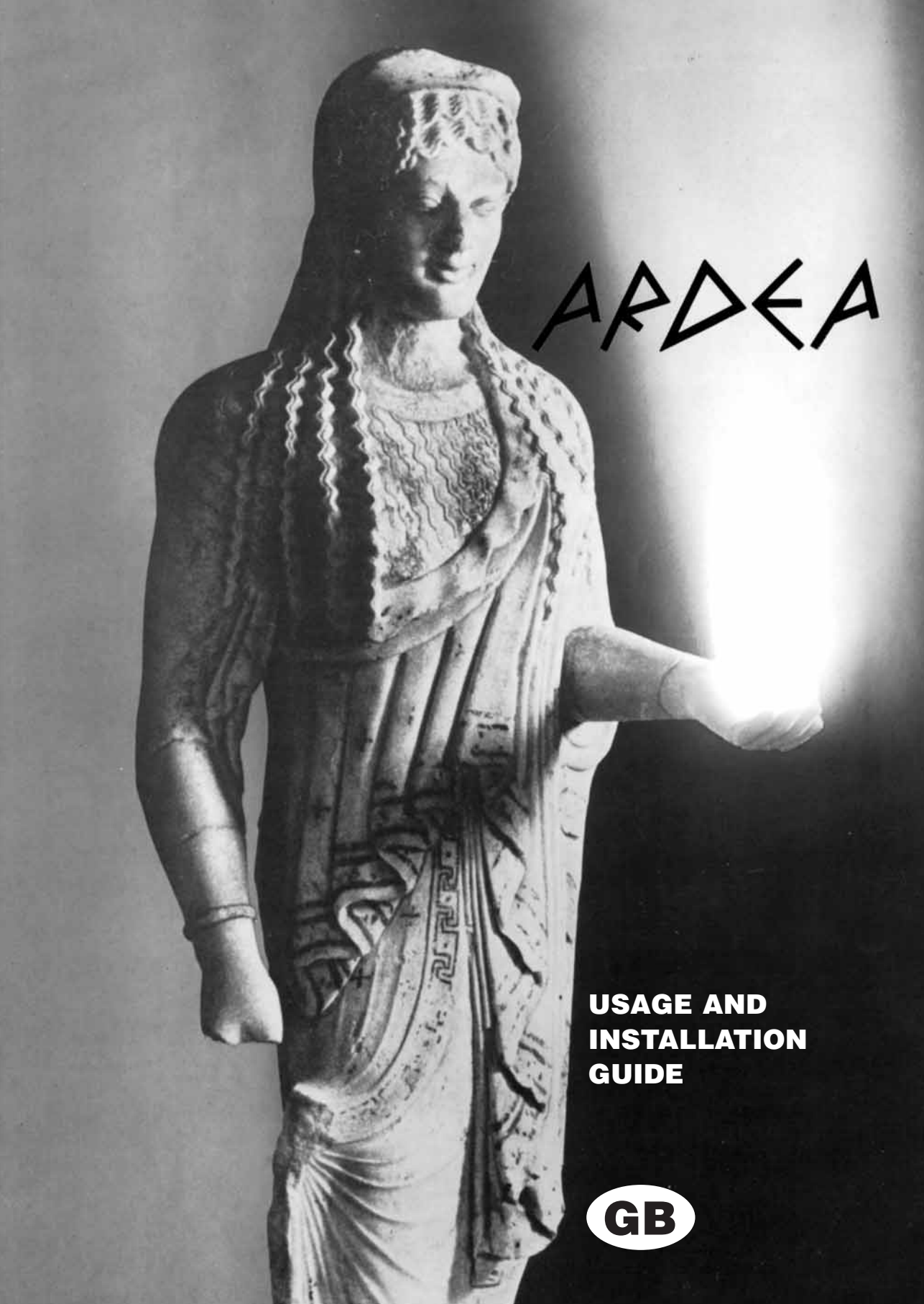


USAGE AND INSTALLATION GUIDE

GB

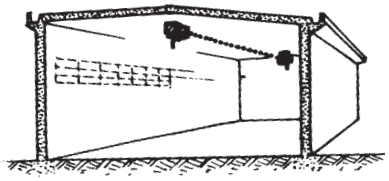
IMPORTANT

☞ 1) - Keep this manual close to hand for reference at all times.

☞ 2) - The information contained here is available in PDF files on the manufacturer's web site: www.setronicverona.com

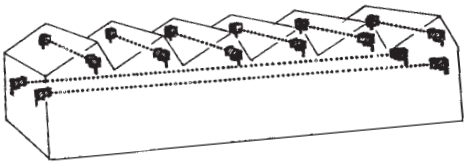
FOREWORD

Where any of the application recommendations provided in this manual wholly or partly fail to accord with any future Italian or European regulations that may come into effect then such recommendations will cease to apply when the regulations come into force.



As these products are sold abroad the installation requirements applicable in the individual countries have to be followed rather than any recommendations given here where there is any divergence between the two.

We shall consider such regulations as being followed in the plant that uses our products, as from the date of the order.



The ARDEA detectors **MUST NOT** be used outdoors or in environments without roofs, or where there is fog or steam. Improper use of these detectors in such environments shall mean any guarantees will immediately cease to have effect.
The detectors can work in very cold temperatures **(E.g.:** -15°C), but cannot tolerate thermal inversions from the industrial condensers normally used in cold-storage rooms.

INDOOR ELECTRONIC LINEAR BEAM FIRE DETECTORS ARDEA SF (page. 18 and 19) - S/2 (page. 22 and 23) - DUST (page. 24 and 25)

The system consists of a Transmitter unit, a Receiver unit and an interface card.
The Transmitter and Receiver units are two independent pieces of equipment while the interface can be replaced by a control unit compatible with the detectors.
The Transmitter and Receiver units are connected by cables with the interface. The detector units are designed to be positioned at variable distances from the top of the roof or ceiling. The Transmitter unit sends a beam of infrared light to the wall opposite it. The cone of infrared light (IR) from the Transmitter crosses the protected area and picks up any indications of the beginnings of a fire. These fire signs are collected and demodulated by the Receiver unit through a special telephoto lens and circuit. Both units
are designed to be easily aligned one to the other. The special design of the sliding support bracket has three real additional advantages:

* The brackets can be installed separately from the apparatus
* The units' orientation can be in any direction relative to the bracket's plane of attachment
* The units simply press onto the brackets; removal being equally easy by simply pulling off. The brackets and the Transmitter and Receiver's alignment micromechanisms make for simple alignment one to the other as well as providing unequalled long term stability.

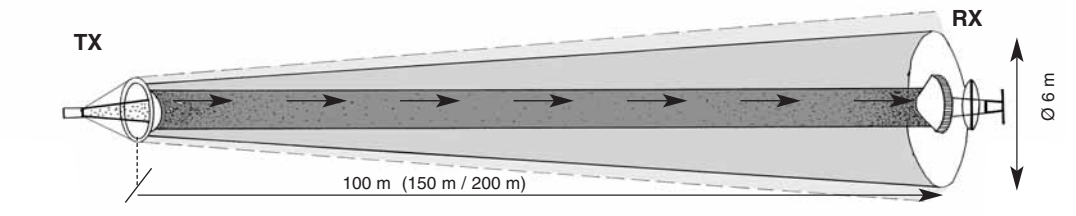
The fire alarm is recognised and confirmed when there is either **smoke**, that reduces the carrier's intensity in a specific way, between the Transmitter and Receiver unit, **or by** turbulence caused **by a fire** accompanied by smoke, or by the two phenomena occurring simultaneously, even in varying proportions to each other.

Ardea also effects the following additional controls:

* When the Infrared signal from the Transmitter falls below a certain level the Receiver unit identifies a «fault» by the use of electrical criteria that are different from those it applies for a fire.
* If the carrier of the infrared signal emitted by the Transmitter tends to fall away over time, the Receiver unit automatically adjusts according to constant altered environmental conditions that apply over a long period.
* If an obstacle comes between the two units, a «Fault» warning is promptly activated.
* As soon as the obstacle is removed the system returns to its normal working conditions with no reset procedure being necessary
* The special electronic circuits used in the different Ardea models permit: either black or white smoke detection (Ardea»S/2») - or fire and smoke detection (Ardea «SF»), or the detection of special combustion processes (Ardea «Dust»). By special combustion processes we meant such events as fires from plastic and possibly toxic materials.
* If there is a fire alarm the detector must necessarily be reset manually by switching off voltage to the system. *Different reset options are possible on request.*
* The Ardea system has still today not been superseded in its ability to confirm a fire alarm when the conditions are those of an actual while systematically denying the alarm even when the environmental conditions are generating modulations very similar in amount and quality to those of fire or smoke, but are not those of an actual fire.
* Both the Transmitter and Receiver units have optical systems using LEDs that show the detector's status at any given time: I.e. Normal working, Fire alarm or Fault.

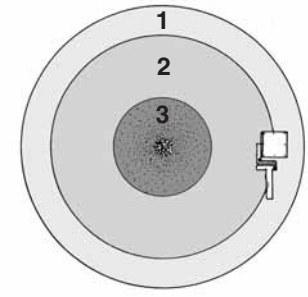
THE DISTRIBUTION OF THE INFRARED LIGHT

The Transmitter's special telephoto lens projects a series of concentric cones of light, **(1-2-3)** where only the innermost cone is active in fire and smoke detection:

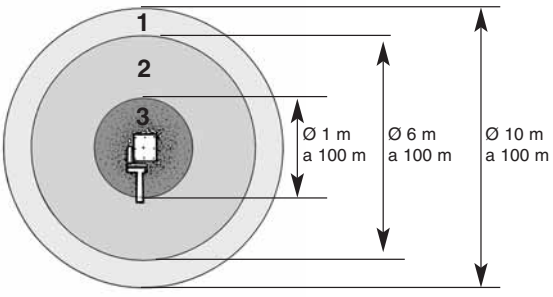


The figure shows the active part of the infrared radiation emitted as well as that which is «*virtually lost*». Even the «virtually lost» infrared is however important where there is movement of the structure the Transmitter unit is mounted on. The following figures show correct and incorrect illumination signals for the Receiver.

INCORRECT



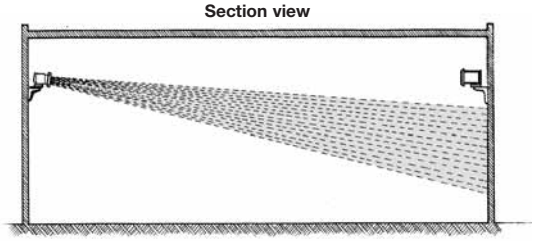
CORRECT



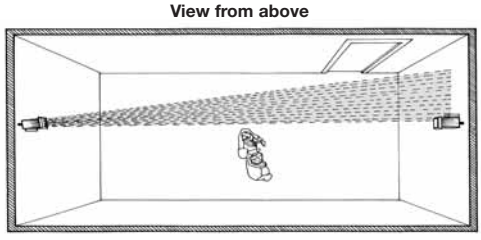
PARALLAX ERRORS

It would at first sight seem easy for the Transmitter and Receiver units to be centred and aligned with respect to each other at the same height from the floor (or from ceiling). The opposite is in fact the case as serious errors can be introduced on two axes as shown in exaggerated form in the following figures:

Section view



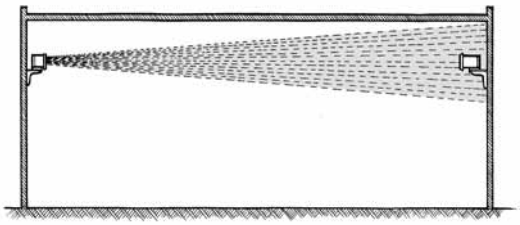
View from above



ALIGNMENT AND ALIGNMENT STABILITY

Proper alignment is always optically indicated by bright LEDs on the working Transmitter / Receiver unit. Proper alignment does not require special skills **or the use of additional** instrumentation. Alignment stability is always obtained when the units are mounted on rigid surfaces that are fixed and not subject to vibrations or twisting movements. The desirable starting situation is that shown in the drawing alongside.

