



# UNIVERSAL PUSHBUTTON DIMMER

## ETD U2

## ETD 2E

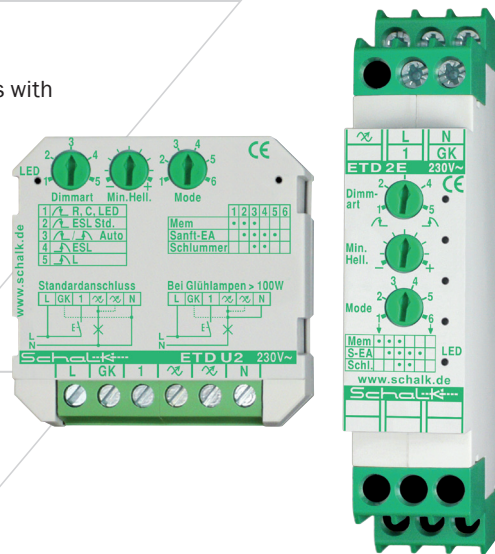
(Flush mount version)

(Rail mount version)

General purpose, user-friendly electronic pushbutton dimmer for a wide variety of lamps (LED, CFL, incandescent, LV halogen with electronic or wound transformer, HV halogen)

### Special features

- ▶ Dims suitable LED lamps, CFLs, incandescent lamps, LV halogen lamps with electronic or wound transformers and HV halogen lamps
- ▶ Dimming modes:  
forward phase control, reverse phase control, automatic detection of wound transformers, CFLs with delay for ignition and warm-up
- ▶ Electronic short-circuit and overload protection
- ▶ Suitable for use with automatic demand switches – built-in base load and brightness memory
- ▶ Rated load for HV/LV incandescent lamps:  
up to 500 VA (up to 4x 500 VA with power expansion)
- ▶ Rated load for LED/CFL: up to 400 VA with reverse phase control
- ▶ Suitable for use with switches from diverse product lines



### General information

The ETD U2 and ETD 2E universal pushbutton dimmers can dim a wide variety of lamps (LED, CFL, incandescent, LV halogen with electronic or wound transformer, HV halogen). Along with automatic detection of wound transformers in Auto dimming mode, the dimming mode can be set manually to forward or reverse phase control if necessary (especially for lamps with electronic ballasts or electronic transformers). A special CFL dimming mode additionally provides an ignition and warm-up delay for compact fluorescent lamps. The compact dimensions of the ETD U2 allow it to be installed in electrical boxes behind a button switch from any desired product line, making it equally suitable for new installations as well as maintenance-free replacement of existing or defective rotary or button dimmers.

### Operation

A short button press toggles the lamp; a long press increases or reduces the brightness.

### Extra functions

**Slumber („Schlummer“)** (e.g. for helping children get to sleep)

When this function is activated by dimming the lamp, the light level is dimmed down very slowly, with a duration that depends on the brightness at the start of dimming (duration from maximum brightness: 60 min).

