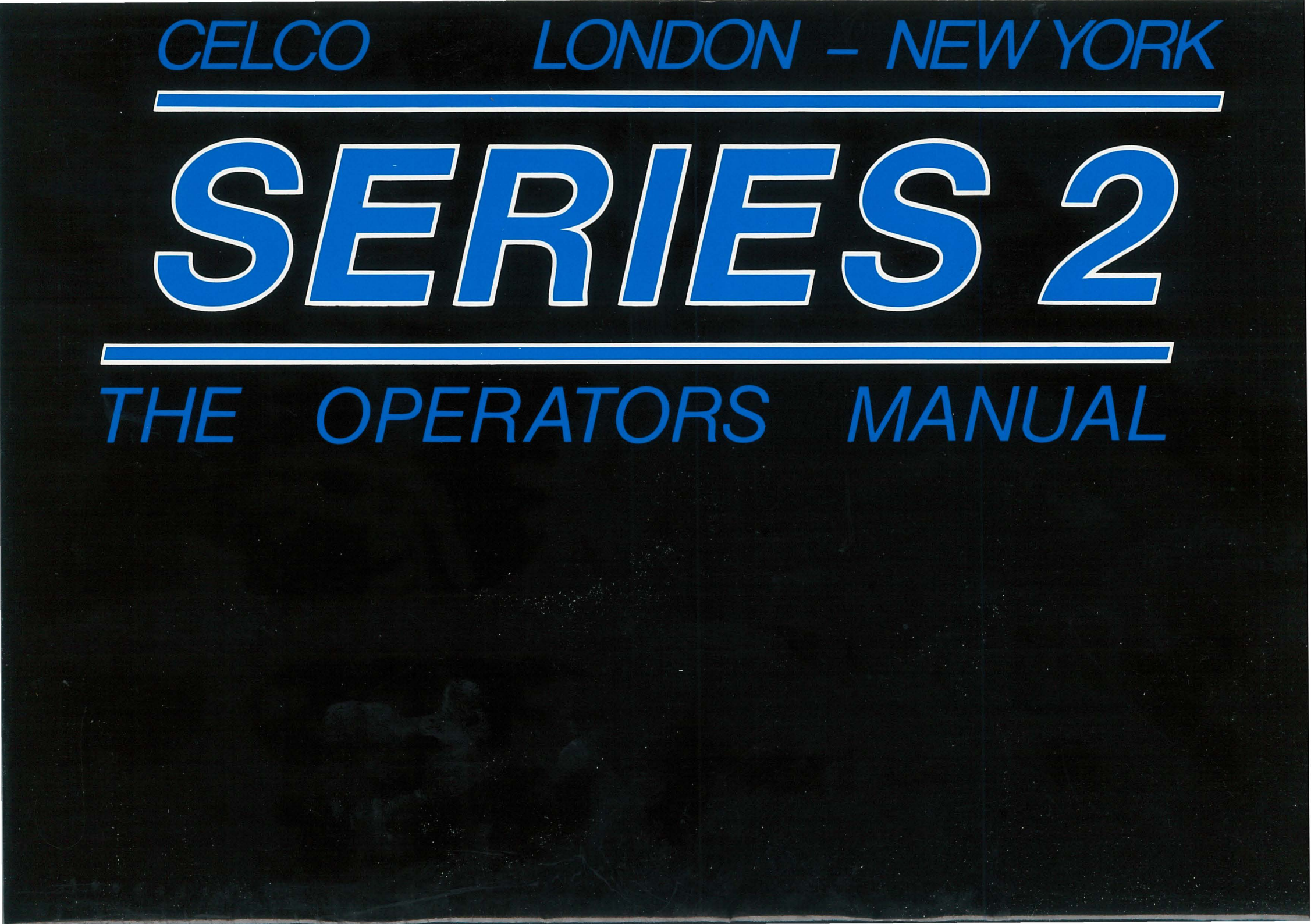
CELCO LONDON – NEW YORK

SERIES 2

THE OPERATORS MANUAL



Celco Series 2 Dimmer Manual.

The Celco Dimmer System has been designed to offer the highest possible standard of performance and reliability in addition to encompassing the requirements of many users throughout the world.

This manual is separated into chapters covering individual Dimmer Packs and Dimmer Systems from which the user will be able to fully comprehend the many advantages available.

All positions directions (e.g. 'Right hand side') in this manual assume that the reader is facing the front side of the unit (e.g. The side containing the circuit breakers and switches on a dimmer pack) and that the unit is horizontal.

A dimmer RACK is a complete system consisting of a POWER DISTRIBUTION UNIT (PDU), a number of dimmer PACKS and, where applicable, 36 WAY OUTLET BOXES and a CONTROL PATCH.

A dimmer PACK consists of a FAN MODULE and three dimmer MODULES.

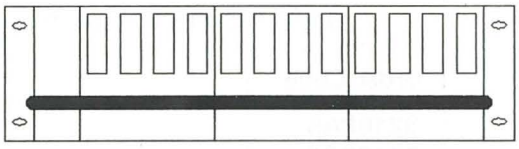
We thank you for purchasing this, the ultimate Dimmer System, and trust that you will receive many years of unremitting service and superior performance.

Celco Ltd.

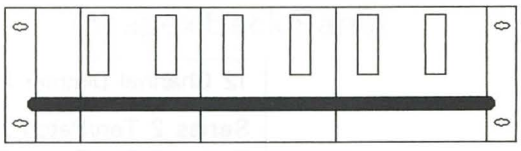
Contents.

The Dimmer Packs.

The Series 2 Dimmer Packs can be broken down into two main categories;

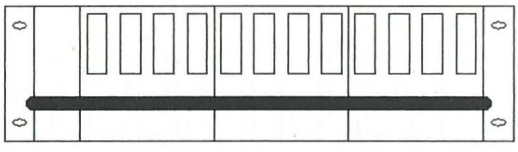


12 Channel Dimmer Pack

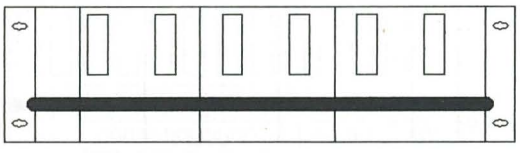


6 Channel Dimmer Pack

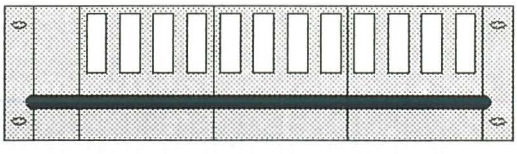
Both the 12 Channel and 6 Channel Dimmer Packs can be broken down further into specific types determined by their Channel Load Ratings.



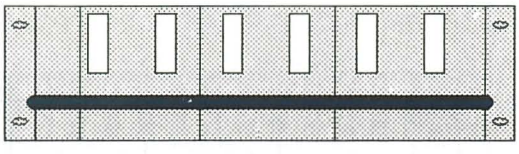
12 Channels @ 10A per Channel



6 Channels @ 10A per Channel



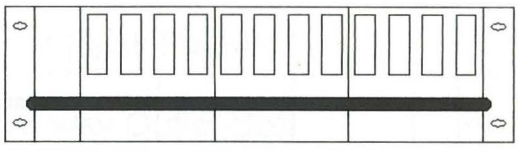
12 Channels @ 20A per Channel



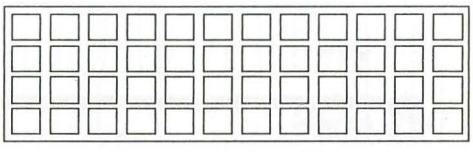
6 Channels @ 25A per Channel

This can be further sub-divided into Dimmer Packs with different Outlet Connectors for use in various applications in many countries;

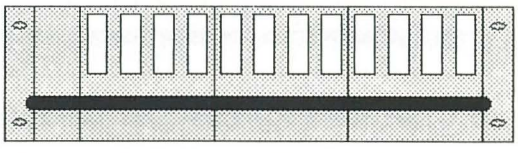
12 Channel Dimmer Packs	Order Code
Series 2 Ten/Patch Parallel	S210PAR
Series 2 Ten/Patch Series	S210SER
Series 2 Ten/Socapex	S210SOX
Series 2 Ten/Install	S210INS
Series 2 Twenty/Patch Parallel	S220PAR
Series 2 Twenty/Patch Series	S220SER
Series 2 Twenty/Install	S220INS



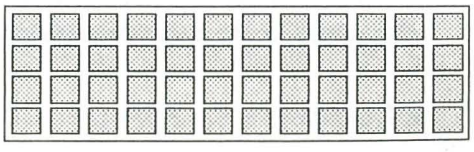
Series 2 Ten/Patch Parallel
Series 2 Ten/Patch Series



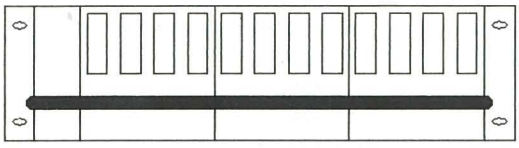
Mains Patch Back Panel



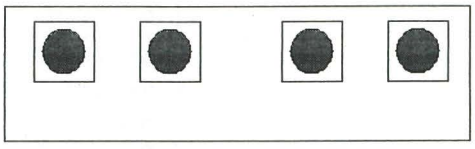
Series 2 Twenty/Patch Parallel
Series 2 Twenty/Patch Series



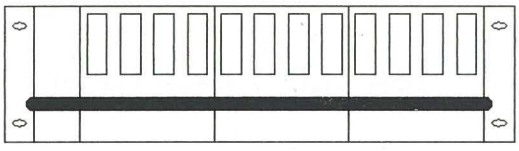
Mains Patch Back Panel



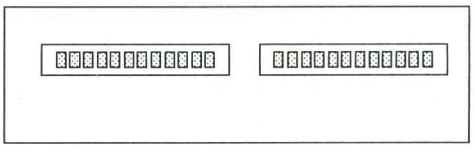
Series 2 Ten/Socapex



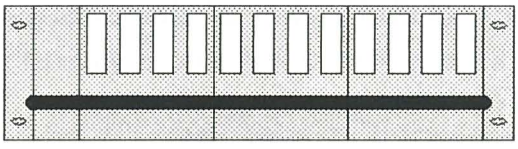
Socapex Back Panel



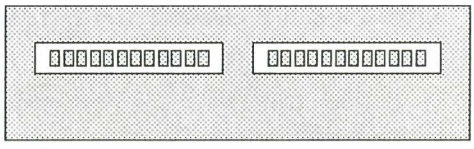
Series 2 Ten/Install



Installation Back Panel

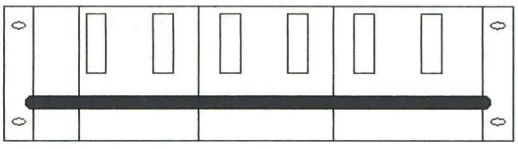


Series 2 Twenty/Install

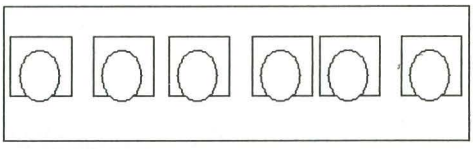


Installation Back Panel

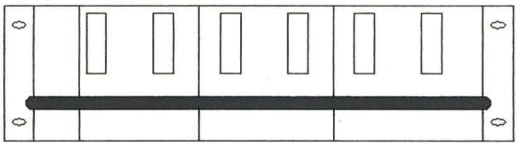
6 Channel Dimmer Packs	Order Code
Series 2 TV10	S2TV10
Series 2 TV10/US	S2TV10US
Series 2 TV25	S2TV25
Series 2 TV25/US	S2TV25US



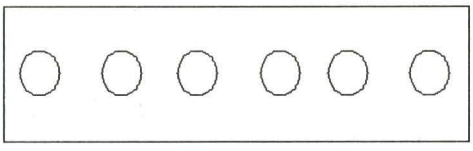
Series 2 TV10



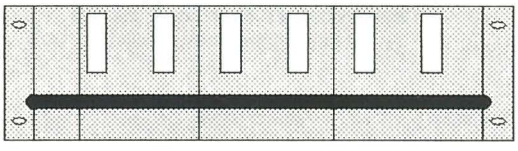
16A CEE17 Back Panel



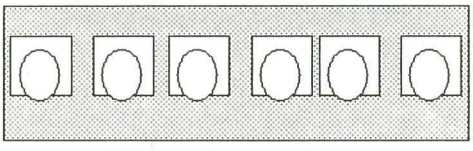
Series 2 TV10/US



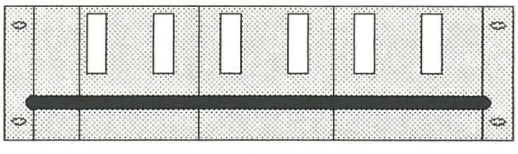
NEMA L5 – 20 Back Panel



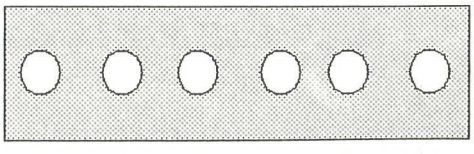
Series 2 TV25



32A CEE17 Back Panel



Series 2 TV25/US



NEMA L5 – 20 Back Panel

Installation Instructions.

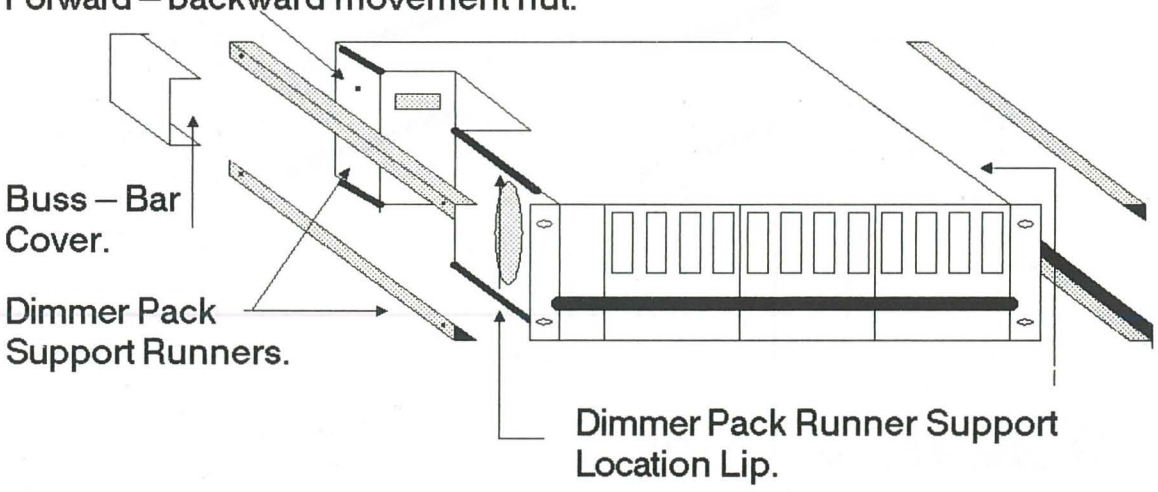
The Series 2 Dimmer Pack(s) are designed for 19" Racking enclosures, and in particular the dedicated Celco Touring Racks. This allows their fitting into a variety of suitable units. However, whether they are intended for touring or installation, care must be taken in selecting and installing the Dimmer Packs into the enclosure. Failure to do so at this stage could cause serious damage and would render the warranty null and void.

With each Dimmer Pack you will find a set of Supporting Runners. These are provided to assist in the Dimmer Packs installation. The Supporting Runners must be fixed to a suitable Racking Enclosure between the front and the back so as to stop the Dimmer Pack from moving up or down. They must be spaced apart to allow the Dimmer Pack to slide in and out, supported by the Packs' Runner Location Lips at the top and the bottom of the side panels.

If you have purchased a Celco Touring Rack you will find that the Racking Strips on the front and the back of the cabinet allow the Support Runners to be located. If you are installing the Dimmer Packs into a flightcase or installation cabinet of your own design then you must allow for the location of these Support Runners.

It is impossible to give detailed installation notes on fixing these devices as there are many Racking Enclosures and Flightcase designs around the world. The following notes and diagram should assist in selecting an appropriate design.

Celco Series 2 Dimmer Pack and Supporting Runners.



