

# zencontrol

## DALI wireless drivers datasheet



### Features

- Compatible with DALI control systems
- Supports IEC62386-104 over Thread
- Selectable output current via DIP switch
- Soft, flicker-free dimming
- Smooth dimming with flicker-free output
- Wide dimming range (1–100%)
- High PF and efficiency with low THD
- Screw-free, press-type strain relief for easy installation with thicker cables
- Intelligent LED hot-plug protection



### Wireless DALI

Compliant lighting control with no wires.



### Independent driver

Suitable for troffers, downlights, spotlights, and more.



### Applications

Designed for commercial LED lighting.



Product range

Order code	Description
zc-driver-22j-wl	22W DALI wireless dimmable constant current LED driver

Features

- Compatible with DALI control systems
- Supports IEC62386-104 over Thread
- Selectable output current via DIP switch
- Soft, flicker-free dimming meets ErP standards
- Smooth dimming with flicker-free output
- Wide dimming range (1–100%)
- High PF and efficiency with low THD
- Screw-free, press-type strain relief for easy installation with thicker cables
- Intelligent LED hot-plug protection

Specifications

Output parameters

Output type	Constant current
Output current range	0.225–0.6A
Output voltage range	6–38/42VDC
Rated output power	23.1W Max
Output current adjustment	DIP Switch (10 levels)
Output current ripple LF	±2%
Output current accuracy	±2%
Linear regulation	±1%
Load regulation	±1%
No load output voltage	50VDC
Flicker-free (typical)	Flickering percent (IEEE 1789) = 0.184%, Flicker index (IEEE 1789) = 0.003, Pst LM = 0.000, SVM = 0.004 <i>(Note: Flicker performance tested with panel lights.)</i>

Safety

Withstand voltage	I/P-O/P (LED): 3.75kV AC
Main surge capability	L-N: 2kV (Performance criterion: A)
Leakage current	<0.34mA

Radio features

Frequency band	2.4G
Max radio tx power	+8 dBm

Dimming output

Dimming range	1–100%
Dimming type	AM (Amplitude modulation)

Input parameters

Input voltage AC	200–240V ±10%
Input voltage DC	200–240V
Input current	<0.14A
Input frequency	0/50/60Hz
Input PF	PF: 0.98 <i>(see tables overleaf)</i>
Input THD	8%
Efficiency (typical)	86%
In-rush current	6.28A peak, 206µs duration (50% Ipeak)
Switching cycles	>50,000 switching cycles
Power consumption	Full load (Pno): 26.9W, No load (Pno): N/A, Stand-by (Psb): <0.5W, Network stand-by (Pnet): N/A

Emergency Support

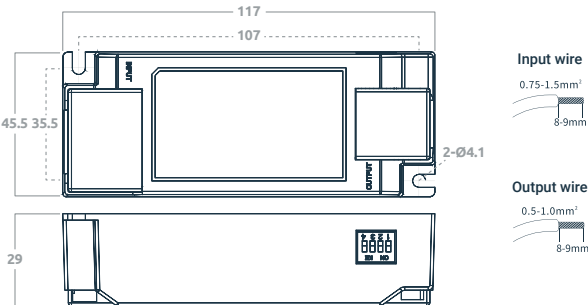
Central emergency system	Supported (normal dimming with DC input)
Self-contained emergency	Supported

Environment & Life time

Operating temperature	Ta= -20–50°C
Case temperature	Tc=90°C
Operating humidity	5–85% RH (non-condensed)
Storage temp / humidity	-40–80°C, 5–85% RH (non-condensed)
IP grade	IP20
MTBF	500,000 Hrs (MIL-HDBK-217F @25°C)
Life-time	Nominal lifetime up to 100,000 hrs
Vibration resistance	10–500Hz, 5G, 12 minutes/cycle, for 72 minutes each along X,Y,Z axes
Acoustic noise	<25dB (30cm distance, Normal operation)
Environmental protection	RoHS

Mechanical dimensions (mm)

