# AVS ELECTRONICS

Curtarolo (Padova) Italy
www.avselectronics.com

## MICROWAVE BEAMS
## FOR INDOOR AND OUTDOOR USE

# BM 60 M
# BM 120 M
# BM 200 M
# BM60M WS


*A COMPANY WITH*
*CERTIFIED SYSTEM*
*OF QUALITY*
**ISO9001**

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CE The product is in conformity to the CE Directive for electromagnetic compatibility

Supplying must come from a very low security-tension circuit, featuring a limited-power source protected by fuse.

**THE INSTALLATION MUST BE EXECUTED BY QUALIFIED PERSONNEL**

# *MICROWAVE BEAM*

Models **BM60M, BM120M, BM200M and BM60M WS** are microwave intrusion detection systems, whose principle of working is the “field-interruption”.Thanks to the microprocessor managing the signals, they are the ideal instruments for protecting big surfaces, both indoor and outdoor, thus granting a high security standard.

## Chapter 1: General Description

The system is made by a Transmitter and a Receiver **which must be installed as a couple, choosing the same working frequency among the 5 available, in both units (tx and rx)** , through SW1 (4 dip-switch module) on board.

### Compatibility with existing models

In case of replacement, choose the same frequency on the beam to be replaced (F1 by F1, F3 by F3 etc.). In order to identify the corresponding frequency, use the chart “BEAMS CHANNELS”

### Filter of selection and compensation

Any receiver is equipped with a selection filter choosing only the frequency of its channel and rejecting the others, thus not making possible the elusion of the beam in case of use of a false transmitter. Special self-adjusting and signal-elaboration circuits have been used in the receiver for automatic compensation of temperature variations.

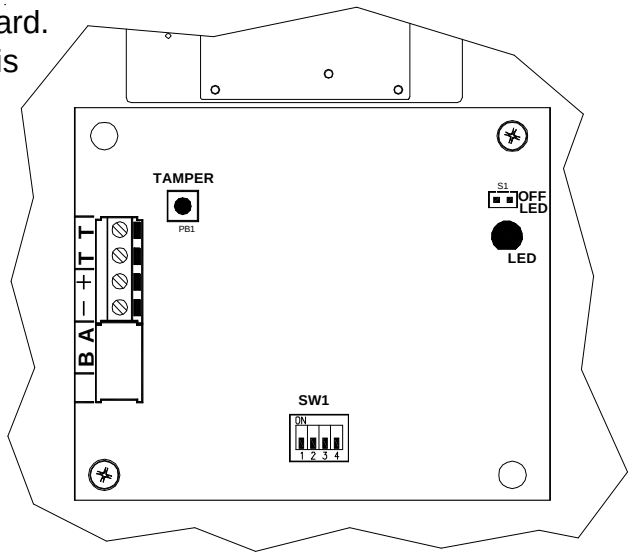
### Detection Area

The shape of the irradiation area is very well defined and this allows a higher possibility of detection and a reduction of false alarms risk.
These beams are manufactured exclusively with solid-state components and are tropicalyzed in order to obtain a very good seal against weather conditions.

## Chapter 2: Transmitter

The transmitter is made of a planar microwave emitting a narrow and directional higly-stable low power beam.
A 4-dip-switch for setting working frequency is on board.
Check that the transmitter working frequency set is the same as in the receiver coupled

| BM M CHANNELS | DIP 1 | DIP 2 | DIP 3 | DIP 4 | BM Q PLUS CHANNELS |
|---|---|---|---|---|---|
| **F1** | ON | OFF | OFF | OFF | **GOLD** |
| **F2** | OFF | ON | OFF | OFF | **BLUE** |
| **F3** | OFF | OFF | ON | OFF | **SILVER** |
| **F4** | OFF | OFF | OFF | ON | **YELLOW** |
| **F5** | OFF | OFF | OFF | OFF | **-** |

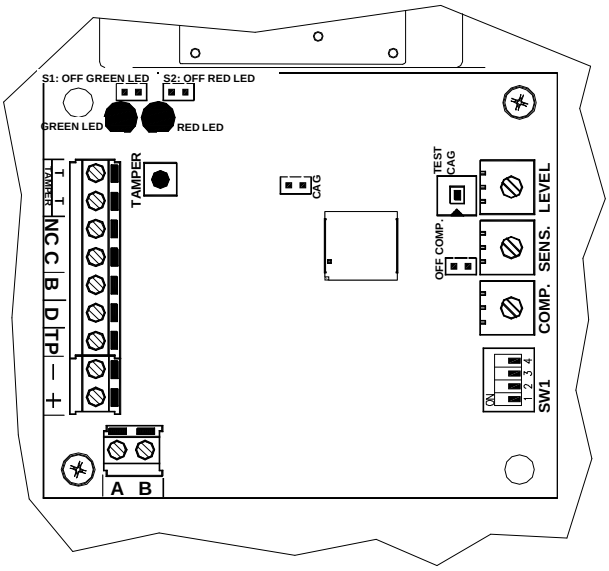



| | | |
|---|---|---|
| **-** | | supplying negative 12 V ⎓ |
| **+** | | supplying positive 12 V ⎓ |
| **T T** | | n.c. output for protection agaist detector opening |
| **S1** | closed<br>open | supplying Led enabled<br>supplying Led disabled |

## Chapter 3: receiver of hard-wired systems BM60M, BM120M, BM200M

The receiver is made of a high-sensitivity electronic circuit coupled to the antenna; it detects the signal transmitted in its channel and measures its intensity. Special techniques of signal-elaboration allow to compensate the variations in the sorroundings and to minimize the effect of possible perturbations due to small animals or birds.
A 4 dip-switch is on board for setting working frequency

| BM M CHANNELS | DIP 1 | DIP 2 | DIP 3 | DIP 4 | BM Q PLUS CHANNELS |
|---|---|---|---|---|---|
| **F1** | ON | OFF | OFF | OFF | **GOLD** |
| **F2** | OFF | ON | OFF | OFF | **BLUE** |
| **F3** | OFF | OFF | ON | OFF | **SILVER** |
| **F4** | OFF | OFF | OFF | ON | **YELLOW** |
| **F5** | OFF | OFF | OFF | OFF | **-** |




Check that the working frequency of the receiver is the same as set in the transmitter coupled.

**Terminal Board**

| | |
|---|---|
| **-** | supplying negative 12 V ⎓ |
| **+** | supplying positive 12 V ⎓ |
| **D** | output of Disqualification signal; it gives a transistorized negative (50 mA max.)during quiet condition.This negative fails in case the signal of the transmitter is not received within 30sec |
| **TP** | positive output of Test Point for visualization of the signal received |
| **B** | positive input: 12 V ⎓ for stand-by; giving a positive to this terminal, the alarm relay blocks in quiet condition |
| **C / NC** | n.c.. exchange of alarm relay |
| **T T** | n.c. output for protection against detector opening |
| **A B** | serial door for connection of remote panel |

**Trimmer**

| | |
|---|---|
| **LEVEL** | trimmer for adjusting the signal received |
| **SENS.** | trimmer for adjusting sensitivity; it increases by turning clockwise |
| **COMP.** | trimmer for adjusting compensation; it increases by turning counter-clockwise |

**Jumpers**

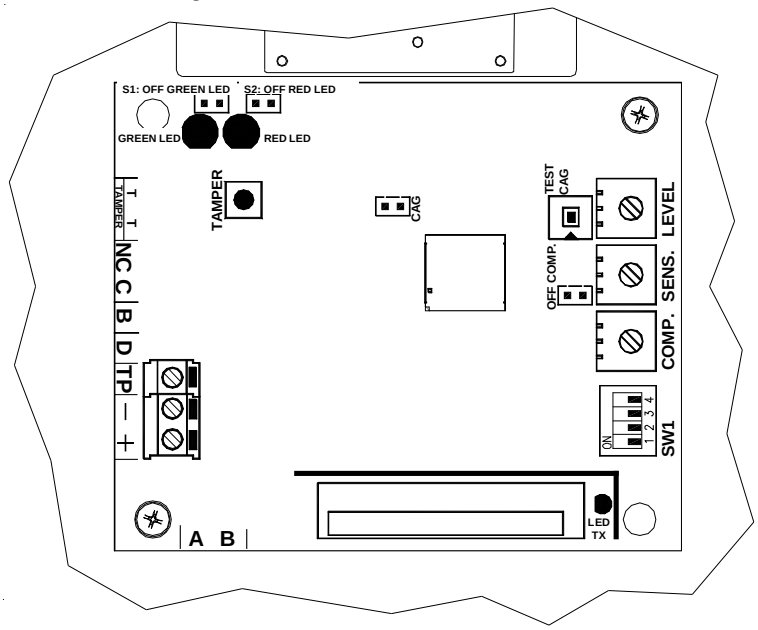
| | | | |
|---|---|---|---|
| **S1** | closed<br>open | green Led of signal-quality of microwave, enabled<br>green Led of signal-quality of microwave, disabled | default |
| **S2** | closed<br>open | red Led of alarm signalling, enabled<br>red Led of alarm signalling, disabled | default |
| **OFF COMP** | closed<br>open | compensation circuit included<br>compensation circuit excluded | default |
| **CAG** | closed | **this jumper must remain closed** | |

## Chapter 4: Receiver of the wireless system BM60M WS

The receiver has the same characteristics as the hard-wired models, with a few differences:

- the 4-ways dip-switch on board adjusts both working frequency and the zone address set. If, e.g., the beam is addressed on frequency F2 (dip 1,3,4 in OFF and dip 2 in ON), it is automatically acquired as detector 2. **It is not possible to select the working frequency and the zone address in the control panel, in a separate way.**

| BM_M CHANNELS | DIP 1 | DIP 2 | DIP 3 | DIP 4 | ADDRESS |
|---|---|---|---|---|---|
| **F1** | ON | OFF | OFF | OFF | **1** |
| **F2** | OFF | ON | OFF | OFF | **2** |
| **F3** | OFF | OFF | ON | OFF | **3** |
| **F4** | OFF | OFF | OFF | ON | **4** |
| **F5** | OFF | OFF | OFF | OFF | **5** |




- the terminals on board are the supplying (+ and -) an the signal reading (TP)
- the alarm transmission occurs for both movement detection inside a pattern and protracted absence of the signal received (disqualification): the restore transmission occurs a few seconds after the signal is restored in the limits preset.

**Check that the working frequency of the receiver is the same as the frequency set on the transmitter coupled.**

### Terminal Board

| | |
|---|---|
| **-** | supplying negative 12 V ⎓ |
| **+** | supplying positive 12 V ⎓ |
| **TP** | positive output of Test Point for visualization of the signal received |

### Trimmer

| | |
|---|---|
| **LEVEL** | trimmer for adjusting the signal received |
| **SENS.** | trimmer for adjusting sensitivity; it increases by turning clockwise |
| **COMP.** | trimmer for adjusting compensation; it increases by turning counter-clockwise |

### Jumpers

| | | | |
|---|---|---|---|
| **S1** | closed<br>open | green Led of signal-quality of microwave, enabled<br>green Led of signal-quality of microwave, disabled | default |
| **S2** | closed<br>open | red Led of alarm signalling, enabled<br>red Led of alarm signalling, disabled | default |
| **OFF COMP** | closed<br>open | compensation circuit included<br>compensation circuit excluded | default |
| **CAG** | closed | **this jumper must remain closed** | |

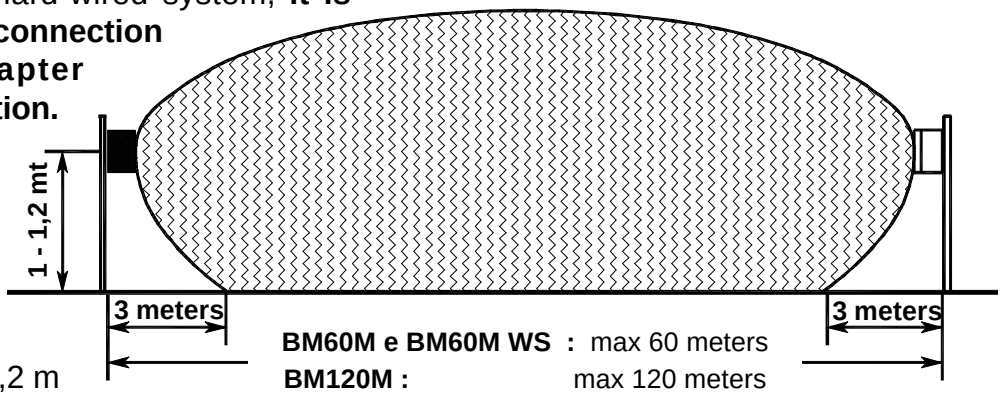
## Chapter 5: Description of working

The two units (transmitter: TX and receiver: RX) must be positioned facing each other at the two ends of the distance to protect. **Be aware that the nature of the ground underneath, or special weather conditions might affect the real range.**

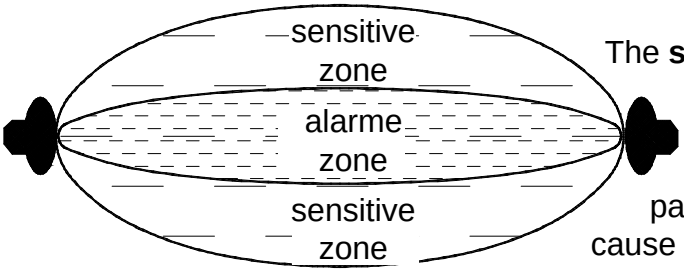
### Working

The transmitter emits a modulated microwave signal (10,525 GHz), which is received by the receiver and whose amplitude is compared with the programmed alarm threshold.
When an intruder crosses the microwave area, it causes a signal-intensity decrease under a minimum level fixed; the receiver shows the alarm condition, lighting up a red Led indicator and opening the contat of the alarm relay.
If the signal of the transmitter is not received for over 30 seconds, the alarm relay could go back to quiet condition and the negative to terminal D (disqualification) fails until signal restoring.
For this reason, in the hard-wired system, **it is suggested to make the connection described in the chapter concerning disqualification.**

The drawings identify the natural shadow areas in the immediate sorroundings of the two units, which extend for about 3 meters, in a typical installation at 1 - 1,2 m height.