**Discreet dim up („Diskret Eindimmen“)**

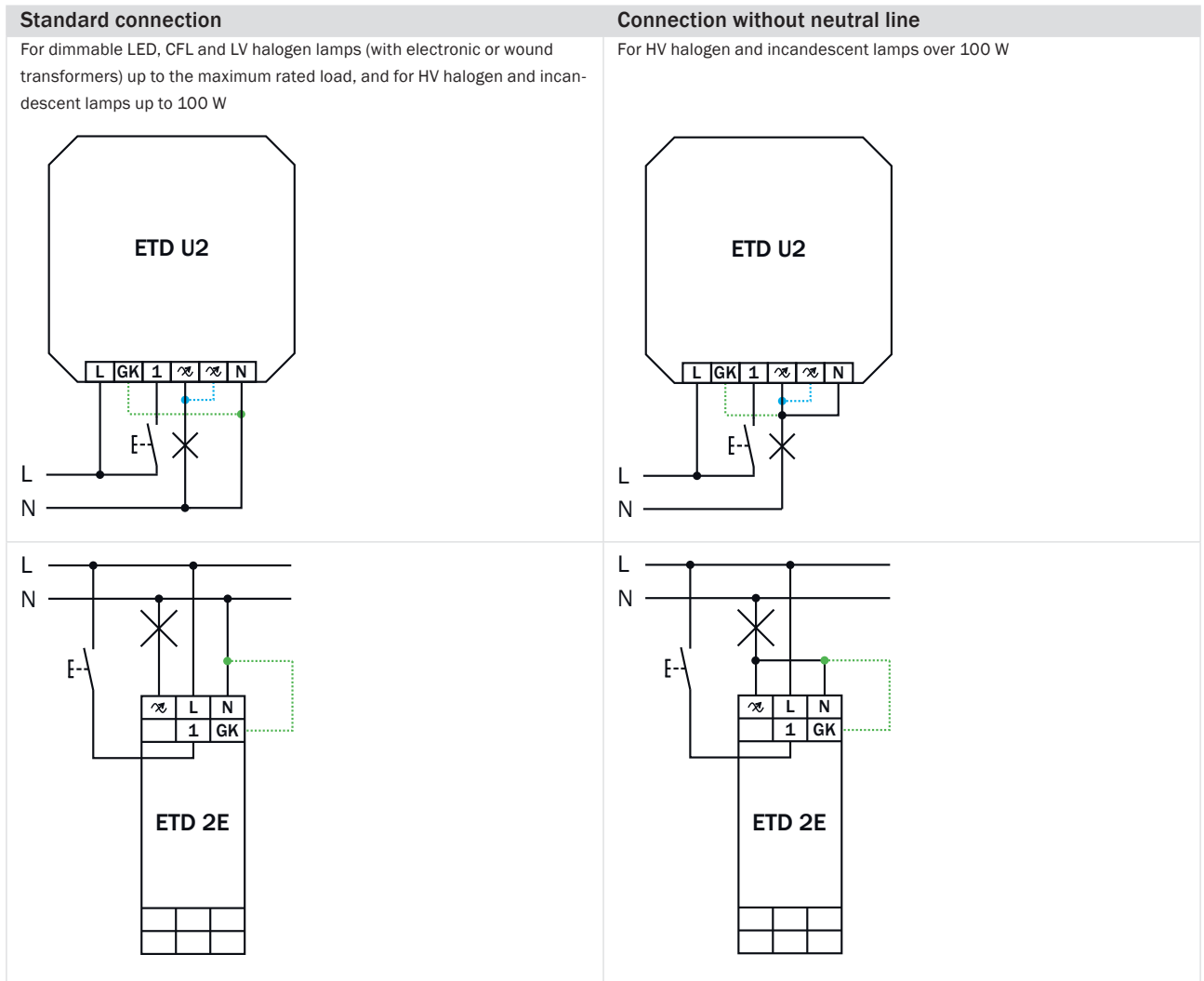
In response to a long button press when the lamp is off, the dimmer switches on and dims up from the minimum brightness.

**Sync**

If several dimmers are controlled by a single button, they may become unsynchronised because the button command (toggle) is not unambiguous. Synchronisation is achieved by holding the button pressed long enough (approximately 10 s) for all dimmers to dim down to minimum brightness and then stop at maximum brightness (maximum level).

### Installation

The ETD U2 and ETD 2E dimmers have a neutral line connection, so the lower load limit is 0 VA. However, the dimmer must be operated without a neutral connection with incandescent lamp loads over 100 W to avoid EMC problems. In this case the neutral terminal is jumpered to the load output. This has no effect on operation. If the dimmer is used in a circuit with an automatic demand switch, the integrated base load (GK terminal) must be connected to the N terminal (and thus to the load terminal as well with incandescent lamps over 100 W).

