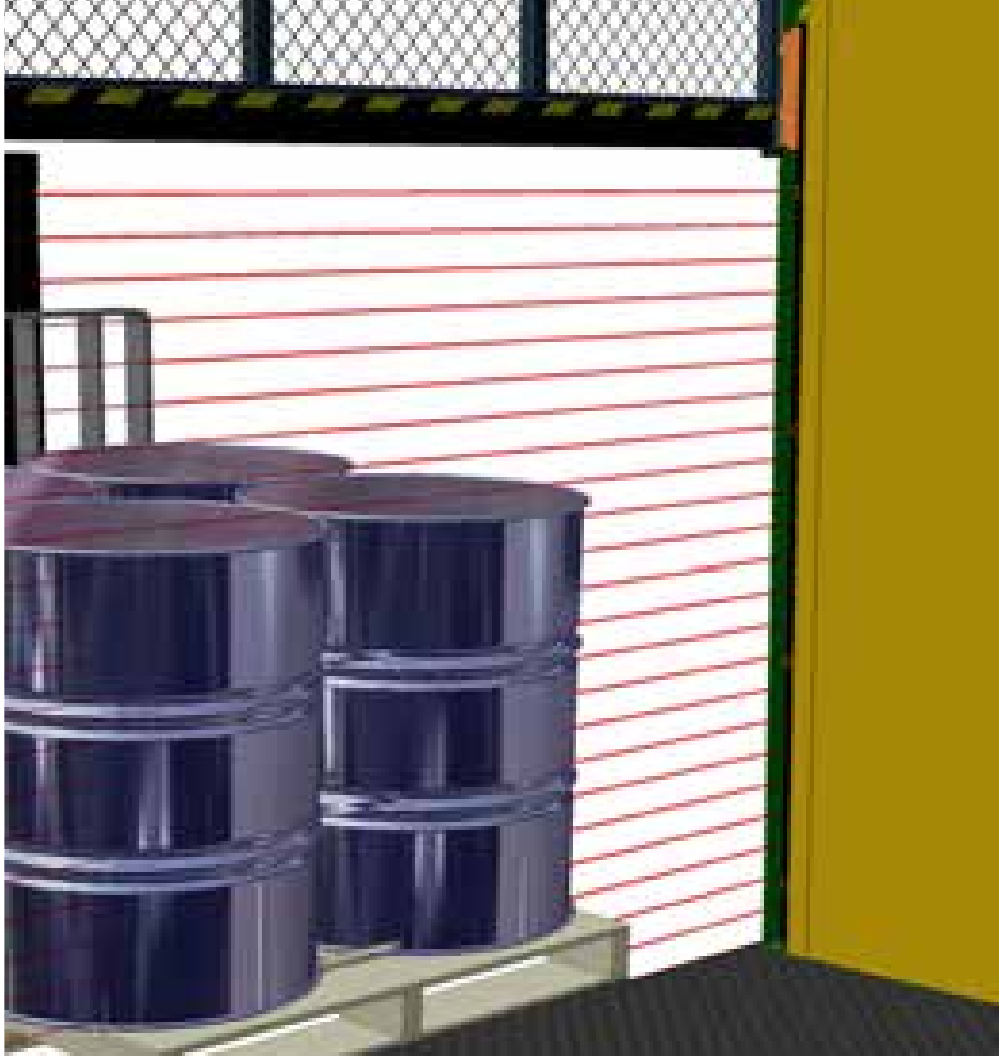
PEELLE®

THE PEELLE COMPANY

FREIGHT DOORS | CAR GATES | CAR ENCLOSURES

GUIDE 222



THE PROTECTOR™
Safety Light Curtain

INSTALLATION GUIDE

&

DUAL LIGHT CURTAIN INSTALLATION GUIDE

Light Curtain Series 4699 & 4700

VSD | VERTICALLY SLIDING DOORS

04/23/2014 - V9

Table of Contents

IMPORTANT INFORMATION

FOLLOW THE INSTRUCTIONS GIVEN IN THIS MANUAL CAREFULLY. FAILURE TO DO SO MAY CAUSE CUSTOMER COMPLAINTS, INJURY, OR CALL BACKS. KEEP INSTRUCTION MANUAL ON SITE.

FOR THE OPERATION OF LIGHT CURTAIN IN THE MODE “AUTO BLANKING ”, THE FOLLOWING POINTS MUST BE OBSERVED:

- THE DOOR CONTROLS MUST GENERATE THE TEST INPUT SIGNAL WITHOUT FAIL.
- THE LIGHT CURTAIN REMAINS INACTIVE UP UNTIL THE GATE IS COMPLETELY OPEN. RUNNING MOVEMENTS BELOW THE ENTIRE OPENING ARE NOT MONITORED.

DO NOT USE THIS PRODUCT IN EXPLOSIVE ATMOSPHERES, RADIOACTIVE ENVIRONMENTS OR FOR MEDICAL APPLICATIONS! USE ONLY SPECIFIC AND APPROVED DEVICES FOR SUCH APPLICATIONS OTHERWISE SERIOUS INJURY OR DAMAGE TO PROPERTY MAY OCCUR!

IT IS IN THE SOLE RESPONSIBILITY OF THE PLANNER AND/OR INSTALLER AND/OR BUYER THAT THIS PRODUCT IS USED ACCORDING TO ALL APPLICABLE CODES AND STANDARDS IN ORDER TO ENSURE SAFE OPERATION OF THE WHOLE APPLICATION.

ANY CHANGE OF THE DEVICE BY THE BUYER OR USER MAY RESULT IN AN UNSAFE CONDITION.

THE MANUFACTURE DENIES EVERY LIABILITY AS WELL AS WARRANTY CLAIMS WHICH RESULT FROM SUCH MANIPULATION.

VOLTAGES HIGHER THAN 30 VDC AT THE TEST INPUT TERMINALS WILL DAMAGE THE DEVICE.

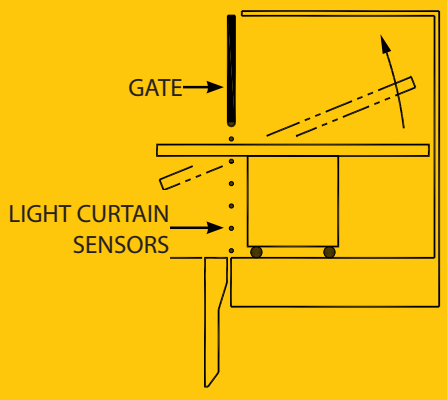
OBJECTS THAT PASS THROUGH THE PROTECTED AREA FASTER THAN THE MAXIMUM RESPONSE TIME OF THE DEVICE MAY NOT BE DETECTED.

IT IS THE RESPONSIBILITY OF THE SPECIFIER, PURCHASER AND INSTALLER TO ENSURE THAT ON COMPLETION, THE INSTALLATION COMPLIES WITH ALL RELEVANT FEDERAL, STATE AND LOCAL CODES AND REGULATIONS THAT APPLY TO YOUR APPLICATION. PARTICULAR ATTENTION SHOULD BE GIVEN TO CLAUSE 2.13.3.4 POWER CLOSING OF VERTICALLY SLIDING HOISTWAY DOORS AND VERTICALLY SLIDING CAR DOORS OR GATES OUTLINED IN ASME A17.1a-2008 / CSA B44a-08 ADDENDA TO SAFETY CODE FOR ELEVATORS AND ESCALATORS. THESE LIGHT CURTAIN SYSTEMS MUST BE INSTALLED ONLY BY AUTHORIZED AND FULLY TRAINED PERSONNEL.

CAUTION!

