



### Driver LC 35W 200-350mA stepDIM Ip SNC

essence series non-SELV (stepDIM)

#### Product description

- Constant current built-in LED Driver
- Motion and daylight detection (included in delivery)
- For luminaires of protection class I and protection class II
- Temperature protection as per EN 61347-2-13 C5e
- Selectable fixed output current 350, 300, 250 and 200 mA
- Max. output power 35 W
- Up to 87 % efficiency
- Nominal life-time up to 100,000 h
- 5-year guarantee (conditions at [www.tridonic.com](http://www.tridonic.com))

#### Housing properties

- Casing Driver: metal, white
- Casing sensor: polycarbonat, white
- Type of protection IP20

#### Functions

- Overload protection
- Short-circuit protection
- No-load protection

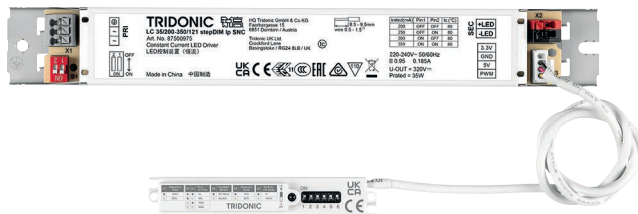
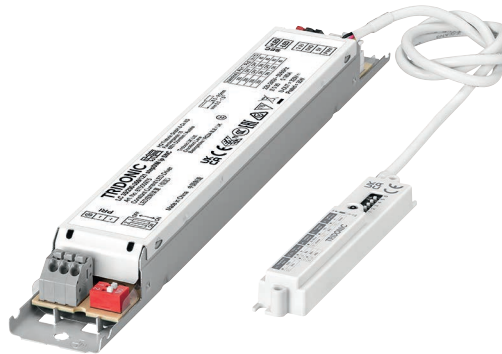


**Technical data LED Driver**, page 3

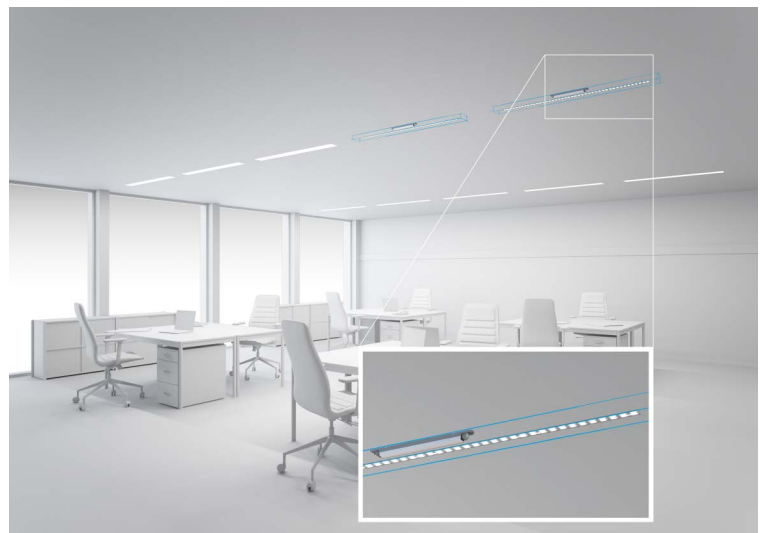
**Product description LED Driver**, page 4–6

**Technical data Motion Sensor**, page 3

**Product description Motion Sensor**, page 7–9



LED Driver with sensor (included in delivery)