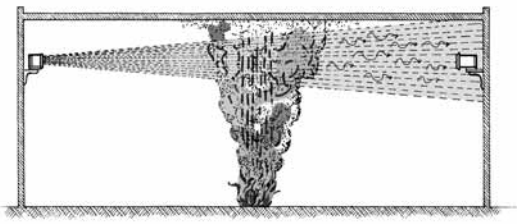
Section view



WORKING

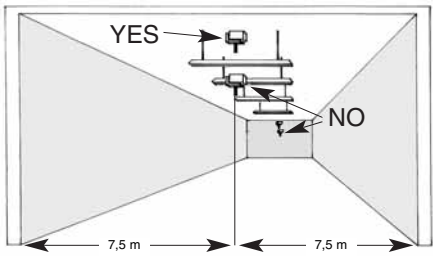
The working situation is shown alongside. A description of the main working conditions is given on pages 1 and 2 of this booklet.

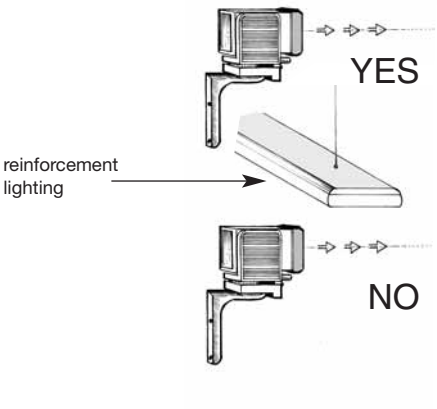
Section view

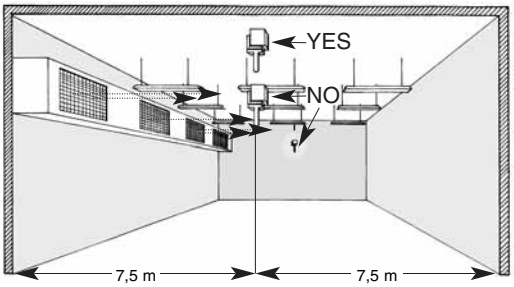


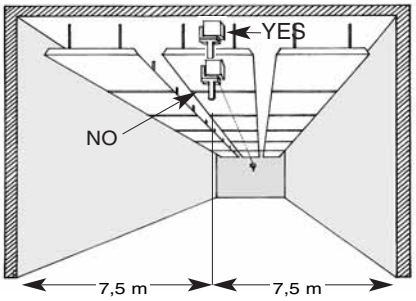
FLAT CEILINGS: SOME WORDS OF CAUTION

Often there are lights hanging from the ceiling and other times there are pipes, raceways for air conditioning, overhead radiant heaters and hot water and steam pipes. The following drawings show preferred installations and those to be avoided.





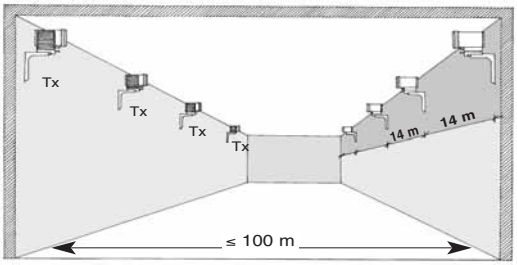




THE INSTALLATION OF SEVERAL DETECTORS IN A FLAT-CEILINGED ROOM

While awaiting specific regulations applying to the detectors and the areas they cover (being the object of discussion for a supplement to the UNI 9795 standard at the time of publication of these instructions - January 2002) **we recommend the following values:**

1. Do not exceed 1600 square metres of cover from each detector pair.
2. While observing these 1600 sq. m of coverage **it is advisable not to** exceed 7.5 m per side (total 15 m) of total coverage width.
3. While observing these 1600 sq. m of coverage and the working width of 7.5 m per side **it is advisable** to decrease the width with any increase in the distance between the Transmitter unit and the Receiver unit beyond 100 m of distance.
   E.g..: 106 m x 15 m = 1590 m. **Or 200 m x 8 m = 1600 m.**

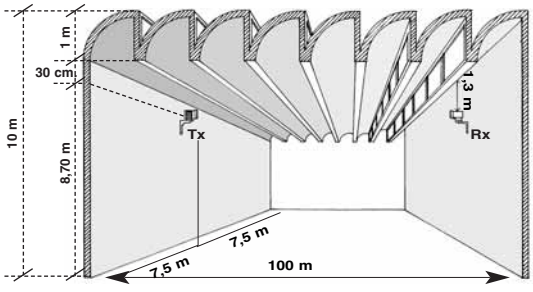


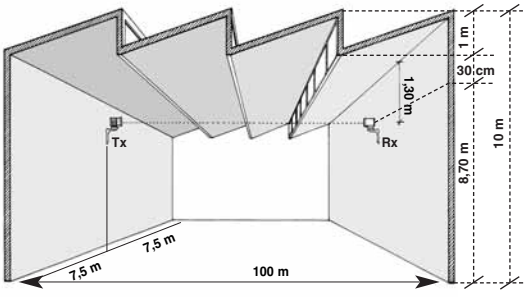
4. While observing these 1600 sq. m of area of coverage **it is advisable not to** exceed 11 m in the height of the building to be protected with a single detector pair. Additional pairs of detectors can be added along the vertical plane if the room is over 11 m in height (see also page 14).

5. Where roofs and ceilings are flat **it is advisable not to** exceed a distance equivalent to **13% from the highest point of the roof when positioning the detection units.**

MINI SHED CEILINGS OR SMALL FULL THICKNESS BEAMS

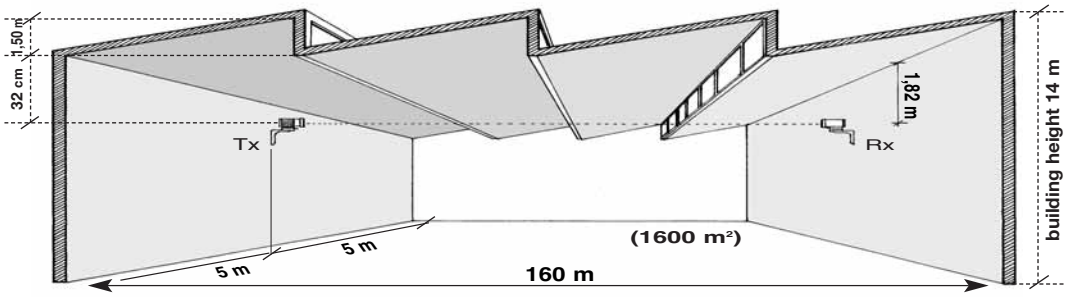
These types of conditions *always* require the crosswise detector placement with respect to the mini sheds (or beams). It is recommended that the units' total distance from the top **should not exceed 13% of the height of the building to be protected**.



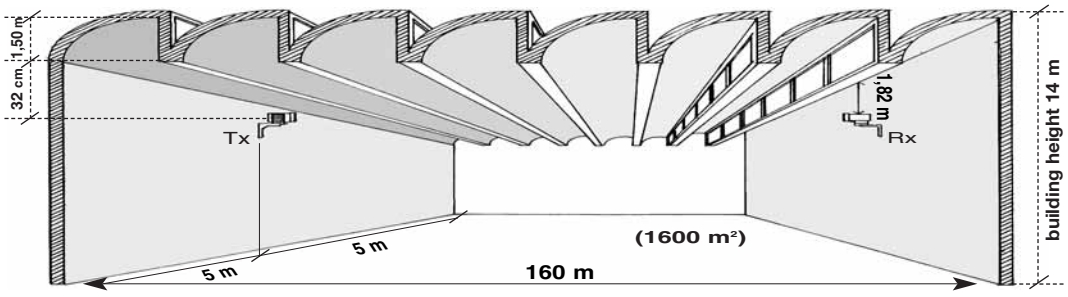


SHED CEILINGS OR WHERE THERE ARE LARGE FULL BEAMS

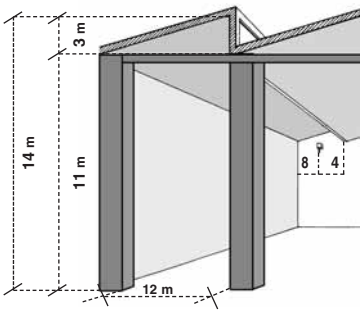
If the shed or full thickness beams are up to 13% from the top of the building to be protected **it is advisable to** place the detectors below the lower edge of the beam installing the detection units crosswise with respect to the shed or full thickness beams. This arrangement should always be the preferred one.



Note how in the above example, and in the next one, the building is 160 m long and the positioning of the detection units along the short side is reduced by 2.5 m per side (a total 5 m), thus bringing us up to the 1600 sq m limit.



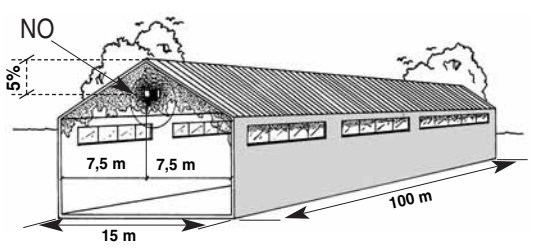
If the shed height from the supporting beam is greater than 2,5 m **it is advisable to** position the detectors inside each shed whatever the height of the building.
Since the length of the sheds in this case is generally quite short, or at any rate usually less than 40 - 60 m, **it is advisable to** combine a line detector with a reflection system such as the **Mini-boomerang** or **Horu**s systems. (see the specifications for the two models).
It is advisable to position the detection units in such an installation at a maximum of 13% from the top of the building's total height .

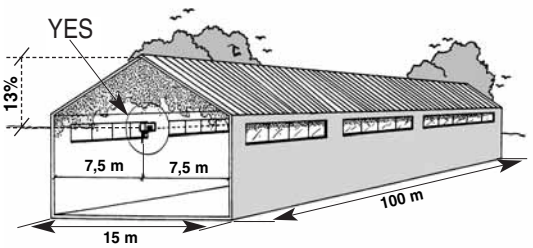


It is advisable for the detectors' operative width to be of the following proportion: **q-**3.
E.g. in the case of the drawing alongside the horizontal measurements will be: 8 m and 4 m (where the total width is 12 m). **It is advisable to** also position the detection units taking into account the fact that temperatures are likely to be higher just below the roof or ceiling. This means possibly having to increase the figure of 13% by a measure corresponding **as a maximum** to that of the beam's supporting base (see also the guide on page. 16).

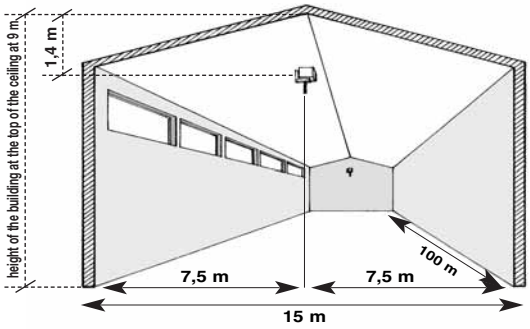
DOUBLE STEEPLY SLOPING ROOFS WITH HOT AIR LAYER

The presence of cushions of hotter air just under the roof may be the result of various factors. One useful way of dealing with the problem is to study the roof angle. Detector positioning as in the figure on the left shows one of the most common installation errors. The preferred installation where there is no environmental ventilation is that shown on the right.





