HYL-045DA1050G130AD

Constant current LED driver
DALI Dimmable

Product description

- Dimmable Independent constant current LED Driver
- Adjustable output current between 700 and 1,050 mA
  via DIP switch Factory default setting 700 mA gear
- 50 mA current step to achieve the precice output lumen
- Max. output power 44W
- Up to 88 % efficiency
- Power input on stand-by < 0.3 W
- Dimming range 1 – 100 %
- For luminaires of protection class I and protection class II
- Nominal life-time up to 70,000 h
- 5-year guarantee

Benefits

- Application-oriented operating window for maximum compatibility
- Best energy savings due to low stand-by losses and high efficiency
- Long lasting and high reliability
- Classic compact housing

Interfaces

- DALI-2 (DT6)
- SwitchDIM (with memory function)
- corridorFUNCTION
- Terminal blocks: 45° push terminals

Applications

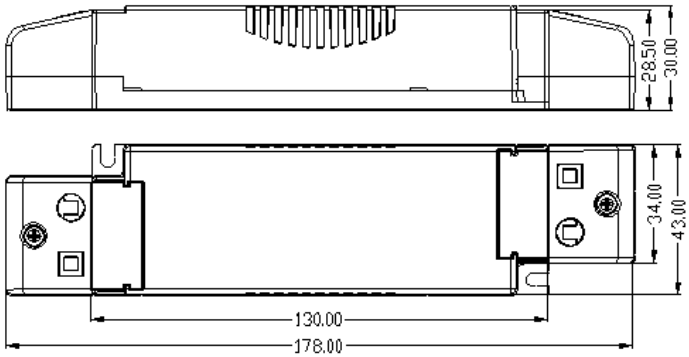
- Linear and area lighting
- Office – industrial – shop

Approval marks

In preparation

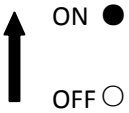
Technical data

Rated supply voltage	220 – 240 V
AC voltage range	198 – 264 V
DC voltage range	198 – 264 V
Mains frequency	0 / 50 / 60 Hz
Leakage current (at 230 V, 50 Hz, full load)	550 uA
Max. input power	50 W
Typ. efficiency (at 230 V / 50 Hz / full load)	88%
λ (at 230 V, 50 Hz, full load)	0.95
Typ. power input on stand-by	< 0.3 W
Typ. input power in no-load operation	n.a①
In-rush current (peak / duration)	18 A /260 us
THD (at 230 V, 50 Hz, full load)	< 10 %
Time to light (at 230 V, 50 Hz, full load)	< 0.6 s
Time to light (DC mode)	< 0.5 s
Switchover time (AC/DC)	< 0.5 s
Turn off time (at 230 V, 50 Hz, full load)	< 20 ms
Output current tolerance	± 5 %
Output LF current ripple (< 100 Hz)	< 5 %
Output PsTLM	< 1.0
Output SVM	< 0.4
Max. output voltage (no-load voltage)	60 V
Dimming range	1 – 100 %
Mains surge capability (between L – N)	1 kV
Mains surge capability (between L/N – PE)	n.a
Surge voltage at output side (against PE)	n.a



Units：mm

DIP Switch



Ordering data

Type	Packaging carton	Weight per pc.
HYL-045DA1050G130AD	36 pcs	0.165 Kg

Specific technical data

Type	DIP Switch PIN 1	PIN 2	PIN 3	Output current (mA)	Min. forward voltage (V)	Max. forward voltage (V)	Min. output power (W)	Max. output power (W)	Typ. power consumption (at 230 V, 50 Hz, full load) (W)	Typ.current consumption (at 230 V, 50 Hz, full load)(A)
HYL-045DA1050G130AD	●	●	●	1050	30	42	31.5	44	50	0.221
	●	●	○	1000	30	42	30.0	42	47	0.209
	●	○	●	950	30	42	28.5	40	44	0.199
	●	○	○	900	30	42	27.0	38	42	0.189
	○	●	●	850	30	42	25.5	36	40	0.179
	○	●	○	800	30	42	24.0	34	38	0.170
	○	○	●	750	30	42	22.5	32	36	0.162
	○	○	○	700	30	42	21.0	29	33	0.150

① Valid at 100 % dimming level

ACCESSORIES

Product description

- Optional strain-relief set for independent applications
- Transforms the LED Driver into a fully class II compatible LED Driver (e.g. ceiling installation)

