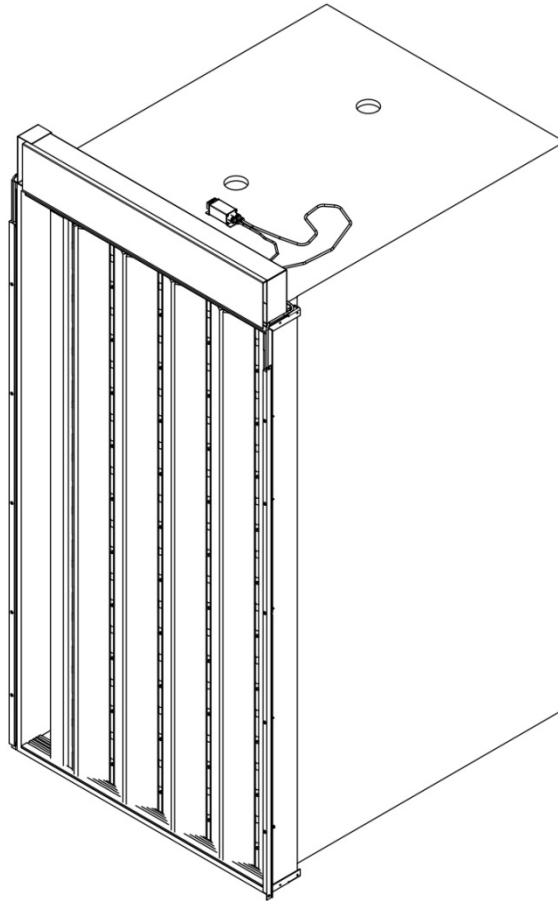




**ROCKY MOUNTAIN
ELEVATOR PRODUCTS**
LIVE LIFE ELEVATED

RMEP LIGHT CURTAINS

Weco 957Q and Caro Gavazzi BFL194



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CAUTION: This installation does not in any way negate, supersede, or otherwise bypass the .75" X 3" rule. This is a supplemental safety item intended to address the possibility of injury in a home elevator that meets code.

Rule 5.3.1.7.2 of the Safety Code for Elevators and Escalators Part 5.3 Private Residence Elevator Code states:

Clearance between hoistway doors and landing sill. The distance between the hoistway face of the hoistway doors and the hoistway edge of the landing sill shall not exceed 19mm (0.75in).

This unit is designed to interrupt the GC circuit and prevent the elevator from operating while there is an obstruction blocking the light curtain. Inserting this circuit into a main safety chain (MSC) will cause the unit to require a reset every time the beams are broken.

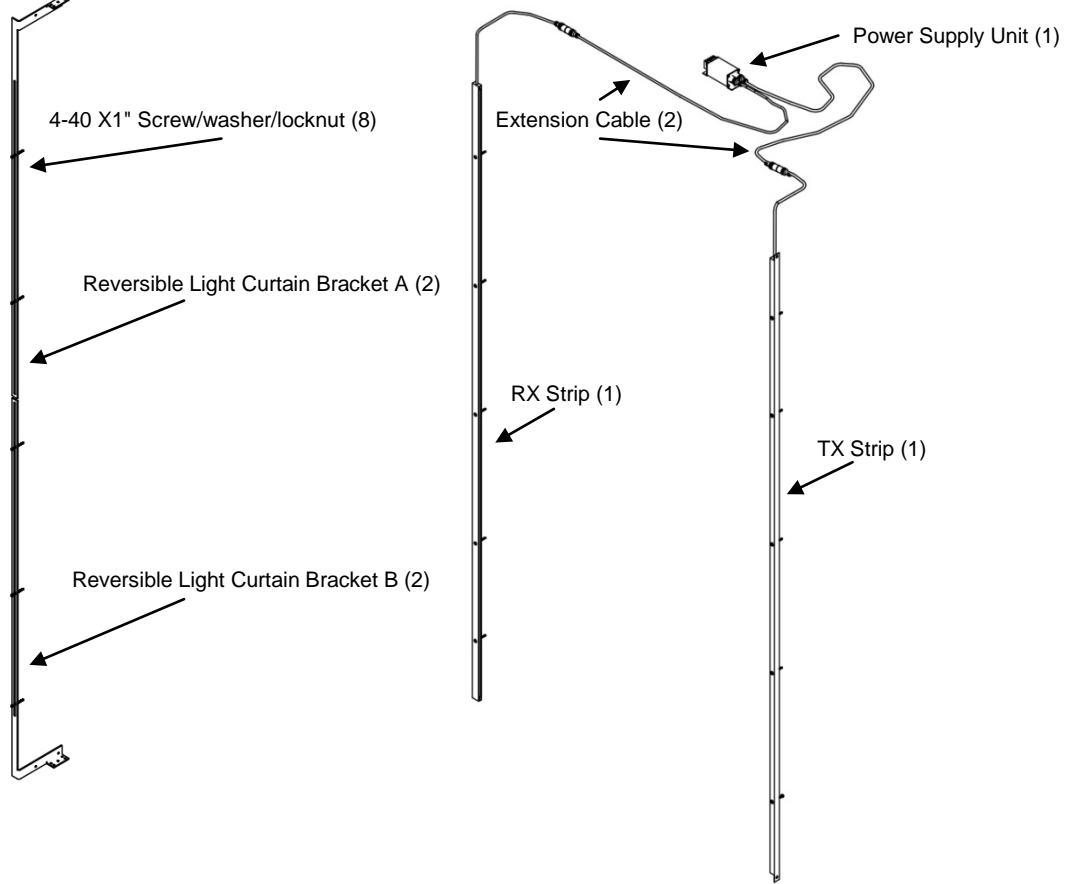
TOOLS

- Phillips screwdriver
- Small flathead "tweezer" 'electronics screwdriver' for electrical connections
- 1/4" box wrench
- Wire strippers
- Basic hand tools for working on elevators
- 18ga wire and crimps

WECO 957Q RETROFIT

PARTS IDENTIFICATION

Figure 1 Also see Appendix A



Installation

See Appendix A for manufacture recommendations.

Preparation

Start by ensuring that there is enough room in the running clearance to install the light curtains, as they will protrude past the front of the cab by 7/8" (0.875"). See Figure 2. Run the cab to each floor and inspect the running clearance taking in consideration of any trim or door casings that may extend into the hoistway.

If needed, remove or trim the door trim in the hoistway or any other objects to obtain the running clearance needed.

Remove the Weco Light Curtains from the packaging and verify that the RX, TX, extensions cables, and control box, are present. Check to see that all the mounting brackets are also present in the kit apart from the Weco shipping tube. (2 of each type, for 4 total).

Run the cab in-between the first and second floor so that there is access to both the top and bottom of the cab. Secure the power to the elevator, and place safety jacks to prevent the car from lowering.

Measure the distance from the bottom of the cab to the top of the sill. This will be measurement 'A'. See Figure 3.

Attach a bracket to the lower part of a light curtain bar (either the RX or TX) with the 4-40 1-1/2" screws, washer, and nuts. Set the distance from the face of the bracket that attaches to the bottom of the cab to the bottom of the light curtain bar to the same distance as measurement 'A'. Tighten the 4-40 screws and nuts on the assembly.

Repeat the prior attachment and measurement procedure with the other light curtain bar and opposite light curtain bracket.