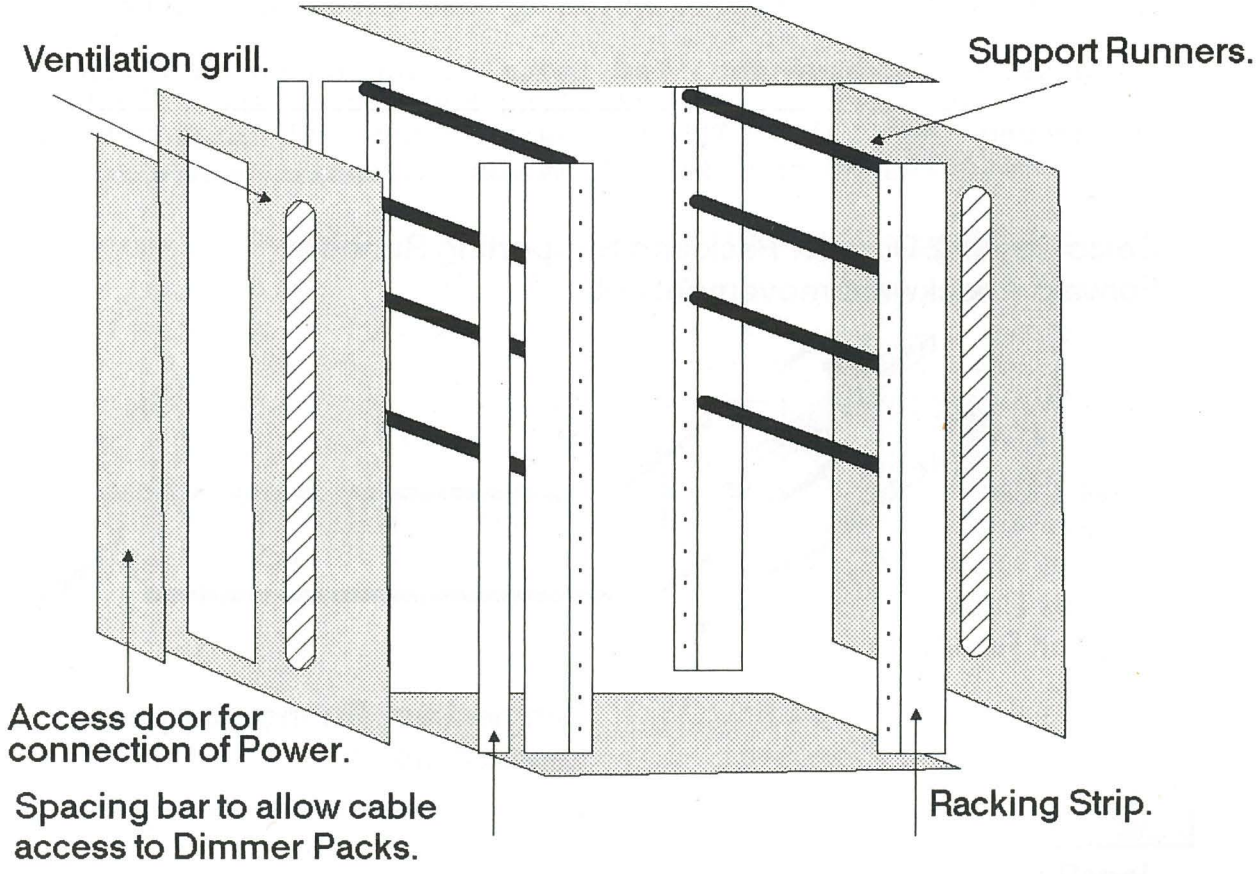
1. Always ensure that the left hand side of the enclosure is removable or that it has a door with an access suitable to allow connection of the Mains (Power) Cables.

2. Ensure that the distance between the front and the back of the enclosure is sufficient to take the depth of a Dimmer Pack and that it has provision for fixing the Support Runners on both the front and the back.

3. Adequate provision must be made so as not to restrict the airflow of the Dimmer Packs' forced air cooling.

4. A space should be allowed on the left hand side deep enough to take the Mains (Power) Cables. This is, of course, dependant on the quantity of Dimmer Packs being installed.

Considerations for a Racking Enclosure.



Phase Loading.

Regardless of what type of Celco Series 2 Dimmer Pack you have purchased the operation of any one is the same. Only the quantity of Channels, Current Ratings and the Outlet Connectors vary.

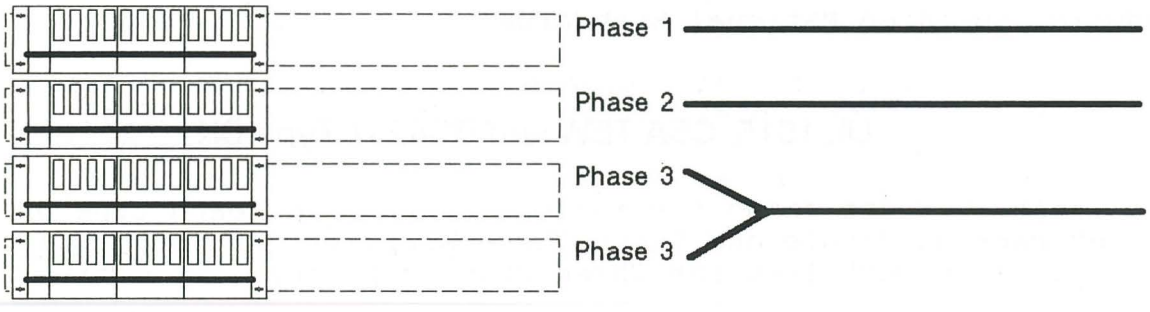
In the next chapter we will deal with the different Outlet Connector options available, for now though let us use one particular Dimmer Pack, the Series 2 Ten/Patch Parallel, as an example and describe the set-up procedure.

Viewing the Dimmer Pack from the front you will see a recess on the left hand side. This recess contains the Buss-bar Connections on to which the Mains (Power) Supply should be connected.

Before you proceed though you must first decide whether you wish to run your Dimmer Pack on a Single or Three Phase Mains (Power) Supply. In most cases, particularly in Europe, a Three Phase Supply is preferable as the Dimmer Pack is more than likely to present a balanced load across all three phases (of course, this depends on the channel loadings).

This is particularly beneficial if you intend using 'even numbered' quantities of Dimmer Packs. For instance, if you had four Series 2 Tens, each wired for single phase operation you would have to decide which of the three phases was to carry the extra Dimmer Pack, this is an unbalanced load:

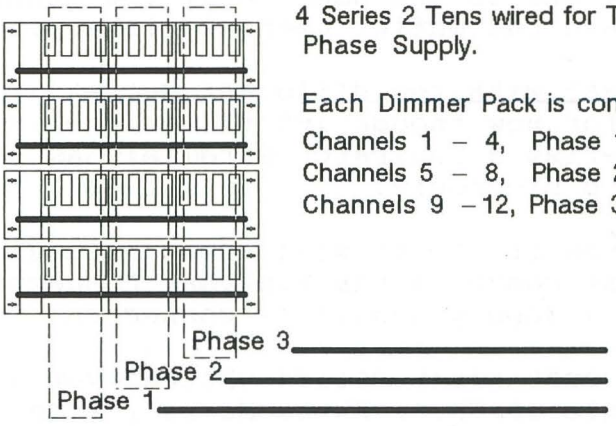
4 Series 2 Tens wired for Single Phase operation connected to a Three Phase Supply.



However, if you had wired the Series 2 Tens for Three Phase operation the problem of Phase loadings would not be as great though, we must stress that this is dependant on the Dimmer Channels used at any one time.

The diagram overleaf shows a 48 Channel system wired for Three Phase operation.

Connecting to the Mains Supply.



4 Series 2 Tens wired for Three Phase operation connected to a Three Phase Supply.

Each Dimmer Pack is connected thus:

Channels 1 – 4, Phase 1
Channels 5 – 8, Phase 2
Channels 9 – 12, Phase 3

Having decided whether to run your Dimmer Packs on a Single or Three Phase Mains Supply you must next consider which type of cable is appropriate.

As the rating of cables varies from country to country it would be in-correct for Celco to state which size of cable should be used. However, if national regulations permit, a Tri-rated Cable is beneficial as its' reduced size assists greatly in installation of the Dimmer Packs.

N.B. A Tri-Rated Cable has an insulation sheath that can withstand higher temperatures and therefore allows a smaller cross sectional area to be used. Tri-Rated Cable is so named because it complies to three National Standards:

UL 1015, CSA TEW and BS6231 Type CK

The table overleaf shows the maximum current for each type of Dimmer Pack on Single and Three Phase supplies. As you can see, the cable size is much less for Three Phase supplies.

If you are considering running a Touring Dimmer Rack on a Three Phase supply it might be worth considering making the Neutral Cable the same size as that used on a Single Phase supply. This is useful should you encounter a Single Phase supply in your travels as you would be able to gang the three Phase cables into the Single Phase Supply and use the existing Neutral you installed. If you disregard this advice you could discover that you would burn out the Neutral Cable as it would only be rated at the lower capacity.

Power Ratings for Series 2 Dimmer Packs.		
Model #	Single Phase	Three Phase
S210PAR	120 Amps.	40 Amps./phase
S210SER	120 Amps.	40 Amps./phase
S210SOX	120 Amps.	40 Amps./phase
S210INS	120 Amps.	40 Amps./phase
S220PAR	240 Amps.	80 Amps./phase
S220SER	240 Amps.	80 Amps./phase
S220INS	240 Amps.	80 Amps./phase
S2TV10	60 Amps.	20 Amps./phase
S2TV10US	60 Amps.	20 Amps./phase
S2TV25	150 Amps.	50 Amps./phase
S2TV25US	150 Amps.	50 Amps./phase

Connecting the Mains Cables.

Place the Dimmer Pack on a work surface with the left hand side facing you.

Undo the two retaining screws that hold the Buss-bar Cover in place and remove the Buss-bar cover from its' position.

Take the five M10 x 12mm slotted grub screws from the accessories pack - these are to hold the cables in place. Strip back your cables 15mm (5/8") and, depending on whether you wish to run Single or Three Phase, follow the instructions below:

Three Phase.

Insert your Phase Cables into the Phase Buss-bars i.e. Phase Cable 1 to Buss-bar 01 (Ph 1), Phase Cable 2 to Buss-bar 02 (Ph 2) ensuring that there are no stray wires that might short. For this purpose each Buss-bar is covered with Prespahn paper.

Insert the Neutral Cable into the Neutral Buss-bar N.
Insert the Earth (Ground) Cable into the Earth Buss-bar E (GND).
Use the M10 x 12mm grub screws to secure the cables in the Buss-bar.

Single Phase

Insert one Phase Cable into Buss-bar 01 (Ph 1).
Insert the Neutral Cable into the Neutral Buss-bar N.
Insert the Earth (Ground) Cable into the Earth Buss-bar E (GND).
Take the Shorting Strap from the accessories pack and connect it across the three Phase Buss-bars; 01 (Ph 1), 02 (Ph 2) and 03 (Ph 3) using the three M5 x 10mm screws provided. Ensure that the Prespahn paper covering the sides of each Phase Buss-bar is not trapped under the Shorting Strap.

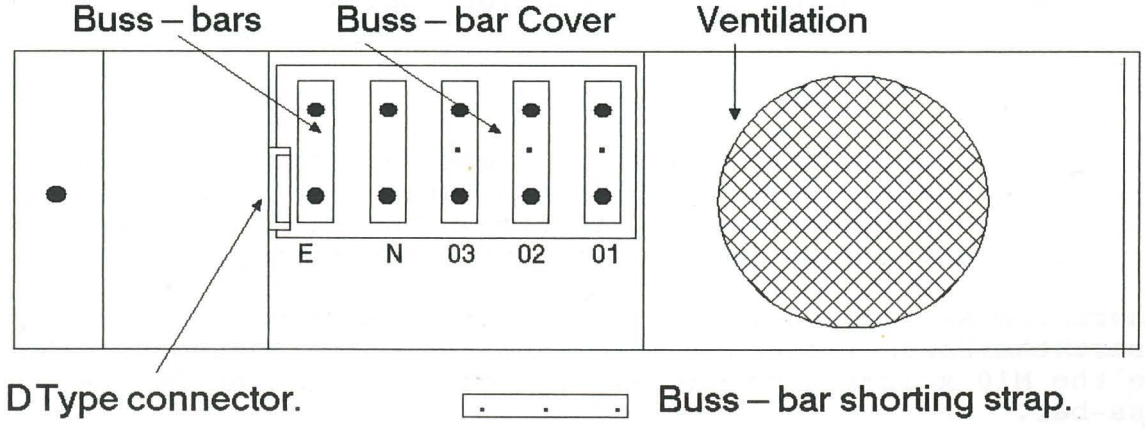
Single and Three Phase Supplies.

If you are using multiple Dimmer Packs it may be beneficial to use the General Purpose Earthing Braid, supplied in the accessories pack, to connect the Dimmer Pack to the Racking Enclosure/Strip instead of running individual Earth Cables to each Pack. It is then possible to connect the external earth cable direct to the Racking Enclosure/Strip.

Take the Earthing Braid from the accessories pack, note that it has an M6 Eyelet on both ends. Cut one of the Eyelets off and secure this end of the braid to the Earth Buss-bar E (GND) using the M10 x 12mm slotted grub screw provided. Secure the other end to the Racking Enclosure/Strip using the M6 Eyelet.

Replace the Buss-bar Cover using the screws provided BEFORE connecting the Dimmer Pack to the mains supply.

In most cases the procedure for connecting the mains cables will be carried out in a confined area with limited access (See diagram of a typical enclosure on Page 6). Therefore additional care must be taken at this early stage to ensure correct installation.

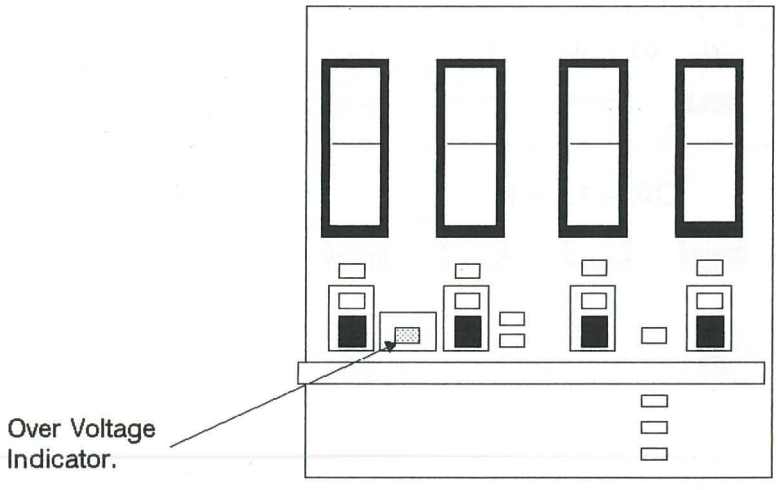


Autoseeking Power Device.

Celco Series 2 Dimmer Packs are equipped with an Auto-Seeking Voltage Device. This protects the Dimmer Modules should the Mains Supply be incorrectly connected and prevents their operation.

Each Dimmer Module (every two or four channels, depending on type) has this device fitted along with a separate unit that looks after the Fan Module.

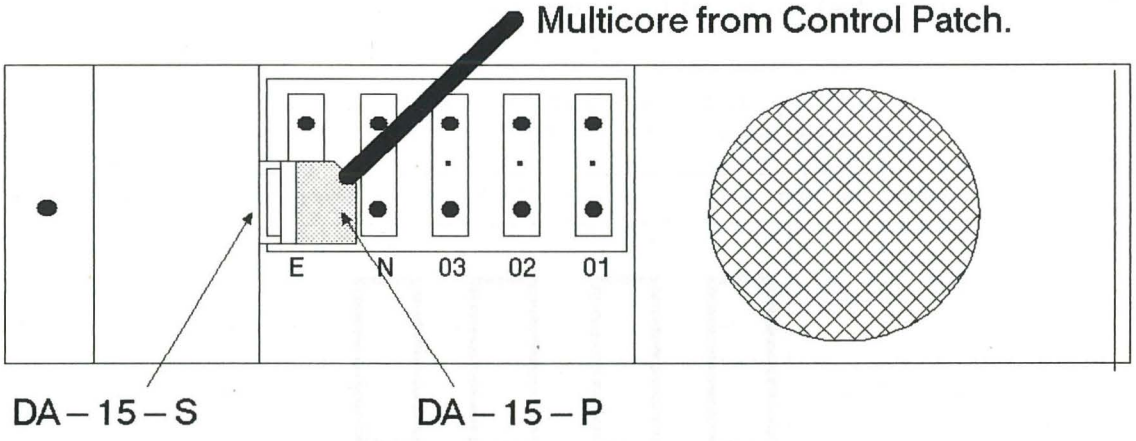
After connecting the Mains Supply and switching it on the Dimmer Pack's Logic Supply Voltage Indicators will illuminate if it has been correctly set-up. However, should the Line Over Voltage Warning Indicator illuminate, the Dimmer Pack must be immediately isolated from the Mains Supply as it is showing that the unit has been incorrectly connected. An examination of the wiring to the Dimmer Pack must be performed to ascertain the cause of the problem. (For additional notes and diagram see Front Panel Controls - Page 13).



