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Please leave this leaflet with the end user for future reference

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A. INTRODUCTION

The Dimmer Switches in these ranges incorporate push on/off switches to provide 1 or 2 way switching and conform to the latest standards BS EN 60669-2-1 and BS EN 55015. They can be divided into two categories.

- Standard Dimmers.** – for use in conventional installations using GLS tungsten filament lamps only.
- Low Voltage Dimmers** – for use in conventional installations as well as Low Voltage Lighting Systems. For detailed explanation of product features in this category, please see section B, Product Features.

A pre-set level of brightness can be achieved if the control knob is not allowed to rotate during the actuation of the push switch.

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B. PRODUCT FEATURES

Standard Dimmers: These dimmer switches use simpler circuitry with overload protection by incorporating thermal cut outs. If this type of dimmer is loaded with higher than the maximum specified load the dimmer will switch off after operating for a period which is dependent upon the severity of the overload. The dimmer switches back on when it has cooled down sufficiently. The dimmer will keep on cycling in this manner until the load is reduced to be within its specified range. This process ensures safe operation of the dimmer as well as avoids damage to the installation. **The dimmers in this category are identified by being without the LV suffix letters in their list numbers, e.g. K4306 POB.**

Low Voltage Dimmers: These dimmer switches incorporate the latest micro-controller based circuitry to provide sophisticated features concerned with safety and prolonging the life of the lamps as well as the dimmer. They constantly monitor the load conditions and either turn down the brightness or switch off if abnormal conditions are detected.

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The dimmers in this category are suitable for use in Low Voltage Lighting Systems, in conjunction with suitable low voltage transformers (electronic or wirewound) and tungsten halogen lamps. They are also suitable for use with the normal GLS lamps and mains voltage tungsten halogen lamps. **The dimmers in this category are identified by the suffix LV in their list numbers, eg K4306 POB LV.** The features provided by the Low Voltage Dimmers are detailed below.

Soft Start

When the dimmer is switched on, the brightness of the lights will be gradually increased over a period of 1 to 3 seconds until a pre-selected level (set via the control knob) is attained. This feature alone will help to greatly extend the life expectancy of filament lamps being used in conjunction with these dimmers, by avoiding the initial power surge.

Overload Protection

If any of the dimmer switches in this range is over-loaded, the output to the load(s) will be automatically reduced to provide protection against damage to the dimmer and to the installation.

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B. PRODUCT FEATURES continued

These dimmer switches use an Intelligent Power Monitoring System (IPMS) to provide protection from overload by reducing power levels to the load(s) in stages according to the severity of the overload, as shown in Table 1, below:-

Case	Approximate load on the Dimmer as a percentage of its maximum rating	Power output to load when dimmer control is set to maximum
1	Up to 125	Load will receive maximum power continuously.
2	>125 to 150	Output to load will be reduced to 50% of the maximum after a delay of approximately 20 seconds after switch on.
3	>150 to 200	Output to load will be reduced to the minimum setting of the dimmer after a delay of approximately 20 seconds after switch on.
4	>200	Output will be disabled (load will be switched off) almost instantaneously after switch on

Table 1

Normal operation will resume after the dimmer switch is switched off and turned back on, with the load adjusted to be within its minimum and maximum rating.

Note: For correct operation of the dimmer, it is important that the total load on the dimmer must not be less than the Min. Power/Load Rating and must not be greater than the Max. Power/Load Rating marked on the dimmer (see Table 2).

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B. PRODUCT FEATURES continued

lamps, so that their total wattage adds up to 80 to 105 Watts.

The dimmer switches in this range are not suitable for use with non-dimmable Electronic Transformers.

Note: Some transformers for low voltage lighting have input circuits which, when used with phase delay type of dimmers, result in very high peak power pulses in the dimmer. To avoid overloading and possible malfunctioning of the Dimmer Switch, do not connect more than the maximum number of transformer, specified in Table 3, to any one dimmer.

The dimmer's micro-controller based circuitry monitors the essentially a.c. supply conditions required for wire wound transformers and if a d.c. supply condition is detected due to some fault, which could overheat and damage the transformer, the dimmer automatically turns off the supply to the transformer after a short period.

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Compatibility with Mains Voltage Halogen Lamps

The **Soft Start** feature incorporated in this range of dimmers makes them ideally suited to drive mains voltage halogen lamps, which have inherently high inrush currents at switch on. By soft starting this type of load(s), not only is the dimmer switch protected

against premature failure but the lamp(s) load also benefits from prolonging its life due to limiting of the life shortening high inrush currents at switch on.

IF IN DOUBT AND FOR FURTHER INFORMATION, CONSULT MK ELECTRIC TECHNICAL SALES AND SERVICE DEPARTMENT (see section G).

Failure to comply with the pre-requisites above, could compromise System Safety.