THE LIGHT CURTAIN IS DESIGNED TO DETECT PASSENGERS AND FREIGHT OF A SPECIFIC SIZE

OBJECTS SMALLER THAN THE SPACING BETWEEN THE LIGHT BEAMS MAY NOT BE DETECTED. TRANSPARENT OBJECTS MAY NOT BE DETECTED.



AVOID IMPROPER USE

Introduction

The light curtain is an optoelectronic sensor. A number of infrared beams, emitted by an emitter edge and received by a receiver edge, separated by a given distance, form a grid that is called a light curtain. If all infrared beams are free (not interrupted), an output signal is activated, e.g. to allow an industrial gate to close. However, if one or more beams are interrupted, the output signal is inactivated in order to prevent the gate from closing or to reopen the gate during closing.

Auto Blanking Mode

Due to the possibility of installing the Peelle Protector exactly in the closing area of the car gate, a much higher safety level can be achieved compared to solutions where the light curtain has to be installed with a small offset to the car gate panels. However, a closing car gate that interrupts the light beams of the light curtain in a sequential order from top to down does not affect the function. The Peelle Protector recognizes the gate movement and automatically blanks the beams that are interrupted by the gate itself. Hence, the Peelle Protector differentiates between the gate and an object that has to be protected.

When the gate closes in this arrangement, beam by beam will be interrupted. The software in the control unit performs a specific task to monitor the moving gate in order to disable the light beams before the gate blocks them.

This function is implemented as follows (please refer also to Figure 1): When the gate is fully open, the two top light beams are inactive (1). They still detect if an object is present or not, but simply do not stop the gate. As the gate closes, this is first detected by the uppermost light beam (2), then by the next one (3). Using the time difference of the interruption between the first and second beam, the gate closing speed is computed. Using this computed speed value, the time when the gate will interrupt the next beam (4) is calculated. Just before this light beam (4) is reached by the gate edge, the light beam is blanked (5 and 6), thus preventing the gate itself from being detected as an object in the path of the gate. When a light beam is switched to inactive (blanked), the area from this light beam to the next one is no longer monitored. Since the light beam is set inactive just before the leading edge of the gate arrives at this position, the area not monitored is never larger than the distance between the individual light beams.

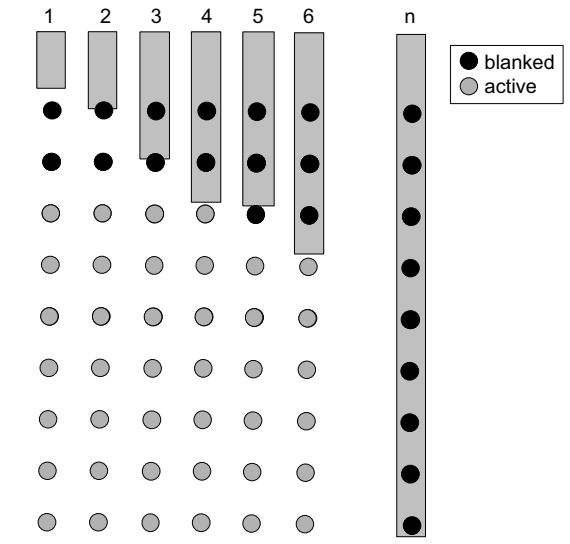


Figure 1: Explanation of Auto Blanking Mode

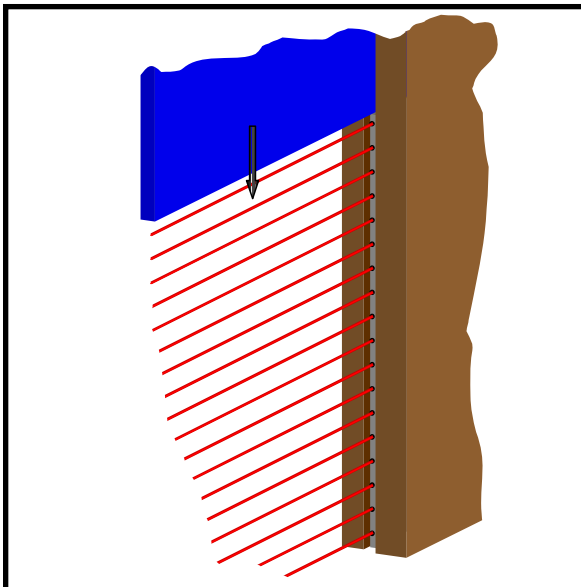


Figure 2: The Protector installed directly in line with the car door

Detailed Description

Block Diagram

Figure 3 shows the block diagram of the light curtain. As indicated, it consists of an emitter and a receiver edge that are connected with detachable cables to the control unit.

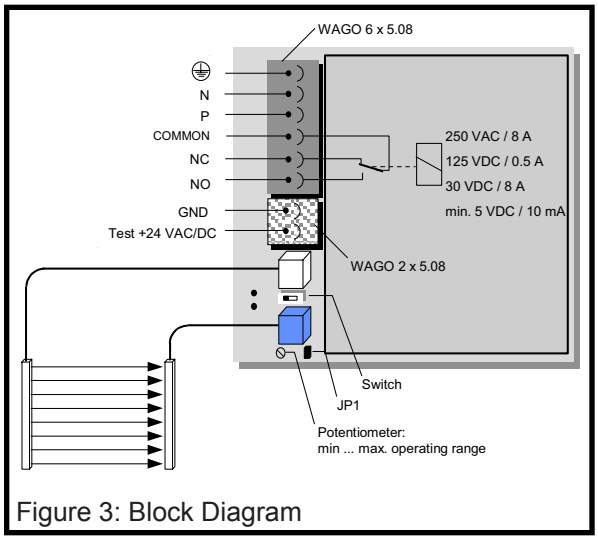


Figure 3: Block Diagram

The control unit contains the power supply and the logic that manages the sensor edges. A relay provides the status output of the light curtain grid to the gate drive unit or the gate control unit.

Power Supply Input

The light curtain has a universal power supply that operates within an input voltage range between 17 to 240 Volt AC or DC. No adjustment is necessary. The power supply automatically detects the voltage and adjusts itself for proper function.

Buzzer

The control unit has a buzzer that is active when one or more beams are interrupted. The buzzer can be switched on and off with the slide switch located between the connectors of the sensor edges.

It is very useful to verify the installation with a turned-on buzzer

Output Relay

The output relay provides the status of the light grid to the gate or door drive control unit.

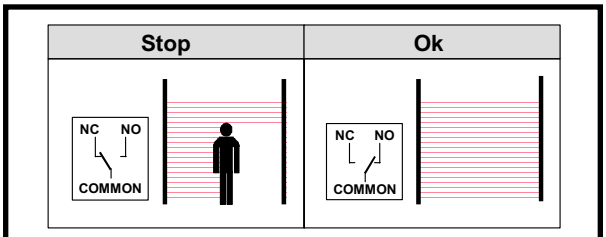


Figure 4: Relay Output Status

Operating Range Setting

A sensitivity potentiometer is provided to adjust the operating range when the Peelle Protector is used on short range of less than 3 meters.

Figure 5:
Potentiometer (factory set “MAX”)
Angle of rotation from min to max is 270 deg

Should operating range be less than 3m, adjust the sensitivity potentiometer as follows:

1. Ensure that the protection field is free and the potentiometer is on position "max".
2. Turn the potentiometer slowly counter-clockwise until the yellow LED illuminates, then immediately stop turning.
   Please note: For assistance the buzzer can be switched on with the slide switch. It reacts like the yellow LED then (acoustic signal, when LED illuminates).
3. Remember this potentiometer position.
4. Now turn the potentiometer half way back in a clockwise direction between the position determined in step 3 and the setting "max".

