Grid Plus Technical

Modular Switching System

Standards and approvals

Switch modules
BS EN 60669-1:1999

Indicator units
BS 5733:2010

Dimmer switches
Dimmers comply with BS EN 60669-2-1

Accessory modules
Single non-isolated, TV/FM socket outlet, BS 3041-2:1977

Module Dimensions (mm)

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/240V buzzer units</td>
<td>22x65x25</td>
</tr>
<tr>
<td>Single dimmer module</td>
<td>34x65x25</td>
</tr>
<tr>
<td>Double dimmer module</td>
<td>57x65x25</td>
</tr>
<tr>
<td>Fluorescent dimmer module</td>
<td>57x65x25</td>
</tr>
<tr>
<td>All switch and indicator modules</td>
<td>22x65x25</td>
</tr>
<tr>
<td>Fuse unit</td>
<td>25x65x31.5</td>
</tr>
<tr>
<td>Cord unit</td>
<td>42x65x25</td>
</tr>
</tbody>
</table>

Description

Grid Plus is a comprehensive modular switching and monitoring system ideal for a variety of applications within the commercial, public and domestic sectors.

Grid Plus cover plates have the advantageous design features of the MK wiring device ranges and the interchangeable modules also feature many of the wiring and installation benefits common to the MK wiring device ranges.

The system is extremely easy to assemble (see illustration) and modules can be individually changed without re-wiring of complete assembly by removal of frontplate and simply clipping in or out as required. For further installation details see ‘Installation’ overleaf.

Features

- Grid modules clip fit to frame without special tools
- Modules can be removed/ replaced when grid frame is fixed in position
- Grid Plus frontplates available to match all MK wiring device ranges
- All products are 100% tested before delivery
- Options of neon/filament indicators label in rocker or printed rockers
- Wide variety of switch modules rated at 10 or 20 amps
- Single or double dimmer modules available
- Vast range of grid plates and modules from one source
- Manufactured from pre-galvanised steel to prevent corrosion
- Grid frame earth terminal has 16mm² cable capacity
- Backed out and captive terminal screws
- Up to 12 gang Logic Plus grid frontplates and up to 24 gang in decorative metal finish frontplates
- Top access terminal screws

For a full range of corresponding products, see pages 70-97 in the product selector.
Modular Switching System

FRONTPLATE DIMENSIONS

<table>
<thead>
<tr>
<th>RANGE</th>
<th>MODULES</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic Plus™</td>
<td>1,2,3,4,6,8,12</td>
<td>86</td>
<td>146</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Aspect*</td>
<td>1,2,3,4,6,8</td>
<td>86</td>
<td>146</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Edge™</td>
<td>1,2,3,4,6,8,9,12,18,24</td>
<td>86</td>
<td>146</td>
<td>206</td>
<td>267</td>
</tr>
<tr>
<td>Albany Plus™</td>
<td>1,2,3,4,6,8,9,12,18,24</td>
<td>86</td>
<td>146</td>
<td>206</td>
<td>267</td>
</tr>
<tr>
<td>Metalclad Plus™</td>
<td>1,2,3,4,6,8,9,12,18,24</td>
<td>86</td>
<td>146</td>
<td>206</td>
<td>267</td>
</tr>
</tbody>
</table>

*Aspect 12 module front plate available through MK Design Service

TECHNICAL SPECIFICATION

ELECTRICAL

SWITCHES

VOLTAGE RATING
250V a.c.

CURRENT RATING
10 or 20 amps – no derating when used on fluorescent or inductive loads

LOAD TYPE
No restriction

TERMINAL CAPACITY
4 x 1mm², 4 x 1.5mm², 4 x 1mm², 3 x 2.5mm², 2 x 4mm², 1 x 6mm²

INDICATOR UNITS

VOLTAGE RATING
24V indicators min. 21V, max. 36V

240V indicators min. 200V, max 250V

TERMINAL CAPACITY
as switches

BUZZER UNIT

VOLTAGE RATING (NOMINAL)
240V a.c.

