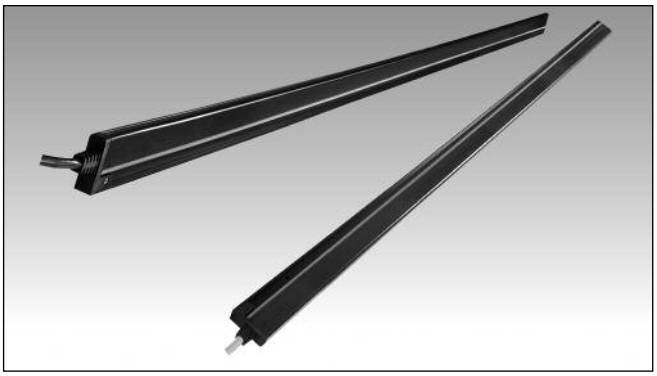
# Light Curtains
# Light Curtains for Lift
# Type BFL



- **Protective screen for lift doors generated by light curtains**
- **Height version 200 cm**
- **Diodes position on the edge of the profile**
- **Output type: static opto-mosfet (70 mA) for NPN/PNP and voltage free contact**
- **Output working mode: NO or NC (selectable)**
- **9.7 mm ultra slim PC-ABS plastic housing**
- **4 m range**
- **Light immunity > 100 kLux**
- **Automatic signal level adjustment**
- **High speed scanning**
- **LED indication for power supply ON and system status**
- **Dynamic mounting (directly on the lift sliding doors)**
- **Static mounting (on the fixed walls of the lift opening) by optional kit (BFLMOUNT)**
- **Timeout and blanking functions**
- **Flexible connecting cables**
- **According to EN 81-70 requirements**
- **IP65 versions BFLxxxE200I, IP54 versions BFLxxxE200**

## Product Description

The BFL series provides the protection of the lift car/passenger doors through a light curtain of infrared beams between the emitting and receiving units. Whenever a person or an object breaks at least one beam, the system is triggered causing the doors to re-open. In the same way, the BFL can be used for access openings in industrial production, in automatic stores for cargo monitoring and in many other applications.

The transmitting unit (TX) and the receiving unit (RX) are synchronized by the wire and are designed for dynamic and static mounting. The system is able to adjust the power of the signal depending on the distance between the two units, in order to minimise the power consumption and ensure maximum life-span of the components without any set up. No external control box is required.

## Ordering Key

**BFL 194 E 200 I**

**Function**
**Beams number**
**Diodes position**
**Height**
**Extended IP**

## Type Selection

| Height | Diodes number | Beams number (max.) | Protection degree | Output | Supply 10 to 30 VDC |
|---|---|---|---|---|---|
| 200 cm | 22 | 104 | IP65 | opto-mosfet | **BFL 104 E 200I** |
| 200 cm | 40 | 194 | IP65 | opto-mosfet | **BFL 194 E 200I** |
| 200 cm | 22 | 104 | IP54 | opto-mosfet | **BFL 104 E 200** |
| 200 cm | 40 | 194 | IP54 | opto-mosfet | **BFL 194 E 200** |

## Output Specifications

| | | |
|---|---|---|
| **Output** | (TX) | |
| Type | | NC static: opto-mosfet<br>NO configuration selectable by connecting the NONC black wire on RX to ground.<br>Voltage free contact |
| Load | | $V_{ON}$ 2.5 VAC/DC max 70 mA<br>$V_{max}$ 30 VDC<br>(27 VAC rectified) |

## Supply Specifications

| | |
|---|---|
| **Power supply** | Overvoltage cat. 1 (IEC 60664) |
| Rated operational voltage through brown and blue wires | 10 to 30 VDC<br>18 to 27 VAC rectified |
| **Rated operational current** | |
| TX | max. 50 mA |
| RX | max. 15 mA |