The positioning of a detector at a distance of «X» from the top of the ceiling depends on a careful analysis of the environmental conditions. Once possible solution we give by way of example, and that considers the average of the environmental conditions found in a building with no ventilation, is to establish a figure that is a percentage of the total height. The distance that results from that percentage indicates a reasonable detector «X» position.
This suggestion works where the height of the building is not greater than 11 m.
The **advised positioning limit** figure of 13% of total building height limit may be increased or reduced under certain circumstances:
1. It may be **Increased** where a higher temperature under the roof is constantly or normally the case. The increase in height of the installation can generally be expressed as a percentage of the temperature.



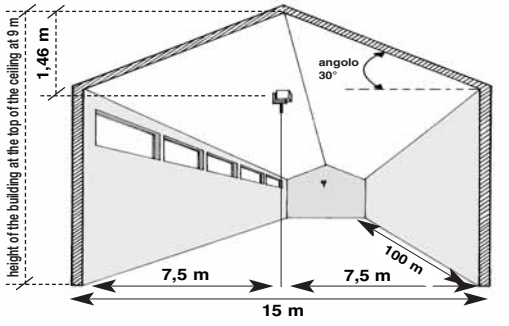
(see also the guide on page. 16).
Example:
floor temperature +25°C
continuous ceiling temperature +30°C
(percentage increase 20%)
Height of the building H = 9 m
Up to 13% of 9 m = 1,17 m
% on 1.17 m (20%) by temp. = 23,4 cm

Positioning of the detector:
117 cm + 23,4 cm = **140 cm approximately**

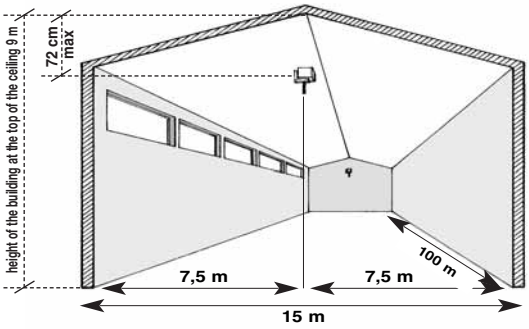
2. **Increase** of 1% for every degree of roof slope **up to a maximum of 25%.**

Example:
Height of the building H = 9 m
Up to 13% of 9 m = 1.17 m
Slope of roof: 30°
max % increase on 1.17 m = 25%

Positioning of the detector:
117 cm + 29 cm appx (25%) = **146 cm max.**

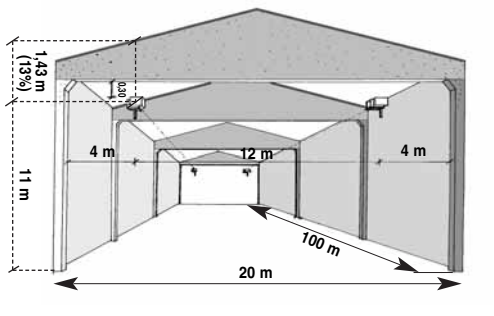


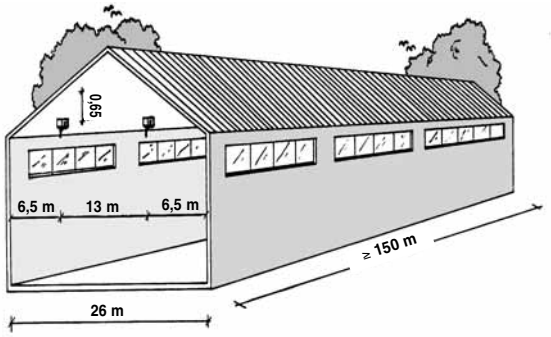
3. **Reduced,** even greatly, if there are extractor fans or air expulsion units on the ceiling or where temperatures are typically very low. E.g. +5°C / ±0°C. The required reduction in detector installation height follows a roughly logarithmic pattern and is in any case difficult to predict precisely. In these cases **it is advisable**, where possible, to position the detectors at a height **that is not more than 8%** of the total height of the building if there are up to 2 complete air changes per hour as a result of the expulsion units (see page 11). If there are a greater number of air changes it must be a fraction of 8%, as the speed of the upper air needs also to be considered. The speed must be =a 1 m/sec. in these cases the detector must not, as far as is possible, have extraction fan air flow crossing the infrared carrier between the transmitter and the receiver. See the indications on page 11 of the general part of the manual.



To confirm the detectors' positioning and calibration it is good practice to carry out a scale fire simulation using, for example, 40 cl of petrol. If the positioning of the ARDEA unit could be improved then this should be done.
It is a mistake to increase or decrease the detectors' sensitivity to make up for positioning errors (see page. 32).

EN 54/14 (2001) states that line detectors should be positioned with a **maximum width of 15 m.** The same standard appears also to establish that the centre line of the detector's working width must coincide with a line under the top of a double sloping roof. It would therefore seem to follow that the line detector must work at the roof's centre, i.e. in the position of maximum distance from the top of the ceiling even where there are solid beams. Since at time of publication of this guide there is some controversy about the regulations, **it is advisable to** prefer arrangements that place the detectors rather nearer the walls. Here are two examples:



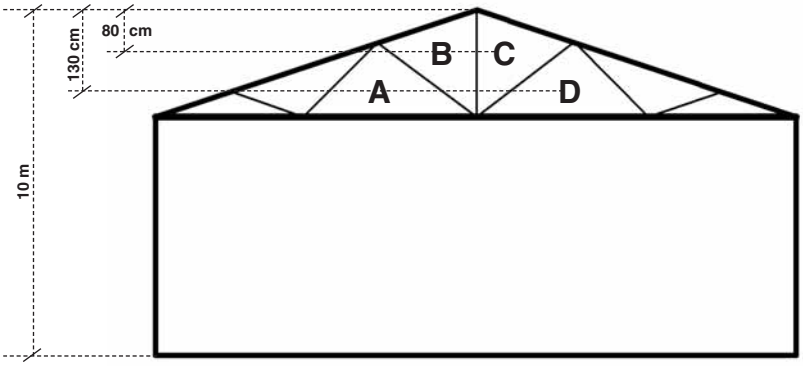


From the examples in the above figures it can clearly be seen that the fire risk should be divided between two units if the beam is =a 15 m. The beginnings of a fire in a position close to the right or left walls of the buildings shown must necessarily be immediately detected by the unit nearest to the location of the beginnings of the fire. If, on the other hand, a fire starts along a vertical line from the top of the roof, the combustion products must necessarily spread out in all directions and so also towards the side walls. If the «smoke» loses temperature and therefore energy it will «get heavier», and so spread and **«descend»** along the optical axes of the detectors' infrared beams, placed where the roof's slope is least deep.

STEEL OR CONCRETE LATTICE BEAMS

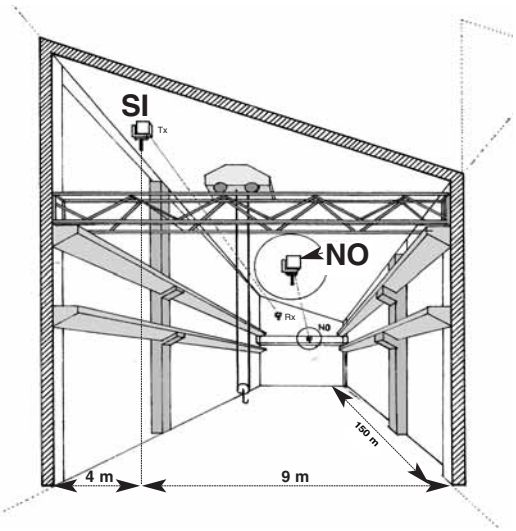
These type of beams allow installation of ARDEA in the 4 positions shown in the figures: **A-B-C-D**. Generally speaking the positions **B** and **C** are preferable in unheated buildings with well insulated ceilings and also in dusty environments. Positions A-**D** are those of choice in all other cases. It is advisable to install the units preferably **within the 13%** of the room's total height. The detection units' installation should **always** be such that there are no other things like ventilation heaters, overhead radiant heaters, chains, steel cables and pipes etc. are found within each triangle. The units must also be orthocentrically positioned to the triangle. In these types of structures the fill-in is often in fretted roofing sheet material.

In this case the units must be installed on the base of the lattice beam's stringer with a T-shaped steel counter-bracket and on a surface that is free from shaking, vibration or twisting movements.



SHED ROOFS WITH MOBILE BRIDGE CRANES

It is not uncommon for serious errors to be made in this kind of building In buildings where a mobile bridge crane is in use for example. The bridge crane is normally supported by CLS or steel columns. These columns may or may not also be those that support the building itself, the same being true for the beams the bridge crane travels along. The example given here is of a shed roof but the situation applies to any kind of building with any kind of roof. The general advice is **not to mount** the detection units either to the beams or the columns but to the fill-in structures as they are usually not connected to these. In any case, as the fill-in structures do not work directly in harness with the columns they are generally less subject to the spread of shocks or vibrations as strong as those in the beams and columns. During its movement the bridge crane may also be subject to vertical oscillations.



These cannot be seen but may even amount to some centimetres of movement. As the bridge crane moves along its path these conditions may result in alternate obscuring of the Infrared projection cone between the Transmitter and Receiver units. This generally occurs at the top plane of the bogie and the lower edge of the ceiling. **This must therefore be taken into account when centring the units.** To align the units it is therefore necessary to carry out a movement check (forward-back-right-left) to ensure that the detector is not influenced by the bridge crane's movements.

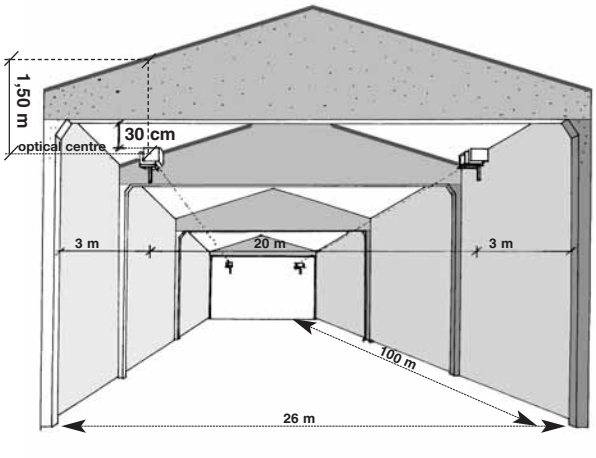
PREFABRICATED SOLID CLS BEAMS FOR DOUBLE-PITCHED ROOFS

When choosing the detector installation position in such cases, as shown in the sketch, three points have to be considered:

1)-A maximum vertical distance, from the ceiling to the detector's installation position, of **more than 2.10 m is not advisable** (including the height under point 3 below).

2)-When positioning the respective detectors **it is advisable** to place them toward the ends of the building's long sides if the total width of the continuous CLS prefabricated beam is ≥ a 15 m.

3)-The distance between the lower edge of the beam base and the Transmitter-Receiver units' optical centre must not be less than 30 cm for a 200 m distance between Transmitter and Receiver.



