

## IMPORTANT WARNINGS TO READ BEFORE THE INSTALLATION

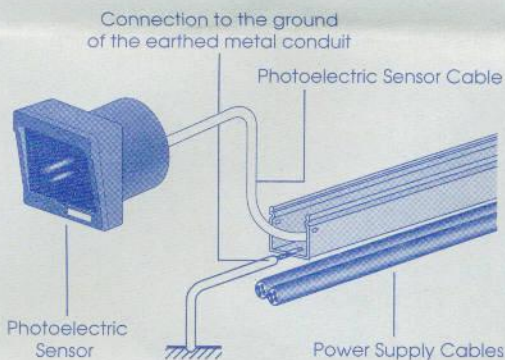


INFRA photoelectric barriers are devices that give an electric signal when an object passes through their sensing area. They are made of high quality materials and they are severely tested before being traded. However, should they be used in an application whose failure could cause damages, the following indications have to be taken into account:

- THE PHOTOELECTRIC BARRIER CAN BE USED AS A SENSOR TO DETECT THE PRESENCE OF AN OBSTACLE IF THE SENSING BEAM GETS INTERRUPTED. IN NO CASE THIS DEVICE CAN SUBSTITUTE THE OBLIGATORY SAFETY DEVICES THAT MUST BE APPLIED ON ALL DANGEROUS EQUIPMENTS.
- SHOULD THE BARRIER BE INSTALLED NEAR INVERTERS, SWITCHING SUPPLIERS OR SIMILAR, DO NOT FORGET THAT THESE DEVICES (IF NOT PROPERLY FILTERED) GIVE INTO THE POWER SUPPLY NET HIGH INTENSITY ELECTRIC DISTURBANCES THAT CAN INTERFERE WITH THE PHOTOELECTRIC BARRIER FUNCTIONING. THEREFORE, IN THESE CASES, IT IS NECESSARY TO PROVIDE UPSTREAM THE EQUIPMENT WITH AN ADEQUATE NET FILTER.

### CONNECTIONS

- 1) Do not exceed the voltage limits printed on the product label. For DC photoelectric sensors, use stable tension.
- 2) Do not connect the photoelectric sensors power supply cables downstream from other devices and make sure that they are directly connected to the mains.
- 3) If the power supply source is a switching voltage regulator, connect the FG (Frame Ground) terminal to the ground.
- 4) Connect to ground the FG (Frame Ground) terminal and all metallic parts of every industrial machinery or not if a photoelectric sensor is used in it.
- 5) Do not use the photoelectric sensors near electromagnetic or high frequency fields.
- 6) The cables of photoelectric sensors must be separate from the power supply cables, from the engines cables, from the inverters cables, or from any other electromagnetic device because induction noise could cause malfunction or damage to the photoelectric sensors. Separate the wires of the photoelectric sensor from the above indicated cables and then insert the wires into an earthed metal conduit.
- 7) After making all operations mentioned in the above point 6), if inductive interference exists, an adequate transient suppression filter must be used on the power supply line in proximity to the photoelectric sensors.
- 8) When a large distance by the connection wires to the sensor has to be covered, use conductors with a cross-section of at least 0.50 mm<sup>2</sup> and do not exceed the maximum distance of 100 m.
- 9) The output signal of a photoelectric sensor cannot be used during the "INITIAL ZERO SETTING" (not more than 300 mS, see detailed description on GENERAL CATALOG).



### ASSEMBLY

- 1) For correct assembly and alignment, all the accessories supplied with the sensor must be used.
- 2) To regulate the sensitivity adjustment trimmer use a suitable screw-driver without exerting excessive force.
- 3) Do not turn too much fixing screws or nuts to avoid electrical or mechanical damages.
- 4) When mounting photoelectric sensors side by side, leave an appropriate space between them to avoid mutual interferences or use photoelectric sensors equipped with synchronism system.
- 5) When installing two or more emitters and the receivers side by side, alternate the emitter with the receiver or install a light barrier to prevent reciprocal interferences. Avoid reflection coming from the side or back walls or objects.
- 6) Do not expose the photoelectric sensors to direct source of fluorescent light which could prevent the correct working. Do not exceed the immunity limits to external light.
- 7) Do not use organic solvents or corrosive liquids to clean the lenses of the photoelectric sensors. The optical parts must be cleaned with a soft cloth and then dried.
- 8) Do not use the sensors in open air without adequate protection.
- 9) Do not use the photoelectric sensors in dusty places, in presence of steam, gases, corrosive steams, corrosive liquids, rain or water jets. Do not let condensation form on the sensor lenses.
- 10) Do not exceed the indicated temperature limits.
- 11) Do not subject the appliance to strong vibrations or to shocks which can damage the sensor or can harm its impermeability.