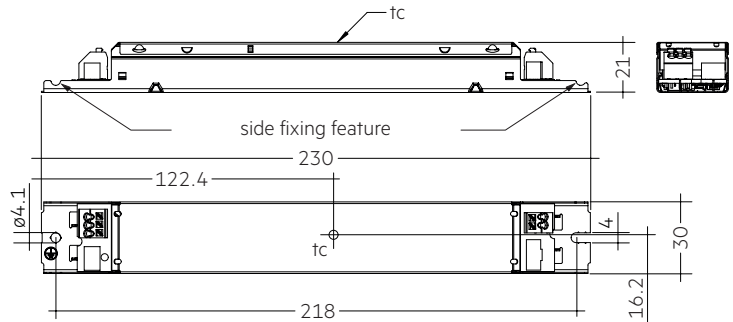


IP20      

### Driver LC 35W 200-350mA stepDIM Ip SNC essence series non-SELV (stepDIM)

#### Technical data

|   |                  |
|---|------------------|
| Rated supply voltage  | 220 – 240 V      |
| AC voltage range  | 198 – 264 V      |
| Input current (at 230 V, 50 Hz, full load)                  | 0.185 A          |
| Leakage current (at 230 V, 50 Hz, full load)                | < 450 µA         |
| Mains frequency   | 50 / 60 Hz       |
| Overvoltage protection                                      | 320 V AC, 1 h    |
| Output power range  | 10.4 – 36.4 W    |
| Typ. efficiency (at 230 V / 50 Hz / full load) <sup>®</sup> | 87 %             |
| λ (at 230 V, 50 Hz, full load) <sup>®</sup>                 | 0.95             |
| Output current tolerance <sup>®</sup>                       | ± 7.5 %          |
| Max. output voltage   | 320 V            |
| THD (at 230 V, 50 Hz, full load) <sup>®</sup>               | < 10 %           |
| Max. peak output current at full load <sup>®</sup>          | 390 mA           |
| Output LF current ripple (< 120 Hz) at full load            | ± 3 %            |
| Output P <sub>ST</sub> <sup>LM</sup> (at full load)         | ≤ 1              |
| Output SVM (at full load)                                   | ≤ 0.4            |
| Starting time (at 230 V, 50 Hz, full load)                  | ≤ 0.5 s          |
| Turn off time (at 230 V, 50 Hz, full load)                  | ≤ 0.5 s          |
| Hold on time at power failure (output)                      | 0 s              |
| Ambient temperature t <sub>a</sub> (at life-time 50,000 h)  | 60 °C            |
| Storage temperature t <sub>s</sub>                          | -40 ... +80 °C   |
| Mains burst capability                                      | 1 kV             |
| Mains surge capability (between L – N)                      | 1 kV             |
| Mains surge capability (between L/N – PE)                   | 2 kV             |
| Surge voltage at output side (against PE)                   | 4 kV             |
| Life-time   | up to 100,000 h  |
| Guarantee (conditions at www.tridonic.com)                  | 5 years          |
| Dimensions L x W x H  | 230 x 30 x 21 mm |
| Hole spacing D  | 218 mm           |



#### Ordering data

| Type <sup>®</sup>                | Article number | Packaging, carton | Packaging, pallet | Weight per pc. |
|----------------------------------|----------------|-------------------|-------------------|----------------|
| LC 35/200-350/121 stepDIM Ip SNC | 87500975       | 20 pc(s).         | 420 pc(s).        | 0.158 kg       |

#### Specific technical data

| Type                             | Output current <sup>®</sup> | Min. forward voltage | Max. forward voltage | Max. output power | Typ. power consumption (at 230 V, 50 Hz, full load) | Typ. current consumption (at 230 V, 50 Hz, full load) | Max. casing temperature t <sub>c</sub> | Ambient temperature t <sub>a</sub> max. | Output select |
|----------------------------------|-----------------------------|----------------------|----------------------|-------------------|---|---|--|---|---------------|
| LC 35/200-350/121 stepDIM Ip SNC | 200 mA                      | 52 V                 | 121 V                | 24.2 W            | 27.5 W  | 130 mA  | 80 °C                                  | -20 ... +60 °C                          | 1=off / 2=off |
|                                  | 250 mA                      | 52 V                 | 121 V                | 30.3 W            | 33.3 W  | 155 mA  | 80 °C                                  | -20 ... +60 °C                          | 1=off / 2=on  |
|                                  | 300 mA                      | 52 V                 | 121 V                | 36.3 W            | 40.5 W  | 185 mA  | 80 °C                                  | -20 ... +60 °C                          | 1=on / 2=off  |
|                                  | 350 mA                      | 52 V                 | 104 V                | 36.4 W            | 41.0 W  | 185 mA  | 80 °C                                  | -20 ... +60 °C                          | 1=on / 2=on   |

<sup>®</sup> LED Driver with sensor (included in delivery).

<sup>®</sup> Test result at 350 mA.

<sup>®</sup> Test result at 25 °C.

<sup>®</sup> Output current is mean value.

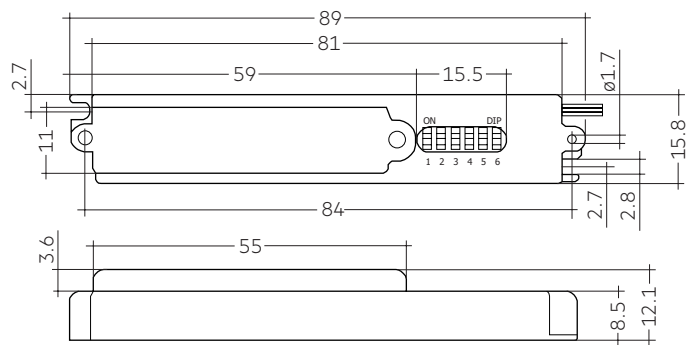
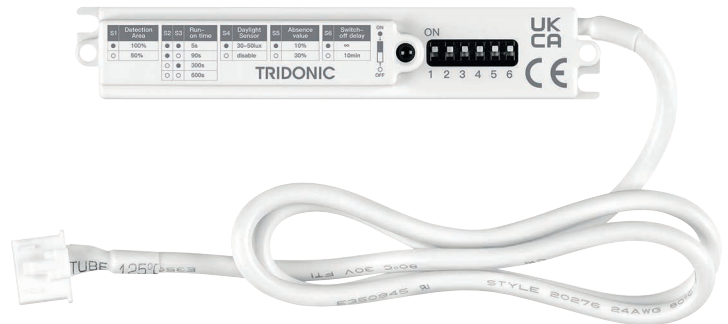