Safety Integrity Check

Because the Peelle Protector is a safety device, safety mechanisms can be integrated by the user, so that its safe functioning is ensured. Its safe functioning can be monitored using a “test signal”. The signal is put either in an end position of the gate or on a high-level control. This test signal puts the Peelle Protector into a test mode where the device checks all relevant safety circuits including the output relay. If this internal test is successful, the output relay closes its contacts and allows the door/gate to operate. If this internal test fails, the output relay contacts remain open and prevent the door/gate operating in a dangerous way.

Test Input

The safety integrity check of The Protector (described in section Safety Integrity Check) is initiated by a test input signal as follows:

1. In normal operation, the Test Input has to be set to high level. In this mode, the output relay follows the status of the light beams as shown in Figure 6.

2. Prior to gate/door closing, the Test Input has to be set to low level. The Output Relay changes its status to ‘Stop’ as if one or more beams are interrupted. This is the indication that The Protector is performing an internal safety check.

3. If this internal safety check is successful (no failure detected) and no beam is interrupted, the Output Relay changes its state to ‘OK’ so the gate/door drive can close the gate/door.

4. If the internal safety check detects a failure of The Protector meaning that the device looses its safety functionality, the status of the Output Relay remains in the ‘Stop’ position. Refer also to the following timing diagram:

When light curtain is used as THE PROTECTOR

The test Input needs to be DISABLED
Ensure the black jumper is in place on the controller circuit board.

Jumper Position	Test input
	Disabled Protector

When light curtain is used as DUAL LIGHT CURTAIN (LC #1 & LC #2)

The test Input needs to be ENABLED
Ensure the black jumper is REMOVED from the controller circuit board.

Jumper Position	Test input
	Enabled Dual LC

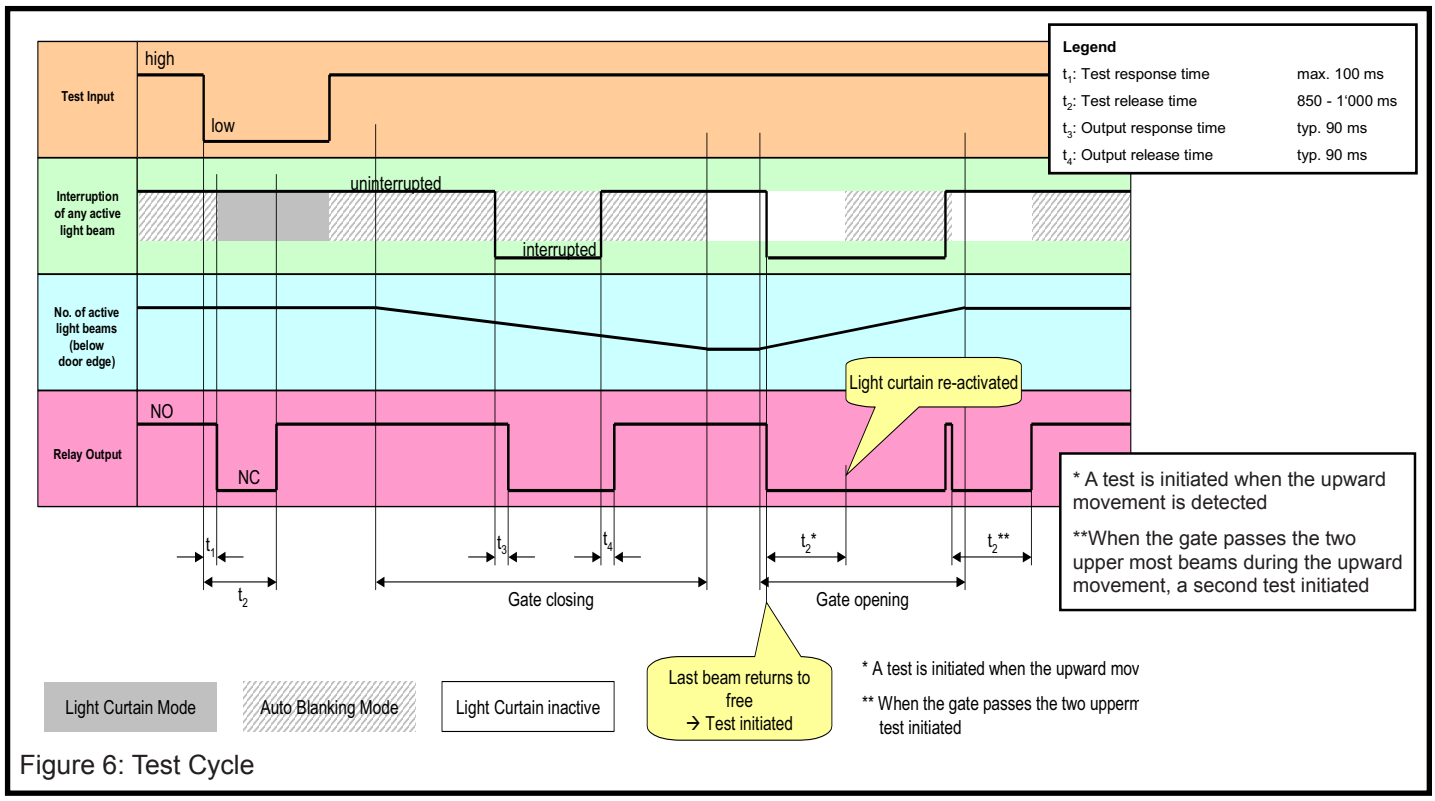


Figure 6: Test Cycle

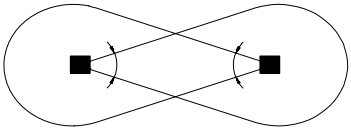
Assembly Notes

Position

The cable outlets of the sensor edges must be at the top, as the car door must enter the protective area from the top.

Alignment

The sensor edges have to be aligned within 10 degrees of each other.



Cleaning of the sensor edges

The edges shall be cleaned with a soft tissue and little soapy water only. Any use of abrasive or inappropriate cleaning solvents may cause loss of range or may damage the device.

Environment

The sensor edges must not be bent or exposed to tension.

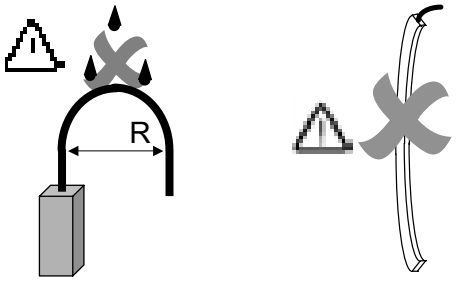
The cables shall not be stretched or squeezed.

Ensure the cable radius is not less then 80 mm (3 in)

Avoid contamination by oil or greasy liquids.

Keep the optical edges free and clear of dust and dirt on the lenses.

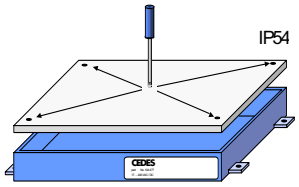
Ensure there is no direct light sources interfering with the light curtain receiver. i.e. sunlight, flashlight, strobe light. If this happens, switch the location of the emitter and receiver.



Control Unit

Mount the control unit using 4 screws to a secure location.