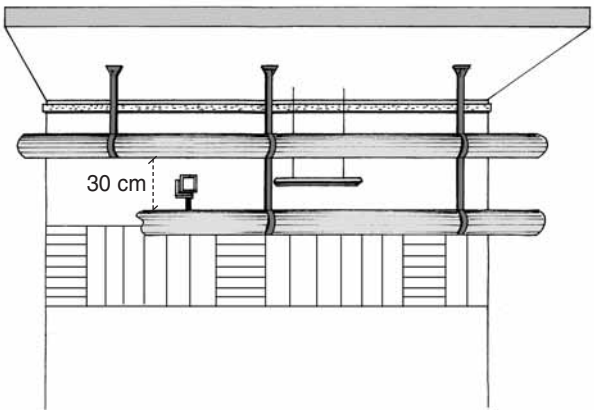
Normally pre-pressed CLS beams are longer than 15 m and so 2 detectors are required. Even in this case with 2 detectors it is possible to install for distances = a 150m. While we await the final provisions of the regulations under EN 54/14 Europe, and UNI 9795 we advise installation as shown here for this type of situation.

It should be pointed out neither of these sets of regulations (European and Italian) has yet been published at the time these instructions are printed. The 2 publications are expected during the course of the year 2002.

COMPOSITE OBSTACLE TRANSIT

The following sketch shows a very common situation.
Even in this difficult situation ARDEA can be easily centred and aligned. All that is needed is a minimum space of **30 cm horizontally x 30 cm vertically = 900 cm**

When the projected Infrared crosses the areas between one obstacle and another, it must not Contact in any way pipes for very hot fluids (e.g. steam, oil or air).



galvanised heating or hot air race-ways. Temperatures up to 30°C do not count for these purposes.

Oil or steam piping for example, must be at least 1.5 m to the side of the ideal centring line for the infrared beam between the Transmitter and Receiver units.

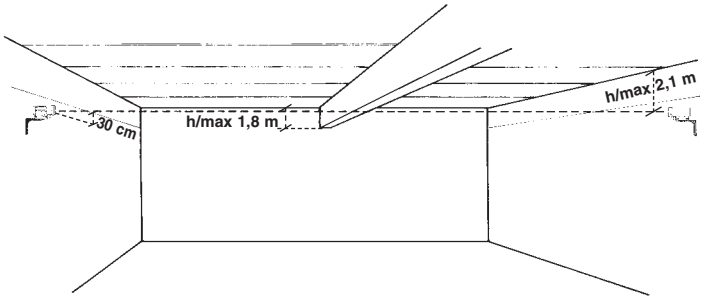
The positioning of the detection units in environments where heating is by means of overhead radiant heaters must necessarily be **above the radiant heaters** themselves.

See also the suggestions on page 4.

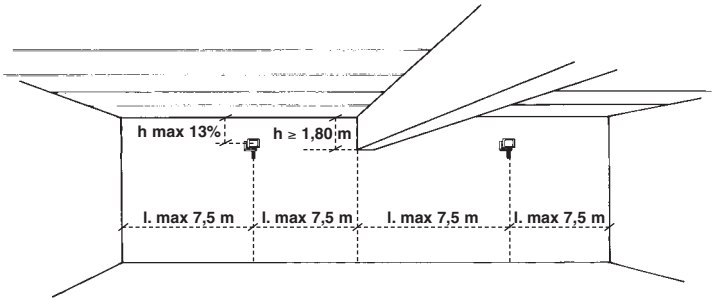
FULL THICKNESS BEAMS

Generally speaking the ARDEA detector can be positioned below full thickness beams provided their height is the usual standard. The positioning of the detection units may therefore be crosswise with respect to the beams. At the time of printing these instructions there are no precise indications in the Italian and European standards of what should be the working distance between one beam and another. There is also no indication whether the positioning of line detectors has to comply with a given distance between beams when the detectors work crosswise to the direction of the beams. Until the regulations establish exactly what the measurements are, and where temperatures are not excessively high under the ceiling level, **the following are our own recommendations**:

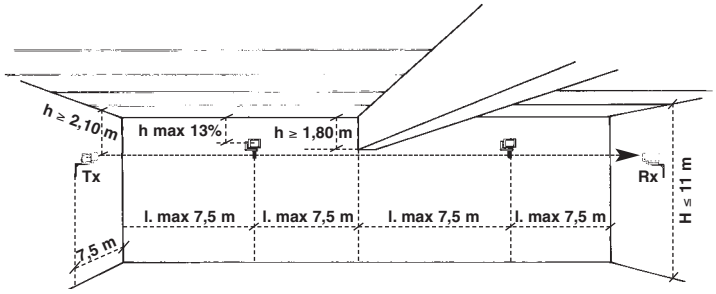
a)- do not install the detection unit more than 2.10 m from the lower level of the roofing (flat roof) and the outline of the beam or raceways or obstructions in general, where:
- 1.80 m may be roughly considered the maximum beam height or that of the obstructions in general (steel raceways, wiring channels, pipes, noise cowlings and so on), ... **and**
a - 0,30 m detection unit installation distance from the lower edge of the beam and/or extraneous objects.



b)- place different models of detectors **(E**.g. beam reflection detectors: **Boomerang, Miniboomerang, Horu**s) parallel to the direction of the beams where their height = 2.10 m **(E.**g. 2.5 m -3 m or more). Installation in this case must be carried out by locating the detector in the mid position of the space between one beam and the next. In this case the resulting volume between one beam and the next should be treated as if it were between two walls, repeated for all the beams in the building.

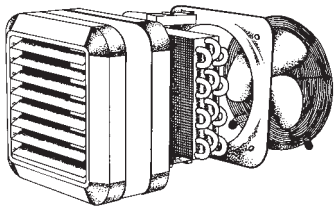


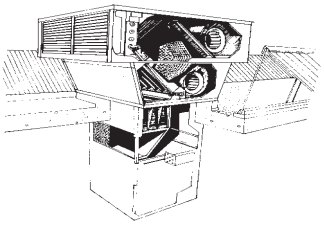
c)- If the temperatures below the ceilings of the working area in industrial buildings are very high (e.g. =a 45°C.) it is advisable also to use **ARDEA** detectors mounted crosswise to the beams (or sheds), placed below their lower edge. The setting up of a second level of detectors may be part of an arrangement whereby any alarm from the **parallel** detectors between one beam and the next can also correspond to an alarm from one or more crosswise **detectors** mounted below the beams.

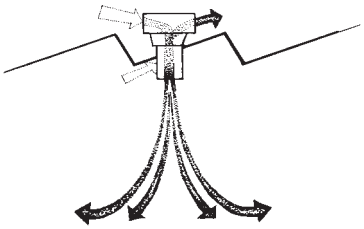


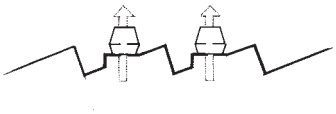
WHERE THERE ARE VENTILATION HEATERS

Ventilation heaters that push out air horizontally or vertically must not, as far as possible, interfere with the infrared beam between the Transmitter and Receiver units, at least not from too close (.... 2,5 m). Installation of the units must thus take account of the fact that the bands of heated air may interfere with the outermost parts of the intermediate level cone of the infrared beam. (See page. 4). Installations should as far as possible be avoided where disturbances are caused to the detectors by sudden temperature increases especially if these are also accompanied by violent air movements. The amount and duration of the disturbances can in any case be measured with the UTA or ADM unit. It is however possible to manage these disturbances by appropriate setting of the sensitivity thresholds. See description of the Models ARDEA SF and ARDEA S/2 (Page 21/23)





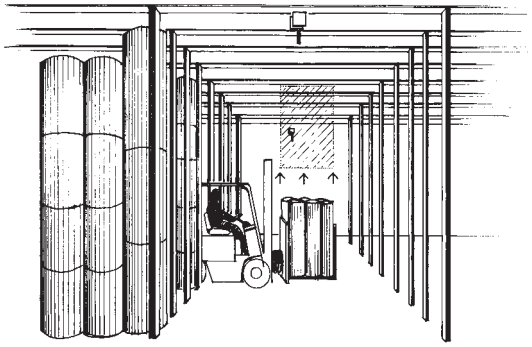




THE PRESENCE OF BIRDS IN ARDEA PROTECTED BUILDINGS

ARDEA detectors are not normally troubled by sporadic disturbances caused by one or more birds crossing the infrared beam between the Transmitter and Receiver units. It is however a different matter if the birds' are present continuously, and are both numerous and moving rapidly. The conventional version of the detector is unable to cancel out disturbances of this kind. The remedy is to install specific guards on the windows or roofing to prevent the day or night time access for birds.

TRANSIENT AND CONTINUOUS OBSTRUCTIONS TO THE INFRARED BEAM



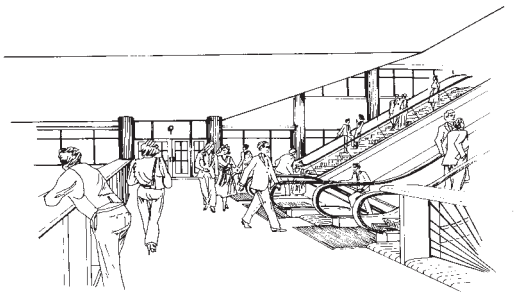
Transient obstruction of the infrared beam between the Transmitter and Receiver, for example during the movement of loads by fork-lift trucks in warehouses may briefly inhibit the working of the detector.

In this situation the detector is able to identify an "operational fault". On the removal of the obstacle the detector will automatically restart its normal working. The fault will however remain active if the load is left behind between the Transmitter and the Receiver. At the planning and installation stage the positioning of the units must therefore take account of the possibility of any transient obstructions resulting from the movements of goods that could interfere with the infrared beam. Generally speaking the space required for proper centring and alignment should not be less than 30 cm x horizontally by 30 cm vertically i.e. = 900cm. It is possible to inhibit the output from the universal interface **INT/8-BA (page 30)** to the fault signal exchange where obstructions occur in a range up to 90 sec.

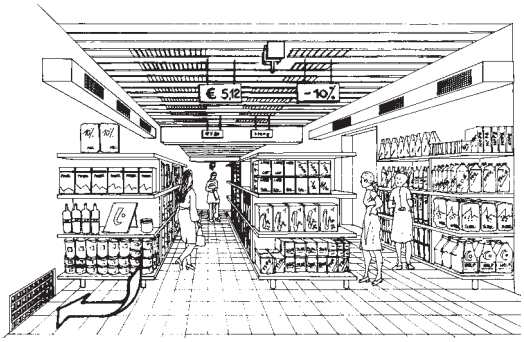
Permanent obstructions like cables or vibrating stay rods must be avoided.

SHOPPING CENTERS AND LARGE STORES

These buildings are architecturally complex and generally include large spaces to be protected.



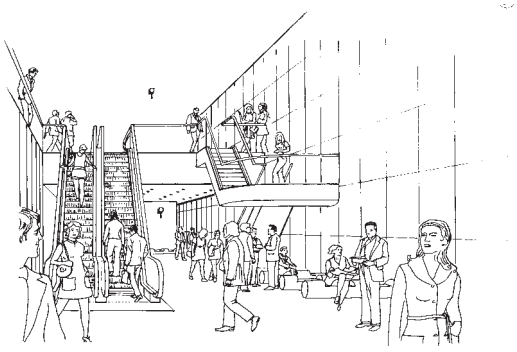
The use of ARDEA in such large areas is not substantially different from applications in industrial buildings (also in the light of amendments to the fire protection Law 46/90 of 01/01/2002 on buildings “whatever their use” Head V, Art. 107 paragraph 1,”g”).
Some additional attention should however be given to such matters as the following:
a)- Internal protection of false ceilings (See UNI 9795 and/or pr.EN54/14-2001)



b)- Protection of sloping areas above and below escalators.
c)- Signs and hoardings in the shopping areas.
d)- Air conditioning plant, heating and fans that suck in or push out volumes of air. Careful investigation is required to establish the direction and speed of “smoke” from the beginnings of a fire towards the place where the detectors are installed (see page 11).