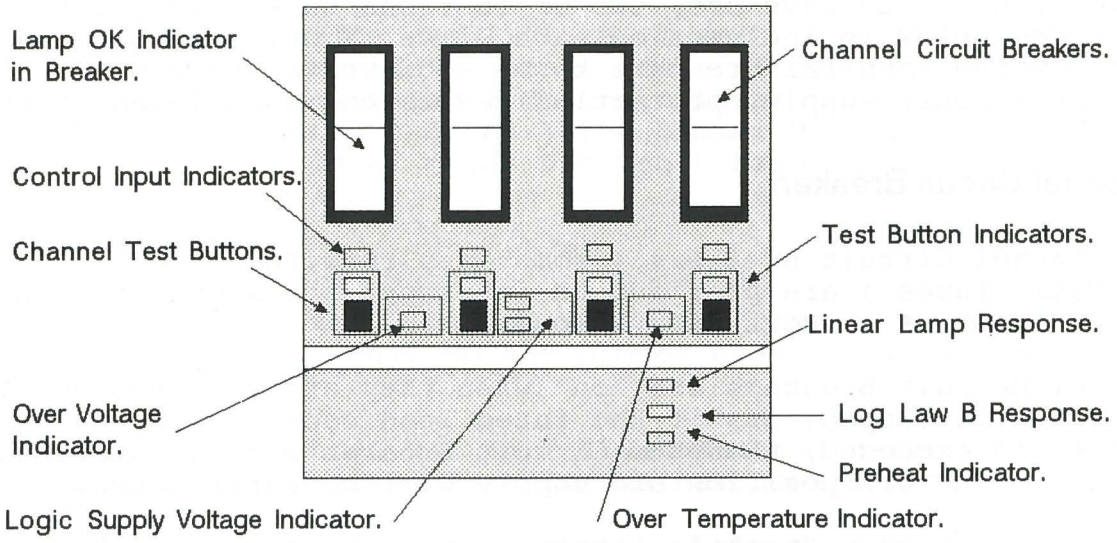
Connecting the Control Signal.

The Control Signal Input Connector (DA-15-S) is located in the Buss-bar recess in front of the Buss-bar Cover. To connect the Control Signal to the Dimmer Pack you should follow the Pin Wiring Details given in the appendix section at the back of this manual. You will find an appropriate mating connector (DA-15-P) in the accessories pack.

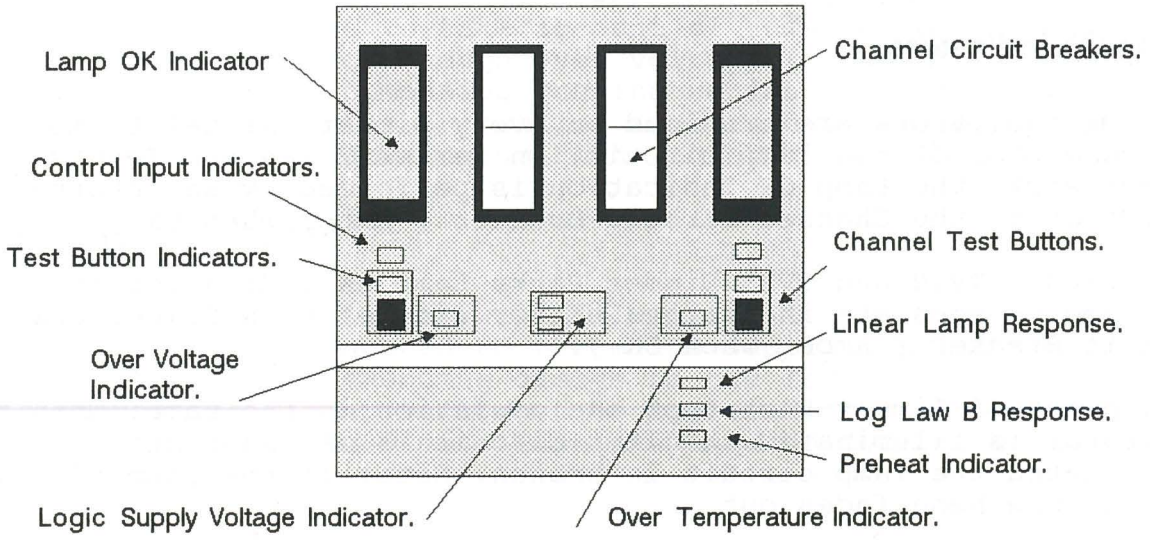
When you have completed wiring your connector it should be secured using the screw locks provided. This will prevent the Control Signal Connector from becoming detached from the Dimmer Pack.



Front Panel Operation.



Series 2 Ten and Twenty Front Panel Layout.



Series 2 TV10 and TV25 Front Panel Layout.

Each Series 2 Dimmer Pack contains three Dimmer Modules. Each Dimmer Module can have one, two or four channels. Every function described below is included on each Dimmer Module, enabling a better worse case failure rate to be achieved as each Module has its own trigger supply, protection device and associated circuits.

Channel Circuit Breakers.

The Channel Circuit Breakers (sometimes referred to as automatic fuses) are provided to interrupt the supply to the lamp in the event of a short or overload.

Channel Circuit Breakers are 'on' when they are switched up. If a short has developed, or, if the rated load capacity of the Dimmer Channel is exceeded, then the Circuit Breaker will automatically switch to the off position and supply will be interrupted.

Should the Circuit Breakers interrupt the supply to the lamp then an examination of the lamp circuit should be carried out to determine the cause of the fault. Once the fault has been found and corrected the circuit can be reconnected to the Dimmer Pack and the Circuit Breaker switched to the 'on' position.

For technical details on the Circuit Breakers performance consult the Dimmer Specifications section at the back of this manual.

Lamp OK Indicators.

Lamp OK Indicators are provided on every Dimmer Channel to monitor the condition of the lamp circuit. On Series 2 Ten and Twenty Dimmer Packs the Lamp OK Indication is performed by an internal indicator in the Channel Circuit Breaker (Amber when OK).

On Series 2 TV10 and TV25 Dimmer Packs Lamp OK Indication is provided by separate indicators either side of each Dimmer Channel Circuit Breaker (Amber when OK).

Regardless of Dimmer Pack type the operation is the same. When the Indicator is illuminated the lamp circuit is ok, when not illuminated the lamp circuit is broken. Note: If the lamp circuit is 'on' the Neon fades out.

By looking at both the Lamp OK Indicator and the position of the Channel Circuit Breaker one is able to determine whether a fault is due to a short or an unconnected circuit. (for additional notes, see Fault Finding on Page 41).

Control Input Indicators.

The Control Input Indicators, located beneath the Channel Circuit Breaker/Indicator, provide a simple means of determining whether the Dimmer Pack is receiving a Control Signal from the Lighting Board. When illuminated (green) the Dimmer Pack is receiving a voltage. (For additional notes see Fault Finding, Page ##).

Channel Test Buttons.

The Channel Test Button, located under the Dimmer Circuit Breaker/Indicator can call up any Dimmer Channel to half or full power.

Each Channel Test Button has an indicator above (Yellow) that illuminates if the Channel Test Button has been selected.

Pushing the Test Button once causes the lamp to go to half power, pushing once more causes the lamp to go to full power and pushing for the third time causes the lamp to turn off.

If, during the course of calling a lamp up, you discover that the lamp is at full power when the Test Button is at half (by possible incorrect patching of series/parallel circuits) then the Channel Circuit Breaker should be switched to the off position before proceeding through full power to the off position using the Test Button. Failure to take account of this could cause certain lamps to be destroyed through over voltage (However, this mainly applies to European companies running series lamp circuits on parallel patching units or running a mixture of series and parallel circuits on series patching units using shorting plugs).

Over Voltage Indicator.

The Over Voltage Indicator will illuminate if the Dimmer Module has been incorrectly connected to the mains supply causing the Dimmer Pack to shut down preventing damage to the lamp circuits. Should this happen the Dimmer Pack must be isolated from the mains supply and the wiring to the Dimmer Pack examined to determine the cause of the fault.

Over Temperature Indicator.

The Over Voltage Indicator will illuminate should the Dimmer Pack exceed its rated temperature causing the Dimmer Pack to shut down. Should this occur the Dimmer Pack should be left to cool before any attempt to determine the cause of the fault is investigated. In normal use it is unlikely that the Dimmer Pack will shut down and the Indicator illuminate as every Series 2 Dimmer Pack is designed to operate at 100% Duty Cycle. Only in extreme circumstances, such as with a faulty fan module, would a situation cause the Packs shut down.

Logic Supply Indicators.

The Logic Supply Indicators (+15V and -15V) illuminate to show that the Control Circuits of the Dimmer Module are functioning correctly. In normal operation both + and - 15V Indicators will be illuminated.

If the Over Voltage Indicator is on due to an incorrectly wired mains supply then both Logic Supply Voltage Indicators will not be illuminated.

If the Over Temperature Indicator is illuminated, due to exceeding the temperature ratings, then only the -15V Indicator will be illuminated.

Linear Lamp Response.

The Linear Lamp Response Indicator shows that a Linear Lamp response has been selected using the internal Bit Switch (See Bit Switch Settings Page 21). Linear Lamp Response is provided for use with lighting control boards or multiplex systems that have their own control curve profiles.

Log Law B Response.

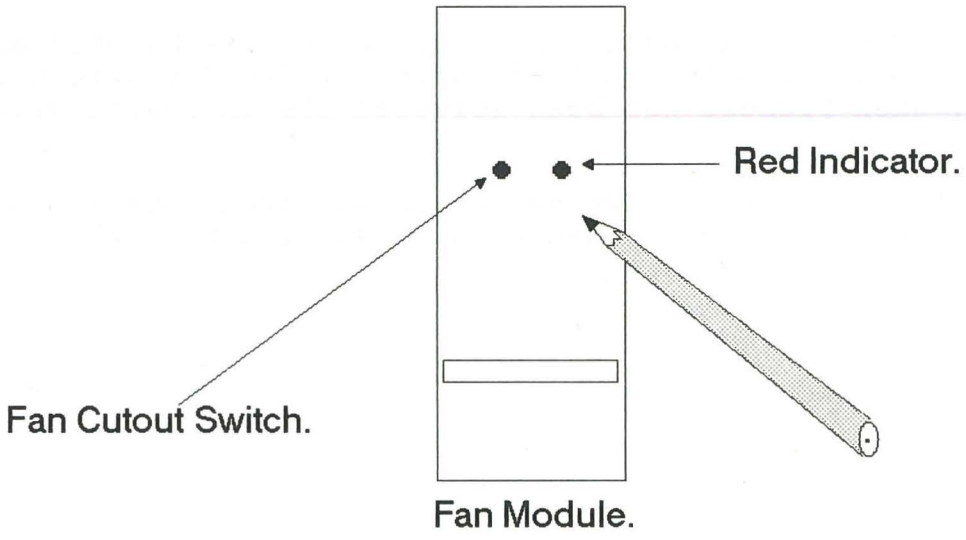
The Log Law B Response Indicator shows that a Log Law B response has been selected using the internal Bit Switch (See Bit Switch Settings Page 21). Log Law B Lamp Response is the normal setting for use with most lighting control boards and complies with BBC TV304.

Preheat Indicator.

On Series 2 Dimmer Modules a Preheat circuit is available and is selected by using the internal Bit Switch (See Bit Switch settings Page 21). When Preheat has been selected the Indicator will illuminate.

Note; The Preheat circuit can be set to different levels as well as being switched in and out (See Preheat Setting Page 21).

Fan Cutout - TV10 and TV25.



A fan cutout switch is provided on both the Series 2 TV10 and TV25 Dimmer Packs to allow the user to de-select fan operation if he so desires.

The switch is located on the fan module above the handle and is accessed by using a pencil or similar object to push the switch button which is recessed for security. When the Fan Module is On the Red Indicator next to the switch will illuminate.

A subsequent push of the button will turn off the fans operation and extinguish the Red Indicator.

After turning the fan off you will be able to select fan operation again by pushing the button once more.

Special attention must be made to the Dimmer Packs' Over Temperature Warning Indicator when selecting the fan operation 'out'.

As Series 2 Dimmer Packs are designed to be forced air cooled switching the fan off might cause a temporary over heating shutdown. This will depend upon Dimmer loading, ambient temperature and duration of fan cutout. This is remedied by leaving the Dimmer Pack for a few minutes until it reaches its' operating temperature. Therefore, as no damage can be done to the Dimmer Pack, a degree of experimentation can be performed to ascertain whether it is safe to run the Dimmer pack with the fan off before commencing with the show proper.

Removing a Dimmer Module.

A Series 2 Dimmer Module may need to be removed for one of three reasons;

To change the Bit-switch settings.

To change the preheat level setting.

To replace the Module.

Removing and reinstalling a Dimmer Module is simplicity itself, follow the steps set out below:

1. Ensure that the Dimmer Pack is isolated from the Mains supply.

Under no circumstances whatsoever must a Dimmer Module be removed before isolating the mains (power) supply.

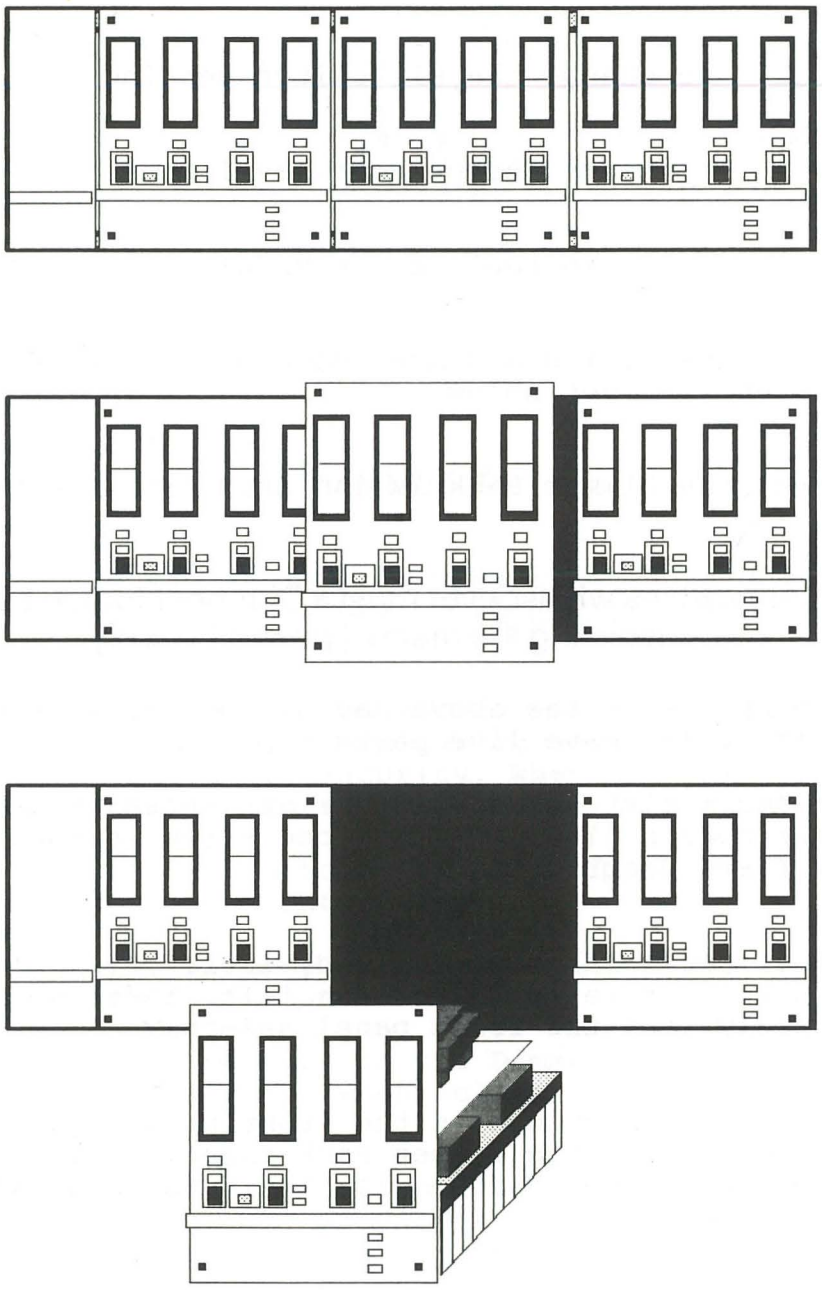
Failure to comply with the above may damage the internal Module connector, and will leave live parts exposed.

2. Using a small flat bladed screwdriver, unscrew the four screws of the Dimmer Module. You will find one screw in each corner of the front panel (see diagram Page 20).

Note. The four screws are captive and, therefore, only need unscrewing until little resistance is felt. They should not be removed entirely from the front panel assembly.

3. Using the handle provided on the front panel, gently withdraw the Dimmer Module from the Dimmer Pack chassis. It is wise to take the weight of the Dimmer Module with the other hand as it reaches one third distance out.

For reinstallation reverse the steps above taking care to gently push the Dimmer Module in until the internal Connector mates. Again, ensure that the Dimmer Pack is isolated from the supply.



Removing a Dimmer Module.

Setting the Bit-Switch & Preheat Level.

The internal Bit-switch, located on the printed circuit board of the Dimmer Module, is used to select the different control curves and the Preheat Status (refer to Page 16 for function details).

