

## Installation and operating instructions for Dasy TC series twilight switches



These instructions describe the installation and commissioning of the Dasy TC twilight switch with integrated timer switch. They are intended for use by (electrically) skilled persons. Electrical laypersons must not install and connect devices of this type due to the considerable potential dangers. The instructions must be kept so that they can be referred to at a later stage.

### Safety instructions

Working with and on high voltages can be potentially fatal; the extent of injury cannot be predicted. The basic requirement for safe work and the avoidance of accidents due to electric current (electric shock, electric arcs, secondary effects, e.g. accidents caused by tripping) is to comply with all safety and operating requirements stated in these instructions. The local accident prevention regulations are also applicable.

1. Installation and connection must only be carried out by an electrician.
2. Ensure there are no people or animals in the danger area when manually switching (putting the Dasy in dark conditions) and when pressing the test key.
3. Avoid quick switching sequences if sensitive luminaires (e.g. HQL) are connected.
4. When the inner protective cover for the terminal is opened, voltage-carrying parts of the Dasy TC become exposed. Touching these can cause life-threatening injury. Only open the cover when the supply voltage is disconnected.
5. Test all settings after switching off the voltage in order to ensure that the switching function of the Dasy is working.

### Intended use

The DASY is intended for brightness-linked control of electrical consumers. The DASY TC has the additional function of an integrated timer switch for time-linked control of the consumers. According to their protection class they are also suitable for outdoor use, in which case they must be installed on the wall or on a mast.

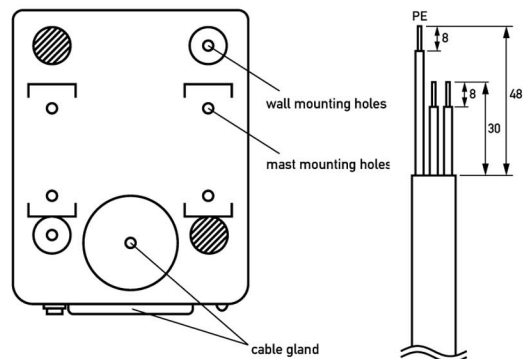
### Assembly

Observe the following points when selecting the place of installation and during mounting itself:

1. Avoid locations in direct sunlight. North and east-facing walls are ideal.
2. The light reaching the sensor must not be interrupted by overhanging roofs etc.
3. The switched light source must not directly affect the sensor.
4. Mount the device so that the light conductor and potentiometer are facing downwards.
5. Use the optional mounting kit (must be ordered separately) to mount the device on masts or pipes.

### Installation

1. In order to prevent death or injury due to electric shock, the power supply must be cut off before installation.
2. The device's supply line must be protected using the specified miniature circuit breaker.
3. The cable gland on the underside or back of the device should be used for the supply line.
4. The specified stripping lengths for the lines are given in the following diagram.
5. The silicon tubes enclosed are to be fitted to the cores of the connection lines.
6. The terminal assignment is shown in the following figure.
7. The maximum torque when tightening screw-type terminals must not be exceeded.
8. Close the protective cover after connecting the wiring and secure the cover with the screw supplied.
9. Close the device securely after commissioning by screwing the front cover.



▲ Cable glands and attachments, stripping lengths

### Commissioning

The appropriate voltage must be supplied to the device for commissioning. Use the protective cover to ensure that the wiring cannot be accessed.

### Functional description – twilight switch

The twilight switch compares the current illuminance with the set switch-on threshold. If the illuminance drops below the desired switch-on threshold, the internal relay switch (normally opened contact) is switched on once the switch-on delay has expired. If the switch-off threshold is reached due to increasing illuminance (1.5 times the switch-on threshold), the load relay switches off again after the switch-off delay has expired.