### FURTHER INFORMATION

The manufacturer is not liable for the improper use of the product. Any use and/or application which are not provided for by this instructions sheet must be previously and directly authorized by the same manufacturer.

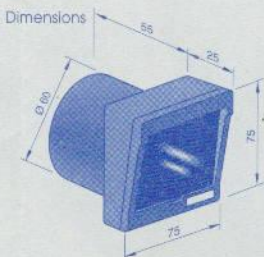
These photoelectric sensors are not safety devices, therefore they cannot be used to prevent injuries to persons, damages, industrial damages, accidents.

**Approved and homologated devices must be used for safety and accident prevention applications.**

## P40 PHOTOELECTRIC BARRIER FOR EXTERNAL APPLICATION

### TECHNICAL CHARACTERISTICS

- Double nylon-fibreglass housing.
- Anti-interference optical filter to improve the functioning in case of high luminosity.
- Modulated emitter with (Ga-Al-As) infrared LED.
- Green LED on the emitter. It indicates that the receiver is supplied.
- Yellow LED on the receiver. It indicates that the receiver is supplied. Once the tuning is performed, it switches off.
- 12 - 24 V AC/DC power supply
- 1A 24 VDC - 0.5A 120 VAC relay output according to EN 12978, EN 12453, EN 12445, EN 954-1 Cat. 2 norms, connected to the internal terminal board.
- Maximum switching distance in optimal conditions: 55 meters.
- Protection degree : IP54



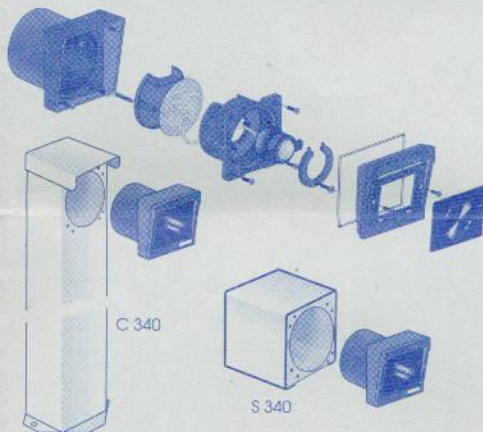
To open the housing insert a screw-driver in the suitable hole and remove the optical protection filter.



### INSTRUCTIONS FOR MOUNTING AND ALIGNMENT

- 1) Insert the external housings on a fixed support or mount them directly on the wall.
- 2) Before tuning, check that the emitter and the receiver supply voltage corresponds to the value printed on the device.
- 3) Remove emitter and receiver front protections and release the screws that fix the projectors.
- 4) Orientate manually the projectors one against the other pushing on the side flaps until the yellow LED on the receiver switches off. (WARNING: the green LED on the emitter must be switched on.)
- 5) Tighten the fixing screws of the mobile equipments both of the receiver and the emitter.
- 6) Check that the device is functioning using the suitable pierced TEST STRIP.
- 7) **WARNING: during the installation consider that in case of poor visibility due to fog, rain or other, the functioning distance can be highly reduced.**
- 8) All the provided accessories must be installed.
- 9) **The photoelectric barrier must be periodically tested by specialised technicians to prevent or to identify any possible failure.** Particularly:
  - Check the optical parts and make sure that they are always clean.
  - Verify the relay triggering and check also the electrical contacts.
  - Check the emitter-receiver alignment.
  - Check the fixing screws and that all the equipment does not bear mechanical vibrations.
- 10) **The non-observance of the above norms can cause the device failure.**

### DETAILED SIGHT AND SIGHT INCLUDING ACCESSORIES



### TESTING PROCESS FOR P40 AND P41

Connect in series on the emitter the test contact (terminal 1 or 2) to the supply

Test steps:

- 1) Without target open the test contact. 2) Wait for 3 seconds.
- 3) Check the change of the output status on the receiver. 4) Close the test contact.

