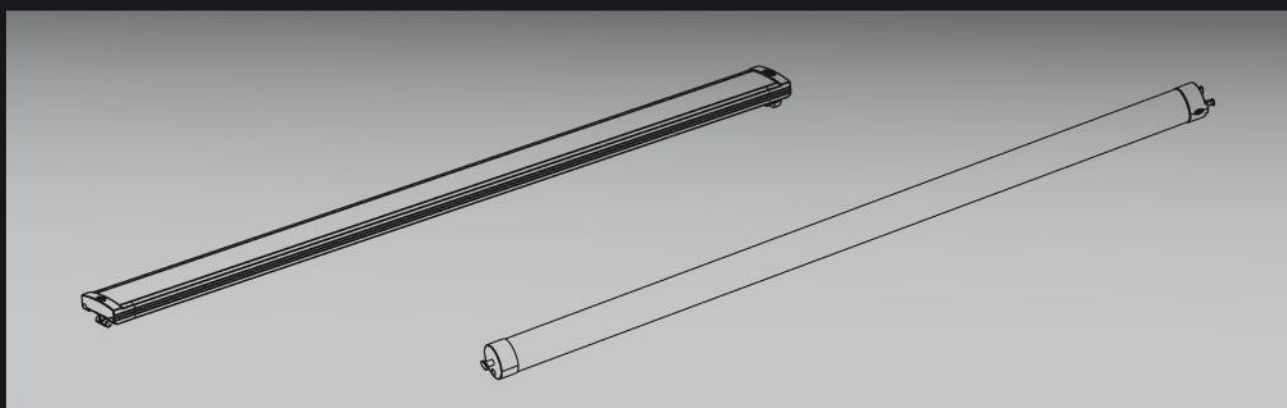
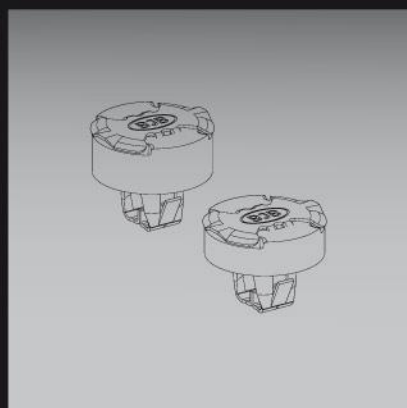
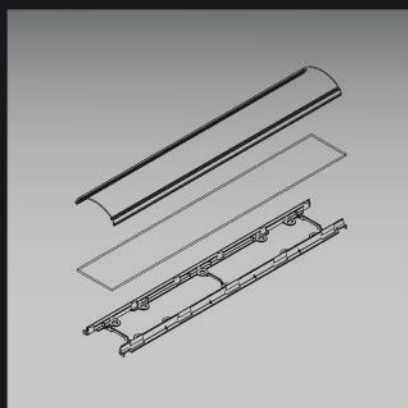
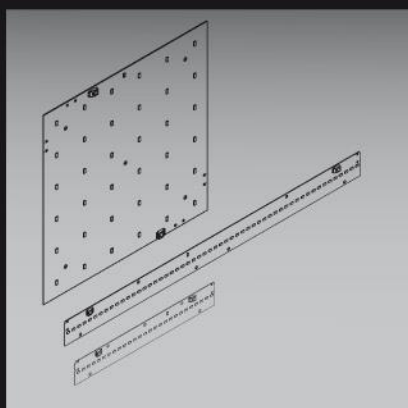
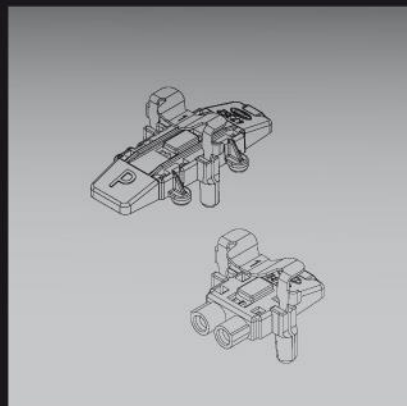
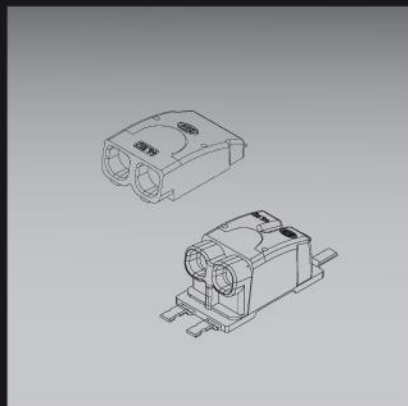
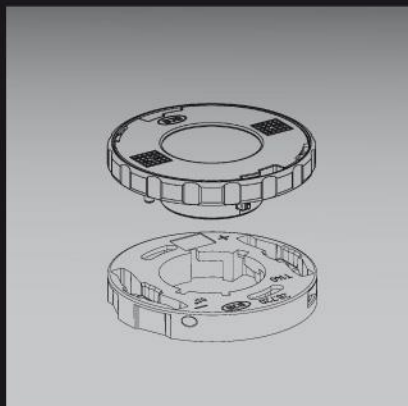


BJB///OEM-Line

The smartest route to your LED application

Design-In-Guide



Version: 2015-04-16



Your Connection to Light

BJB /// OEM-LINE

Design-In-Guide

We have always had a keen interest in the future of light!

Throughout the 140-year history of our company, we have been developing lighting solutions for the future. We began producing components for oil lamps in Arnsberg in 1867. Then, with the first major technological change to electric light and the advent of the incandescent bulb as the universal light source, we went on to produce the electrical connection between the power source and the lamp. Today we also develop and manufacture innovative, user-friendly lampholder and connection systems for LEDs, the light source of the future. We call our products “connections to light”, but they are also links to the future as we will never lose our enthusiasm for new challenges. This is why you will also find LED light sources in our portfolio in future.

LEDs are definitely the future, but they are also much in evidence at present. In streets and squares, homes and offices, hotels and restaurants, department stores and boutiques, galleries and museums, concert halls and theatres, hospitals and doctors’ surgeries – these powerful little devices with their modest appetite for energy are already in operation everywhere. Efficient, reliable, low-maintenance and long-lasting.

With our **components** we ensure that every light receives the safest and fastest connection to the power source. Regardless of the form or purpose of the light or which manufacturer it comes from, we have the right solution for (almost) everyone.

Our portfolio now also includes **active LED modules**. In addition to the well-known LED circuit boards, there are now new LED modules with lamp bases for both linear and punctiform applications. These are therefore exchangeable and offer the luminaire manufacturer a whole new range of possibilities – also in terms of the arguments he can use to present their advantages to his customers.

The BJB///OEM-Line modular system marks the beginning of a new era in which top-quality light and maximum efficiency are no longer mutually exclusive. This versatile system solution is economically and ecologically sound and adaptable to future requirements. It will enable you to create an excellent lighting atmosphere in a wide variety of applications where LEDs show their strengths – in salesrooms, offices, hotels, restaurants or museums.

When you are developing a new luminaire series with LEDs, there are some differences to bear in mind in comparison to a system using conventional light sources. This design guide should help you. It answers important questions including aspects of lighting technology, mechanical structure, electrical contacting, thermal management, optical requirements and the possibility of automated production processes.

Overview of chapters

For the purposes of orientation within the Design-In-Guide, the information on the BJB///OEM-Line modular system is clearly arranged in a number of chapters: First you will find a system overview in which the various versions are compared. Next, the mechanical, electrotechnical, optical and thermal aspects of the components are discussed. At the end of the Design-In-Guide there is then a summary of information on ordering and sources of supply.

Important information on the selection of suitable BJB LED modules and products

All articles in the BJB///OEM-Line modular system have been designed on the basis of relevant national and international regulations. The selection of products and correct technical installation are the responsibility of the user. Precise information is available on request. Product specifications are subject to change.

The LED modules and products manufactured by BJB have various geometric forms which are compatible with dimensions of numerous standard products from other companies. Certain limits or rated values which customers should adhere to are indicated in our technical information and data sheets.

BJB guarantees compliance with the specified geometric dimensions, limits or rated values.

Otherwise, the customer is responsible for the selection of the LED modules and products which are suitable for the desired luminaire design and any components from other manufacturers. In particular, BJB has no influence on the dimensional form or other technical characteristics of components from other manufacturers, such as geometric form, power limits, colour temperature or beam angle. The other manufacturers are responsible for defining these characteristics.

The customer is therefore responsible for observing the information provided in the respective data sheets for the BJB LED modules and products as well as all the physical correlations involved in the specific, complex load situation of an LED luminaire design. Factors such as electrical heat, radiant heat, colour temperature, light intensity, light composition (wavelengths), beam angle, reflections, chemical influences (vapours or disintegration of plastics) or contamination, etc. can attack or interact unfavourably with components when the luminaire is in operation. These conditions can therefore also have a long-term adverse effect on the service life of individual components.