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C. PRODUCT RANGE

Standard Dimmers		Power/Load Rating with GLS Lamps		Power/Load Rating with LV Transformers and Mains Halogen Lamps		Comments
Size of Front Plate	Number of Dimmers	Min. W	Max. W	Min. W or VA	Max. W or VA	
1 Gang	Single	40	250	unsuitable	unsuitable	
1 Gang	Double	40	250	unsuitable	unsuitable	Rating is for each dimmer
2 Gang	Triple	40	250	unsuitable	unsuitable	Rating is for each dimmer
1 Gang	Single	75	500	unsuitable	unsuitable	
2 Gang	Double	65	450	unsuitable	unsuitable	Rating is for each dimmer

Table 2

Dimmers described in Tables 2 and 3 are available in all the product ranges mentioned on page 1 of this leaflet. Please consult the MK Catalogue for their List Numbers.

All dimmers in these ranges can provide 1 or 2 way switching.

NOTES for Standard Dimmers:

- Do not operate the dimmer with more than the Max. Load (W) specified for the dimmer.
- Do not operate the dimmer with less than the Min. Load (W) specified for the dimmer.
- Do not operate the dimmer with Fluorescent Loads.

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C. PRODUCT RANGE (continued)

Low Voltage Dimmers			Power/Load Ratings with Mains Tungsten Halogen Lamps and LV Transformers			Max. No of Transformer	Comments
Size of Front Plate	Number of Dimmers	Power/Load Rating with GLS Lamps	Min. W	Max. W	Min. W or VA		
1 Gang	Single	40	300	40	240	4	
1 Gang	Double	40	300	40	240	4 per dimmer	Rating is for each dimmer
1 Gang	Single	60	500	60	400	5	
2 Gang	Double	60	450	60	360	5 per dimmer	Rating is for each dimmer

Table 3

NOTES for Low Voltage Dimmers:

- Do not exceed the Max. Power/Load Rating (W or VA) of the dimmer when using with Low Voltage transformers, as shown in Table 3 above.
- The minimum load on the transformer should not be less than the **Min. Power/Load Rating of the dimmer**, even if the transformer has a lower Min. Power/Load

Rating (eg. 20W or VA). If the transformer is loaded with more than one lamp to achieve the minimum load in accordance with the Min. Power/Load Rating, then on failure of one or more of the lamps, the total load may fall below the **Min. Power/Load Rating of the dimmer**, which could result in the system not functioning correctly.

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D. PRODUCT SPECIFICATION

Mains Supply Voltage: 230V a.c.
Mains Supply Voltage Range: 216 to 253V a.c.
Mains Supply Frequency: 50 ± 3Hz
Ambient Temperature Range: 0°C to 40°C
Load Rating: See label on the back of the dimmer and Section C of this leaflet.

NOTE: The total load on the dimmer must be within the Min. and Max. ratings of the dimmer.

Type of Loads:
Standard Dimmers: Fused GLS Tungsten Filament lamps only to BS161, rated at 230/240V.
Low Voltage Dimmers: Fused GLS Tungsten Filament lamps to BS161, rated at 230/240V. Dimmable wire wound or electronic Low Voltage Transformers of good quality.

NOTE: Transformer must be suitable for dimming, using phase delay (not phase cut) type of dimmers.

WARNING: These dimmer switches are not suitable for use with Fluorescent Lamps or Energy Saving Lamps.

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E. COMPLIANCE WITH STANDARDS & EC DIRECTIVES

The dimmers in this range comply with the following EC directives:

Low Voltage Directive (73/23/EEC)

Electromagnetic Compatibility Directive (89/336/EEC)

They also comply with the requirements of the following Standards: BS EN 60669-2-1
BS EN 55015

NOTE: While the dimmer switches in this range conform to the EMC requirements in compliance with the EC Directives when used with Tungsten Filament Lamp Loads specified above, it is the responsibility of the **installer** to ensure that when using these dimmers with transformers in Low Voltage Lighting Systems, the complete installation complies with the Electromagnetic Compatibility Regulations (SI 1992/2372).

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F. SAFETY INSTRUCTIONS

- To prevent the risk of electrocution, turn off the mains electricity supply before commencing work.
- Do not work on this product with electricity supply to it switched on.
- To ensure a safe installation;
 - This product must be installed by a competent person (e.g. a qualified electrician) in accordance with these instructions and the appropriate clauses of the current edition of the IEE Wiring Regulations (BS 7671).
 - Where the mounting box incorporates an earth terminal, it must be connected to the circuit protective (Earth) conductor.
 - NOTE:** All bare earth wires must be covered with appropriate green/yellow sleeving.

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- It is essential that all connections are made as instructed, that the cables are not stressed and that the terminal screws are fully tightened.