### WIRING DIAGRAMS FOR P40 AND P41

#### SYNCHRONISM

This photoelectric thru beam permits to work in synchronism (without mutual interference) with another couple of P40 or P41-photoelectric thru beam. To activate the synchronic working, you must supply the photoelectric thru beam in AC and connect PHASE and NEUTRAL to the same clamps of the emitter and of the receiver.

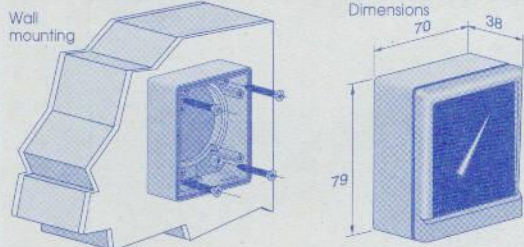
EXAMPLE: Emitter: 1 + Phase • 2 - Neutral  
Receiver: 4 + Phase • 5 - Neutral

If the photocells are supplied in DC, the synchronism function is not activated.

## P41 PHOTOELECTRIC BARRIER FOR EXTERNAL APPLICATION

### TECHNICAL CHARACTERISTICS

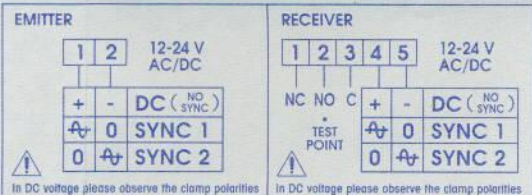
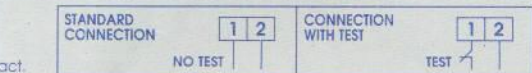
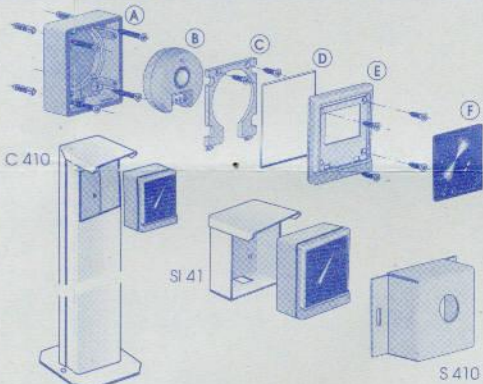
- Nylon-fibreglass housing for electronic components.
- Anti-interference optical filter to improve the functioning in case of high luminosity.
- Quick installation housings for flat surfaces with minimal drilling working.
- Modulated emitter with (Ga-Al-As) infrared LED.
- Green LED on the emitter. It indicates that the receiver is supplied.
- Yellow LED on the receiver. It indicates that the receiver is supplied.
- Once the tuning is performed, it switches off.
- 12 - 24 V AC/DC power supply
- 1A 24 VDC - 0.5A 120 VAC relay output according to EN 12978, EN 12453, EN 12445, EN 954-1 Cat. 2 norms, connected to the internal terminal board.
- Maximum switching distance in optimal conditions: 35 meters.
- Protection degree : IP54