zc-driver-22j-wl W45.5 / H29 / D117 mm

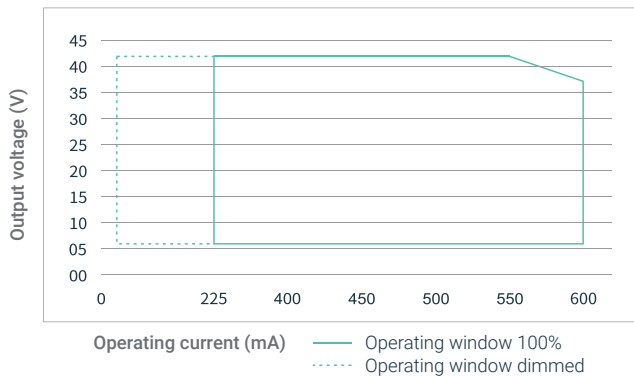


Input		
Number	Function	Colour
1	ACL/DC+	Orange
2	ACN/DC-	Orange

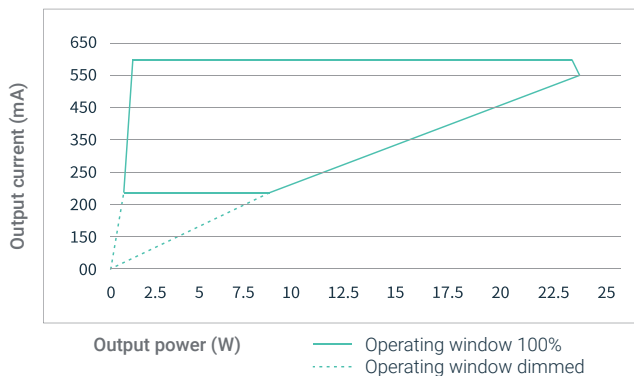
Output		
Number	Function	Colour
1	LED-	Black
2	LED+	Red

## Electrical values

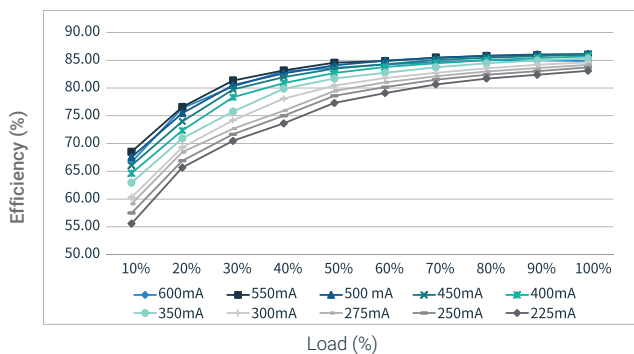
Operating window



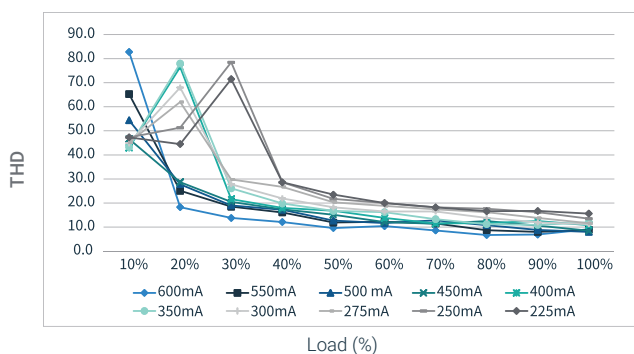
Operating window



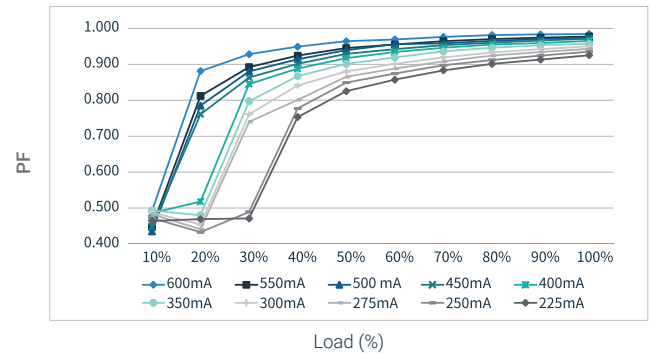
Efficiency vs load



THD vs load

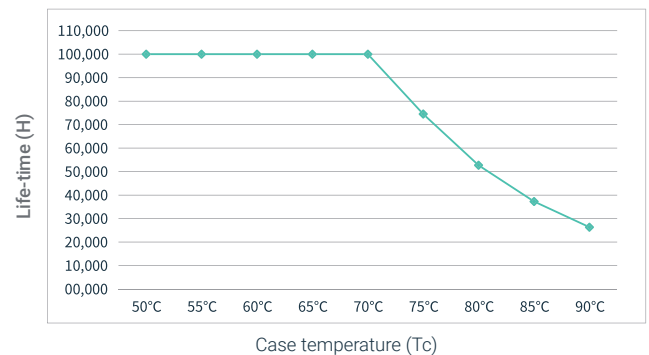


Power factor vs load



## Expected life-time B10

Life-time vs case temperature



## Notice

- Life-time calculated to B10 (90% survival rate).
- The relation of Tc to Ta temperature depends on the luminaire design.