- Dimmer switches must **NOT** be installed in bathrooms, washrooms or any location subject to splashes of water, condensation or excessively damp conditions.
- Ensure that the product is mounted on an even surface in the vertical plane (see Note in section G, step 9).
- To avoid damage to the Dimmer Switch do not operate it with higher than the maximum rated load of the Dimmer Switch. Also, do not use the Dimmer Switch with less than its minimum rated load.
- Do not use the Dimmer Switch in ambient temperatures higher than the maximum temperature specified for the dimmer.

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- To avoid premature failure of the Dimmer Switch and lighting system do not use the Dimmer Switch with fluorescent lamps or Energy Saving Lamps.
- Do not attempt to open the Dimmer Switch as there are **NO user serviceable parts** inside.

NOTE: It is normal for the Dimmer Switch front face to become quite warm in use, the temperature reached being dependent upon the lamp load and the ambient temperature.

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G. INSTALLATION

IMPORTANT

Refer to Product Features (B) and Safety Instructions (F), before starting work.

- Turn off the mains electricity supply.
- Use the appropriate Flush Mounting Box from Table 4 below, ensuring that it is firmly secured to the wall.
 - Note: When using a box with four mounting lugs, it may be necessary to bend down flat, the top and bottom lugs.**
- Strip back Supply Cable outer sheath and trim wires to the appropriate length to allow cable ends to reach terminals.
- Carefully strip Red and Black Insulation by 8mm (½"), and place a Red Sleeve over the Black Insulation.
- Slide an appropriate length of green/yellow insulating sleeve on the bare Earth conductor of

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G. INSTALLATION (continued)

Type of Box	Size of Frontplate	MK List Numbers for Boxes
Surface for Albany and Chroma only	1 Gang 2 Gang	K829 ALM and K899 ALM K830 ALM and K897 ALM
Flush	1 Gang (excluding the Double Dimmers) 1 Gang (for Double Dimmers) 2 Gang	861 ZIC (25mm) 866 ZIC (35mm) 862 ZIC (25mm)

the Supply and connect to the Earth terminal of the Dimmer Switch, marked \oplus .

If the mounting box is provided with an Earth terminal, connect it to the Earth terminal of the Dimmer Switch using an appropriate length of Earth conductor, sleeved with green/yellow insulation.

- You must connect the wires to the correct terminals of the Dimmer:
 - If replacing a switch, take note of original wire(s) and terminal positions to aid reconnection.

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- When connecting to a Low Voltage Lighting System the dimmer switch must **ONLY** be connected to the appropriate 230V Input Terminal of the transformer (in accordance with the manufacturer's instructions)
- Insert the bared ends of the wires fully into the relevant terminals and securely tighten the Terminal Screws (refer to fig.1 for one way switching and fig. 2 for two way switching).

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- Carefully push wired Dimmer back into the Mounting Box, ensuring cables are not trapped or pinched.

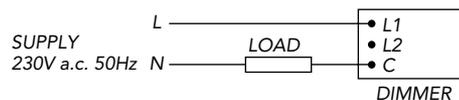


Fig.1 One Way Switching

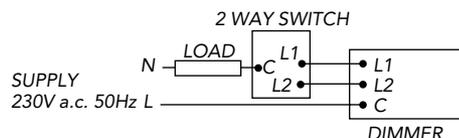


Fig. 2 Two Way Switching (only 1 Dimmer can be used)

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Note: The Dimmer can be installed with its terminals at the top or at the bottom. If the cable lengths are long enough, install the Dimmer with its terminals at the bottom. This will provide a much more reliable installation in the long run by keeping the heat dissipated from the suppression choke at the top, thereby allowing other electronic components to operate at a lower temperature.

- Locate and tighten frontplate fixing screws. Do not over tighten screws, to do so may damage frontplate or box threads.
- Retain these Instructions, leave them with the end user for future reference.** Remaining Packaging can safely be disposed of via standard refuse facilities.

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G. INSTALLATION (continued)

The completed installation should be tested in accordance with the current IEE wiring regulations by a qualified electrician.

IMPORTANT: Dimmer Switch should be disconnected before performing the Insulation Resistance Test (i.e. Clause 713-04).

If you are in any doubt regarding the application or installation of this product, please contact MK Technical Sales Service Department

Telephone 01268 563720 (National).
+44 (0) 1268 563758 (International).

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H. GUARANTEE

The Company undertakes to replace or repair, at its discretion, this product should it become defective within a period of 10 years after delivery, solely as a result of faulty materials and/or workmanship. Understandably, if the product has not been installed or maintained in accordance with the Company's instructions, has not been used appropriately, or if any attempt has been made to rectify, dismantle or alter the product in any way, the guarantee will be invalidated.

This Guarantee states the Company's entire liability. It does not extend to cover consequential loss or damage or installation costs arising from the defective product. This Guarantee does not restrict or infringe the normal statutory or other rights of the consumer.

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