



### Driver LCI 65W 150mA–400mA TOP INDUSTRY sl TOP series

#### Product description

- Fixed output constant current built-in LED Driver, particularly suitable for industrial applications in tough environments such as cold warehouses or factories with elevated ambient temperatures
- The LED Driver is designed for a life-time stated above under reference conditions and with a failure probability of less than 10 %
- If being operated up to 50 °C ambient temperature for 100,000 h the LED Driver offers a lower failure probability of less than 2.5 %
- Output current adjustable between 150 – 400 mA
- Max. output power 65 W
- Nominal life-time up to 100,000 h
- 8-year guarantee
- Suitable for mains voltage peaks (burst/surge) up to 4 kV
- Extended temperature range of -40 ... +70 °C

#### Properties

- White slim metal casing
- Type of protection IP20

#### Functions

- Adjustable output current (I-select resistor)
- Intelligent Temperature Guard (overtemperature protection)
- Short-circuit proof
- Overload protection
- Suitable for emergency escape lighting systems acc. to EN 50172
- Intelligent Voltage Guard (overvoltage and undervoltage monitoring)



**Standards**, page 4

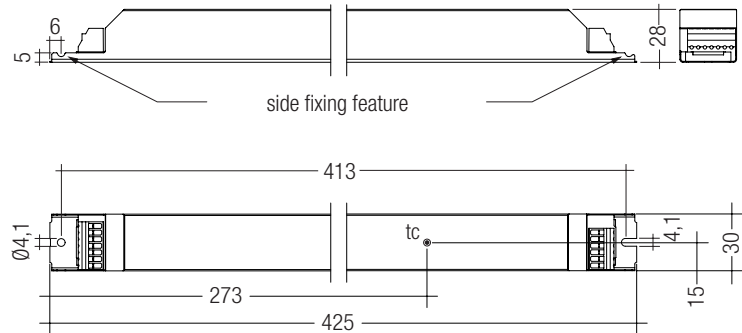
IP20       

### Driver LCI 65W 150mA–400mA TOP INDUSTRY sl

TOP series

#### Technical data

|  |                       |
|--|-----------------------|
| Rated supply voltage   | 220 – 240 V           |
| AC voltage range   | 198 – 264 V           |
| DC voltage range   | 170 – 280 V           |
| Mains frequency  | 0 / 50 / 60 Hz        |
| Overvoltage protection   | 320 V AC, 48 h        |
| Typ. current (at 230 V, 50 Hz, full load) <sup>①</sup>                 | 323 mA                |
| Typ. current (230 V, 0 Hz, full load, 15 % dimming level) <sup>①</sup> | 56 mA                 |
| Leakage current (PE)   | < 0.27 mA             |
| Max. input power   | 72.8 W                |
| Typ. efficiency (at 230 V, 50 Hz, full load) <sup>①</sup>              | > 90 %                |
| $\lambda$ (at 230 V, 50 Hz, full load) <sup>①</sup>                    | 0.98                  |
| THD (at 230 V, 50 Hz, full load) <sup>①</sup>                          | < 5.3 %               |
| Time to light (at 230 V, 50 Hz, full load)                             | < 0.4 s               |
| Time to light (DC mode)  | < 0.4 s               |
| Switchover time (AC/DC)  | < 0.4 s               |
| Turn off time (at 230 V, 50 Hz, full load)                             | < 50 ms               |
| Output current tolerance <sup>②</sup>                                  | ± 3 %                 |
| Output L.F. current ripple (< 120 Hz)                                  | < 2 %                 |
| Max. peak output current   | Output current + 18 % |
| Max. output voltage (no-load voltage)                                  | 250 V                 |
| Suitable for burst / surge peaks up to (between L - N)                 | 4 kV                  |
| Suitable for burst / surge peaks up to (between L/N - PE)              | 4 kV                  |
| Burst / surge peaks output side against PE                             | < 0.5 kV              |
| Dimensions L x W x H   | 425 x 30 x 28 mm      |



