



ZITARES CCD 2nd Generation

SELV constant current control gear, 2-channel, dimm- and adjustable



zitares360



ECG versions

Model	Order no.	Output currents ¹⁾	Output power
CCD290-60FR-20/220-240/DALI	10116445	2 x 250 - 900 mA	5 - 60 W
CCD290-100FR-20/220-240/DALI	10116447	2 x 250 - 900 mA	12.5 - 95 W

¹⁾ Combined adjustment for both channels by means of software or resistor

Performance characteristics

- Dimmable 2-channel ECG for constant current operation of LED modules
- Adjustable output currents by plug-in of resistors or digital programming*
- Selection of additional output currents by means of parallel connection of the output channels
- SELV equiv. output voltage ≤ 60 VDC
- Very high efficiency of up to 91 % (100 % load)
- Soft start and low output current ripple
- For use in luminaires of protection class I
- ECG extensively protected against abnormal operating conditions at the output e.g. short-circuit, open circuit or overload
- Suitable for direct current operation and application in combination with central battery installations
- Push-DIM function of DALI interface: switching and dimming via push-button
- Dimming range: 1 ... 100 % luminous flux
- Conformance with international regulations, regarding safety and operation, electromagnetic compatibility and immunity to interference
- Nominal service life: 50,000 h with failure rate ≤ 10 % and operation at $t_c = t_{c,max}$

* Programming via software ZITARES 360

Applications

Office

Shop

Industrial

Markings





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General technical data

Mains voltage supply	
Rated voltage range	220 ... 240 V
Max. permanent voltage range (continuous)	198 ... 264 V
Rated frequency	0 / 50 ... 60 Hz
Battery operation	
Voltage range for continuous operation	198 ... 278 VDC
Lowest limiting value for temporary operation	176 VDC / 0.5 h
Mains overvoltage	
Overvoltage protection	350 VAC / 2 h
Automatic switch-off of the LEDs at	appr. 350 VAC
Protection against voltage peaks	
Voltage peaks L - N	1 kV
Voltage peaks L/N -PE	2 kV
Starting time	
Time to 100% luminous flux	< 0.5 s
Total harmonic distortion (THD)	
At 100% load to ECG-output	< 10 %
Output data	
Tolerance of output current	+/- 5 %
Max. ripple of output current	+/- 10 %
Max. wire length to LED module	2 m
Galvanic separation to mains input	yes, test voltage 3.75 kV
Protection functions output side	
Overload operation	yes; limitation of output voltage and reduction of output current
Underload / Short-circuit operation	yes; output channel switch-off in case of permanent operation, restart after mains interruption
Open-circuit operation	yes; output voltage max. 60 VDC (SELV equiv.)
Hot plug-in	allowed; protection of LED module has to be ensured
Dimming operation and interface	
Overvoltage protection of interface	264 VAC
Galvanic separation to output side	yes, test voltage 3.75 kV
Stand-by power losses	≤ 0.5 W
Dimming range for luminous flux	1 ... 100 %
Dimming technology	Mixed Mode ²⁾
Max. number of ECG for Push-Dim control	25
Rset interface	
Overvoltage protection of interface	60 VDC
Range of control voltage	0 ... 10 VDC
Range of resistance detection (resolution)	0 ... 10 kΩ (100 Ω)
Max. control current	max. 4 mA
Connection terminals	
Type	90°- terminal with key ¹⁾
Wire cross section	0.5 mm ² - 1.5 mm ²
Wire stripping length	7.5 mm - 8.5 mm
Thermal protected device	
Max. surface temperature acc. to EN 61347-1/C5e	+ 110° C
Degree of protection	
Degree of protection of ECG housing	IP 20

¹⁾ Terminals and ECG construction are designed for an automatic wiring with robots

²⁾ See page 8 "dimming methods" for further information



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Temperatures (operation)