Figure 2

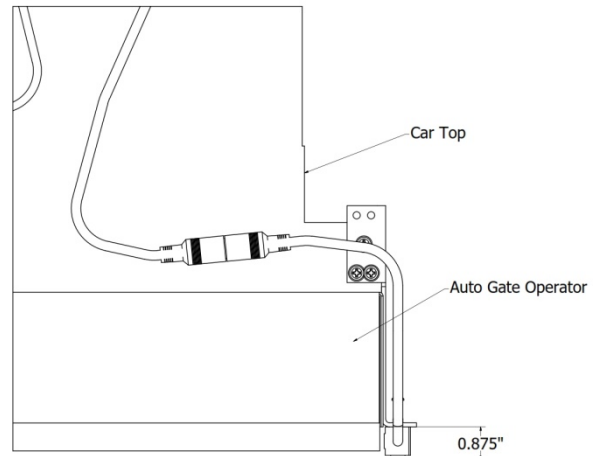
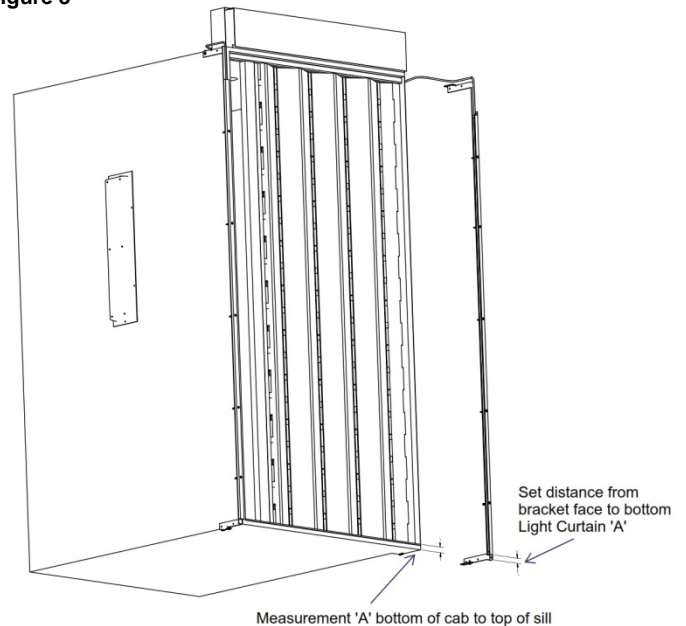


Figure 3



Measurement 'A': _____

Measure the distance from the top of the cab to the bottom. This will be measurement 'B'. **See figure 4.** This will be the distance that the brackets are set to with final assembly of the light curtain brackets.

Figure 4

Attach the remaining two brackets to the upper part of the light curtain bars paying rough attention to the distance ('B') between the faces of the brackets that attach to the cab. After the brackets are loosely attached, set the distance between the faces to the distance 'B' measured. Then tighten the 4-40 screws and recheck the measurement.

Installation on cab

From the roof of the cab, drop the lower part of the assembly between the cab and the hoistway wall. Set the upper bracket into place on the roof, and position the light curtains trailing edge flush with the front of the cab, so that it has a clear line of sight across the cab, but does not protrude any further than necessary. Drive a 1/2" long screw through the bracket into the roof, securing the upper bracket in place.

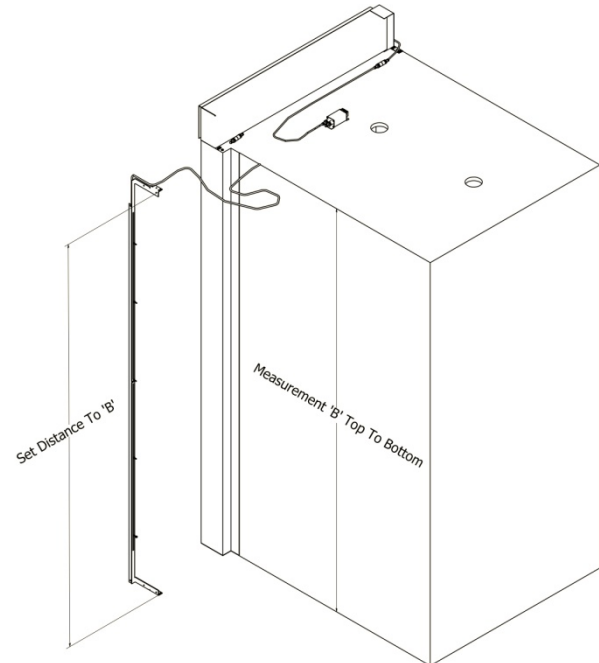
From under the cab, verify that the lower face of the bracket will mount flush to the bottom of the cab and verify that the position of the light curtains trailing edge is flush with front of the cab.

If the bracket is not flush with the bottom of the cab, remove the top screw from the upper bracket, pull the unit out and adjust the distance 'B', reinstall the unit and verify the fit.

Once the fit is correct, secure the upper and lower brackets with the provided screws by securing the brackets into the roof and base.

Repeat the prior steps for the opposite side light curtain.

Secure the pigtail connectors to the brackets close to the roof of the cab with zip ties so that you have access to them, and they are not interfering with the function of the elevator or gate operator if there is one.



Measurement 'B' : _____

WARNING!

This installation requires access to the top and bottom of the elevator car. Observe all safety precautions required when entering a hoistway. After positioning the cab where you have access to the top and underside of the cab, secure all sources of power to the elevator that can allow it to move. Follow all lockout/tagout safety procedures. Place rated jack-stands to secure the elevator from falling while working under the cab.

Install the Weco power supply unit (see **Figure 5**) where it will not be stepped on, or in the way of normal operations of the elevator. Locate a position and use two screws to mount it to the roof.

Attach the 5 pin DIN extension cables to the pigtail ends of the light curtain rods, these can be taped together or zip tied with three zip ties to secure them together. See **Figure 6**.

Route the cables in a manner that they will not be in the way of working on the cab top, and will not interfere with the operation of the elevator. Secure them to the roof of the cab with cable clamps, or zip ties with eyelets.

Figure 5

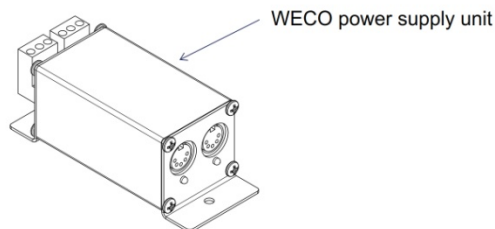
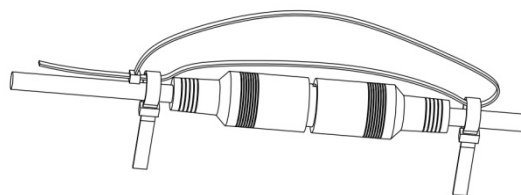


Figure 6



Wiring

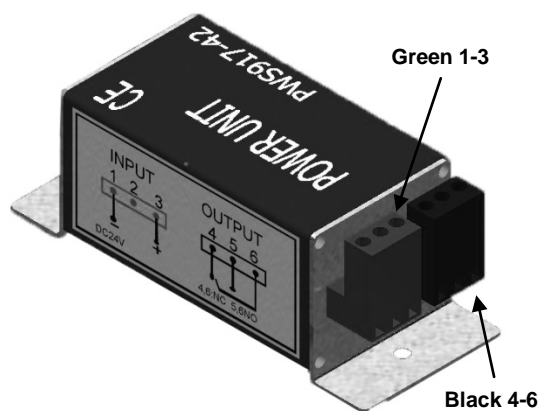
This unit is powered by 24vdc. The load is 3 watts (0.125 amps at 24v). The wire diagram is located on the side of the power supply unit. The green plug is for power in, the black plug is the relay connection. See **Figure 7**.

Ensure the power supply is ample enough to power all the units attached to it (control boards, gate operator, lights, ect) by adding up the wattage ratings (watts = volts x amps if load rating is given in amps) before connecting the unit. If necessary replace the power supply with a larger one, or attach a separate 24v power supply.

Connect the negative (-) input from the power supply to pin one (1) of the green connector, and the positive (+) input of the power supply to pin three (3) of the green connector.

The black connector is the relay connection. Pin six (6) is the common, pin five (5) is the normally open connection, pin four is the normally closed connection. See the example wiring diagrams for ideas on how to wire the relay into the system to temporarily interrupt the operation of the elevator.