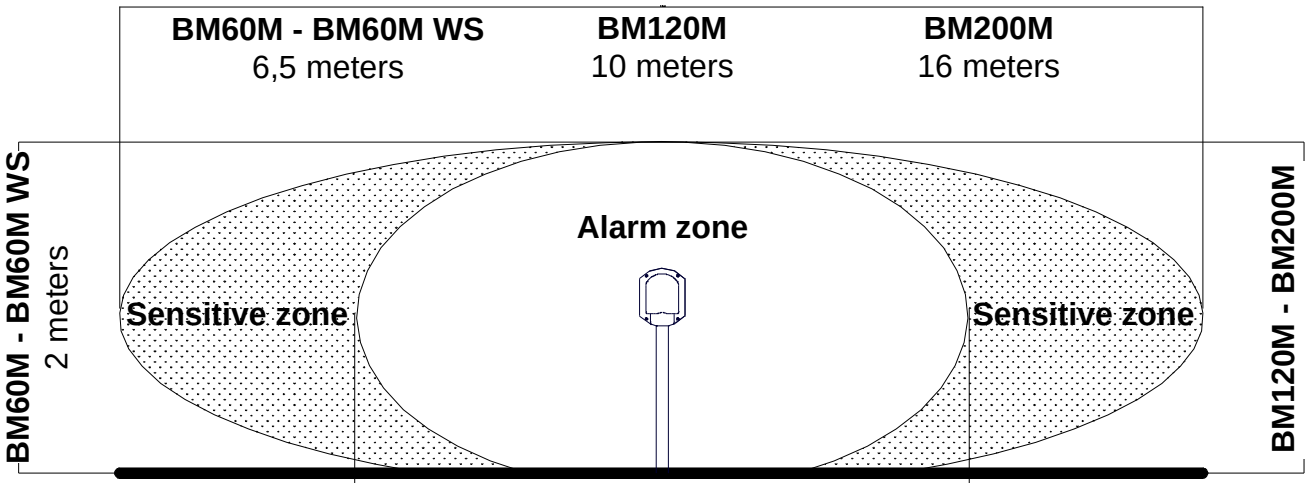



**BM60M e BM60M WS :** max 60 meters
**BM120M :** max 120 meters
**BM200M :** max 200 meters




The **sensitive zone** shown in the drawings is to be taken into consideration, as a big target. Overpassing this area might cause the same perturbations as a small body passing the alarm area, that's to say might cause false alarms.

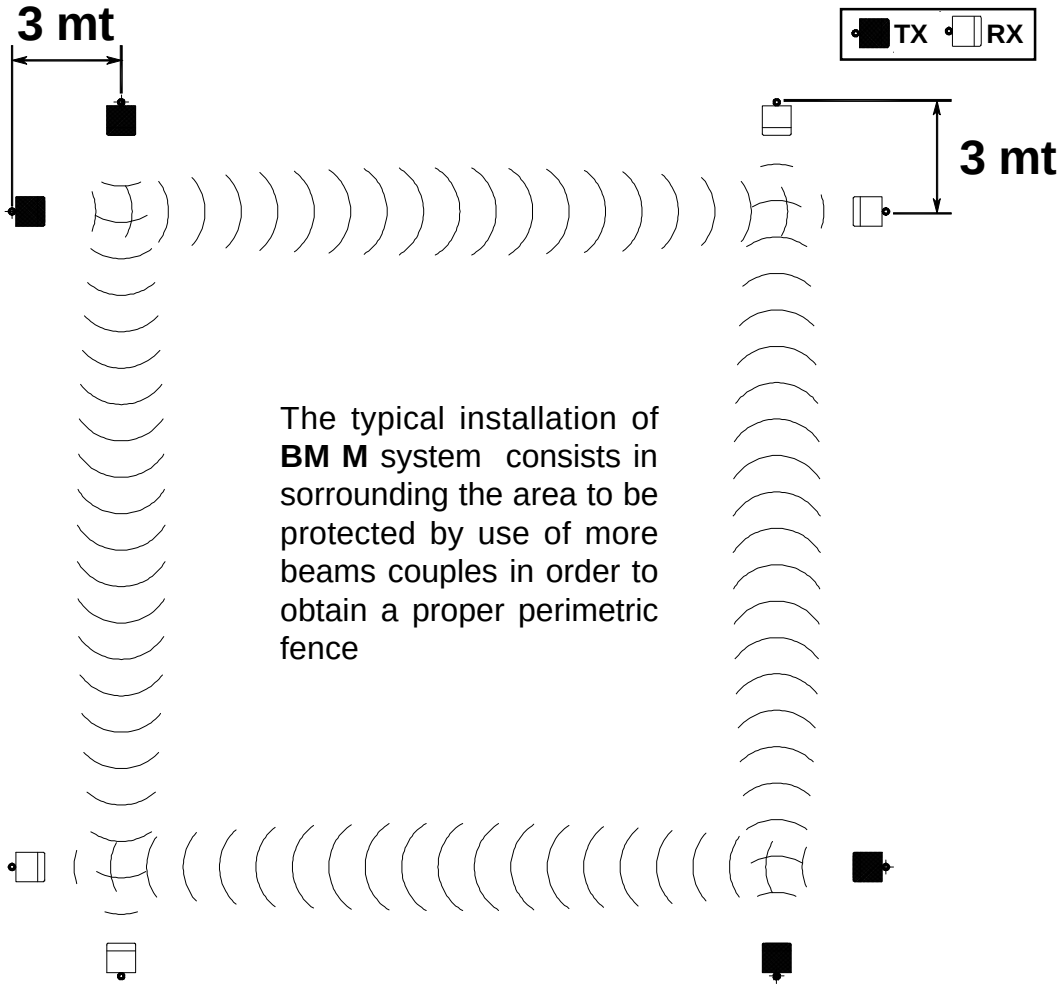
**Note: the diagrams of the patterns shown in the drawings are an indication and a guide during installation. They do not represent the real radiation diagram of the antennas as they may be subject to variations due to environmental context.**



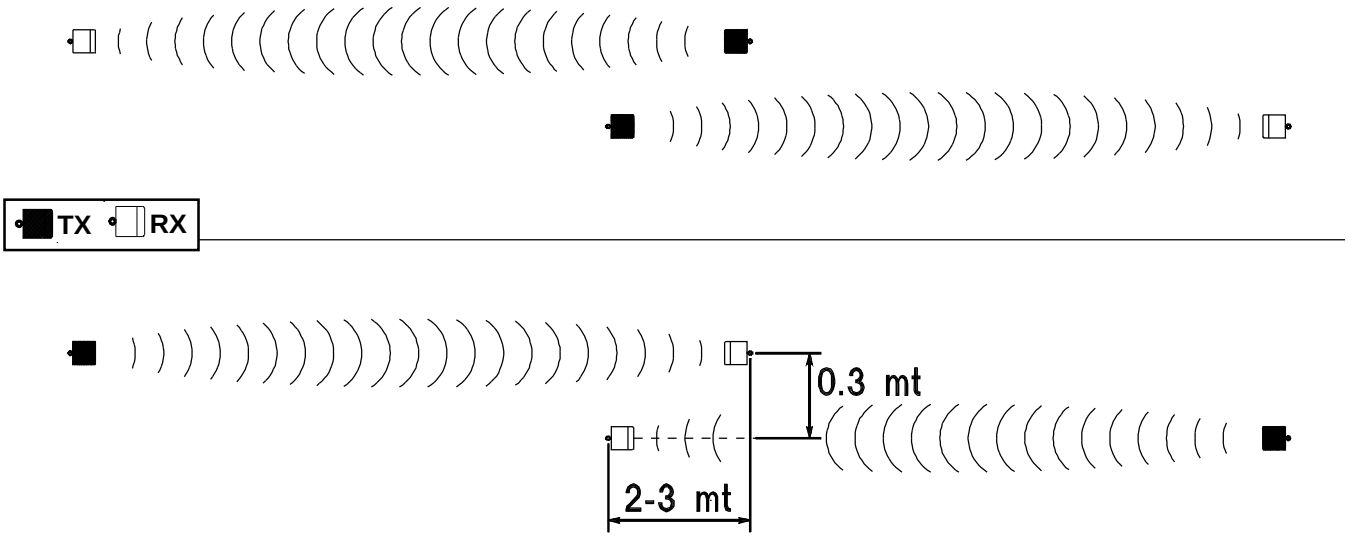

**BM60M - BM60M WS** 1,2 meters
**BM120M** 3 meters
**BM200M** 4 meters

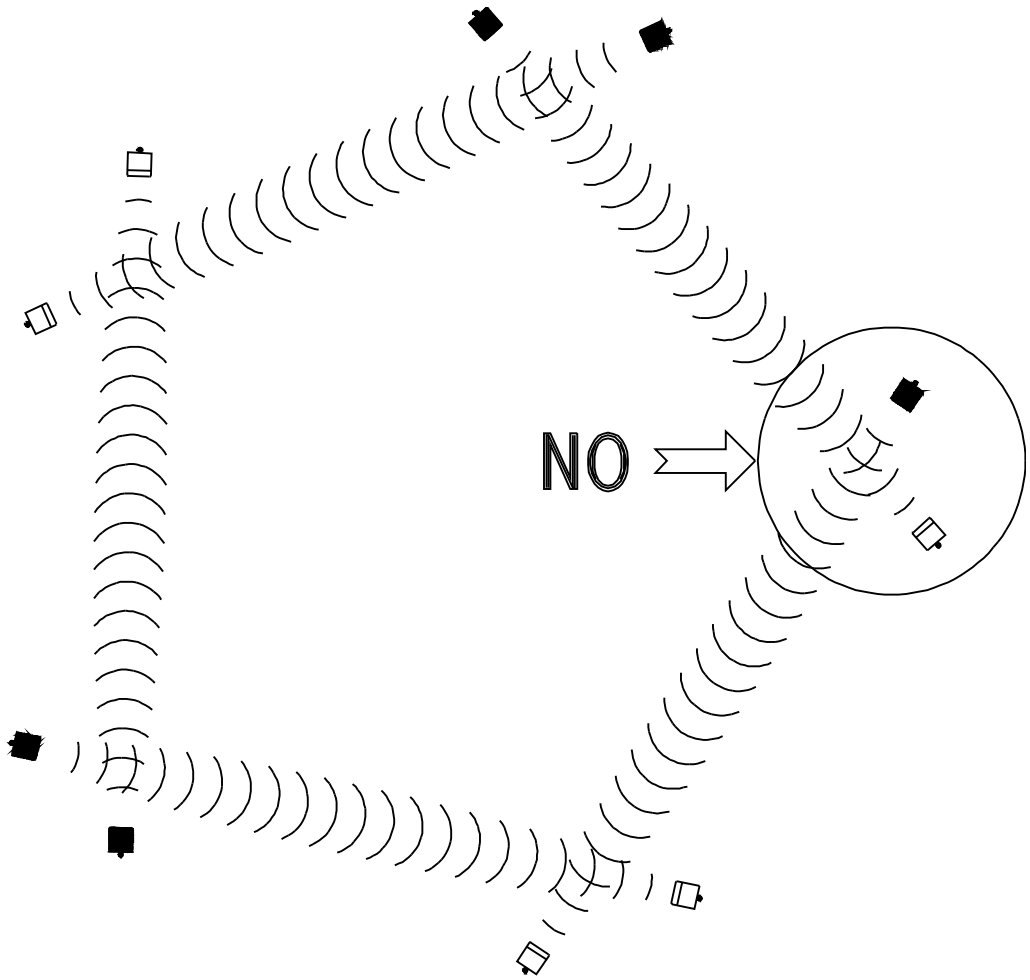
## Chapter 6 : Positioning of the beams

For a correct installation of the system, choose carefully the positioning of the two units, according to following advice:

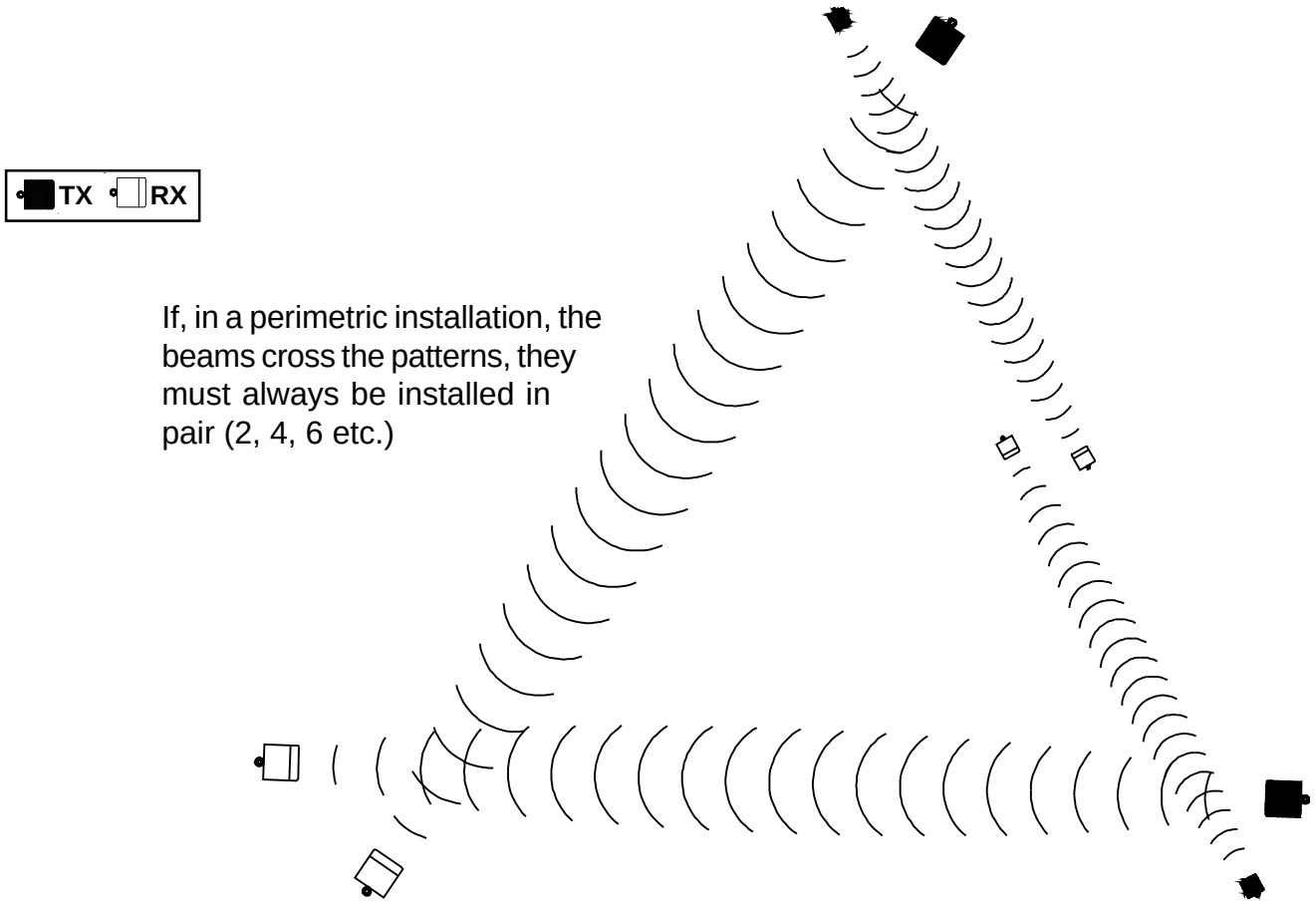



Drawings identify the correct positioning of transmitters and receivers, in order to eliminate any possible shadow area.
The drawings here below show how one or more couples of beams have to be positioned for reaching the distance required.
**BE CAREFUL: only elements with different frequencies (F1, F2, F3, F4, F5) and of the same type (TX/TX or RX/RX) can be installed in proximity one to the other; in order to avoid interferences between transmitters and receivers belonging to different couples.**



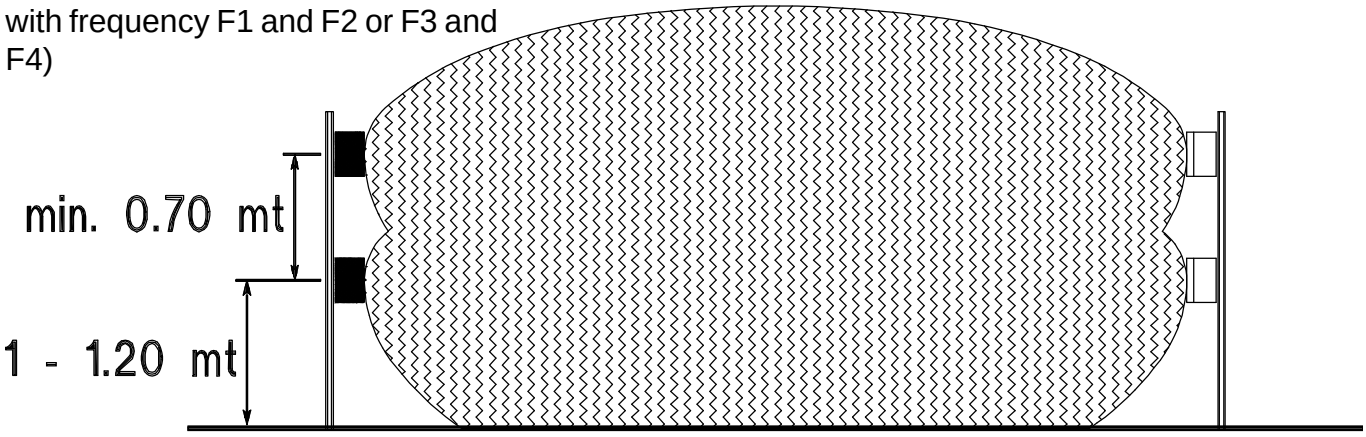



It is absolutely necessary to avoid installing a transmitter near a receiver belonging to another couple

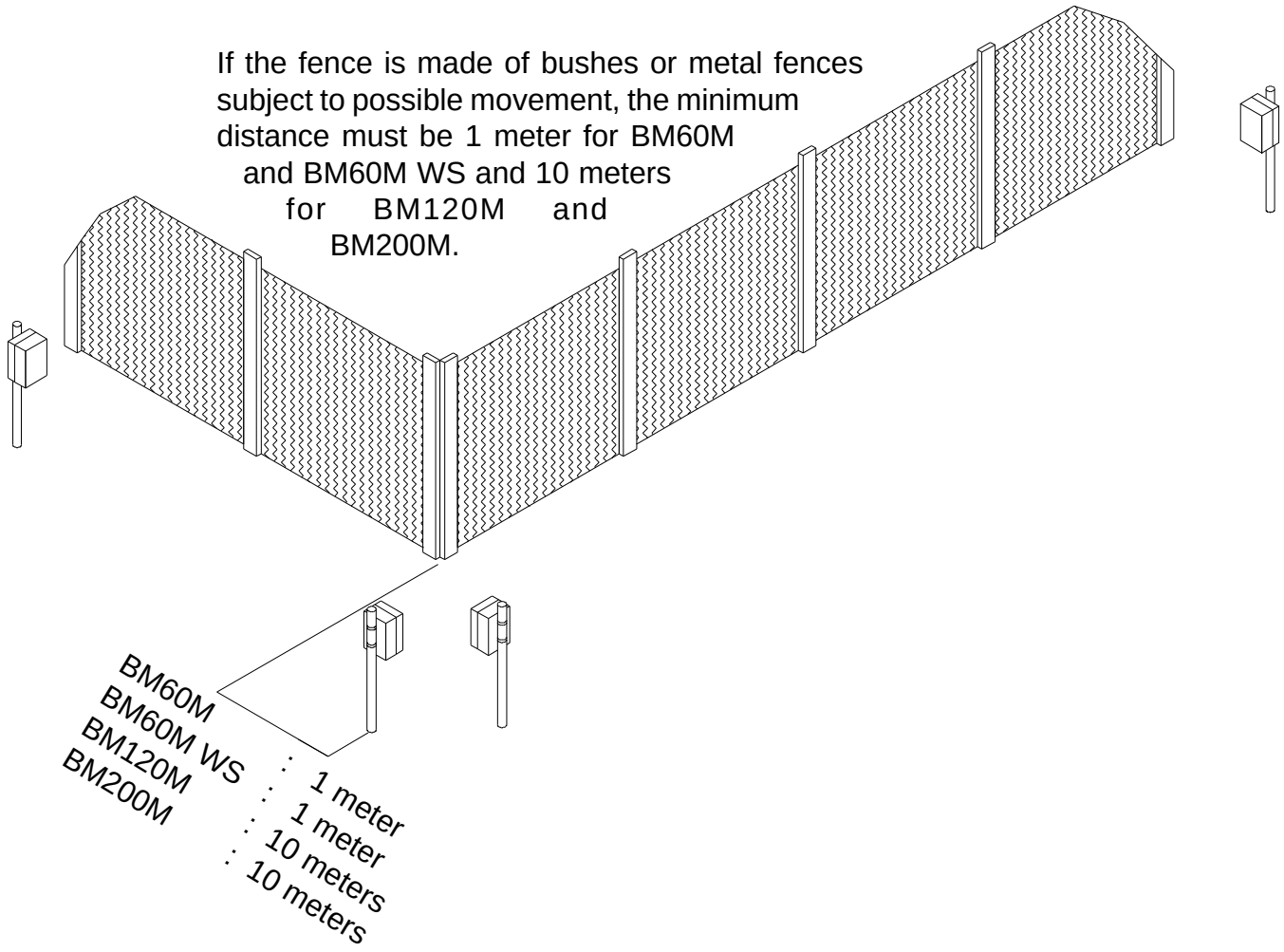



If, in a perimetric installation, the beams cross the patterns, they must always be installed in pair (2, 4, 6 etc.)

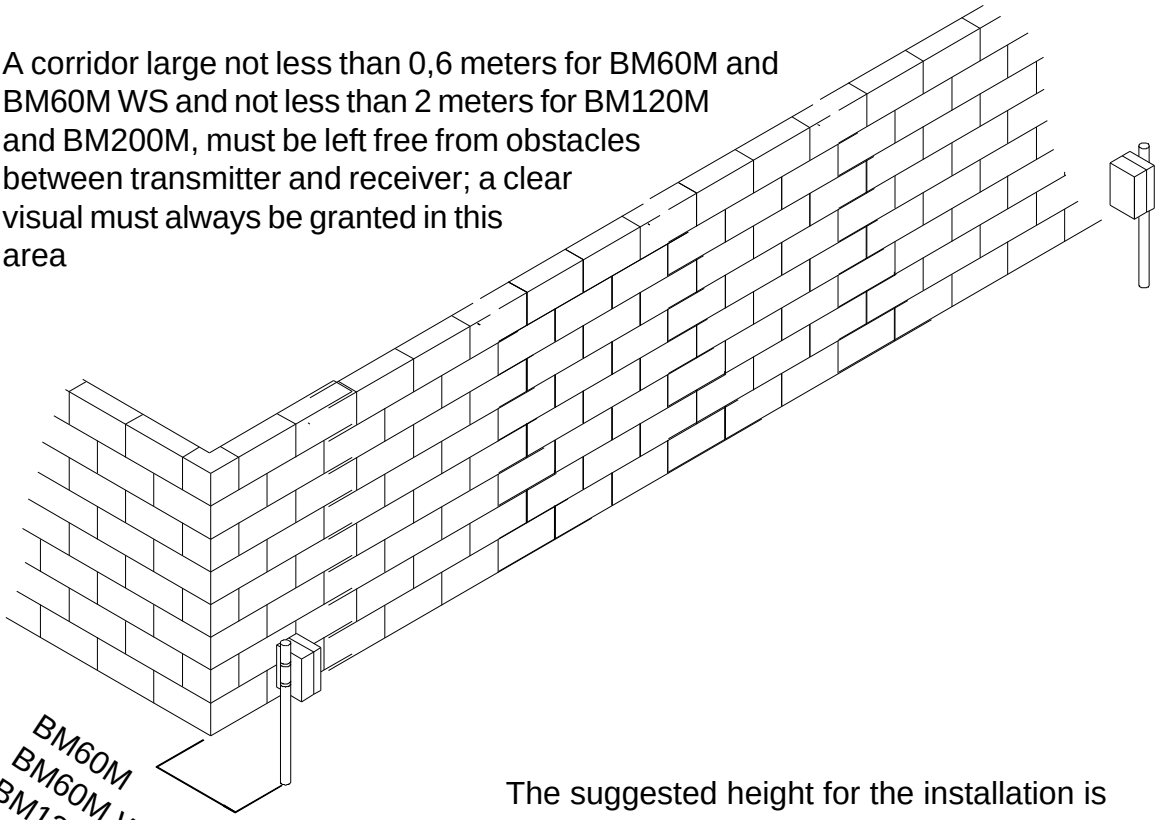
In order to extend the height of the protection, two couples of beams can be installed as shown in the picture. In this case, **it is suggested to use couples of beams having close working frequency** (two couples with frequency F1 and F2 or F3 and F4)




If the fence is made of bushes or metal fences subject to possible movement, the minimum distance must be 1 meter for BM60M and BM60M WS and 10 meters for BM120M and BM200M.