BJB as a component manufacturer cannot foresee these physical influences or the various combination options and installation conditions. Consequently, we cannot anticipate the actual stresses and interactions in relation to the BJB products used.

The luminaire manufacturer is responsible for the consideration of luminaire-specific requirements. A guideline for good, practice-related luminaire design can be found in IEC 60598-1, Appendix L.

Information

You will find the current version of this guide at www.bjb.com. All information provided has been compiled with the greatest possible care. No warranty or representation is made as to the accuracy, correctness and completeness of this information, which is subject to errors, amendments, additions and omissions. BJB assumes no liability for any resultant damage or loss

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Board-to-Cable [B2C]
47.312
Board-to-Board [B2B]
47.35x
Chapter 5.3

End caps for
holder for optical
profiles and plates
31.930.-3xx

Optical
components
31.930.-4xx
Chapter 6.3

BJB SMD terminal
block 46.10x
Chapter 5.1

BJB SMD terminal block
for wiring below the PCB
46.11x
Chapter 5.2



Push-to-Fix [P2F]
28.901
Chapter 4.1

BJB LED module
31.110 / 31.130
Chapter 3.1

Holder for optical
profiles and
plates
31.930.-3xx
Chapter 6.1

Spot-/Downlight-
System DC
32.120 / 28.720



Linear Flat System
32.130 / 28.701
Chapter 3.2



1 BJB///OEM-Line modular system application matrix

Whether you need wide-area lighting or spotlighting, with the components from the BJB /// OEM-Line modular system you can design your lighting application to suit your own requirements. In addition, our products offer many technical refinements which will assist you in organising your luminaire production in as efficient a manner as possible. You can find further information and technical data as well as the entire BJB LED product portfolio on the Internet at www.bjb.com or in the BJB catalogue.

2 General information

The general information given below should be of assistance in dealing with the components of the BJB///OEM-Line modular system and must be observed for the safety of people as well as components.

Exact product specifications, such as dimensions or electrical operating parameters can be found on the relevant product data sheet.

2.1 Area of application

The components of the BJB///OEM-Line modular system are designed for indoor luminaire applications and are usually used in luminaires of Protection Class I. Other applications, for example outdoors or with higher protection classes are conceivable with an appropriate luminaire design.

2.2 Electrostatic discharge ESD / electrical overload EOS

Some components of the BJB///OEM-Line modular system can be damaged by electrostatic discharge (ESD) and electrical overload (EOS), so that these components can only be used and handled when ESD or EOS protection is provided.

Modules in which no contact with the circuit board is possible due to their design do not require any precautions against electrostatic discharge (ESD) during normal installation work.

2.3 Chemical substances

Depending on the application, BJB///OEM-Line products may come into contact with chemical substances from the surrounding area.

Examples of cases in which chemical substances are used are:

- In outdoor luminaires or luminaires designed for high levels of humidity (protective coatings)
- When components are encapsulated
- When components are glued
- When luminaires are sealed

In the design and layout of the luminaire, attention should be paid to use of materials, particularly near to or in the luminaire itself, which might emit vapours or which might be present in close proximity during the lifetime of the luminaire.

The use of adhesives (especially epoxy resin adhesives), coatings, potting compounds and hardening materials should be avoided. As far as possible, the use of seals and sealants should be avoided to prevent the emission of vapours from incompatible chemicals. If the use of seals or sealants cannot be avoided, minimal quantities of silicone-compatible adhesives should be used, or thorough tests should be carried out to determine their compatibility.

The use of non-polar fluids and solvents should be avoided. These are usually used for cleaning during luminaire production or during machining (oil) or other processes and can come into contact with and damage the BJB///OEM-Line components, especially the LED units.

Only mechanical methods should be used to attach other components, such as covers, circuit boards, lenses, etc.

The luminaire should not be hermetically sealed. If a seal is required, for example to achieve a certain protection class, the following points should be observed:

- There must be sufficient room immediately above the LED components for hot air to escape, so that it does not directly envelop the LED components.

- Adequate air circulation must be ensured, for example through the use of breathable materials or an appropriate luminaire design. It is always preferable for the luminaire design to allow as high a volume of air exchange as possible.

Before the product goes on the market, all materials must be shown to be completely suitable.

2.4 Packaging and transport

BJB///OEM-Line products are delivered in suitable packaging. Where required, the packaging provides protection against mechanical and electrostatic damage (ESD). We therefore recommend leaving BJB///OEM-Line products in this packaging for onward transportation.

2.5 Electrical engineering aspects




Attention: Danger

To avoid life-threatening situations, it is essential that the following rules be observed:

- Electrical work on luminaires must only be carried out by a qualified electrician.
- Before such work is carried out, the luminaire must be disconnected from the mains power supply.
- The luminaire must be checked for damage.
- If the luminaire is damaged, it must be replaced.

2.5.1 Basic allocation of protection classes

Depending on the type of luminaire, various electrical protection classes are achieved:

	<p>Luminaires operating within Protection Class III (also SELV for Safety Extra Low Voltage) have such low internal voltages that an electric shock is of no consequence. Alternating current voltages up to 50 V AC effective value and direct current voltages up to 120 V DC are termed extra-low voltage.</p>
	<p>Protection class II (NON-SELV) applies to luminaires with double insulation without protective earth between mains circuit and output circuit or metal housing. Even if the luminaires have electrically conductive surfaces, they are protected against contact with other live parts by their insulation.</p>
	<p>Protection class I (NON-SELV) applies to luminaires with basic insulation and protective earth. All electrically conductive housing components are connected via a protective conductor system which is at earth potential.</p>

2.5.2 Basic insulation of BJB LED modules

The BJB LED modules have basic insulation and can be installed in luminaires of Protection Class I.

With appropriate design measures it is possible to construct a luminaire in accordance with Protection Class II.

2.5.3 Electrostatic safety and electromagnetic compatibility EMC protection

The LED components of the BJB///OEM-Line modular system are tested to a voltage of 3kV. Depending on the ambient conditions, for example during luminaire production or installation, appropriate precautions have to be taken to avoid higher voltages. To ensure good EMC, the conductors should be routed separately from the mains connections and mains cables. The luminaire manufacturer must ensure that the luminaire complies with the EMC Directive.

2.5.4 Electrical power supply and choice of converter

Caution

The LED components of the BJB///OEM-Line modular system have no special protection against overvoltage, overcurrent, overload or short-circuit current.

To ensure safe and reliable operation, it is necessary to use a converter which complies with the relevant regulations.

The BJB LED components are to be operated with converters which supply constant current.

Permanent damage can be caused by using converters which supply constant voltage.

Reverse polarity can lead to damage to the BJB LED components.

In case of parallel connection of the BJB LED components, a wire break or a component failure will result in an increase in current. This can seriously reduce the service life of the components.

The minimum and maximum input voltage of the LED modules should be observed.

With regard to clearance and creepage distances, the BJB LED components are designed for a voltage of up to 250 V. It is important to ensure that this voltage is not exceeded.

The permissible and maximum operating parameters can be found on the relevant product data sheets.

3 Active components and systems

3.1 BJB LED modules – 31.110 / 31.130

LED modules, square 31.110.xxxx.00

LED modules, linear 31.130.xxxx.00

Details and advice can be found on the data sheet for the relevant product.

3.1.1 Important information

3.1.1.1 Avoiding damage

The BJB LED modules are made up of components which can sometimes be damaged by mechanical stress. Such stresses should therefore be kept to a minimum.

The following types of mechanical stress can cause irreversible damage and should therefore be avoided:

- pressure
- bending
- drilling, milling, breaking, sawing
- and similar mechanical processing.

3.1.1.2 Pressure

The components of the BJB LED modules are sensitive to pressure. During installation in a luminaire, therefore, it is important that no pressure be exerted on the components.

When covers, such as glass or plastic panels, are fitted, care should be taken that no pressure is exerted on the LED chip.

BJB LED modules should only be touched or held at the edges.

3.1.1.3 Bending

Excessive bending of the BJB LED modules can cause damage and should therefore be avoided.

3.1.1.4 Protection of LED chip

The following points should be observed to avoid damage to the LED chip:

- The chemicals used in the LED application must not be solvent based, condensation crosslinked or acetate crosslinked. These could break down to form reaction products which could damage the BJB LED module or the LED chip. This advice applies equally to chemicals which are not in direct proximity to the BJB LED module, e.g. seals, and to chemicals which come into direct contact with the BJB LED module, e.g. adhesives or insulating coatings.
- To identify the chemical and the type of crosslinking, it is necessary to request a technical data sheet with a list of ingredients from the manufacturer.