COMMUNICATING HALLS BETWEEN TWO OR MORE SPACES

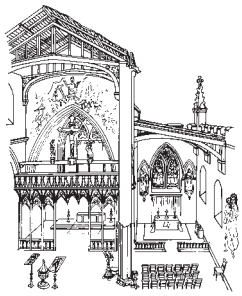
In this type of situation it is essential to observe what air currents can be produced between the hall and adjacent areas, where the buildings next to the hall may have different pressures and/or temperatures.
The suggested installation distance from the top of the ceiling could be = 2.10 m, if the roofing has a glass or similar roof light (such as Plexiglass or Polycarbonate).
It should also be considered that if all or a part of the roof is made of transparent materials, the Receiver unit may not be installed where morning or evening sunlight shines on it.



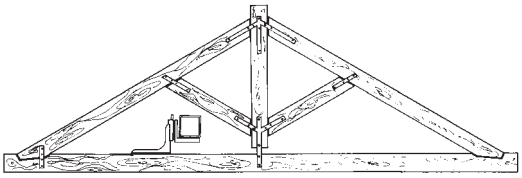
Installations where the Receiver units necessarily receive sunlight must be equipped with suitable optical filters and diaphragms. Such filters and diaphragms must be selected according to distance between the Transmitter and Receiver, as well as the characteristics of the environmental light disturbance. These situations should be referred to our Technical Dept. or to our service centres at the system planning stage.

PLACES OF WORSHIP

Building protection should in such cases be divided up into areas of risk. The protection of wooden alter columns or painted canvases, for example, needs to be addressed specifically and locally.



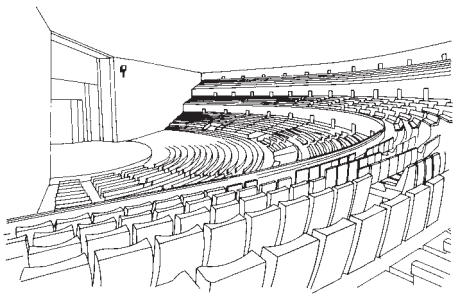
The protection of the building as a whole is a different matter, where a fire may start at floor level (e.g. with pews, chairs or knee-rests), or in roof trusses, decorations, in the apse or choir etc. The protection of the main space should generally be effected by placing the ARDEA detectors above the base stringers of roof trusses.



These are generally locations that are not invasive or ugly as usually hidden from the view of worshippers. Our experience with such buildings means our Technical department is able to answer your specific queries, even in apparently problematic situations.

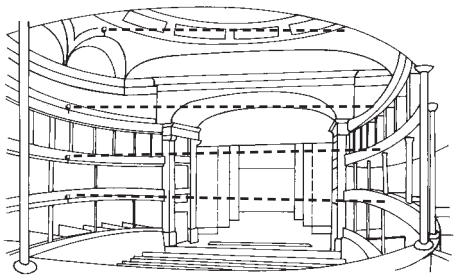
PLACES OF PUBLIC ENTERTAINMENT

Dance halls and discotheques have specific problems but apart from special effects smoke requiring specific fire detection arrangements, the problems relating to the positioning of detectors are similar to those of buildings used for other purposes. Fire detection in theatres, including those of special historic and artistic value, may need a number of levels of detectors, while the principal fire detection location will still be close to the ceiling or roof.



Other detectors are generally installed at varying intermediate heights.

The detectors use may be reflection types such as the **Miniboomerang or Horu**s. Normally such installations have to take account of such matters as the seating slope, the curtains and furnishings and decor that could spread fire.



When analysing possible fire scenarios the heating and air conditioning plant have to be considered as ways of conduits for fire data from one part of the room to another and also possibly fuelling the fire the themselves. The number and characteristics of the detectors need to be increased to ensure they collect information on the beginnings of a fire by being close to or at the probable place of origin of a fire, or close to “areas of the room” where smoke is most likely to gather, possibly driven by the ventilation system itself.

Our Technical Dept. has mathematical models that can indicate suitable installation positioning at the system planning stage.

FIRE DETECTION IN TOWERS, STAIRWELLS AND SHAFTS.

Unusual installations that may even be considered eccentric, though entirely feasible, can usefully be set up with ARDEA detectors **(Boomerang - Mini-boomerang - Horu**s) for vertical fire detection. Such installations are ideal for telephone towers, shafts for cabling or for lifts, hoisting towers or the proscenia of theatres and so forth. The use of the ARDEA detector in in a vertical setup has still not been addressed by European and Italian regulations (at the time of printing - January 2002), though such an arrangement is covered by American **NFPA** guidelines.

TALL AND INTENSIVE AUTOMATIC-PALLET WAREHOUSES

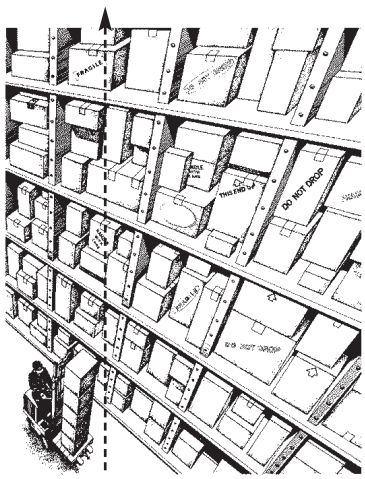
If detectors are installed for vertical working in tall automatic warehouses, there is provision for the installation of a number of detectors in a continuous series “recessed into the floor”.
The recommended distance between detectors is set at = a 8 m in a building that is = a 15 m tall with a forklift truck aisle of = a 2.5 m. Taking into account the mean size of a forklift truck, including its load, it can at most cut off one detector at a time when paused or stationary along the whole length of its working aisle.

At the same time a fire starting at any height will quickly interfere with the optical beam between the Transmitter and Receiver units positioned in the aisle.

Any smoke produced by loads on the shelving will tend to go into the free area of the transit aisle and so invest the nearest vertical light beam to the fire. In this way the area of ceiling protected above the corridor will be:

- about 50 square metres in typical working.
(4 m x 4 m x π = 50,24 m^2)
- about 200 square metres if the truck obscures a detector when working.
(8 m x 8 m x π = 200,96 m^2)

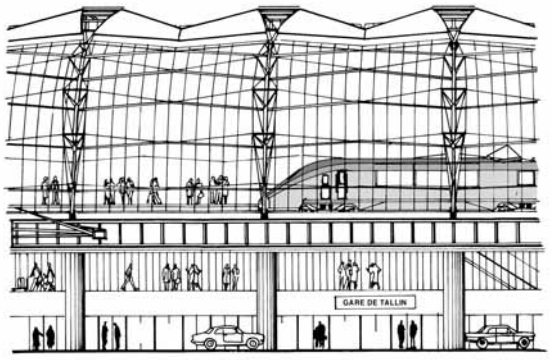
Naturally the arrangement of a series of detectors is required for each “corridor”. This enables several detectors in a number of aisles or corridors to work together to identify the fire both at the ceiling at mid levels and at the floor.
Such an installation system does not mainly consider the roof **area** either at the ceiling or floor, but the working **volume** along the whole length of the infrared beam. This means that the actual protected area will be the sum of all those areas corresponding to each pallet level and so on for the whole height of the load.
The entirety should be considered as a “volume”, while “one or more volumes” are considered and Envisaged at the planning stage when working out how the smoke will act in relation to the clear free adjacent air.

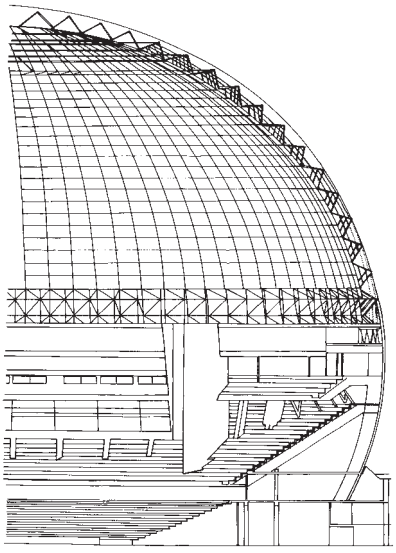


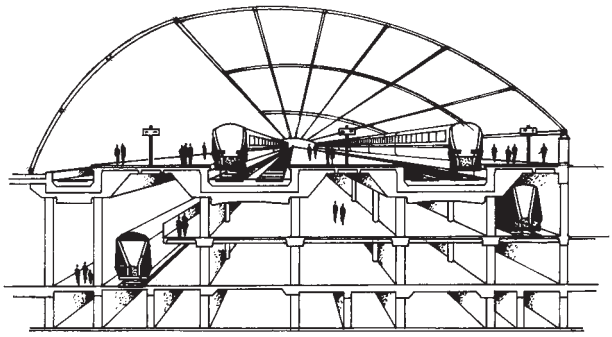
THE PROTECTION OF LARGE SPACES, EXHIBITION CENTRE PAVILIONS, SPORTS CENTRES, RAILWAY STATIONS, UNDERGROUND RAILWAY STATIONS, AIRPORTS AND AIRCRAFT HANGARS.

In such spaces the use of ARDEA is especially indicated because these are normally tall buildings of very large dimensions. In the cases of railway and underground stations there are three particular problems that have been the subject of study and brilliantly solved:

a) The presence of extremely strong electromagnetic disturbances **(EMF)** produced by the power take-offs along the electrical supply cable inside the stations.
b) Rapid rises and falls in pressure during the train arrivals and departures.
c) The formation of electrostatically charged graphite dust clouds travelling in randomly around various parts of the station.



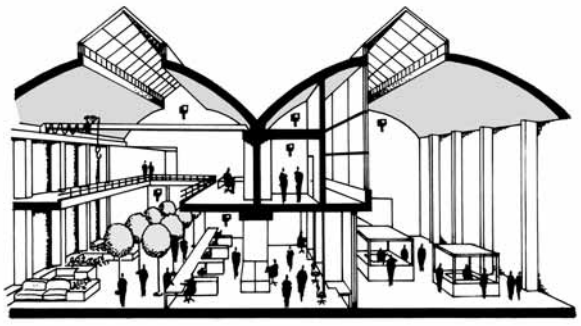




There are now tried and tested solutions to each of these problems, often using standard ARDEA equipment.

The protection of exhibition centres requires no special procedures apart from the normal attention indicated in the applications indicated above.

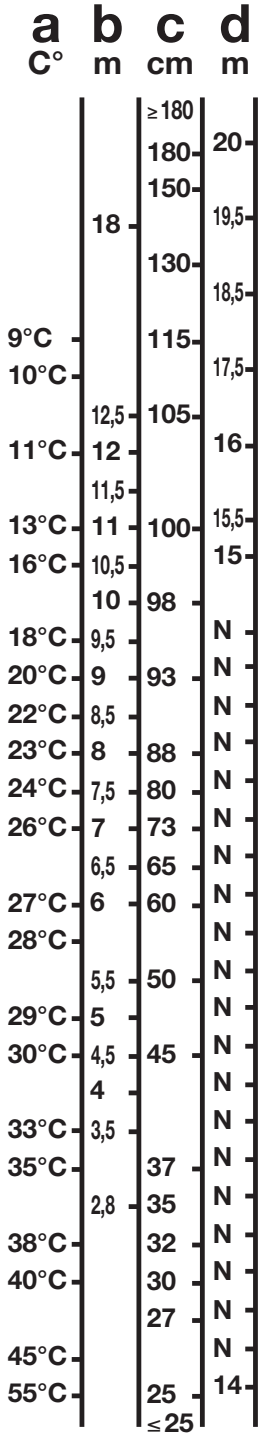
With regard to such spaces it is generally best to use the initial calibration of the detectors until the winter heating and air-change fans are running.