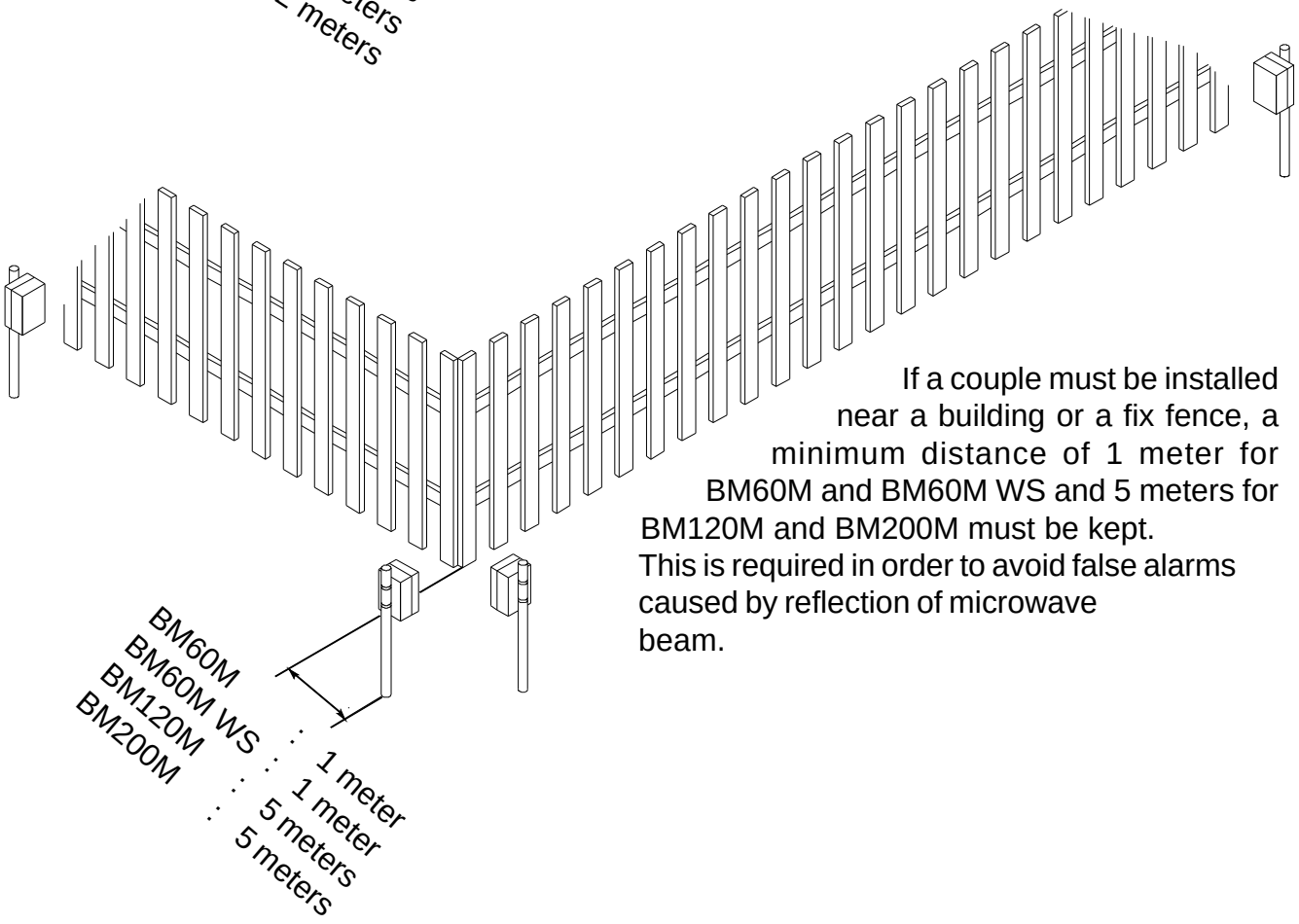


A corridor large not less than 0,6 meters for BM60M and BM60M WS and not less than 2 meters for BM120M and BM200M, must be left free from obstacles between transmitter and receiver; a clear visual must always be granted in this area



BM60M : 0,6 meters
BM60M WS : 0,6 meters
BM120M : 2 meters
BM200M : 2 meters

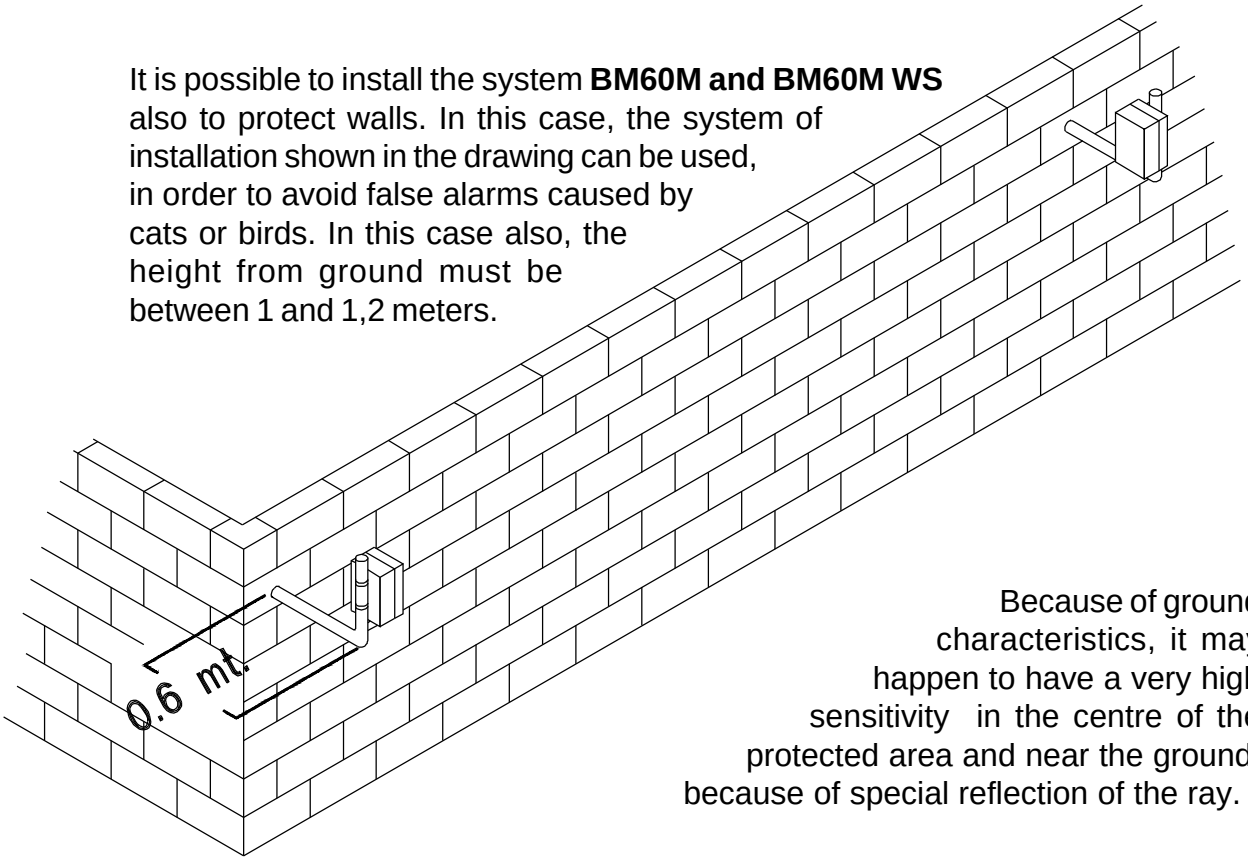
The suggested height for the installation is between 1 and 1,2 meters.



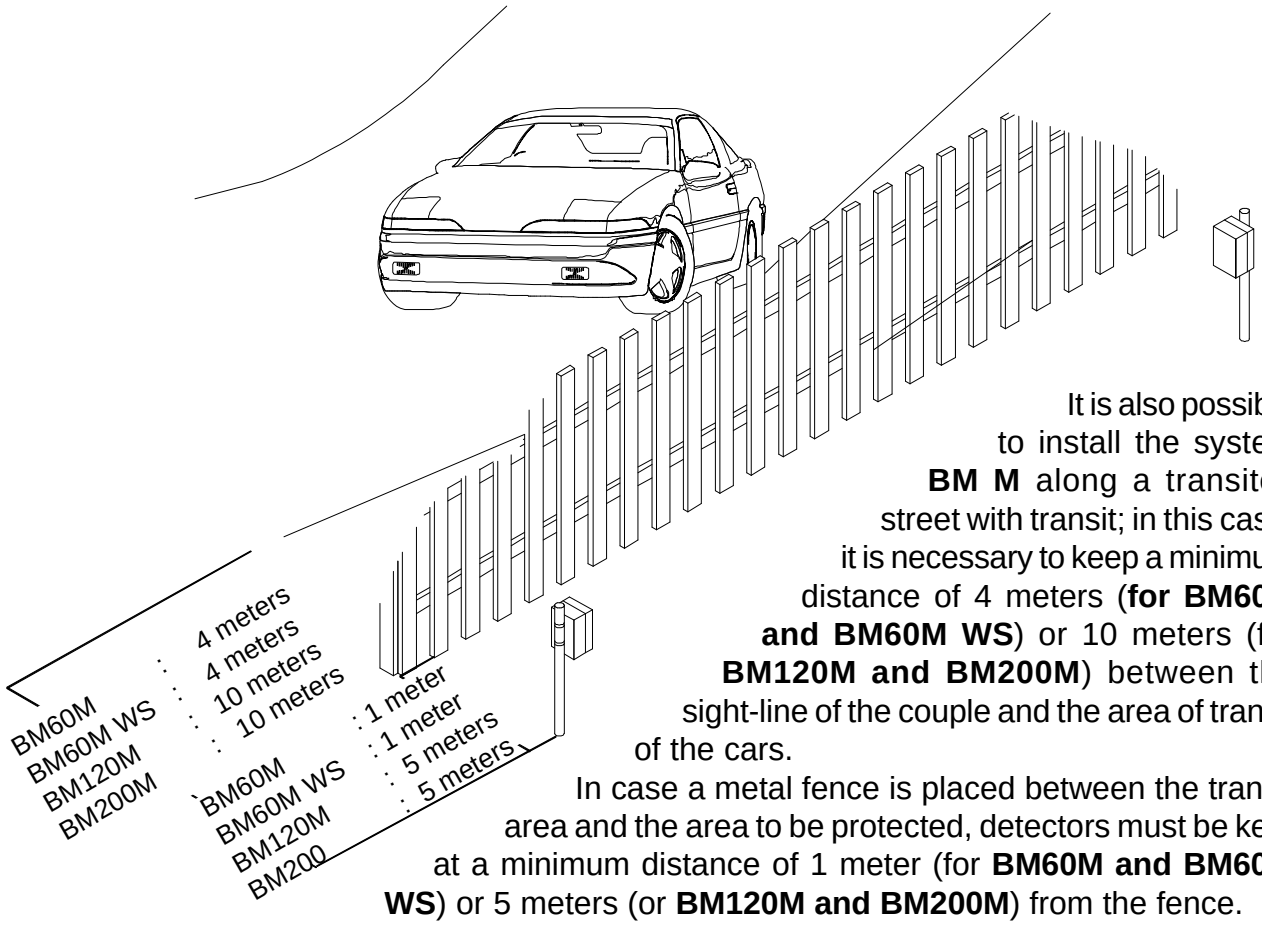
If a couple must be installed near a building or a fix fence, a minimum distance of 1 meter for BM60M and BM60M WS and 5 meters for BM120M and BM200M must be kept.
This is required in order to avoid false alarms caused by reflection of microwave beam.

BM60M : 1 meter
BM60M WS : 1 meter
BM120M : 5 meters
BM200M : 5 meters

It is possible to install the system **BM60M and BM60M WS** also to protect walls. In this case, the system of installation shown in the drawing can be used, in order to avoid false alarms caused by cats or birds. In this case also, the height from ground must be between 1 and 1,2 meters.



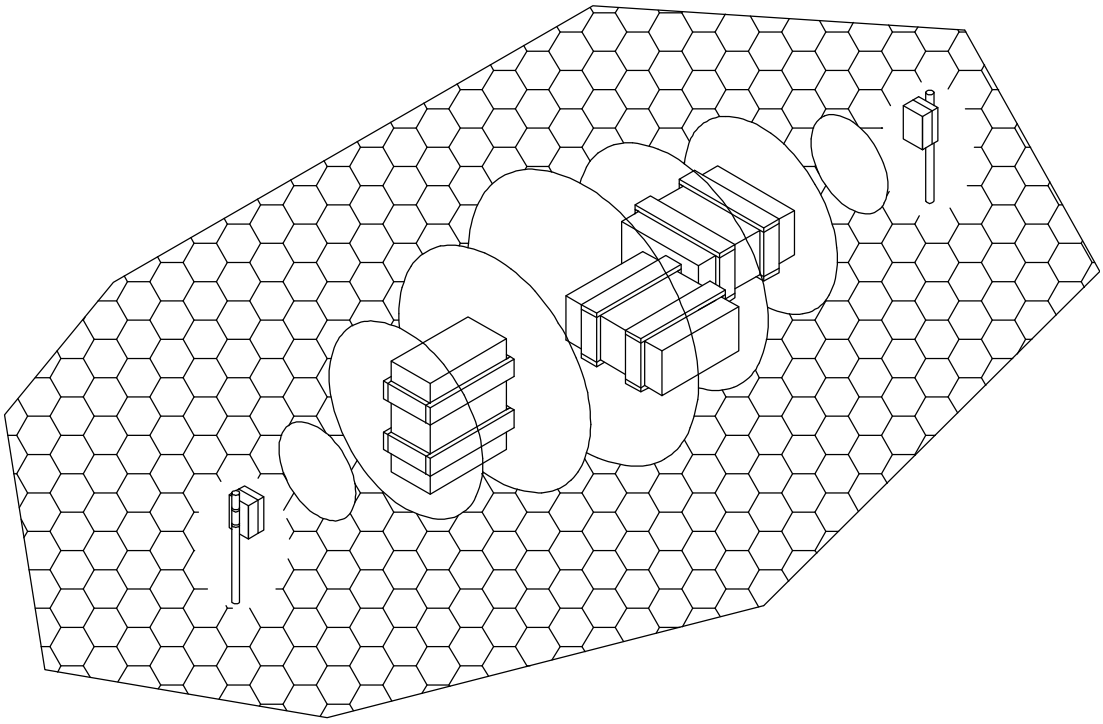

Because of ground characteristics, it may happen to have a very high sensitivity in the centre of the protected area and near the ground, because of special reflection of the ray.