CARLO GAVAZZI

# General Specifications

| | |
|---|---|
| **Operating range** | 0 to 4 m |
| **Protected height** | 20.5 to 1846 mm |
| **Distance between the diodes** | |
| BFL194E | 46.8 mm |
| BFL104E | |
| Bottom 4 diodes | 46.8 mm |
| Top 18 diodes | 93.6 mm |
| **Beam pattern** | Self-adaptive, depending on the signal transmitting level |
| Typical values | |
| BFL104E | |
| < 70 cm: | 22 beams (1 beam/LED) |
| 70 to 140 cm: | 64 beams (3 beams/LED) |
| > 140 cm: | 104 beams (5 beams/LED) |
| BFL194E | |
| < 35 cm: | 40 beams (1 beam/LED) |
| 35 to 70 cm: | 118 beams (3 beams/LED) |
| > 70 cm: | 194 beams (5 beams/LED) |
| **Light immunity** | > 100 kLux |
| **Start-up time** | 300 ms @ 0 m<br>1800 ms @ 4 m |
| **Reaction time** | |
| BFL104E | 35 ms @ uniform illum. (L)<br>+ 5 ms if \|L-Lmax\| > 30 kLux |
| BFL194E | 50 ms @ uniform illum. (L)<br>+ 5 ms if \|L-Lmax\| > 30 kLux |
| Alarm OFF delay | 500 ms |
| **Angular mounting tolerance** | |
| Vertical | ± 3.5° (@ 3 m) |
| Horizontal | ± 3.0° (@ 3 m)<br>(see details in the Mounting Tolerance Diagrams) |
| **Linear mounting tolerance** | |
| Vertical | ± 4.0 mm (@ 0 m) |
| Horizontal | ± 2.0 mm (@ 0 m)<br>(see details in the Mounting Tolerance Diagrams) |
| **RX-TX synchronisation** | By wire |
| **Transmitting signal power level** | Self-adaptive, depending on the distance between TX and RX |
| **Connecting cable** | 5 x 24AWG, PVC, not shielded |
| Length | 4 m |
| Diameter | 5.2 mm |
| **Timeout function** | Enabled connecting the TOBK white wire on RX to GND<br>Function activation time after diode(s) obstruction 10 s ± 2 s |
| **Blanking function** | Teach-in at power supply on, after connecting the TOBK white wire on RX to VDC |
| **Distance between bottom beam and bottom of housing** | 13.7 mm |
| **Distance between top beam and bottom of housing** | 1838.7 mm |
| **LEDs indication** | |
| TX | 1 red, 1 yellow |
| RX | 1 red, 1 yellow<br>(see details in the LEDs indication tables) |
| **LEDs position indication** | Approx. 10 cm from the top of the housing |
| **Environment** | (EN 60529) |
| Degree of protection | |
| BFLxxxE200I | IP 65 |
| BFLxxxE200 | IP 54 |
| Pollution degree | 3 |
| Operating temperature | -5 to +55°C, R.H. < 95% |
| Storage temperature | -20 to +65°C, R.H. < 95% |
| **Housing** (TX, RX) | |
| Dimensions (W,H,L) | 30 x 2001 x 9.7 mm |
| Material | Plastic (PC-ABS) |
| **Weight** (TX, RX) | Approx. 1 Kg |
| **Mounting** | |
| Dynamic | Standard mounting |
| Static | Optional mounting by the BFLMOUNT kit: BFLMOUNT200 |
| **Approvals** | UL, CSA |
| **CE Marking** | Yes |
| **EMC** | Electromagnetic Compatibility |
| Immunity | According to EN 12016 |
| Emission | According to EN 12015 |
| **According to** | Protective height stated in EN 81-70 norm |

CARLO GAVAZZI

## LEDs Indication

| TX LED | Status | Description |
|---|---|---|
| L1 (red) | ON<br><br>OFF<br>Flashing | • Power supply ON/ Transmitter operating<br>• Unit not supplied<br>• Wrong TX-RX transmission |
| L2 (yellow) | OFF<br>ON | • Blanking function not enabled<br>• Blanking function enabled |

| RX LEDs | Status | Description |
|---|---|---|
| L1 (red) | ON<br><br>OFF<br>Flashing | • Power supply ON/ Receiver operating<br>• Unit not supplied<br>• Alarm condition |
| L2 (yellow) | OFF<br>ON<br>Flashing | • Timeout function not enabled<br>• Timeout function enabled<br>• Timeout function enabled and at least 1 diode excluded |

## Function Setting

If the NONC (black) wire is not connected, the BFL is in NC output configuration.
Select the NO output function by connecting the NONC wire on RX to ground.
If the TOBK (white) wire on RX is not connected, both Timeout and Blanking function are not enabled.
Select the Timeout function by connecting the TOBK wire to GND.
Select the Blanking function by connecting the TOBK wire to VDC.