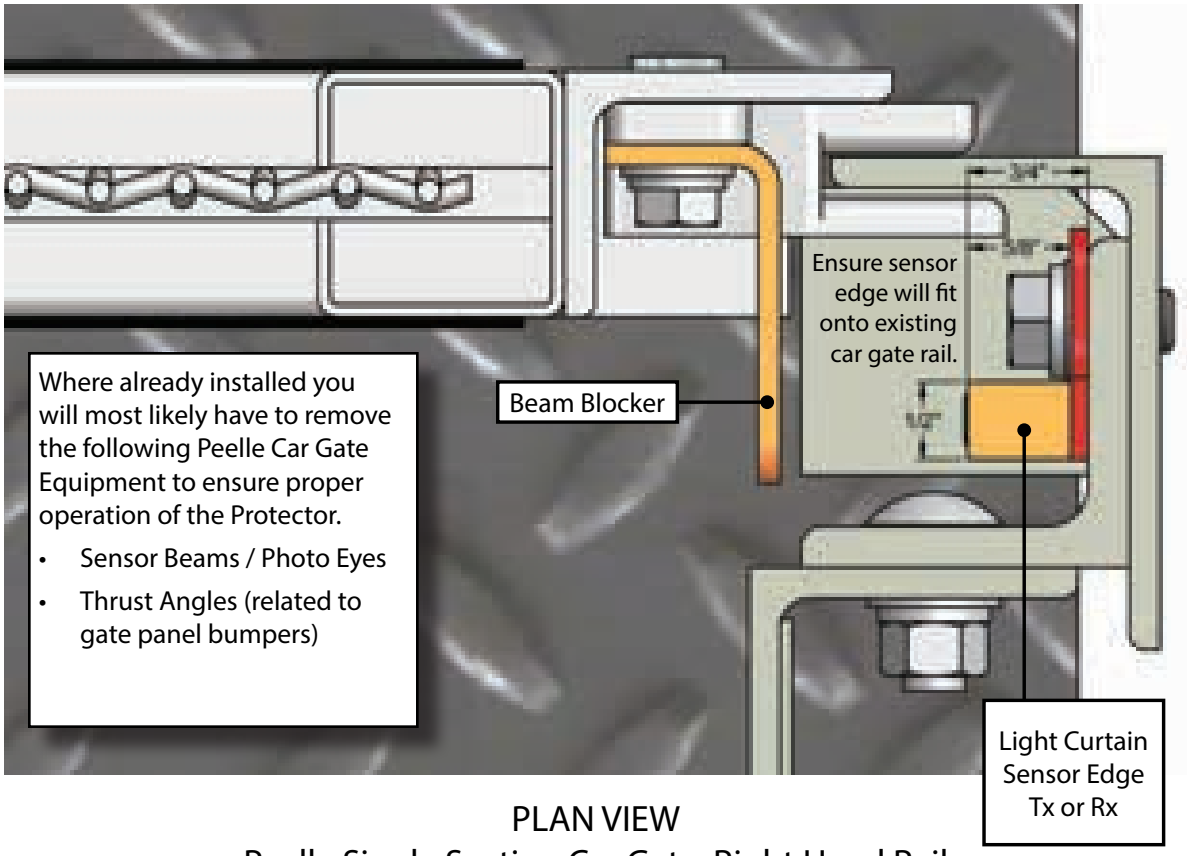
Ensure the cover of the control unit is installed using 4 screws, this prevents the entry of dust, dirt, humidity and liquids which can damage the electronic circuits.



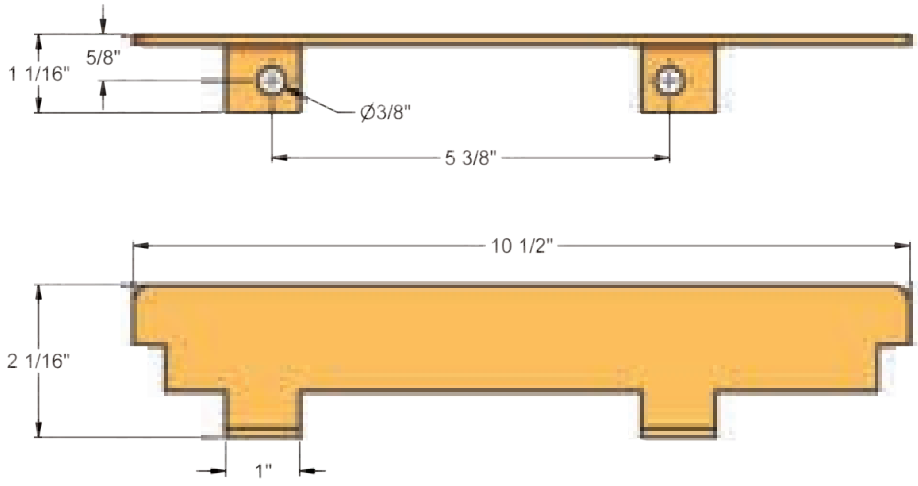
Danger of high voltage!
Disconnect power before opening the cover of the control unit!