Figure 7



Insert the 5 pin plugs into the power supply unit. They are universal and there is no need to discriminate transmitter or receiver. Just insert the plugs as shown in **figure 8**.

Typical Wiring

If you wish the light curtain to interrupt the closing of an auto gate, use the N.O. (Normally Open) relay on the Weco Power Supply to activate the Door Open Button (DOB) as shown in **Figure 9**.

***Note* Figure 9 depicts a 4M2 controller wiring. Numbers and connections may vary due to different controllers, verify wire numbers and nomenclature to the controllers diagram first to determine how activate the DOB button.**

If you wish to use the light curtain on a non-powered gate system to keep the car from moving if there is an obstruction in the space between the hoistway door and the gate, insert the light curtain relay into the Gate Closed Circuit. Find the gate switch (typically 'GC') terminal in the car top box, remove one leg from the connector/ terminal strip. Run that wire to the Weco power supply units black connector terminal four (4) normally closed (N.C.) terminal. Attach another wire to terminal six (6) common on the Weco power supply unit, and connect it to the now vacant gate switch terminal that you removed the GC wire from.

See **Figure 10**.

Figure 9 4M2 Controller DOB wiring.

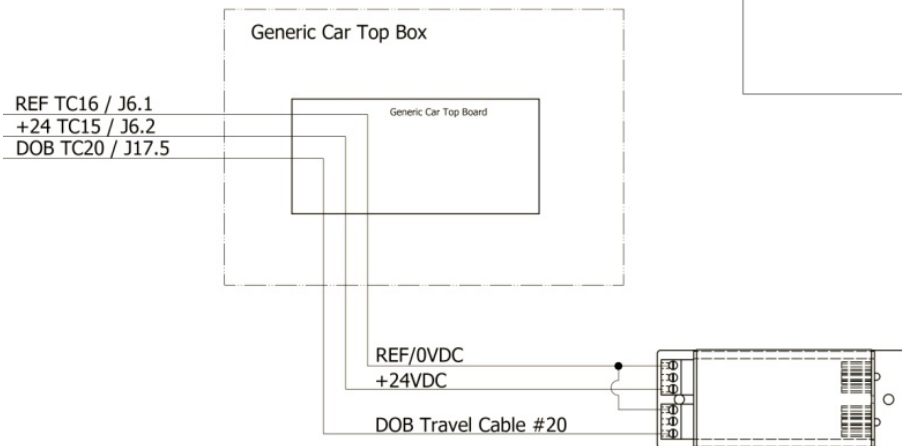


Figure 8

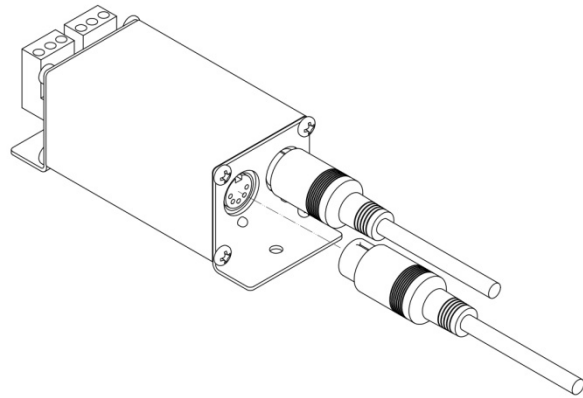
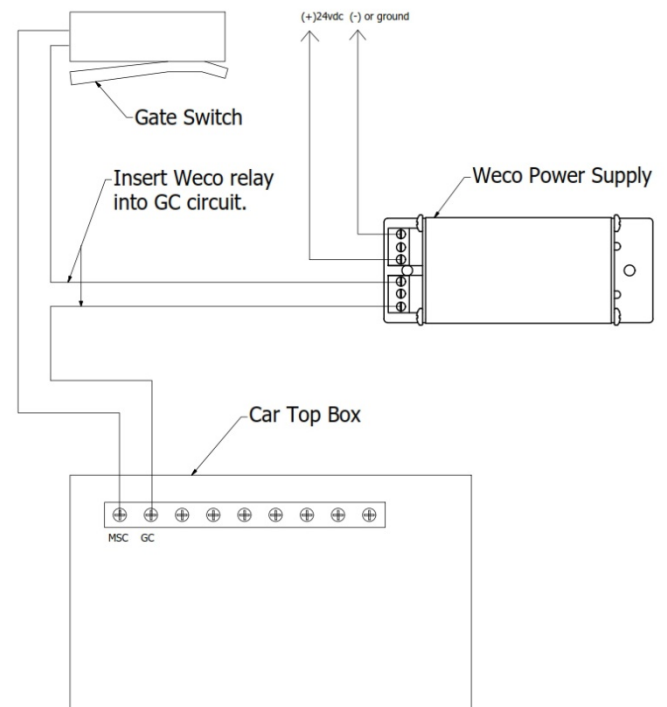


Figure 10 Gate switch interrupt



Testing

Also see Appendix A.

The unit should activate and a red LED in the receiver bar should light and become visible when looking at the receiver and the beam is broken. If it remains broken, an audible alert will beep intermittently (it is not very loud).

Break the beam with your hand and ensure that the unit functions properly along the entire length of the light curtain.

Open and close the gate and hoistway doors on each floor to ensure that nothing interferes with the beam.

The unit should interrupt the operation of the lift anytime the beam is broken and resume proper operation when the obstruction is removed.

Troubleshooting

This unit relies on a series of infra-red LEDs that transmit different pulsed frequencies across to receivers that are in line with each transmitter. Each receiver looks only for its matched pulse and will not respond to an adjacent transmitting LED, this reduces the chance that natural infra-red light will interfere with the unit, and increases sensitivity. The whole transmitting bar must be visible to receiver bar for the system to work properly. **Also see Appendix A.**

Problem	Possible Cause	Possible Solution
Does not power up / no power light on power supply unit	Loose connection at power terminal, 24v p.s. unplugged, failed unit	Check for 24v with meter, tighten connections, replace unit.
Unit beeps, red LED is lit inside the receiver bar	Obstruction blocking the beam, transmitter has no power check plugs and extensions for problems. Failed transmitter LED (bad TX bar), failed receiver sensor (bad RX bar) or failed power supply control unit.	Look for obstructions in the beam path, check plugs for proper connection, replace unit.
Elevator stops in mid travel	Something is blocking the beam as the car travels. Loose connection vibrating and activating the unit. Weak sensors intermittently failing (not likely)	Inspect hoistway for loose cables, trim, drywall tape, or other obstructions that may break the beam as the car travels. Check for loose connections. Replace unit.

Carlo Gavazzi BFL194

Parts Identification

The transmitter and receiver are identical except for the color of the jacket on the cables, and the label near the top of the units. **See Figure 11.**

f

Figure 11. The transmitter has a black jacket on the cable, and the receiver has a grey jacket on the cable.



Introduction

The Carlo Gavazzi light curtain is a thinner (3/8") design with more features available.

Blanking Function: This function will allow the curtain to work with parts of the curtain blocked at power up. (15 seconds of 'learning' are required at power up. To enable, attach the WHITE RX wire to +24VDC.) After 'learning' the setting is retained. To reset, disconnect power and the WHITE RX wire, then restore power without the WHITE RX wire attached. Reattach WHITE RX wire with power removed to enable blanking with a new learning configuration.