3.1.1.5 Protective measures when sealing

The points listed above should also be observed for chemicals used for sealing the luminaire housing. Damage to the LED chip due to solvent vapours emitted while the chemical is hardening can be kept to a minimum by ensuring adequate distance from the BJB LED module already fitted in the luminaire as well as by providing ventilation through an open housing and air circulation by means of an extractor or fan.

3.1.1.6 Reflectors and diffusors

If a diffusor or reflector is used in combination with the BJB LED modules, the minimum distance between active components and conductive optical components must be observed as stipulated in standard EN 60598-1.

Caution!

If a NON-SELV converter is used, protection against accidental contact must be ensured. Typically, this is achieved by means of a non-removable lens which provides protection against electric shock in accordance with EN 60598.

The luminaire manufacturer must verify that the luminaire complies with the standards for protection against accidental contact.

3.1.2 Directives / standards

The BJB LED modules 31.110. / 31.130. comply with the following directives and standards:

2006/95/EG Low Voltage Directive: Directive relating to electrical equipment designed for use within certain voltage limits

2002/95/EC RoHS Directive: Directive relating to the restriction of the use of certain hazardous substances in electrical and electronic equipment

DIN EN 62031 Safety specifications for LED modules

DIN EN 62471 Photobiological safety of lamps and lamp systems

3.1.3 Assembly with Push-to-Fix [P2F]

Illustrations of the assembly process can be found in Chapter 4.1.4.

- Positioning of the mounting plate and LED board
- The P2F is inserted directly into the fixing holes provided and snapped in simply by pressing*.
- The circuit board and mounting plate are then perfectly connected.

*The P2F can be inserted manually – with or without an installation tool. BJB supplies simple hand tools for this purpose. These enable processing work to be carried out continuously.

Use of the Push-to-Fix [P2F] fixing element is recommended.

The advice on temperature and position of the tc point (casing temperature) on the product data sheet should be observed.

3.1.4 Attachment of conductors

Illustrations showing the insertion of the conductor into the SMD terminal block can be found in Chapter 5.1.1.

- Insertion of conductor at an angle of 0° to 10°, insulation strip length 8.0 mm + 1.0 mm

Depending on the installation situation of the BJB LED modules and the converter, the following requirements must be complied with:

- Observance of the necessary clearance from active conductive materials
- The maximum permissible temperature at the tc point must not be exceeded and an adequate cooling of the BJB LED module must be ensured

The BJB SMD push-wire contacts of the BJB LED modules make wiring quick and easy, either manually or automatically. The conductors can be released again by twisting and pulling.

3.1.5 Screw fixing as an alternative to Push-to-Fix [P2F]

Alternatively, the BJB LED module can also be attached to the heat sink or mounting plate with screws. It is advisable to use all the fixing holes in order to achieve an optimum thermal connection. To avoid damage to the BJB LED module, only round-head screws should be used with plastic washers.

The chosen method of fixing should ensure that the thermal stress on components complies with the relevant specifications.

It should be noted that screws provide no compensation of thermal expansion as would be the case with Push-to-Fix [P2F].

The tightening torque must not exceed 0.5 Nm.

Standard M4 screws can be used for fixing purposes, but countersunk screws are unsuitable. It is important to ensure that the underside of the screw head is flat and that the BJB LED module is not damaged by the screw.

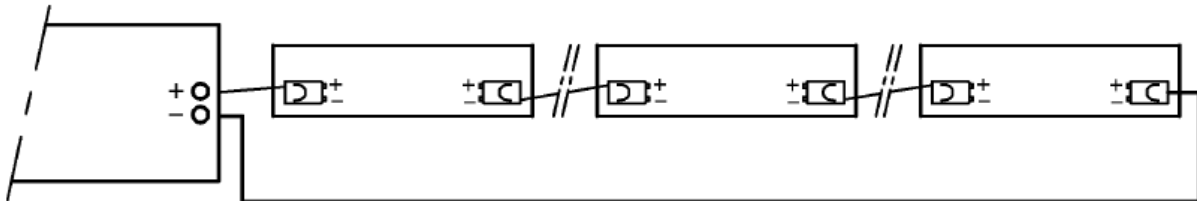
3.1.6 Fixing with adhesive as an alternative to Push-to-Fix [P2F]

BJB LED modules can also be fixed with adhesives. However, it is strongly recommended that the BJB Push-to-Fix [P2F] fixing element be used due to the numerous advantages it offers. In particular, when the P2F is used, no special attention has to be paid to vapour emissions from adhesives, incompatibility with the LED module or the permanency of thermal conductivity.

3.1.7 Electrical connections

Information regarding the connection of the converter to the mains power supply and of the converter to the LED module can be found in the product specifications of the components used. The advice given in this document on the selection of the converter should be observed.

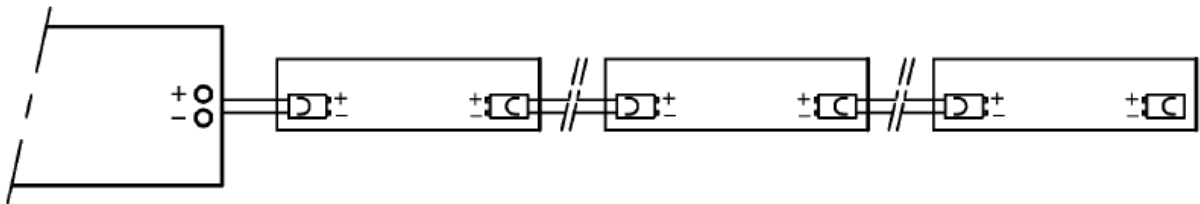
3.1.7.1 Series connection



The wiring diagram shows the serial wiring of BJB LED modules to a converter.

The maximum forward voltage of the modules connected in series must not exceed the maximum output voltage of the converter (see data sheets).

3.1.7.2 Parallel connection



The wiring diagram shows the parallel wiring of BJB LED modules to a converter.

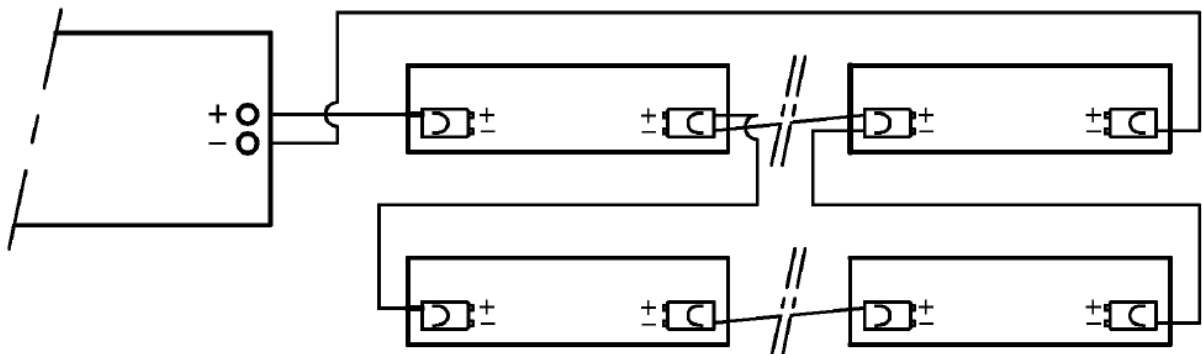
Note

In case of parallel wiring, there may be tolerance-related differences in brightness between the LED modules.

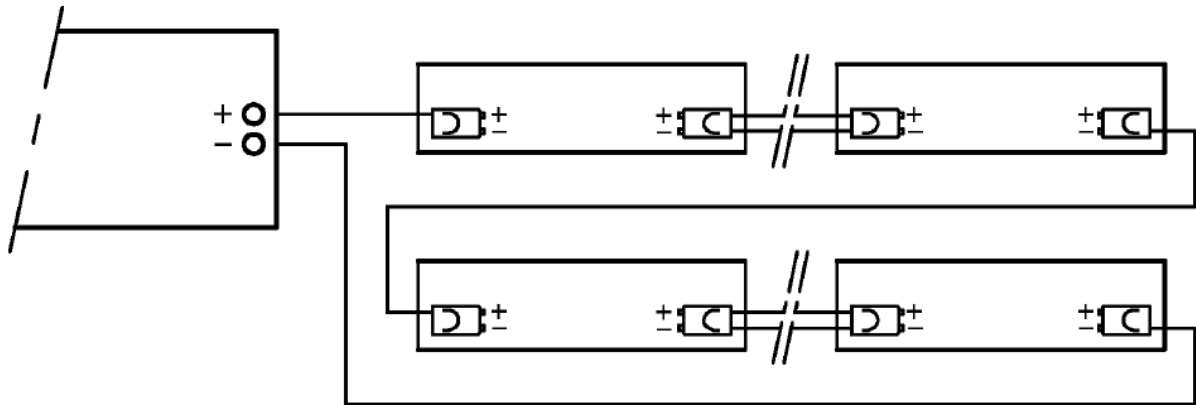
If one module fails, the remaining modules may be overloaded.