**Motion Sensor (included)**

Automatic switching based on motion and light level

**Technical data**

|                                  |                        |
|----------------------------------|------------------------|
| Supply voltage DC                | 5.3 – 10 V             |
| Current draw                     | 45 mA                  |
| Max. input current               | 50 mA                  |
| Output signal                    | 0 – 5 V (PWM 3 kHz)    |
| Power                            | < 0.5 W                |
| Frequency                        | 5.8 GHz (± 75 MHz)     |
| Transmission power               | < 0.2 mW               |
| Detection angle                  | 150°                   |
| Max. detection area <sup>①</sup> | ∅ 14 m                 |
| Max. mounting height             | 6 m                    |
| tc                               | 70 °C                  |
| Ambient temperature ta           | -20 ... +70 °C         |
| Storage temperature ts           | -20 ... +70 °C         |
| Humidity                         | min. 5 % ... max. 95 % |
| Type of protection               | IP20                   |
| Protection class                 | Protection class II    |
| Casing material                  | PC, halogen-free       |
| Casing colour                    | White                  |
| Dimensions L x W x H             | 89 x 15.8 x 12.1 mm    |
| Hole spacing D                   | 84 mm                  |



<sup>①</sup> ≥ 3.5 m radius at 1 m/s speed at mounting height 3 m.

## Driver LC 35W 200-350mA stepDIM Ip SNC4

## Product description

## 1. Standards

EN 55015  
 EN 61000-3-2  
 EN 61000-3-3  
 EN 61347-1  
 EN 61347-2-13  
 EN 61547  
 EN 62384  
 EN 60598-1

## 2. Thermal details and life-time

## 2.1 Expected life-time

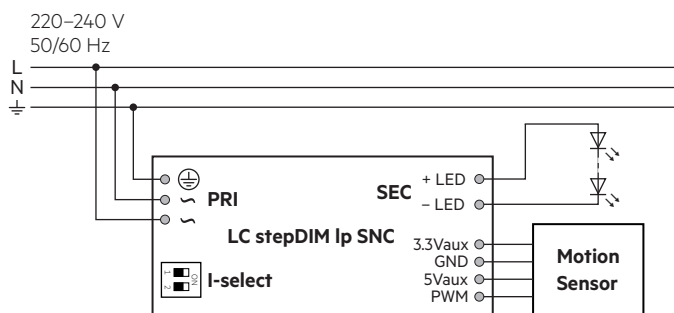
| Type                             | ta        | 50 °C     | 60 °C    |
|----------------------------------|-----------|-----------|----------|
| LC 35/200-350/121 stepDIM Ip SNC | tc        | 70 °C     | 80 °C    |
|                                  | Life-time | 100,000 h | 50,000 h |

The LED Driver is designed for a life-time stated above under reference conditions and with a failure probability of less than 10 %.

The relation of tc to ta temperature depends also on the luminaire design. If the measured tc temperature is approx. 5 K below tc max., ta temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.

## 3. Installation / wiring

## 3.1 Circuit diagram

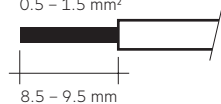


## 3.2 Wiring type and cross section

The wiring can be stranded wires with ferrules or rigid wires with a cross section of 0.5 – 1.5 mm<sup>2</sup>.

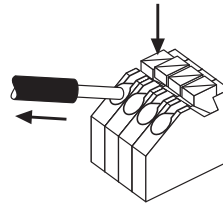
Strip 8.5 – 9.5 mm of insulation from the cables to ensure perfect operation of the push-wire terminals (WAGO 250).

wire preparation:  
0.5 – 1.5 mm<sup>2</sup>



## 3.3 Release of the wiring

Press down the “push button” and remove the cable from front.



## 3.4 Wiring guidelines

- All connections must be kept as short as possible to ensure good EMI behaviour.
- Mains leads should be kept apart from LED Driver and other leads (ideally 5 – 10 cm distance)
- Max. length of output wires is 2 m.
- Incorrect wiring can damage LED modules.
- To avoid the damage of the Driver, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

## 3.5 Earth connection

The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via metal housing. If the LED Driver will be earthed, protection earth (PE) has to be used. There is no earth connection required for the functionality of the LED Driver. Earth connection is recommended to improve following behaviour.