#### Ordering data

| Type                                | Article number | Packaging carton | Packaging pallet | Weight per pc. |
|-------------------------------------|----------------|------------------|------------------|----------------|
| LCI 65W 150mA-400mA TOP INDUSTRY sl | 28000537       | 10 pc(s).        | 480 pc(s).       | 0.411 kg       |

#### Specific technical data

| Type                                | Output current <sup>③</sup> | Min. forward voltage | Max. forward voltage <sup>②</sup> | Max. output power <sup>②</sup> | Typ. power consumption (at 230 V, 50 Hz, full load) | Typ. current consumption (at 230 V, 50 Hz, full load) | Max. casing temperature $t_c$ | Ambient temperature $t_a$ max. | I-select resistor value     |
|-------------------------------------|-----------------------------|----------------------|-----------------------------------|--------------------------------|---|---|-------------------------------|--------------------------------|-----------------------------|
| LCI 65W 150mA-400mA TOP INDUSTRY sl | 150 mA                      | 121 V                | 220 V                             | 33 W                           | 38 W  | 174 mA  | 90 °C                         | -40 ... +75 °C                 | open                        |
|                                     | 175 mA                      | 115 V                | 220 V                             | 39 W                           | 43 W  | 196 mA  | 90 °C                         | -40 ... +75 °C                 | 63.40 k $\Omega$            |
|                                     | 200 mA                      | 110 V                | 220 V                             | 44 W                           | 49 W  | 219 mA  | 90 °C                         | -40 ... +75 °C                 | 54.90 k $\Omega$            |
|                                     | 225 mA                      | 105 V                | 220 V                             | 50 W                           | 55 W  | 247 mA  | 90 °C                         | -40 ... +75 °C                 | 47.50 k $\Omega$            |
|                                     | 250 mA                      | 99 V                 | 220 V                             | 55 W                           | 62 W  | 275 mA  | 90 °C                         | -40 ... +70 °C                 | 40.20 k $\Omega$            |
|                                     | 275 mA                      | 99 V                 | 220 V                             | 61 W                           | 67 W  | 295 mA  | 90 °C                         | -40 ... +70 °C                 | 34.00 k $\Omega$            |
|                                     | 300 mA                      | 98 V                 | 217 V                             | 65 W                           | 71 W  | 316 mA  | 90 °C                         | -40 ... +70 °C                 | 27.40 k $\Omega$            |
|                                     | 325 mA                      | 90 V                 | 200 V                             | 65 W                           | 72 W  | 319 mA  | 90 °C                         | -40 ... +70 °C                 | 22.00 k $\Omega$            |
|                                     | 350 mA                      | 84 V                 | 186 V                             | 65 W                           | 73 W  | 323 mA  | 90 °C                         | -40 ... +70 °C                 | 12.00 k $\Omega$            |
|                                     | 375 mA                      | 78 V                 | 173 V                             | 65 W                           | 73 W  | 323 mA  | 90 °C                         | -40 ... +70 °C                 | 6.19 k $\Omega$             |
|                                     | 400 mA                      | 73 V                 | 163 V                             | 65 W                           | 73 W  | 323 mA  | 90 °C                         | -40 ... +70 °C                 | short circuit (0 $\Omega$ ) |

<sup>①</sup> Depending on the selected output current.

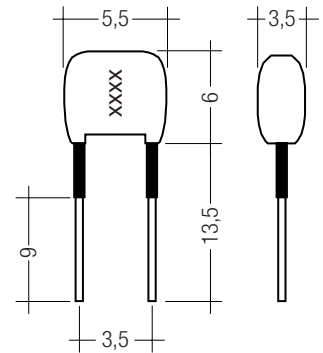
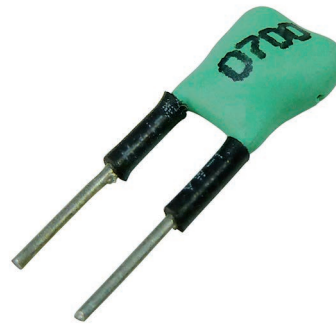
<sup>②</sup> At full load.

<sup>③</sup> Output current is mean value.