Model	Ambient (t_a)	Case (t_c)
CCD290-60FR...	- 25 °C ... +50 °C	max. + 75 °C
CCD290-100FR...	- 25 °C ... +50 °C	max. + 75 °C

Lifetime

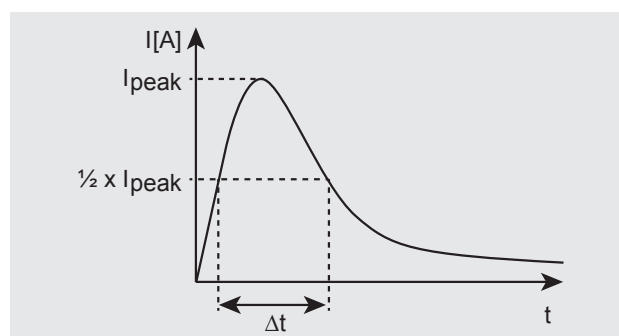
Lifetime	
Operation at $t_c = t_{c,max}$	50,000 h; failure rate $\leq 10 \%$
Operation at $t_c = t_{c,max} - 10 \text{ K}$	100,000 h; failure rate $\leq 10 \%$

Circuit breaker / Inrush current

Model	typ. $I_{peak} / \Delta t$	Number of ECG at one single-pole circuit breaker (CB)				
		CB-Typ	10 A	16 A	20 A	25 A
CCD290-60FR...	49 A / 154 μs	B	10	17	21	27
CCD290-100FR...		C	16	26	33	41

- Data for $U_{supply} = 230 \text{ VAC}$, mains impedance = 1Ω
- 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





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Operating data

Model	Input current ¹⁾ A	Input power ¹⁾ W	Power factor ¹⁾	ECG efficiency ¹⁾ %	Output currents ⁴⁾ mA	Output voltage / channel V	Total output power ^{2), 3)} W
CCD290-60FR...	0.30	67	0.98	90	2 x 250 ... 900	10 ... 33	5 ... 60 W
CCD290-100FR...	0.45	104	0.98	91	2 x 250 ... 900	25 ... 53	12.5 ... 95 W

¹⁾ All specifications with 230 VAC nominal operation and 100 % load at 2 x 900mA output current

²⁾ The precised load range for undimmed operation results out of the adjusted output current(s) multiplied with the output voltage range (see operating range diagram)

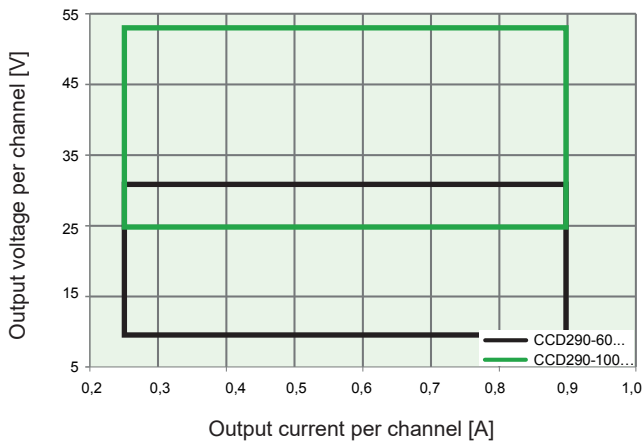
³⁾ Asymmetric load distribution on the outputs is permissible

⁴⁾ Combined adjustment for both channels by means of software or resistor

Selectable output currents

Output current	CCD290-60FR ...		CCD290-100FR ...	
250 ... 900 mA	2 x		2 x	
500 ... 1800 mA		1 x		1 x
see Page 6: ECG Wiring diagrams output	1	2	1	2

