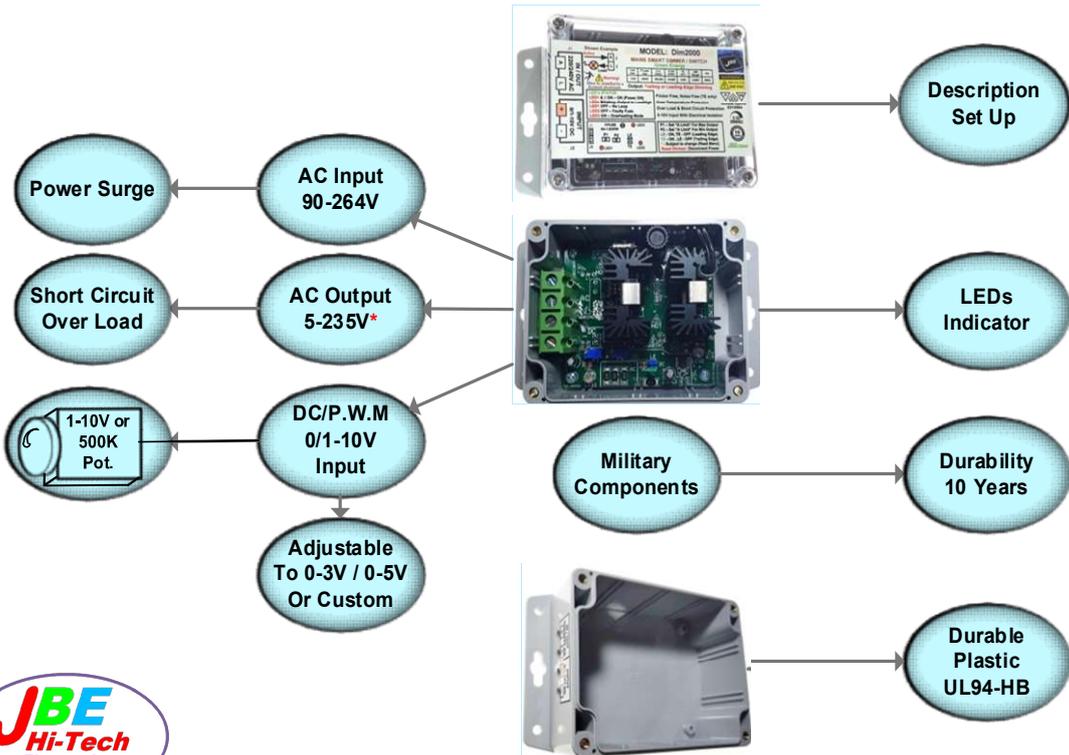




**DIM 2000**

**INDUSTRIAL HIGH QUALITY DIMMER SWITCH**



## DIM2000 Series

### Installation and consumer instructions for 0/1-10V DC, AC Dimmer Switch.

The Dim-series dimmer provides smooth dimming /control of incandescent & LED dimmable lamps, from full brightness down to soft candle glow or close to zero if needed. The Dim 2000 series is configured by default and no adjustment is recommended, but if you still need it due to a flickering of the lights, please contact JBE Hitech for assistance if you cannot resolve an issue. / **Just remember that working on live electrical equipment is dangerous** / {the low-profile **P1 & P2** can be adjusted by *small screwdriver flat with electrical safety hand* to set the desired level of illumination. Via **P1** you can adjust maximum output voltage or maximum brightness. Via **P2** you can setup minimum output (standby mode). **P1** is set for 0-10V & 1-10V and PWM by default}. The new electronic design of the Dim2000 eliminates dimmer buzzing and humming even at minimum light settings (**TE** only).