It is also possible to install the system **BM M** along a transited street with transit; in this case, it is necessary to keep a minimum distance of 4 meters (**for BM60M and BM60M WS**) or 10 meters (for **BM120M and BM200M**) between the sight-line of the couple and the area of transit of the cars.

In case a metal fence is placed between the transit area and the area to be protected, detectors must be kept at a minimum distance of 1 meter (for **BM60M and BM60M WS**) or 5 meters (or **BM120M and BM200M**) from the fence.

- Should any pet be present and free in the installation area, it is suggested to carefully adjust sensitivity, in order to avoid the risk of false alarms due to the passage of these small targets in the areas which are very sensitive at the ground. To further decrease this risk, the height of installation of the couple can be increased a little bit.
- Should trees or bushes affect the protection corridor because of the wind, false alarms might occur. In the same way, if the system is installed near a hedge, this one must be carefully attended to avoid darkening the protected area.
- High grass ad bushes decrease sensitivity at groud level.
- Any obstacle or important difference of level in the ground in the protected area, create shadow-areas and very sensitive zones.

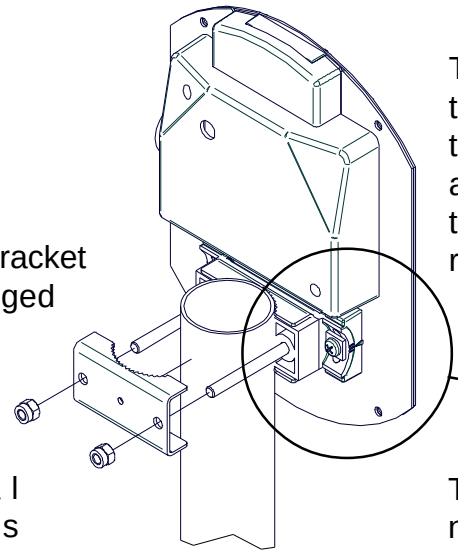


The **BM M** system has a good tolerance against bad weather conditions and temperature variations; nevertheless it is necessary to care for following situations:

- **RAIN:** strong rain only causes a decrease of signal power whilst water puddles may increase sensitivity at ground level
- **SNOW:** snow fall does not affect beams sensitivity, but the system cannot work if it is entirely covered by the snow; so take care in areas with frequent and abundant snow
- **FOG:** a very thick fog can decrease the signal for 1/3. Because of the limits of compensation of the gain automatic control (C.A.G.) , it is suggested to install the beams couple at a distance not exceeding 85% of max range,in the regions where a thick fog is frequent.

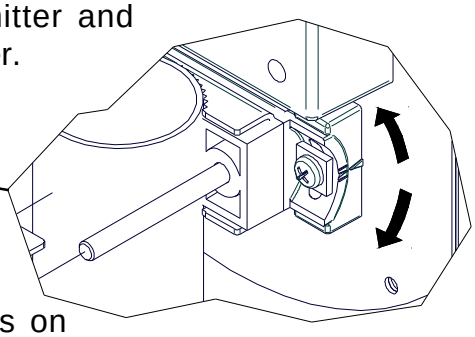
The temperature working concditions are between - 20°C and + 55°C; if the use is required in areas where temperature goes lower than 0°C, it is necessary the permanent installation of the heating kit, which requires an alternate current at 12 V for a consumption of 150 mA for any element of the beam (see **chapter 15** for installation of heating kit).

## Chapter 7: Advice for installation

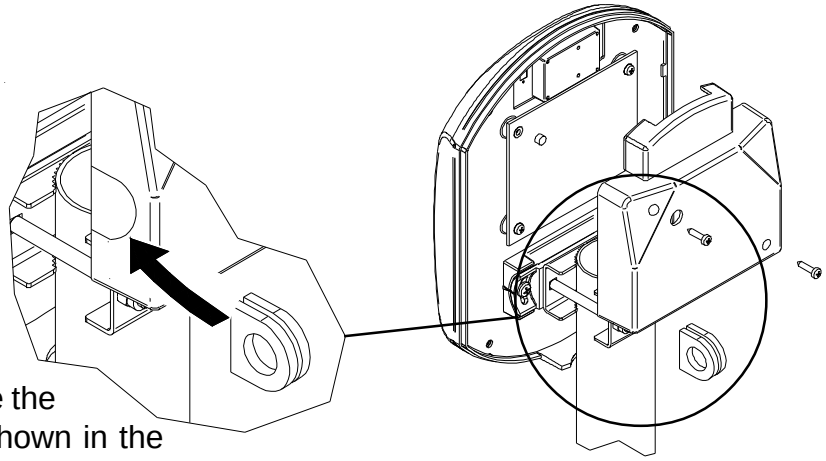


The fixing bracket is pre-arranged for the installation on a steel pipe, whose external diameter is 40 millimeters

Thanks to the two slides on the sides of the fixing bracket, it is possible to adjust the inclination (max 5° upwards and 5° downwards) in both transmitter and receiver.



Two notches on the slides indicate the max inclination



- Use special care for the cables entry, in order to avoid moisture and rain penetrating inside the box.
- For cable entry inside the covers of board protection, use the cable-loops given within (as shown in the drawing)
- **In the hard-wired system use anti-fire shielded cable (2 x 0,75 mm² + 8 x 0,22 mm²)**

In the wireless system, connect the support pole to ground and use an additional shield for the supplying cable 220 V ~ inside the pole, in order to create a double isolation.

- Before installing the support poles in a definitve way, it is suggested to make a trail installation in order to find out the best position of alignement for the best effective detection:

1 Position the beams couple in the centre of a free area, respecting the minimum distances for beams positioning and the installation height
2 Supply the transmitter and the receiver with two batteries and orientate TX and RX one towards the other
3 Check the signal on TP and adjust it at 7,3 V ⎓ .
4 Move the two beams towards RIGHT/LEFT within 30 - 50 cm and Up/Downwards checking the variations of signal of TP and identifying the signal max point.
5 Once identified the best position, fix the brackets.

- During positioning and adjusting of the Receiver, take care not to have big bodies inside the sensitive zone, which will then be moved when the system is in use, such as lorries or cars; the adjustment could be highly affected.

## Chapter 8: Installation of the transmitter in the hard-wired system

1) Choose the position of the transmitter, fix it at the height desired and orientate it as much precisely as you can towards the direction where the receiver will be installed
2) Position the 4 dip-switches according to the working frequency chosen
3) Connect the supplying (from 11,5 V ⎓ to 15 V ⎓) and check the transmitter working by the lighting-up of the Red Led inside; taking off the jumper **S1 (Off Led)**, it is possible to disable the Led for reducing consumption
4) Connect the TT terminals of tamper board to tamper line of control panel.

## Chapter 9: Installation of receiver in the hard-wired system

1) Install the receiver in the support at the same height of the transmitter
2) Position the 4 dip-switches according to the working frequency chosen
3) Connect the supplying (from 11,5 V ⎓ to 15 V ⎓) to the positive + and negative - terminals
4) Connect the C and NC alarm outputs and the disqualification output D to the detection line of the control panel and the TT terminals to anti-tamper line of the control panel

### General Warning for the hard-wired system

It is suggested to reach the two units by use of a plastic flexible and waterproof pipe and to make the connections by use of shielded cables.
The choice of the section of the wires to be used for connections must be made according to the distance from supplying source, in order to grant a minimum continuous tension of 12 V ⎓ on both units. Should the supplying tension get lower than this value, bad-functioning might occur.

## Chapter 10: Installation of transmitter in the wireless system

1) Choose the position of the transmitter, fix it at the height desired and orientate it at sight as much precisely as you can towards the direction where the receiver will be installed.
2) Position the 4 dip-switches according to the working frequency chosen
3) Connect the 230 V ~ supplying to the input of the supply unit given within
4) Connect the support pole to the ground
5) Connect the terminals + and - to the output of the 13,8 V ⎓ /300 mA supply unit, given within and check the functioning of the transmitter by the inside red Led (taking off jumper **S1 Off Led** it is possible to disable the Led to decrease consumption)
6) Connect the batteries poles to terminals + and - of the supply unit given within
7) **In order to have an alarm indication in case of opening of the cover, it is suggested to connect the TT terminals in series to supplying positive**

## Chapter 11: Installation of the receiver in the wireless system

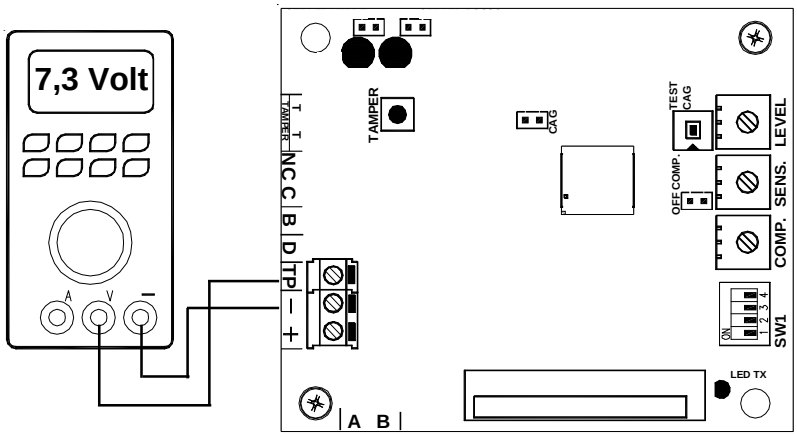
1) Install the receiver in the proper support, at the same height of the transmiter
2) Position the 4 dip-switches according to the working frequency chosen
3) Connect the 230V ~ supplying to the input of the supply unit given within
4) Connect the support pole to the ground
5) Connect the terminals + and - to the output of the 13,8 V ⎓ /300 mA supply unit given within
6) Connect the back-up battery poles to terminals + and - of the supply unit given within

### General Warning for wireless system

**Create a double isolation for the passing of the mains cable at 220 V ~, inside a pole, by using an additional shield.**

## Chapter 12: Adjustments

1) Orientate at sight the device in the direction of the transmitter and connect a voltmeter betwen the negative (-) and **TP** terminal (Test Point) on board

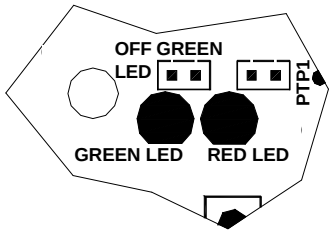



2) Orientate the device in horizontal way, looking for the position giving the max reading; in case it is over 7,3 Volt tthe signal level must be reduced by use of **LEVEL trimmer**, in such a way as to bring the signal to the best point of working, that's to say 7,3 Volt

- It is possible to have a high value also with receiver not aligned to transmitter; in this case it could be a reflection of the beam transmitted, which must most be taken into consideration.
- In case the signal does not reach 6,8 V having LEVEL trimmer at max, move the device in vertical way within a limit of 10-20 cm.
- Shouldn't it be possible to reach the min. value, it will be necessary to decrease the distance between receiver and transmitter or look for a better alignement position

3) Check the quality of the signal received, keeping in mind that in absence of seeming movements inside the protected area:

- Green Led on fix: there is no signal noise
- Green Led quick or slow flashing: the signal noise is low but is anyway detected by the beam
- Green Led slow flashing (off for about 1 second) , the signal noise is more important and it is near to the intervention threshold of the beam




In order to have a more precise indication of noise quantity, it is suggested to make mesurements with an oscilloscope, as specified in chapter 13 (Measurements of the signal by oscilloscope) on the following page

4) Once reached the best condition of working, make a test through the pushbutton **TEST C.A.G.** placed on the receiver board.
Keeping the pushbutton pressed , the red alarm led will light up for about 10 seconds, then the green led will light up again to show normal working; now the pushbutton can be released

5) At the end of all tests, for a reduced consumption of the receiver, it is possible to take off the jumpers **S1 and S2 (Led OFF)** which disable the green led and the red led respectively.