## Mode of Operation

Provided with a height of 200 cm, the BFL series ensures a beam pattern produced by infrared diodes. Depending on the distance between the transmitter (TX) and the receiver (RX) or, in general, depending on the signal transmitting level, each diode produces 1 direct beam, 3 or 5 beams.
The BFL can be connected directly to the lift-controller if it can provide 10 to 30 DC voltage. Otherwise, we recommend to use a suitable power supply unit.

At power on, in NC (NO) output function the TX output is kept closed (open) for 100 ms and then open (closed) for 500 ms before starting the scanning of the beams. If the synchronisation between TX and RX fails, the system repeates this cycle.
If one or more beams get obstructed, the NC (NO) output on the TX operates.
Once the obstacle is removed, the output re-closes (re-opens) after 500 ms.

**Timeout function.**

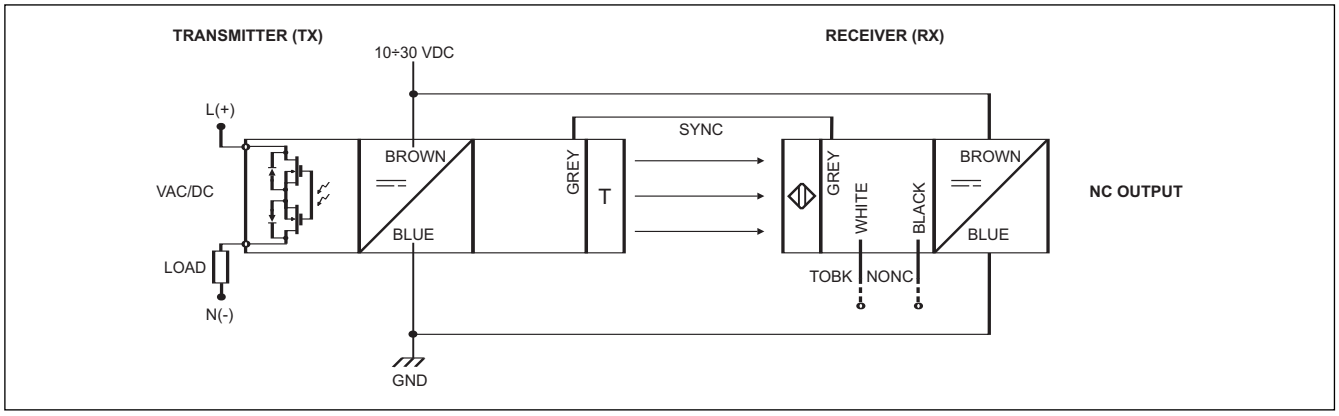
The function is enabled by connecting the TOBK white wire on RX to GND at start up (before supplying the light curtain). This feature allows up to 5 non-adjacent diodes to be ignored in case they are obstructed for more than 10 seconds, in order to enable detectors defaced by vandalism to continue working until arrangements or replacements.