- Electromagnetic interferences (EMI)
- Transmission of mains transients to the LED output

In general it is recommended to earth the LED Driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

For Class II application, protection earth is no need to be connected, below 2 scenarios should be considered:

- If the LED Driver housing is screw on a metal part inside the luminaires, both LED Driver and LED module must be insulated.
- If the LED Driver housing is screw on a plastic part inside the luminaires, the LED module need to be insulated.

## 3.6 Replace LED module

1. Mains off
2. Remove LED module
3. Wait for 30 seconds
4. Connect LED module again

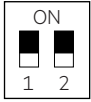
Hot plug-in or output switching of LEDs is not permitted and may cause a very high current to the LEDs.

## 3.7 Mounting of device

Max. torque for fixing: 0.5 Nm/M4

### 3.8 Current setting

**200 mA:** Switch 1 = Off, Switch 2 = Off



**250 mA:** Switch 1 = Off, Switch 2 = On



**300 mA:** Switch 1 = On, Switch 2 = Off



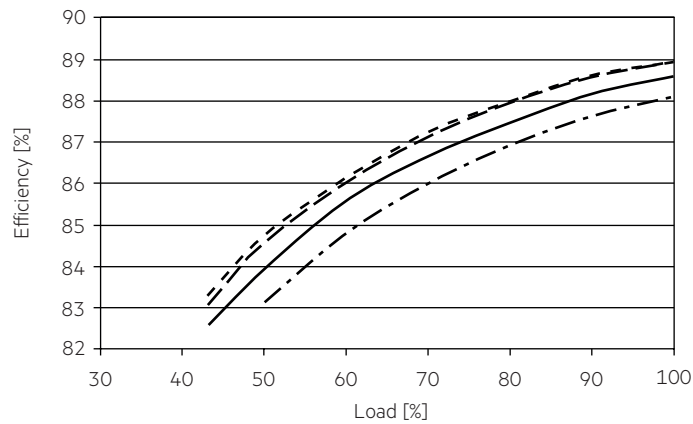
**350 mA:** Switch 1 = On, Switch 2 = On



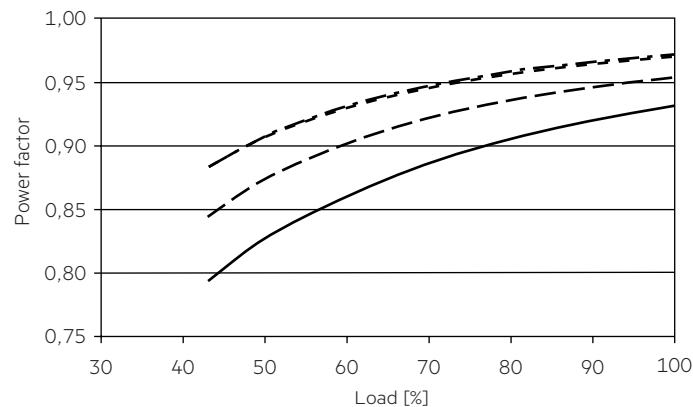
Set the current by DIP switch after mains off.  
Use of DIP switch only after mains off.