## Chapter 13: Measurements of the signal by oscilloscope

In the drawing below, the points where to connect the oscilloscope are shown:

**Point A**

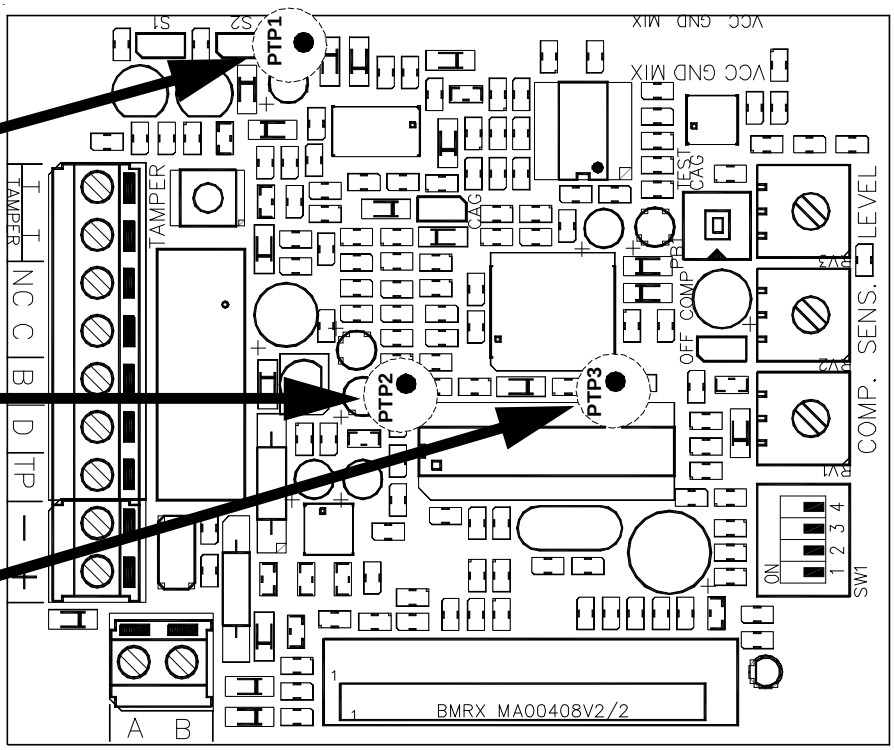
**(PTP1)**
it shows the amplitude of the signal received

**Point B**

**(PTP2)**
it shows the quality of the signal received

**Point C**

**(PTP3)**
it shows the alarm threshold

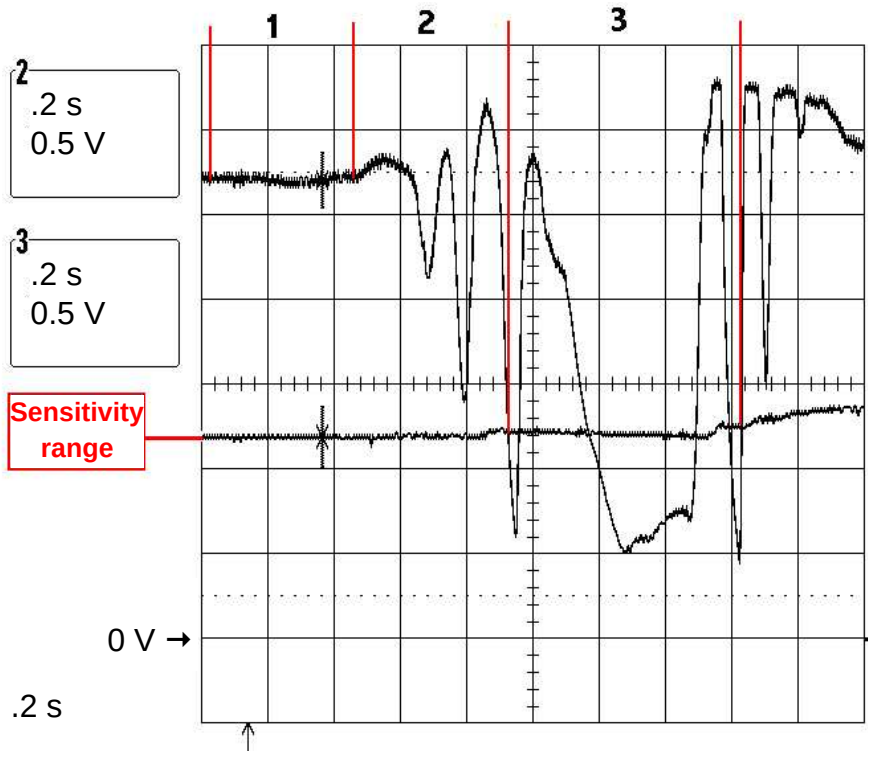



In the graphic here below the wave shapes concerning the signal quality are shown:

**1-** the beam is in quiet condition and there is no passage of people or any perturbation due to moving objects, the level is fix . Check that the quiet condition is as described.

**2-** the beam is disturbed or we are crossing a sensitive area (partial darkening)

**3-** the beam has been darkened and there is an alarm situation




**B** Point **B** shows the quality of the signal received

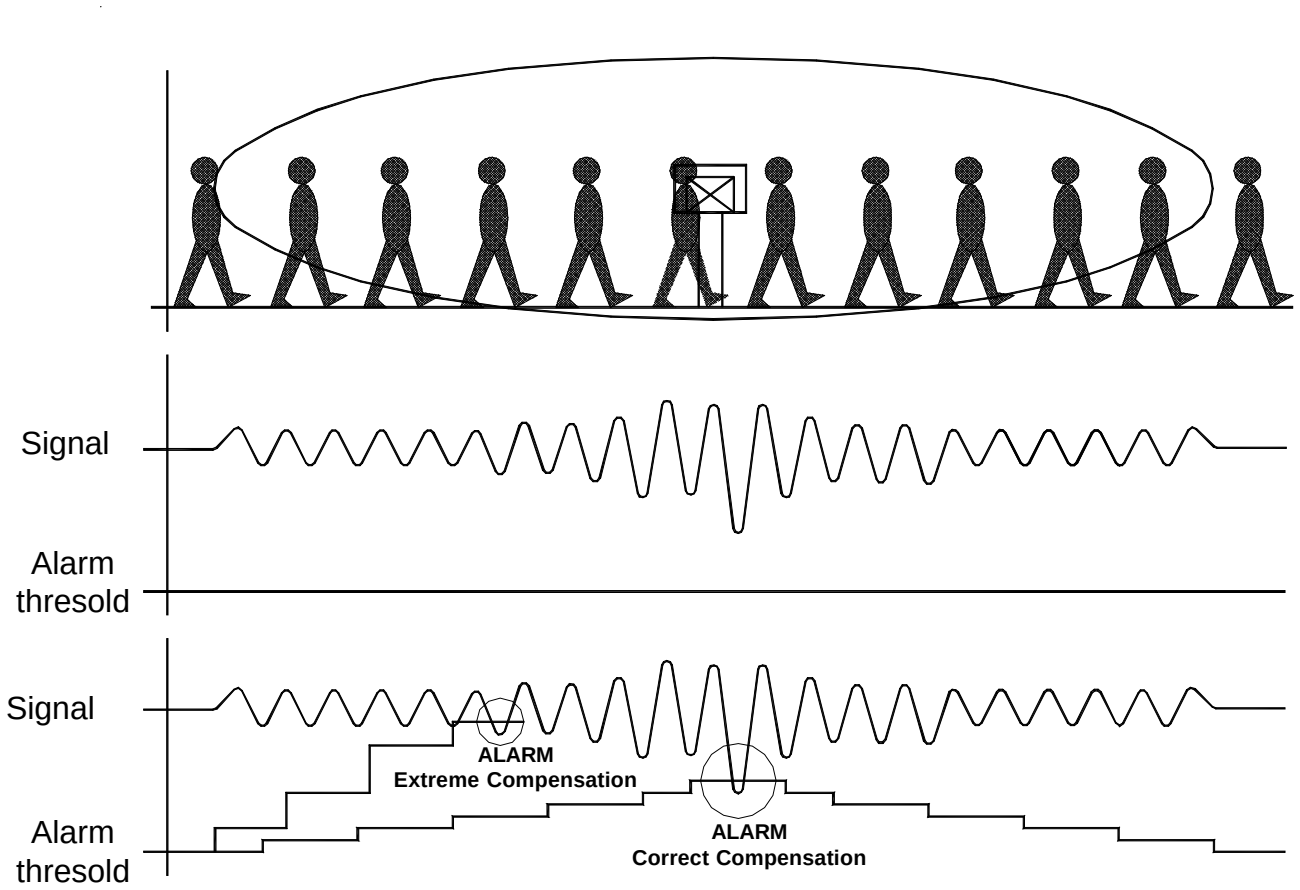
**C** Point **C** shows the alarm threshold (trimmer sens.). In this case the sensitivity is adjusted at the half

## Chapter 14: Sensitivity Adjustment

1) Turn trimmer SENS clockwise in the position of minimum sensitivity and make a trial walking in the central point of the distance covered (point of minimum sensitivity of the system) and check the behaviour of the green led.
2) If necessary, increase the sensitivity progressively until obtining the answer desired
3) After any sensitivity and orientation adjustment, it is necessary to wait about 20 seconds in order to have all signals set and make a new trial

   **Caution:** a high sensitivity can cause false alarms in critical conditions (such as strong rain or snow fall)
4) In the **BM M** system a special compensation circuit has been included, which can be adjusted by means of trimmer **COMP** (turning it clockwise the compensation increases); this circuit records the perturbations resulting in the microwave area when the target approaches or moves away crosswise to the pattern and it automatically increases the receiver sensitivity in order to make easier detection of the target when it crosses the central line of the pattern.

   The compensation circuit can be completely excluded taking off the jumper **OFF COMP**. A high compensation can cause a false alarm of the beam when there are moving objects near the pattern.

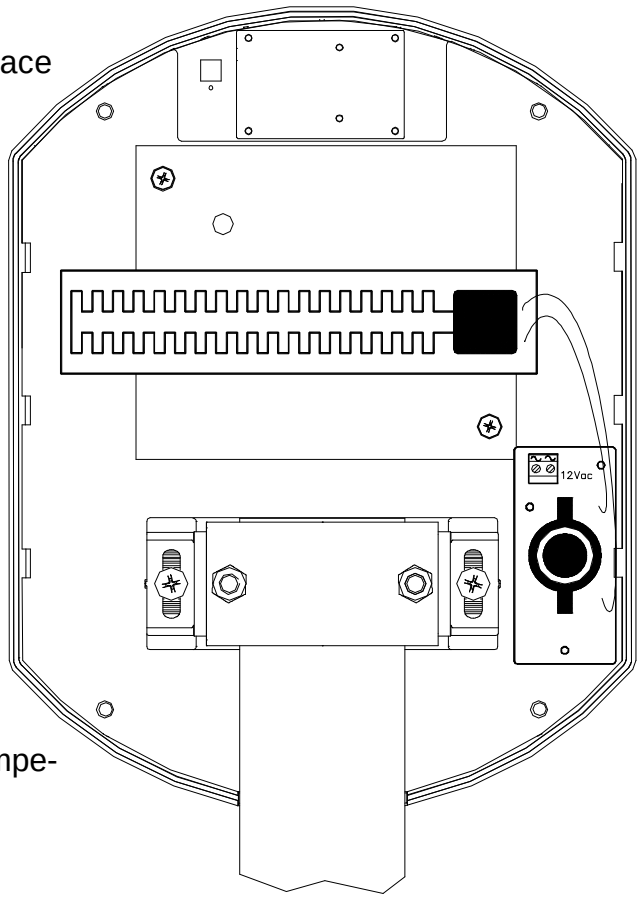



## CAUTION
### (BM120M and BM200M ONLY)

Due to larger pattern and to compensation circuit, **BM M** beams are more sensitive to perturbations caused by moving objects in the areas near the corridor protected. Consequently, the security distance to be kept in the installation, especially in respect to the transit of vehicles, trains, or presence of big trees or bushes, must be increased. In the special case of a street with vehicles transit, parallel to the protected area, it is suggested to keep a minimum security distance of **10 meters**.

## Chapter 15: Kit TERM (optional) Resistence fo inside heating

- For installation in an indoor or outdoor place where temperature can go lower than 0°C, it is necessary to use the heating **kit Term 1** in both Receiver ad Transmitter. This has to be done in order to avoid formation of condensation which might affect the good working of the electronic circuit.
- The optional heating kit, is made of a circuit where an electromechanical thermostat, a heating resistence and a terminal board for connection to supplying, are placed.
- Supplying must be given by means of an external trasnformer with output at alternate 12V ; the consumption of any heating resistence is 150 mA at the tension of alternate 12 V.
- The thermostate intervention occurs taking off supplying to the resistence when the temperature of 30° C is reached inside the box.

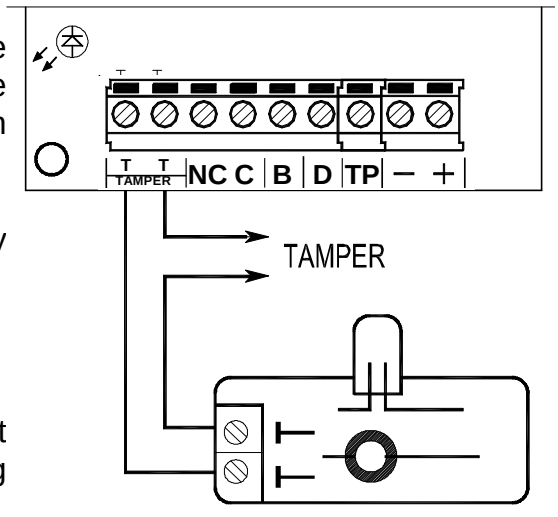



| | |
|---|---|
| **Supplying:** | alternate 12 V |
| **Consumption:** | 150 mA max |
| **Transformer:** | input: 220 V ~<br>output: 12 V ~<br>for 4 couples of beams: 20 W power |

## Chapter 16: Kit AMP (optional) Anti-removal

The anti-removal **kit AMP** is made of two bulbs, whose function is sending an alarm in case of tampering or removal of the beam from its support.
This kit must be positioned in such a way that one of the bulbs is installed in **vertical position** compared to the device and the other one in **horizontal position** as shown in the picture.