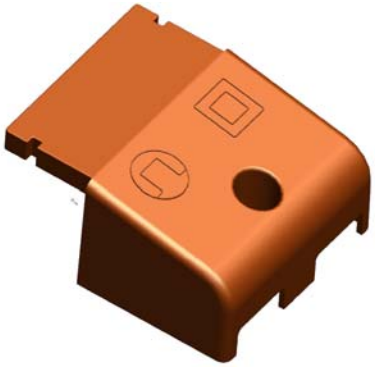


Figure 1

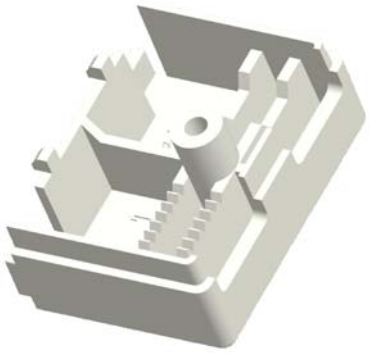


Figure 2

Ordering data

Type	Packaging carton	Weight per pc.	Figure
AWK068	-	-	1
AWK059	-	-	2

1. IEC Standards

IEC Standards	EN Standards	China National Standards
CISPR 15	EN 55015	GB/T17743
IEC 61000-3-2	EN 61000-3-2	GB 17625.1
IEC 61000-3-3	EN 61000-3-3	GB 17625.2
IEC 61347-1	EN 61347-1	GB 19510.1
IEC 61347-2-13	EN 61347-2-13	GB 19510.14
IEC 62384	EN 62384	GB/T24825
IEC 61547	EN 61547	GB/T18595
IEC 62386-101 DALI-2		
IEC 62386-102 DALI-2		
IEC 62386-207 DALI-2		

According to EN 50172 for use in central battery systems

2. Thermal details and life-time

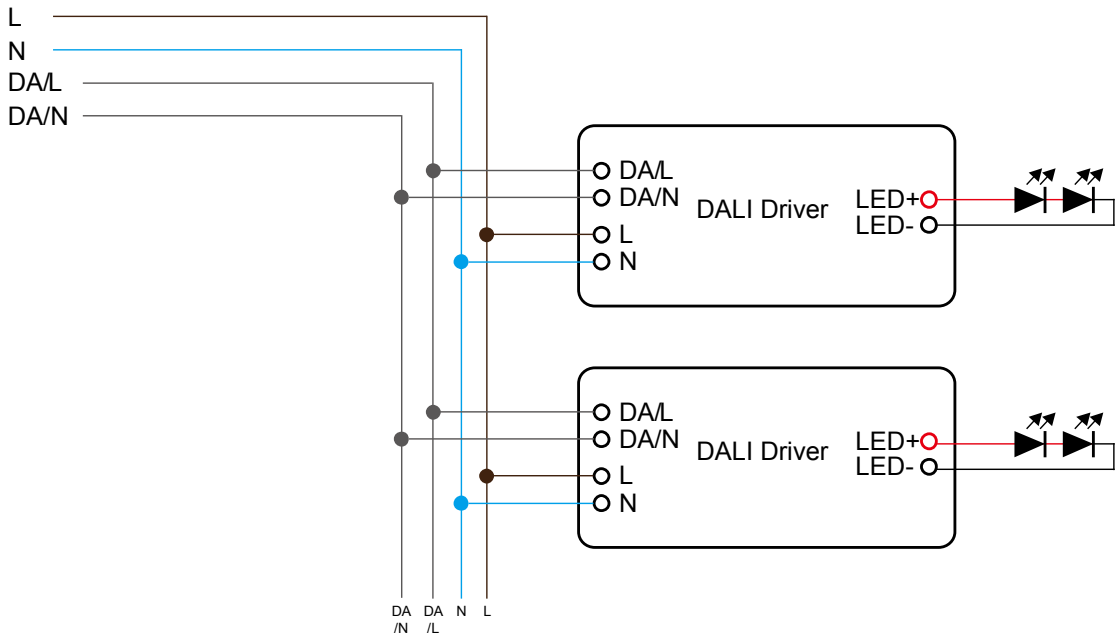
2.1 Expected life-time

Type	Output current	ta	40℃	45℃
HYL-045DA1050G130AD	700-850 mA	tc	70℃	80℃
		Life time	> 70,000 h	> 60,000 h
	> 850-1050 mA	tc	75℃	80℃
		Life time	> 60,000 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 t_C to ta temperature depends also on the luminaire design.

