

**Rotary dimmer universal LED**

Art. No. : 224LEDUDD

**Operating instructions****1 Safety instructions**

Electrical devices may only be mounted and connected by electrically skilled persons.

**Serious injuries, fire or property damage possible. Please read and follow manual fully.**

**Danger of electric shock. Always disconnect before carrying out work on the device or load.**

**Danger of electric shock. Device is not suitable for disconnection from supply voltage. The load is not electrically isolated from the mains even when the device is switched off.**

**Risk of destruction if the set operating mode and load type do not match. Set correct operating mode before connecting or exchanging the load.**

**Fire hazard. For operation with inductive transformers, each transformer must be fused on the primary side in accordance with the manufacturer's instructions. Only safety transformers according to EN 61558-2-6 may be used.**

**These instructions are an integral part of the product, and must remain with the end customer.**

**2 Function****Intended use**

- Switching and dimming of incandescent lamps, HV halogen lamps, electronic transformers for halogen or LED lamps, dimmable inductive transformers for halogen or LED lamps, HV-LED or compact fluorescent lamps
- Mounting in appliance box according to DIN 49073
- Operation with suitable cover

**Product characteristics**

- Device works according to the leading edge phase control or trailing edge phase control principle
- Automatic or manual setting of the dimming principle suitable for the load
- Display of the set operating mode by means LED
- Device can be operated without neutral conductor
- Switch-on via bulb-preserving soft start
- Switch on with last saved brightness or saved switch-on brightness
- Switch-on brightness can be saved permanently
- Minimum brightness can be saved permanently
- Connection of extensions possible
- Electronic short-circuit protection with permanent switch-off after 7 seconds at the latest
- Electronic over-temperature protection
- i** Flickering of the connected lamps due to undershoot of the specified minimum load or through centralised pulses from the power stations. This does not represent any defect in the device.
- i** Brief flickering upon load detection possible. No operation is possible during load detection.
- i** Power extension possible by means of power boosters. Do not connect any LED lamps or compact fluorescent lamps in combination with power boosters.

**3 Operation****Switch light**

- Press the setting knob briefly: Light is switched on or off at the last set brightness or a fixed brightness.

- Turn the setting knob through a quarter turn in a counterclockwise direction, then press the setting knob briefly (figure 1): Light is switched on at minimum brightness.

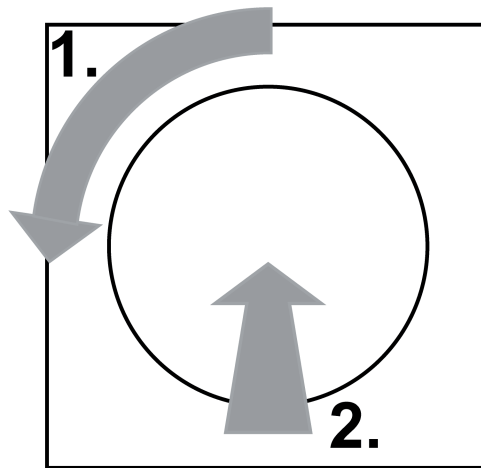


Figure 1: Switch on at minimum brightness

- Turn the setting knob through a quarter turn in a clockwise direction, then press the setting knob briefly (figure 2): Light is switched on at maximum brightness.

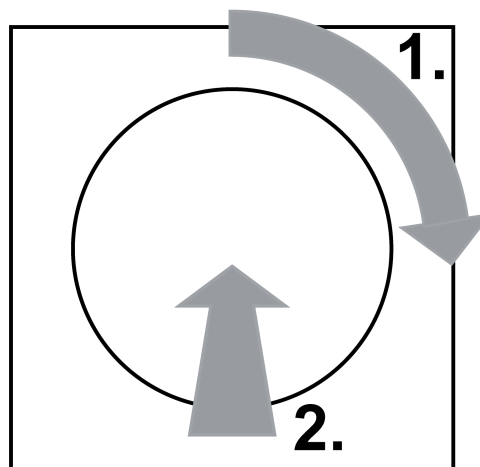


Figure 2: Switch on at maximum brightness

### Adjust the brightness

- Turn the setting knob quickly: Brightness is changed quickly.
- Turn the setting knob slowly: Brightness is fine-adjusted.

### Saving a fixed switch-on brightness

- Adjust the brightness.
- Press the setting knob for longer than 4 seconds.

Switch-on brightness is saved. For confirmation the lighting switches off briefly and then on again to the saved switch-on brightness.

### Deleting fixed switch-on brightness

- Press the setting knob briefly: Light switches on at the saved switch-on brightness.
- Press the setting knob for longer than 4 seconds.

The fixed switch-on brightness is deleted. On switching on, the dimmer switches back to the last set brightness value. The lighting switches briefly off and on again as confirmation.

### Operation via extensions

Precondition: A 2-wire extension or a push-button is connected.