Protector Installation

Space Requirements

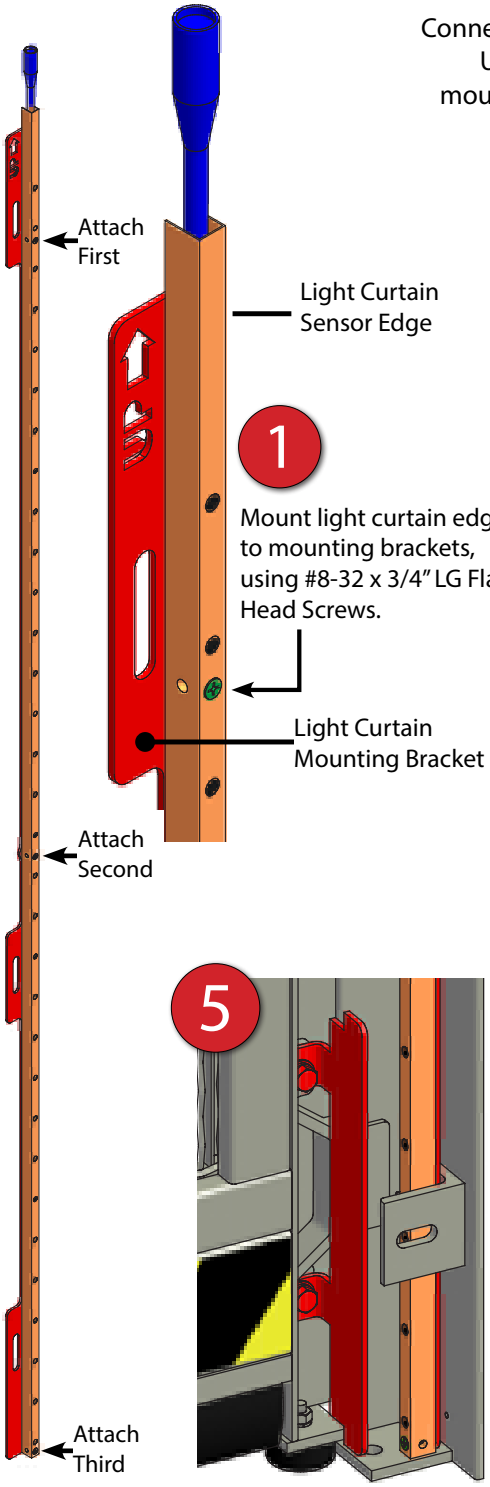


PLAN VIEW
Peelle Single Section Car Gate, Right Hand Rail



Peelle Beam Blocker detail

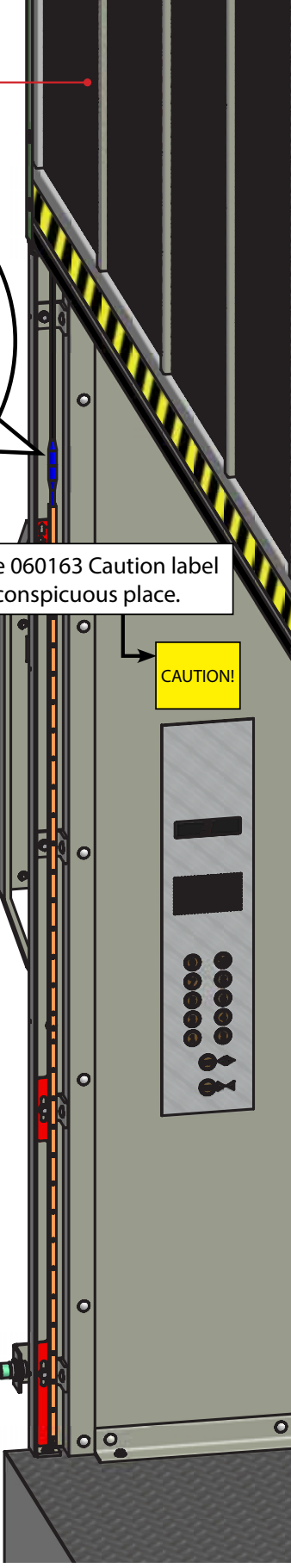
Protector Installation



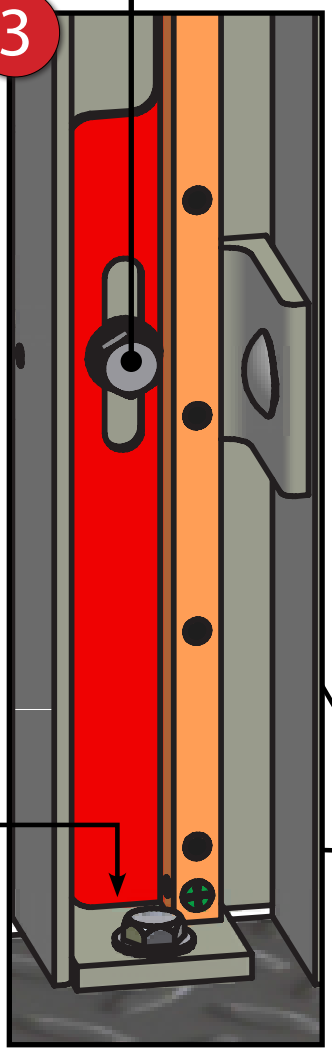
1 Mount light curtain edge to mounting brackets, using #8-32 x 3/4" LG Flat Head Screws.

Light Curtain Mounting Bracket

2 Open the Car Gate to the full open position.



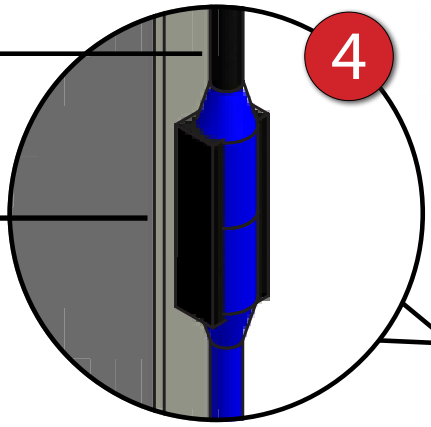
3 Use existing bolts for mounting



Position bracket flush as shown

4 Connect extension cables. Use the tie wraps and mounting pads to secure excess cable.

Ensure the cable clamp is installed.



5 Install Beam Blockers as shown, ensure Beam Blockers cover the lowest sensor, when the Car Gate Panel is in the closed position.

6 Repeat steps 1-5 for opposite side of Car Gate

7 Place 060163 Caution label in a conspicuous place.

CAUTION!

Protector Installation

Wiring

Jumper Position	Test input
	Disabled Protector

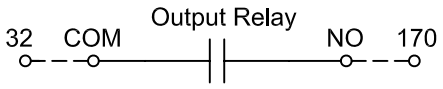
See Pg 4

Initial Wiring Setup

1. Connect the cables from the sensor edges to the control unit. Guide and fix them properly and separate them, as far as possible, from cables that carry high voltages and/or high currents in order to minimize possible EMI interferences.
2. Connect the control unit to the gate/door drive unit (Relay Output, Test Input where applicable)
3. Connect the protective ground terminal of the control unit with a low impedance cable of AWG 18 / 1.5 mm or thicker and a maximum length of 12 inches to a protective grounded frame or a protective ground socket.
4. Connect power to the control unit. The device indicates that it is receiving power by switching-on the green LED (power). When all light beams are free and the test input is on “high”, the output relay changes to the state “OK” (relay output NO) and the yellow LED goes out. Set the buzzer switch to ON.
5. If there are different LED readings than stated in paragraph 4, please go to the trouble-shooting section.

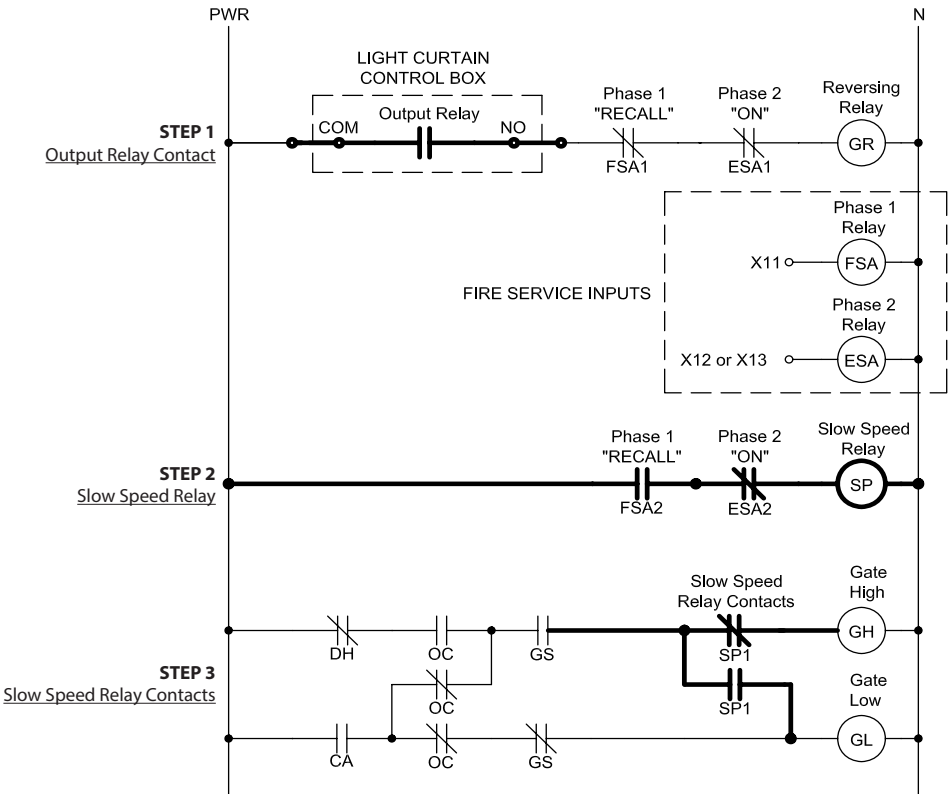
WIRING FOR EXISTING PEELLE GATES WITH SENSOR BEAM

When adding a light curtain to an existing gate, compliance with A17.1-2000 is required. If the pre-existing reversal device is a Peelle Sensor Beam, simply wire the Output Relay Contact between 32 and 170 of the Peelle Controller.



WIRING FOR EXISTING PEELLE GATES WITH OR WITHOUT REVERSING EDGE

1. Wire the Output Relay Contact to the GR relay of the door control. Add Contacts from Fire Service relays (not included) to ignore detection during Fire Service.
2. Wire a gate Slow Speed Relay as shown in the diagram to ensure gate Slow Speed operation during Fire Service Phase 1 Recall.
3. Wire the gate Slow Speed Relay Contacts to the GH / GL contactor of the existing logic as shown.

