



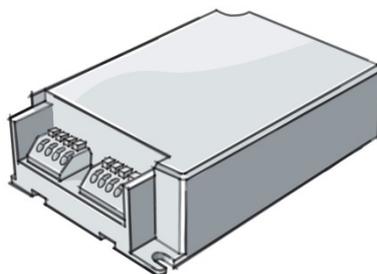
White Paper

How to use Zhaga Book 13

Edition 1.0, November 2015

Zhaga has written a new specification, Book 13, defining LED drivers for use in combination with separate LED modules.

This White Paper explains the benefits of using standardized drivers, and encourages driver and luminaire manufacturers to utilize Zhaga's new Type A and Type B form-factors for new designs.



1. Introduction

Many LED light engines consist of one or more LED modules together with a separate electronic control gear, known as an LED driver.

To enable the interchangeability of LED drivers, Zhaga specifies their mechanical dimensions and provides a reference to a standardized electrical interface between the driver and the LED module.

Drivers typically can be used in multiple applications to supply power to different LED module types. Similarly, an LED module can be used with different drivers.

Information about the mechanical and electrical interfaces of LED drivers is contained in the new Zhaga interface specification, Book 13. This White Paper provides background information about Book 13 and its intended use.

Contents:

- Overview of the specified driver types
- Why does Book 13 provide 78 variants?
- Benefits of using Book 13
- Driver-module interface

2. Overview of the specified driver types

To enable the physical interchangeability of drivers in a luminaire, the mechanical dimensions must be clearly specified. In addition to the maximum outer dimensions (demarcation) of an LED driver, its fixing points are defined within a certain tolerance.

To serve all applications, Zhaga defines several basic driver form-factors. Each form factor is characterized by both the position and number of mounting holes, and the position of the electrical wiring to the LED module and the mains power. Taking into account the specific dimensions per form-factor, Zhaga provides 78 categories of driver with different dimensions.

In Book 13, Zhaga has defined two new sets of LED drivers with standardized dimensions, known as Type A and Type B. Zhaga expects these form-factors to be used for the design of new luminaires and LED drivers.

Within each Type, there are a range of different sizes, based on the maximum outer dimensions (demarcation) of the LED driver. The total number of designations across Type A and Type B is 27 (see Table 1).

Type	Application	Remarks	Number of designations
A	Driver with compact dimensions, typically for down-light and spot-light applications. Two or four fixing points are offered in the corners.	This family was developed by Zhaga to serve all applications from low- to very-high-power drivers.	13
B	Driver with slim (stretched) dimensions, typically for areal luminaires used in office and industrial applications. Two fixing points are offered on the symmetry axis.	Developed by Zhaga to serve areal light systems up to high-power applications.	14

Table 1. In Book 13, Zhaga has defined two new sets of LED drivers with standardized dimensions. The total number of designations across Type A and Type B is 27.

However, there are many existing driver types in the market. After evaluating the range of available products, Zhaga incorporated in Book 13 a series of driver types that cover the existing common practice (Table 2).

Type	Application	Number of designations
1	Compact driver, typically used for down- and spot-light applications. 2 Fixing points are diagonally oriented.	14
1a	Compact driver, typically used for down- and spot-light applications. Fixing points are oriented on the symmetry axis.	4
2	Compact drivers, typically used for down- and spot-light applications. Main applications are drivers, directly attached outside to the luminaire and mounted with studs or 4 mounting holes.	2
2a	Compact driver, typically used for down- and spot-light applications. Main applications are drivers, directly attached outside to the luminaire and mounted with studs only.	1
3	Driver with slim (stretched) dimensions, typically for areal luminaires used in office and industrial application.	12
4	Compact driver, typically used for down- and spot-light applications. 4 fixing points are oriented on the symmetry axis.	3
4a	Driver with slim (stretched) dimensions, typically for areal luminaires used in office and industrial application with high electrical load.	2
5	Independent driver.	5
6	Independent driver.	5
7	This type is offered for very high power applications and has 4 holes specified.	1
8	Compact driver, typically used for down light and spot light applications. 3 fixing points.	2

Table 2. Existing common practice. Zhaga has also defined a set of driver types based on products that have been on the market for years, and that are already specified in existing luminaires. The inclusion of these driver types should enable luminaire manufacturers and control-gear manufacturers to implement a very smooth transition to the new A and B types.

3. Why does Book 13 provide 78 variants?

Zhaga members have worked out that the 27 different built-in driver dimensions in Types A and B can serve nearly all applications, both for compact luminaires (type A) and for areal lighting (type B) over a very wide range of output powers. Zhaga recommends that the new form-factors in Types A and B should be adopted for new luminaire and driver designs.

The lighting industry is known to be quite reliable with respect to long-term availability of products. Continual product-design changes are accepted neither by industrial customers nor by the manufacturers of these products.

Unnecessary changes in the dimensions of a driver can impact a luminaire's design with no real benefit for the end customer. Moreover, slight changes of a driver's dimensions require new product and production layouts.

Therefore, whereas Zhaga recommends that driver manufacturers should adopt type A and type B dimensions when specifying new products, the consortium also acknowledges that many existing products require a long period to gradually phase out. For this reason, the additional driver designations (types 1-8) are also included in Book 13.

4. Benefits of using Book 13

Drivers typically are placed and maintained by professional lighting experts, such as luminaire manufacturers, and these are the main beneficiaries of using drivers with standardized dimensions. This enables luminaire manufacturers to re-use drivers in new products, without changing the mechanical concept of the luminaire. Also, second sourcing is much more straightforward with standardized products.

Drivers defined in Zhaga Book 13 are clearly characterized. The Zhaga designation fully defines the driver from a mechanical point of view. For example, the dimensions of a ZS5H5 driver are 281 x 41 x 31 mm. All drivers with the same designation are mechanically replaceable. Using this driver designation in the luminaire specification will improve the purchasing and maintenance process.

5. Driver-module interface

Zhaga does not specify the electrical interface between the driver and the module directly, but uses references to existing standards for this interface. These references include both the information interface and the power interface.

5.1 Information interface

By coding an LED module (or an external component) using an analogue (resistance, current and voltage) or a digital method, the driver will operate the LED module automatically with its rated current.

Currently, there is only one information interface specified in Book 13, which is the “LEDset1” specification written by MD-SIG.

The compliance of the information interface with the specification (e.g. LEDset1) is verified by the Zhaga testing and certification process.

5.2 Power interface

The rated output values of the LED driver must comply with the requirements of the LED module. For this reason the DMI specifies also the “window” which the driver offers to the LED module for current, voltage and power. The availability of this information in the product data set is verified in the testing and certification process.

6. More information

More information on Zhaga Book 13 can be found on the Zhaga website:

- www.zhagastandard.org/books/book13

More information on the LEDset1 specification can be found on the MD-SIG website:

- <http://md-sig.org>