### INSTRUCTIONS FOR MOUNTING AND ALIGNMENT

- 1) Fix the housing bottom to the wall using the suitable screws and dowels.
- 2) Insert the connection cable through the sleeve and the housing hole, then connect it to the terminal board according to the following instructions.
- 3) Before tuning, check that the emitter and the receiver supply voltage corresponds to the value printed on the device.
- 4) Insert the B projector in the location prepared on the A housing; then block with C projector fixing (see diagram).
- 5) Supply the emitter with power; the green LED must be always switched on.
- 6) Supply the receiver with power; the yellow LED must be switched on (once the tuning is performed, it switches off).
- 7) The alignment is achieved by orientating the optical groups one against the other, by pressing the projector surface (mounted on the ball joint) until the yellow LED on the receiver switches off.
- 8) Tighten the fixing screws of the mobile equipments both of the emitter and of the receiver.
- 9) Check that the device is functioning using the suitable pierced TEST STRIP.
- 10) Close the housing after inserting the D gasket into the A housing groove; fix the E front protection through the suitable screws and insert the F optical protection filter.
- 11) **WARNING: during the installation consider that in case of poor visibility due to fog, rain or other, the functioning distance can be highly reduced.**
- 12) All the provided accessories must be installed.
- 13) **The photoelectric barrier must be periodically tested by specialised technicians** to prevent or to identify any possible failure. Particularity:
  - Check the optical parts and make sure that they are always clean.
  - Verify the relay triggering and check also the electrical contacts.
  - Check the emitter-receiver alignment.
  - Check the fixing screws and that all the equipment does not bear mechanical vibrations.
- 14) **The non-observance of the above norms can cause the device failure.**

### DETAILED SIGHT AND SIGHT INCLUDING ACCESSORIES

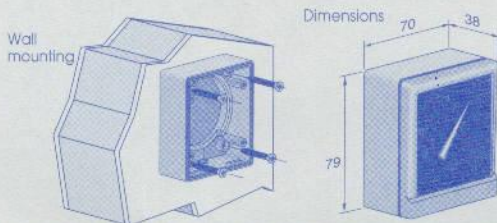


**ATTENTION:** in case you cannot detect the supply polarity (Phase/Neutral) and the couple of photocells, after being duly supplied, do not work, invert the power supply wires on one of the devices (on the EMITTER or on the RECEIVER).

## P44 PHOTOELECTRIC BARRIER FOR EXTERNAL APPLICATION

### TECHNICAL CHARACTERISTICS

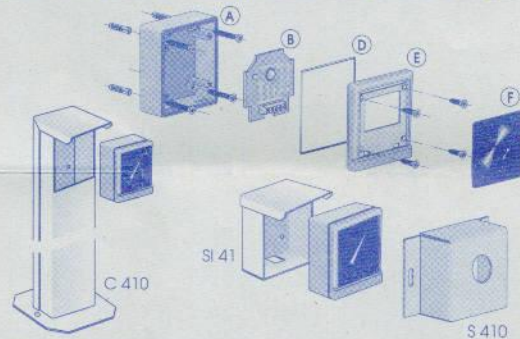
- Nylon-fibreglass housing for electronic components.
- Anti-interference optical filter to improve the functioning in case of high luminosity.
- Quick installation housings for flat surfaces with minimal drilling working.
- Modulated emitter with (Ga-Al-As) infrared diode.
- Green LED on the emitter. It indicates that the receiver is supplied.
- Green LED on the receiver. It indicates that the receiver is supplied.
- Yellow LED on the receiver. It is lighted when the alignment is not correct or in presence of obstacles. It is not lighted when the alignment is correct or in absence of obstacles.
- 12V AC-DC or 24V AC-DC selectable power supply.
- Emitter power supply : 9V alkaline battery.
- 1A 24 VDC - 0.5A 120 VAC relay output according to EN 12978, EN 12453, EN 12445, EN 954-1 Cat. 2 norms, connected to the internal terminal board. NC contact with aligned barrier.
- Maximum switching distance in optimal conditions: 15 meters. The reduced battery strength may strongly reduce the switching distance.
- Protection degree : IP54