## I-SELECT PLUG TOP / ECO

## Product description

- Ready-for-use resistor to set output current value
- Compatible with LED Driver series TOP and ECO
- Resistor is base isolated
- Resistor power 0.25 W
- Resistor value tolerance  $\pm 1\%$



## Ordering data

| Type                   | Article number | Colour | Marking | Resistor value   | Packaging bag | Weight per pc. |
|------------------------|----------------|--------|---------|------------------|---------------|----------------|
| I-SELECT PLUG 175mA BL | 28000446       | Blue   | 0175    | 63.40 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 200mA BL | 28000447       | Blue   | 0200    | 54.90 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 225mA BL | 28000448       | Blue   | 0225    | 47.50 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 250mA BL | 28000368       | Blue   | 0250    | 40.20 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 275mA BL | 28000369       | Blue   | 0275    | 34.00 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 300mA BL | 28000275       | Blue   | 0300    | 27.40 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 325mA BL | 28000449       | Blue   | 0325    | 22.00 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 350mA BL | 28000276       | Blue   | 0350    | 12.00 k $\Omega$ | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG 375mA BL | 28000450       | Blue   | 0375    | 6.19 k $\Omega$  | 10 pc(s).     | 0.001 kg       |
| I-SELECT PLUG MAX GR   | 28000274       | Grey   | MAX     | 0 $\Omega$       | 10 pc(s).     | 0.001 kg       |

**Standards**

EN 55015  
 EN 60068-2-27 (shock – test case: 1,000 shocks in 6 directions with 30 g / 18 ms)  
 EN 60068-2-64 (vibration – test case: acc. to table A.1 transport / category 2)  
 EN 61000-3-2  
 EN 61000-3-3  
 EN 61347-1  
 EN 61347-2-13  
 EN 62384  
 EN 61547  
 According to EN 50172 for use in central battery systems  
 According to EN 60598-2-22 suitable for emergency lighting installations

**Overload protection**

If the output voltage range is exceeded the LED Driver turns off the LED output. After restart of the LED Driver the output will be activated again.

**Overtemperature protection**

The LED Driver is protected against temporary thermal overheating. If the temperature limit is exceeded the output current of the LED is reduced. The temperature protection is activated approx. +5 °C above  $t_{c\ max}$  (see page 2). On DC operation this function is deactivated to fulfill emergency requirements.

**Short-circuit behaviour**

In case of a short circuit at the LED output the LED output is switched off. After restart of the LED Driver the output will be activated again.

**No-load operation**

The LED Driver will not be damaged in the no-load operation. The output will be deactivated and therefore free of voltage. If a LED load is connected the device has to be restarted before the output will be activated again.

**DC emergency operation**

The LED Driver is designed for operation on DC voltage and pulsed DC voltage.

Light output level in DC operation: 15 %

The voltage-dependent input current of Driver incl. LED module is depending on the used load.

The voltage-dependent no-load current of Driver (without or defect LED module) is for:

AC: 46 mA

DC: 5 mA

**Output current setting**

Output current can be set by connecting a resistor between the 2 "I sel" terminals. Relationship between output current and resistor value can be found at the table "Specific technical data". Resistor values specified from standardised resistor value ranges.

Resistor value tolerance has to be  $\leq 1\%$ .

Resistor power has to be  $\geq 0.1\ W$ .

If the resistor is connected with wires a max. wire length of 2 m may not be exceeded and possible interferences have to be avoided.

Resistor detection at each start.

Change of the resistor value during the operation will be not considered.

Resistors for the main output current values can be ordered from Tridonic (see accessories).

**Intelligent temperature monitoring (ITM)**

The device offers the possibility to connect a silicium based temperature sensor (KTY81-210, KTY82-210) to monitor the LED temperature and protect the

module against thermal damages.

If the temperature limit is exceeded the LED output will be dimmed or turned off. If the temperature falls below threshold the device will automatically return to the nominal operation.

The use of a NTC or PTC resistor is not possible.

The device can be operated without a sensor (default setting).

**Intelligent Voltage Guard**

Intelligent Voltage Guard is the name of the electronic monitoring of the mains voltage. It immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the LED Driver.

- If the mains voltage rises above approx. 280 Vrms (voltage depends on the Driver type), the LED light starts flashing on and off.
- To avoid a damage of the LED Driver the mains supply has to be switched off at this signal.