Example: RX BEAM




This system allows a complete protection against any attempt of :
- removal of the beam from the support
- removal of the supports from fixing points

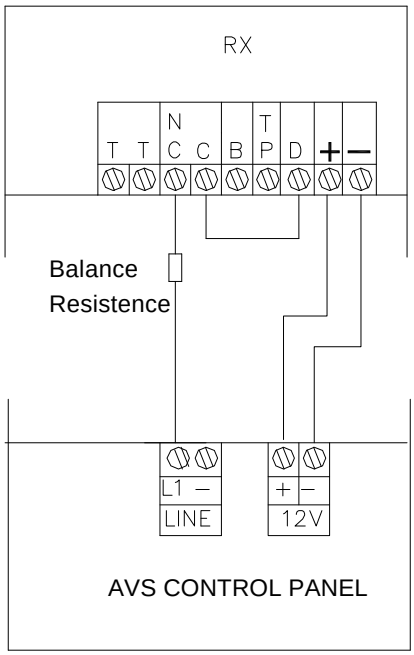
The horizontal bulb must be positioned in such a way that the contact opens as soon as there is an attempt of moving the beam.
Before connecting the tamper line to the control panel, check that the contact of single bulbs as well as tamper line is closed .

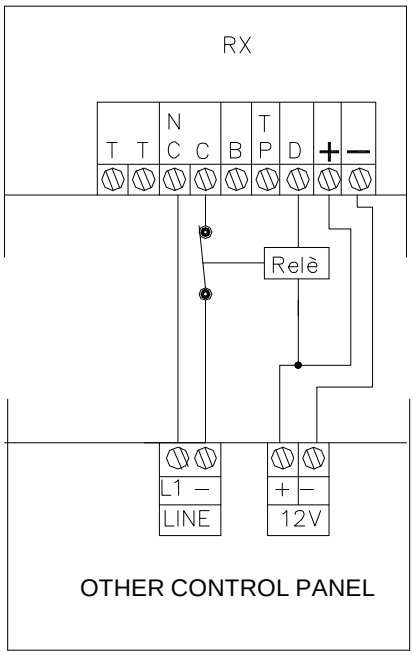
## Chapter 17: Disqualification (Important Warning)

In order to prevent and show disalignements caused by any obstacle placed in the active beam of the barriers at system off, **it is necessary to connect the disqualifiation output (terminal D)** in series to the exchange of the alarm relay or alternatively, use it to control an additional relay, whose exchange has to be put in series to the alarm line.

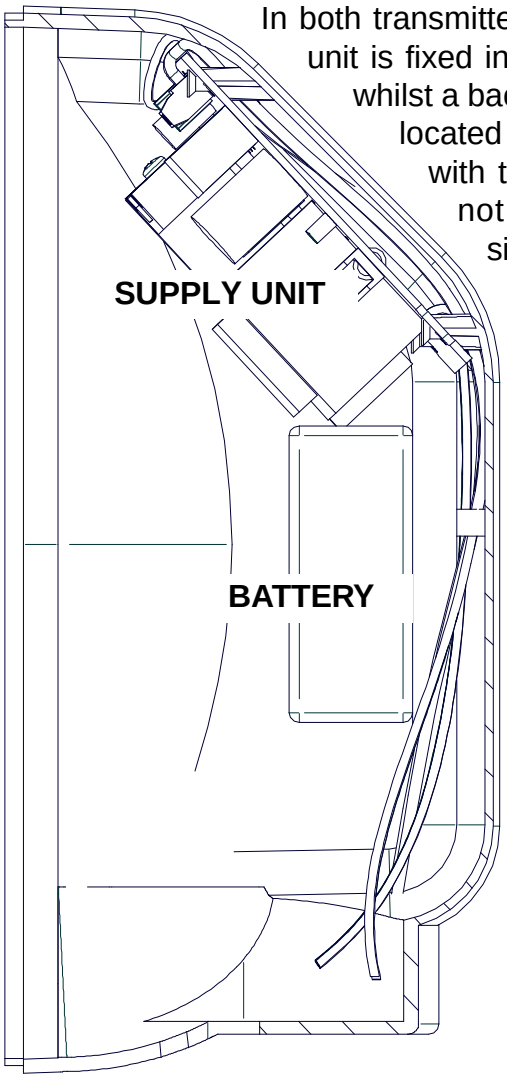
**NOTE**

**The output D** gives a transistorized negative (max. 50 mA) which fails when the signal level goes under a minimum level for over 30 seconds.




## Chapter 18: Additional supply unit for BM60M WS

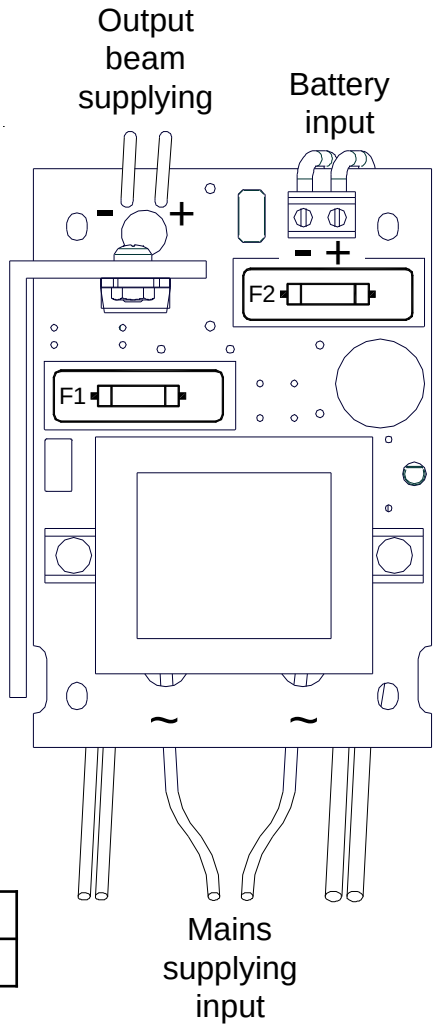



In both transmitter and receiver, the supply unit is fixed inside the cover on the top, whilst a back-up battery 12V 0,8 Ah is located in the bottom (to be fixed with the strip given within), and not exceeding the following size: height 65 mm, length 96 mm, depth 25 mm.

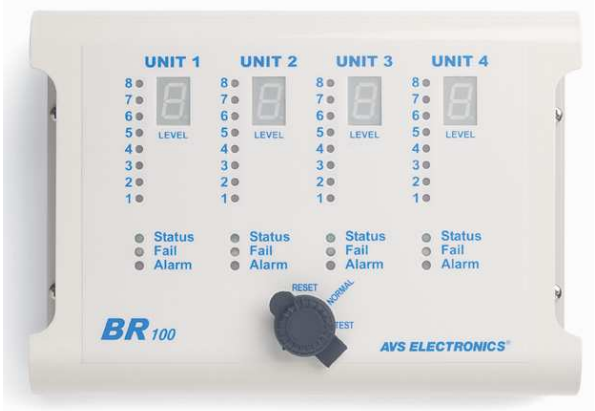
Make the supplying cables pass behind the supply unit and the backup battery, in order not to affect the cover closing.

Two protection fuses are available in the supply unit: **F1** for mains supplying and **F2** of battery input.

| | |
|---|---|
| **F1** | 500 mA L - 250 V |
| **F2** | 500 mA L - 250 V |

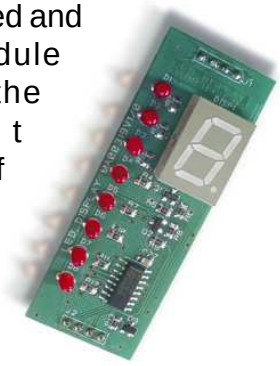


## Chapter 19: BR100 Kit and LCD W (optional) signal remoting-device




**BR100** is an accessory accepting up to 4 **LCD W** boards.

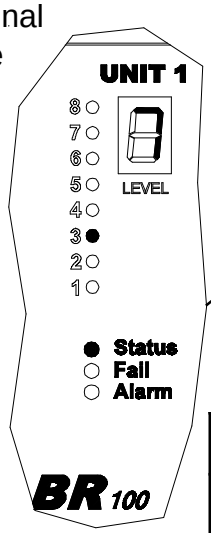
**LCD W** is a Led and display module allowing the constant monitoring of the BM M signal to which it is associated.

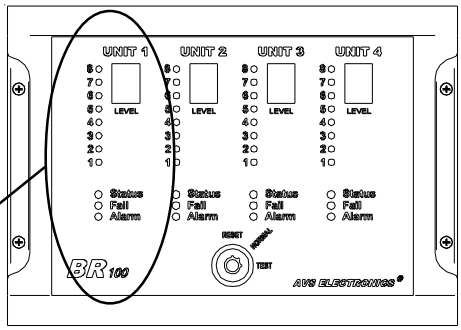


This system of remoting the signal levels of the beams, is made of a Led/display module (**LCD W**) for any couple of beams, to be contained into the **BR100** housing.
Thanks to this system, it is possible to monitor constantly from **1 up to 4 couples** of BM M.

On the front of **BR100** module, for any couple of beams to monitor, there are:

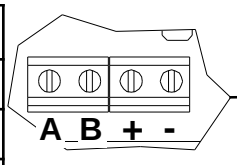
- the LCD W module for vizualising the signal quantity received, expressed in Volt (the display visualizes the units, the Led bar visualizes the decimals). The value shown is the same given by the TP terminal (**Test Point**) of the receiver to which it is coupled
- a yellow Led (**FAIL**) is especially appointed to the Disqualification indication
- a red Led (**ALARM**) indicating the alarm condition (it follows the condition of the receiver red Led)
- a green Led (**STATUS**) visualizing the signal quality (it follows the condition of the receiver green Led)

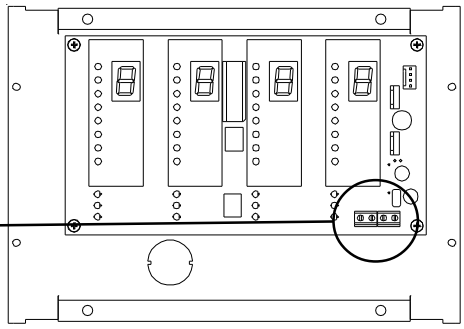



| TECHNICAL CHARACTERISTICS | |
|---|---|
| Nominal tension | 11,5 - 13,8 V ⎓ |
| Consumption | max 110 mA |
| Fuse | F 0.5 A L 250V |

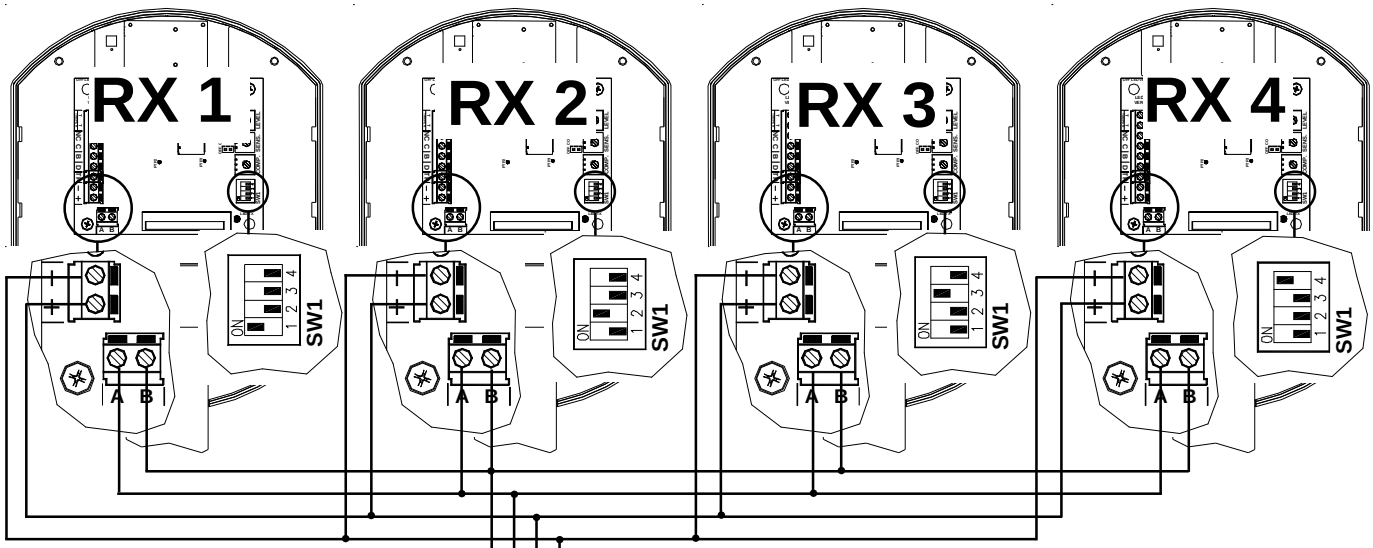
**There also is a key-block which must not be connected (for future uses)**

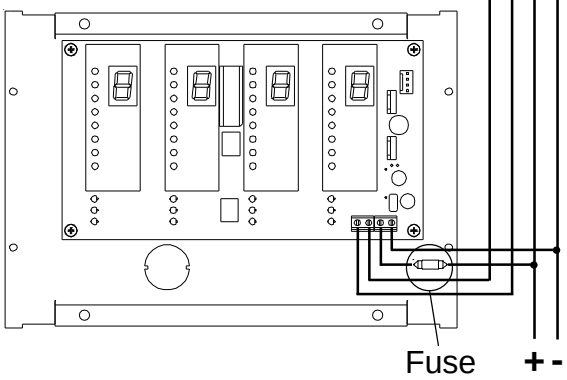


| TERMINAL BOARD | |
|---|---|
| **+** | Supplying positive 12 V ⎓ |
| **-** | Supplying negative |
| **A B** | Input of the dialogue-serial to the associated beams |

The supplying of the BR100 panel must be separate from the beams supplying in order to avoid that a possible short-circuit in the supplying line of the panel can cause the break of the supplying to the beams. To this purpose, use the fuse-holder with its 500 mA fuse given within BR100 panel.