Operating ranges



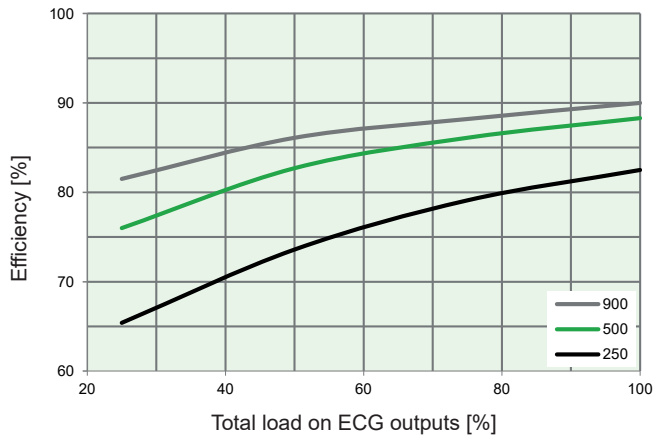


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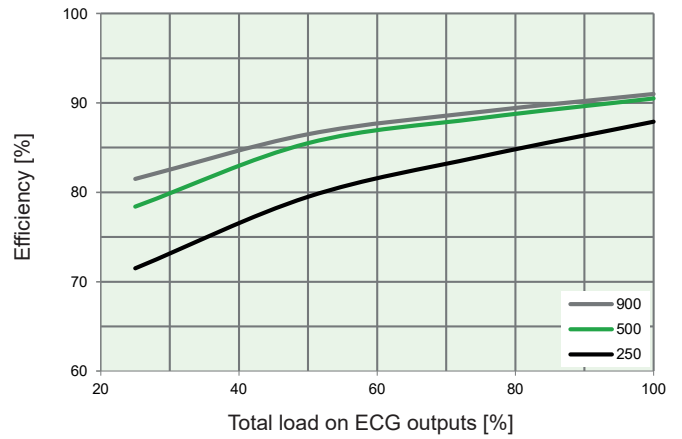
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Efficiency and power factor

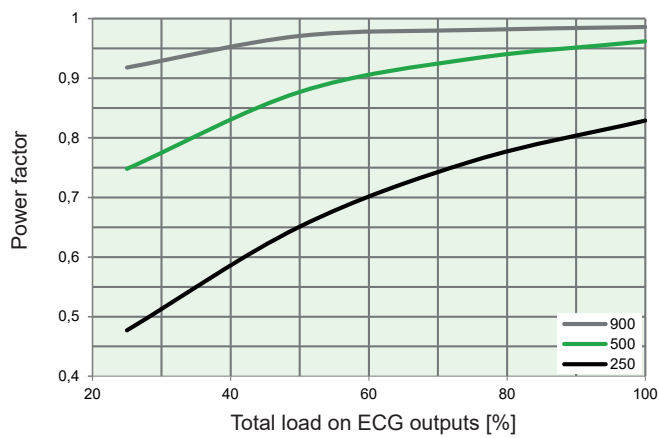
Efficiency vs. output load CCD290-60...



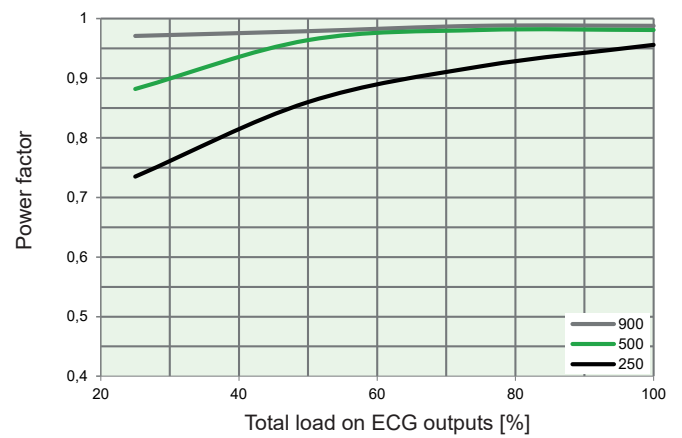
Efficiency vs. output load CCD290-100...



Power factor vs. output load CCD290-60...



Power factor vs. output load CCD290-100...