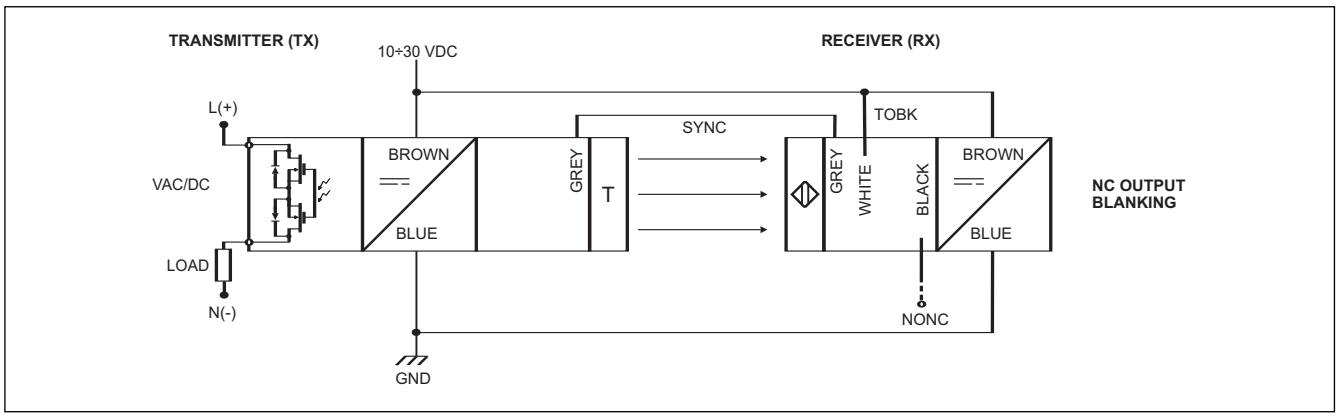
**Blanking function.**

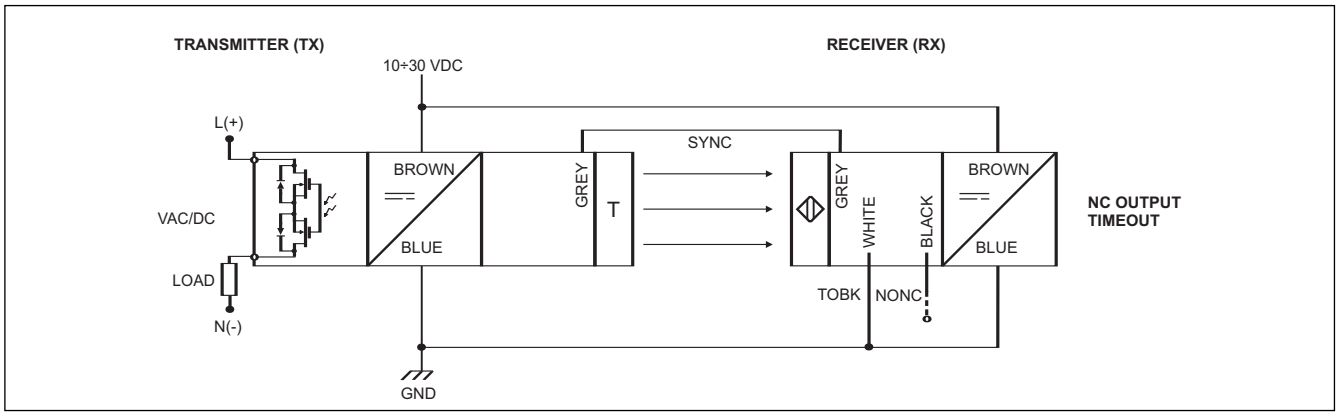
This function allows to inhibit parts of the light curtain beam pattern.
By connecting to VDC the TOBK wire on RX before supplying BFL, the system permanently saves the configuration (15 seconds of teaching-in are needed). To reset the pattern, it is necessary to disconnect the wire.