**Conditions of use and storage**

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

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

The devices have to be within the specified temperature range ( $t_a$ ) before they can be operated.

**Expected life-time**

| Type                                | Output current | $t_a$     | 40 °C       | 50 °C       | 55 °C       | 60 °C       | 65 °C       | 70 °C    | 75 °C    |
|-------------------------------------|----------------|-----------|-------------|-------------|-------------|-------------|-------------|----------|----------|
| LCI 65W 150mA-400mA TOP INDUSTRY sl | < 250 mA       | $t_c$     | 55 °C       | 65 °C       | 70 °C       | 75 °C       | 80 °C       | 85 °C    | 90 °C    |
|                                     |                | Life-time | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | 77,000 h | 55,000 h |
|                                     | 250 – 400 mA   | $t_c$     | 60 °C       | 70 °C       | 75 °C       | 80 °C       | 85 °C       | 90 °C    | x        |
|                                     |                | Life-time | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | 94,000 h    | 67,000 h | x        |

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

**Maximum loading of automatic circuit breakers**

| 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> | 2.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | $I_{max}$      | time   |
| LCI 65W 150mA-400mA TOP INDUSTRY sl | 14                  | 20                  | 24                  | 32                  | 7                   | 10                  | 12                  | 16                  | 40 A           | 200 µs |

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

|                                     | THD | 3.  | 5.  | 7.  | 9.  | 11. |
|-------------------------------------|-----|-----|-----|-----|-----|-----|
| LCI 65W 150mA-400mA TOP INDUSTRY sl | 5.3 | 5.3 | < 1 | < 1 | < 1 | < 1 |

## Electrical connections

### Wiring

LED module/LED Driver/supply

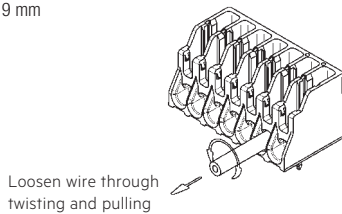
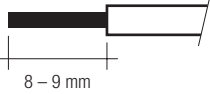
### IDC interface

- solid wire with a cross section of 0.5 mm<sup>2</sup>

### Horizontal interface

- solid wire with a cross section of 0.5–0.75 mm<sup>2</sup> with an insulation diameter up to 2.5 mm
- strip 8–9 mm of insulation from the cables to ensure perfect operation of the push terminals
- Loosen wire through twisting and pulling

wire preparation:  
0.5 – 0.75 mm<sup>2</sup>



### Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit), this applies for LED output as well as for I-select.
- Secondary switching is not permitted.
- The LED Driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.
- 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.).

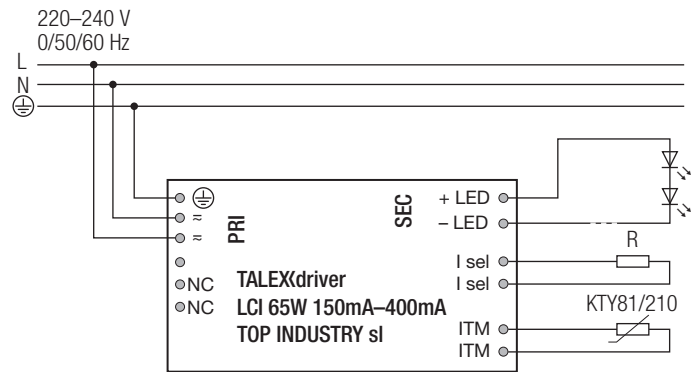
### Earth connection

The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via earth terminal or 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.

## Circuit diagram



### Isolation 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 isolation 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 isolation 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.