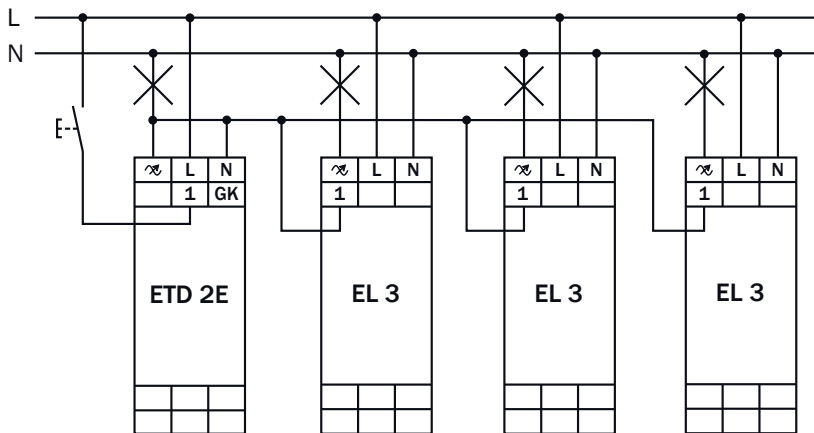


----- Optional; for improved heat dissipation with heavy loads

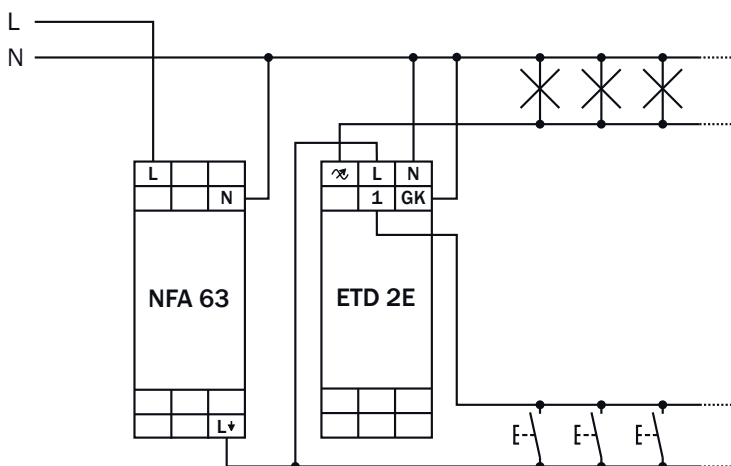
----- Optional; only necessary with an automatic demand switch

### For HV halogen and incandescent lamps: ETD 2E with power extension to max. 4x 500 VA

Note: The EL 3 power extension module is not suitable for LED and CFL lamps.



### ETD 2E with an automatic demand switch



## Settings and initial use

### General information:

Lamps approved for the same dimming mode can usually be used together. Incandescent lamps may always be operated in parallel. However, functional impairments occur fairly often when electronic loads from different manufacturers are operated in parallel, due to mutual interference of manufacturer-specific ballasts and/or electronic transformers. Wound transformers may not be combined with electronic loads.

The dimmer is designed to work with as many different types of lamps as possible. However, it is not possible to guarantee trouble-free operation of every dimmable lamp with the dimmer, since this can be affected by the design or construction of the lamp ballast or transformer.

Flickering or erratic dimming in the low brightness range with LED lamps and CFLs is usually due to the lamp being designed for higher minimum input power. We recommend raising the minimum brightness setting in such cases.


Ripple control signals from electricity plants can lead to perceptible flickering of the lighting. The magnitude of this effect varies from one region to the next.

## 1. Setting the dimming mode

Set the „Dimming Mode“ control to a dimming mode suitable for the lamp (see table)



 = forward phase control

 = reverse phase control

Dimmart (= dimming mode)

All suitable dimmable lamps can usually be operated in dimming mode 3 (Automatic).