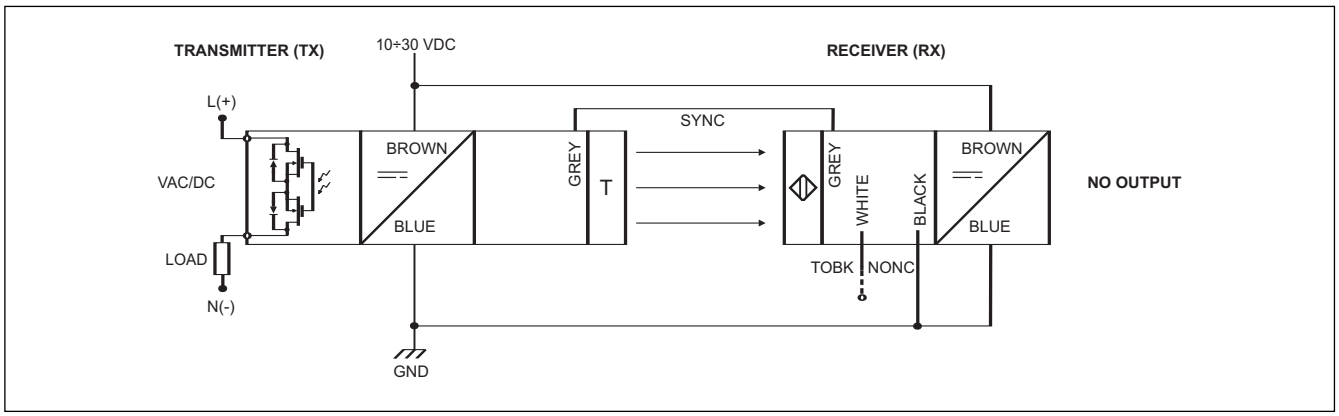
CARLO GAVAZZI

## Wiring Diagrams

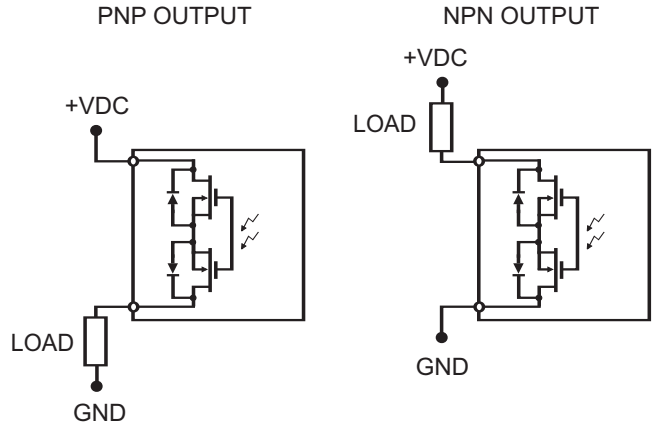


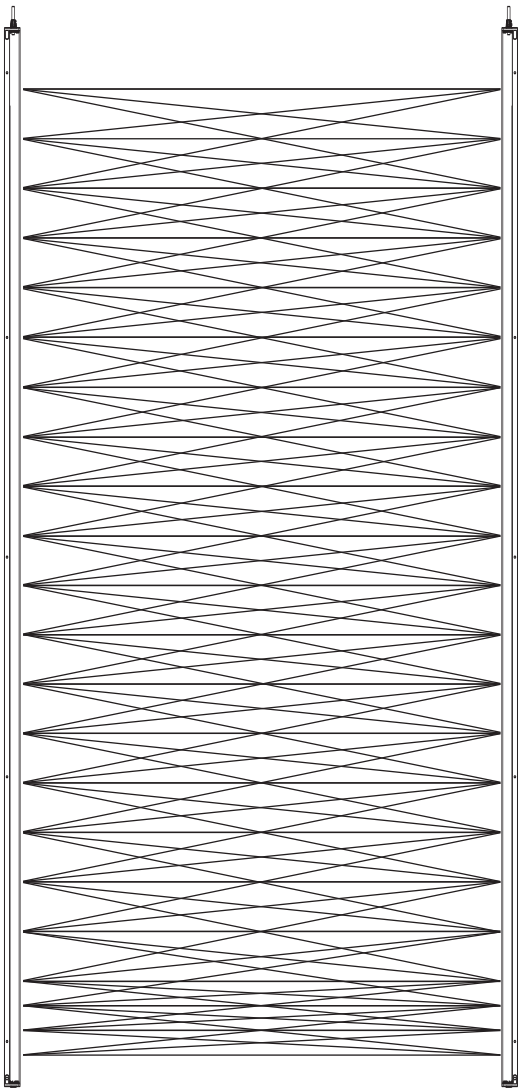
## Wiring Diagrams (cont.)