- Press for less than 0.4 seconds: Light is switched on or off at the last set brightness or a fixed brightness.
- Press for longer than 0.4 seconds when the light is switched off: Switch on at minimum brightness.
- Press for longer than 0.4 seconds when the light is switched on: Set brightness. The dimming operation stops at the appropriate end value.

**i** Push-button: The dimming direction changes on each new long press.

- Press the full surface of the 2-wire extension button for longer than 4 seconds when the light is switched on: Save fixed switch-on brightness.

Switch-on brightness is saved. For confirmation the lighting switches off briefly and then on again to the saved switch-on brightness.

**i** On saving the same brightness again, the fixed switch-on brightness is deleted and the dimmer again switches on with the last set brightness value.

**i** Push-button: Cannot save switch-on brightness.

## 4 Information for electrically skilled persons

### 4.1 Fitting and electrical connection



**DANGER!**

**Mortal danger of electric shock.**

**Disconnect device. Cover up live parts.**

#### Fitting and electrical connection

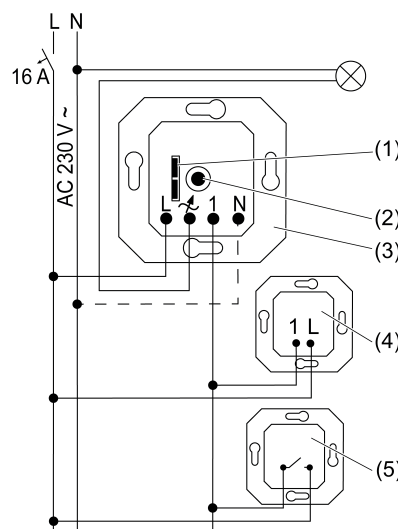


Figure 3: Connection diagram with optional extensions

- (1) Display LED of the dimming principle
- (2) Potentiometer axis
- (3) FM insert
- (4) Extension insert, 2-wire
- (5) Push-button, NO contact

- i** Connect 600 Watt LED lamps or compact fluorescent lamps at most per 16 ampere circuit breaker.
- i** If inductive and electronic transformers are connected, observe the data of the transformer manufacturer on loads and the dimming principle.
- i** The connected load and dimmer quality on LED lamps are dependent on the type of lamp and installation conditions. The connected load of the specified values could vary. We cannot assume any guarantee for proper function.

Operation without neutral conductor possible. There could be an increased likelihood of unsuitable combinations of dimmer and LED lamp.

Only connect illuminated push buttons if they have a separate N terminal.

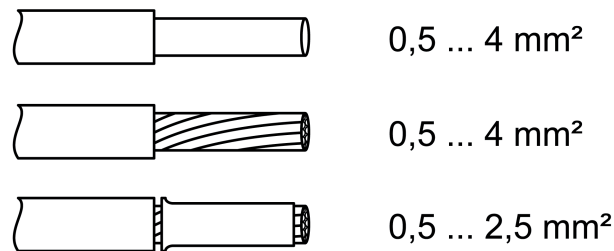


Figure 4: Clampable conductor cross-section

### Reset the overheating protection / short-circuit protection

If the electronic overheating or short-circuit protection has been activated, separate the dimmer from the grid for some time.

## 4.2 Commissioning

### Operating mode R,L,C,LED, universal, LED illuminates green, preset at the factory

- Automatic calibration to the load.
- Trailing edge phase control for incandescent lamps, HV halogen lamps, dimmable HV-LED or compact fluorescent lamps that can be dimmed according to the trailing edge phase control principle or electronic conformers for halogen or LED lamps.
- Leading edge phase control for dimmable inductive transformers for halogen or LED lamps.
- LED leading edge phase control for dimmable HV-LED or compact fluorescent lamps that can be dimmed according to the leading edge phase control principle.

### HV-LED $\triangleleft$ , LED trailing edge phase control, LED turns red

- i** The connection of inductive transformers is not permitted.
- Setting for incandescent lamps, HV halogen lamps, electronic transformers for halogen or LED lamps that can be dimmed according to the trailing edge phase control principle, dimmable HV-LED or compact fluorescent lamps that can be dimmed according to the trailing edge phase control principle.

### HV-LED $\triangleleft$ , LED leading edge phase control, LED turns blue

- i** The connection of inductive transformers is not permitted.
- Setting for incandescent lamps, electronic transformers for halogen or LED lamps that can be dimmed according to the trailing edge phase control principle, HV halogen lamps or dimmable HV-LED or compact fluorescent lamps that can be dimmed according to the leading edge phase control principle.

### Setting operating mode and minimum brightness

Preconditions:

The dimmer is ready for operation and the setting knob and the central plate have not been mounted.

Load is switched off.

- Press the potentiometer axis (2) for approx. 10 to 15 seconds until the LED (1) turns the colour of the current operating mode.

