.4.5 for instructions on enabling the Preheat facility.

Preheat turns on the selected channels a very small amount (around 1%) which heats the lamp filaments and increases their electrical resistance. When the lamp is then turned on full, the surge current is much less and the circuit breaker will not trip.

Other advantages of using Preheat are an increase in lamp life (due to the reduction of thermal shock to the filaments), and a reduction of lamp heat up time (the lamps will flash slightly faster).

When Preheat is on, the lamp filaments may show a barely perceptible dull orange glow.

5.7 Fault finding guide

FAULT SYMPTOM	POSSIBLE CAUSE	REMEDY
Overvoltage indication	Loose or missing supply neutral Phase-neutral swap on supply Load imbalance Supply generator runaway	Re-secure neutral connection Check supply wiring/colour code Re-distribute loads Replace generator
Overtemperature indication	Poor intake ventilation Poor exhaust ventilation Damaged fan Ambient temp above 40°C	Use racks with side ventilation Use racks with side ventilation Replace fan Keep ambient temp below 40°C
Breaker trips when channel flashed to near full	Large incandescent load Excessive load Faulty breaker	Use Preheat facility Reduce channel loading Factory service
Breaker trips after prolonged operation	Excessive load Lamp or wiring fault Faulty breaker	Reduce channel loading Check lamps and wiring Factory service
Breaker trips immediately when channel is driven	Output short SCR / Triac short	Check lamps and wiring Factory service
One channel flickers when dimmed - Drive LED flickers	DMX source problem	Softpatch another desk fader Replace desk
One channel flickers when dimmed - steady Drive LED indication	Faulty channel Same load flickers on another channel	Factory service Insufficient load
All channels flicker when dimmed	Incorrect DMX protocol / wiring Mains control tones exceed limits DMX line unterminated	Replace DMX source / wiring Contact factory Fit terminating plug (see Sec 3.3)
Overvoltage cutout activates	Faulty wiring / poor neutral connection Poor mains supply (or generator)	Check wiring / 3 phase plugs Disable N.Detect function until wiring / generator is repaired
Radio interference	Faulty choke	Factory service

6.0 Installation

The HP Series dimmers are designed to be installed in standard 19-inch wide racks. These racks should have adequate ventilation for the SIDE-TO-SIDE airflow of the dimmers. Fully enclosed racks can cause overheating problems.

It is highly recommended for all applications, but particularly for touring applications, that the rear rack-mounting support brackets be used. These are supplied with each dimmer and are suitable for use in standard JANDS 13RU ventilated welded racks. Extended brackets should be used for installing in the deeper JANDS 27RU and 40RU Contractor Series racks.

6.1 Standard rear rack mounts (JANDS 13RU rack)

To mount the HP Series dimmers in a standard JANDS 13RU rack follow these steps:

- ① Attach the two rear support brackets to the rear mounting rails of the rack with a pair of screws on each side. Do not fully tighten the screws yet.
- ② Attach the dimmer to the front mounting rails of the rack with four screws. Do not fully tighten the screws yet. Slide the dimmer chassis inside the bracket folds.
- ③ Insert a pair of M6 screws through each of the rear flanges of the dimmer chassis into the threaded inserts in the support brackets.
- ④ Finally, tighten all screws.