Sometimes the humidity in these building increases quickly due to sudden inflows of sometimes large numbers of visitors. In such situations the environmental disturbances read by the UTA or ADM may rise by up to 2, 3 or even 4 times.

An initial reading taken for these possibly poor environmental conditions may lead to avoidance of future problems in normal working.

SIMPLIFIED GUIDE FOR FINDING CORRECT DETECTOR INSTALLATION HEIGHT IN RELATION TO TEMPERATURES UNDER THE ROOFING



How to use the guide

Position the enclosed ruler along the dotted line corresponding to the temperature under the roof or ceiling (column a). Line the ruler up along the dotted line corresponding the height of the building to be protected (column b). The resulting alignment indicates **both** the detect installation height from the top of the roof (column c) **and** the theoretical maximum sideways width of the roof (column d).
E.g. temperature in **«a»** 22°C; H of the building 6 m in **«b»**, detector distance from the top of the ceiling about 37 cm. (the ruler alignments are almost always diagonal to the columns). ***You are however reminded that regulations provide for a maximum effective width of 15 m.*** The fact that the detector can also detect fires beyond this width will mean that it will actually reinforce the detecting ability of the next unit and so both will work promptly together to signal an alarm.

Legend

a Temperature under the roof at 50 cm from the slope of the roof.

b Height of the building at the top.

c Detector units installation vertical distance from the top.

d Total width of the roof as two halves (to the right and to the left of the detection units).

N Regulation width according to established custom (15 m), as now enshrined in the European regulation prEN **54/14** (15 m).

13% of the building height (elsewhere indicated as **the maximum distance** the detectors can be installed from the roof - and realised only in part in this guide). Regulations that are likely to shortly come into force could provide for installation heights that may be different from those given in this guide. In this case it will be necessary to diverge from the guide where it differs from any regulations made. It should be noted that this guide is intended to be provide assistance when taking only two variables in account: the temperature under the roof and the height of the building. The indications are for a building with a double sloping roof with a 20° slope, no natural or forced air ventilation or extraction, heating, air conditioning or pressure variations. Even if only one of these factors applies, the resulting height may have to be increased or reduced. Other considerations must also figure in the calculations where there are a number of variables involved in addition to the temperature under the roof **(E.g.** air speed, heating and sudden temperature and pressure changes). **It is advisable to always carry out a real scale fire simulation to check correct positioning of the detection units in the protected building (see also page 32)**

BRACKETS AND THEIR INSTALLATION ON THE MODEL ARDEA S/2 - SF - DUST

The Transmitter-Receiver units come with their own brackets that must be fastened to the structure very rigidly, using plugs as shown in the following figure If the structure is steel, fastening must be by means of through screws and bolts to a support that is not subject to twisting, movements or vibrations.

BRACKET ATTACHMENT AND THE POSITIONING OF ARDEA S/2 - SF - DUST UNITS

The Transmitter-Receiver units attach to their respective brackets by means of a slide that is mechanically integral to them. The bracket's double cone shape means mechanical equipment locks securely by the simple application of pressure. If the Transmitter or Receiver unit has to be removed, it simply pulls away from the bracket.

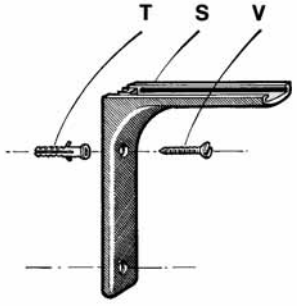


Fig. 1

T = Plug
S = Slide slot
V = Screw

Code: MBP

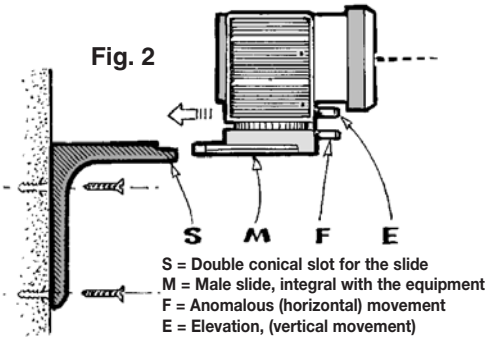


Fig. 2

S = Double conical slot for the slide
M = Male slide, integral with the equipment
F = Anomalous (horizontal) movement
E = Elevation, (vertical movement)

VARIABLE POSITIONING OF THE UNIT WITH RESPECT TO THE PLANE THE BRACKET IS FASTENED ON

Although the Fig. **(**3) shows the most common positioning, others are possible, as can be seen in other figures.

The mechanical part has a worm screw **(**E), that causes precise movement of 1 revolution=1 degree on the vertical axis. Similar precise movement on the horizontal axis is obtained using the knob **(**F).

The bracket can therefore be mounted with the most diverse orientations, where tiny adjustments are made to horizontal and vertical axes, so it is easy to set up any orientation relative to the mounting bracket.

Movement of the whole device, and not just the optical parts makes it easy to obtain precise fastening and subsequent alignment.

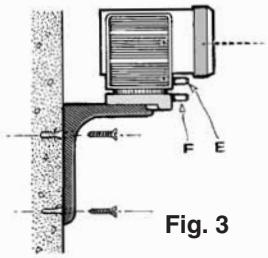


Fig. 3

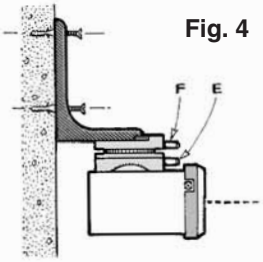


Fig. 4

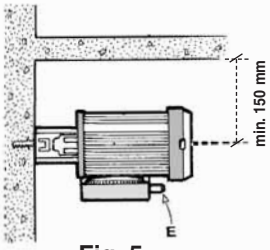


Fig. 5

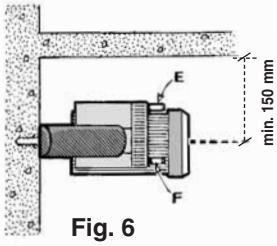


Fig. 6

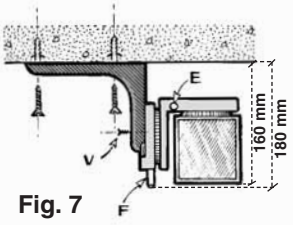


Fig. 7

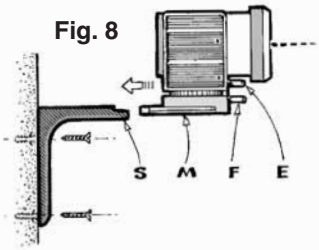


Fig. 8

General size and shape on page 32

ARDEA SF 2P100/01

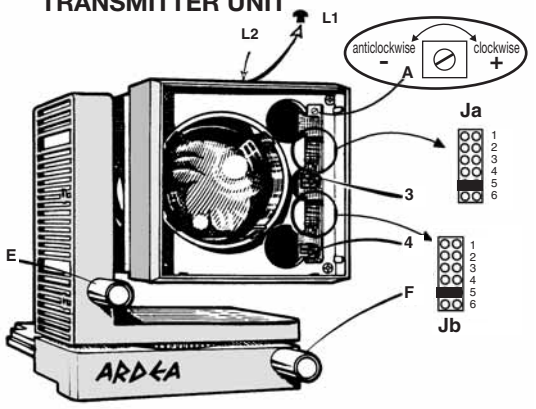
DISTANCE SELECTION AND ENERGY USED

DISTANCE SELECTION	ORDER	POSITION JUMPER	Tx TRIMMER TYPICAL	Tx TRIMMER MAX
5...15 m	1	1a+1b	20.0	20.0
15...35 m	2	2a+2b	21.1	21.8
35...55 m	3	3a+3b	21.6	22.7
55...75 m	4	4a+4b	22.4	24.0
75...100 m	5	5a+5b	31.1	38.6
100...150 m	6	6a+6b	47.5	65.5
EXPRESSED IN mA			TRANSMITTER	

RUNNING CONDITION	INT8BA		RX
	JB IN	JB OUT	
NORMAL WORKING	16.4	25.0	47.7
FAULT	22.4	15.7	66.7
FIRE AND SMOKE ALARM	22.2	30.6	64.0
	INTERFACE		RECEIVER

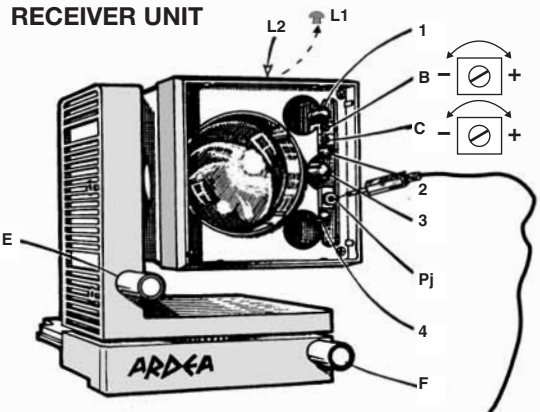
For total energy consumption add up Transmitter+Receiver+INT8BA.

TRANSMITTER UNIT



L1 = Plastic front eject slot cap
L2 = Plastic front eject slot
A = Fine adjustments trimmer for infrared beam
Ja = Approximate distance selection «a»
3 = yellow repeating Led for receiver status
Jb = Approximate distance selection «b»
4 = Green transmitter on Led
E = Vertical movement knob
F = Horizontal movement knob

RECEIVER UNIT

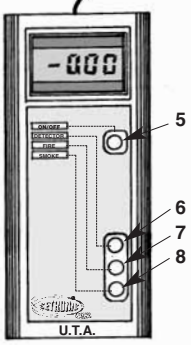


ARDEA SF RECEIVER DEVICE

L1 = Plastic front eject slot cap
L2 = Plastic front eject slot
1 = **Red Led** alarm for **FIRE**
B = Threshold selection trimmer for **FIRE**
C = Threshold selection trimmer for **SMOKE**
2 = **Red SMOKE** alarm Led
3 = Yellow Led for received Infrared intensity level
PJ = Female U.T.A. input cable jack
4 = Detector power signal
E = Vertical movement knob
F = Horizontal movement knob

U.T.A. INSTRUMENT

5 = ON/OFF switch
6 = Environmental disturbance reading
7 = Fire threshold
8 = Smoke threshold



ASSEMBLY AND CALIBRATION PROCEDURE ARDEA SF

- When you open the packaging check the unit is complete. After attaching the brackets in a suitable place below the ceiling, connect up the interface starting from the control unit **(see page 29/30)**.

GROUND LEVEL OPERATIONS TO CARRY OUT WITH THE UNIT ARDEA SF transmitter

a Remove cap L1 from the slot L2 on the front of the unit of the Transmitter and put it to one side for later replacement.
b Use a small screwdriver to remove the plastic front and take off the protective plastic film
c Position the Jumpers **«a»** and **«b»** as in the instructions of the table to exceed the distance to be reached in the building to be protected
d Use a trimmer screwdriver to turn the trimmer «A» clockwise through 18 revolutions.
Do not force it or it could break.
e Gather together the U.T.A, a small straight screwdriver, the **trimmer** screwdriver, the optical filters and caps (L1).