#### TECHNICAL PARAMETERS:

Number of outputs	1
Nominal Mains Supply Voltage	220–240V AC
AC voltage range	190-264V AC
Mains Frequency Range(s)	47 – 53 Hz
Electrical Isolation	0-10V (Version) This input has optical isolation and is insulated from mains
Control Dimmer	0/1-10V (0-5V) DC: 12V P.W.M: 1-10V POT. or 500K potentiometer
Load Brightness Control Range	1% to 98% (2-5%-98% for typical Quality LED loads)*
Minimum Load	10-25W* (TE) & 5W (LE)
Load Rating	7.6A max at 240V AC
Mains Terminals	2 x 4-6 mm <sup>2</sup> screw terminals
0/1-10V Terminals	2 x 4-6 mm <sup>2</sup> screw terminals
Weight	~450g
Operating Temp. Range:	0 – 50°C
	40 °C to +50 °C for output current ≤6.3A max
	0 °C to +40 °C for output current >7.6A max
Max. casing temperature Tc	80 °C
Operating Humidity Range	10% - 90% RH non condensing
Thermal Protection	NTC temperature limit is set to:
Normal	125 °C
Heavy Duty Model	135 °C
Housing Material type	Polycarbonate (UL94-HB)
IP Rating	IP60
Dim Device Type	<b>LE- Leading Edge: TE- Trailing Edge</b>
Safety Compliance	AS/NZS 3100:2017 + VDE Components certificate
Life Time	Up to 100000 h
Dimensions L x W x H (mm)	90 x 115 x 55
<b>Note:</b>	<p>1. All parameters measured at 240V AC input, rated current and 25°C ambient temperature.</p> <p>2. A driver is considered a component that will be operated in conjunction with final equipment such as (LED drivers), if drivers are of poor quality it may interfere with proper operation.</p> <p>3. The lights connected to the dimmer must not exceed 7.6A, the read value of the light, not the current voltage read by the measuring instrument, because the dimmer reduces the current / power to maintain green energy, otherwise the reading will be false and may damage the dimmer.</p>

## SOFT START

The Dim2000 dimmer incorporates a soft start feature providing a noticeably smooth lamp illumination at turn on. This feature also minimise lamp filament start up stress, which may increase lamp life. (It's recommended by manufacture to start dimming from lower brightness to max).

## THERMAL OVERLOAD COMPENSATION

The lamp brightness is automatically reduced in the event of high ambient temperatures or overload of the dimmer for a long time. It resets automatically when conditions are corrected.

## THERMAL CUT-OUT x 2

Dim2000 includes two types of thermal fuses. The first is a non-resettable design that will burn out in the event of catastrophic circuit failure. The second is resettable and will automatically reduce the brightness to "0", if the dimmer is accidentally overloaded or overheated, it resets automatically when the overload conditions are corrected or the dimmer has cooled down.

## SHORT CIRCUIT PROTECTION

The Dim2000 series dimmer feature short circuit protection, design to ensure the dimmer can survive in case of wiring fault or catastrophic failure of the load. To resume to normal operation the dimmer needs to be **switch OFF** (disconnected from mains) and turn ON to resume operation.

## FUSE CUT-OUT

The unit contain fast type fuse designed to blow or open in case of catastrophic circuit failure. This is a secondary protection measure intended to operate as a backup in case of persistent or prolonged overload conditions. If the fuse blow (fuse open), need to be replaced. Any significant overload should be avoided in order to prevent damage to the Dimmer.

## DIM2000 AC Phase Cut Dimmer Controller

### Features

- Ground Leakage Current for Flicker Reduction.
- User Programmable Leading or Trailing Edge Dimming Control
- Dynamic Over-Current and Temperature Protection
- Powered from the AC Line
- Symmetric AC Current Control
- Gate Pulse Width Programmable from 0 to 100% tON
- 8 Bit ADC Input for Dimming Control with an Adjustable Resistor or 0 to 10 V DC Voltage
- 226 Dimming Pulse Widths with 25  $\mu$ s Resolution and Built-in Ramp Up/Down Control for Smooth Dimming
- Automatically reduces the output voltage in the event of an increase in mains voltage like power surge.
- Military Components
- 600  $\mu$ A Quiescent Current
- Precision Temperature Compensated 2% Internal Timer
- Low Power Electronic Off State Mode
- 50 Hz and 60 Hz Options
- 0-10V DC Input with Optical Isolation Option

### Applications

- Dimmer Switches
- Light's control
- AC Controls
- Heaters control system
- Safety Switch (On/Off)

## Description /Operation

The DIM2000 is equipped with a 50Hz/60Hz IC controller for varying the pulse width for AC loads. The Dim2000 is for 50 Hz or 60Hz applications. The Dim2000 is powered from the AC line and generates a programmable gate drive for controlling the pulse width for external IGBT or MOSFET transistors. The pulse width can be user programmable with either an external resistor (potentiometer) or 0 to 10 V DC signal or controlled by a  $\mu\text{P}$  with a logic signal. The pulse width can be controlled from 0 to 100% duty cycle to provide a wide AC symmetric dimming control function when biased with a 3-wire application. For 2-wire Line- Hot and Load-Hot applications, the pulse width can typically be varied from 0 to a maximum gate pulse so that the load voltage is >98% of the AC line voltage. The 50/60Hz ver. will automatically override the pulse width control setting to allow maximum gate pulse width without flicker.