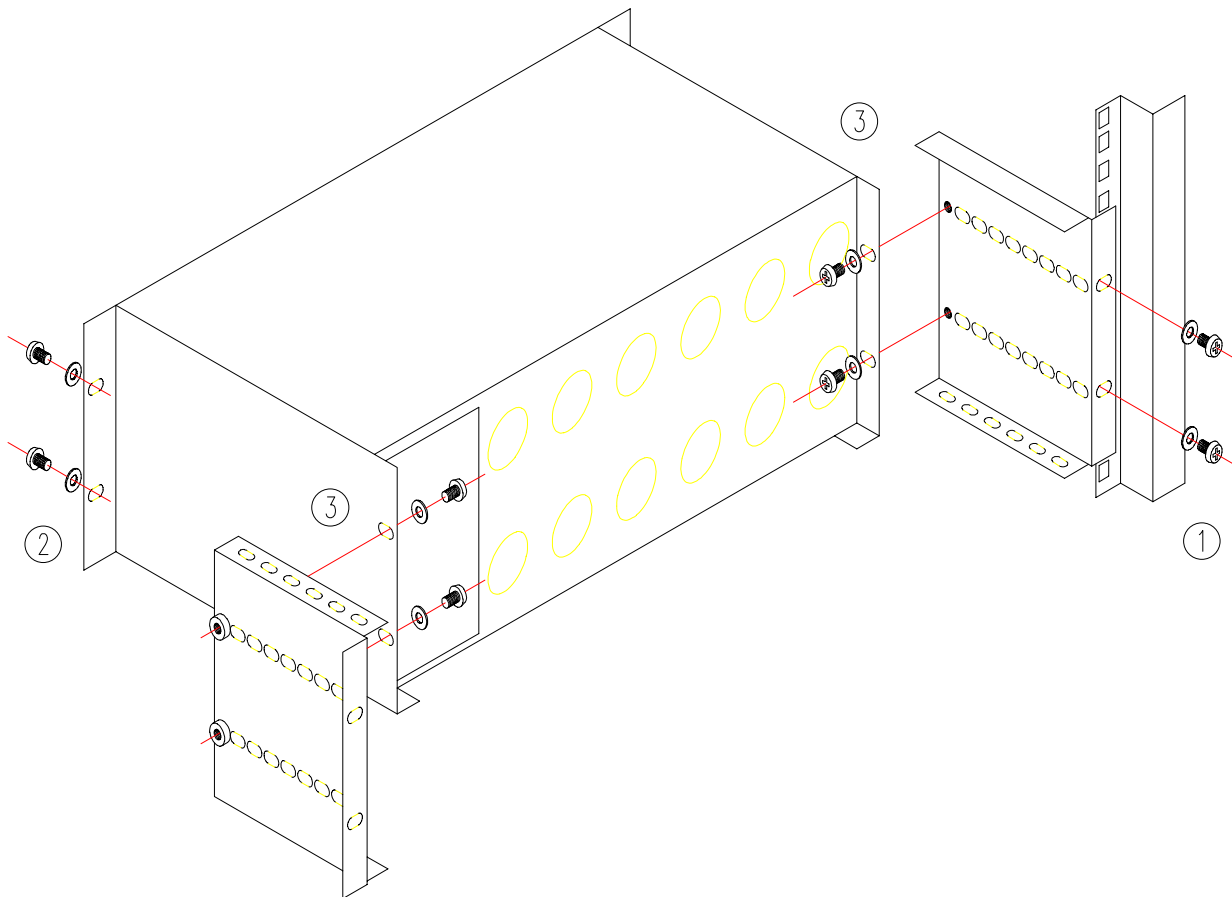


Figure 6.1 Using the standard rack-mounting ears

6.2 Extended rear rack mounts

To mount the HP Series dimmers in a deep JANDS 27RU or 40RU Contracting rack follow these steps:

- ① Attach the two rear support brackets to the rear mounting rails of the rack with a pair of screws on each side. Do not fully tighten the screws yet.
- ② Attach both of the extended slide supports to the dimmer by inserting a pair of M6 screws through the rear flanges on each side of the dimmer chassis, and into the threaded inserts in the slide supports. The dimmer chassis fits inside the bracket folds.
- ③ Attach the dimmer to the front mounting rails of the rack with four screws. Do not fully tighten the screws yet.
- ④ Insert two M6 screws through each of the slide supports and into the threaded inserts in the rear support brackets.
- ⑤ Finally, tighten all screws.