3.1.7.3 Combination

Combined circuit 1: Series circuit in a parallel circuit



Combined circuit 2: Parallel circuit in a series circuit



In case of parallel connection, the maximum permissible current indicated on the data sheets should be adhered to.

3.1.8 Optical aspects

The BJB LED modules are available in various light colours and lumen values. The respective information can be found on the product data sheets.

BJB LED modules correspond to risk group 0 according to DIN EN 62471. The module does not pose any photobiological hazard.

3.2 Linear Flat System – 32.130 / 28.701

The Linear Flat System is an interchangeable linear LED lighting solution. The system consists of the following components:

- Light source 32.130
- Lampholder 28.701
- Lamp support 28.701.Uxxx



3.2.1 Important information

- Before inserting or removing the light source, the power supply should be disconnected. Replacement under load can result in damage to the light source and / or LED driver.
- Do not cover lamp with paper, material or other highly inflammable materials
- Keep lamp away from water and extreme moisture
- Avoid additional mechanical stress on lamp
- Do not touch lamp during or shortly after use – risk of burns!
- Only use suitable drivers
- Max. permissible temperature at Tc point must not be exceeded
- Do not look directly at the lamp
- Before working on the luminaire or lamp, always disconnect from the mains power supply!

3.2.2 Directives / standards

The BJB LED modules Linear-Flat-System 32.130 / 28.701 comply with the following directives and standards:

2006/95/EG Low Voltage Directive: Directive relating to electrical equipment designed for use within certain voltage limits

2002/95/EC RoHS Directive: Directive relating to the restriction of the use of certain hazardous substances in electrical and electronic equipment

DIN EN 62031 Safety specifications for LED modules

DIN EN 62471 Photobiological safety of lamps and lamp systems

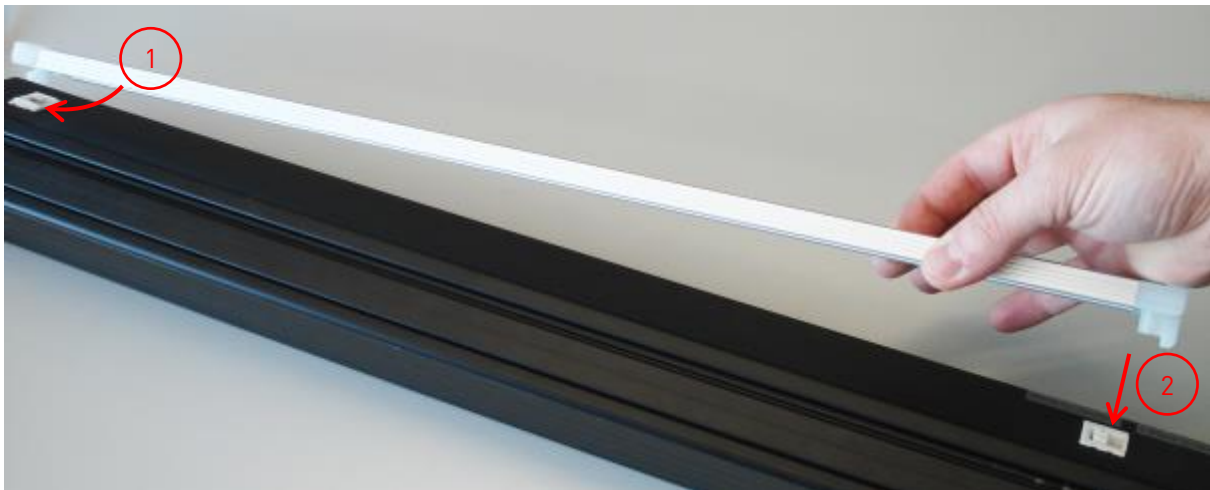
DIN EN 62717 LED modules for general lighting – Performance requirements

DIN EN 62707 LED-binning: General requirements and white grid

DIN EN 62663-2 Non-ballasted LED lamps - Performance requirements

3.2.3 Mode of operation

After being swivelled into position in the lamp support (1), the light source is snapped into place in the lampholder by pressing on the end marked "PUSH" (2). By pushing again, the light source can be released. A safety mechanism ensures that the lamp remains hanging in the lampholder after release and does not fall out.



Note!

Before being pushed in again, the light source must be removed from the lampholder completely!

The Linear Flat System has various keys on the lampholder side and on the lamp side. Details of the various keys can be found on the product data sheet.

3.2.4 Electrical connections

During wiring, attention should be paid to correct polarity as indicated by the markings (+ and -).

The system is not designed for the parallel connection of several light sources to a converter.

In the case of series connection, the permissible forward voltage should not be exceeded. In case of removal or failure of one light source, all other light sources connected in series are also disconnected from the mains power supply.

We recommend operating each light source with a separate driver or driver channel.

3.3 Spot/Downlight System DC – 32.120 / 28.720

This is a socketable LED lighting solution for spot and downlight applications. The system consists of the following components:

- Light source 32.120
- Lampholder 28.720

Light source



Lampholder



3.3.1 Important information

- Before inserting or removing the light source, the power supply should be disconnected. Replacement under load can result in damage to the light source and / or LED ballast (also known as ECG – **E**lectronic **C**ontrol **G**ear).
- Do not cover lamp with paper, material or other highly inflammable materials
- Keep lamp away from water and extreme moisture
- Avoid additional mechanical stress on lamp, max. weight of reflector 30 g. The reflector must not touch the luminaire housing to avoid raising the lamp.
- Do not touch lamp during or shortly after use – risk of burns!
- Only use suitable ballasts/control gear (ECG)
- Max. permissible temperature at Tc point must not be exceeded
- Do not look directly at the lamp
- Before working on the luminaire or lamp, always disconnect from the mains power supply!

3.3.2 Directives / standards

The BJB LED modules DC-Spot/Downlight System 32.120 / 28.720 comply with the following directives and standards:

2006/95/EG Low Voltage Directive: Directive relating to electrical equipment designed for use within certain voltage limits

2002/95/EC RoHS Directive: Directive relating to the restriction of the use of certain hazardous substances in electrical and electronic equipment

DIN EN 62031 Safety specifications for LED modules

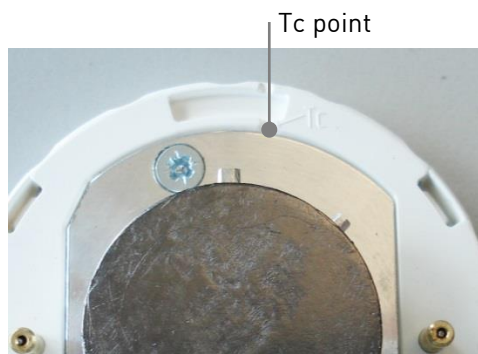
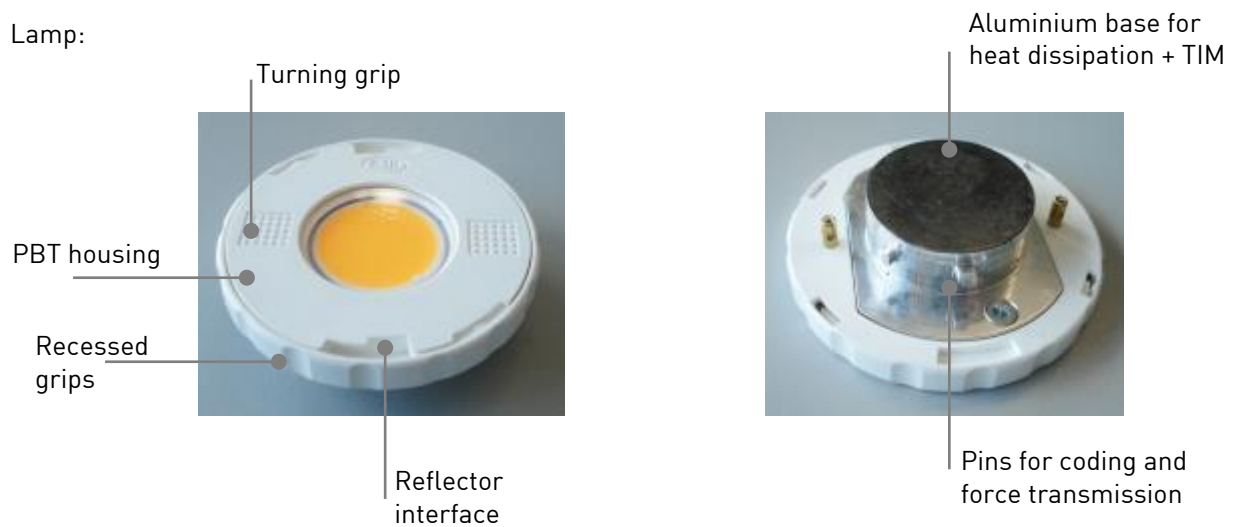
DIN EN 62471 Photobiological safety of lamps and lamp systems