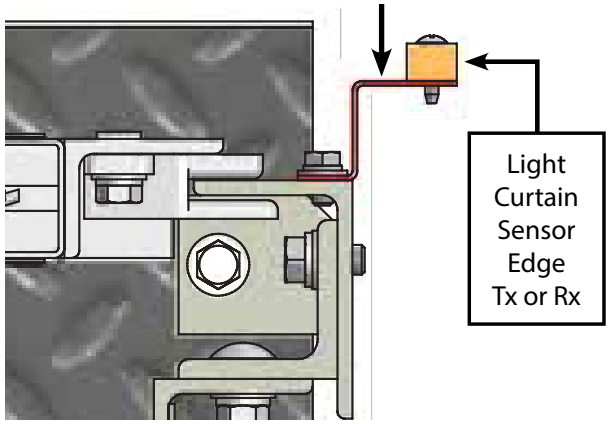


NOTES AND EXCEPTIONS:

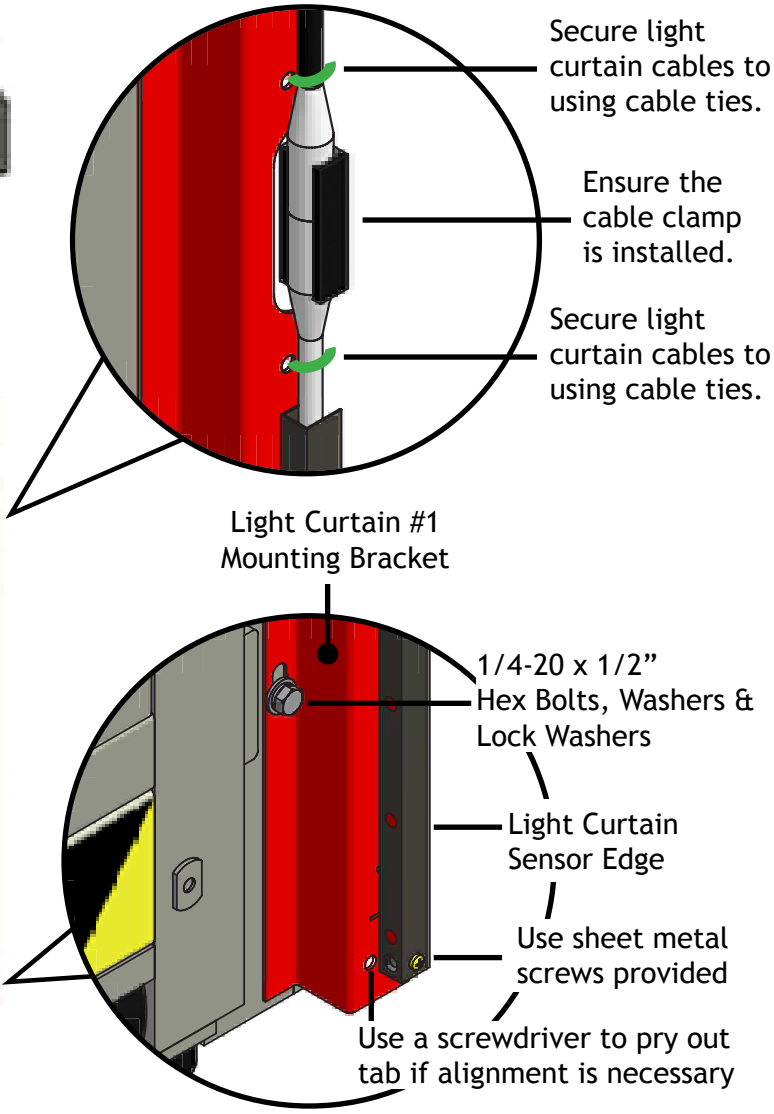
1. Code compliance is the responsibility of the installer.
2. For other control interfaces, please contact Peelle engineering for assistance.

Dual Light Curtain Installation

Outside Car Light Curtain (Light Curtain #1)

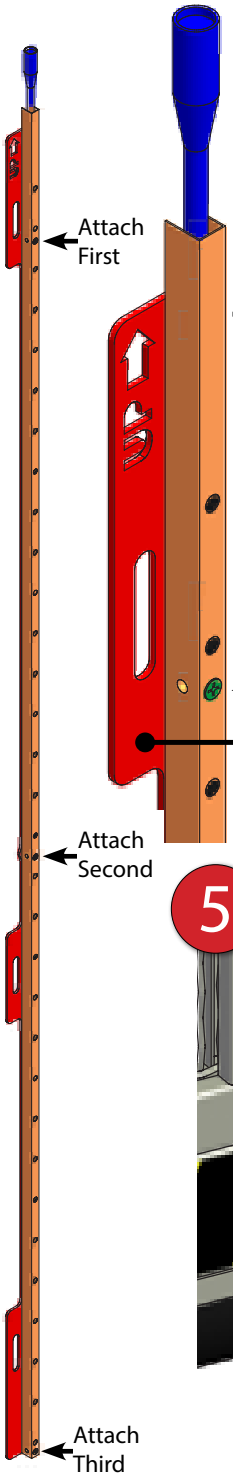


PLAN VIEW
Peelle single section car gate,
right hand rail



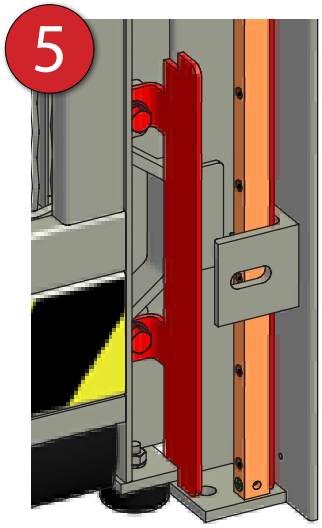
Dual Light Curtain Installation

Inside Car Light Curtain (Light Curtain #2)



1 Mount light curtain edge to mounting brackets, using #8-32 x 3/4" LG Flat Head Screws.

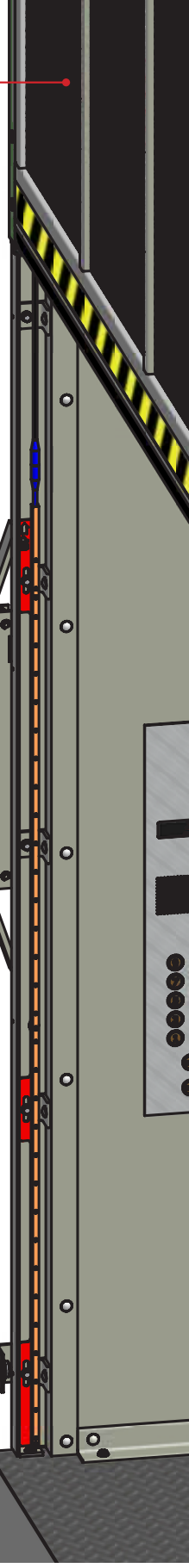
Light Curtain Mounting Bracket



5 Install Beam Blockers as shown, ensure Beam Blockers cover the lowest sensor, when the Car Gate Panel is in the closed position.

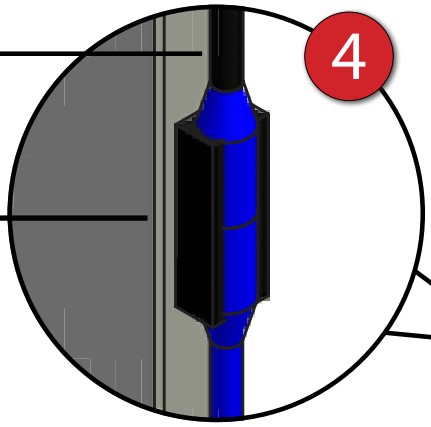
6 Repeat steps 1-5 for opposite side of Car Gate

2 Open the Car Gate to the full open position.



Connect extension cables. Use the tie wraps and mounting pads to secure excess cable.