### INSTRUCTIONS FOR MOUNTING AND ALIGNMENT

- 1) Fix the A housing to the wall using suitable screws and dowels.
- 2) Insert the connection cable through the sleeve and the A housing hole, then connect it to the terminal board according to the following instructions.
- 3) Apply the emitter battery and connect the sensitive edge contacts to the connectors 1 and 2 of the circuit. If the sensitive edge is not present, short-circuit the connectors 1 and 2 (in this case the green LED must flash). **Do not connect other supply sources to the connectors 1 and 2 or to the battery plug: the device could be irreparably damaged.**
- 4) Supply the receiver after being sure that the requested supply voltage has been obtained through the selector. Connect the contact 1 of the terminal board to the ground frame; the lighted green LED indicates that the receiver is supplied.
- 5) Align properly the emitter and the receiver: orientate the receiver around the emitter optical axis to determine the operation area and position it at its centre. When the alignment is done, the yellow LED is switched off.
- 6) Check that when an obstacle is between emitter and receiver the yellow LED lights and the output contact opens.
- 7) The receiver output must activate when an obstacle near the optic covers at least the 30 or 40 % of its surface. If the activation happens with a lower covering, the alignment must be improved.
- 8) Fix steadily the system.
- 9) Close the housing after inserting the D gasket inside the A housing; fix the E front protection through the suitable screws and insert the F protection filter.
- 10) **WARNING: during the installation consider that in case of poor visibility due to fog, rain or other, the functioning distance may be highly reduced.**
- 11) All the provided accessories must be installed.
- 12) **The photoelectric barrier must be periodically tested by specialised technicians** to prevent or to identify any possible failure. Particularity:
  - Check the optical parts and make sure that they are always clean.
  - Verify the relay triggering and check also the electrical contacts.
  - Check the emitter-receiver alignment.
  - Check the fixing screws and that all the equipment does not bear mechanical vibrations.
- 13) **The non-observance of the above norms can cause the device failure.**

### DETAILED SIGHT AND SIGHT INCLUDING ACCESSORIES



### TESTING PROCESS

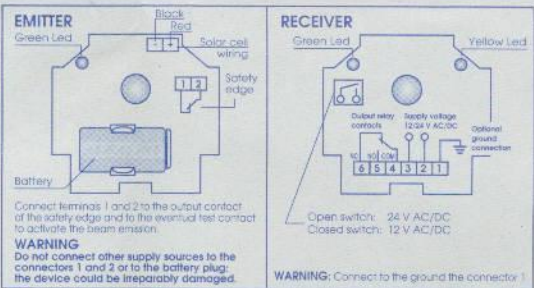
Connect in series on the emitter the test contact (terminals 1 AND 2) or, as alternative, to the safety edge contact.

Test steps:

- 1) Without target open the contact between terminals 1 and 2.
- 2) Wait for 3 seconds.
- 3) Check the change of the output status on the receiver.
- 4) Close the contact between terminals 1 and 2.



### WIRING DIAGRAMS



# BP SERIES PHOTOELECTRIC BARRIERS

## TECHNICAL CHARACTERISTICS

### AMPLIFIER

- ABS housing for electronic components.
- Sensitivity adjustment.
- Green LED. It indicates that the device is supplied.
- Yellow LED. It is lighted when the alignment is not correct or in presence of obstacles. It is not lighted when the alignment is correct or in absence of obstacles.
- 12V AC-DC or 24V AC-DC or 220V AC supply according to the model.
- 1A 24 VDC - 0.5A 120 VAC relay output according to EN 12978, EN 12453, EN 12445, EN 954-1 Cat. 2 norms, 8A 230 VAC relay for BP10220 model.
- Connection through the terminal board.
- Protection degree: IP50

### PROJECTORS

- Body and lenses : **metacrilate**.
- Quick "snap in" fixing system.
- 6 meters connection cable.
- Maximum functioning distance in optimal conditions: 10 meters.
- Protection degree : IP65

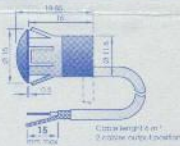
**WARNING: BP series projectors must be used only with INFRA amplifiers.**

### AMPLIFIER



(\*) The dimensions into brackets are related to BP10220, BP20 and BP30 models.

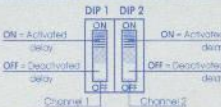
### PROJECTOR



## WAYS OF FUNCTIONING MOD. BP20 - BP30

### DELAY AT SENSOR DEACTIVATION

Operating on the suitable DIP SWITCHES it is possible to select on each channel a delay to the sensor deactivation. It permits to keep the sensor activated for about 1 second once the obstacle has passed the active area. Regulating the DIP SWITCHES ("DIP1" and "DIP2") in position ON, the delay is activated.