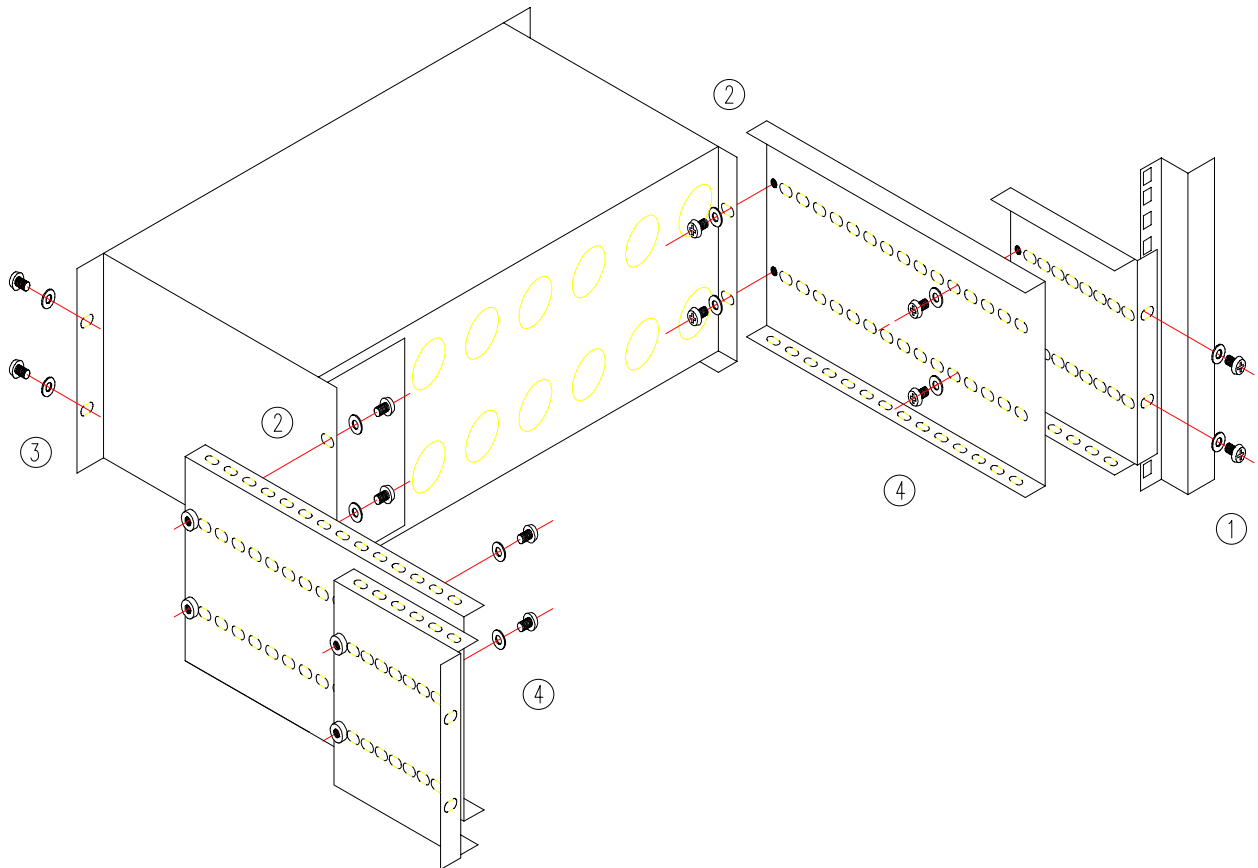


Figure 6.2 Using the extended rack-mounting brackets

7.0 Maintenance

WARNING

DO NOT ALLOW THE ENTRY OF LIQUIDS OF ANY SORT INTO THE DIMMER CHASSIS.

With care, the HP Series dimmer will require little or no maintenance.

If the front panel requires cleaning, wipe with a mild detergent on a damp soft cloth.

DO NOT spray liquids onto the front panel.

DO NOT use solvents for cleaning the front panel.

If the dimmer fan becomes clogged with dirt or fluff, first DISCONNECT THE POWER CABLE, and then undo the thirteen (13) screws securing the lid.

Remove the lid and blow clean the fan and internals with compressed air.

When the fan and internals are clean, replace the lid and screws, and re-connect the power cable.

8.0 Technical Data and Specifications

PARAMETER	HP12	HP6
No. of Channels:	12	6
Input Power Requirements:	3 Phase plus Neutral and Earth 415 Volts AC Phase-Phase 40 Amps / Phase Full size (40A) Neutral conductor	3 Phase plus Neutral and Earth 415 Volts AC Phase-Phase 50 Amps / Phase Full size (50A) Neutral conductor
Max Power / Channel:	2.4 kW	6kW
Max Dissipation:	<24W/chan (<300W total)	<60W/chan (<350W total)
Max Ambient Temp:	40°C	40°C
Control Signal:	DMX-512 (1990) Protocol	DMX-512 (1990) Protocol
DMX Connectors:	AXR-5-21B, AXR-5-22B	AXR-5-21B, AXR-5-22B
Test Function Level:	0 to Full with detent each step	0 to Full with detent each step
LED Indicators:	Status, Control and Output mimics; DMX; Phases A, B, and C	Status, Control and Output mimics; DMX; Phases A, B, and C
Output Protection:	12 x 10 amp circuit breakers	6 x 25 amp circuit breakers
Control fuses:	3 x 63 mA M205 internal fuses	3 x 63 mA M205 internal fuses
Power cable:	2 metre tail with Clipsal 56P532 plug	2 metre tail with Clipsal 56P555 plug
Size (mm):	482 (w) x 133 (h) x 280 (d)	482 (w) x 133 (h) x 280 (d)
Output Connectors: (Australia)	1 x 10 amp Clipsal 415 per channel	2 x 20 amp 20MLB per channel
Weight:	16.5 kg nett	17.5 kg nett
Output Options:	Clipsal 415, 19 pin Socapex (normal or series), 10 pin Wieland, Terminal block	Clipsal 20MLB, Terminal block