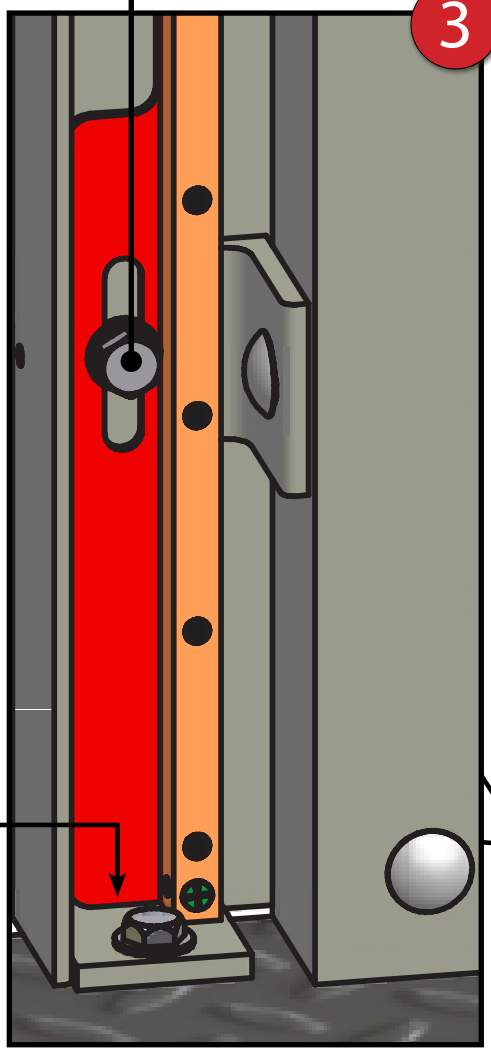
Ensure the cable clamp is installed.



4

Use existing bolts for mounting

3



Position bracket flush as shown

Dual Light Curtain Installation

Wiring

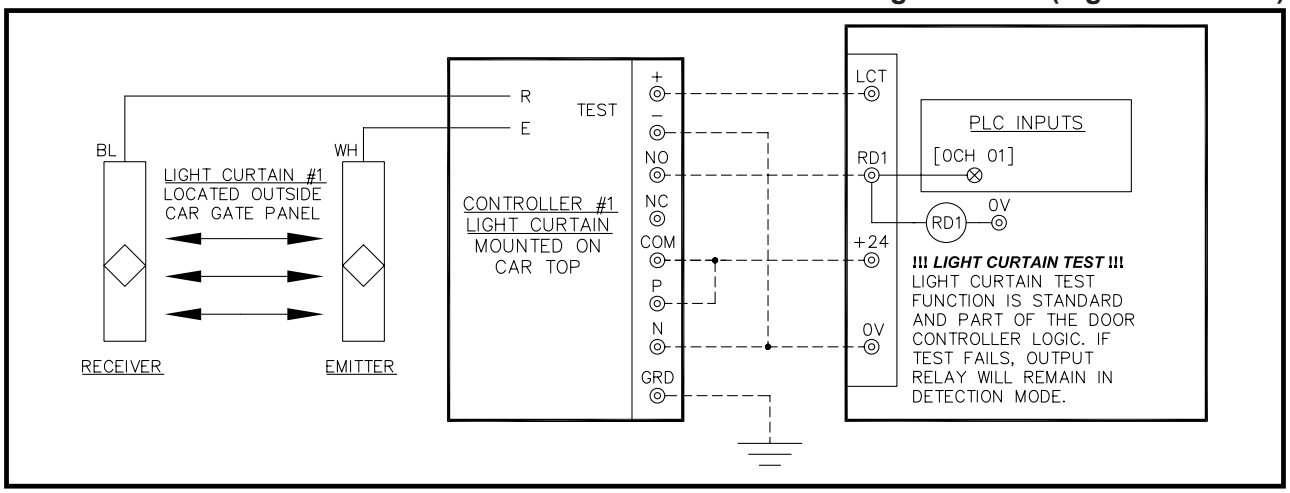
Jumper Position	Test input
	Enabled Dual LC

See Pg 4

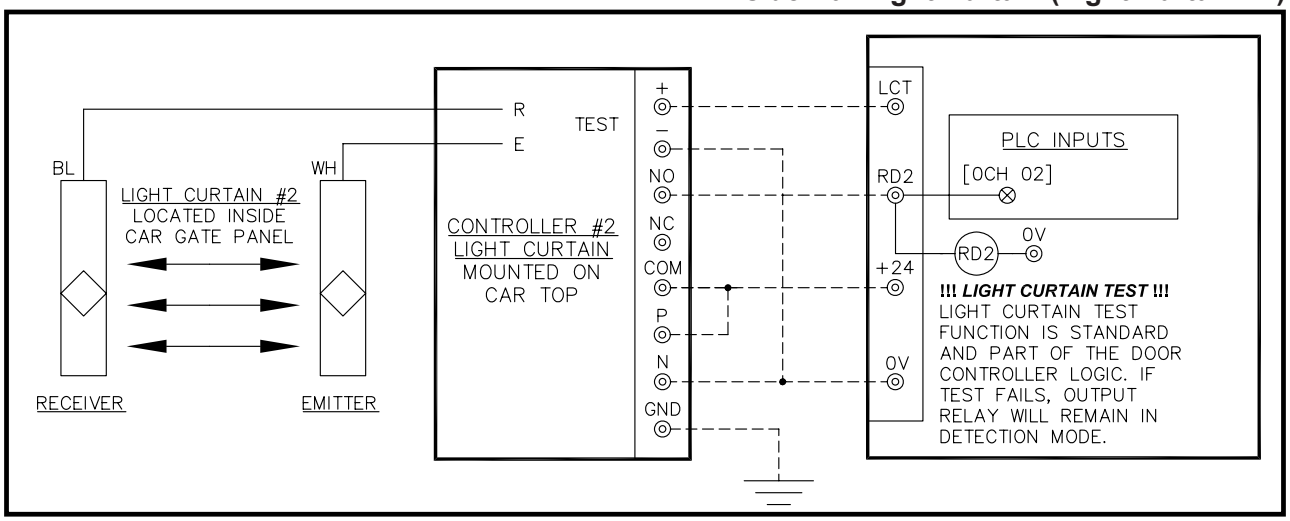
Initial Wiring Setup

1. Connect the cables from the sensor edges to the control unit. Guide and fix them properly and separate them, as far as possible, from cables that carry high voltages and/or high currents in order to minimize possible EMI interferences.
2. Connect the control unit to the gate/door drive unit (Relay Output, Test Input).
3. Connect the protective ground terminal of the control unit with a low impedance cable of AWG 18 / 1.5 mm or thicker and a maximum length of 12 inches to a protective grounded frame or a protective ground socket.
4. Connect power to the control unit. The device indicates that it is receiving power by switching-on the green LED (power). When all light beams are free and the test input is on “high”, the output relay changes to the state “OK” (relay output NO) and the yellow LED goes out.
5. If there are different LED readings than stated in paragraph 6, please go to the trouble-shooting section.

Outside Car Light Curtain (Light Curtain #1)



Inside Car Light Curtain (Light Curtain #2)



NOTES AND EXCEPTIONS:

1. Code compliance is the responsibility of the installer.
2. For other control interfaces, please contact Peelle engineering for assistance.