Exceptions:

- Dimming mode 5 must be selected for lamps with wound transformers in a circuit with an automatic demand switch.
- Dimming mode 2 (or if appropriate mode 4) must be selected for CFLs which require an ignition and warm-up time.

| „Dimmart“ (dimming mode)               | Description   |
|--|---|
| 1: Reverse phase control               | For incandescent lamps, HV halogen lamps, LV halogen lamps with electronic transformers, and dimmable LED lamps   |
| 2: Reverse phase control with CFL mode | For dimmable CFLs which require an ignition and warm-up time  |
| 3: Automatic                           | For dimming nearly all loads with reverse phase control (with automatic change to forward phase control for wound transformers)<br><i>Not suitable for lamps with wound transformers in a circuit with an automatic demand switch; select dimming mode 5 instead.</i> |
| 4: Forward phase control with CFL mode | For dimmable CFLs which require an ignition and warm-up time, and when dimming mode 2 does not provide smooth dimming.  |
| 5: Forward phase control               | For dimming lamps with wound transformers located in a circuit with an automatic demand switch  |

### CFL mode (dimming modes 2 and 4)

Most CFLs need full mains voltage for ignition. For this reason, this mode provides an ignition phase at half brightness before adjusting to the last (saved) brightness level. A warm-up phase with elevated minimum brightness is also provided because most CFLs have significantly reduced minimum dimming capability (without going out) when cold. The minimum brightness is gradually reduced to the normal value during the warm-up phase. The warm-up time depends on the off time, so the full warm-up time (max. 1 minute) is only used when the lamp has been off for an extended time. If a CFL is switched off at very low brightness and then switched on again when cold, the previous minimum brightness will be attained only after the warm-up phase.

### Automatic detection of wound transformers (dimming mode 3)

Wound transformers must be dimmed with forward phase control because reverse phase control generates inductive reverse voltages that can destroy the dimmer if it does not detect them and switch off on time.

In this dimming mode the dimmer automatically changes to forward phase control after being switched on as soon as overvoltages (not yet dangerous) are detected. This setting is retained until loss of mains voltage. This dimming mode is not suitable for use with automatic demand switches because the mains voltage is always disconnected after the lights are switched off.

## 2. Setting the dimming mode

The minimum brightness should be set depending on the lamp so that the on state of the lamp can still be recognised at minimum brightness.

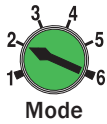


Min. Hell. (= Min. Brightness)

Switch on the dimmer and dim down as far as possible. Then set the minimum brightness to the desired level with the „Min. Brightness“ control.

### 3. Setting the operating mode

Various special functions can be activated or combined using the operating mode setting.



| Mode                     | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|---|---|---|---|---|---|
| Mem                      | • | • | • |   |   |   |
| Sanft-EA (= soft on/off) |   | • | • | • | • |   |
| Schlummer (= slumber)    |   |   | • | • |   |   |

„•“ = activated

„Mem“ (Memory)

If activated, the dimmer switches on at the last (saved) brightness level; otherwise at maximum brightness

„Sanft E/A“ (= soft on/off):

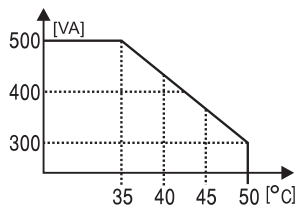
Soft switch-on and switch-off if activated (prolongs lamp life)

„Schlummer“ (= slumber)

If activated, the Slumber function can be used (see „Extra functions“)

### Ambient conditions and troubleshooting

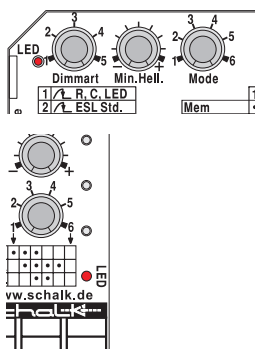
Zulässige Belastung:



Maximal zulässige Last in Abh. der Umgebungstemperatur (bei ausreichender Luftzirkulation)

The efficiency of wound transformers and electronic loads (LEDs, CFLs and electronic transformers) must be taken into account. The (primary) VA value is the critical parameter for the dimmer. Electronic loads must be approved by the manufacturer for dimming with forward or reverse phase control dimmers. The dimmer heats up during operation, depending on the connected load. The connected load must be reduced if this heat cannot be dissipated adequately. Do not mount dimmers close to heat sources.