TERMINAL CAPACITY
as switches

FUSE UNIT

VOLTAGE RATING
250V

CURRENT RATING
13 amps

TERMINAL CAPACITY
2 x 4mm²

CORD OUTLET

VOLTAGE RATING
250V

CURRENT RATING
16 amps

TERMINAL CAPACITY
Supply – 2 x 4mm²

Load – 1 x 1.5mm² multi-strand

DIMMERS

VOLTAGE RATING
230V a.c., 50Hz

LOAD RATING
For single dimmer installations
K4500 min. 40W/VA, max. 400W/320 VA
K4501 min. 40W/VA, max. 220W/180 VA
K4511 min. 40W/VA, max. 220W/180VA LED 4-70W

For multiple dimmer installation
see Load Adjustment table, page 531

LOAD TYPES
K4500, K4501 tungsten filament (GLS) lamps
Low voltage lighting electronic or wire-wound transformers
K4511 Good quality LED lamps (10max)

SOFT START
Raises from low to control knob setting in 1-3 secs, (increases lamp life significantly)

TERMINAL CAPACITY
1 x 2.5mm², 2 x 1.5mm²

Grid Plus Technical
Grid Plus Technical

Modular Switching System

Standards and approvals
Switch modules
BS EN 60669-1:1999
Indicator units
BS 5733:2010
Dimmer switches
Dimmers comply with BS EN 60669-2-1
Accessory modules
Single non-isolated, TV/FM socket outlet, BS 3041 Part 2: 1977

TECHNICAL SPECIFICATION

PHYSICAL (ALL PRODUCTS)
AMBIENT OPERATING TEMPERATURE
-5°C to +40°C
IP RATING
IP4X
MAX. INSTALLATION ALTITUDE
2000 metres

Installation

General
Cut cables to length and make earth connections to grid. Earth: bond grid frame to metal mounting box. Grid frames are screwed to back box, modules wired as appropriate and simply clipped into grid frame by hand. No tools are necessary. The front plate is screw fixed to the grid frame to finish the assembly.

To remove or change modules, simply remove front plate. Individual modules fit perfectly into the frontplate in flush fitting installations.

Grid mounting
An integral design feature automatically ensures that the modules fit perfectly into the frontplate in flush fitting installations.

Some manual adjustment may be required for surface mounted applications or low profile ranges (Edge™).

Dimmers
The two module size dimmer can be fitted to any grid mounting frame over 1 gang. The supplied blank module can be placed at the required pitch to fill in the second position on the grid.

To avoid overheating when using more than one dimmer in the same Grid Plus enclosure it is recommended that the dimmers are preferentially mounted on the bottom row on 6, 8, 9, 12, 18 and 24 gang enclosures, before mounting on any other rows and its load adjusted in accordance with the information provided in the Load Adjustment Table 1 at the bottom of the next page.

Dimmer wiring diagram

One-way switching
Supply 230V a.c. - 50Hz
L N Load

Two-way switching
(only one dimmer can be used)
Supply 230V a.c. - 50Hz
N L Load

Rocker window labels
The following labels are available for insertion into window rockers.
Modular Switching System

The simple installation process is shown below.
Spare labels and windows are available.

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**TV/FM socket outlets**
The TV outlet must not be mounted in the same enclosure as mains voltage exceeding 50V.

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**Printed Modules**
A wide range of pre-printed switches are also available. See pages 194-201 for details.
Grid Plus Dimmer Switches

Standards and approvals

TECHNICAL SPECIFICATION

**ELECTRICAL**
- MAINS SUPPLY VOLTAGE
  - 230V a.c. (Nominal)
- MAINS SUPPLY VOLTAGE RANGE
  - 216V a.c. to 253V a.c.
- MAINS SUPPLY FREQUENCY
  - 50Hz

**TYPE OF LOADS**
- Intelligent Dimmers
  - K4500, K4501
  - Fused GLS Tungsten Filament lamps to BS EN 60064:1996 and BS EN 60432-1,2 rated at 230/240V.
  - Dimmable wire wound or electronic Low Voltage Transformers of good quality. Can also be used with good quality mains voltage halogen lamps incorporating GU10 bases. Please check with lamp manufacturer to determine suitability.
  - K4511
  - Is suitable for use with good quality dimmable LED lamps (10max). Due to market variability in LED lamp design it is advisable to check with lamp manufacturer to determine suitability. For best performance LED manufacturers lamps should not be mixed on one circuit.