The Dim2000 takes advantage of the 2019 2nd edition code revision that allows for up to 0.5 mA of ground leakage current when a neutral wire is not available in the switch box. This improves the flicker performance for non-resistive loads.

The Dim2000 has user programmable over-current and temperature protection. With external or internal sense resistors, the maximum voltage drops across Q1 and Q2 can be set to limit the maximum current and transistor power dissipation.

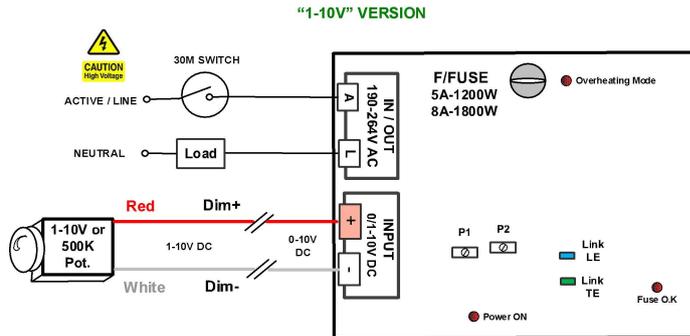
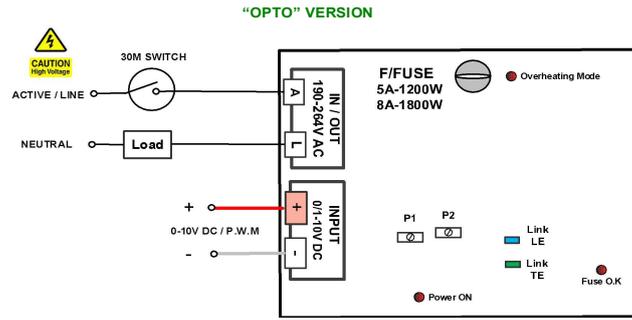
The Dim2000 can be programmed for trailing edge dimming when the DIM Mode pin is low at start up (pulse width starts at the zero-crossing) or leading edge dimming when the DIM Mode pin is connected to the VDD pin at start up (pulse width ends at the zero crossing). When an OFF state is selected (DIM Control pin is 0 V).

The Dim2000 has an internal 8-bit ADC that allows for typically 226 selectable dimming pulse widths with a resolution of 25  $\mu\text{s}$  per step. The 50/60 Hz controls the dim pulse width rate of change so that the minimum to maximum dim ramp time is approximately 1 second. This feature allows for a smooth dim transition. Internally, the Dim2000 contains a 17 V shunt regulator, 5 V linear regulator, 8Bit ADC, detection comparators, control logic and an IGBT or MOSFET gate driver.

## COMPATIBLE LOAD TYPES:

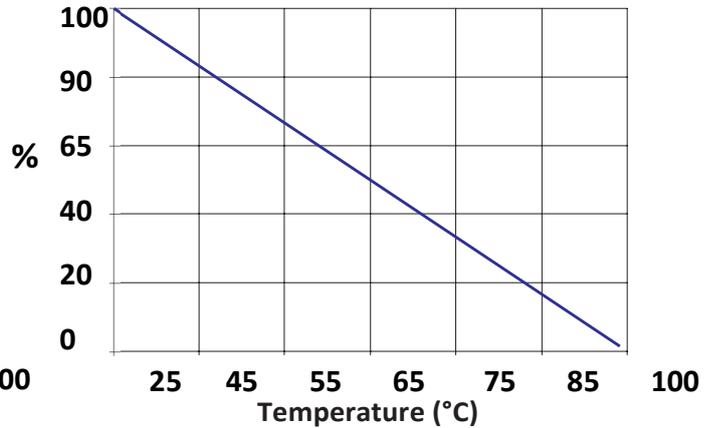
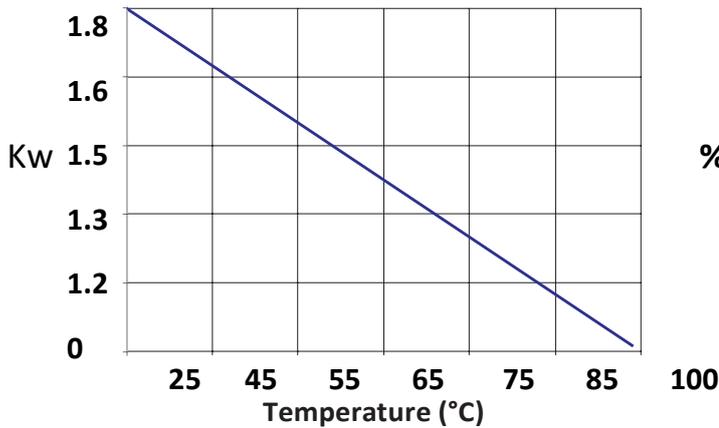
LoadSymbol	Load Type	Output Type LE/TE	Max. Load	Notes
	Dimmable LED Lamps/Driver	TE	1.8KW/ 2KW (1.8KW for Normal operation)	The LED driver must be dimmable. Maximum permitted number of drivers is 1800W divided by driver nameplate power rating. Due to variety of LED lamp designs, maximum number of LED lamps is further dependent on power-factor result when connected to dimmer.
	Electronic Transformers	TE	1800W	Dimmable Version
	Standard Iron-Core Transformers	LE	1600W	Due to variety of transformer designs, maximum LV lighting load is further dependent on transformer
	Toroidal Iron-Core	LE	1600W	
	Incandescent	TE / LE	1.8KW/2KW	1.8KW for Normal Operation (7.6A max)
	Dimmable CFLs	TE	1800W	Due to variety of CFL designs, maximum number of CFL lamps is dependent on particular CFL
	Dimmable LED Tubes	TE	1800W	The LED Tubes must be dimmable
	Ceiling Sweep Fans	LE	1500W	Ceiling Sweep Fans, Exhaust Fans