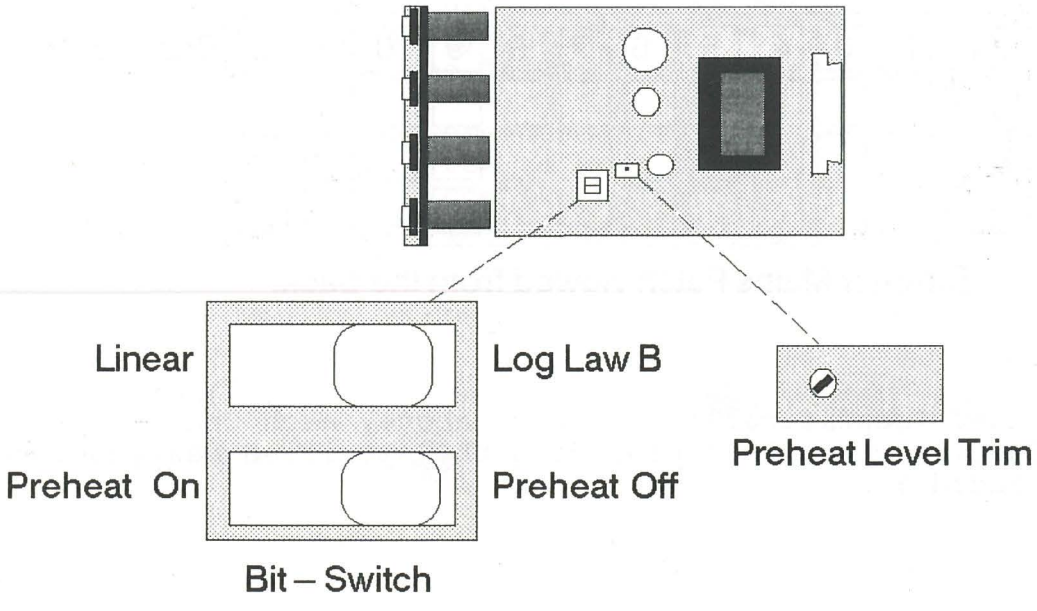
To set the Bit-switch remove the Dimmer Module, following the steps described on Page 19, and place the Module on a flat surface. Locate the Bit-switch (see diagram below) and, using a small screwdriver, carefully slide the appropriate switch across to the desired position. The diagram below shows the actual switch settings for the various functions.

After setting the Bit-switch replace the Dimmer Module, following the steps on Page 19, and connect the Mains power to the Dimmer Pack. The new functions selected will be displayed on the Dimmer Module front panel.

Setting the Preheat Level.

After selecting Preheat On you will see that the factory set level to which it has been set is approximately 15% of full output. However, it is possible to change the Preheat level, if desired, by adjusting the Preheat Trim Pot located next to the Bit-switch on the Dimmer Module circuit card (see below).

To reduce the level of Preheat turn the trimpot anti-clockwise, to increase the level turn it clockwise. The trimpot can be turned a total of ten revolutions (from 0% to 25% intensity).

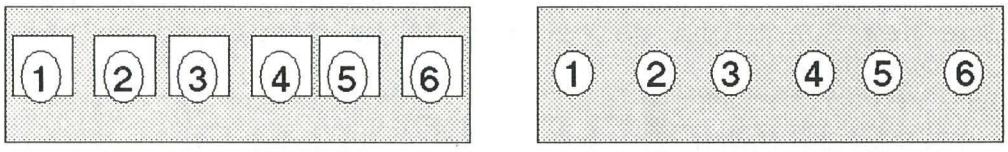


The Back Panels.

Series 2 Dimmer Packs are available with a variety of Back Panel Connectors, each variant has been designed for a particular application.

The TV Dimmers are available with CEE17 or NEMA L5-20 Connectors and the use of these Connectors is straight forward and should require little explanation apart from identifying the channel Outlet configuration.

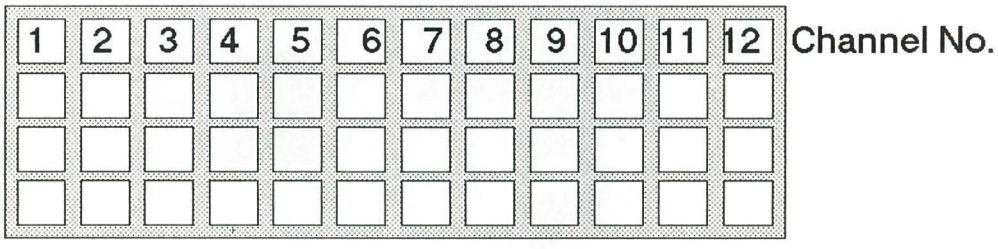
Channel Identification



16A CEE17 Back Panel NEMA L5 – 20 Back Panel

Series 2 Ten and Twenty Dimmer Packs are supplied with either Mains Patch Back Panels (Series and Parallel versions) and Installation Back Panels. In addition the Series 2 Ten is also available with Socapex Outlets.

Both the Series 2 Ten and the Series 2 Twenty have identical Mains Patch Back Panels, only the difference between the Series Wired and the Parallel Wired types need explaining.

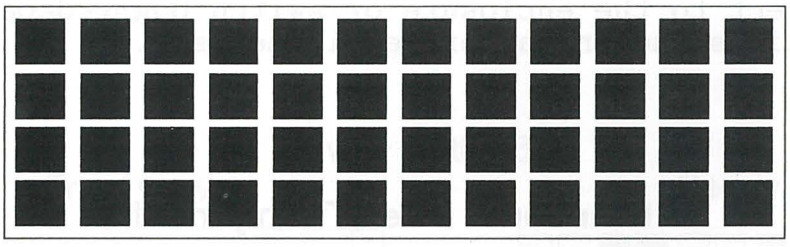


Dimmer Mains Patch viewed from the back.

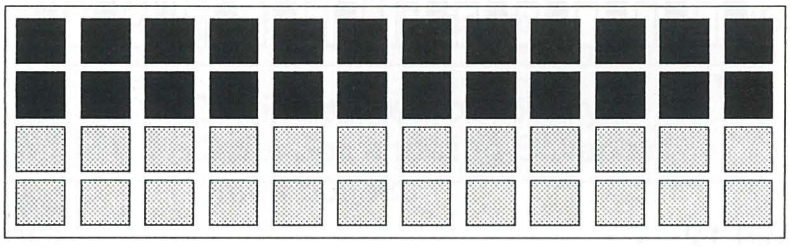
The Channel Identification is shown above, each Channel can accept four lighting circuits (providing the specified maximum load is not exceeded).

The Series Wired Back Panels are colour coded Black/Grey. Each pair of Black Connectors makes one Series Wired Circuit, each pair of Grey Connectors makes another.

The Parallel Wired Back Panels are colour coded Black, any of the four Connectors per channel can be used to connect any lighting circuit.



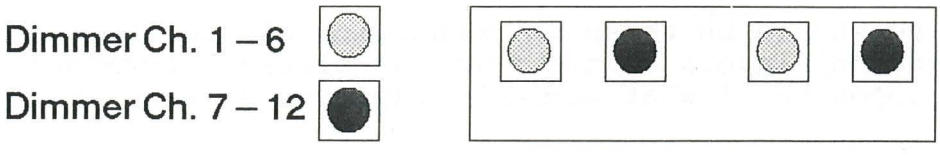
Parallel Mains Patch Back Panel (All Black)



Series Mains Patch Panel (Black/Grey)

The Mains Patch Back Panels are designed to accept the Mains Patch Cords provided with the 36-way Outlet Box. For additional information on connection see 36-Way Outlet Box, Page 25.

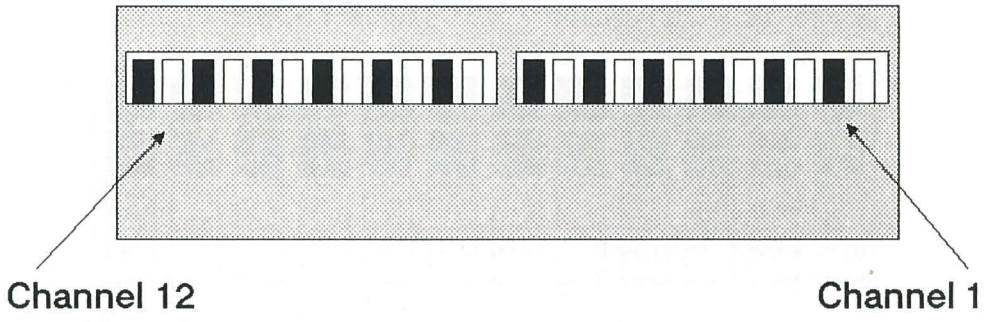
The Series 2 Ten/Socapex is provided with four Socapex Connectors. Each Socapex connector is wired to accept six lighting circuits. Therefore it is possible to connect 24 circuits to 12 Dimmer Channels (Providing the rated channel loading is not exceeded).

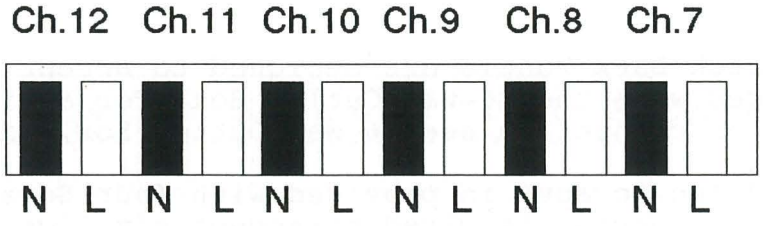


The Series 2 Ten and Twenty Install versions are provided with two terminal block (terminal strip) Connectors on the Back Panel. One terminal block connects to Dimmer Channels 1 - 6 and the other to Dimmer Channels 7 - 12.

Each terminal block is designed to accept the live and neutral wires from the lighting circuits. The earth (ground) wires are connected direct to the enclosure or switch box (depending on local regulations and installer requirements).

Rear Series 2 Ten/Twenty Install.





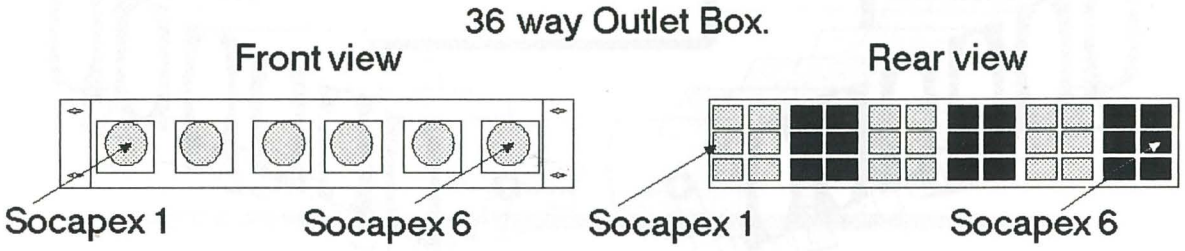
Detail view of one Terminal Connection Strip.
Note that ch.12 is to left, ch. 7 is to right.

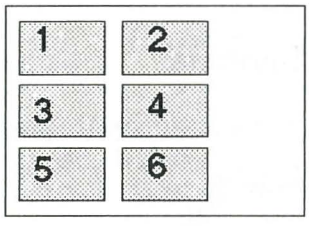
Extra care should be taken in connection of the lighting circuits as the channel layout of the terminal blocks (terminal strips) are the opposite of what would be expected (see diagram above).

36 way Outlet Box.

The Celco Series 2 36-way Outlet Box is used to connect the lamps on multicore circuits to the Dimmer Packs.

Each 36-way Outlet Box is provided with six Socapex 419 type Connectors on the front panel and 36 Mains Patch Inlets on the rear. The Socapex's are labelled in multiples of 6 (depending on rack type) from 1 - 6. The Mains Patch Inlets are labelled to correspond with the Socapex Connectors on the front, again this depends on rack type.





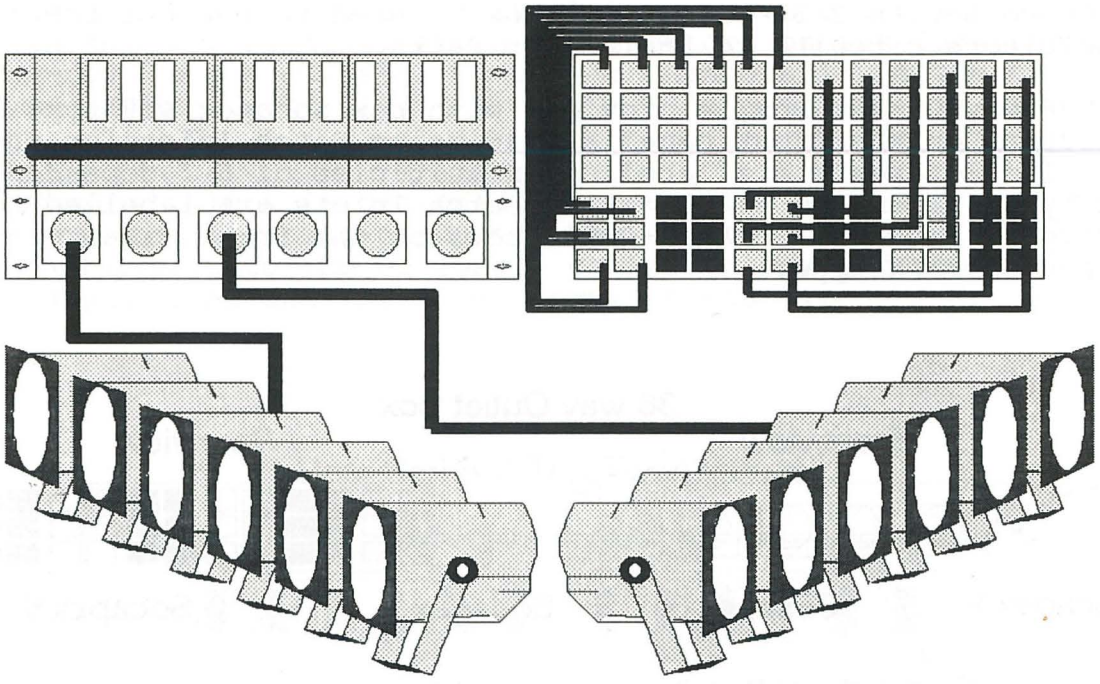
Detail rear view of 36 way Outlet Box showing Socapex circuit outlets.

Patching is performed by connecting a multicore to the appropriate Socapex connector on the front panel and then, using the Mains Patch Cords, connecting between the Socapex circuit (any one of six) and an appropriate Dimmer Channel.

As each Dimmer Channel has 4 Outlet Connectors per channel it is possible to connect up to 4 lighting circuits from any one, or combination of, Socapex Connectors provided that the Dimmer Channel Load Rating is not exceeded.

To make identification easier, each group of 6 Mains Patch Inlet Connectors on the rear of the 36-way Outlet box is alternately colour coded black and grey.

The diagram on the next page shows how to Patch 12 lamps, on two multicores, to 12 independent Dimmer Channels.



Patching 12 Lamps to 12 Dimmer Channels.

In the diagram above the 12 lamps have been connected via Socapex's 1 and 3 to Dimmer Channels 1 to 12. Of course, it would be possible to connect the 12 lamps via Socapex's 1 and 2 or 3 and 6 or any other combination if required.

It would also be possible to connect lamps 1 to 4 to Dimmer Channel 1, lamps 5 to 8 to Dimmer Channel 2 and lamps 9 to 12 to Dimmer Channel 3 providing the Dimmer Channel Load Capacity has not been exceeded.

Important:

The 36-way Outlet box must be grounded to earth using the Earthing Braid provided. This can be connected to the threaded bush on the mains cable recess (left hand side) using the M6 Screw provided.

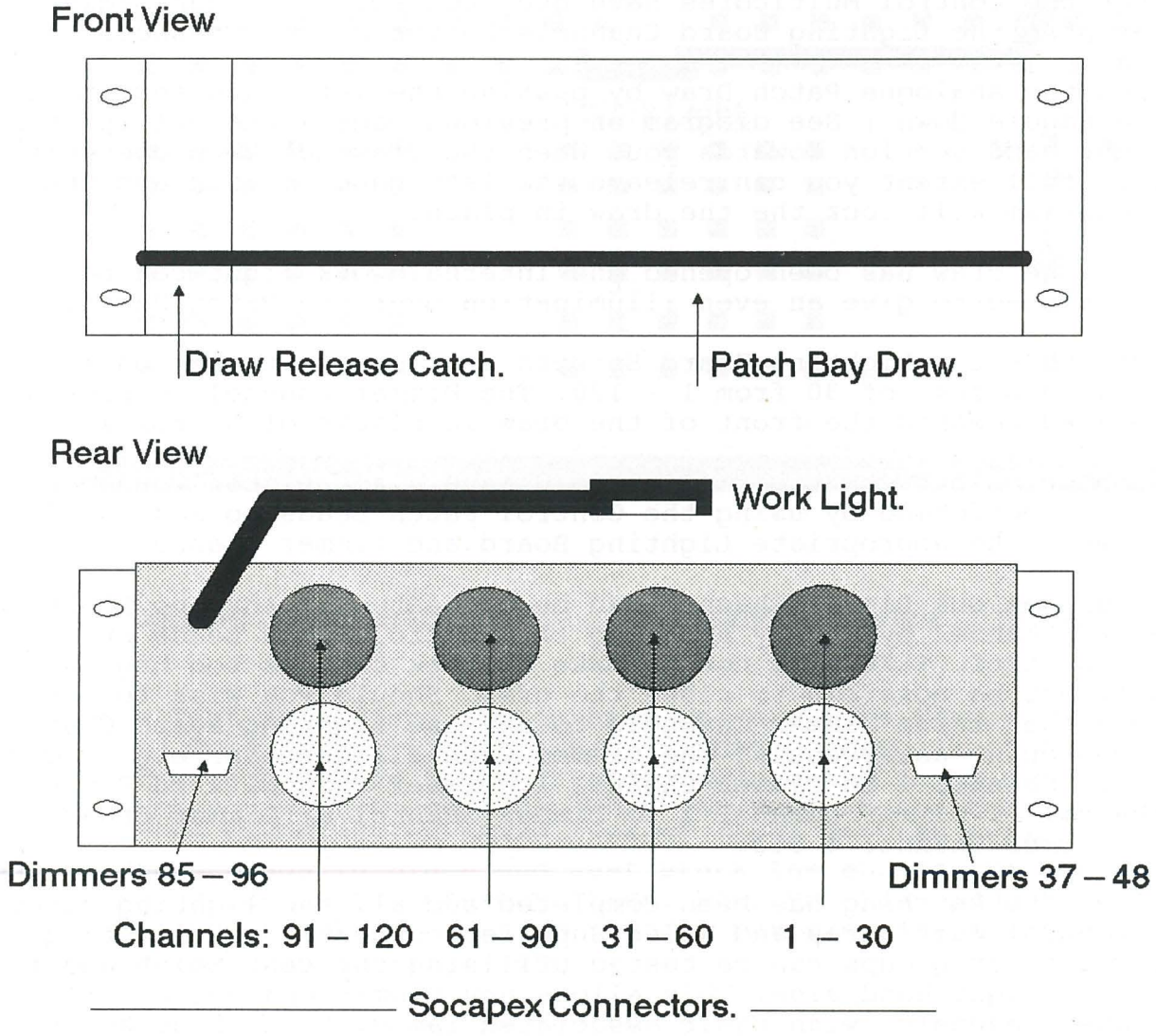
If installing the 36-way Outlet box in an Installation or Touring Rack ensure that the Earthing Braid is connected to the cabinet or enclosure and, in turn, make sure that the cabinet is securely connected to earth.