DIN EN 62717 LED modules for general lighting – Performance requirements

DIN EN 62663-2 Non-ballasted LED lamps - Performance requirements

3.3.3 Mode of operation

Lamp:



Lampholder:

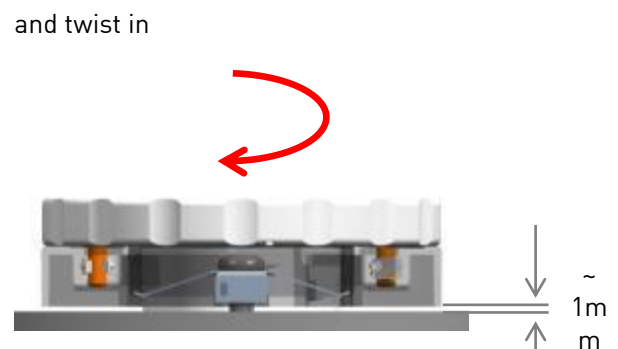
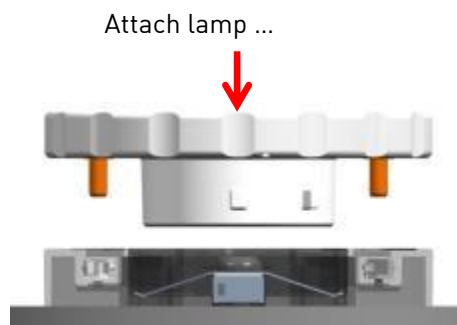


The lampholder is fixed with two corrosion-protected M3 steel screws with a torque of 0.3 Nm. The screw head must not protrude above the surface of the lampholder.

The distance between the screw holes can be found on the data sheet.

The heat sink which is selected must have a flat, smooth surface toward the lamp. The heat sink must be free of foreign matter, oils/grease, etc. This would otherwise impede heat dissipation from the lamp. The heat sink is to be selected according to the key corresponding to the required heat dissipation.

The Spotlight System has various keys on the lampholder side and on the lamp side. Details of the various keys can be found on the product data sheet.



4 Components for mechanical fixing

The following elements of the BJB /// OEM-Line modular system are for the fixing of components and represent a simple alternative to adhesive or screw fixing.

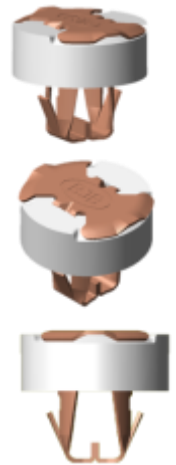
4.1 Push-to-Fix [P2F] – 28.901

Push-to-Fix [P2F] fixing elements for installation in luminaire housings 28.901.Uxxx.10

Full details of the various versions available for different package thicknesses, as well as the respective colour coding and required hole diameters, can be found on the product data sheet.

4.1.1 Advantages to customers

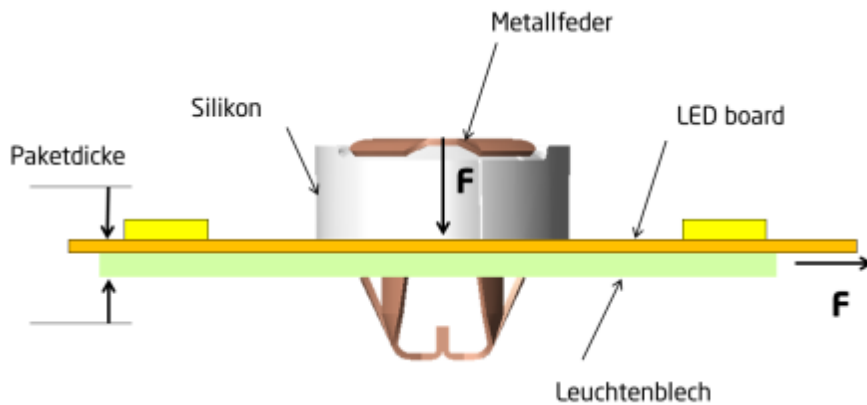
- Quick and easy installation (by hand)
- Torque screwdriver system is not required
- Quick, secure installation using (manual) setting device
- six package thicknesses (snap-in thickness range consisting of LED board, mounting plate and possibly additional components) with different colours of silicone ring for easy differentiation
- Form-fitting snap-in connection
- Only **one** component for attachment
- Electrically insulating connection to PCB
- Shock and vibration resistant
- Permanent pressure by means of elastic silicone + metal spring
- Floating method of connection => compensates tolerances and thermal length variations
- Positive fit of tool bit prevents slipping



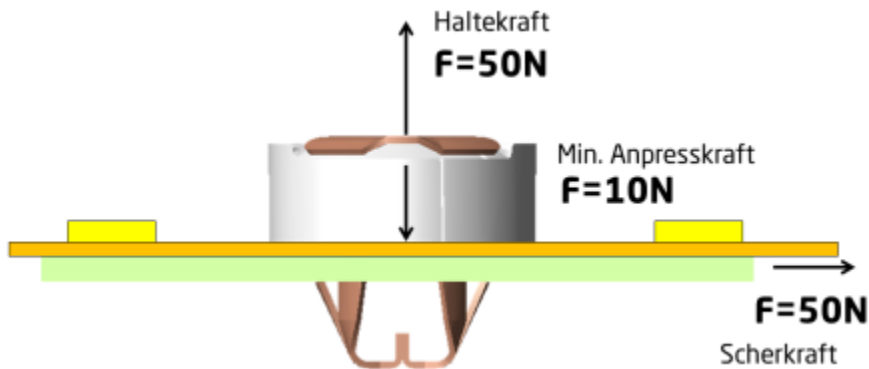
4.1.2 Important information

- The P2F cannot be reused after disassembly.
- We recommend using the P2F only with completely closed holes.
- These components should not be stored in airtight packaging (e.g. foil).

4.1.3 Mode of operation



Forces:



Simple push-in method of fixing. The silicone ring provides an even contact pressure. The mode of operation of the Push-to-Fix (P2F) permits thermal expansion of the PCB.

Characteristics

- Reliable heat dissipation due to permanent, consistent contact pressure
- Compensation of thermal expansion of PCBs through use of CrNi/silicone material combination
- Can be installed manually – with or without an auxiliary tool
- Avoids damage to PCBs (as would be possible in case of incorrect use of screws)

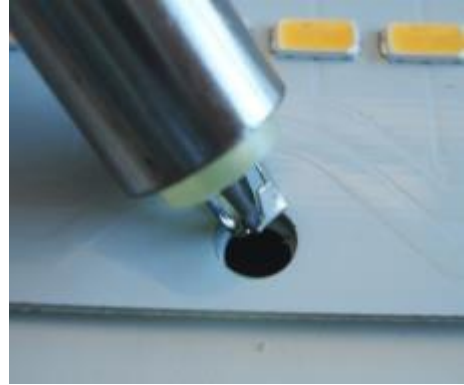
4.1.4 Installation (manually or with installation tool)

The P2F can be inserted manually – without installation tool (photo sequence on left) or with installation tool (photo sequence on right).

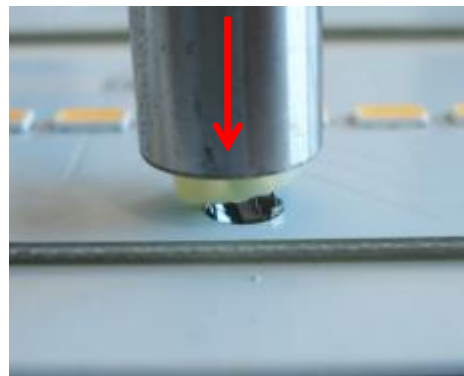
- Positioning of the mounting plate and LED board by hand



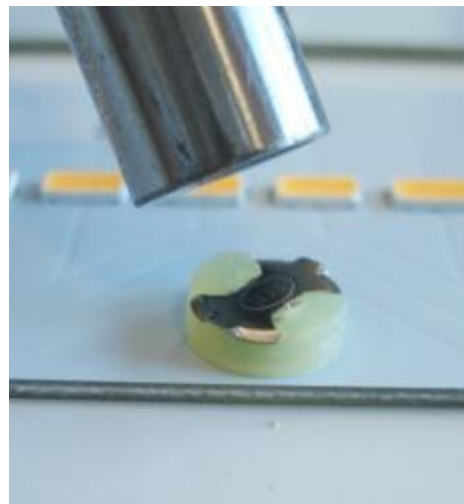
with installation tool



- The P2F is inserted directly into the fixing holes provided and snapped in simply by pressing*.