### Additional information

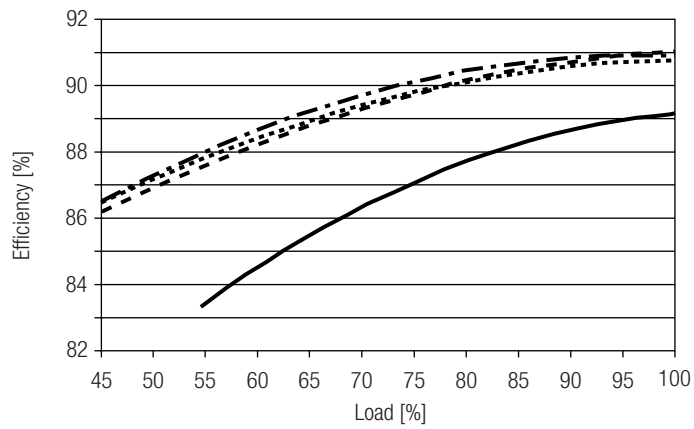
Additional technical information at [www.tridonic.com](http://www.tridonic.com) → Technical Data

Guarantee conditions at [www.tridonic.com](http://www.tridonic.com) → Services

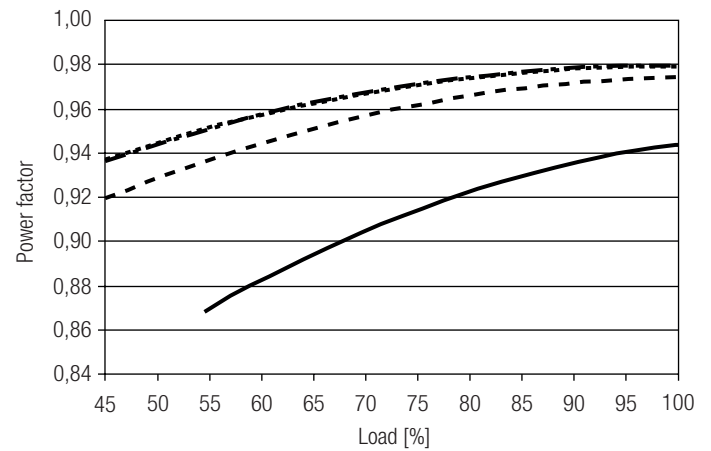
Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.

## Diagrams LCI 65W 150mA-400mA TOP INDUSTRY sl

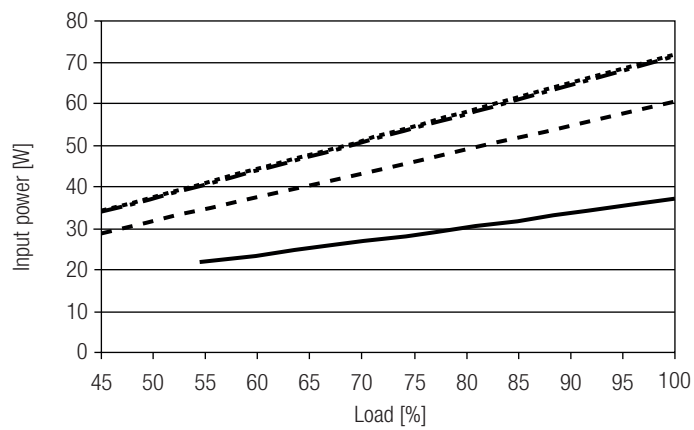
Efficiency vs load



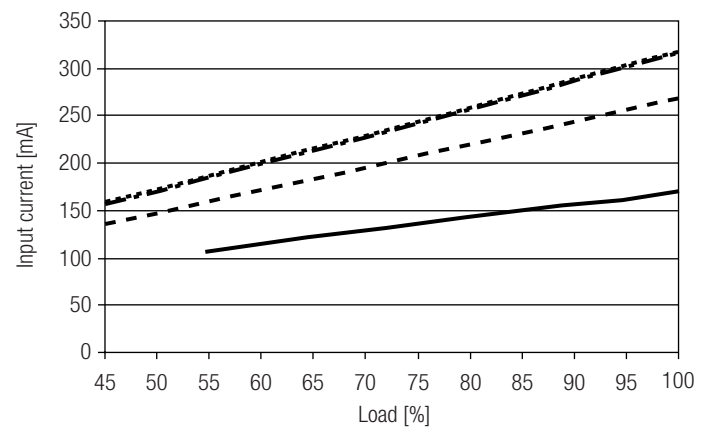
Power factor vs load



Input power vs load



Input current vs load



THD vs load

