

The right relay for LED applications

Quick selection between C10-A15, C7-W10, CHI14 and CHI34

Important: With LED luminaires, it is not just the wattage that matters. LED drivers can generate very brief but extremely high current spikes when switched on. When selecting a relay, it is therefore essential to check **both the rated current AND the Inrush current, including the pulse duration**.

1. Why LED loads have specific requirements

LED drivers contain input capacitors. When switched on, these can cause a current for microseconds or milliseconds that is many times the normal operating current. If several drivers are connected in parallel, the inrush currents add up. A relay may therefore become welded at the contacts or wear out prematurely, despite the low LED power.

2. Selection guidelines

1	LED driver / luminaire type and number per switched contact
2	Operating voltage and rated current of the total load
3	Inrush current per driver: inrush current AND pulse duration in µs/ms
4	Relay contact: 1 NO contact, 1 NC contact or 3 NO contacts / multiple load paths
5	Mounting type and control voltage: pluggable or DIN rail; AC/DC coil voltage

3. Product overview

C10-A15 Where a pluggable changeover contact is required and the inrush current remains moderate.	C7-W10 Where a pluggable make contact is required for very high, short inrush peaks.
CHI14 When a single-pole LED group is connected in the distribution board or high inrush current reserves are required.	CHI34 For 3-phase applications or where 3 load paths are to be switched together; additional semiconductor auxiliary contact and manual actuator.

4. Product comparison

Product	Installation	Contacts	Rated Current	Inrush Current	Contact material	Typical application
C10-A15	pluggable	1 CO	10 A	120 A / 20 ms	AgSnO ₂	Moderate LED load, changeover contact required
C7-W10	pluggable	1 NO	10 A	500 A / 2.5 ms	Tungsten leading contact + AgNi trailing contact	High short-time inrush, industrial / pluggable
CHI14	DIN rail	1 NO	16 A	800 A / 200 µs 165 A / 20 ms	Tungsten lead-in contact + AgSnO ₂ contact Zero-crossing switching	Single-pole LED groups, installation distribution boards, high reserve
CHI34	DIN rail	3 NO + 1 aux. NO	16 A	800 A / 200 µs 165 A / 20 ms	Tungsten lead-in contact + AgSnO ₂ contact Zero-crossing switching	3 load paths / 3-pole applications; auxiliary contact (semiconductor) + manual actuator

Note: The inrush current specification must always be considered in conjunction with the corresponding pulse duration. 500 A / 2.5 ms is not necessarily 'better' or 'worse' than 165 A / 20 ms. The load curve of the LED driver must match the relay specification. Do not approve an application based solely on wattage; instead, request the driver data (datasheet) where necessary and subject the application to a technical assessment.

5. Checking the LED array

A. Rated load	Determine the total operating current of all LED drivers connected in parallel. This must be below the relay's permissible rated current.
B. Inrush current	As a conservative initial estimate: number of drivers × Inrush current per driver. For the same current, the driver's pulse duration must be shorter than the specified pulse duration of the relay.
C. Contact configuration	Check whether 1 CO, 1 NO or 3 NO are required. Otherwise, a relay that is electrically suitable may still be functionally unsuitable.
D. Installation	Determine the socket or DIN rail and the appropriate coil voltage.

6. Example

Example: 8 LED drivers, each rated at 60 W, each with an Inrush current of 20 A for 300 µs.
Total power: 480 W – nominally not a problem for any of the four relays.
Conservative inrush peak: $8 \times 20 \text{ A} = 160 \text{ A}$ for approx. 300 µs.
Consequence: C10-A15 is not the first choice despite the low wattage. C7-W10 is suitable for the short, high peak; CHI14 is also a robust choice for DIN rail mounting and reduces the Inrush current through a zero-voltage circuit.

7. Customer checklist for safe approval

This information can be requested directly from the customer or from the manufacturer of the LED driver:

	Specification	Value / Information from the customer
1	Manufacturer / LED driver type	
2	Number of drivers per relay contact	
3	Supply voltage of the load	
4	Rated current per driver / total	
5	Inrush current per driver [A]	
6	Pulse duration of the Inrush current [µs/ms]	
7	Switching frequency	
8	Contact function / number of load paths	
9	Control voltage and mounting type	

8. Limits of the quick selection

- Both the rated current and the Inrush current must fall within the product limits.
- The pulse duration is part of the inrush current specification and must not be ignored.
- Where LED drivers are connected in parallel, the inrush currents may add up; for applications operating at the limits, a measurement or the manufacturer's specification is preferable.
- A technical assessment is required in the event of an unknown Inrush current, an unusually high switching frequency, DC loads or specific environmental conditions.
- The selection guide does not replace the current data sheet or any application-specific approval.

If in doubt: send the LED driver data sheet, the number of drivers and the required contact function to Technical Support (support@comatreleco.com). This will enable the relay selection to be checked quickly and transparently.