Note: Transformers must be suitable for dimming leading or trailing edge dimmers.

Warning: These dimmer switches are not suitable for use with Fluorescent Lamps or CFL Lamps.

**PHYSICAL**
- AMBIENT OPERATING TEMPERATURE
  - 0°C to +40°C
- IP RATING
  - IP4X
- MAX. INSTALLATION ALTITUDE
  - 2000 metres

Multiple Dimmer Installation Load Ratings
When installing more than one dimmer in multi-gang plates, the power rating must be reduced to allow for heat generation.

See Table 1 page 531.

Features
MK Grid Plus Dimmer Switches incorporate the following advanced features
- Suitable for dimming Low Voltage Halogen lamps via suitable, fully dimmable electronic or wire-wound transformers. See Table 2 for the number of transformers allowed to be used with each dimmer
- Can be used with good quality mains voltage halogen lamps incorporating GU10 bases. Please check with lamp manufacturer to determine suitability
- Unidirectional current sensing. While being used with wire-wound transformers for low voltage lighting, these dimmer switches continuously monitor the drive conditions to the transformers, which require essentially, bi-directional a.c. supply at their input terminals. If, due to some fault condition, the supply to the wire-wound transformer is detected to be unidirectional, which could result in over-heating and/or damaging the transformer, the dimmer switches’ circuitry automatically stops supplying the transformer after a few cycles of detected unidirectional supply
- Soft Start, which gradually increases the light output from the load over 1 to 3 seconds after switch on. The Soft Start feature is also particularly beneficial when used to dim Mains Voltage Tungsten Halogen lamps which have inherent very high inrush current at switch on
- Grid Plus dimmer switches which are rated for LED load types incorporate a minimum brightness adjustment. This setting may be performed without removing any fixing screws to account for LED load performance. Please refer to the relevant installation instructions on mkelectric.co.uk
Grid Plus Dimmer Switches

**TABLE 1 – LOAD ADJUSTMENT FOR GRID PLUS DIMMERS**

<table>
<thead>
<tr>
<th>FRONTPLATE SIZE, NUMBER OF GANGS</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>9</th>
<th>12</th>
<th>18</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Power/Load per Row – Tungsten GLS Lamps – W</td>
<td>400</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>720</td>
<td>720</td>
<td></td>
</tr>
<tr>
<td>Max Power/Load per Row – Mains Tungsten Halogen Lamps or Low Voltage Transformers – W or VA</td>
<td>320</td>
<td>380</td>
<td>380</td>
<td>380</td>
<td>380</td>
<td>380</td>
<td>580</td>
<td>580</td>
<td></td>
</tr>
<tr>
<td>Max Power/Load for Total Plate – Tungsten GLS Lamps – W</td>
<td>400</td>
<td>480</td>
<td>480</td>
<td>740</td>
<td>740</td>
<td>940</td>
<td>940</td>
<td>1440</td>
<td>1800</td>
</tr>
<tr>
<td>Max Power/Load for Total Plate – Mains Tungsten Halogen Lamps or Low Voltage Transformers – W or VA</td>
<td>320</td>
<td>380</td>
<td>380</td>
<td>600</td>
<td>600</td>
<td>750</td>
<td>750</td>
<td>1155</td>
<td>1440</td>
</tr>
</tbody>
</table>

K4511 – No derating is required for LED load types.

**TABLE 2 – OVERLOAD REACTION**

<table>
<thead>
<tr>
<th>40-400W CIRCUIT</th>
<th>40-300W CIRCUIT</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overload management</td>
<td>Overload management</td>
<td>This is the minimum controlled voltage</td>
</tr>
<tr>
<td>40-220W nominal</td>
<td>40-275W function without dimming</td>
<td>&gt; 500-700W dim to 68V±8V r.m.s.</td>
</tr>
<tr>
<td>&gt; 700W switch off</td>
<td>&gt; 375W switch off</td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions**

1 gang

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>57</td>
</tr>
<tr>
<td>56</td>
<td>59</td>
</tr>
</tbody>
</table>