3. Installation / wiring

3.1 Circuit diagram

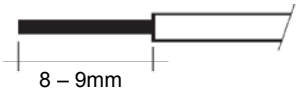


Wiring diagram for DALI application

3.2 Wiring type and cross section

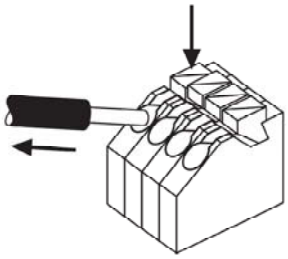
Solid wire with a cross section of 0.5 – 1.5 mm². Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals

Wire preparation:
0.5 – 1.5 mm²



3.3 Loose wiring

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



3.4 Wiring guidelines

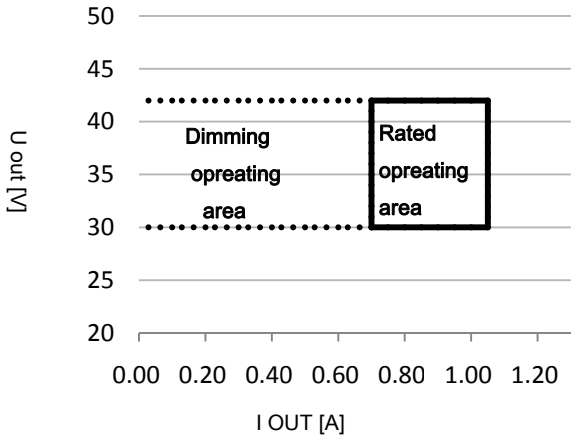
- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit), this applies for LED output.
- Secondary switching is permitted. But the secondary switch may damage the LED modules, so it is not recommended to do so.
- The LED Driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.
- Wrong wiring of the LED Driver can lead to malfunction or irreparable damage.

3.5 Hot plugging

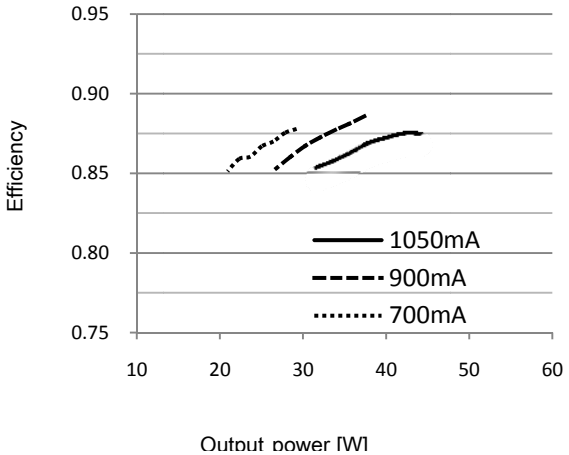
Hot plug-in is supported, but it may damage the LED modules due to residual output voltage is too high.

