

**Intelligent Dimmer
Switches for Mains and
Low Voltage Lighting**

K1501 WHILV, K1521 WHILV,
K1522 WHILV

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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 this range conforming to the latest standards BS EN 60669-2-1 and BS EN 55015, are designed for 1 or 2 way operation and are suitable for controlling the light output of GLS Tungsten filament lamps. They are also suitable for controlling the light output of Low Voltage Tungsten Halogen Lamps, when used in conjunction with suitable Low Voltage Lighting (Electronic or Wirewound) Dimmable Transformers.

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B. PRODUCT FEATURES

The dimmer switches in this range employ the latest technology, using micro-controller based circuitry to provide the following features.

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 overloaded, the output to the load(s) will be automatically reduced to provide protection against damage to the dimmer and to the installation. These dimmer switches use an Intelligent Power Monitoring

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B. PRODUCT FEATURES continued

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 ratings.

Note: For correct operation of the dimmer, it is very 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

So as not to compromise system safety, MK recommend that transformers have built in thermal protection and have over-current protection on both primary and secondary circuits. The LV system must comply with the EMC directive and carry the CE marking. The total transformer load on the dimmer (obtained by adding together the load rating of each transformer) must be within the minimum and maximum load rating W/VA of the dimmer. In addition, transformers MUST be loaded correctly and they must provide correct loading to the dimmer, within its specified minimum and maximum Power/Load ratings.

The total lamp load on any transformer being used in conjunction with any of the dimmers in this range must not be less than the minimum Power Rating (W or VA) of the dimmer, or higher than the maximum Power/Load Rating (W or VA) specified for the transformer or the dimmer - see

Table 2 and markings on the back of the dimmer. Also, check the information provided in the instruction leaflet for the transformer and any markings on it. For optimum performance of the dimmer switch, load each transformer with lamp(s) so that the total load on each transformer is between 75-100% of its rated load (e.g., load a transformer rated at 25 to 105W/VA with 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 transformers, specified in Table 2, 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.

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

List No.	Power/Load Ratings with Mains Tungsten GLS Lamps		Power/Load Ratings with Mains Tungsten Halogen Lamps and LV Transformers		Size of Front Plate	Max No of Transformers	Comments
	Min. W	Max. W	Min. W or VA	Max. W or VA			
K1501 WHILV	60	500	60	400	1 Gang	5	
K1521 WHILV	40	300	40	240	1 Gang	4	
K1522 WHILV	40	300	40	240	1 Gang	4 per dimmer	Double Dimmer, Power/Load ratings are for each dimmer

Table 2

NOTES:

- Do not exceed the Max. Power/Load Rating (W or VA) of the dimmers when using with Low Voltage transformers, as shown in Table 2 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 (nominal): 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 markings at the back of the dimmer and Section C.

NOTE: Loads must be within the min. and max. ratings of the dimmer.

Type of Loads: Fused GLS lamps conforming to BS161, rated at 230/240V. Wire Wound Low Voltage transformer(s) of good quality, laminated or toroidal. Fully dimmable Electronic Transformer(s) suitable for mains input voltage range specified above, used in conjunction with low voltage halogen lamp(s). Mains rated halogen lamps.

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

1. To prevent the risk of electrocution, turn off the mains electricity supply before commencing work.
2. Do not work on this product with electricity supply to it switched on.
3. 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.

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

4. Dimmer switches must **NOT** be installed in bathrooms, washrooms or any location subject to splashes of water, condensation or excessively damp conditions.
5. Ensure that the product is mounted on an even surface in the vertical plane (see Note in section G, step 9).
6. 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.

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F. SAFETY INSTRUCTIONS (continued)

7. Do not use the Dimmer Switch in ambient temperatures higher than the maximum temperature specified for the dimmer.
 8. To avoid premature failure of the Dimmer Switch and lighting system do not use the Dimmer Switch with fluorescent lamps or Energy Saving Lamps.
 9. 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.

1. Turn off the mains electricity supply.
2. Use the appropriate Flush Mounting Box from Table 3 below, ensuring that it is firmly secured to the wall.

Dimmer List No.	Flush Metal Box MK List No.		Surface Box MK List No.	
	With Patress	Without Patress	With Patress	Without Patress
K1501WHILV	ZIC 3995	ZIC 861	K2160 WHI	K2140 WHI
K1521WHILV	ZIC 3995	ZIC 861	K2160 WHI	K2140 WHI
K1522WHILV	ZIC 861	ZIC 866	K2160 WHI	K2140 WHI

- Note:** When using a box with four mounting lugs, it may be necessary to bend down flat, the top and bottom lugs.
3. Strip back Supply Cable outer sheath and trim wires to the appropriate length to allow cable ends to reach terminals.
 4. Carefully strip Red and Black Insulation by 8mm (1/3"), and place a Red Sleeve over the Black Insulation.

5. Slide an appropriate length of green/yellow insulating sleeve on the bare Earth conductor of 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.
6. You must connect the wires to the correct terminals of the Dimmer:
- If replacing a switch, take note of original wire and terminal positions to aid reconnection.
7. 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)
8. 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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G. INSTALLATION (continued)

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

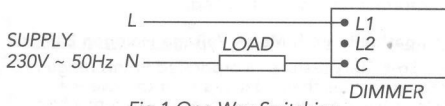


Fig. 1 One Way Switching

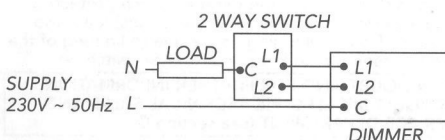


Fig. 2 Two Way Switching (only 1 Dimmer can be used)

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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.

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

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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