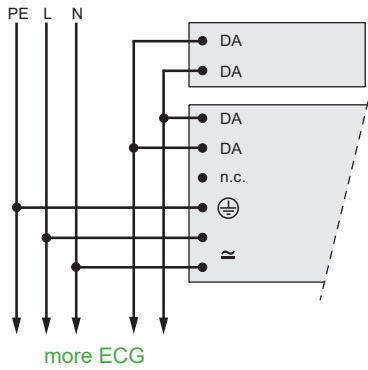


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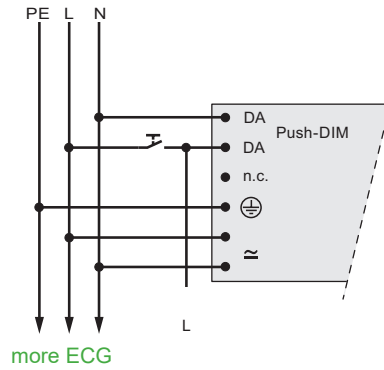
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Wiring diagrams ECG input

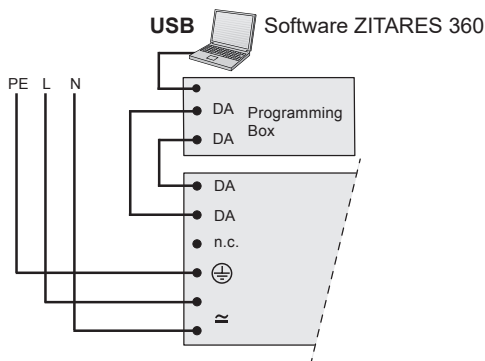
A Connection of ECG input side for DALI control



B Connection of ECG input side for control via push-button

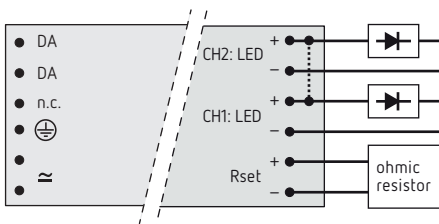


C Connection ECG-Programming Box for programming

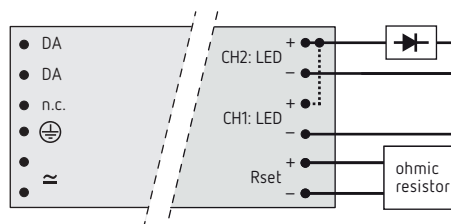


Wiring diagrams ECG output

1 Connection of ECG output side



2 Connection of ECG output side





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○ Push-button operation / supplementary functions

Push-button operation

In addition to control via DALI control signals, the DALI interface can also be used for switching and dimming via a push-button.

Button press	Status: LEDs switched off, ECG in standby mode	Status: LEDs switched on
Short button press	Switching on of LEDs to the last dimming level (memory function)	Switching off of LEDs and saving of current dimming level; ECG in standby mode
Long button press	Switching on of LEDs to the last dimming level and then dimming up or dimming down	Dimming up or dimming down of LEDs; each release and repressing of the button reverses the dimming direction

Recovery function - behaviour after mains voltage interruption

The behaviour of the ECG after mains voltage interruption can be specified via the recovery function.

Recovery function activated: After return of mains voltage the ECG returns to the operating mode before power interruption. If the lighting system is switched on, the last set dimming level is called up.

Recovery function deactivated: (Factory setting) After return of mains voltage the ECG switches the lighting to 100 % luminous flux.

Activation or deactivation of the recovery function can also be implemented via the programming software ZITARES 360.

Synchronisation of the ECG

If synchronising the ECG is needed in an application, this can be implemented via a push-button connected to the DALI interface. When the lighting system is switched on the push-button must be pressed and held for approximately 10 s until the complete system is increased to 100 % luminous flux. All ECGs are then synchronised after releasing the push-button.



