Series 3B
Photoelectric Sensors and Light Scanners
Sensor solutions for nearly any application –
Series 3B.

Compact, versatile, user-friendly, robust.

Series 3B from Leuze electronic offers a range of unique features and the largest variety of functions in this performance class of all competitors on the market.

In addition to large operating ranges and improved performance reserves for reliable object detection, even in dusty environments or with high alignment tolerances, technologies such as Active Ambient Light Suppression (A²LS) or "brightVision®" for easy handling and fast commissioning or device models with homogenous pin-point light spot are characteristic of Series 3B.

The diverse range of models make these sensors ideal for a wide variety of applications, for example in mounting and handling technologies, in the conveyance of extremely small containers as well as in printing and packaging technologies.
The most important **advantages** at a glance.

**User friendly**
- 360° visibility of the indicator diodes
- Simple, one-point teaching
- Robust teach button, can be operated manually or using a tool
- Teach devices also with line teaching
- Protection against manipulation by means of a lockable button

**Reliable**
- Maximum performance reserve
- High extraneous light protection through A^2LS
- Energy savings through lower power consumption
- Protection classes IP 67

**Versatile**
- The following functions are available:
  - Retro-reflective photoelectric sensor and light scanner for all standard applications
  - Light scanner with special light-spot profiles (rectangular, small) and background suppression
  - Light scanner with V-optics and background suppression
  - Sensors with autocollimation principle
  - Retro-reflective photoelectric sensors and light scanners with laser light and collimated light beam propagation
  - Energetic light scanner also with fading (background suppression)
  - Throughbeam photoelectric sensors with small light beam propagation and a high range

**Robust**
- Integrated attachment sleeve made of metal to protect against housing breakage
- M8 metal plug
- Reinforced in the connection area

**Flexible**
- Push-pull outputs for NPN or PNP controls
- All common connections:
  - M8 connector
  - 2000 mm cable
  - Cable with M8 or M12 connector
- Slot for flexible mounting
Throughbeam photoelectric sensors

For **reliable** object detection **independent** of the environmental conditions.

<table>
<thead>
<tr>
<th>LSR 3B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range limit</td>
<td>0 – 10 m</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>Large operating range</td>
</tr>
</tbody>
</table>

- High performance reserve
- Transmitter with small, homogeneous light spot by means of pin-point LED
- Transmitter optionally with activation input
- Receiver optionally with warning output
- Warning output for increased availability

Projection monitoring
Retro-reflective photoelectric sensors

• High performance reserve
• Reliable object detection with small, misadjusted reflectors, large operating range or heavy soiling

<table>
<thead>
<tr>
<th>PRK 3B/66</th>
<th>PRK 3B/66.1</th>
<th>PRK 3B/6.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range limit</td>
<td>0.02 – 6 m</td>
<td>0.02 – 6 m</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
<td></td>
</tr>
<tr>
<td>Functions</td>
<td>Standard</td>
<td>with adjustment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRK 3B/6.22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range limit</td>
</tr>
<tr>
<td>Switching frequency</td>
</tr>
<tr>
<td>Functions</td>
</tr>
</tbody>
</table>

Reliable function with small, *misadjusted* reflectors and heavy *soiling*.

The specialist for *positioning tasks*.

- High performance reserve
- Especially designed for positioning with high accuracy
- Short range with foil reflectors
- Autocollimation principle for use at zero distance
- Easy adjustment via lockable teach button or teach input

Reliable object detection

Short range also with foil reflectors
Retro-reflective photoelectric sensors

The world’s **first laser autocollimator** in this size.

<table>
<thead>
<tr>
<th>PRKL 3B/22</th>
<th>PRK 3B/6.42</th>
<th>RKR 3B/6.42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range limit</td>
<td>0–3 m</td>
<td>0–3.5 m</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>2,000 Hz</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>dynamic teach-in</td>
<td>for bottles</td>
</tr>
</tbody>
</table>

- Reliable detection of objects with a diameter ≥ 0.1 mm
- Object detection through slits, holes and gaps with extremely small dimensions
- Especially designed for the detection of fast events and small parts

- Especially designed for the detection of transparent media such as glass, PET and foils thinner than 20 μm
- Easy adjustment via lockable teach button or teach input
- Particularly suited for highly transparent PET and glass bottles

**Trigger photoelectric sensor**

**Bottle detection**
Laser retro-reflective photoelectric sensor for bottles.

- Particularly suited for highly transparent PET and glass bottles
- For highly transparent full and empty bottles; foil > 20 µm
- Detection or counting of highly transparent objects – especially suited to small space between objects

Switching on glossy surfaces.