4. Electrical values

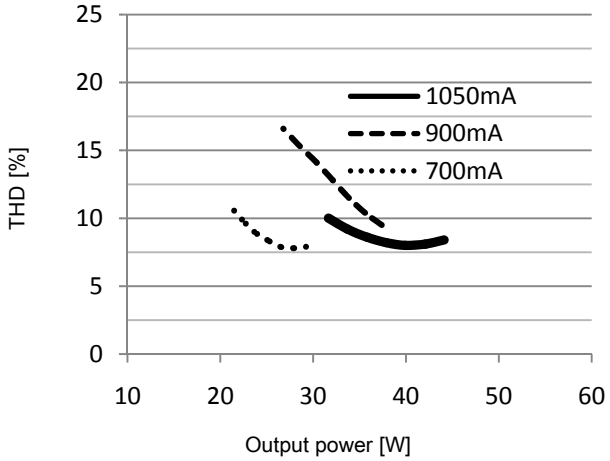
4.1 Typical Opreating Window



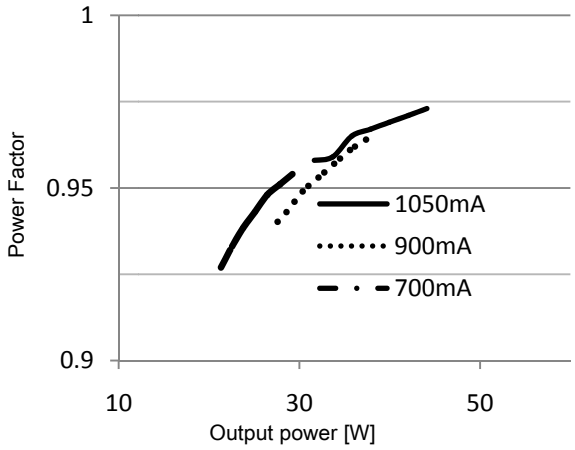
4.2 Efficiency vs load



4.3 THD vs load



4.4 Power Factor vs load

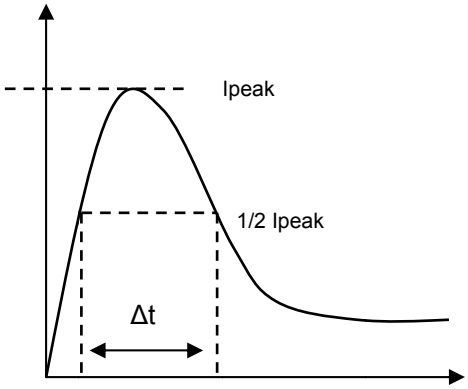


4.5 Maximum loading of automatic circuit breakers

Type	typ	Number of ECG at one singlepole				
	Ipeak /Δt	circuit breaker (CB)	10 A	16 A	20 A	25 A
		CB-Typ				
HYL-045DA1050G130AD	18 A / 260 us	B	15	24	30	37
		C	25	40	50	62

Data for Usupply = 230 VAC, mains impedance = 1 Ω

- In case of multi-polar CB the maximum number is reduced by 20 %
- The max. number may differ depending on CB manufacturer.
- Please consider the specifications of the manufacturer.
- Basically, CB with C-characteristics are recommended to be used in lighting groups.



Typical current - time profile when switching on

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

	THD	3.	5.	7.	9.	11.
HYL-045DA1050G130AD	< 10	< 5	< 5	< 5	< 3	< 3

4.7 Dimming

Dimming range 1 % to 100 % Digital dimming value

Digital control with:

DALI signal: 16 bit Manchester Code

Speed 1 % to 100 % in 0.2 s

Programmable parameter:

Minimum dimming level

Maximum dimming level

Default minimum = 1 %

Programmable range 1 % ≤MIN ≤100 %

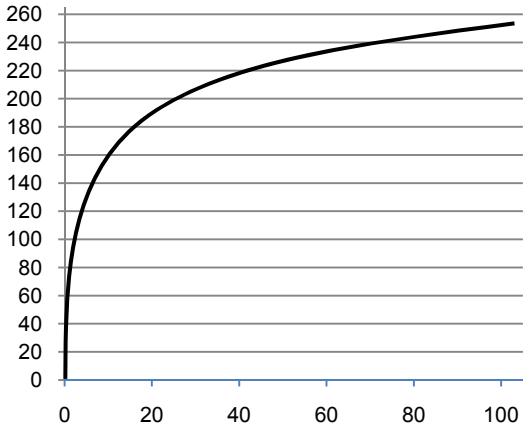
Default maximum = 100 %

Programmable range 100 % ≥MAX ≥1 %

Dimming curve is adapted to the eye sensitiveness.

Dimming is realized by amplitude dimming.

4.8 Dimming characteristics



Dimming characteristics as seen by the human eye

5. Interfaces / SwitchDIM / corridorFUNCTION

5.1 Control input (DA/N, DA/L)

Digital DALI signal or switchDIM can be wired on the same terminals (DA/N and DA/L).The control input is non-polar for digital control signals (DALI). The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations. Different functions depending on each module.