## 4. Electrical values

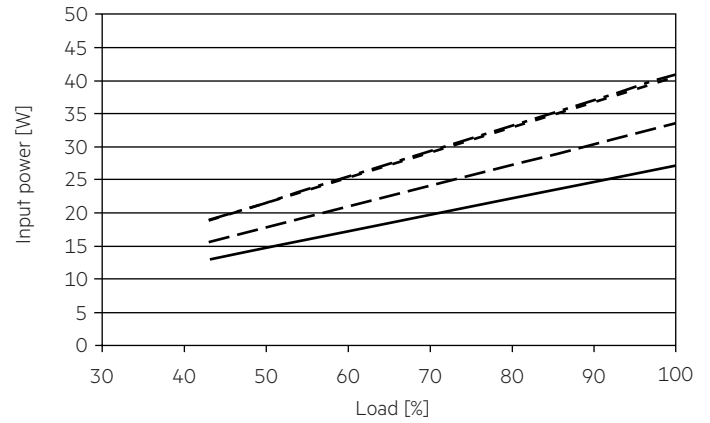
### 4.1 Efficiency vs load



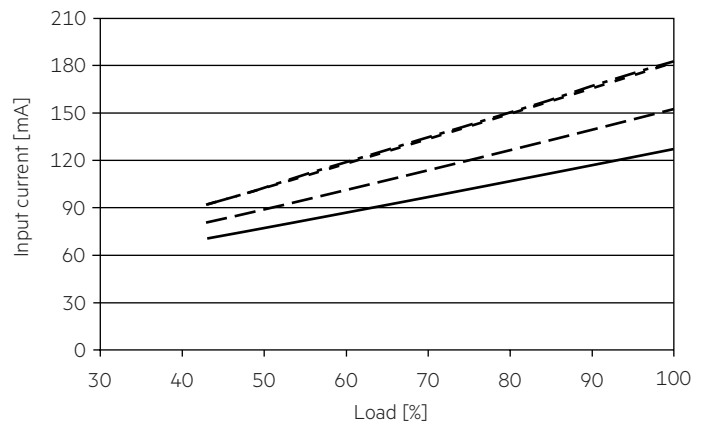
### 4.2 Power factor vs load



### 4.3 Input power vs load

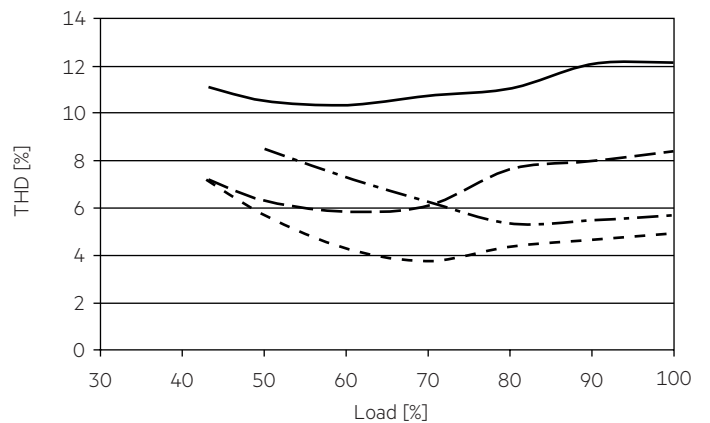


### 4.4 Input current vs load



### 4.5 THD vs load (without harmonic < 5 mA or 0.6 % of the input current)

THD without harmonic < 5 mA (0.6 %) of the input current:



— 200 mA  
 - - - 250 mA  
 - - - 300 mA  
 - - - 350 mA

#### 4.6 Maximum loading of automatic circuit breakers in relation to inrush current

| Automatic circuit breaker type          | C10                 | C13                 | C16                 | C20                 | B10                 | B13                 | B16                 | B20                 | Inrush current   |       |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------|-------|
| Installation Ø                          | 1.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | I <sub>max</sub> | Time  |
| <b>LC 35/200-350/121 stepDIM Ip SNC</b> | 36                  | 47                  | 58                  | 73                  | 36                  | 47                  | 58                  | 73                  | 12 A             | 80 µs |

These are max. values calculated out of continuous current running the device on full load. There is no limitation due to in-rush current. If load is smaller than full load for calculation only continuous current has to be considered.

#### 4.7 Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

|   | THD  | 3.  | 5.  | 7.  | 9.  | 11. |
|---|------|-----|-----|-----|-----|-----|
| <b>LC 35/200-350/121 stepDIM Ip SNC</b> | < 10 | < 7 | < 5 | < 5 | < 5 | < 3 |

Acc. to 6100-3-2. Harmonics < 5 mA or < 0.6 % (whatever is greater) of the input current are not considered for calculation of THD.

## 5. Functions

### 5.1 Short-circuit behaviour

In case of a short circuit on the output side (LED) the LED Driver switches off. After elimination of the short-circuit fault the LED Driver will recover automatically.

### 5.2 No-load operation

The LED Driver works in burst working mode to provide a constant output voltage regulation which allows the application to be able to work safely when LED string opens due to a failure.

### 5.3 Overload protection

If the maximum load is exceeded by a defined internal limit, the LED Driver will protect itself and LED may flicker. After elimination of the overload, the nominal operation is restored automatically.

## 6. Miscellaneous

### 6.1 Insulation and electric strength testing of luminaires

Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an insulation test with 500 V<sub>DC</sub> for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal. The insulation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1500 V<sub>AC</sub> (or 1.414 x 1500 V<sub>DC</sub>). To avoid damage to the electronic devices this test must not be conducted.

### 6.2 Conditions of use and storage

Humidity: 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Storage temperature: -40 °C up to max. +80 °C

The devices have to be within the specified temperature range (t<sub>a</sub>) before they can be operated.

The LED Driver is declared as inbuilt LED controlgear, meaning it is intended to be used within a luminaire enclosure. If the product is used outside a luminaire, the installation must provide suitable protection for people and environment (e.g. in illuminated ceilings).

### 6.3 Additional information

Additional technical information at [www.tridonic.com](http://www.tridonic.com) → Technical Data

Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.

## 1. Standards

IEC 61347-1  
IEC 61347-2-11  
EN 61347-1  
EN 61347-2-11

### 1.1 Glow wire test

according to EN 60598-1 with increased temperature of 850 °C passed.