All earths (Grounds) on the Socapex Connectors are not wired to the Mains Patch Cords. Socapex Earths are connected to an internal buss-bar in the 36-way Outlet box.

The Analogue Control Patch.

The Series 2 Analogue Control Patch allows the connection of up to 120 Lighting Board Control Signals to 96 Dimmer Channels. The Patch Bay is located in a draw which is accessible from the front of the unit.

The diagram below shows both the front and rear views of the Analogue Control Patch.



Control Multicores can be connected to either the Male or Female Socapex's on the back of the unit as both types are wired in parallel, however it would be standard practice to use the Male connector as this is generally regarded as the input.

Multicores should be connected in order, i.e. multicore from Lighting Board Channels 1-30 connected to Analogue Control Patch Socapex 1-30, multicore from Lighting Board Channels 31-60 connected to Analogue Control Patch Socapex 31-60 etc.

Once the Control Multicores have been connected you can begin Patching the Lighting Board Channels to the Dimmer Channels.

Open the Analogue Patch Draw by pushing the left hand section of the handle down (See diagram on previous page) and pulling the right hand section towards you. When the draw has been opened to its' full extent you can release the left hand section and the mechanism will lock the the draw in place.

Once the draw has been opened the internal work light can be positioned to give an even illumination over the Patch Bay Area.

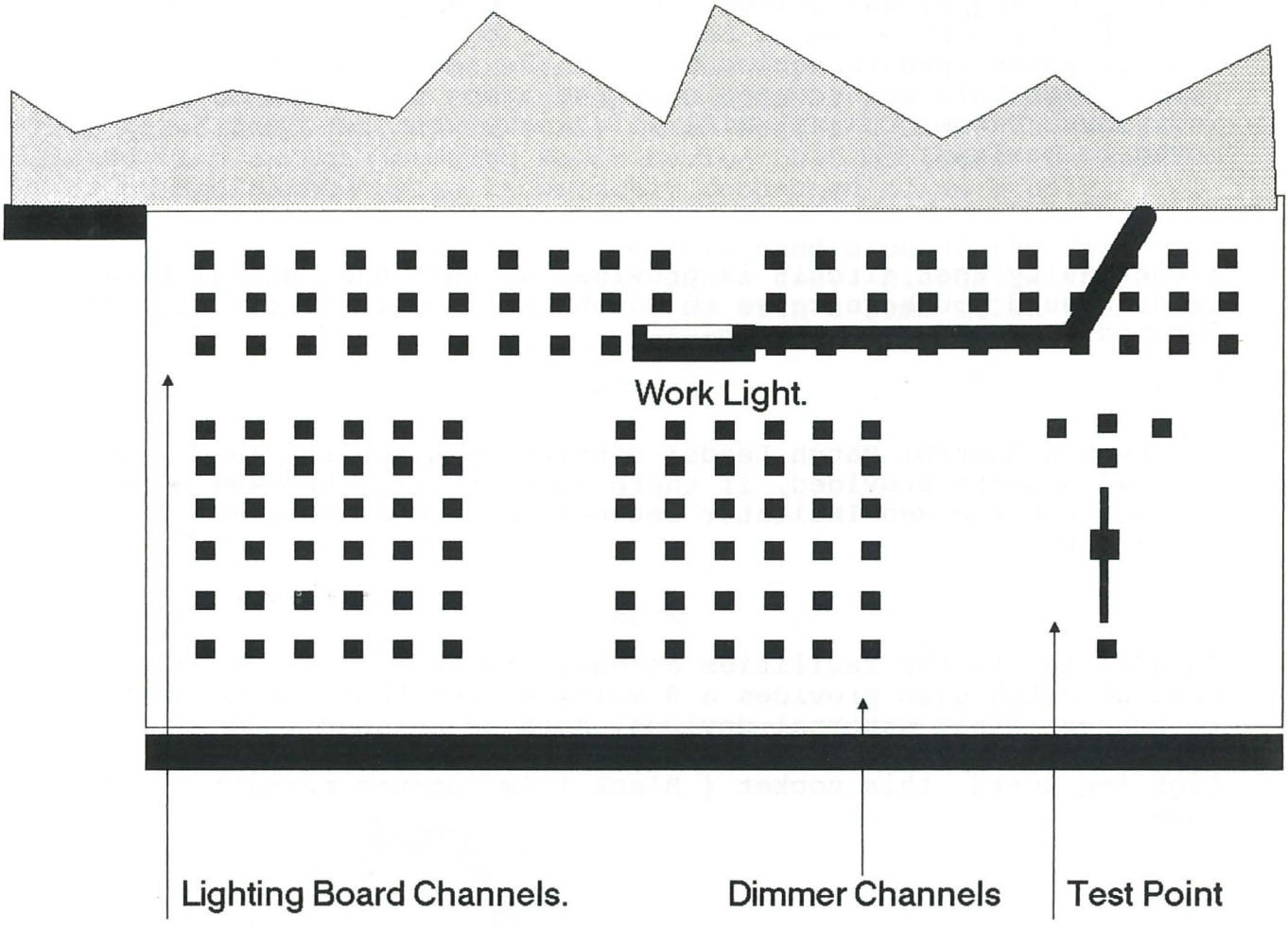
Note that the Lighting Board Sockets are located to the back of the draw in blocks of 30 from 1 - 120. The Dimmer Channel Sockets are located towards the front of the draw in blocks of 6 from 1 - 96.

Connection between Lighting Board Channels and Dimmer Channels is easily performed by using the Control Patch Leads to make a circuit between the appropriate Lighting Board and Dimmer Channel Sockets.

More than one Dimmer Channel can be connected to any one Lighting Board Channel by simply stacking the Control Patch Leads on top of one another. Take care not to make a stack that is too high as it will not be possible to close the draw. Should you wish to connect more than three Dimmer Channels to any one Lighting Board Channel you should 'daisy chain' the Dimmer Channels together e.g. Lighting Board Channel 1 to Dimmer Channel 1, Dimmer Channel 1 to Dimmer Channel 2, Dimmer Channel 2 to Dimmer Channel 3, Dimmer Channel 3 to Dimmer Channel 4 etc.

After the Patching has been completed and all the lighting circuits , control multicores and Mains Supplies connected the lighting circuits or groups can be tested utilising the test point and fader on the right hand side. This allows any Dimmer Channel or groups of Dimmer Channels, with their associated lamps, to be brought up to full power without having to go to the Lighting Board.

The diagram on the next page shows the position of the Lighting Board sockets, Dimmer Channel sockets and test Point and fader.



To use the Test Point facility connect one end of a Control Patch Lead to the Test Signal Socket (Red) located above the Test Fader and the other end of the Control Patch Lead to the Lighting Board Channel that you want to control. When you connect the Control Patch Lead to the Lighting board Channel leave all the other Control Patch Leads in place and just stack the end of the Control Patch Lead on top of the present stack. When you have made the connection move the Test Fader up towards maximum, the lighting circuits will begin to illuminate.

It is always possible to check whether a Test (or Control) Signal is making a circuit by viewing the Control Input Indicators on the Dimmer Modules.

Testing an individual Dimmer Channel is easily performed by removing the Control Patch Lead that is connected to the Dimmer Channel Socket and replacing it with the lead connected to the Test Point. With this arrangement only the lamps connected to the individual Dimmer Channel will illuminate when the Test Fader is moved to maximum.

A continuity test circuit is provided to test the Control Patch Leads should you have cause to doubt their reliability. This is located above the Test Fader.

To check a Control Patch Leads' continuity place the lead ends in the two sockets provided, if there is continuity between both ends of the lead the Red Indicator between the two sockets will illuminate.

In addition to the facilities already mentioned the Analogue Control Patch also provides a 0 volts socket that can be utilised to connect other external devices, such as strobes', smoke machines etc., onto the patch and subsequently control them from the Lighting Board. this socket (Black) is located beneath the Test Fader.

On the rear of the Control Patch there are two 'D' type connectors labelled 'Dimmers 37 -48' and 'Dimmers 85 - 96'. These two connectors provide either duplication of the internal Dimmer Channels (if the Dimmer Rack size is above 36 Channels), or additional Dimmer Channels. In both cases these connectors can be used to affix additional equipment, such as more Dimmer Packs, to the Patch Bay. This offers the owner greater flexibility as a 36 Channel Touring Rack, for example, can quickly be upgraded to a 48 Channel Rack by adding two TV25 Dimmer Packs and controlling them from the Analogue Patch Bay in the Touring Rack.

If the D Type connectors are utilised in a Touring rack of more than 36 Channels then it must be remembered that additional Dimmer Packs will be running in parallel with Dimmer Channels 37 -48 and 87 - 96.

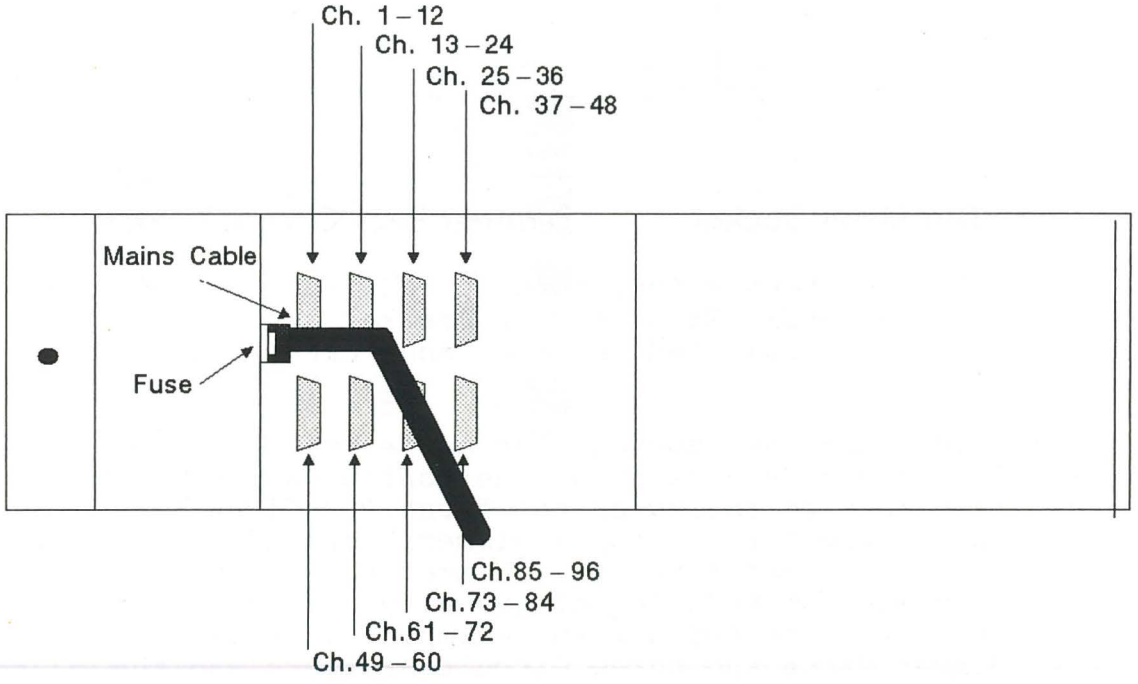
Installing a Control Patch.

If you have purchased an Analogue Control Patch separately you will need to install it in your flightcase or touring rack.

Each Analogue Control Patch is provided with a mains cable which should be connected to a single phase mains (power) supply. The Analogue Control Patch, like all Celco Series 2 Dimmer Products, is fitted with an Auto-seeking Power Device that protects the unit from damage caused by an incorrectly connected mains supply.

The mains cable is situated on the left hand side of the Control Patch and is recessed in the mains cable tray. Alongside the mains cable is a fuse holder, this is fitted with a 20mm 1.25A fuse. The fuse protects the unit from short circuits and overload.

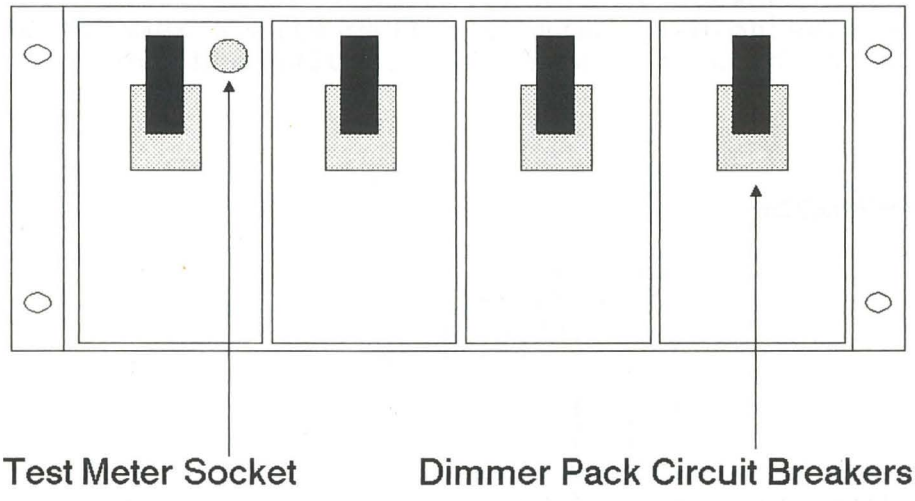
Side elevation.



The output from the Control Patch to the Dimmer Packs is via 'D' type connectors. These are located in the mains cable recess, as shown in the diagram above. The technical appendix at the back of this manual details the pin wiring required to construct a signal cable to connect the 'D' type outputs on the Control Patch to the 'D' type inputs on the Dimmer packs. When connecting the Outputs from the Control Patch to the Inputs of the Dimmer Pack ensure that you identify and connect the correct channels to avoid mistakes.

The Power Distribution Unit.

The Series 2 Power Distribution Unit distributes the incoming mains supply to the Dimmer Packs through three or four Circuit Breakers (depending on Rack size). PDU's are available with a choice of Circuit Breaker ratings and Mains Power Inlets, this allows their use in a variety of different applications. Each PDU is supplied with a Test Meter that offers the user tyhe ability of measuring the supply voltage and current on each phase.

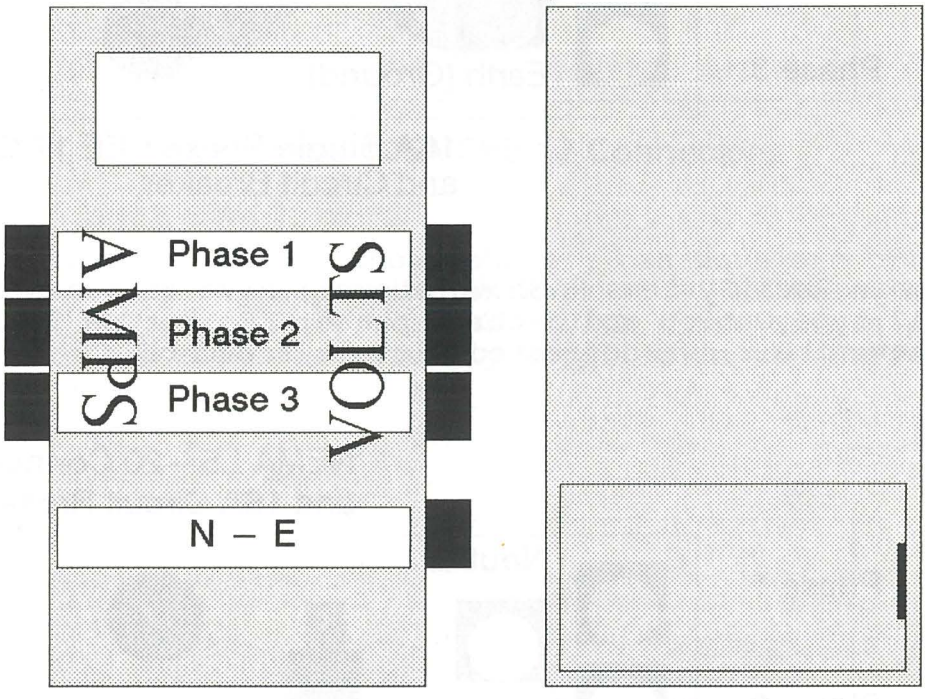


The diagram above shows a four circuit PDU, such as would be fitted to a US0048 or 4800SOX. Each Circuit Breaker is in the 'ON' position when it is switched up-wards and 'OFF' when it is switched down.