NOTE before going aloft note how the knobs «E and «F» move the parts clockwise anti-clockwise

OPERATIONS TO BE CARRIED OUT ON THE ARDEA SF 2P100/01AT HEIGHT

f First connect the Receiver unit to the bracket after removing the cap L1 and plastic front. Point the Receiver unit roughly in the direction of the point where the Transmitter unit will be, using the knobs «E» and «F». Finally put the connector in place and, after checking once more that the connections to and from the INT8BA are correct **(page 29 and 3**0), switch the unit on.

g Insert the Transmitter unit opposite. After making sure that the jumpers on the Transmitter have been set correctly and after a final check on the connections to and from the interface INT8BA **(page 29 and 3**0), and switch on.

h The **yellow** LED "3" on both the Transmitter and the Receiver may now assume the following **three** states:

1) **It may be flashing -** that means the infrared beam intensity from the Transmitter is too much. This is however the state you **ALWAYS** require at the start. (Saturation)
2) **It may be steady** - that means the Transmitter and/or Receiver are not pointing in the right direction or that there is an obstruction (possibly partial) between Transmitter and Receiver. This condition can be changed by moving the knobs**(E -** F) right-left, up-down: points l-m-n-o of the Transmitter and Receiver
3) **It may be off -** that means you are probably very close to having saturation.

i By turning the knobs «E» and «F» you can horizontally and vertically move the Transmitter. The **YELLOW Led «3»** will start flashing at a certain point. In this state the interface fault Relay will also be intermittent.

l By turning the knob "F" very slowly (e.g. clockwise) the Transmitter parts will move horizontally so that the **YELLOW led «3»** continues to flash. Stop when the Led «3» stops flashing.

m Now turn the same knob «F» in the opposite direction. The **YELLOW Led «3»** will start flashing again. Continue turning the knob "F" in this opposite direction to cause the device to rotate horizontally. When carrying this out the **YELLOW led «3»** continues flashing and you have to count how many turns have to be made with the knob before the Led goes off

n The R and L extremes within which the **YELLOW Led «3»** is flashing locates the horizontal arc within with the Infrared beam emitted by the Transmitter is at its maximum. **At the half way point in the arc you are centred.**

o Now carry out the same procedure with the vertical axis, using knob «E»

p Carry out the same procedure with the Receiver (which should have its Led «3» flashing at the start) follow exactly the same instructions as in**«l - m - n - o»**

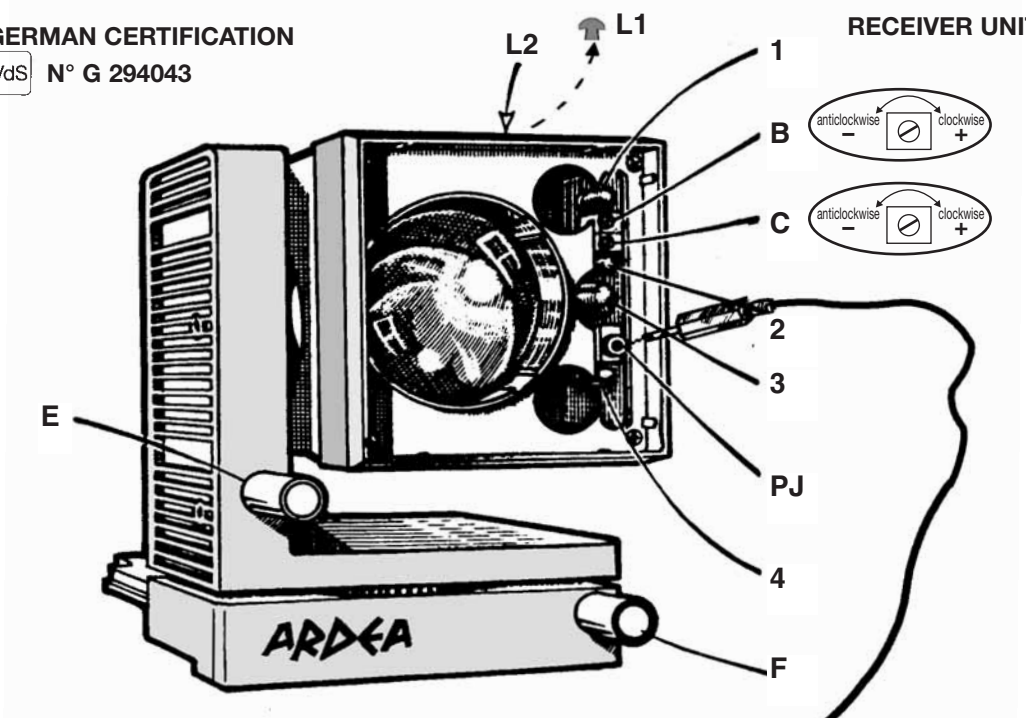
q Turn **the Transmitter unit's trimmer "A"** anti-clockwise to reduce infrared beam intensity until the **YELLOW led «3» GIALLO goes off**. When led «3» is off, make a half-turn of the trimmer in a clockwise direction. Then put your hand in front of the Transmitter and keep it there for 10 seconds. The **YELLOW led «3» will go on continuously**.
When you take your hand away, the Led «3» should go off immediately.

r **The detector is now ready for calibration of the Receiver unit (page 20 and 21).**

ARDEA SF 2P100/01 CALIBRATION WITH UTA

GERMAN CERTIFICATION
VdS **N° G 294043**

RECEIVER UNIT

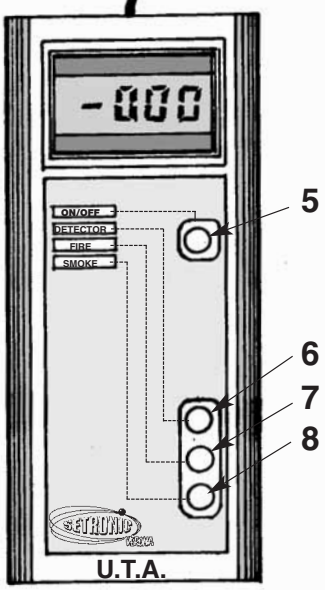


ARDEA SF RECEIVER UNIT

L1 = (See through) plastic front ejection slot cap
L2 = Plastic front eject slot (see through)
1 = **Red Led alarm** for **FIRE**
B = Threshold selection trimmer for **FIRE**
C = Threshold selection trimmer for **SMOKE**
2 = **Red** SMOKE **alarm Led**
3 = **Yellow Led** for infrared beam intensity (transmitted and received)
PJ = Female jack for U.T.A. input cable
4 = **Green Led** indicating electrical supply to the detector
E = Vertical movement knob
F = Horizontal movement knob

U.T.A INSTRUMENT

5 = ON/OFF switch
6 = Environmental disturbance selection **(detecto**r)
7 = Fire threshold
8 = Smoke threshold



ARDEA SF 2P100/01 CALIBRATION PROCEDURE USING THE U.T.A INSTRUMENT.

The ARDEA SF must be calibrated with the U.T.A or with the **ADM** adapter and a digital tester **(to calibrate with the ADM see pages 26 and 2**7). The U.T.A or the ADM must have an efficient battery that goes in the back of the instrument. It is advisable to remove the instrument's battery after use if you do not intend to use it again for some time.

a) Insert the U.T.A.'s male jack in the socket of the ARDEA Receiver **(P**J)

b) Switch on the instrument with switch**«5**». Check the Jack (male) is in good contact with the socket **PJ** on the Receiver unit.

c) Select the **«Detector»** function with button **«6»** . The display will show the **negative** values starting from 1900 divisions.

d) The value should quickly increase: 1900 - 1800 - 1500 - 1300 - 800 - 600 - 500 -200 until it is close to a positive value in about one minute.

e) The reading must settle in this initial stage at an average positive value. This value could initially be lower **(e.g.** negative =15 / positive =35). In this case, quickly pass your hand over the front of the receiver and at the same time observe the rise in value on the U.T.A. or ADM. The raised value caused by the hand in front of the receiver should return to its original value within a few seconds.

f) In the **«Detector»** position, now note all the peak values on the display when the environment is most disturbed for a period of at least 10-15 minutes. **(E.**g. when windows are being opened or closed, when machines or air conditioning starts up and as long as environmental disturbances persist (especially where they occur at the same time). This stage requires patience as correct detector calibration depends on careful analysis of the values. **If the installation position for the ARDEA is good** the detector's values will be on average from negative value =15 / positive =70 divisions. It must be recalled that the «peak» values are in this mean, generally a maximum of 200-280 UTA (ADM) instrument reading divisions.
Note down the peak values.

g) Press the UTA's **"Fire" (**7) button. This value is factory set at about 400 divisions on the receiver. This must therefore be the value your read on the instrument.
The 400 divisions value (mV) is increased by turning the trimmer «B» **clockwise if** the peaks read on the UTA (or ADM), in the function Detector are =at 100 divisions (mV) observing the following:
• increase the fire threshold by 300 divisions above that observed in the function detector **(e.g.**.: peak 110 div. + 300 div. = 410 div. or peak 280 div. + 300 div. = 580 div.).
We strongly advise you NOT to go below 300 divisions in total.

h) Select **«Smoke»** with button **«8»** of the instrument. This value is factory set at 600 divisions on the ARDEA receiver unit. The value of 600 divisions can be increased by turning the ARDEA Receiver unit's trimmer **«C»** clockwise. If the peaks reading in the **«Detector» position** (point f) showed that during the busiest moments in the life of the building peaks of e.g. 400 divisions are reached (mV on the ADM), the **smoke threshold** should be raised to 400 divisions (mV) above the observed peak.
E.g..: peak of 280 div. + 400 div. = threshold to be set at 680 div. (mV div. on the ADM).

i) Now switch the U.T.A instrument off. (or ADM), take the jack out of the Receiver, replace the filter and the Receiver's cap.

ATTENTION

1) If the ADM adapter is used with a tester, follow the instructions on **pages 26 and 27**
2) You are urged to read the precautions and alarm check on **pages 28 and 32** of this booklet.

ARDEA S/2-2P100

SELECTION OF DISTANCES AND ENERGY CONSUMPTION

DISTANCE SELECTION	ORDER	POSITION JUMPER	Tx TRIMMER TYPICAL	Tx TRIMMER MAX
5...15 m	1	1a+1b	20.0	20.0
15...35 m	2	2a+2b	21.1	21.8
35...55 m	3	3a+3b	21.6	22.7
55...75 m	4	4a+4b	22.4	24.0
75...100 m	5	5a+5b	31.1	38.6
100...150 m	6	6a+6b	47.5	65.5
VALUES EXPRESSED IN mA				TRANSMITTER

RUNNING CONDITION	INT8BA		RX
	JB IN	JB OUT	
NORMAL WORKING	16.4	25.0	47.7
FAULT	22.4	15.7	66.7
FIRE AND SMOKE ALARM	22.2	30.6	64.0
	INTERFACE		RECEIVER

For total energy consumption add up Transmitter+Receiver+INT8BA.

GROUND LEVEL OPERATIONS

1) Take cap L1 out of slot L2

2) Insert a straight screwdriver into the slot L2 and lever out the plastic front cover

3) Place the front cover above the detector removing the protective film

4) Select the approximate distance to cover according to the table, using the jumper. Both jumpers must be positioned in the same order, bearing in mind that the selections must be carried out **always with on the down side in relation to the distances to be covered** in the building. **(e.g.** If the length of the building to be protected is 75m, use the selection 55..75 and not 75..100).