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Rset interface

The Rset interface principally enables the connection of ohmic resistors functioning as current heat sink. The resistor value is evaluated by the ECG and can utilized for symmetrical output current adjustment of both channels.

Rset formula for calculation of output current per channel

$$I_{\text{out}} [\text{A}] = \frac{2.5 \text{ V}}{\text{Rset} [\Omega]} \times 1,000$$

Resistor Ω	Output current A
10,000	0.250
7,150	0.350
4,990	0.500
3,570	0.700
2,770	0.900

Rset formula for calculation of output current of parallel connected output channels

$$I_{\text{out}} [\text{A}] = \frac{5 \text{ V}}{\text{Rset} [\Omega]} \times 1,000$$

Because the Rset interface complies with SELV requirements no supplementary insulation measures are required. With selection of the connected elements it must be ensured that these are also galvanically isolated from mains voltage and that the required creepage and clearance distances are complied with.

Dimming methods

Mixed Mode - dimming:

The combination of amplitude and pulse width modulation (PWM) dimming leads to an optimized dimming performance.

High dimming levels are realized by reduction of current amplitude. Light colour and light output ratio is stable in this case. The electromagnetic, -thermal and -acoustic system load can be optimized by means of current reduction.

Below a defined amplitude threshold value down to a 1% dimming level the luminous flux is reduced by means of pulse width modulation with 500 Hz without any change in light colour.

Programming and software settings

Programming of ECG is done via the DALI interface by using the BAG programming box (Order no. 10112596) and the Software ZITARES 360. The connection of the ECG to the programming box is shown in figure „C“ in section „Wiring diagrams ECG input“. The software and programming documentation contains further information. This is can be requested or is available via the BAG website.

Factory settings

DALI addresses	1	For combined control of both output channels
DC detection	deactivated	100% luminous flux during DC operation
Recovery function	deactivated	After return of mains voltage the ECG switches the lighting to 100 % luminous flux.
Dimming method	mixed mode	Dimming of LEDs via reduction of current amplitude and pulse width modulation in a range of 1...100% luminous flux
Output current channel 1	700 mA	Threshold value for amplitude dimming: 500 mA
Output current channel 2	700 mA	Threshold value for amplitude dimming: 500 mA
Rset interface	activated	Combined adjustment for both channels by means of resistor

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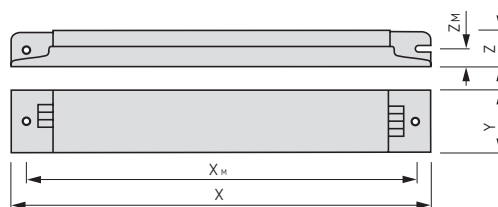


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ECG dimensions

Model	X	X _M	Y	Z	Z _M
	mm	mm	mm	mm	mm
CCD290-60FR...	360	350	30	21	9
CCD290-100FR...	360	350	30	21	9



Logistic data

Model	Order no.	EAN	Weight ECG kg	ECG PU ¹⁾ pcs.	Dimensions PU mm	Weight PU kg
CCD290-60FR-20/220-240/DALI	10116445		0,315	30		
CCD290-100FR-20/220-240/DALI	10116447		0,315	30		

¹⁾ Packaging unit

Conformance with regulations

EN 61347-1	General and safety requirements
EN 61347-2-13	Particular requirements for d.c. or a.c. supplied electronic control gear for LED modules
EN 62384	D.C. or A.C. supplied electronic control gear for LED modules - Performance requirements
EN 61547	Equipment for general lighting purposes - EMC immunity requirements
EN 55 015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 62386-102	Digital addressable lighting interface - General requirements for control gear
EN 62386-207	Digital addressable lighting interface - Particular requirements for control gear - LED modules (device type 6)
IEC 60 068-2-6	Environmental testing: Tests – Test Fc: Vibration (sinusoidal)
IEC 60 068-2-27	Environmental testing: Tests – Test Ea and guidance: Shock