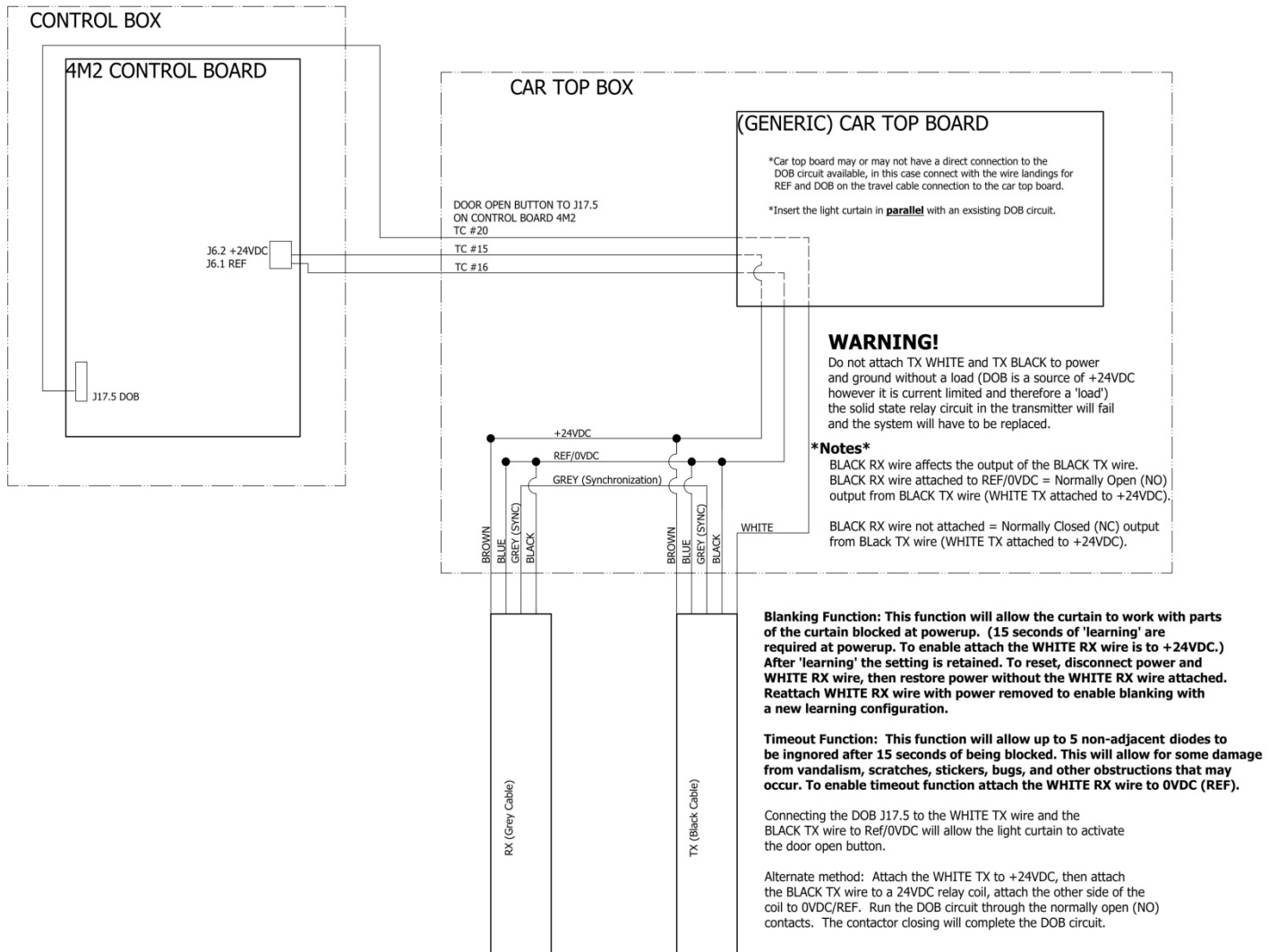
Timeout Function: This function will allow up to 5 *non-adjacent* diodes to be ignored after 15 seconds of being blocked. This will allow for some damage from vandalism, scratches, stickers, bugs, and other obstructions that may occur. To enable timeout function, attach the WHITE RX wire to 0VDC (REF).

Installation

The Carlo Gavazzi light curtain comes with screws for mounting. The mounting should be done on a flat surface with a clear view of the matching light curtain on the other side. Should there be an obstruction or protrusion that prevents normal operations, enable the blanking feature by attaching the white RX wire from the grey cable to +24VDC. To enable the 'Timeout' function, attach the white RX wire from the grey cable to REF/0VDC. **See Appendix B.**

Wiring

The BFL light curtain should be wired as shown in Figure 12. **Also See Appendix B.**



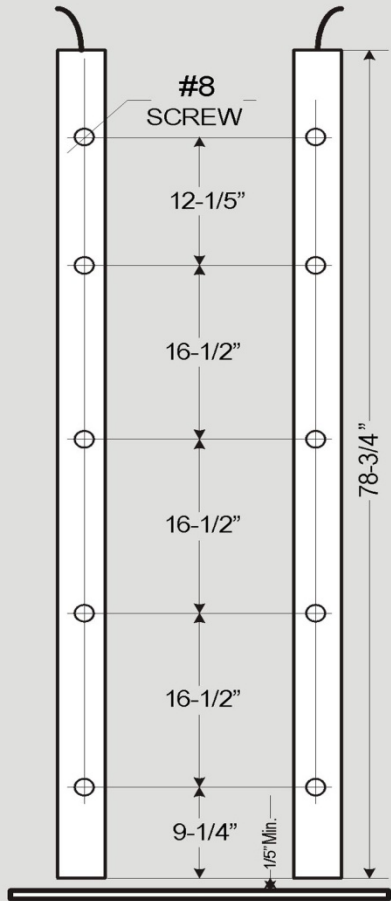
Testing

See the troubleshooting in Appendix B.

Appendix A



WECO957Q Residential Model



WECO ELEVATOR DOOR DETECTOR

WECO957Q

TECHNICAL FEATURES

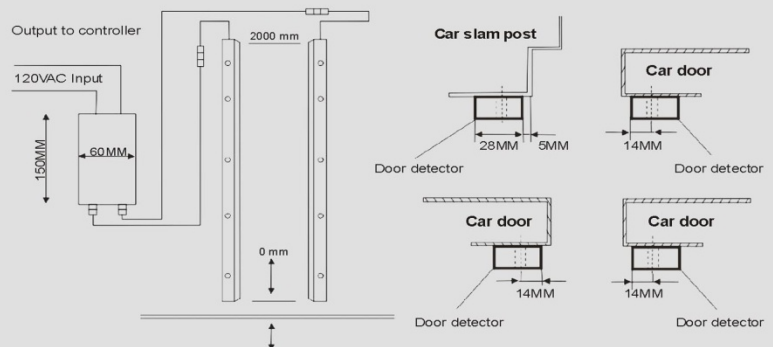
WECO957Q	11mm × 28mm × 2000mm
Number of infra-red beams	94 Non-parallel
Number of diodes	32 pairs
Scan mode	3 ways
Response time	65ms
Diodes spacing	59mm
Operating range	0...3000mm(Max.4000mm as required)
Detecting height	20mm...1841mm
Infra-red pulses ratio	1:2
Max.ambient light(sunlight)	≥100,000LUX
Linear tolerance	±15mm vertical, ±4mm horizontal
Connection flexible cables	3,500mm × 2(Super strong flexible cables)
System indicators	Normal-Interrupted-Faulty
LED indicators	Green LED × 1, Red LED × 1
Operating temperature range	-20°C - 65°C
Storage temperature range	-40°C - 85°C
IP Rate	IP54
Isolation	≥1500V

Power Unit PWS957_120

Dimension	50mm × 60mm × 190mm
Operating Voltage	120VAC ± 15%, 60HZ
Enclosure	Steel cartop box
Output relay capacity	1NO+1NC(AC120V,8A or DC24V,8A)
Operation life	≥ 10 ⁷
Power consumption	3VA
Buzzer functions	OFF-ON-Timer
Buzzer delay/Nudging delay	45S, 60S(USA)/20S, 30S(CAN)
Buzzer active	60s, infinite
Buzzer setting	USA, CAN