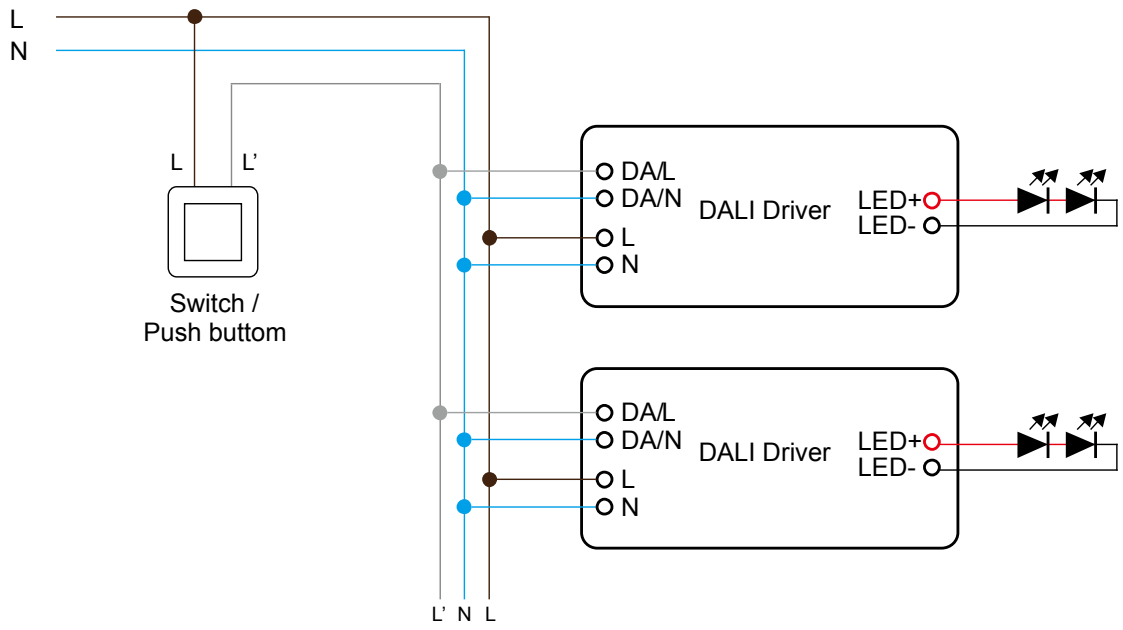
5.2 SwitchDIM

Using the switchDIM function

switchDIM is operated by the mains voltage push button.

Procedure:

- Switch the device on/off by briefly actuating the push button -or-
- Dim the device by holding down the push button



Wiring diagram for SwitchDIM (up to 20 DALI Drivers permitted)

Synchronizing devices

If the devices in a system do not operate synchronously, the devices must be synchronized, i.e. put in the same status (on/off).

Procedure:

Hold down the push button for 10 seconds

- All devices will be synchronized to the same status
- LEDs will be set to a uniform light value (approx. 50 %)

Switching the control gear to automatic mode

In automatic mode the device detects which control signal (DALI, switchDIM, etc.) is connected and automatically switches to the corresponding operating mode.

Integrated switchDIM function allows a direct connection of a pushbutton for dimming and switching. Brief push (< 0.6 s) switches LED Driver ON and OFF. The dimming level is saved at power-down and restored at power-up. When the pushbutton is held, LED modules are dimmed. After repush the LED modules are dimmed in the opposite direction. In installations with LED Drivers with different dimming levels or opposite dimming directions (e.g. after a system extension), all LED Drivers can be synchronized to 50 % dimming level by a 10 s push.Use of pushbutton with indicator lamp is not permitted.

5.3 Commissioning(corridorFUNCTION)

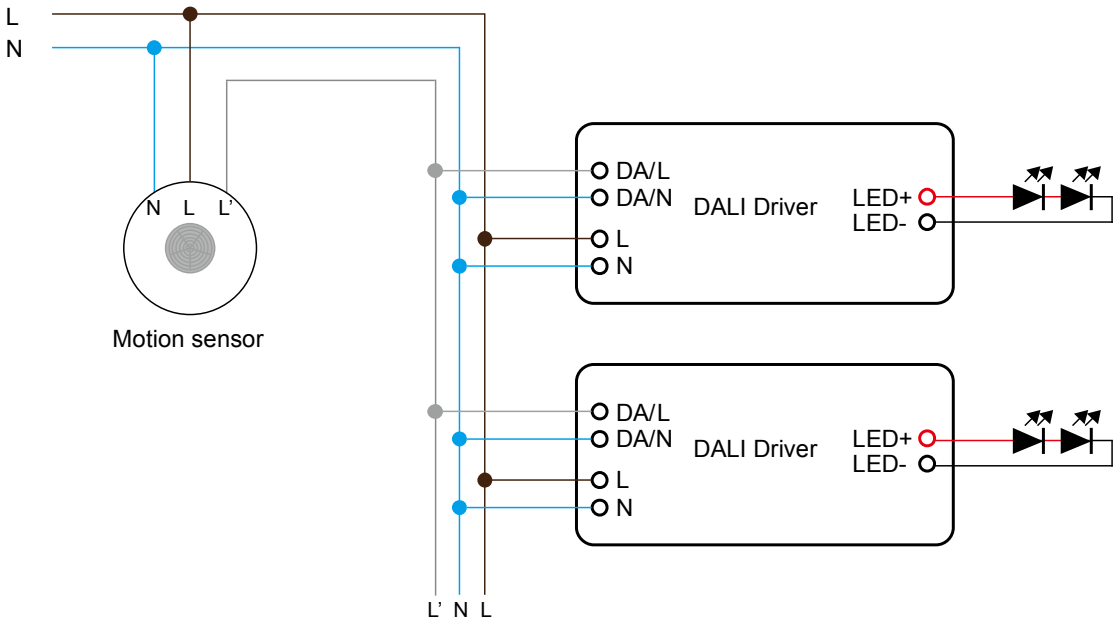
Activating and deactivating the corridorFUNCTION