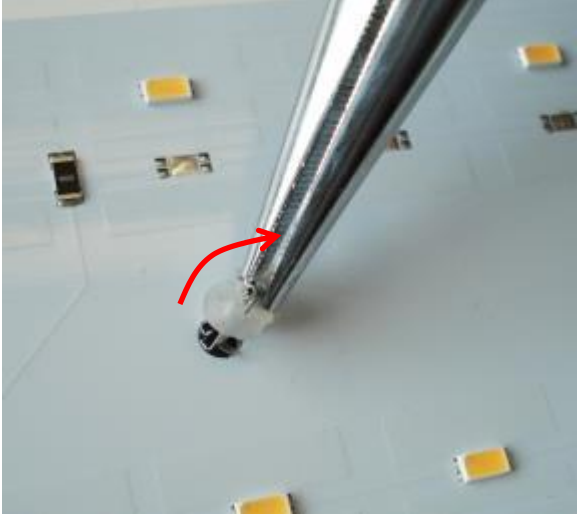
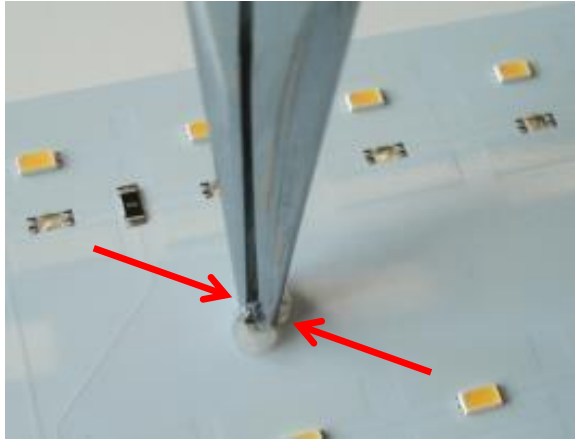
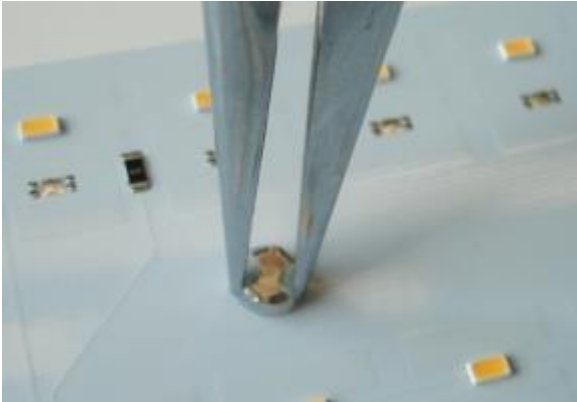


- The circuit board and mounting plate are then perfectly connected.



4.1.5 Removal

- Using long-nosed pliers, compress the P2F in the mid-section and pull out



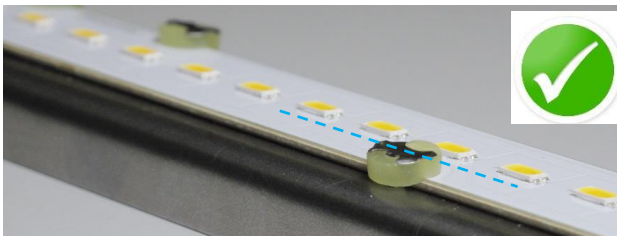
4.1.6 P2F – installation in open fixing holes



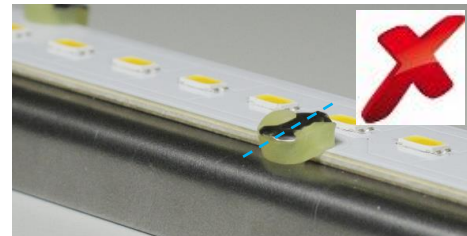
Example - 20 mm-wide LED module with open fixing hole

The heat dissipation function has been proven to work in this installation situation. The following points should be noted, however:

- The open form of the fixing holes means that conditions for the silicone ring are less favourable than would be the case with closed holes
- Due to the open form of the fixing holes, the silicone ring does not lie completely on the surface of the board. This results in a reduced build-up of force compared to closed holes. The maximum possible build-up of force is achieved when used with closed fixing holes.
- To achieve the best possible transmission of force, the metal part of the P2F should be aligned horizontally (see illustration). This should be done before the installation process and not by rotating the component once it has been installed.



Horizontal alignment



Vertical alignment

- We DO NOT recommend the type of fixing in this installation situation for high-power LEDs, e.g. COB-LEDs. For fixing high-power LEDs and COBs, we recommend using special versions of the P2F.

5 Electrical contact

The following components provide electrical contact.

In general, depending on the version, BJB LED modules are equipped with the one-pole or two-pole BJB standard or push-through SMD terminal block and have an interface for B2C or B2B.

Exception: Modules with a width of 24mm – Due to the limited space available, this interface is not possible here.

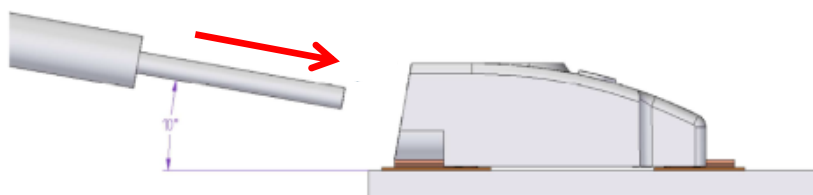
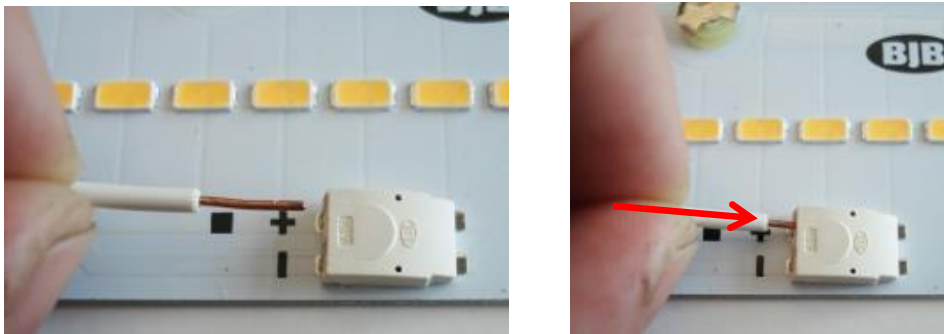
5.1 BJB SMD terminal block – 46.101 / 46.102

- SMD PCB terminal block 1-pole 46.101
- SMD PCB terminal block 2-pole 46.102



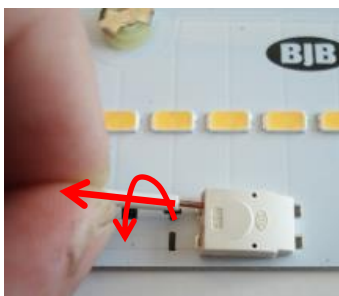
5.1.1 Attachment (insertion of conductor)

- Insertion of conductor at an angle of 0° to 10°, insulation strip length 8.0 mm + 1.0 mm



5.1.2 Removal (release of conductor)

- Conductor can be released without tools by simultaneously twisting and pulling the wire.



All technical data can be found on the relevant product data sheet.

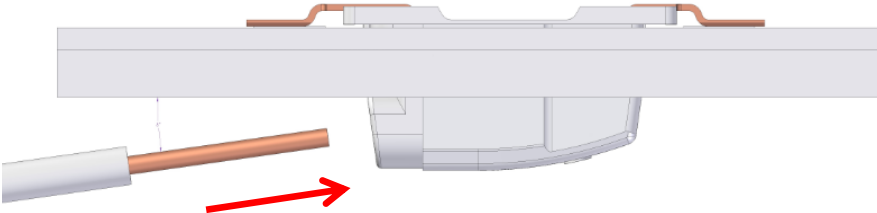
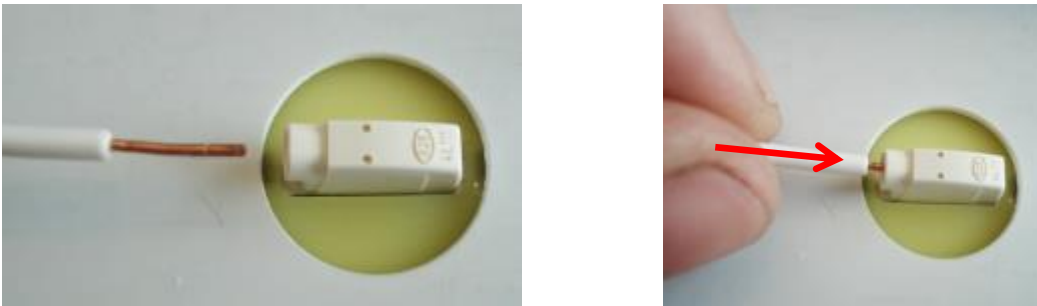
5.2 BJB SMD terminal block for wiring below the PCB – 46.111 / 46.112

- SMD PCB terminal block for wiring below the PCB 1-pole 46.111
- SMD PCB terminal block for wiring below the PCB 2-pole 46.112



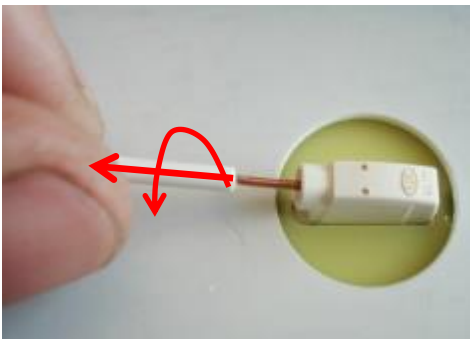
5.2.1 Attachment (insertion of conductor)

- Insertion of conductor at an angle of 0° to 10°, insulation strip length 8.0 mm + 1.0 mm. The wire insulation must be inserted into the terminal block housing.



