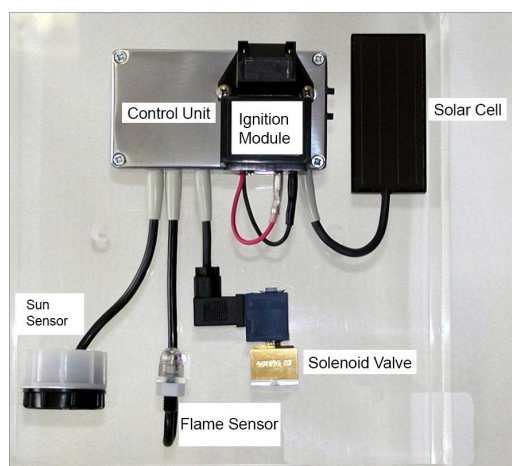


# Twilight switch BS-GC Solar



## Concept

Until now, only battery-powered devices were available on the market. Malfunctions occur due to oxidized battery contacts, as well as prematurely discharged or even leached batteries.

The BS-GC twilight switch is used to control gas lights. By using a powerful solar cell in conjunction with an electric double-layer capacitor, the device works completely independently. No batteries or accumulators are required for operation, making this device maintenance-free.

## Mode of operation

The sun sensor (LDR1) records the ambient brightness. If it falls below a certain threshold value, the twilight switch opens the solenoid valve and switches on the electronic ignition for 30 seconds. When the flame sensor (LDR2) detects a glow of the filaments, the ignition switches off immediately. The light is switched off (valve closed) when the dawn exceeds the switch-on point of the sun sensor.

## Technical data

Capacitor voltage:	1,0 – 2,5 V
Capacitor quantity:	1
Capacitor type:	Double layer capacitor
Solarpanel:	Thin film module for outdoor use
Open circuit voltage:	5,5 V
Working voltage:	3,4 V
Closed-circuit current:	ca. 300 $\mu$ A
Switching current valve:	Pulse ca. 400 mA/16 ms
Switching voltage valve:	4 V
Threshold values (flame/sun):	Adjustable bw. 4 – 60 lx, 20 – 1 klx
Switching hysteresis:	ca. 5% of threshold value
Housing material:	Aluminum
Temperature resistance of the control elements:	-40°C bis +120°C
<u>Cable lengths</u>	
Sun sensor:	ca. 450 mm
Solenoid valve:	ca. 200 mm
Solar cell:	ca. 450 mm
Valve:	Micro solenoid valve 2/2 way valve pulse controlled
Safety shutdown:	yes
Flame control:	yes
Automatic re-ignition:	yes
several circuit programs:	yes
Low voltage indicator (optional)	yes, red LED flashes every 3 seconds

# Technical information about the twilight switch BS-GC Solar

## Solar technology: the ecological energy source

Until now, only battery-powered devices were available on the market. Malfunctions occur due to oxidized battery contacts, as well as prematurely discharged or even leached batteries.

The BS-GC twilight switch is a device for controlling gas lights.

By using a powerful solar cell in combination with an electric double-layer capacitor, the device works completely independently. No batteries or accumulators are required for operation, making this device maintenance-free.

### Mode of operation

The sun sensor (LDR1) records the ambient brightness. If it falls below a certain threshold value, the twilight switch opens the solenoid valve and switches on the electronic ignition for 30 seconds. When the flame sensor (LDR2) detects a glow of the glowing elements, the ignition switches off immediately. The light is switched off (valve closed) when the dawn exceeds the switch-on point of the sun sensor.

### Solar energy supply

Daylight and light at night are converted into electrical energy by a thin-film solar cell and stored in the electrical double-layer capacitor. The solar cell is characterized by maximum performance with small dimensions. The double-layer capacitor is charged even at low light intensity. The double-layer capacitor stores the energy gained from light and reliably supplies the device with the necessary voltage. The energy system used in this device for electrical self-sufficiency can achieve a service life of between 10 and 12 years with regard to the capacitors. It should be emphasized that double-layer capacitors can be charged and discharged daily due to their long service life of around 100,000 charge/discharge cycles. Conventional batteries, however, reach their upper performance limit at 2000 to 5000 charge/discharge cycles.

### Cables and sensors

All control cables that feed out of the metal housing are provided with an anti-kink protection, which simultaneously works as a strain relief. The control cables and cores are sheathed with notch-resistant silicone and are best suited for a warmer operating temperature. The sensors for daylight and flame monitoring are high-quality components (LDR), which are also used, for example, in exposure measurement technology.

### Valve

A 2/2 way micro solenoid valve is used. The diameter for the gas flow rate is 2.5mm, so that in natural gas operation, each type of lamp can be supplied with up to 12 flames. If a higher gas throughput is required, a 2/2 way valve with a larger diameter can be used.

BRAUN Lighting Solutions e. K. is a participant in the export initiative "Energie Effizienz – made in Germany", initiated by the Federal Ministry for the Economy and Technology. Due to the complexity of the many possible combinations of drivers and LED modules, the values shown for technical LED parameters, including performance parameters, are typical. Actual values of specific products in specific configurations may vary from these typical values. The information and diagrams contained in this document do not constitute an offer or contractual obligation. Product parameters may change as a result of technical innovation and will be undertaken without prior notice. Our manufacturing conforms to DIN EN and VDE regulations; the product conforms to European EMC regulations.

# Switching program

1.

If the flame sensor (LDR2) detects that the bulbs have lit up, the ignition switches off and monitors the flame all night.

2.

The maximum ignition time is limited to 30 seconds. After that the ignition is switched off in any case and the solenoid valve is closed. Only after one minute a second start procedure is performed. Thereby the ignition is switched on again and the valve is opened.

If the ignition is unsuccessful in the second start procedure, the ignition is not switched on again until the next night.

3.

If the flame goes out at night after successful ignition, a re-ignition takes place. If this remains unsuccessful after 30 seconds, the gas valve is closed and no further starting procedure follows during the night.

## Safety shutdown to prevent "permanent lighting" or the escape of unburned gas:

The double layer capacitor is monitored at night and during the ignition time. If the charging voltage drops below a set minimum voltage, the running ignition is not interrupted. However, further post-ignitions are blocked. The charging voltage is checked again the next evening. Ignitions are possible again if the voltage is sufficient.

## **Note**

For the proper function of the twilight switch, the following must be observed:

- do not bring lubricating oils or similar agents into contact with the inside of the valve

## Security alert:

- Caution high voltage! The ignition spark voltage is approx. 27 KV!
- Do not remove, install or transport the unit with a charged capacitor

BRAUN Lighting Solutions e. K. is a participant in the export initiative "Energie Effizienz – made in Germany", initiated by the Federal Ministry for the Economy and Technology. Due to the complexity of the many possible combinations of drivers and LED modules, the values shown for technical LED parameters, including performance parameters, are typical. Actual values of specific products in specific configurations may vary from these typical values. The information and diagrams contained in this document do not constitute an offer or contractual obligation. Product parameters may change as a result of technical innovation and will be undertaken without prior notice. Our manufacturing conforms to DIN EN and VDE regulations; the product conforms to European EMC regulations.