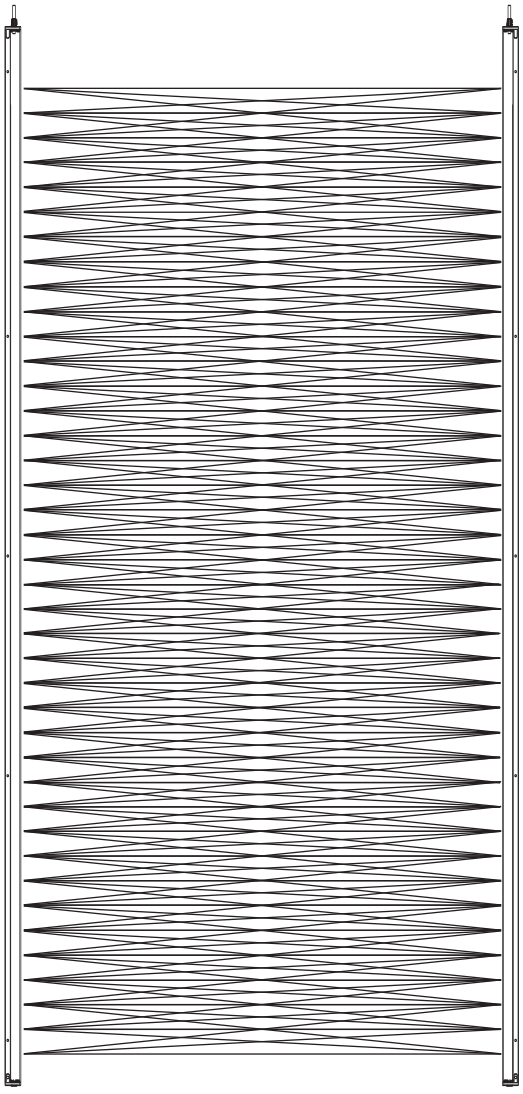

The connection to VDC and GND is not depending on the cable color sequence (black or white).

## Beam Pattern

**BFL104E200x**



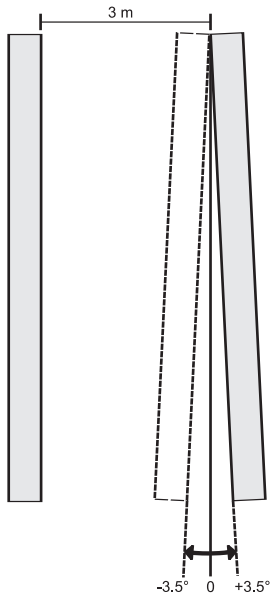
**BFL194E200x**



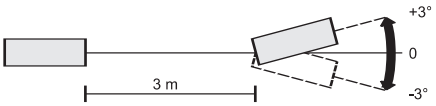
## Mounting Tolerance Diagrams

**Angular mounting tolerance**

**Vertical**

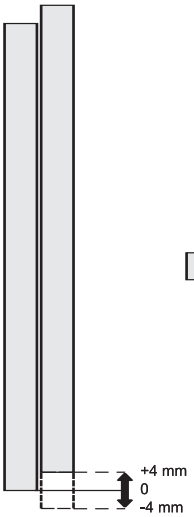



**Horizontal**



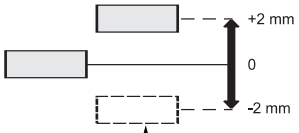

**Linear mounting tolerance**

**Vertical**




| Linear mounting tolerance (vertical) | |
|---|---|
| *Distance (TX-RX)* | *Max displacement* |
| 0 m | ± 0.4 cm |
| 1 m | ± 3.5 cm |
| 2 m | ± 7.0 cm |
| 3 m | ± 10.5 cm |
| 4 m | ± 14.0 cm |

**Horizontal**




| Linear mounting tolerance (horizontal) | |
|---|---|
| *Distance (TX-RX)* | *Max displacement* |
| 0 m | ± 0.2 cm |
| 1 m | ± 3.0 cm |
| 2 m | ± 6.0 cm |
| 3 m | ± 9.0 cm |
| 4 m | ± 12.0 cm |

## Dimensions