5.2.2 Removal (release of conductor)

- Conductor can be released without tools by simultaneously twisting and pulling the wire.



All technical data as well as details of the footprint and cut-out can be found on the appropriate product data sheet.

5.3 Board-to-Cable [B2C] and Board-to-Board [B2B] – 47.312 / 47.351 / 47.352

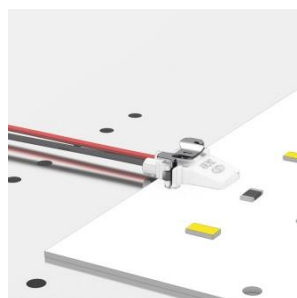
The B2C feeder and the B2B connector provide the electrical connection and mechanical fixing in their local area of application.

- B2C feeder for LED modules 47.312
- B2B connectors for LED modules in series connection 47.351
- B2B connectors for LED modules in parallel connection 47.352

Important:

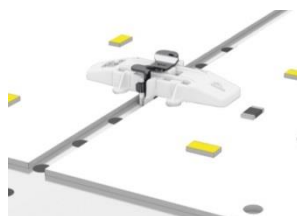
In conjunction with metal core boards, the permissible voltage range is reduced to 50V. This is due to the clearance and creepage distances which have to be complied with according to the standard requirements.

B2C - 47.312



B2B - 47.351

for series connection
(component marking 'S')



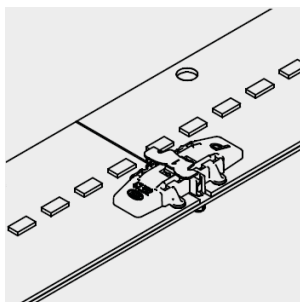
B2B - 47.352

for parallel connection
(component marking 'P')



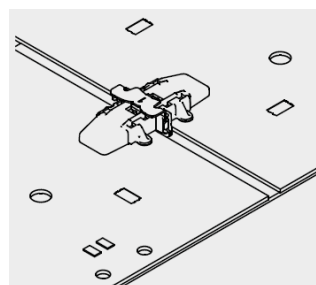
When using the B2C and B2B, the PCBs are required to have compatible hole patterns and contact geometry. More precisely, we differentiate between two footprints.

(1) Seamless connection of LED modules



Example: Linear modules 31.130.

(2) Gapped connection of LED modules



Example: Square modules 31.110.

Precise details can be found on the respective product data sheets. The BJB LED modules of product groups 31.110. and 31.130. meet the appropriate geometrical requirements.

5.3.1 Important information

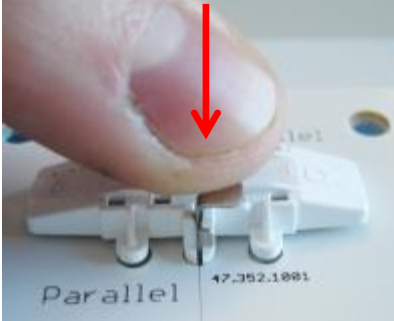
- When installed, the guide pins of the B2B and B2C protrude from the rear side of the metal plate of the luminaire housing. It is important to ensure that they are free to do so.
- When using B2B and B2C, fixing with P2F is recommended. If another method of fixing is used, it should be a "floating" method of attachment to compensate for the linear expansion of the LED modules.
- We recommend that the B2B should not be attached last. Preliminary fixing of the LED module should be carried out first, then the B2B can be put in place and finally the LED module can be attached completely.
- When using B2B and B2C, it is important to ensure that the luminaire body is level.
- The holding clips must snap into place on both sides.
- Use with plastic luminaire bodies is not recommended.
- If released in the correct manner, the B2B and B2C can be reused.

5.3.2 Installation (manually or with installation tool)

(1) Position B2C or B2B



(2) Press metal clip down



(3) The PCB and the mounting plate are now perfectly connected and the electrical contact has been provided.



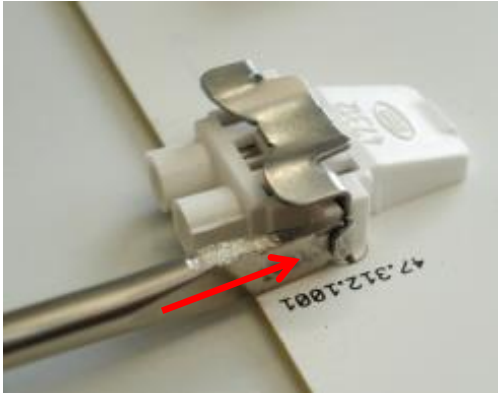
5.3.3 Removal

- Using a screwdriver, the metal clip of the B2C or B2B can be carefully released on the right and left sides
- Alternatively, the hooks on the underside of the mounting plate can be carefully pushed apart

(1)



(2)



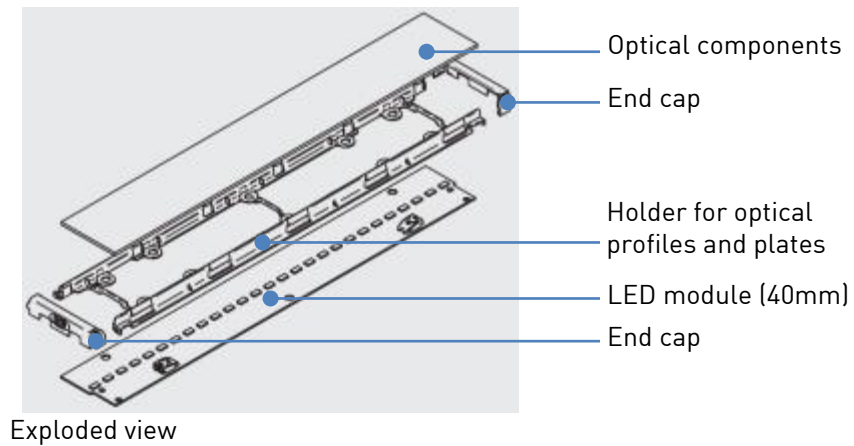
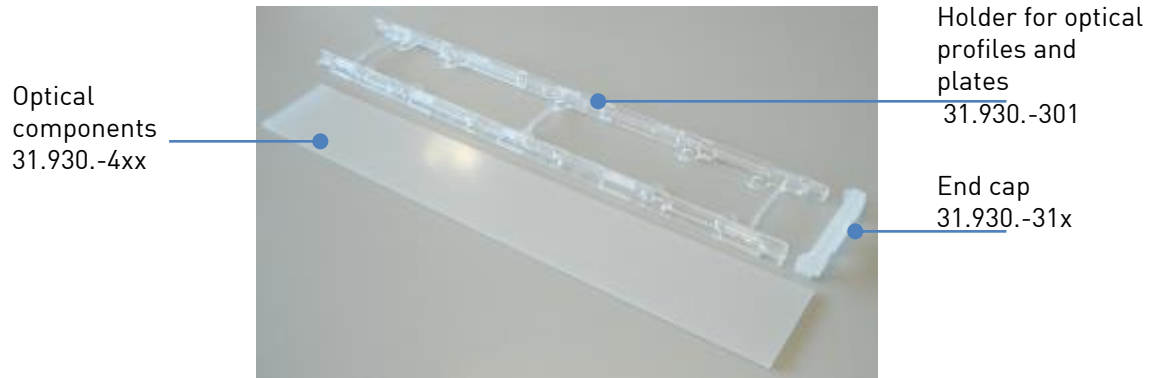
(3)



(4)