LED status display



The LED is lit in the On state. In the Off state it blinks intermittently if the dimming mode or the operating mode has been changed. If a fault occurs, it displays a fault code.

**Fault codes: (LED blinks periodically 1 to 9 times)**

|   |  |
|---|--|
| 1 | Overload >500VA                          |
| 2 | Overtemperature                          |
| 3 | Overcurrent (short-circuit)              |
| 4 | Transformer reverse voltage              |
| 5 | Transformer saturation (unbalanced load) |
| 6 | Overload > 900 VA                        |
| 7 | Mains overvoltage                        |
| 8 | Synchronisation fault                    |
| 9 | Memory fault                             |

There is a restart lockout interval of up to 10 seconds after an overload, overtemperature, overcurrent or overvoltage condition to allow the heated components to cool down.

## Technical data

|   |  |
|---|--|
| Operating voltage   | 230V AC 50 Hz  |
| Power consumption   | 0.3 W in off state   |
| Power dissipation   | 2 W max. with 500 VA load  |
| <b>Rated load</b>   |  |
| Incandescent, HV and LV halogen lamps, wound or electronic transformers | 500 VA with ambient temperatures up to 35°C;<br>300 VA with ambient temperatures up to 50°C  |
| LED/CFL   | Up to 400 VA (lamps of the same make recommended).<br><b>Differences in manufacture-specific ballast or electronic transformer circuitry may lead to restrictions on load capacity, the maximum number of lamps or the dimming and/or switching functions.</b> |
| Bursting strength   | Compliant with EN 61000-4-4 Level 2  |
| Surge resistance  | Compliant with EN 61000-4-5 Level 2  |
| EMC   | Compliant with EN 55015  |
| Ambient temperature range   | -10°C to +50°C (reduced power above +35°C)   |
| Insulating housing  | Non-flammable acc. to VDE 0304 Part 3, Level FV D  |
| Wiring capacitance on terminal 1  | max. 100 nF  |
| Glow lamp load on terminal 1  | max. 20 mA   |

### ETD U2

|                    |   |
|--------------------|---|
| Outside dimensions | 43 x 43 x 18.5 mm <sup>3</sup>  |
| Weight             | 35 g  |
| Connections        | Terminals with captive screws M3.0<br>2 x 1.5mm <sup>2</sup> / 1 x 2.5mm <sup>2</sup> |

### ETD 2E

|                    |  |
|--------------------|--|
| Mounting           | Click-mount on standard 35-mm rail (EN 50022)  |
| Outside dimensions | 18 x 88(45) x 58 mm <sup>3</sup>   |
| Installation depth | 55 mm  |
| Weight             | 80 g   |
| Connections        | Terminals with captive screws M3.5;<br>4x 1.5 mm <sup>2</sup> / 2x 2.5 mm <sup>2</sup> / 1x4 mm <sup>2</sup> |
| RAL colour         | Grey 7035 / Green 6029   |

## Order data

| Item no. | EAN             | Type   | Item designation  |
|----------|-----------------|--------|---|
| ETDU29   | 4 046929 201100 | ETD U2 | Universal Pushbutton Dimmer (UP), 230 V AC, 0–500 VA, also for LED/CFL  |
| ETD2E9   | 4 046929 201117 | ETD 2E | Universal Pushbutton Dimmer (REB), 230 V AC, 0–500 VA, also for LED/CFL |