2 gang

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>57</td>
</tr>
<tr>
<td>59</td>
<td>57</td>
</tr>
</tbody>
</table>

**TABLE 3 – GRID PLUS INTELLIGENT DIMMER SWITCHES**

<table>
<thead>
<tr>
<th>RATING</th>
<th>MAX NO. OF TRANSFORMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 module dimmer switch</td>
<td>40-220W (LV rating 40-180VA)</td>
</tr>
<tr>
<td>2 module dimmer switch</td>
<td>40-400W (LV rating 40-320VA)</td>
</tr>
</tbody>
</table>

Do not connect more than the maximum number of transformers stated for each dimmer. Grid Plus dimmer switch ratings are for each dimmer when installed singly. In multiple installations, each dimmer switch must be de-rated – see Table 1 above.

**Wiring Diagrams**

One-way switching

Supply 230V a.c. - 50Hz

Two-way switching

(only one dimmer can be used)

Supply 230V a.c. - 50Hz

Fluorescent dimmer

Wires must be connected to the correct dimmer terminals. DO NOT connect earth to dimmer.

**Fluorescent Dimmer**

MK Fluorescent dimmers are low voltage controllers that require only a single two-core wire connection to 1-10V controllable ballast inputs. The dimmer operates by applying a variable resistance to the ballast 1-10V control input.

We recommend using a separate on/off switch to isolate the luminaire(s) in use.

**Features**

Preset adjust to set minimum light level. Preset adjust for use with multiple dimmable ballasts.

Up to four ballasts can be connected to one dimmer.
Minimum Brightness Adjustment for LED Intelligent Dimmers

The light output of some LED lamps may appear to be too dim or invisible when the dimmer knob is at the minimum dim level. Follow the steps below to adjust the minimum brightness level. This feature is primarily for adjusting the minimum brightness level of the LED lamp although it can be used for other load types.

For a double gang dimmer, the light level of each gang has to be adjusted separately.

**Step 1 – Access To Programming Mode**

1. Push the dimmer knob so that it is in OFF state.
2. Set the dimmer knob to minimum level.

3. Turn on the dimmer and immediately rotate the knob 3 times in full rotary span within 5 seconds.

**Step 2 – Adjust Brightness Level and Exit Programming Mode**

5. Rotate the dimmer knob anticlockwise to adjust the lamp to the desired brightness level.

6. Confirm the new setting and exit programming mode by turning OFF the dimmer.

**Step 3 – Success indication (Programming Complete)**

7. The next time the dimmer is turned on the lamp will automatically brighten to the maximum level before dimming to the brightness level corresponds to the knob level.
LED Dimmer from MK Electric offers the widest lamp compatibility for a reliable dimming solution and allows the user to create ambience for comfortable surroundings.

Product Specifications
- MK Electric is the first leading manufacturer to offer a LED dimming solution across its wiring devices range
- Available as a single or double dimmer, in MK Logic Plus and MK Grid Plus*
- MK Logic Plus product is rated 4 – 70W (300W/240VA)
- MK Grid Plus product is rated 4 – 70W (220W/180VA)
- Compatible with tungsten filament, low voltage halogen and dimmable LED lamps
- Greater user control, with a minimum load adjustment control on dimmer switch
- Maximum 10 lamps per circuit
- Intelligent load protection will prevent lamp wattage exceeding rating of dimmer

Reduce Energy Costs
LED lighting technology delivers enhanced lamp endurance and energy savings. Dimmable LED lamps can increase energy savings, allowing you to reduce energy costs further.

Achieve a Consistent Look
The MK LED Dimmer is available in a wide range of decorative finishes to compliment interior design styles. Matching wiring devices including sockets and switches are available to ensure a consistent look and feel.

Decorative LED Finish Selector

A Perfect Match
The MK LED Dimmer has been tested with leading lamp manufacturers and is compatible with tungsten filament, low voltage halogen and a wide range of dimmable LED lamps.

*Grid Plus range is available in 14 colour options, with black or white inserts. The Module is designed to be used with MK Electric’s decorative range of Aspect, Edge, Albany Plus cover plates.