Both the US0048 and the 4800SOX have an 'even' number of Dimmer Packs and, in cases such as this, the configuration of PDU Circuit Breakers is simple to follow as the first PDU Circuit Breaker will be connected to the first (top) Dimmer Pack and the fourth PDU Circuit Breaker to last (bottom) Dimmer Pack. However, in some cases there might not be an equal quantity of Dimmer Packs and PDU Circuit Breakers - the 6000SOX for example. In this situation there are five Dimmer Packs and three Circuit Breakers and the configuration would be: Dimmer Packs one and two connected to Circuit Breaker one, Dimmer Packs three and four to Circuit Breaker two and Dimmer Pack five to Circuit Breaker three. Therefore, whenever a Dimmer Rack has an 'even' number of Dimmer Packs there will always be an 'even' number of Circuit Breakers on the PDU and every Circuit Breaker will control one or two Dimmer Packs. In cases where there is an uneven number of Dimmer Packs the last Circuit Breaker on the PDU will always control the 'odd', or last, Dimmer Pack and the others will control one or two 'Packs.

The Test Meter supplied with a PDU can be connected to the socket that is located on the front panel (as shown on the previous page). The Test Meter will display both the voltage and current per phase. If you have purchased a PDU with CEE 17 125A Inlets you will see that there is more than one Test Socket, this allows the voltage and current on each Inlet Connector to be read as each connector might be connected to a different Power Supply (Where permitted).

The Test Meter is easily operated by pushing the left or right buttons to display the voltage and current readings per phase. If you are using a Single Phase PDU (Such as the MPP3600U) then only the Phase 1 Buttons will operate.



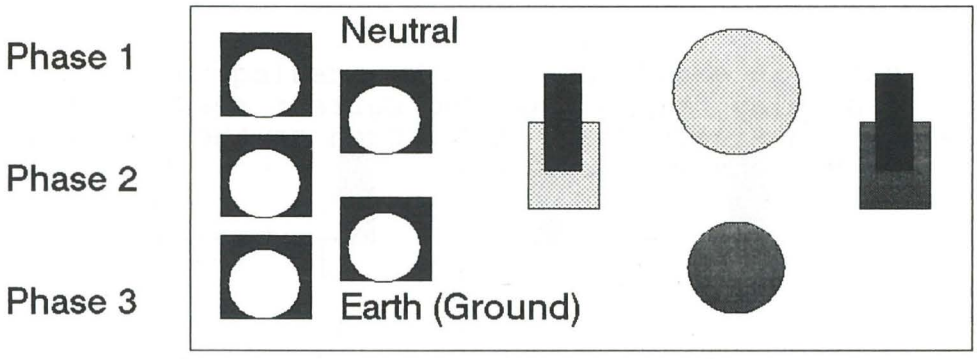
Battery Housing Cover

The Battery Housing on the rear of the Test Meter contains a PP9 battery, a type that is commonly available in any high street store throughout the world. Should the battery need changing (after some considerable time) remove the rear Housing Cover, using a small screwdriver or coin, and disconnect the battery from the terminal. Reverse this procedure to fit a new battery.

Note: The Test Meter only operates when connected to the PDU, when it is not connected operation of any kind is disabled to prolong the life of the battery.

PDU's equipped with Camlok Mains Power Inlets are provided with additional outlet connectors. These can be used to power the 'out front' equipment or three phase motors.

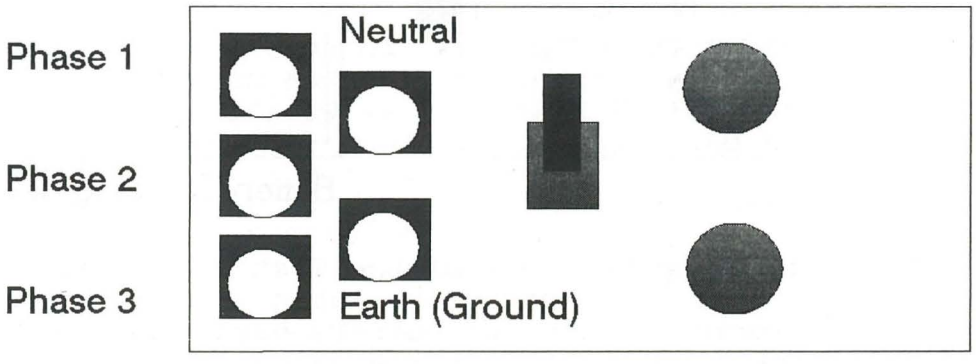
32A, 3 Phase CEE 17 Outlet and Circuit Breaker.



16A,Single Phase CEE 17 Outlet and Circuit Breaker.

The European Rack Systems (Shown above) have both a single phase 16A CEE 17 type Outlet and a three phase CEE 17 type Outlet. Both Outlets have their own dedicated Circuit Breakers.

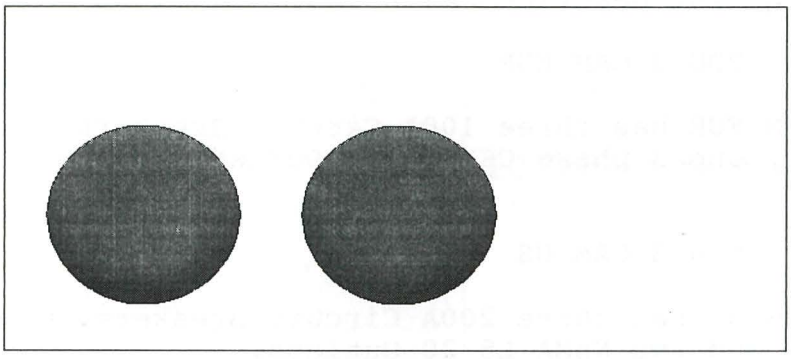
NEMA L5 – 20 Connectors and 16A Circuit Breaker.



American Rack Systems (Shown above) are supplied with twin NEMA L5-20 Outlets on one single phase 16A Circuit Breaker.

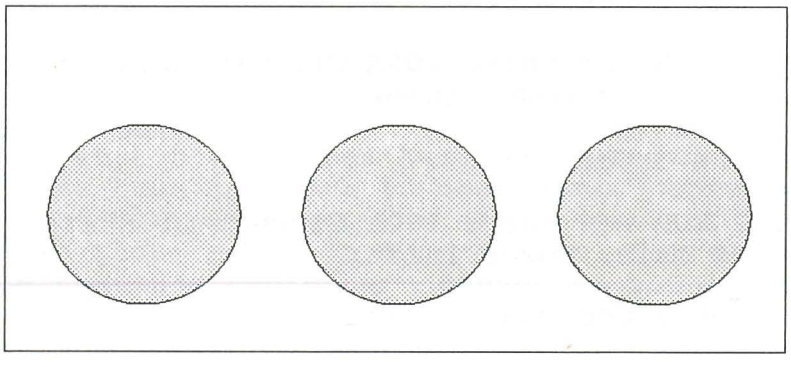
For details of mating connectors and connector wiring see the appendix section at the back of this manual.

PDU's supplied with CEE17 Mains Power Inlets, whether single or three phase, are not supplied with any Auxiliary Outlets as the physical size of the Inlets does not permit additional connectors to be included on the same PDU rear panel.



Three Phase 125A CEE 17 Connectors.

European CEE17 type PDU's (Shown above) can have one or two 3 phase 125A CEE17 Inlets depending on Rack size. UK Television specification PDU's are only available with three Single phase 125A CEE17 Inlets. This model is normally supplied in the MPP3600U Touring Rack System.



Single Phase 125A CEE 17 Connectors.

Installing a Power Distribution Unit.

Installation of a Power Distribution Unit purchased separately requires careful planning to ensure that it will operate satisfactorily. There are eight basic types of PDU available, each model has different Circuit Breaker and Power Inlet combinations. All Circuit Breakers are 3 phase types in either 100A or 200A per phase.

The following list describes each PDU:

Model: PDU 3 CAM EUR

The PDU 3 CAM EUR has three 100A Circuit Breakers, Camlok Mains Power Inlets, one 3 phase CEE17 32A Outlet and one 1 phase CEE17 16A Outlet.

Model: PDU 3 CAM US

The PDU 3 CAM US has three 200A Circuit Breakers, Camlok Mains Power Inlets and two NEMA L5-20 Outlets.

Model: PDU 4 CAM EUR

The PDU 4 CAM EUR has four 100A Circuit Breakers, Camlok Mains Power Inlets, one 3 phase CEE17 32A Outlet and one 1 phase CEE17 16A Outlet.

Model: PDU 4 CAM US

The PDU 4 CAM US has four 200A Circuit Breakers, Camlok Mains Power Inlets and two NEMA L5-20 Outlets.

Model: PDU 3 CEE 1 EUR

The PDU 3 CEE 1 EUR has three 100A Circuit Breakers and one CEE17 125A three phase Mains Power Inlet.

Model: PDU 3 CEE 2 EUR

The PDU 3 CEE 2 EUR has three 100A Circuit Breakers and two CEE17 125A three phase Mains Power Inlet.

Model: PDU 4 CEE EUR

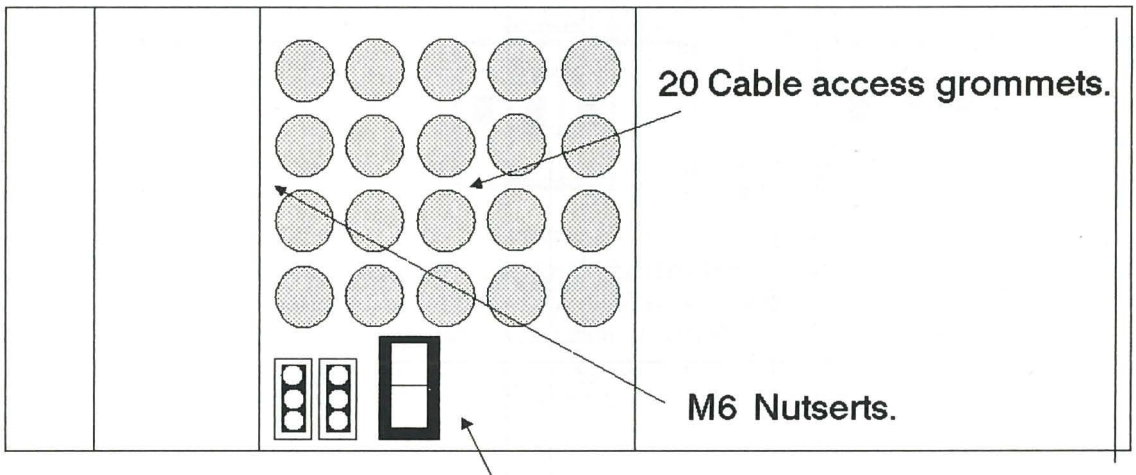
The PDU 4 CEE EUR has four 100A Circuit Breakers and two CEE17 125A three phase Mains Power Inlets.

Model: PDU 3 CEE UK

The PDU 3 CEE UK has three 100A Circuit Breakers and three CEE17 125A single phase Mains Power Inlets.

To connect the mains cables from the Dimmer Packs to the PDU follow the instructions below:

Having wired the Dimmer Packs with appropriate cables (see Dimmer Pack Installation, Page 8) push the cables connected to Dimmer Pack number One through the grommets on the left hand side of the PDU (See diagram below).

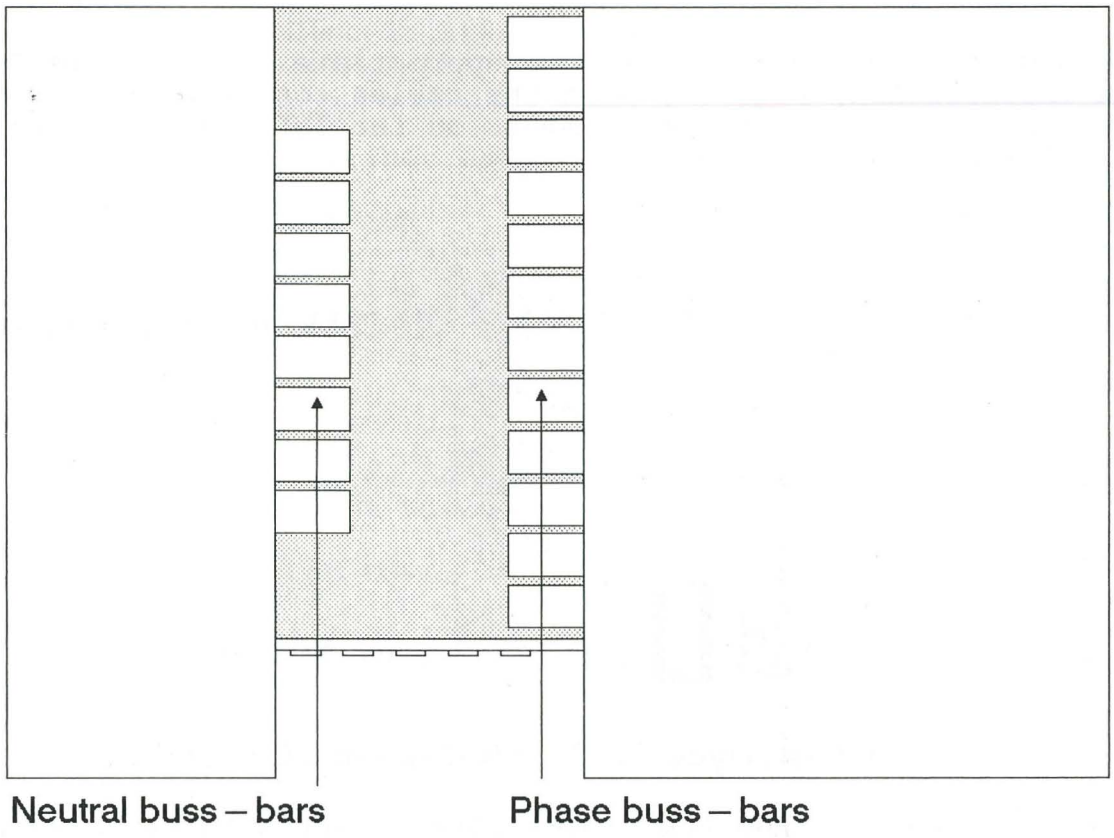


Wieland type ST18 – 3 Sockets and Circuit Breaker

Connect the cables from the Dimmer Pack to the internal buss-bars in the PDU. It would be wise to follow the Celco convention of connecting Dimmer Pack One to Circuit Breaker One, Dimmer Pack Two to Circuit Breaker Two etc. If you have an uneven number of Dimmer Packs then the 'odd' one should be connected to the last Circuit Breaker (the one to the right of the unit).

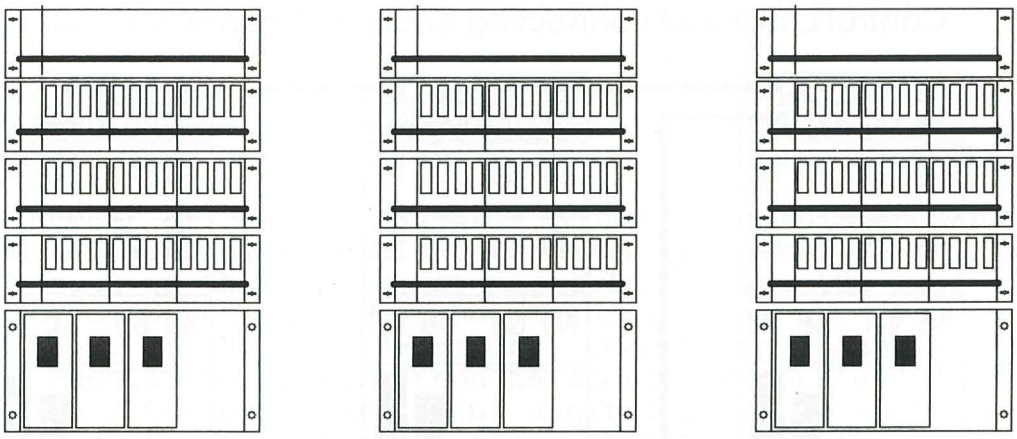
The diagram on the next page shows where the buss-bars are located in the PDU. Note that the Neutral Buss-bars are to the rear of the unit and the Phase Buss-bars are to the front. Depending on the particular type of PDU supplied, the arrangement of buss-bars may be different from those shown in the diagram. Extreme care must be taken to ensure that the cables are connected to the correct buss-bars. Always follow the phase colour coding clearly marked on the PDU and, if necessary, trace the internal wiring from the Mains Power Inlets to the buss-bars to determine the correct connection.