## 2. Description

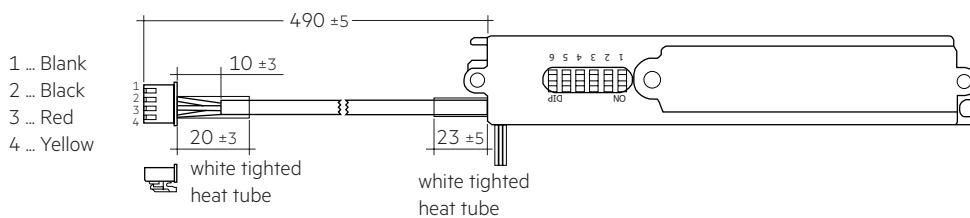
- The schell is made of flame retardant, with fire rating of V-0
- Compared with PIR module, microwave motion sensor is better – more wide detection range, no dead area, no fresnel lens, no aging problem, no environment interface
- Strong anti-interference ability – it is not affected by temperature, humidity, airflow, dust, noise, brightness and other factors.

## 3. Installation



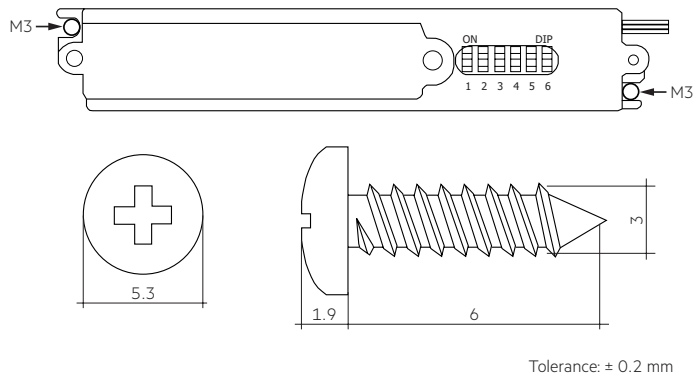
- Avoid installing metal accessories or shells, metal will block the microwave and affect the effect.
- The antenna surface should avoid large current circuit coverage, which may cause interference.
- The photosensitive position should avoid being blocked by opaque objects, which will change the light intensity.
- The recommended installation distance of the sensor is greater than 1.5 m.

### 3.1 Circuit diagram



Cable: White UL 20276 3x24AWG black-red-yellow  
Heat tube: φ 4.5 UL L = 28 mm  
Connector: XH2.5-T 4P white shell with buckle

**3.2 Ceiling installation**

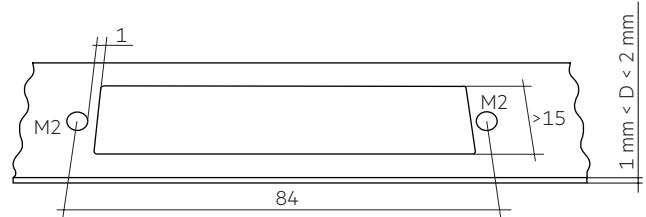


2. When the thickness of the baffle plate and the aluminum substrate (all the metal part) is  $1\text{ mm} < D < 2\text{ mm}$ , the suggested hollow length is 80 mm, width  $> 15\text{ mm}$ .

lamp board:



aluminum substrate:

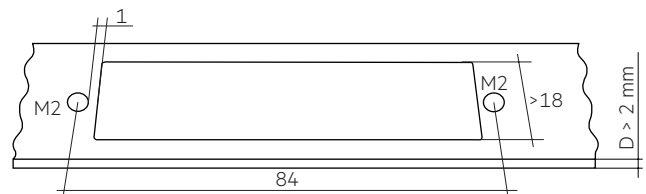


3. When the thickness of the lamp block plate and the aluminum substrate (all the metal part) is  $D > 2\text{ mm}$ , the suggested hollow length is 80 mm, width  $> 18\text{ mm}$ .

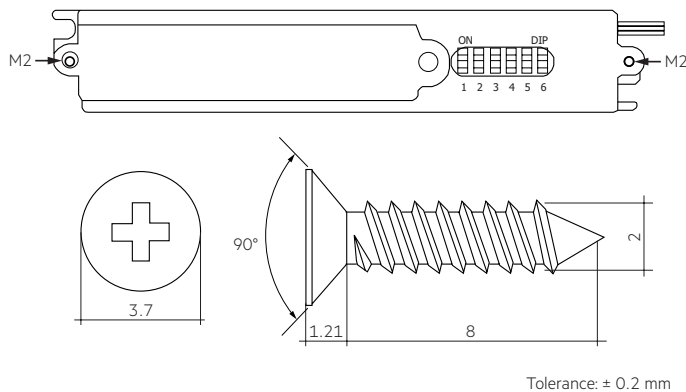
lamp board:



aluminum substrate:



**3.3 Embedded installation**



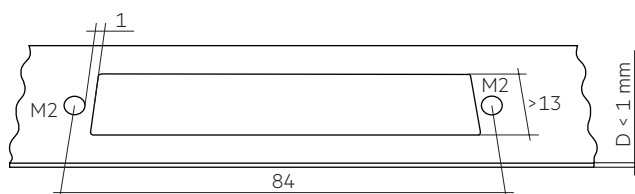
When the radar module is embedded in the lamp board or aluminum substrate, the metal is close to the RF hollow width of the lamp board or aluminum substrate is required as follows:

1. When the thickness of the baffle plate and the aluminum substrate (all the metal part) is  $D < 1\text{ mm}$ , the suggested hollow length is 80 mm, width  $> 13\text{ mm}$ .

lamp board:



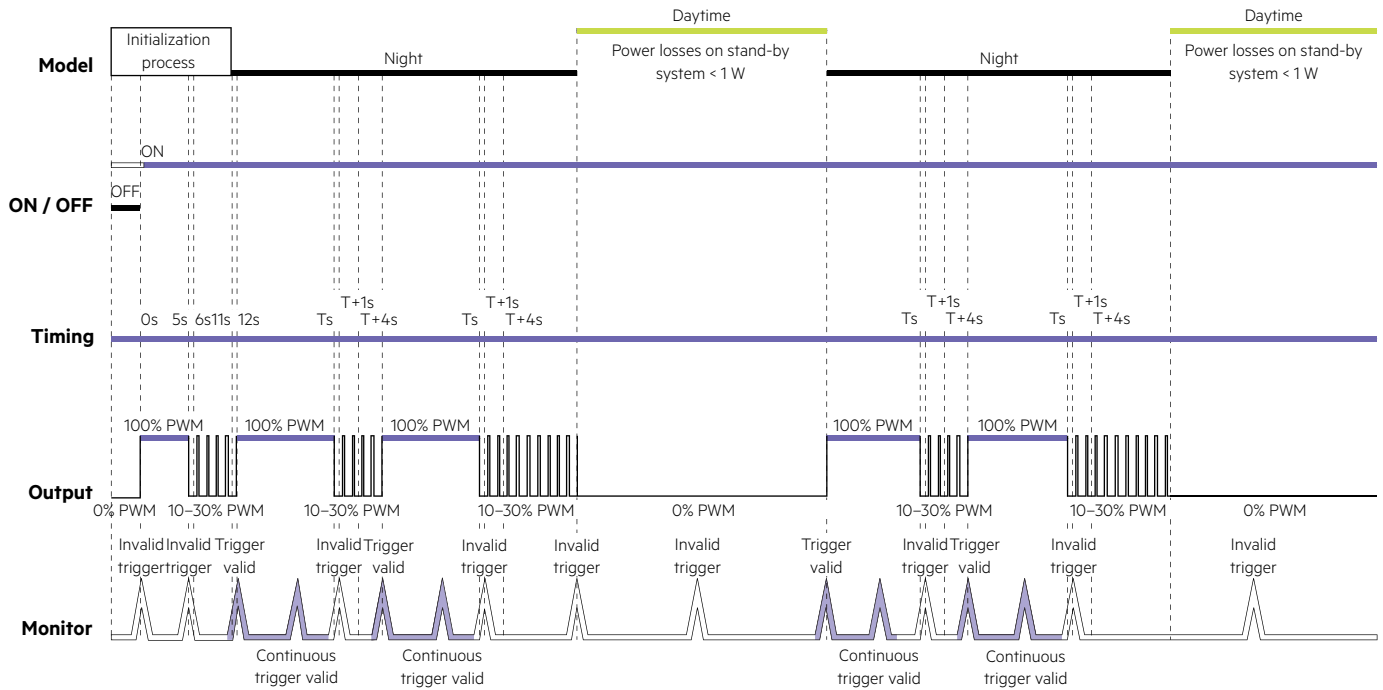
aluminum substrate:





## 4. Functions

### 4.1 Process diagram when power on



- In this sequence diagram, the default state of dialing is all ON state.
- When the PWM output signal changes from 100 % to 10 % or 30 %, the gradual change time is 1 s, followed by a blocking time of about 3 s, during which there is no induction.
- T = the set delay time (5 s, 90 s, 300 s, 600 s) and start timing with the last valid trigger.
- Within 20 s after turning on, once daylight is detected, turn off the light directly. After that, there will be a 10-minute photosensitive threshold judgment. If the daylight continues to be detected, it will finally be judged as daytime mode, and the daytime mode induction is invalid.
- When night changes to day, it also needs to pass 10 minutes of photosensitivity threshold before it is judged as day mode. When day changes to night, it only takes 3 s to trigger directly.
- When the 6. digit dialing status is OFF, if the output signal is 10 % or 30 % PWM and there is no human sensing within 10 minutes, the output signal will become 0 % PWM.