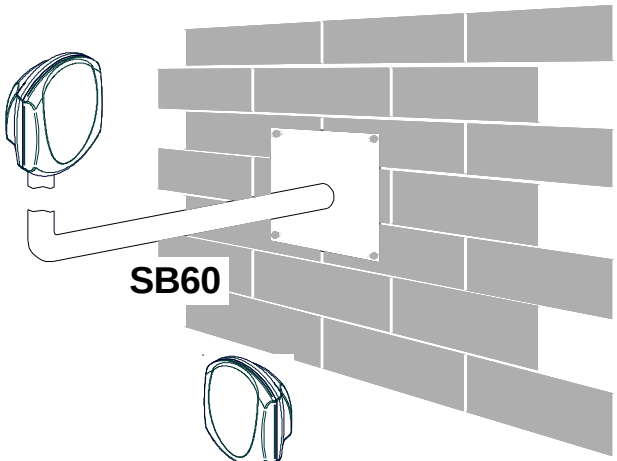




| CORRESPONDENCE BETWEEN WORKING FREQUENCY AND VISUALIZATION UNIT | | | | | |
|---|---|---|---|---|---|
| **BEAM CHANNEL** | **DIP 1** | **DIP 2** | **DIP 3** | **DIP 4** | **UNIT** |
| **F1** | ON | OFF | OFF | OFF | **1** |
| **F2** | OFF | ON | OFF | OFF | **2** |
| **F3** | OFF | OFF | ON | OFF | **3** |
| **F4** | OFF | OFF | OFF | ON | **4** |
| **F5** | OFF | OFF | OFF | OFF | **1** |
| **CAUTION**<br>The beam set with F5 is addresses onto UNIT 1 | | | | | |

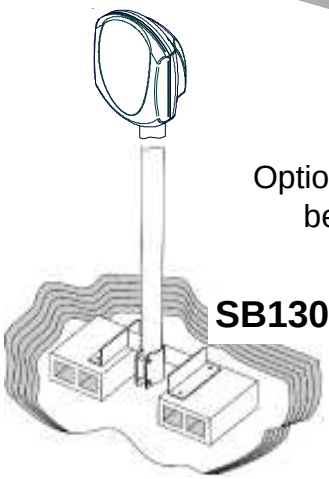
## Chapter 20: Optional Brackets

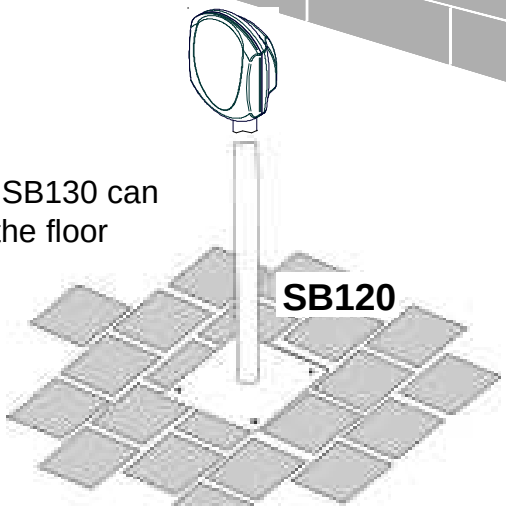
The optional bracket **SB20** and **SB60** can be used for installation to the wall


Optional bracket **SB60** can be used with **BM60M** and **BM60M WS only**




Optional brackets SB120 and SB130 can be used for installation to the floor



## Information in conformity to the Directive 1999/5/CEE for model BM_M

The product here described is in conformity to the essential prescriptions of the Directive 1999/5/CEE (R&TTE) on the radio-transmitting devices of low power and on the use of frequencies of the radioelectrical spectrum, in accordance with CEPT 70-03 recommandation.

| | |
|---|---|
| Trade mark | AVS ELECTRONICS |
| Model | BM60M - BM120M - BM200M |
| Working frequency | 10,525Ghz |
| Type of supplying | continuous current |
| Nominal tension | 12 V ⎓ |
| Nominal current (TX and RX) | 101 mA |
| Countries of use in the European Community | Wherever with the exception of local restrictions |
| Date | 5th April 2006 |

**AVS ELECTRONICS**®

CE

**DICHIARAZIONE DI CONFORMITA**

***(MANUFACTURERS DECLARATION OF CONFORMITY)***

| | |
|---|---|
| **Costruttore** ***(Manufacturer)*** | AVS ELECTRONICS SPA |
| **Indirizzo** ***(Address)*** | Via Valsugana, 63 - 35010 Curtarolo (PD) - ITALY |

**DICHIARA CHE LA SEGUENTE APPARECCHIATURA**
***(DECLARES THAT THE FOLLOWING EQUIPMENT)***

| | |
|---|---|
| **Nome dell'Apparecchiatura:** ***(Equipment Name)*** | : **BM60M - BM120M - BM200M** |
| **Tipo di Apparecchiatura** ***(Type of Equipment)*** | : RIVELATORI BARRIERE A MICROONDE PER ESTERNO (OUTDOOR MICROWAVE SPAN ALARM SYSTEM) |
| **Modello** ***(Model)*** | : |
| **Anno di Costruzione** ***(Year of Manufacture)*** | : 2006 |

**RISULTA CONFORME CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE COMUNITARIE:**
***(IS IN ACCORDANCE WITH THE FOLLOWING COMMUNITY DIRECTIVES)***

| | |
|---|---|
| 89 / 336 / EC (EMC) | 99 / 05 / EC (R&RTTE) |
| 73 / 23 / EC (LVD) | |

**E CHE SONO STATE APPLICATE LE SEGUENTI NORMATIVE**
***(APPLYING THE FOLLOWING NORMS OR STANDARDS)***

| | |
|---|---|
| EN 300440 | |
| EN 301 489 - 3 | |
| EN 50130 - 4 | |
| EN 60950 | |

**IDENTIFICATORE DI CLASSE DEL DISPOSITIVO** (per apparati RF regolamentati dalla direttiva R&TTE)
***(Equipment class identifier** (RF products falling under the scope of R&TTE))*

☐ Not Applicable ☐ None (class 1 product) ☒ (class 2 product)

**Il costruttore dichiara sotto la propria responsabilità che questo prodotto é conforme alla direttiva 93/68/EEC (marcatura) e soddisfa i requisiti essenziali e altre prescrizioni rilevanti della direttiva 1999/5/EC (R&TTE) in base ai risultati dei test condotti usando le normative (non) armonizzate in accordo con le Direttive sopracitate.**
*(We declare under our sole responsibility that this product is in conformity with directive 93/68/EEC (Marking) and/or complies to the essential requirements and all other relevant provisions of the 1999/5/EC (R&TTE) based on test results using (non)harmonized standards in accordance with the Directives mentioned)*

**Luogo** *(Place) :* Curtarolo

**Data** *(Date) :* **April 2006**

**Firma** *(Signature)*

**Nome** *(Name) :* **G. BARO**

**Amministratore**
*(Managing Director)*

## Information in conformity to the Directive 1999/5/CEE for model BM60M WS

The product here described is in conformity to the essential prescriptions of the Directive 1999/5/CEE (R&TTE) on the radio-transmitting devices of low power and on the use of frequencies of the radioelectrical spectrum, in accordance with CEPT 70-03 recommandation.

| | |
|---|---|
| Trade mark | AVS ELECTRONICS |
| Model | BM60M WS |
| Working frequency | 10,525 Ghz (Microwave working frequency)<br>868,350 MHz (Transmission frequency) |
| Type of supplying | alternate current + 12 V back-up battery |
| Nominal tension | 230 V ~ 300 mA |
| Nominal current (TX and RX) | 101 mA in quiet condition<br>131 mA during transmission |
| Countries of use in the European Community | Wherever with the exception of local restrictions |
| Date | 5th April 2006 |

**AVS ELECTRONICS**

CE

**DICHIARAZIONE DI CONFORMITA**

***(MANUFACTURERS DECLARATION OF CONFORMITY)***

| | |
|---|---|
| **Costruttore** ***(Manufacturer)*** | AVS ELECTRONICS SPA |
| **Indirizzo** ***(Address)*** | Via Valsugana, 63 - 35010 Curtarolo (PD) - ITALY |

**DICHIARA CHE LA SEGUENTE APPARECCHIATURA**
***(DECLARES THAT THE FOLLOWING EQUIPMENT)***

| | |
|---|---|
| **Nome dell'Apparecchiatura:** ***(Equipment Name)*** | : **BM60M WS** |
| **Tipo di Apparecchiatura** ***(Type of Equipment)*** | : RIVELATORE BARRIERA A MICROONDE PER ESTERNO (OUTDOOR MICROWAVE SPAN ALARM SYSTEM) |
| **Modello** ***(Model)*** | : |
| **Anno di Costruzione** ***(Year of Manufacture)*** | : 2006 |

**RISULTA CONFORME CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE COMUNITARIE:**
***(IS IN ACCORDANCE WITH THE FOLLOWING COMMUNITY DIRECTIVES)***

| | |
|---|---|
| 89 / 336 / EC (EMC) | 99 / 05 / EC (R&RTTE) |
| 73 / 23 / EC (LVD) | |

**E CHE SONO STATE APPLICATE LE SEGUENTI NORMATIVE**
***(APPLYING THE FOLLOWING NORMS OR STANDARDS)***

| | |
|---|---|
| EN 300440 | EN 300 220-3 |
| EN 301 489 - 3 | |
| EN 50130 - 4 | |
| EN 60950 | |

**IDENTIFICATORE DI CLASSE DEL DISPOSITIVO** (per apparati RF regolamentati dalla direttiva R&TTE)
***(Equipment class identifier** (RF products falling under the scope of R&TTE))*

☐ Not Applicable ☐ None (class 1 product) ☒ (class 2 product)

**Il costruttore dichiara sotto la propria responsabilità che questo prodotto é conforme alla direttiva 93/68/EEC (marcatura) e soddisfa i requisiti essenziali e altre prescrizioni rilevanti della direttiva 1999/5/EC (R&TTE) in base ai risultati dei test condotti usando le normative (non) armonizzate in accordo con le Direttive sopracitate.**
*(We declare under our sole responsibility that this product is in conformity with directive 93/68/EEC (Marking) and/or complies to the essential requirements and all other relevant provisions of the 1999/5/EC (R&TTE) based on test results using (non)harmonized standards in accordance with the Directives mentioned)*

**Luogo** *(Place) :* Curtarolo

**Data** *(Date) :* **April 2006**

**Firma** *(Signature)*

**Nome** *(Name) :* **G. BARO**

**Amministratore**
*(Managing Director)*

| | BM60M | BM120M | BM200M | BM60M WS |
|---|---|---|---|---|
| Max range | 60 meters | 120 meters | 200 meters | 60 meters |
| Nominal tension | 12 V ⎓ | 12 V ⎓ | 12 V ⎓ | 12 V ⎓ |
| Min tension | 11.5 V ⎓ | 11.5 V ⎓ | 11.5 V ⎓ | 11.5 V ⎓ |
| Max tension | 15 V ⎓ | 15 V ⎓ | 15 V ⎓ | 15 V ⎓ |
| Supply-unit given within | - | - | - | Input tens.: 230 V ~<br>Current: 300 mA<br>Power: 6 VA<br>Out tens.: 13.8 V ⎓ |
| Battery to locate | - | - | - | 12 V - 0,8 Ah<br>Mod. NP 0,8 - 12 |
| Consumption during quiet | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 70 mA |
| Consumption during alarm | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 70 mA | TX : 31 mA<br>RX : 100 mA |
| Size: (P x L x H) | 150 x 105 x 195 | 136 x 225 x 225 | 136 x 225 x 225 | 136 x 225 x 225 |
| Transmission frequency | - | | | FM 868 MHz |
| Survival indication | no | | | yes |
| Block of detector relay | by appointed terminal B | | | - |
| Alarm output | n.c. exchange with 500 mA range at 12 V ⎓ | | | - |
| Tamper output | micro-switch | | | - |
| Optional kit for anti-removal (AMP) | no | yes | yes | no |
| Output for serial | serial door for connection of remote panel | | | - |
| | | | | |
| Disqualification output | transistorized output for checking of signal good reception | | | |
| Test Point output | for checking of signal received | | | |
| Mirowave working frequency | 10,525 GHz (+/-20MHz) | | | |
| Modulation | in 5 different channels, selection through dip-switch | | | |
| Irradiation of RF power | peak: 25 dBm | | | |
| Temperature conditions | from - 20°C to + 55°C<br>For installation outdoor, the use of the optional heating kit (Term2) is suggested . | | | |
| IP Protection | IP 34 | | | |
| Given within | Bracket for fixation on 40 mm tube | | | |


# AVS ELECTRONICS S.p.A.

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