Power Unit PWS957_24

Dimension	37mm × 42mm × 75mm
Operating voltage	24VDC
Enclosure	Aluminium module
Output relay capacity	1NO+1NC(AC120V,1A or DC24V,1A)
Operation life	≥ 10 ⁷
Power consumption	≤ 3VA



Appendix B

Carlos Gavazzi BFL 194

Light Curtains

Light Curtains for Lift

Type BFL104x, BFL194x



BFL E



BFL S

- Flexible connecting cables
- According to EN 81-70 requirements
- IP65 versions BFLxxxx200I, IP54 versions BFLxxxx200

- Protective screen for lift doors generated by light curtains
- Height version 200 cm
- Diodes position on the edge and on the side 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

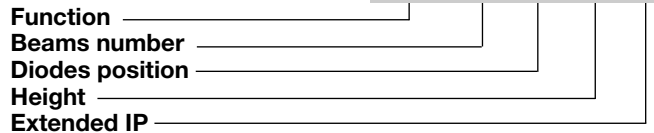
Product Description

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



Type Selection

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

Output Specifications

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

Supply Specifications

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

General Specifications

Operating range	0 to 4 m	Timeout function	Enabled connecting the TOBK white wire on RX to GND Function activation time after diode(s) obstruction 10 s ± 2 s
Protected height	20.5 to 1846 mm	Blanking function	Teach-in at power supply on, after connecting the TOBK white wire on RX to VDC
Distance between the diodes	46.8 mm	Distance between bottom beam and bottom of housing	13.7 mm
BFL194x	46.8 mm	Distance between top beam and bottom of housing	1838.7 mm
BFL104x	93.6 mm	LEDs indication	TX 2 red RX 2 red (see details in the LEDs indication tables)
Bottom 4 diodes	46.8 mm	LEDs position indication	Approx. 10 cm from the top of the housing
Top 18 diodes	93.6 mm	Environment	(EN 60529) Degree of protection BFLxxxx200I IP 65 BFLxxxx200 IP 54 Pollution degree 3 Operating temperature -5 to +55°C, R.H. < 95% Storage temperature -20 to +65°C, R.H. < 95%
Beam pattern	Self-adaptive, depending on the signal transmitting level	Housing (TX, RX)	Dimensions (W,H,L) BFLxxxE 29.9 x 2001 x 9.7 mm BFLxxxS 16.4 x 2009 x 26 mm Material Plastic (PC-ABS)
Typical values		Weight (TX, RX)	Approx. 1 Kg
BFL104x		Mounting	Dynamic Standard mounting Static Optional mounting by the BFLMOUNT kit: BFLMOUNT200
< 70 cm:	22 beams (1 beam/LED)	Approvals	UL, CSA
70 to 140 cm:	64 beams (3 beams/LED)	CE Marking	Yes
> 140 cm:	104 beams (5 beams/LED)	EMC	Immunity Electromagnetic Compatibility Emission According to EN 12016 According to EN 12015
BFL194x		According to	Protective height stated in EN 81-70 norm
< 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 1800 ms @ 4 m		
Reaction time			
BFL104x	35 ms @ uniform illum. (L) + 5 ms if L-Lmax > 30 kLux		
BFL194x	50 ms @ uniform illum. (L) + 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) (see details in the Mounting Tolerance Diagrams)		
Linear mounting tolerance			
Vertical	± 4.0 mm (@ 0 m)		
Horizontal	± 2.0 mm (@ 0 m) (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		

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.

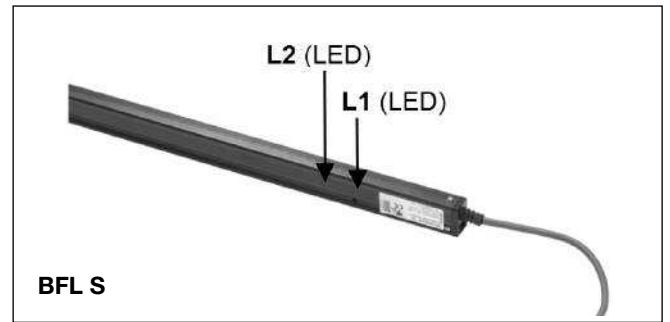
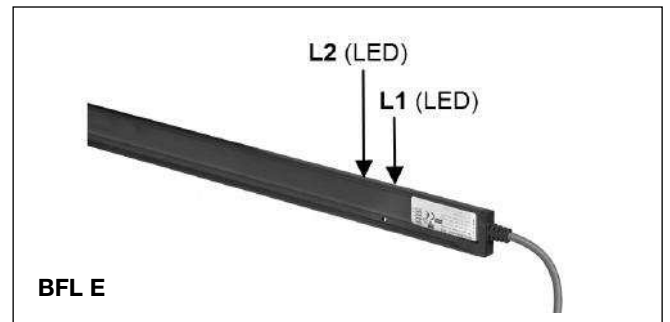
LEDs Indication

TX LEDs	Status	Description
L1 (red)	OFF ON	<ul style="list-style-type: none"> • Blanking function not enabled • Blanking function enabled
L2 (red)	ON OFF Flashing	<ul style="list-style-type: none"> • Power supply ON/ Transmitter operating • Unit not supplied • Wrong TX-RX transmission

RX LEDs (BFLxxxE)	Status	Description
L1 (red)	ON OFF Flashing	<ul style="list-style-type: none"> • Power supply ON/ Receiver operating • Unit not supplied • Alarm condition
L2 (red)	OFF ON Flashing	<ul style="list-style-type: none"> • Timeout function not enabled • Timeout function enabled • Timeout function enabled and at least 1 diode excluded

RX LEDs (BFLxxxS)	Status	Description
L1 (red)	OFF ON Flashing	<ul style="list-style-type: none"> • Timeout function not enabled • Timeout function enabled • Timeout function enabled and at least 1 diode excluded
L2 (red)	ON OFF Flashing	<ul style="list-style-type: none"> • Power supply ON/ Receiver operating • Unit not supplied • Alarm condition

LEDs Position



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.

Timeout function.

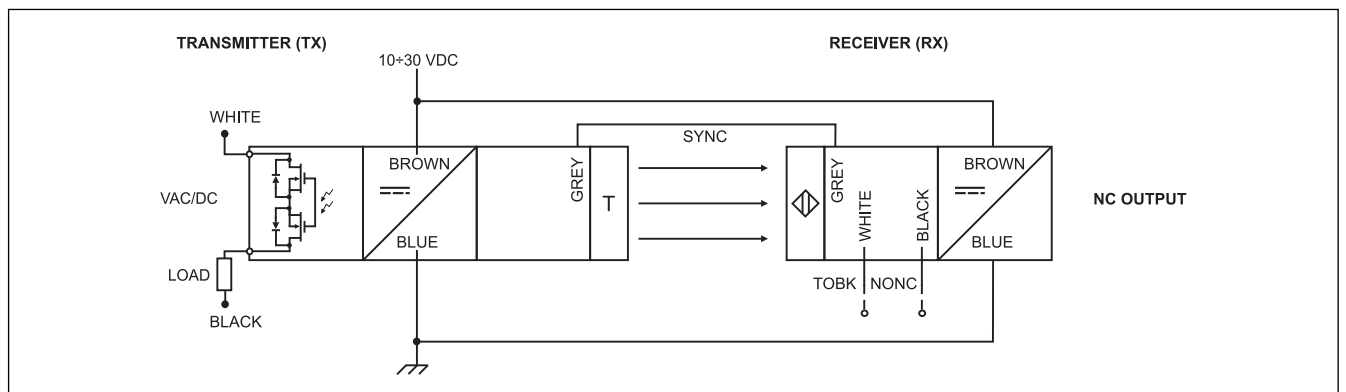
The function is enabled by connecting the TOBK white wire on RX to GND at start up (before supplying the

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.