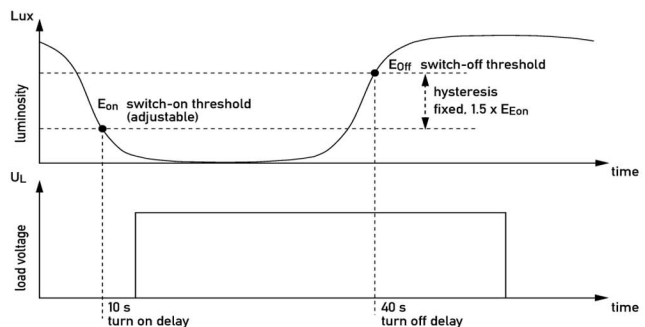
Light conductor on	Illuminance below the switch-on threshold
Light conductor off	Illuminance above the switch-on threshold

### Switch-on threshold

After connecting the operating voltage, move the potentiometer to the left stop ☺ to set the switch-on threshold  $E_{ON}$ . If the outdoor brightness is at the desired level, the potentiometer should be slowly turned to the right ☻ until the control diode illuminates. This process sets the switch-on threshold to the desired illuminance. The load relay switches on after the switch-on delay has expired.

### Switch-off threshold

The switch-off threshold  $E_{OFF}$  is fixed at 1.5 times the value of the switch on threshold  $E_{ON}$ . If the switch-off threshold is exceeded due to increasing brightness, the control diode and the load relay switch off once the switch-off delay time has expired.



### Switch-on/switch-off delay time

As soon as the switch-on threshold is altered due to the potentiometer being operated, the switching delays are reduced to 1 second for 5 minutes. This causes the load relay to switch almost synchronously with the control diode, to be able to check immediately that the device and load are functioning correctly. Should the delay times be activated prematurely, the power supply to the device should be momentarily interrupted.

During normal operation or directly after the power is restored, the delay prevents the twilight switch from being actuated due to brief lighting fluctuations (lightning, car headlights, etc.) The light conductor on the underside of the device indicates the status of the internal twilight sensor.

### Instructions for function test

When the weather is sunny or if the device is installed at an unfavourable location with a lot of natural light, covering the lens with your hand may not suffice for test purposes. The switch-on point cannot be reached because too much light is able to enter the housing. In these cases, use the packaging to cover the housing or another opaque aid to create conditions which are sufficiently dark for testing.

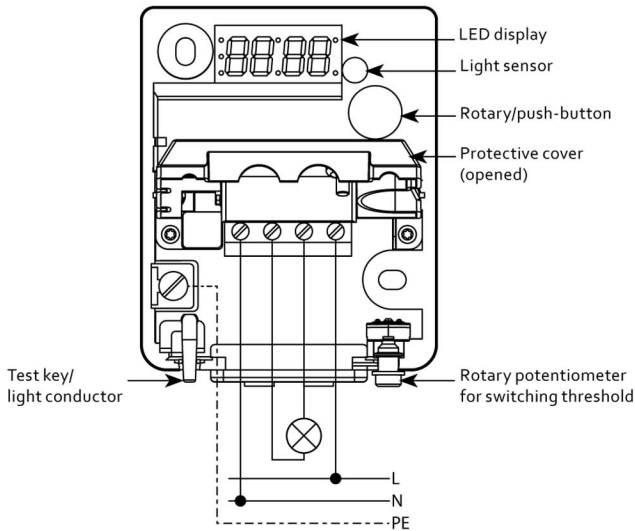
### Functional description – Dasy TC timer switch

The integrated timer switch can be used to set a time range during which the connected consumer is switched off. The function of the timer switch is prioritised over the twilight switch. This means the consumer remains switched off even during appropriate darkness.

The Dasy TC variant has a storage capacitor that, when fully charged, buffers the internal timer chip for approx. one week in the event of a power failure. Full charge is achieved after approx. 10 min when the operating voltage is connected. When the storage capacitor is empty, incorrect values or "--:--" may be displayed when the operating voltage is switched on. "--:--" is also displayed during initial commissioning. In this state, night-time switching is automatically disabled and the device functions purely as a twilight switch.

### Dasy TC connection, controls and display

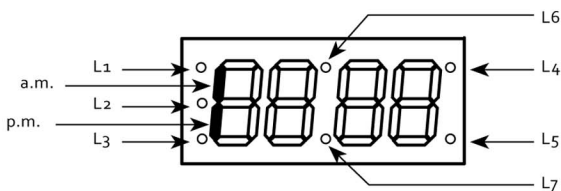
The control elements and the display of the Dasy TC can be viewed and accessed after unscrewing the front cover:



Description	Function/explanation	
Test key/light conductor	- manual operation of the relay - feedback on the switching status of the twilight sensor	
Rotary potentiometer	Switch-on threshold setup	
LED display	Display for setting the operating mode and time	
Rotary/push-switch	Operation via menu	
Operation of the rotary pressure switch	in main menu	in submenus
	Turn left/right	Select menu items
Hold down	Open setting menu	
Briefly press	-	Confirm set value