Activating the corridorFUNCTION via mains voltage

Activating the corridorFUNCTION is simple. If an AC voltage of 230 V is applied to the digital interface of the LED driver for a period of at least 5 minutes the LED driver detects the corridorFUNCTION and automatically activates it. Activation is required only once per device. There are different procedures for activating by the mains voltage. The requirements are the same in eachcase.

Requirements

- The LED driver is correctly installed in the luminaire
- AC voltage is applied
- A motion sensor is connected to information DA/L or DA/N



Wiring diagram for corridorFUNCTION (up to 20 DALI Drivers permitted)

Procedure Version 1

- Remain in the activation range of the motion sensor for more than 5 minutes
  - The motion sensor detects movement and switches on
  - The corridorFUNCTION is activated automatically after 5 minutes
  - The light value switches to presence level (default: 100 %)

Procedure Version 2

- Set the run-on time on the motion sensor to a value greater than 5 minutes
- Remain in the activation range of the motion sensor for a short time
  - The motion sensor detects movement and switches on
  - The corridorFUNCTION is activated automatically after 5 minutes
  - The light value switches to presence value (default: 100 %)
- Reset the run-on time of the motion sensor to the required value

Deactivating corridorFUNCTION

Deactivate the corridorFUNCTION, if the corridorFUNCTION is activated. To operate the LED Driver via DALI or switchDIM, the corridorFUNCTION must be deactivated

Procedurevia DALI

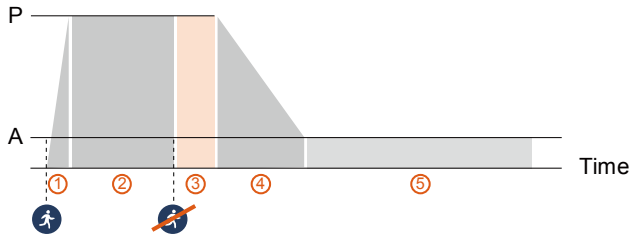
- Send 5 DALI commands within 3 seconds via DALI bus to the control gear

Procedurevia switchDIM

- Connect mains voltage switch to control input DA/L
- Connect neutral conductor to control input at input DA/N
- Press the switch 5 times within 3 seconds

Factory default setting

Light value



Factory default setting parameters:
P: 100%, ③: 120s, ④: 30s
A: 10%, ⑤: unlimited

Profile	Phase	Default	Setting range
Fade-in time	①	0s	0...7.5s
Occupancy time	②	Sensor	-
Run-on time	③	120s	0...465s
Fade time	④	30s	0...255s
Switch-off delay	⑤	unlimited	60...1,860s or unlimited
A (Absence Value)	-	10%	1...100%
P (Presence Value)	-	100%	1...100%

6. Functions

6.1 Function: adjustable current

Adjustable output current between 700 and 1,050mA via DIP switch.

6.2 Short-circuit behavior

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.

6.3 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.

6.4 Overload protection

If the output voltage range is exceeded the LED Driver will protect itself and LED may flicker. After elimination of the overload, the nominal operation is restored automatically.

6.5 Over temperature protection

The LED Driver is protected against temporary thermal overheating. If the temperature limit is exceeded, the Driver switch off.

It restarts automatically. The temperature protection is activated typically at 10 °C above tc max.

6.6 Software / programming

Programming of ECG is done via the DALI interface by using the Interface DALI USB and the PC Software. Tridonic DALI-USB Interface and Software masterCONFIGURATOR are recommended.

7. Miscellaneous

7.1 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 DC 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 AC (or 1.414 x 1500 V DC).

7.2 Storage conditions

Environmental conditions: 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 acclimatized to the specified temperature range (ta) before they can be operated.

7.3 Additional information

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