When connecting the Neutral and Phase Cables from a particular Dimmer Pack ensure that they are connected to the same buss-bar system. For instance, if your PDU is equipped with more than one CEE17 type connector it would be in-advisable to connect the phase cables from a Dimmer Pack to one Inlet and the neutral to another.



Every PDU is supplied with two Weiland ST18-3 type sockets and their mating connectors. These are provided to facilitate connection of other internal equipment such as an Analogue Control Patch or Connexion RxU. The two sockets have their own 10A Circuit Breaker to protect the additional equipment. Wiring details are shown in the technical appendix.

Linking two or more Racks.

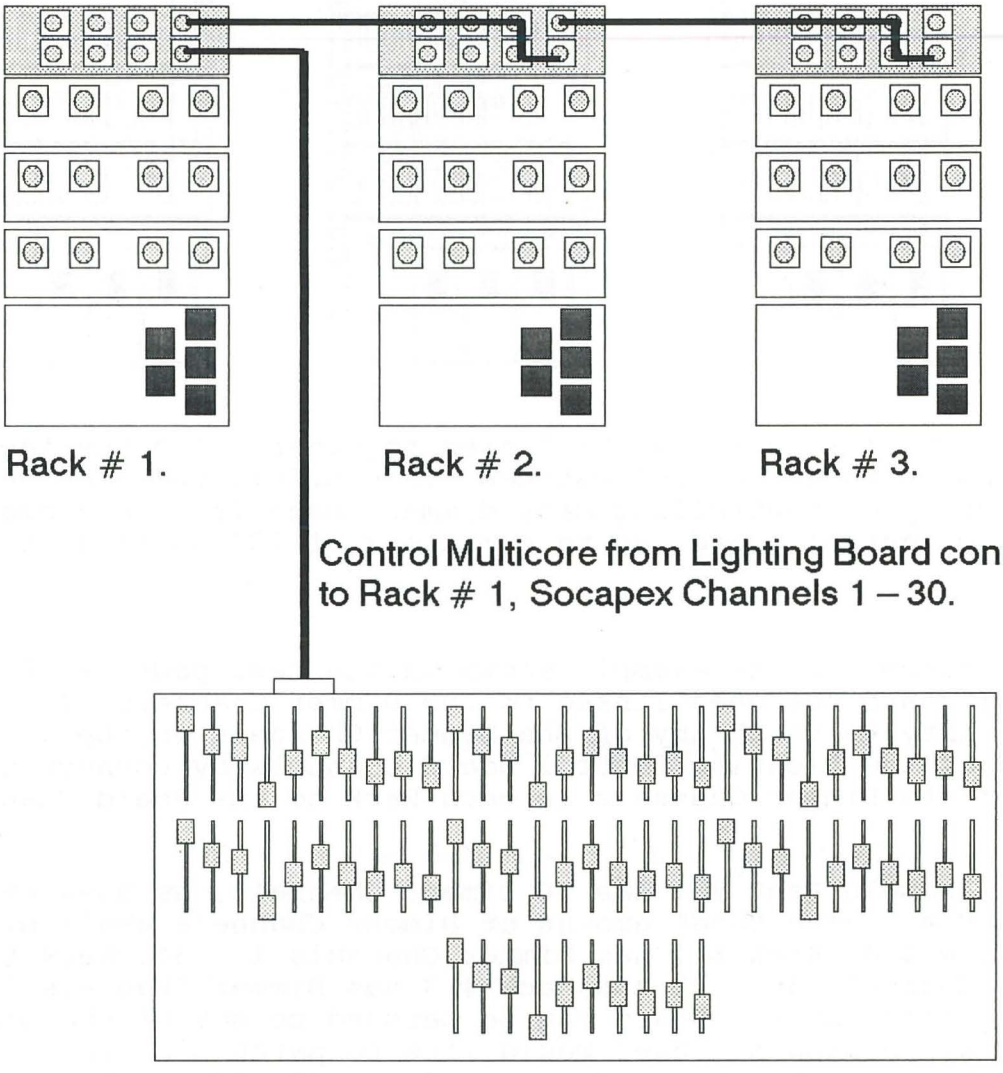


Series 2 Dimmer Racks can be linked together using the facilities provided on their Control Patches. This offers the user the opportunity of controlling many dimmer channels from a smaller lighting control board, up to a maximum of 120 control channels in size.

For instance, in the example shown on the next page, a 30 channel control board has been linked to 108 Dimmer Channels. The user has the ability to patch any of the Dimmer Channels in the Dimmer Racks to any of the Lighting Control Board Channels by connecting the appropriate Dimmer Channels in each Rack to the Board Channels.

In our example Rack # 1 has 36 Dimmer Channels, as does Rack # 2 and Rack # 3. The total amount of Dimmer Channels available is therefore 108. Rack # 1 has Dimmer Channels 1 - 36, Rack # 2 has Dimmer Channels 37 - 72 and Rack # 3 has Dimmer Channels 73 - 108. The Lighting Control Board can be patched to any of the Dimmer Channels. Perhaps the user would like to patch Lighting Control Board Channel 1 to Dimmer Channels 3, 7, 39, 43 and 78. This is simply carried out by patching Control Board Channel 1 to Dimmer Channels 3 and 7 in Rack # 1, 39 and 43 in Rack # 2 and 78 in Rack # 3. Of course, the Dimmer Racks are not numbered in this way when supplied by Celco so some interpretation must be made. For example, Dimmer Channel 39 in Rack # 2 is labelled Dimmer Channel 3 and Dimmer Channel 78 in Rack # 3 is labelled Dimmer Channel 6. There are several methods of describing actual Dimmer Channels when linking more than one Dimmer Rack. Some technicians call the Rack by number or letter then the Dimmer Channel (e.g. Rack 3/Channel 6, or simply 3/6 and Rack A/Channel 6, or simply A/6) and others by the system number 78.

Control Link Lead connecting Socapex Channels 1 – 30's.

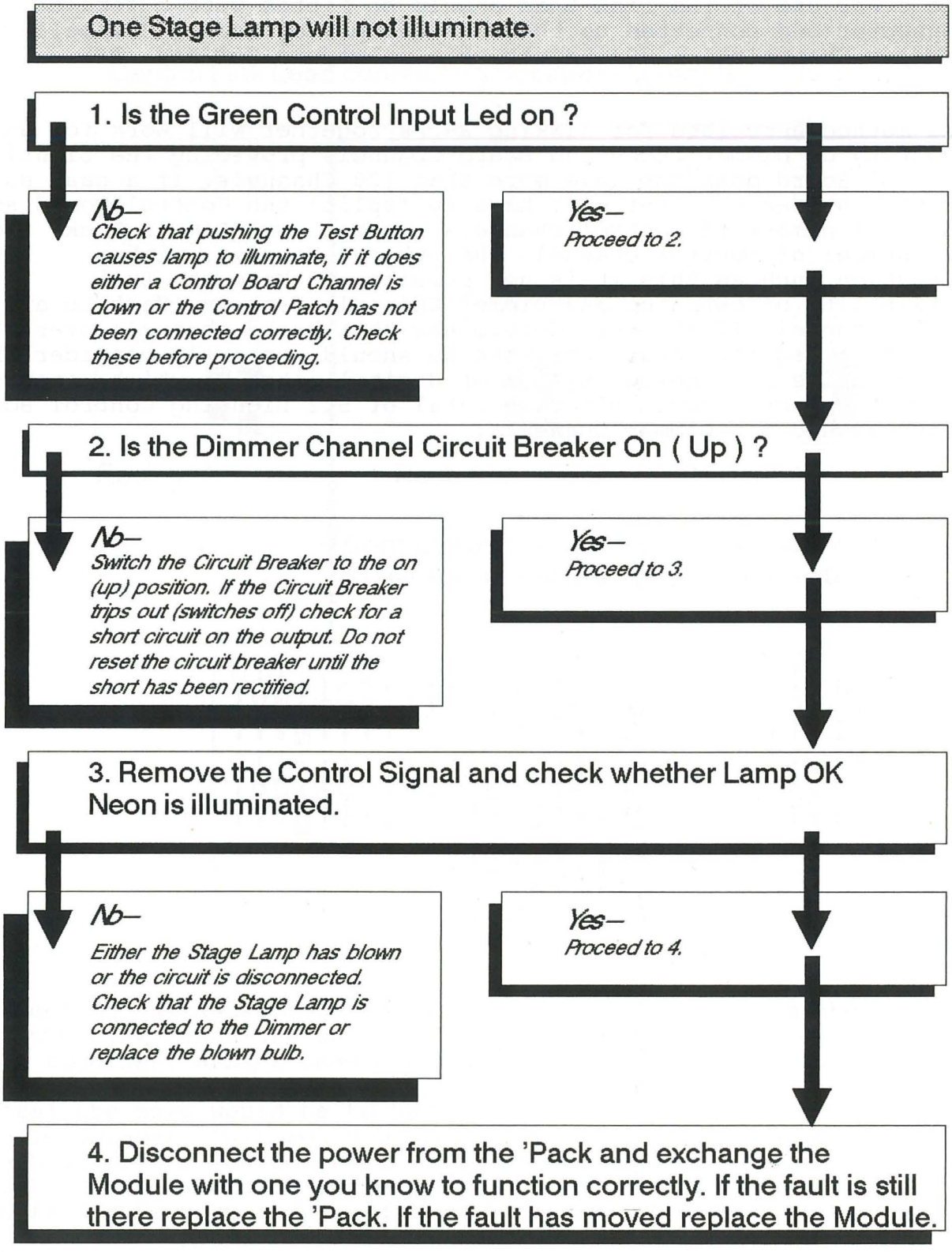


Connecting the Racks together is very easy. The diagram above shows how two Link Leads are used to join the Socapex connectors of every Rack together. A Link Lead consists of a multicore with a Male and Female Socapex connector on each end. As already stated in this manual the norm would be to have the multicore end fitted with a female Socapex. This would be connected to the male connector on the back of the Control Patch labelled 'Socapex Channels 1 - 30'. The Link Lead would be connected above the multicore connector to the female Socapex and would therefore require a male connector,

the other end of the Link Lead should be fitted with a female connector and connected to the male Socapex of Rack # 2 labelled Socapex Channels 1 - 30. Repeat this procedure for Rack # 3.

The method described for linking Racks together will work for any quantity of Dimmer racks and board Channels providing the Lighting Control Board does not have more than 120 Channels. If a case such as this arises the user will have to 'split' the Control Board so that 'n' number of control channels control some Dimmer Racks and 'x' number of control channels the others. However, with a situation such as this it is not possible to have the full flexibility of patching any Dimmer Channels from any Rack to any Board Channel. If the user determines that board channels over 120 will be a regular occurrence then he should seriously consider the Celco Series 2 Connexion System of digital patching which, amongst many other advantages, offers a total of 512 Lighting Control Board Channels and 512 Dimmer Channels.

Basic Fault Finding.



One Stage Lamp is on all the time.

1. Is the Green Control Input Led on ?

No–
Proceed to 2.

Yes–
Remove the Control Signal. Is the Stage Lamp still on?

If it is proceed to 2.

2. Turn the Channel Circuit Breaker off. Is the Lamp still on ?

No–
Replace the Dimmer Module.
(Refer to Page 19)

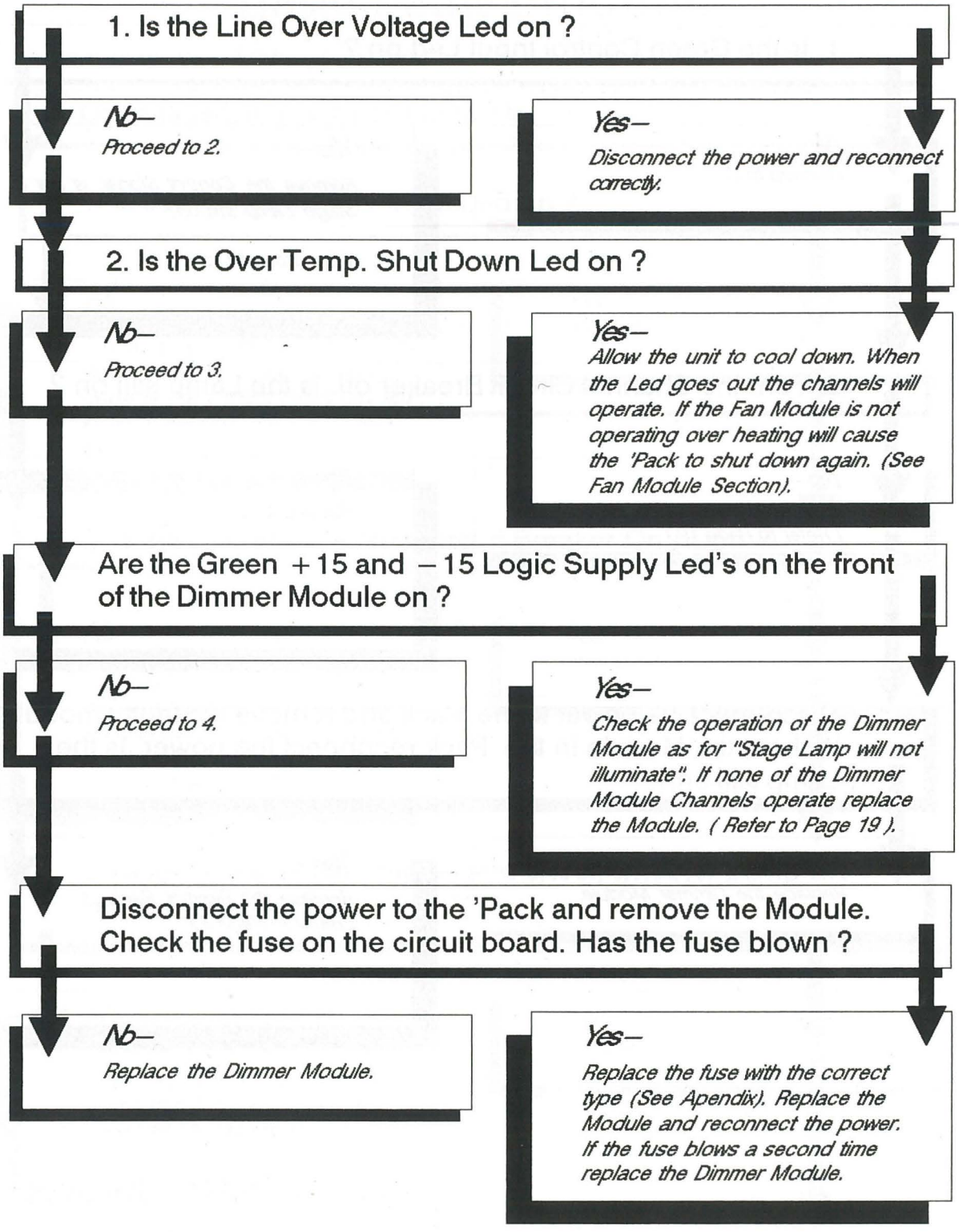
Yes–
Proceed to 3.

Disconnect the power to the 'Pack and remove the faulty module Without the Module in the 'Pack reconnect the power. Is the Lamp still on ?

No–
Replace the Dimmer Module.

Yes–
Replace the Dimmer Pack.
(Refer to Page 8)

A Dimmer Module of 1, 2 or 4 Channels will not function.



All of the Channels in a Module are on all the time or fade unevenly

1. Are the Green Logic Supply Voltage Led's on ?

No–

If both Led's are off check the fuse as in the previous page. If one Led is on and the other is off replace the Dimmer Module (Refer to Page 19 for details).

Yes–

Check the operation for each Channel as in the previous page. If none of the Dimmer Module Channels operate replace the Dimmer Module (Refer to Page 19 for further details).

Channels on different Modules or 'Packs do not fade the same way.

1. Is the Lamp Response set the same in all the Modules ?

No–

Disconnect the power to the 'Pack and set all the Modules to the same response curve. (Refer to Page 21 – Setting the Bit Switches – for further details).

Yes–

Proceed to 2.