8.1 Multipin output connector pin-outs

19 PIN SOCAPEX CONNECTORS

PIN No	OUTPUTS 1-6	OUTPUTS 7-12
1	ACTIVE 1	ACTIVE 7
2	NEUTRAL 1	NEUTRAL 7
3	ACTIVE 2	ACTIVE 8
4	NEUTRAL 2	NEUTRAL 8
5	ACTIVE 3	ACTIVE 9
6	NEUTRAL 3	NEUTRAL 9
7	ACTIVE 4	ACTIVE 10
8	NEUTRAL 4	NEUTRAL 10
9	ACTIVE 5	ACTIVE 11
10	NEUTRAL 5	NEUTRAL 11
11	ACTIVE 6	ACTIVE 12
12	NEUTRAL 6	NEUTRAL 12
13	EARTH 1	EARTH 7
14	EARTH 2	EARTH 8
15	EARTH 3	EARTH 9
16	EARTH 4	EARTH 10
17	EARTH 5	EARTH 11
18	EARTH 6	EARTH 12
19	NOT CONNECTED	NOT CONNECTED

19 PIN SERIES-WIRED SOCAPEX OUTPUTS 1-6 (OUTPUTS 7-12)

CONNECTOR "A"			CONNECTOR "B"		
PIN No	CONNECTION	PIN No	CONNECTION	PIN No	CONNECTION
1	ACTIVE 1 (7)	1	LINK 1 (7)		
2	LINK 1 (7)	2	NEUTRAL 1 (7)		
3	ACTIVE 2 (8)	3	LINK 2 (8)		
4	LINK 2 (8)	4	NEUTRAL 2 (8)		
5	ACTIVE 3 (9)	5	LINK 3 (9)		
6	LINK 3 (9)	6	NEUTRAL 3 (9)		
7	ACTIVE 4 (10)	7	LINK 4 (10)		
8	LINK 4 (10)	8	NEUTRAL 4 (10)		
9	ACTIVE 5 (11)	9	LINK 5 (11)		
10	LINK 5 (11)	10	NEUTRAL 5 (11)		
11	ACTIVE 6 (12)	11	LINK 6 (12)		
12	LINK 6 (12)	12	NEUTRAL 6 (12)		
13	EARTH 1 (7)	13	EARTH 1 (7)		
14	EARTH 2 (8)	14	EARTH 2 (8)		
15	EARTH 3 (9)	15	EARTH 3 (9)		
16	EARTH 4 (10)	16	EARTH 4 (10)		
17	EARTH 5 (11)	17	EARTH 5 (11)		
18	EARTH 6 (12)	18	EARTH 6 (12)		
19	NOT CONNECTED	19	NOT CONNECTED		

10 PIN WIELAND

PIN No	CONNECTION	SOCKET	"A"	"B"	"C"
1	ACTIVE		1	5	9
2	NEUTRAL		1	5	9
3	ACTIVE		2	6	10
4	NEUTRAL		2	6	10
5	ACTIVE		3	7	11
6	NEUTRAL		3	7	11
7	ACTIVE		4	8	12
8	NEUTRAL		4	8	12
9	EARTH		1	5	9 + LOOP
10	EARTH		2	6	10 + LOOP
EARTH	EARTH		3	7	11 + LOOPS +
			4	8	12 + LOOPS

8.2 DMX connector pin-outs

PIN No	CONNECTION (DMX IN)	CONNECTION (LOOP)
1	SHIELD	SHIELD
2	IN-	OUT-
3	IN+	OUT+
4	NC	NC
5	NC	NC

8.3 DMX bank allocations

BANK	CHANNELS	BANK	CHANNELS
1	1 - 12	23	265 - 276
2	13 - 24	24	277 - 288
3	25 - 36	25	289 - 300
4	37 - 48	26	301 - 312
5	49 - 60	27	313 - 324
6	61 - 72	28	325 - 336
7	73 - 84	29	337 - 348
8	85 - 96	30	349 - 360
9	97 - 108	31	361 - 372
10	109 - 120	32	373 - 384
11	121 - 132	33	385 - 396
12	133 - 144	34	397 - 408
13	145 - 156	35	409 - 420
14	157 - 168	36	421 - 432
15	169 - 180	37	433 - 444
16	181 - 192	38	445 - 456
17	193 - 204	39	457 - 468
18	205 - 216	40	469 - 480
19	217 - 228	41	481 - 492
20	229 - 240	42	493 - 504
21	241 - 252	43	505 - 512
22	253 - 264		

8.4 Mains wiring colour codes

Phase A	Brown
Phase B	White
Phase C	Black
Neutral	Blue
Earth	Green / Yellow