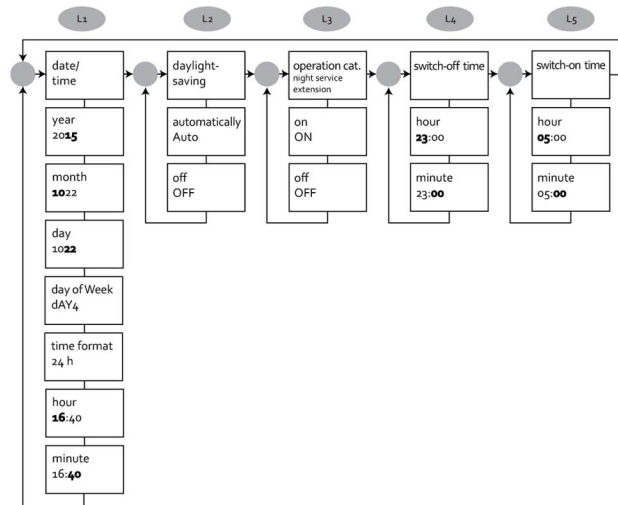
### LED display

The LED display is switched off during normal operation. Enable it by turning or briefly pressing the rotary/push-button. The LED display has four 7-segment indicators and an additional seven individual LEDs (L1 to L7) which indicate the current menu (configuration). The relay is switched off when the display is enabled.



### Timer switch: Setting the timer function

#### Menu structure



#### Menu L1: Setting the date, time and time format

1. Turn the rotary switch until L1 flashes.
2. Hold down the rotary switch until L1 illuminates constantly (no flashing) and the year field flashes.
3. Change the values by turning the rotary switch and confirm the values by pressing the switch.
4. Proceed accordingly with the following points:

Year	Month	Day	Day of the week (DAY)	Time format	Hour	Minute
2015 – 2099	1 – 12	1 – 31	1 (Monday) – 7 (Sunday)	24 h 12 h	0 – 23 1 – 12	0 – 59

When the 12-h format is selected, the left-hand segments of the first 7-segment display indicate the morning/afternoon time.

top: a.m. = morning, bottom: p.m. = afternoon/evening

#### Menu L2: Setting the automatic adjustment for daylight saving time

1. Turn the rotary switch until L2 flashes.
2. Hold down the rotary switch until L2 illuminates constantly (no flashing) and the current value flashes.
3. Select the desired value by turning the rotary switch and confirm the value by pressing the switch.

Auto	Automatic switching for daylight savings
OFF	No daylight savings

#### Menu L3: Switching the timer switch on/off

1. Turn the rotary switch until L3 flashes.
2. Hold down the rotary switch until L3 illuminates constantly (no flashing) and the current value flashes.
3. Select the desired value by turning the rotary switch and confirm the value by pressing the switch.

On	The timer switch is enabled; the set switch-on and switch-off times apply.
OFF	The timer switch is disabled; the set switch-on and switch-off times are ignored.

#### Menu L4: Setting the switch-on and switch-off time

1. Turn the rotary switch until L4 (switch-off time) or L5 (switch-on time) flashes.
2. Hold down the rotary switch until L4 or L5 illuminates constantly (no flashing) and the hour field flashes.
3. Select the desired value for the hour by turning the rotary switch.
4. Press the rotary switch to confirm and move on to the minute setting.
5. Once the minute setting is confirmed, the device will automatically switch to the main menu.

Hour	Minute
0 – 23 or 1 – 12 a.m./p.m.	0 – 59

#### Testing the relay

The test key (light conductor) can be used to test the function of the twilight sensor, and if pressed, can be used to test the relay as well. In the latter case, the relay switches on or off depending on the current switching status for approx. 60 s.