- Retro-reflective photoelectric sensor with un-polarized red light, making it especially suited to switching on a polished metal plate serving as a reflector
- RKR 3B/22D.01 and /44D.01: increased switching frequency for high precision
- RKR 3B/66.11: extra large light spot for high angle tolerance

<table>
<thead>
<tr>
<th>PRKL 3B.42</th>
<th>RKR 3B/22D.01</th>
<th>RKR 3B/44D.01</th>
<th>RKR 3B/66.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range limit</td>
<td>0 – 0.5 m</td>
<td>0.02 – 5 m</td>
<td>0.02 – 7 m</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>2,000 Hz</td>
<td>1,500 Hz</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>for bottles</td>
<td>increased switching frequency</td>
<td>extra large light spot</td>
</tr>
</tbody>
</table>

Detection of cap seals

Switching on metallic backgrounds
**Diffuse reflection scanners**

**energetic**

- Energetic diffuse reflection light scanner with scanning range adjustment
- High switching frequency for detection of fast events

*For use in standard applications with high ranges.*

<table>
<thead>
<tr>
<th>RTR 3B/66</th>
<th>RTR 3B/6.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning range limit</td>
<td>0–750 mm</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>Standard, Economy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RTFR 3B/66</th>
<th>RTFR 3B/6.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning range limit</td>
<td>0–450 mm</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>Standard, Economy</td>
</tr>
</tbody>
</table>

**Diffuse reflection scanners**

**with fading**

- Fading – no object detection in background
- Potentiometer for scanning range adjustment
- High switching frequency for detection of fast events

*For detection of objects on a transport system.*

**Detection (background suppression)**

<table>
<thead>
<tr>
<th>Object detection (free background)</th>
<th>Detection (background suppression)</th>
</tr>
</thead>
</table>

11 × 11 mm @ 200 mm; 27 × 27 mm @ 500 mm
Diffuse reflection light scanner with background suppression

- Very good bw/wb behavior and reliable switching nearly independent of the object and background properties
- Exact scanning range adjustment through 8-turn potentiometer
- Also available with infrared light (HRT 3B)

For use in standard applications.

<table>
<thead>
<tr>
<th></th>
<th>HRTR 3B/66</th>
<th>HRTR 3B/6.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning range limit</td>
<td>5–400 mm</td>
<td>5–200 mm</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>Standard</td>
<td>Economy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>HRTR 3B/66-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning range limit</td>
<td>5–200 mm</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>Small light spot</td>
</tr>
</tbody>
</table>

For demanding object detection.

- Small, homogeneous light spot by means of pin-point LED
- Very good background suppression
- Excellent black/white behaviour and reliable switching on glossy objects and objects with colored structure
- Exact scanning range adjustment through 8-turn potentiometer

Detection (background suppression)

Demanding object detection
Diffuse reflection light scanner with background suppression

For the **reliable detection** of objects with openings and holes.

- Especially designed for the detection of objects with openings, holes and grooves, e.g. circuit boards
- Also for transparent foil and bottles
- HRTR 3B-L: Especially designed for the use of fluorescent lights with HF-ballast

<table>
<thead>
<tr>
<th>Product</th>
<th>Scanning range limit</th>
<th>Switching frequency</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRTR 3B/66-XL</td>
<td>5 – 100 mm</td>
<td>1,000 Hz</td>
<td>extra large light spot</td>
</tr>
<tr>
<td>HRTR 3B/66-L</td>
<td></td>
<td>150 Hz</td>
<td>large light spot</td>
</tr>
</tbody>
</table>

Short response time for fast processes and highly precise detection of small parts.

- Especially designed for the detection of fast events and small parts
- For applications with high demands on positioning and reproducibility
- Standard design in laser class 1
- Extendable scanning area with very good bw/wb behavior in laser class 2

Object detection in wide light beam

Small part detection
For the detection of **glossy objects** with background suppression.

### Reliably detect contrasts in small housing.

<table>
<thead>
<tr>
<th>HRTR 3B/66-V</th>
<th>KH1W 3B</th>
<th>KRTM 3B</th>
<th>KRTL 3B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning range limit</td>
<td>15–200 mm</td>
<td>14.5 mm ±2 mm</td>
<td>14.5 mm ±2 mm</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
<td>6,000 Hz, 10,000 Hz</td>
<td>10,000 Hz</td>
</tr>
<tr>
<td>Functions</td>
<td>V scanner</td>
<td>White light</td>
<td>Multicolor</td>
</tr>
</tbody>
</table>

- With V-optics:
  - Especially designed for the detection of flat, reflective or highly glossy surfaces
  - Also for transparent objects

- KRTW 3B: contrast scanner with white light and YellowBoost, especially designed for detecting more than one contrast
- KRTM 3B: contrast scanner with RGB (red, green, blue) light, especially designed for detecting one contrast
- KRTL 3B: contrast scanner with laser-generated red light, especially designed for large scanning distances (40–80 mm)
- All devices optionally with IO-Link interface
Optoelectronic Sensors
Cubic Series
Cylindrical Sensors, Mini Sensors, Fibre Optic Amplifiers
Measuring Sensors
Special Sensors
Light Curtains
Forked Sensors
Double Sheet Monitoring, Splice Detection
Inductive Switches
Accessories

Identification Systems
Data Transmission Systems
Distance Measurement
Bar Code Readers
RF-IDent-Systems
Modular Interfacing Units
Industrial Image Processing Systems
Optical Data Transmission Systems
Optical Distance Measurement/Positioning
Mobile Code Readers

Safety Sensors
Safety Systems
Safety Services
Safety Laser Scanners
Safety Light Curtains
Transceivers and Multiple Light Beam Safety Devices
Single Light Beam Safety Devices
AS-i-Safety Product Range
Safety Sensor Technology for PROFIBUS DP
Safety Switches, Safety Locking Devices, Safety Command Devices
Safety Relays
Sensor Accessories and Signal Devices
Safety Engineering Software
Machine Safety Services