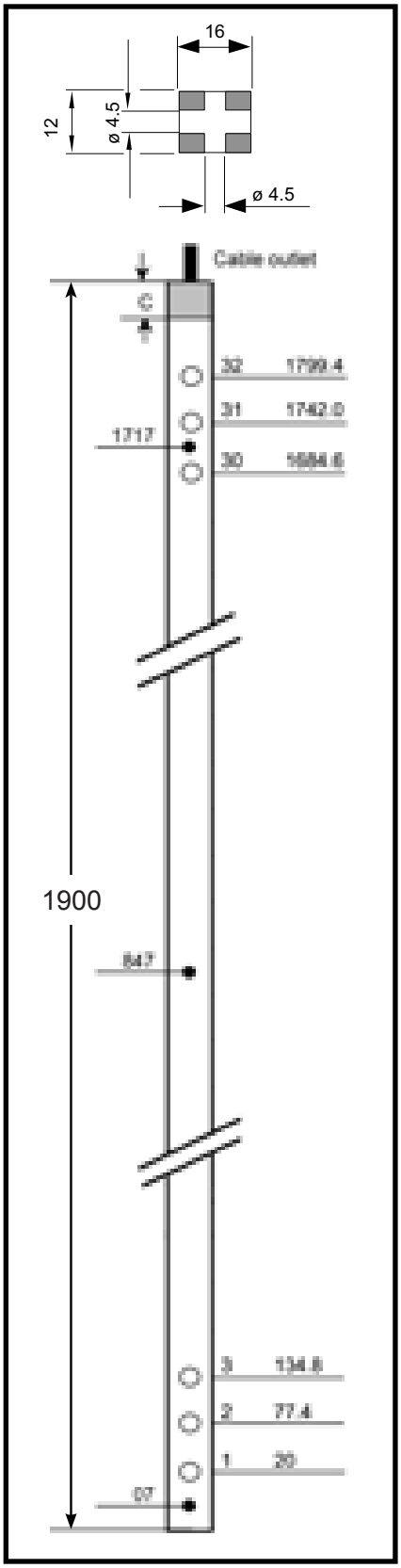
Troubleshooting

Problem	Solution
Intermitent Reversal / No Function	Clean Light Curtain Lenses
	Check to ensure that the Controller is properly grounded
	Check that the Light Curtain Connection Cables are not running beside High Voltage motor wires
	Check that the Plugs are securely fastened using the cable clamps provided. (Do Not tape plugs together)
	Check to ensure Receiver is not in direct sunlight. Swap the transmitter and receiver if the receiver is affected
	Check to ensure proper alignment. Please see line of site diagram on page 5.
	If Warning strobe lights are used in close proximity of receiver, relocate light or shield if possible.
Light Curtains Plugged in / No Reversal / No Closing	Verify that the +24 & RD wires are connected to the proper relay output contact. RD relay in Peelle controller must be on (no detection) and off for reversal.

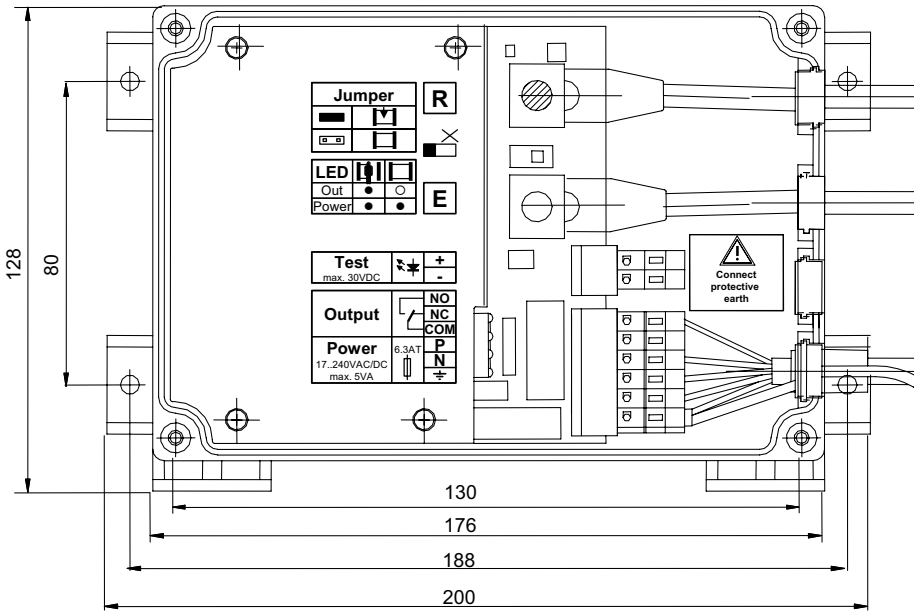
Cleaning of the sensor edges

The edges shall be cleaned with a soft tissue and little soap water only. Any use of abrasive or inappropriate cleaning solvents may cause loss of range or may damage the device.

Light Curtain Specifications



Parameter	Specification
The Protector (same specs for Dual Light Curtains)	4699 - NEMA1 (IP65) - 13 Ft Range With IP54 Control Unit
	4700 - NEMA1 (IP65) - 24 Ft Range With IP54 Control Unit
	4699M - NEMA4 (IP67) - 13 Ft Range With IP54 Control unit & IP67 moisture protection kit
	4700M - NEMA4 (IP67) - 24 Ft Range With IP54 Control unit & IP67 moisture protection kit
No. of light beams	32
Min. object size to be detected	57.4 mm (2.3 in) for 1800 mm edge
Response time	Max. 210 ms, typical 120 ms
Automatic detection of upward movement (door opening)	~ 100 ms; occurs when the lowest blocked beam transitions from obstructed to clear of obstruction
Power supply voltage	17 … 240 VAC / DC
Power consumption	6 VA 115 / 230 VAC, 130 mA / 24 VDC
Fuse	6.3 A (slow-to-blow, 250 V, measurement: 5 x 20 mm)
Relay output	250 VAC / 8 A, 30 VDC / 8 A (resistive load), min. 5 VDC / 10 mA
Test input	High 12 .. 30 VDC / Low 0 … 3 VDC
Temperature range	-20 ... +65°C
Max. door speed	1.08 m/s (3.54 ft/s) for 1800 mm edge
Vibration and shock resistance	IEC 68-2-29, IEC 68-2-6



Dimensions in mm

Maintenance and Inspection

1. Doors and gates shall be maintained in accordance with Peelle Detail Installation and Maintenance Guide 215 Section 19.
2. Maintenance and inspection of the light curtains system shall be performed on a monthly basis. More frequent maintenance may be necessary where car gates are subject to demanding environments of dust, corrosion, moisture, grease, chemical or other conditions.
3. Where necessary, the elevator should be taken out of service for maintenance following proper procedures by trained maintenance personnel.
4. Refer to Guide 215 Section 19 for gate rail, panel and operating component maintenance.
5. Ensure that each light curtain edge is properly secured to the gate rail according to the installation instructions.
6. Ensure that the beam blockers are securely fastened to the gate panel.
7. Ensure there is no debris affixed to the car gate panel or rails, for example plastic bags or other rubbish.
8. Check and clean the plastic lens filters on the edges to keep the system in optimum working condition.
9. Where provided, check the gate leading edge rubber astragal for wear or damage and replace if necessary. Make sure the astragal is properly seated in the holding extrusion.
10. Where pull straps have been provided for manual operation of power operated car gates, the pull strap should be removed to avoid interfering with the light curtain. If it is desirable to retain the pull strap, the strap shall be held in position above the leading edge of the car gate. An electric contact shall be provided that will break the contact, and prevent power operation of the car gate when the strap is removed from the held position for use. The contact shall be wired according to the car gate controller manual and wiring diagram.

Note to Maintenance:

The light curtain system represents an important safety device of the elevator and relies on integrity of all components. Should any part or function of the system be observed not to be in proper order, the elevator should be taken out of service until such time as the system is repaired.

PEELLE®

THE PEELLE COMPANY

FREIGHT DOORS | CAR GATES | CAR ENCLOSURES

TECHNICAL SUPPORT
1-800-787-5020 ext 275

NORTH AMERICAN SALES
sales@peelledoor.com

EXPORT SALES
exportsales@peelledoor.com