## WIRING DIAGRAM:



1-10V rotary analogue dimmer

**Load Power Derating vs. Ambient Temperature**



## LEDs INDICATOR:

LEDs indicates the status working and faults

Indicator	Description
LED1 & LED2- ON	Mains ON (no Flicking Loop its O.K)
LED1 & LED2- ON	Flicking (output is too high or too low) P1 is for high level adjustment, P2 is for low level adjustment. If P2 is set too low P1 will not adjust maximum level (example 240V input max output is 230V)
LED1- OFF, LED2- OFF	Mains OFF or no loop
LED1- ON, LED2- OFF	Faulty fuse (Thermal fuse or 8A Fast fuse)
LED3- ON	No output, Overheating Mode (Reset automatically)
LED1- ON, LED2- ON	60% of brightness, 0-10V is "0" reading - Faulty Dimmer. Please contact JBE Hitech for replacement

### **Warning 1**

*0/1-10 V source need to be with double or reinforced insulation with respect to AC mains. Suitable for passive and active control.*

### **Warning 2**

*This dimmer will not operate with external filters to reduce flickering.*

### **Fault in the device operation**

*Dim2000 is designed for use in harsh environments where faults may occur, therefore, please read the "Installation Guide" and then check the status of the LEDs. If fuse is blown (LED2 is OFF), to replace the fuse, turn OFF the mains voltage to the dimmer (LED1 & LED2 is OFF) then unscrew the top cover of the dimmer, replace the fuse as described on the top sticky tag cover.*

### **Safety Notice**

*Read and understand all safety information in this instruction. Improper installation of the product can result in electrical shock that can result in death or serious injury. If you are not qualified to install this equipment, use a qualified electrical installer. In this instruction, a WARNING box alerts you to a hazard that, if ignored, could result in death or serious personal injury. A Caution box describes a hazard that can cause minor personal injury. The attention triangle tells you about actions that can cause damage to the product or property. Improper installation of this product or use for any purpose other than described in this instruction, can result in product failure or damage to attached equipment. Pay attention to the specifications and wiring diagrams in this document.*

## **Warranty**

This product is guaranteed for a period of 24 to 60 months from the date of purchase against defects in workmanship and materials. Defects will be will be rectified by replacement of the product purchased except where, at our discretion, minor adjustments can be undertaken. The guarantee become invalid if in our opinion the product has been misused, abused, incorrectly installed, tampered with, connected to a power supply not corresponding with specifications, or subject to power surges. The guarantee does not include any labour or other associated expenses that may be involved in removal or installation of the product. To obtain a replacement under this guarantee, return the goods (prepaid) to the place of purchase or direct to the Australian Distributor. Proof of purchase must be supplied. This product does not contain any user serviceable parts. Spare parts and repair facilities are not available. This guarantee is in addition to and does not affect your rights under applicable law except where that law expressly provides otherwise.

***Please contact JBE Hitech Australia [jbehitech@yahoo.com](mailto:jbehitech@yahoo.com)***

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