- Keep pressing the potentiometer axis (2) briefly until the required operating mode has been selected.  
The LED (1) lights up in the colour of the selected operating mode.
- ❗ After 30 seconds without an actuation, the LED (1) goes out and the setting is not saved.
- Turn the potentiometer axis (2).  
LED (1) flashes. The dimmer applies the set operating mode and switches to the minimum brightness setting.
- ❗ On changing the operating mode to Universal, the first task is the calibration to the load.  
During this time, the LED (1) is off.
- Turn the potentiometer axis (2) to set the minimum brightness.
- Press the potentiometer axis briefly - the minimum brightness is saved.
- ❗ Alternatively, the setting is saved after 30 seconds without an actuation.

## 5 Appendix

### 5.1 Technical data

Rated voltage  
Mains frequency  
Standby power  
Power loss  
Ambient temperature  
Connected load at 25 °C (figure 5)

AC 230 V ~  
50 / 60 Hz  
max. 0.5 W  
max. 4.5 W  
+5 ... +45 °C

W 20...420	W/VA 20...420	W 3...100	W/VA 20...100

Figure 5

- ❗ Operating mode **HV-LED** : Connection power for HV-LED lamps, typ. 3...200 W, electronic transformers with LV-LED typ. 20...200 W.

#### Mixed load

ohmic-capacitive 20 ... 420 W  
capacitive-inductive not permitted  
ohmic-inductive 20 ... 420 VA  
Ohmic and HV LED typ. 3 ... 100 W  
Ohmic and compact fl lamp. typ. 3 ... 100 W

- ❗ Power specifications including transformer dissipation.
- ❗ Operate inductive transformers with at least 85% nominal load.
- ❗ Ohmic-inductive mixed load: maximum 50% proportion of ohmic load. Otherwise, an incorrect measurement is possible.
- ❗ Operation without neutral conductor: Minimum load 50 W. Does not apply to loads with HV-LED and compact fluorescent lamps.

#### Power reduction

per 5°C in excess of 25°C: -10 %  
when installed in wooden or dry construction walls: -15 %  
when installed in multiple combinations: -20 %

Power boosters see power booster instructions.

Number of extension units	unlimited
Extension insert, 2-wire	unlimited
Unlit push-buttons	unlimited
Total length of extension unit cable	max. 100 m
Total length power cable	max. 100 m

## 5.2 Troubleshooting

### **Connected LED lamps or compact fluorescent lamps switch off in the lowest dimming position or flicker**

Cause: The set minimum brightness is too low.

Increase minimum brightness.

### **Connected lamps do not switch on in the lowest dimming position or only after a delay**

Cause: The set minimum brightness is too low.

Increase minimum brightness.

### **Connected LED lamps or compact fluorescent lamps flicker or buzz, no correct dimming possible, device buzzes**

Cause 1: Lamps are not dimmable.

Check manufacturer's instructions.

Exchange lamps for another type.

Cause 2: Operating mode (dimming principle) and lamps do not optimally match.

Check operation in another operating mode, reduce connected load as well if necessary.

Set the operating mode manually.

Exchange lamps for another type.

Cause 3: Dimmer is connected without neutral conductor.

Connect neutral conductor if possible, otherwise exchange lamp for another type.

### **Connected LED lamps or compact fluorescent lamps in the lowest dimming position are too bright; dimming range is too small**

Cause 1: The set minimum brightness is too high.

Reduce minimum brightness.

Cause 2: Operating mode (dimming principle) does not optimally match the connected HV-LED lamps.

Check operation in another operating mode, reduce connected load as well if necessary.

Set the operating mode manually.

Exchange HV-LED lamps for another type.

### **The dimmer switches the load off briefly and then on again.**

Cause: short-circuit protection has tripped but now there is no longer a fault.

### **The dimmer has switched off and the load cannot be switched on again**

Cause 1: overheating protection has tripped.

Disconnect dimmer from mains by switching off circuit breaker.

LED trailing edge phase control: Reduce the connected load. Exchange lamps for another type.

LED leading edge phase control: Reduce the connected load. Check operation in the LED trailing edge phase control setting. Exchange lamps for another type.

Let dimmer cool down for at least 15 minutes.

Switch circuit breakers and dimmer on again.

Cause 2: Surge protection has triggered.

LED trailing edge phase control: Check operation in the LED leading edge phase control setting, reduce connected load as well if necessary.

Exchange lamps for another type.

Cause 3: short-circuit protection has tripped.

Disconnect dimmer from mains by switching off circuit breaker.

Eliminate short-circuit.

Switch circuit breakers and dimmer on again.

**i** Short-circuit protection is not based on a conventional fuse, no metallic separation of the operational current.

Cause 4: load failure.

Check load, replace light bulb. For inductive transformers, check primary fuse.

### **LED lamp is dimly lit when dimmer is switched off**

Cause: LED lamp is not suitable for this dimmer.

Use another type of LED lamp or an LED lamp of another manufacturer.

## **5.3 Warranty**

The warranty follows about the specialty store in between the legal framework as provided for by law.

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