### 4.2 Adjustable code switch setting

#### Setting the detection area (1. code switch)

| 1 | Sensitivity     |
|---|-----------------|
| ● | 100 % (default) |
| ○ | 50 %            |



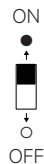
#### Setting the standby dimming (5. code switch)

| 5 | Standby dimming |
|---|-----------------|
| ● | 10 % (default)  |
| ○ | 30 %            |



#### Setting the hold time (2. and 3. code switch)

| 2 | 3 | Hold time     |
|---|---|---------------|
| ● | ● | 5 s (default) |
| ● | ○ | 90 s          |
| ○ | ● | 300 s         |
| ○ | ○ | 600 s         |



#### Setting the second-order delay (6. code switch)

| 6 | Second-order delay |
|---|--------------------|
| ● | ∞ (default)        |
| ○ | 10 min             |



#### Setting the daylight sensor (4. code switch)

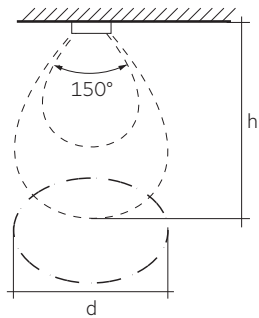
| 4 | Daylight sensor  |
|---|------------------|
| ● | 30 lux (default) |
| ○ | disable          |



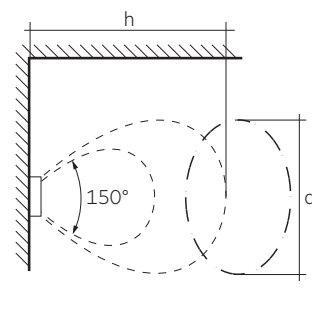
DIP switch factory settings all default ON state. Set the DIP switch only after mains off. Hot plug-in is not permitted when connecting sensors.

#### 4.4 Motion detection

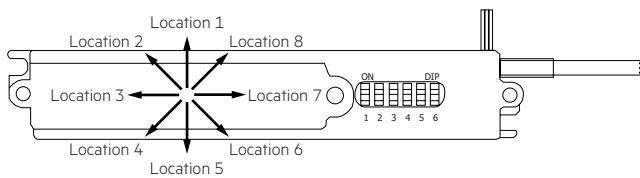
Ceiling mounted:



Wall mounted:



Take 3 m as an example, the detected moving target person is: approx. 170 cm high and weighing approx. 65 kg. In the test room, the module is installed with the antenna facing down and the person is moving in the direction of the sensor at a speed of 1 m/s.



| Sensing position      | Detection radius at 1 m/s moving speed |                  |
|-----------------------|--|------------------|
|                       | 100 % sensitivity                      | 50 % sensitivity |
| Location 1            | 4.0 m                                  | 2.0 m            |
| Location 2            | 3.5 m                                  | 2.5 m            |
| Location 3            | 3.5 m                                  | 2.5 m            |
| Location 4            | 4.0 m                                  | 2.5 m            |
| Location 5            | 4.0 m                                  | 2.5 m            |
| Location 6            | 3.5 m                                  | 2.0 m            |
| Location 7            | 4.0 m                                  | 2.5 m            |
| Location 8            | 4.0 m                                  | 2.5 m            |
| Overall sensing range | 3.5 m                                  | 2.0 m            |

A person moved towards the sensor with a speed of 1 m/s during the test in the test room. The sensing range at different heights is as follows:

| Application height | Detection diameter at 1 m/s moving speed |                  |
|--------------------|--|------------------|
|                    | 100 % sensitivity                        | 50 % sensitivity |
| 0.5 m              | 5.0 m                                    | 2.5 m            |
| 1.0 m              | 6.0 m                                    | 3.0 m            |
| 1.5 m              | 7.0 m                                    | 4.0 m            |
| 2.0 m              | 8.0 m                                    | 5.0 m            |
| 2.5 m              | 8.0 m                                    | 5.0 m            |
| 3.0 m              | 8.0 m                                    | 5.0 m            |
| 3.5 m              | 7.5 m                                    | 4.0 m            |
| 4.0 m              | 7.0 m                                    | 3.0 m            |
| 5.0 m              | 6.0 m                                    | 2.5 m            |
| 5.5 m              | 5.0 m                                    | 2.0 m            |
| 6.0 m              | 4.5 m                                    | 2.0 m            |
| 6.5 m              | 4.0 m                                    | 2.0 m            |

Influence factors of detection distance:

- It is related to the speed of the object.
- It is related to the size of the object (the area of reception and reflection).
- In the open environment and the environment with walls, the distance difference is related to the reflection of electromagnetic waves in the face of walls.

#### 4.5 Detection sensibility

Optimized for detection of pedestrians with a speed of 0.5 – 1.5 m/s corresponds to 1.8 – 5.4 km/h. Depending on the application and environmental conditions the maximum detectable speed of object may vary.

### 5. Miscellaneous

#### 5.1 Disposal of equipment



Return old devices in accordance with the WEEE directive to suitable recycling facilities.

#### 5.2 Additional information

Additional technical information at [www.tridonic.com](http://www.tridonic.com) → Technical Data

Lifetime declarations are informative and represent no warranty claim. No warranty if device was opened.