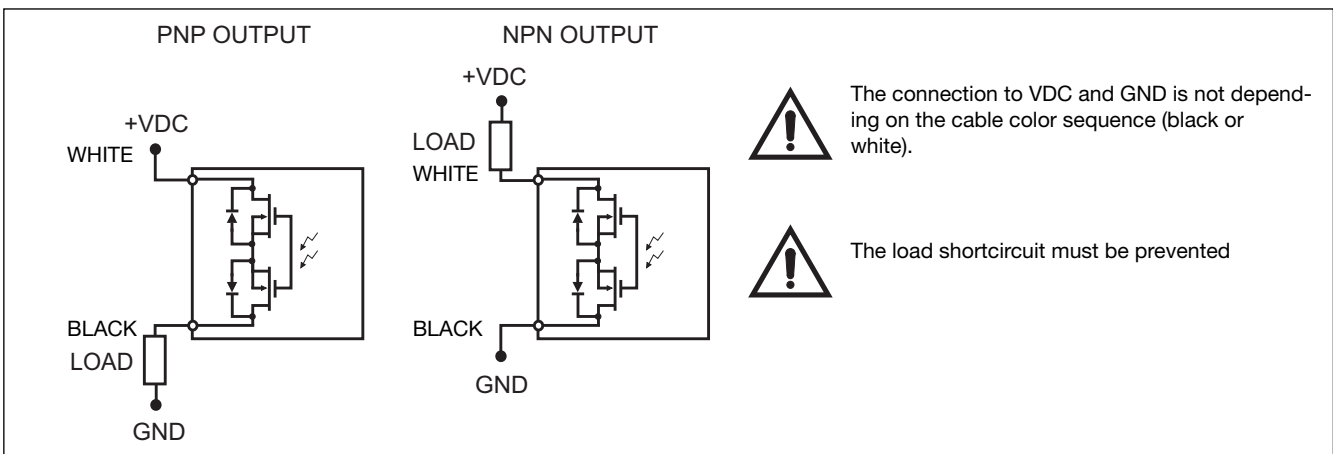
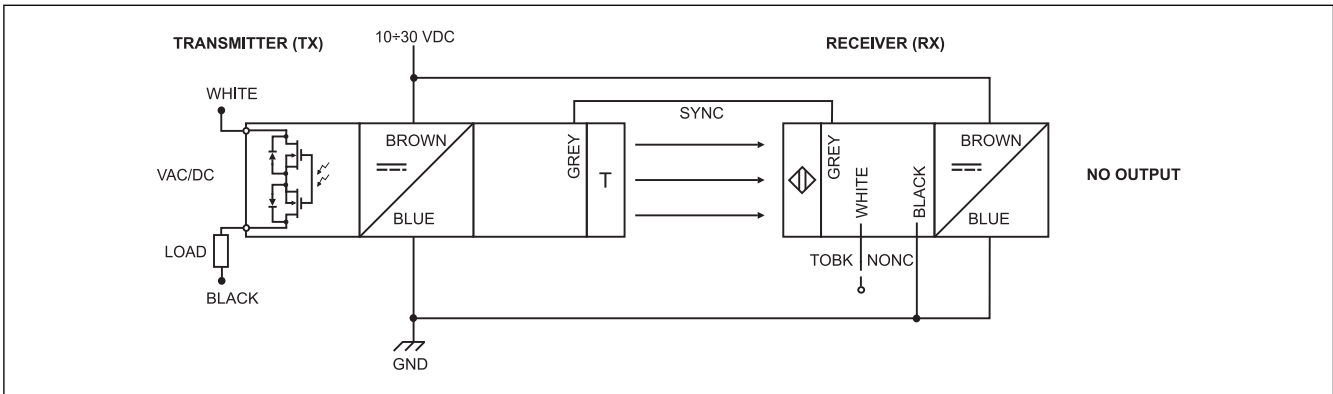
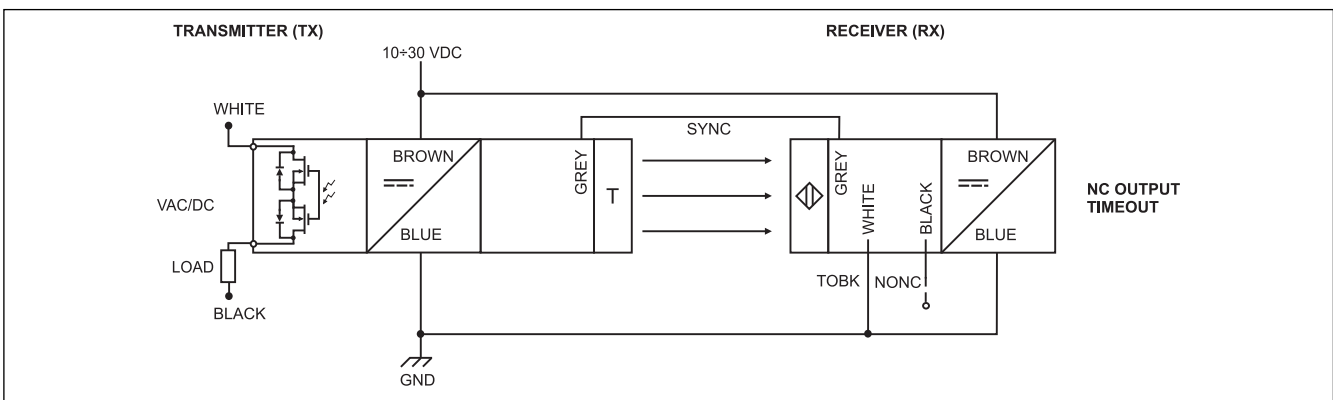
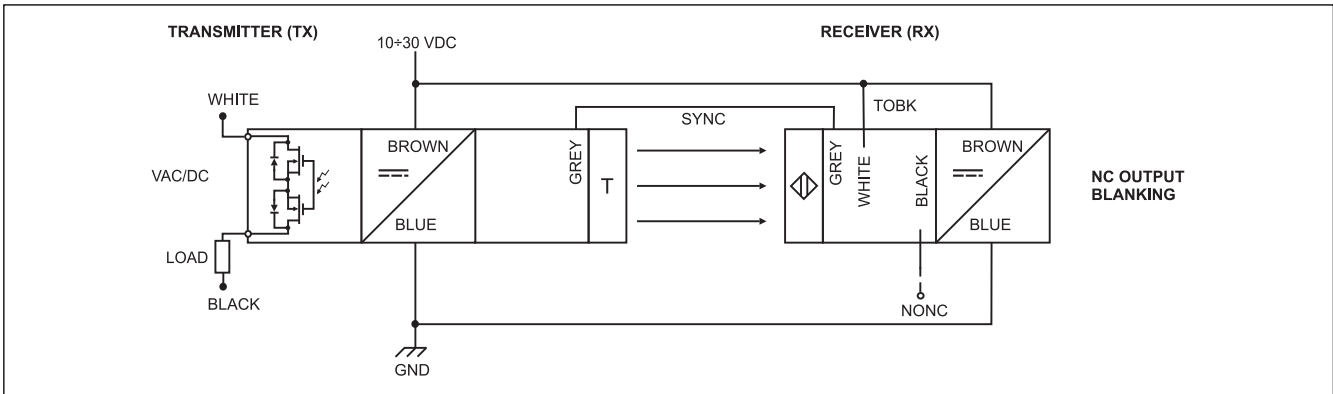
Blanking function.

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.