## Installation notes

### Hot plug-in

- Despite protection, hot-plugging the LED load should be avoided due to a residual output voltage.
- If an LED load is connected, whilst driver is switched on and unloaded, the device must be restarted
- Restart can be achieved by power cycling the driver or executing an on/off command (action) through the control interface (DALI)

### Wiring guidelines

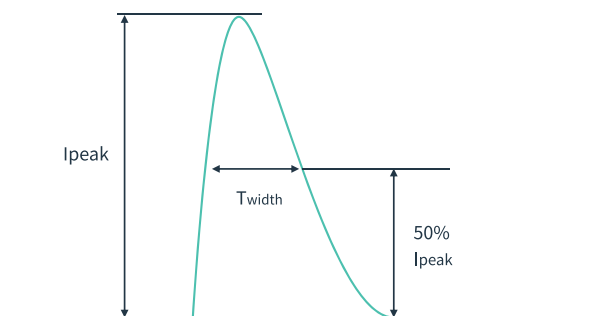
- All input and output wiring connections must be kept as short as possible to minimise EMI
- Mains leads should be kept apart from the LED driver and other leads (ideally 5–10 cm distance)
- Max. length of output wires is 2 m
- Incorrect wiring polarity can damage LED modules
- Use M4 mounting screws. The maximum permissible torque at the clamping screw is 0.5 Nm.

### Procedure to replace LED module

- Shut down driver (power OFF)
- Remove LED module
- Wait for 5 seconds
- Connect new LED module
- Restart driver (power ON)

## Surge

Model	Ipeak	Twidth	Condition	Relative number of MCB / pcs														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	D25
zc-driver-22j-wl	6.28A	206us	AC 230V, full load, cold start, Ta <30°C, MCB is not installed side by side.	48	62	77	96	120	57	74	91	113	142	57	74	91	113	142



## Installation

The number of drivers mounted under different MCBs in the table is the maximum value. Please **do not** exceed this number during installation. Calculation uses typical values from ABB series S200 as a reference.

With different brands and models of miniature circuit breakers, the number of drivers mounted will be slightly different.

If the ambient temperature of the MCB installation exceeds 30°C or multiple MCBs are installed side by side, the number of drivers mounted will be reduced and the calculation needs to be recalculated.

Electricians usually consider Type B for household lighting and Type C for commercial lighting application.

## Protection functions

### Output short-circuit behaviour

This driver is short circuit proof. After removing the short circuit fault, the driver will automatically resume output.

### LED hot-plug protection

In the following two cases, the LED driver will automatically turn off the output to protect the LED:

- When the **driver is powered on without LED connected** and the **LED is connected later**.
- During operation the **LED is disconnected and connected again**

The output will be activated again after power cycling the driver.

## Insulation between circuits

Isolation	Input	Output	Case
Input	-	Double	Double
Output	Double	-	Basic
Case	Double	Basic	-

## Output current setting

Output			DIP switch				Dimming depth
Prated(W)	Irated(W)	Voltage(Vdc)	1	2	3	4	
9.45	225*	6 - 42	--	ON	ON	ON	1%
10.50	250	6 - 42	ON	--	ON	ON	1%
11.55	275	6 - 42	--	--	ON	ON	1%
12.60	300	6 - 42	--	ON	--	ON	1%
14.70	350	6 - 42	--	--	--	ON	1%
16.80	400	6 - 42	ON	ON	ON	--	1%
18.90	450	6 - 42	--	--	ON	--	1%
21.00	500	6 - 42	--	ON	--	--	1%
23.10	550	6 - 42	ON	--	--	--	1%
22.80	600	6 - 38	--	--	--	--	1%

\*This item is the factory default current. -- Switch position OFF.

## Installation requirements

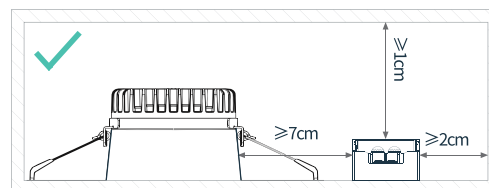
The driver should be installed in a dry, acid-free, oil-free, fat-free environment.

The installation ambient temperature of the driver shall not exceed the value of Ta at any time.

The temperature of the mounting surface of the driver should be lower than 40°C.

The driver should keep a certain distance from heat sources (such as the luminaire radiator). The recommended distance between the driver and the heat source should be  $\geq 7$  cm.

**Do not** stack the drivers. The recommended distance between two drivers should be  $\geq 15$  cm to avoid affecting heat dissipation and the lifespan of the drivers.



**Do not** place the driver inside a non-vented enclosure, metal boxes or luminaires. Note: this driver is **not suitable** for internal installation within a luminaire.

Preferably install on systems free from metal obstructions or materials that heavily weaken radio frequency signals (e.g. fibre-reinforced plastic).

**Do not** route cables near the antenna area of the driver (e.g. high voltage input lines, LED power lines).

**Do not** place the drivers on the floor. The recommended distance between the driver and the floor should be  $\geq 100$  cm to avoid signal interference.

**Avoid installing** the driver near large metal objects (e.g. metal stud ceilings), beams, or in corners. Maintain a minimum distance of  $\geq 15$  cm between the driver and any metal object, beam, or corner to prevent signal interference.