6 Accessories for linear BJB LED modules



6.1 Holder for optical profiles and plates – 31.930.-3xx

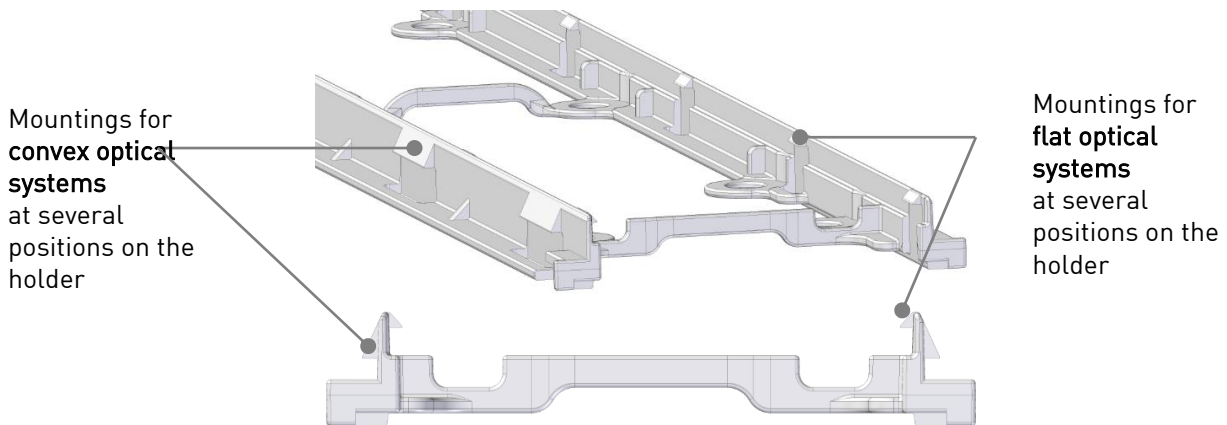
- Holder for optical profiles and plates 31.930.-3xx

A holder for optical profiles and plates is offered for the linear, 40mm-wide BJB LED modules. This allows secondary optics to be integrated easily. Diffusers or optics can be mounted quickly and easily by pushing them into or clipping them onto the fixing brackets provided.

The hole pattern of the holder for optical profiles and plates is compatible with LED boards in accordance with Zhaga Book 7. The hole pattern is also mirror-symmetrical, ensuring easy handling during luminaire production.

6.1.1 Advantages to customers

- Easy integration of optical components
- Two defined interfaces for attaching lenses, diffusors and covers
- internal: mounting for cover plates (2 mm)
- external: mounting for profiles



- Accidental contact protection provided by the plastic frame round the outer edge in combination with specified selectable optical components
- Avoidance of stray light by means of optic frame and optional end caps

Other advantages:

- Optic frame can be installed using P2F (screw fixing optional)
- Pre-assembly of component groups possible
 - P2F + optic frame
 - P2F + optic frame + PCB
- Arrangement of several optic frames in sequence possible
- Use of B2C / B2B possible (only when using convex profile covers)
- Easy mounting of lenses/diffusors/covers by snap-in or slide-in attachment

6.1.2 Important information

- The holder for optical profiles and plates may be slightly distorted due to the production process. In general, this is remedied by correct installation and does not have any negative effect on the function of the component.
- The holder for optical profiles and plates has fixing holes for use with PCBs in accordance with Zhaga Book 7 (Indoor LLE-L28W4, LLE-L56W4). However, we recommend using (at least two) additional fixing points (a total of ten are possible) to ensure sufficient mechanical stability and a secure hold for lenses. The number of fixing points should be adjusted to requirements.
- The holder for optical profiles and plates can be used in combination with other components (lenses, end caps) as a protective measure against electric shock. For this purpose, we recommend fixing by means of at least six screw points (the middle and the two outer holes on each side) in order to avoid unwanted lifting due to external forces.
- **Note:** Protection against electric shock is the sole responsibility of the luminaire manufacturer and should be tested when the components are installed in the luminaire in the appropriate manner.
- BJB assumes no liability for this function.

- We recommend using the holder for optical profiles and plates exclusively in combination with original BJB components (LED boards, lenses, end caps, etc.) as these are optimally suited for use together. We assume no liability if components from other manufacturers are used.
- We recommend using P2F fixing elements to install the holder for optical profiles and plates. If screws are used, the torsion induced by the screw head may cause distortion in the component.
- When calculating the package thickness for the P2F element to be used, a material thickness of 1 mm is to be assumed for the holder for optical profiles and plates.
- The cross-members may cause shadowing. To minimise the effect of shadowing, we recommend using the transparent holder for optical profiles and plates.
- SMD components, such as LEDs, which may be located directly beneath the cross-members, must be no higher than 2 mm.
- If possible, the LED board used should be 1 mm thick - definitely no thinner – as it is otherwise not possible to ensure a secure fixing in combination with the holder for optical profiles and plates.

6.2 End caps for optical profile holder – 31.930.-3xx

Depending on the optical component to be used, there is a choice of two different end caps for the optic frame.

For convex optical components 31.930.-311



For flat optical components 31.930.-312



In addition to design considerations, the end caps can also help to provide protection against electric shock in conjunction with the luminaire design.

6.2.1 Important information

- **Note:** Protection against electric shock is the sole responsibility of the luminaire manufacturer and should be tested when the components are installed in the luminaire in the appropriate manner. BJB assumes no liability for this function.
- The use of end caps reduces soiling of the LED modules as a result of penetration by dust and other foreign bodies.
- When using end caps, care should be taken that the optical component used has enough space for expansion in the axial direction. Otherwise the end caps may come loose.
- When determining the length of the optical component, it is important to allow clearance for the anticipated thermal expansion of the materials. As a rule, the edges of the end caps provide enough overlap to bridge the resultant gap.

6.3 Optical components – 31.930.-4xx

- 31.930.-4xx

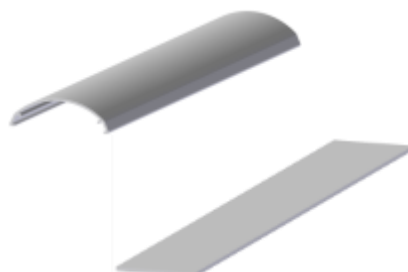
In addition to the holder for optical profiles and plates, a selection of optical components are available.

There are two different structural designs:

- convex for external snap-on fixing
- flat for internal snap-in fixing

again with various structures:

- PMMA transparent (plate)
- PC frosted (plate)
- PMMA frosted (profile)
- PMMA LinearPRISM, lengthwise (plate)
- PMMA LinearPRISM, crosswise (plate)
- PMMA DiamondPRISM (plate)

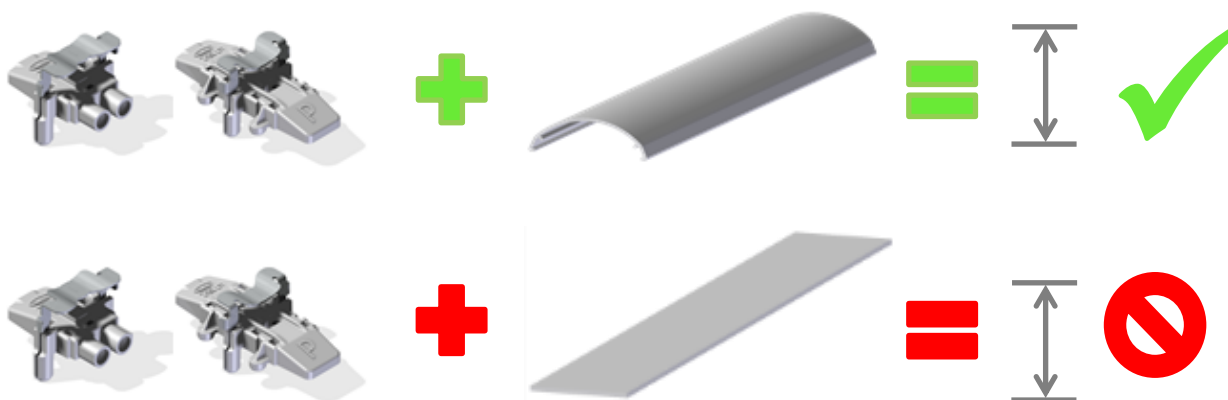


Important: To ensure the correct function of the 'Prism' optical components, the structured side of the plates must face outwards, i.e. away from the LED.

The relevant information can be found on the product data sheets.

6.3.1 Important information

- When using the B2B or B2C, only the convex optical profile can be used due to the overall height requirement.



- The luminaire manufacturer is responsible for the correct and appropriate selection of components required for the final application.
- **Note:** Not all optical components on offer pass the impact test (spring hammer) required for protection against electric shock according to EN 60598. Special solutions using more impact-resistant materials (e.g. polycarbonate) can be offered on request. Contact us if you require more detailed information.
- When determining the length of the optical component, it is important to allow adequate space in the luminaire for the anticipated thermal expansion of the material.

7 Ordering information and sources of supply

All relevant information regarding ordering information and sources of supply can be found on the BJB website at www.bjb.com or in the BJB catalogue.

8 BJB worldwide

Contacts at BJB and details of our representatives worldwide can be found at www.bjb.com

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