Wiring Diagrams

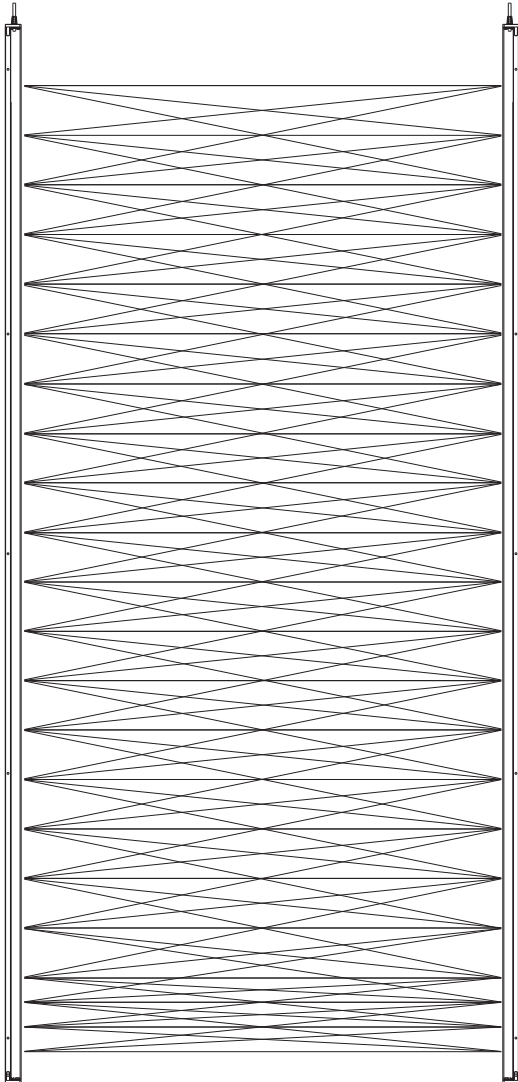


Wiring Diagrams (cont.)