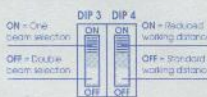


**WARNING:** the position of the DIP 4 must always remain on "OFF".

### ONE/DOUBLE BEAM SELECTION AND WORKING DISTANCE

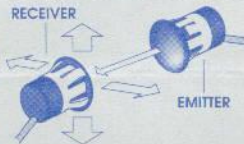
In case the barrier is used with just one emitter and one receiver, check that the selection DIP-SWITCH (DIP3) is in position ON. In case the barrier is used with two emitters and two receivers, check that the selection DIP-SWITCH (DIP3) is in position OFF.

In order to reduce the working (switching) distance to 50% set the dip switch "DIP 4" in position ON.



### MOUNTING AND ALIGNMENT INSTRUCTIONS

- 1) Install the emitter and the receiver one against the other inside the indicated switching distance.
- 2) Connect the projectors to the amplifier.
- 3) Supply the amplifier (green LED lighted).
- 4) Align properly the emitter and the receiver: orientate the receiver around the emitter optical axis to determine the switching area and position it at its centre.
- 5) Check that when an object is between the emitter and the receiver the status LED indicator lights.
- 6) The photoelectric sensor must activate when an obstacle, near the receiver, covers at least 30 or 40% of its surface. If the activation happens with a lower covering, the alignment must be improved.
- 7) Fix steadily the system.
- 8) **WARNING :** during the installation consider that in case of poor visibility due to fog, rain or other, the functioning distance may highly be reduced.
- 9) All the provided accessories must be installed.
- 10) **The photoelectric barrier must be periodically tested by specialised technicians** to prevent or to identify any possible failure. Particularly:
  - Check the optical parts and make sure that they are always clean.
  - Verify the relay triggering and check also the electrical contacts.
  - Check the emitter-receiver alignment.
  - Check the fixing screws and that all the equipment does not bear mechanical vibrations.
- 11) **The non-observance of the above norms can cause the device failure.**



### TESTING PROCESS

Put in series a NC contact to the projector cable of the transmitter. For mod. BP30 connect one test contact for each projector.

**WARNING:** use a bipolar shielded cable (max. recommended length 500 mm) and connect it as per the drawing.

Test steps:

- 1) Without target open the contact.
- 2) Wait for 3 seconds.
- 3) Check the change of the output status.
- 4) Close the contact.

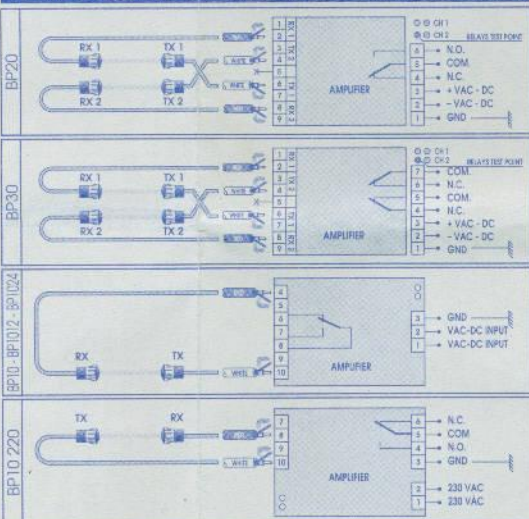
### STANDARD CONNECTION



### CONNECTION WITH TEST



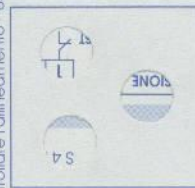
## WIRING DIAGRAMS



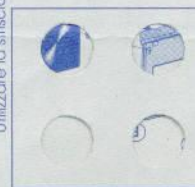
STRISCIA DI PROVA - TEST STRIP



0 - 5 m



5 - 10 m



10 - 15 m

The products are in conformity with 89/536/CEE (concerning electro-magnetic compatibility) and 73/23/CEE (concerning the electrical material bound to be used within certain voltage limits) directives.



For the latest updated specifications see our web-site: [www.infracom.com](http://www.infracom.com)



For all the products bearing this mark

**WARRANTY:** INFRA equipment is covered by a 24 months warranty during which any defective part will be substituted, afterwards, if our examination's response will indicate that the defect has been caused by improper use, all costs will be borne by the customer himself. Instructions may be submitted to modifications. No part of it may be reproduced. INFRA reserves the right to modify dimensions and text at any time without prior notice.

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