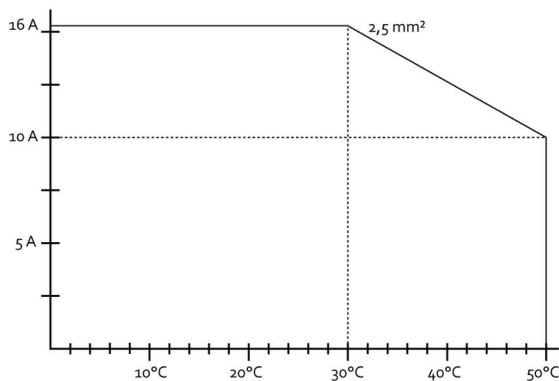
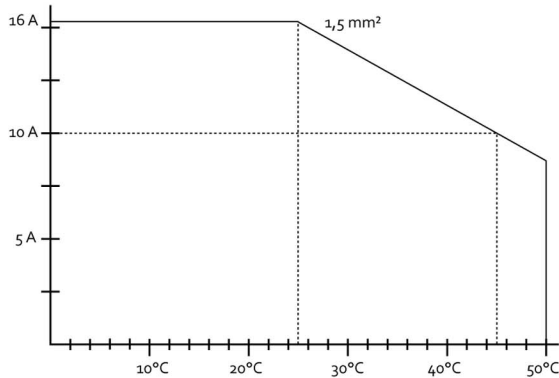
- » Relay off (in brightness): pressing the control diode initiates the switch-on process – the LED flashes until the relay is switched **on**
- » Relay on (in darkness): pressing the control diode initiates the switch-off process – the LED flashes until the relay is switched **off**

The test can be cancelled prematurely by pressing the diode again. Pressing the test key switches the LED display off.

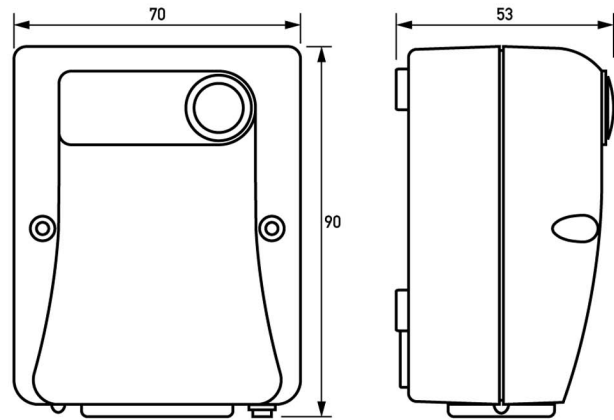
#### Warranty

All professionally installed, unaltered devices are covered by warranty for the duration of the statutory warranty period from the day of purchase by the end user. The warranty is not applicable to damage incurred during transport or caused by short-circuit, overloading or improper use. In the event of defects in workmanship or material being discovered within the warranty period, the company will provide repair or replacement free of charge.

#### Derating based on the cable cross-section



#### Dimensions



#### Technical Data

Dasy 016-230 TC	
Operating voltage	230 V AC $\pm$ 10%, 50 Hz 115 V AC $\pm$ 10%, 60 Hz
<b>Design</b>	
white	09 500 044
anthracite	09 500 048
<b>Output</b>	
Type	All-or-nothing relay
Contact	1 NO contact Micro switch-off
Miniature circuit-breaker	max. 16 A
Switching power	4,000 VA
Capacitor for parallel compensation	max. 140 $\mu$ F
Number of electrical switching cycles	min. 100,000
Internal consumption	0.9 W
Switch-on delay	10 s (1 s) <sup>1)</sup>
Switch-off delay	40 s (1 s) <sup>1)</sup>
<b>Switching thresholds</b>	
Switch-on value	adjustable, 1–200 lux
Switch-off value	1.5 times the switch-on value
<b>Control display</b>	
Red LED	Illuminates: switch-on threshold exceeded Flashes: test key pressed
<b>Terminals</b>	
Type	Screw terminals with strain-relief clamp
Clamping area	0.4 mm $\varnothing$ to 4 mm <sup>2</sup> (rigid)
Tightening torque	0.5 Nm
<b>Housing</b>	
Dimensions (H x W x D in mm)	90 x 70 x 53
Type	On-wall housing for wall or mast mounting <sup>2)</sup>
Protection class	IP54
Material	Polycarbonate (PC)
Weight	0.143 kg
Design regulations/standards	DIN EN 60669
<b>General data</b>	
Ambient temperature	-40 °C to +50 °C
Accessories mast bracket	09 500 049

<sup>1)</sup> These values apply for 5 minutes after the last switch-on threshold change.

<sup>2)</sup> Optional mounting kit to be ordered separately