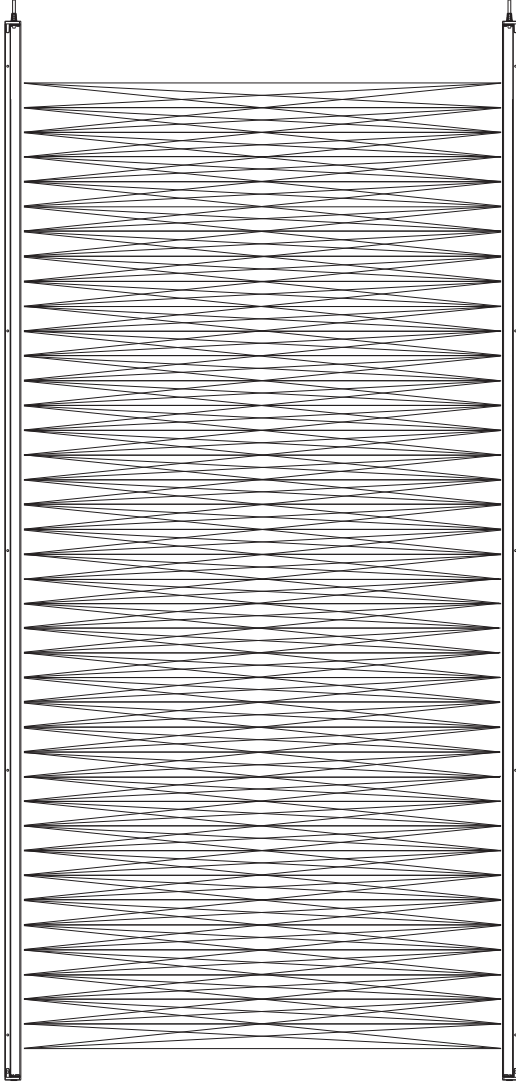


Beam Pattern

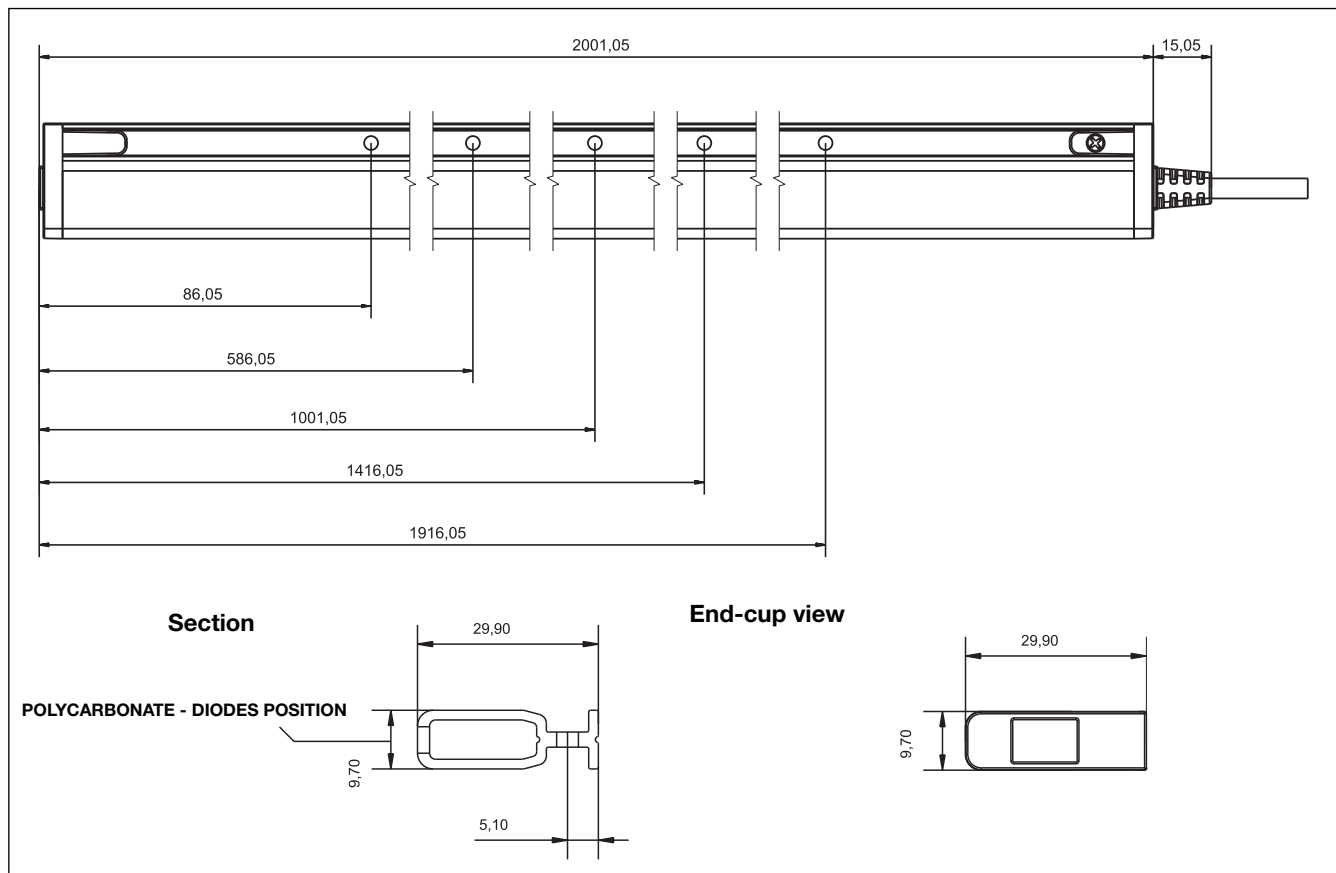
BFL104x200x



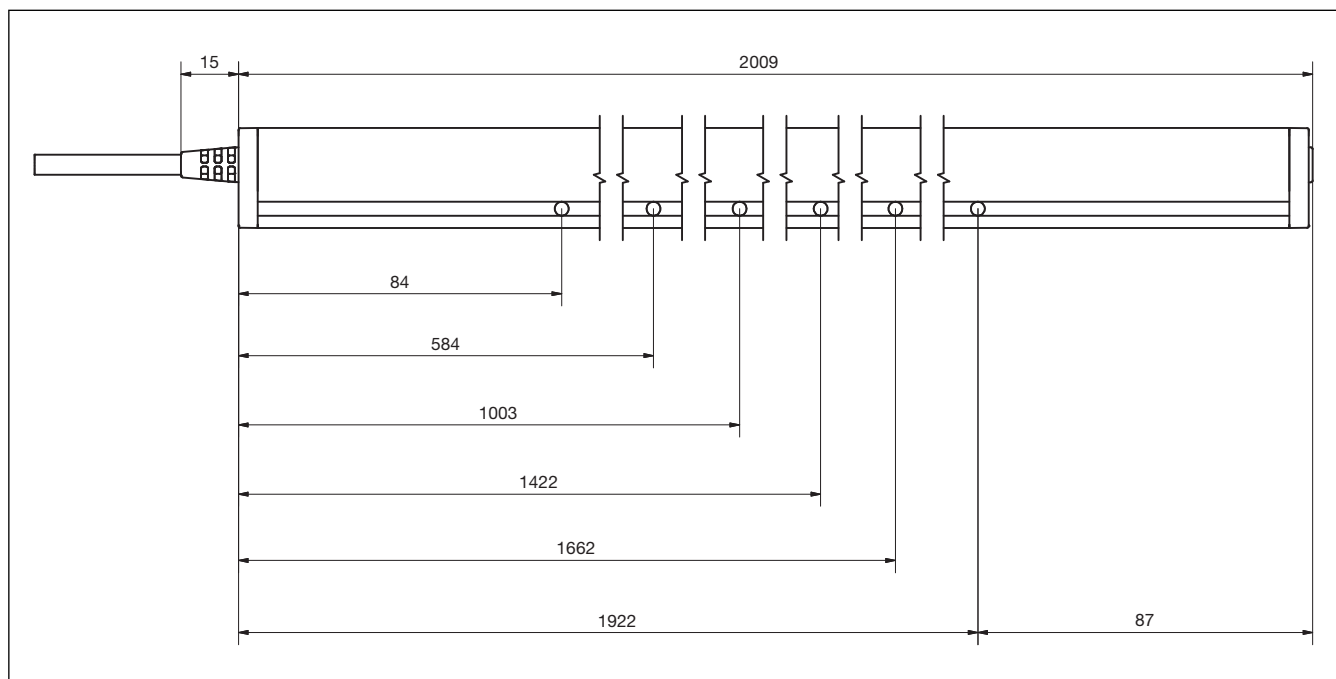
BFL194x200x



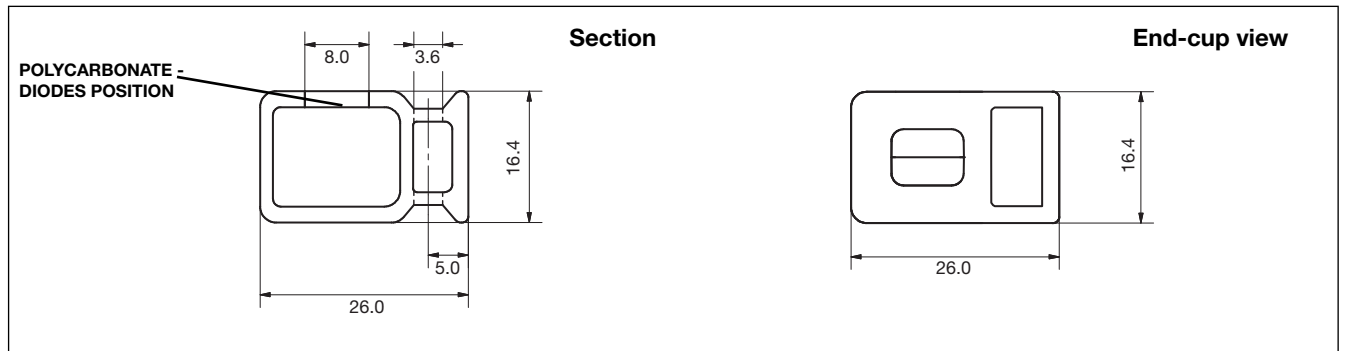
Dimensions BFLxxxE200x



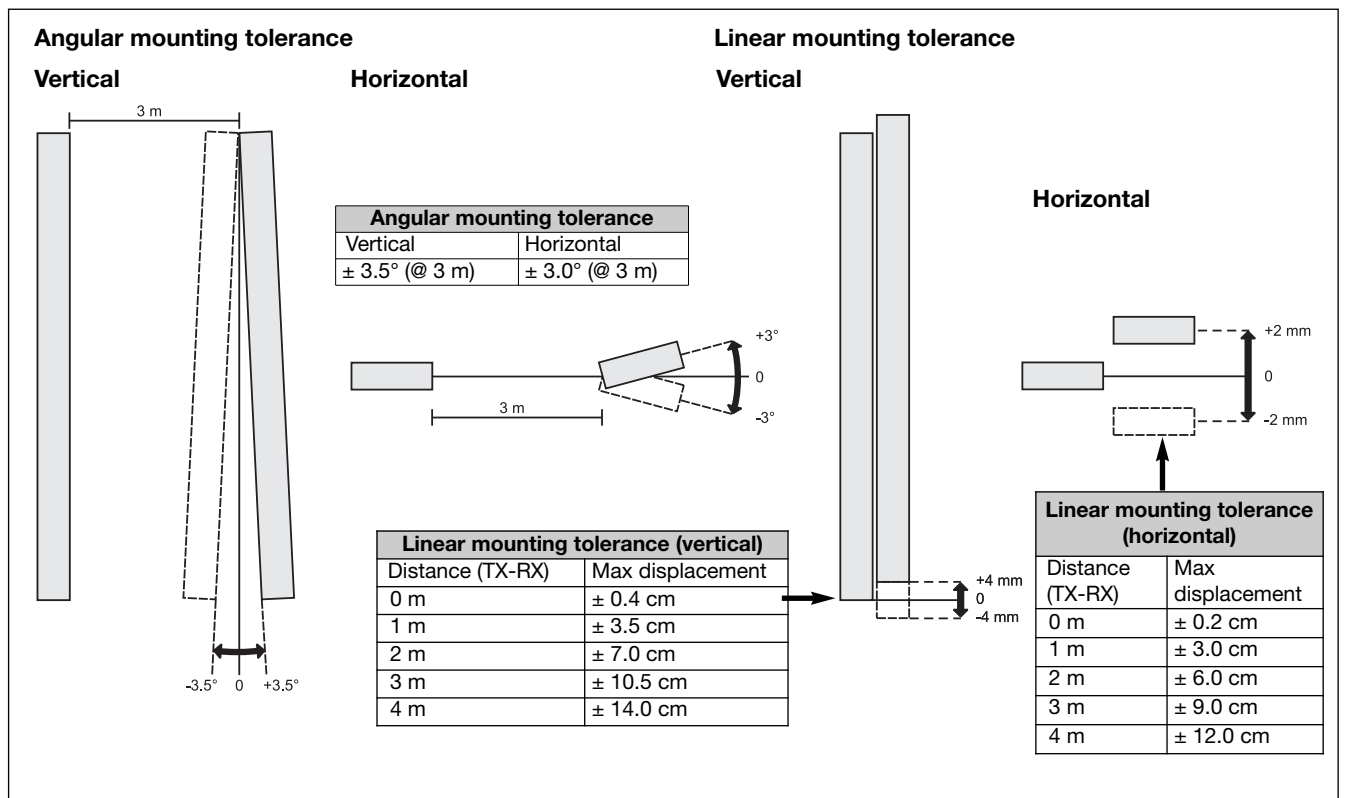
Dimensions BFLxxxS200x



Dimensions BFLxxxS200x (cont.)



Mounting Tolerance Diagrams



For assistance, please contact Rocky Mountain Elevator Products at: 1-866-482-4472 during normal business hours. (8am-5pm MST)