2. Are the Preheat settings the same on all the Modules ? (Either On or Off on every Module).

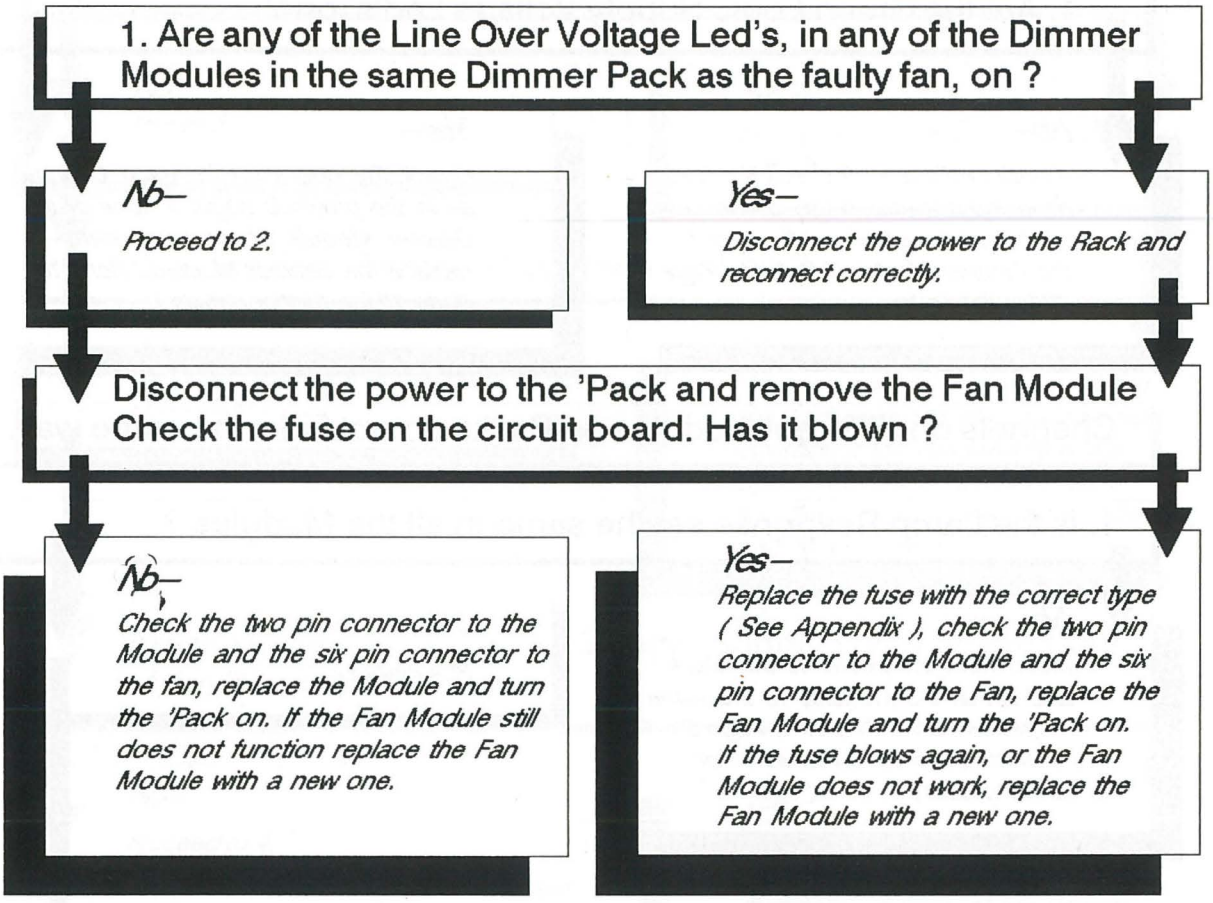
No–

Disconnect the power to the Dimmer Packs and set the Preheat switches to the same settings in all the Dimmer Modules.

Yes–

Check the fade on all the Modules and try to single out one Module as being different from the rest. Once this test has been performed isolate the power to that Modules' Pack and replace the Module with a new one.

The Fan Module does not operate.



Control Patch Work Lights and Test Point do not function.

1. Are all phases connected to the Rack and switched on ?

No–
Connect the power to the Rack and switch on. Check that all the phases are correct by using the Power Distribution Test Meter supplied with the Dimmer rack.

Yes–
Proceed to 2.

2. Is the Control Patch power lead connected to the PDU.

No–
Connect the Weiland connector on the Control Patch power lead to the PDU. Remember to disconnect the power before opening the Rack Door and switch it back on after connecting the plug.

Yes–
Proceed to 3.

3. Check that the Circuit Breaker to the side of the Weiland sockets on the PDU is on and that the Control Patch fuse hasn't blown.

No–
Switch the Weiland Socket Circuit Breaker on and/or replace the Control Patch fuse. Should either the Circuit Breaker trip out or the fuse blow again proceed to 4.

Yes–
Proceed to 4.

4. Remove the Control Patch from the Rack after disconnecting the power and control leads from the left hand side. Remove the rear top cover to reveal a circuit board. Disconnect the circuit board from the two connectors and replace with a new one. Refit the rear top cover and install the Control Patch in the Rack, connect up the D Type sockets and power. Does it operate correctly now ?

No – Replace the Control Patch

Yes – Job done, problem solved!

A complete Pack cannot be controlled from the Test Point (Green Control Led's do not light), even though the Pack can operate from the Channel Test Buttons and the Control Patch Test Point does operate channels on other Dimmer Packs.

1. Disconnect the power to the complete Rack and open the side door. Check that the D Type connectors on both the 'Pack and Control Patch are connected. Reconnect the power and test each channel using the Test Point on the Control Patch. Do all the Green Control Input Led's on the Dimmer Modules illuminate ?

Yes – Job finished.

No – Proceed to 2.

2. Disconnect the power to the complete Rack and open the side door. Remove the D Type cable from the Dimmer Pack that will not function and replace with a D Type cable from a Pack that is known to operate correctly. Reconnect the power. Can all the channels on the faulty Dimmer Pack be controlled from the Test Point now ?

Yes – Replace the original D Type cable with a new one.

No – Proceed to 3.

3. Disconnect the power to the complete Rack and open the side door. Remove the D type cable, used in 2 above, from the faulty Dimmer Pack and reconnect it to the working 'Pack that it was originally from. Now connect the other end of that D type cable to the output from the Control Patch to the faulty Dimmer Pack – this will establish whether the Control Patch is at fault – reconnect the power and use the Test Point. Are you now able to bring the Control Input Led's up on the working Dimmer Pack ?

Yes – The problem is in the Dimmer Pack. You can either replace the complete Dimmer Pack or check the connections between the 'Packs D type input and the 'Packs Module connections.

No – Procced to 4.

Connect a known working cable from a known working Control Patch output to the faulty Dimmer Pack. Use the Test Point to determine whether the Green Control Input Led's illuminate on the faulty Dimmer Pack.

Yes – The problem lies with the Control Patch. Either replace the Control Patch or use another of the D type outputs, if available, as a tempory substitute.

No – You have checked all the parts with in the system. Consult your Celco Service centre for further advice.

A single Dimmer Channel cannot be controlled using the Test Point facility provided in the Control Patch (Green Control Input Led does not illuminate). It is assumed that the Dimmer Channel can be controlled using the Dimmer Channel Test Button.

1. Disconnect the power to the complete Rack and open the side door. Check that the D Type connectors on both the 'Pack and Control Patch are connected. Reconnect the power and test each channel using the Test Point on the Control Patch. Do all the Green Control Input Led's on the Dimmer Modules illuminate ?

Yes – Job finished.

No – Proceed to 2.

2. Disconnect the power to the complete Rack and open the side door. Remove the D Type cable from the Dimmer Pack that will not function and replace with a D Type cable from a Pack that is known to operate correctly. Reconnect the power. Can the channel on the faulty Dimmer Pack be controlled from the Test Point now ?

Yes – Replace the original D Type cable with a new one.

No – Proceed to 3.

3. Disconnect the power to the complete Rack and open the side door. Remove the D type cable, used in 2 above, from the faulty Dimmer Pack and reconnect it to the working 'Pack that it was originally from. Now connect the other end of that D type cable to the output from the Control Patch to the faulty Dimmer Pack – this will establish whether the Control Patch is at fault – reconnect the power and use the Test Point. Are you now able to bring the Control Input Led up on the working Dimmer Pack ?

Yes – The problem is in the Dimmer Pack. You can either replace the complete Dimmer Pack or check the connections between the 'Packs D type input and the 'Packs Module connections.

No – Proceed to 4.

Connect a known working cable from a known working Control Patch output to the faulty Dimmer Pack. Use the Test Point to determine whether the Green Control Input Led illuminates on the faulty Dimmer Pack.

Yes – The problem lies with the Control Patch. Either replace the Control Patch or use another of the D type outputs, if available, as a tempory substitute.

No – You have checked all the parts with in the system. Consult your Celco Service centre for further advice.

One or more Lighting Board Channels will not control Dimmer Channels that have been proved operational by using the Test Point facility provided on the Control Patch.

1. Check that the lead(s) used to connect between the Lighting Board and the Dimmer Channel in the Control Patch is working correctly by testing it in the Lead Test Point in the Control Patch. Does the Lead Test Indicator illuminate ?

Yes – Proceed to 2.

No – Discard lead and substitute a new one.

2. Disconnect the Socapex cable from the Control Patch that is connected to the 'Board Channel in question. Using a Voltmeter, set to + 10 volts DC, measure between the pin for the channel not working and 0 volts (pins 35 – 37) on the Socapex that is on the end of the multicore. Do you get approximately + 10 volts DC ?

Yes – Proceed to 3.

No – Check the output from the Lighting Board and the multicore for continuity between both ends.

3. Reconnect the Socapex cable to the Control Patch. Using a Voltmeter set to + 10Vdc and with the 'Board Channel at maximum, measure between the 0 volts socket below the Test Point fader and the socket for the Lifghting Board Channel. Does the meter read approximately + 10 volts DC ?

Yes – The Dimmer Channel should work if connected to a 'Board Channel with a working lead. If the problem persists call your Celco Service Centre for further advice.

No – The problem is in the Control Patch between the Socapex input and the 'Board Channel socket. Either replace the Control Patch or move the Socapex to another input, if available, and re – patch the leads as a temporary substitute.

One Dimmer Pack cannot be switched on from the PDU.

1. Are the mains (power) cables connected to all inlets ?

No–

Reconnect power cables to the Dimmer Rack and switch mains power on. Dimmer Pack can then be activated by PDU Circuit Breaker.

Yes–

Consult your Celco Service Centre immediately.

Control Patch Output (To additional Racks) Socapex SL – EF 337P (Chassis Socket Female)	Mating Connector: Socapex SL – FMD 337P (Cable Socket Male)	Pin Wiring: Pins 1 – 30 wired to Channels 1 – 30.
Control Patch Input (From Lighting Board) Socapex SL – EME 337P (Chassis Socket Male)	Mating Connector: Socapex SL – FFDR 337P (Cable Socket Female)	Pins 35, 36 and 37 wired to 0 volts – (Common).
Dimmer Pack Input: 15 way 'D' Type Female. (Chassis Socket Female)	Mating Connector: 15 way 'D' Type Male (Cable Socket Male)	Pin Wiring: Pins 1 – 12 wired to Channels 1 – 12.
Control Patch Output (To Dimmer Packs): 15 way 'D' Type Female (Chassis Socket Female)	Mating Connector: 15 way 'D' Type Male (Cable Socket Male)	Pins 13, 14 and 15 wired to 0 volts – (Common).
Power Distribution Units (Inlets from Mains Supply) Camlok J Series E1016 (Chassis Socket Male)	Mating Connector: Camlok J Series E1016 (Cable Socket Female)	Wiring Details: Phase 1 – Red Phase 2 – Yellow Phase 3 – Blue Neutral – Black Ground – Green
CEE 17, 125A, 3p N + E (Chassis Inlet) CEE 17, 32A, 3p N + E (Chassis Outlet)	CEE 17, 125A, 3p N + E (Trailing Cable Outlet) CEE 17, 32A, 3p N + E (Trailing Cable Inlet)	Phases 1,2 and 3 wired to terminals 1,2 and 3. Neutral to terminal 'N', Ground to terminal 'E'
CEE 17, 125A, 1p N + E (Chassis Inlet) CEE 17, 16A, 1p N + E (Chassis Outlet)	CEE 17, 125A, 1p N + E (Trailing Cable Outlet) CEE 17, 16A, 1p N + E (Trailing Cable Inlet)	Phase 1 to terminal 'L'. Neutral to terminal 'N', Ground to terminal 'E'.

36 way Outlet Box. (Socapex Outlets) Socapex SL – EF 419AR (Chassis Socket Female)	Mating Connector: Socapex SL – FMD 419AR (Cable Socket Male)	Pin Wiring: Circuit 1 Live to Pin 1 Neutral to Pin 2. – thru to..... Circuit 6 Live to Pin 11, Neutral to Pin 12. Circuit 1 Ground to Pin 13 thru Circuit 6 Ground to Pin 18.
Series 2 Ten/Sox Socapex SL – EF 419AR (Chassis Socket Female)	Mating Connector: Socapex SL – FMD 419AR (Cable Socket Male)	
Series 2 TV10 CEE 17, 16A 1p N + E (Chassis Outlet)	Mating Connector: CEE 17, 16A 1p N + E (Trailing Cable Inlet)	Pin Wiring: Phase 1 to terminal 'L'. Neutral to terminal 'N'. Ground to terminal 'G'.
Series 2 TV12 CEE 17, 32A 1p N + E (Chassis Outlet)	Mating Connector: CEE 17, 32A 1p N + E (Trailing Cable Inlet)	
Series 2 TV10/US NEMA L5 – 20R (Chassis Outlet)	Mating Connector: NEMA L5 – 20P (Cable Plug)	Refer to instructions supplied with connectors for terminal identification
Series 2 TV25/US NEMA L5 – 20R (Chassis Outlet)	Mating Connector: NEMA L5 – 20P (Cable Plug)	

Dimmer Specification

Dimmer Pack — Physical Specifications

The Dimmer Pack shall be 3U high (132mm, 5¼"), 19" Rack Mounting. Dimmer Pack depth shall be 530mm (21"), not including connectors. The Dimmer Pack shall be supported by 4 Support Runners (supplied).
The Power Connections shall be recessed on the left hand side (when viewed from the front) and be made by five terminal block (terminal strip) connections being three phases, neutral and earth (ground).
The Control Input shall be made by a 15 way 'D' type connector (female connector on Dimmer Pack) located in a recess on the left hand side of the Dimmer Pack (as viewed from the front).
The Dimmer Pack shall be made up of a Chassis unit containing all outlet connectors, suppression devices and associated wiring, a Fan Module and three Dimmer Modules containing all electronics, Power and Protection devices.
It shall be possible to remove any of the Dimmer Modules with the Chassis mounted in a rack enclosure (providing the relevant Dimmer Pack has been isolated from the mains power supply).

Electrical Specifications

Control Input;
The Control Input shall withstand external voltages of up to ± 2000V DC.
The common (zero volts) for the Control Input shall *not* be connected to the protective ground (earth).
The Rise Time of the Control Signal, after filtering, shall not exceed 20mS.
Outputs;
The Output of the Dimmer Pack shall be controlled by the Control Input Signal. The response shall be by either Linear, giving a linear response in Vrms output, or, Log Law B (square law B) to meet the requirements of BBC TV304 response specifications.
The response characteristics shall be user selectable by dip switch.
The Output Filtering shall meet the requirements of BS800 (1983), VDE0875 and BBC TV304 for interference suppression.
The Output at full shall be not less than 95% of the incoming mains voltage.
The variation between Channel Outputs for a given input signal shall not be more than ± 2%. The Repeatability on any one Dimmer Channel shall be better than ± 0.5%.

Features

Each Channel of the Dimmer Pack shall be fitted with a Magnetic Circuit Breaker Protection Device. This shall isolate the output if the load exceeds 125% of the rated capacity within 60 seconds or if the current exceeds 200% of rated capacity within 200mS and protect the output device.
Each Dimmer Channel shall have a Lamp OK indicator Neon mounted inside the Circuit Breaker.
Each Dimmer Channel shall have a Control Voltage Indicator to determine whether a Control Signal is present.
Each Dimmer Channel shall have a Test Button. Operation of the Test Button is as follows;
Press Once; To set Dimmer Channel at Half Output.
Press Again; To set Dimmer Channel at Full Output.
Press Again; To set Dimmer Channel off.
Each Test Button shall be equipped with a Test Indicator which shall remain on if the Test Button is selected to half or full power.
Each Dimmer Module in a Dimmer Pack shall be equipped with a Line Voltage Selection Device and a Line Over Voltage Indicator. If the Line Voltage is in the region of 60 - 160 volts the unit will select 120 volt operation. If the Line Voltage is in the region of 160 - 300 volts the unit will select 230 volt operation. If the unit detects a Line Voltage of 300 volts or more the unit will switch off and the Line Over Voltage Indicator illuminate.
Each Dimmer Module shall have an Over Temperature Sensor and Indicator.
Each Dimmer Module shall have an internal Response Selection Switch and Indicator for Linear or Log Law B Control Curves.
Each Dimmer Module shall have a Pre-heat on/off selection switch (internal) with Pre-heat level adjustment (internal) and a Pre-heat on/off Indicator. Pre-heat level is factory set to 15%.
Each Dimmer Pack shall have a Fan Module located on the left hand side (as viewed from the front). This Module shall include a switch circuit to select the Line Voltage to the Fan and to protect the Fan in the event of a cross phasing of the Line Inputs.
The Dimmer Pack shall operate at 100% load on all channels for extended periods in environmental temperatures up to the maximum specified.
The Dimmer Pack shall operate within the range 0 - 50 degrees Centigrade and stored within the range -20 - +70 degrees Centigrade.
The Dimmer Pack shall operate on either a Single Phase Supply or on a Three Phase Star connected supply.
The Case of the Dimmer Pack shall be connected to Protective Ground (Earth). No part of the internal circuit of the unit shall be connected directly or indirectly to the Case.

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