Account must also be taken of the fact that:

5) Factory set transmitter delivery has the jumpers in **position «5»** as shown in the transmitter unit

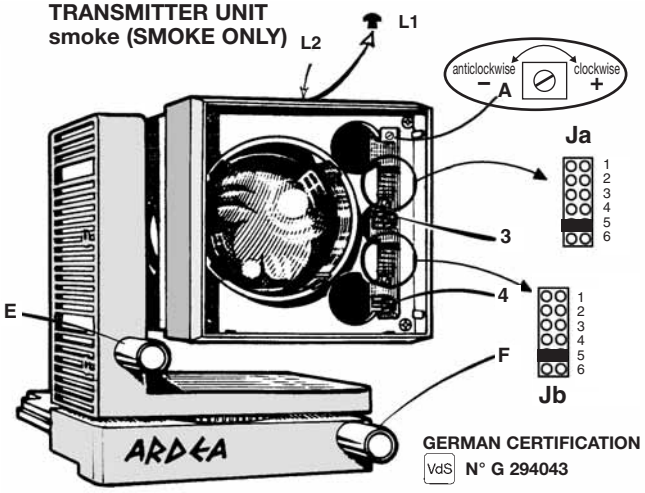
6) The jumpers **«Ja»** and **«Jb»** must also be positioned in the same order.
The order must not be changed

7) It is advisable to put the jumpers in position at ground level before assembly, with the selection in relation to the length to be covered in the building

8) Turn trimmer **A** a maximum of 18 times clockwise.
Do not continue to turn beyond this point or it could break

9) The «fine» level selection trimmer **«A»** can be turned for a maximum of 20 revolutions **with no stop switch**.
It is desirable for 11 or 12 turns **clockwise** to result in the saturation point at the Receiver unit **(Led 3 flashing)**

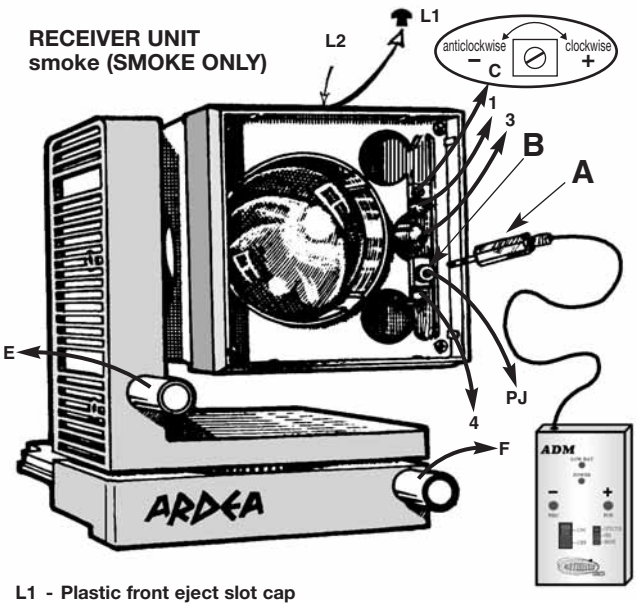
TRANSMITTER UNIT
smoke (SMOKE ONLY)



GERMAN CERTIFICATION
VdS **N° G 294043**

L1 = Plastic front eject slot cap
L2 = Plastic front eject slot
A = Fine adjustments trimmer for infrared beam
Ja = Approximate distance selection «a»
3 = **yellow repeating Led** for receiver status
Jb = Approximate distance selection «b»
4 = **Green Led** transmitter power on
E = Vertical movement knob
F = Horizontal movement knob

RECEIVER UNIT
smoke (SMOKE ONLY)



L1 - Plastic front eject slot cap
L2 - Plastic front eject slot
C - Smoke threshold selection trimmer
1 - RED fire alarm Led
3 - YELLOW Infrared beam intensity level Led
PJ - female connector for UTA or ADM unit input + digital head
4 - Green Led showing electrical supply on
A - Male jack for ADM adapter
B - Ardea PJ jack socket
E - elevation movement
F - fault movement

OPERATIONS CARRIED OUT HEIGHT ON THE **ARDEA S/2 2P100**

a First put the Receiver unit onto the bracket after removing the cap L1 and plastic front. Point the Receiver unit approximately in the direction of where the Transmitter will be placed, using knobs «E» and «F». Finally insert the connector having first checked the connections to the interface INT8BA (page 29 and 300), switch the unit on.

b On the other side insert the Transmitter unit with its output trimmer at maximum points **5 - 6 - 7 - 8 - 9**. After checking the connections with the interface **(page 29 and 3**0), switch the unit on.

c The **yellow LED «3»** on the Transmitter and the Receiver will now be as follows:

1) **Flashing** which means the intensity of the infrared beam emitted by the Transmitter is too high. This is however the **condition you ALWAYS want at this initial stage. (Saturation)**
2) **Continuously on**, which means the Transmitter is not pointing in the direction of the receiver. This condition may however be changed (points 1 and 3) by moving knobs **(E-F)** right and left, and up and down, points **d-e-f-g-h**
3) **Off**, which means that you are probably very near to the saturation point (the condition in point 1 above) and thus correctly aligned.

d By moving the knobs «E» and «F» you rotate the transmitter unit horizontally and vertically. **The led «3»** will start flashing at a certain point. In this state the fault relay on the interface will also be intermittent at the same frequency as the leds on the Transmitter and Receiver units.

e By very slowly turning the knob"F" (e.g. clockwise) **you will move the transmitter parts horizontally until the led «3»** starts of flash continuously. Stop when the **Led «3»** goes off.

f Now turn the knob **"**F" anti-clockwise. **The Led «3» will start flashing** again.
Continue turning the knob «F» for horizontal rotation of the device.
When you do this **the led «3» will still be flashing** and you have to count how many turns are required before the Led goes off.

g The right and left extremes within which **the Led «3»** is flashing indicate the horizontal arc interval within which the infrared beam intensity is at its maximum level.
By stopping halfway along this interval you are at the exact centre **(right-left**).

h Now carry out the same procedure with the vertical axis using the knob **«E» (high-low**).

I Now use the procedure for the **receiver** (whose **Led «3»** will be flashing in the initial stage) following the same instructions in «f-g-h» above

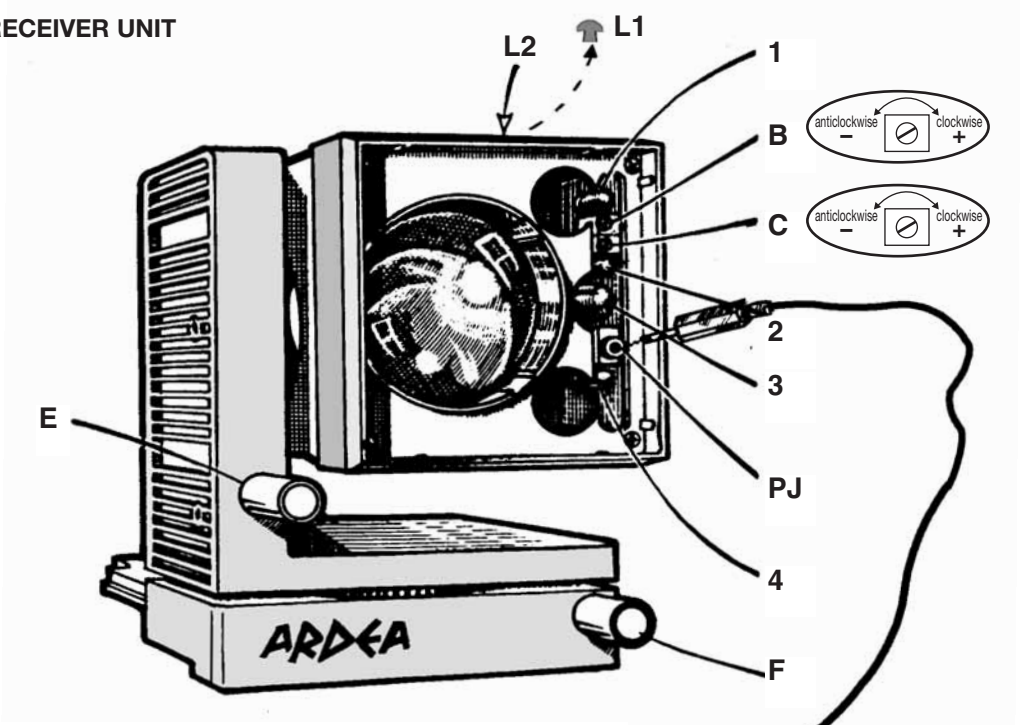
l Now turn the transmitter trimmer **«A»** anti-clockwise, thus reducing the infrared beam intensity, until **the led «3»** goes off. When **the led «3»** is off, once again turn **the trimmer, this time clockwise. Then put your hand in front of the Transmitter for 10 seconds.**
The led «3» will then go on continuously. When you take your hand away, **the Led «3»** should go off immediately.

m After an ON/OFF reset the detector is ready to work. **FOR ANY SENSITIVITY CHANGES SEE "n" BELOW WITH THE ADM INSTRUCTIONS (pages 26 and 27).**

n ADJUSTING ARDEA «S/2» SENSITVITY
To change the ARDEA S/2 detector's sensitivity you need only to use the **ADM adapter** or the instrument used for the ARDEA SF, **the U.T.A.** Sensitivity can be changed in relation to the amount of environmental disturbance shown by the DETECTOR function of the ADM adapter, connected to a digital voltmeter (o an oscilloscope for more precise readings). See the ADM adapter description on pages 26- 27. In the factory the**«SMOK**E» s set at **400 mV**., this is a level that gives the detector excellent sensitivity and sufficient strength to cope with environmental disturbances. This value can, if required, be increased up to **900 mV.** by using trimmer **«C»** when there are intense environmental disturbances. **Settings beyond this value are not advised and should only be considered after contacting our assistance centre for further information and advice.**

CALIBRATION OF THE ARDEA SF 2P100/01-DUST USING THE UTA

RECEIVER UNIT

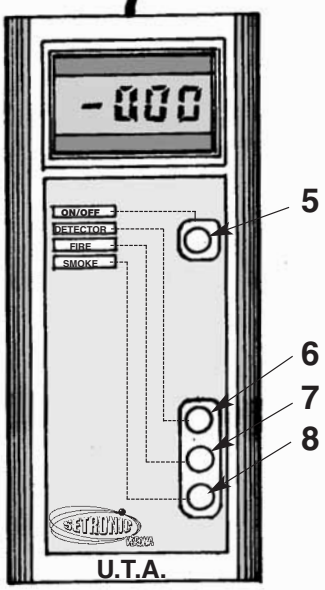


THE ARDEA SF RECEIVER

L1 = Plastic front eject slot cap
L2 = Plastic front eject slot (see through)
1 = Red Led alarm for **FIRE**
B = Threshold selection trimmer for **FIRE**
C = Threshold selection trimmer for **SMOKE**
2 = Red SMOKE **alarm Led**
3 = Yellow Led for infrared beam intensity (transmitted and received)
PJ = Female jack for U.T.A. input cable
4 = Green Led indicating electrical supply to the detector
E = Vertical movement knob
F = Horizontal movement knob

U.T.A INSTRUMENT

5 = ON/OFF switch
6 = Environmental disturbance selection **(detector)**
7 = Fire threshold
8 = Smoke threshold **U.T.A.**



ARDEA SF2P100/01-DUST CALIBRATION PROCEDURE

ATTENTION

1) **The installation procedures are the same as for the ARDEA SF (pages 18-19)**
2) If the **ADM adapter** is used with a tester, follow the instructions on **pages 26 and 27**
3) You are urged to read the precautions and alarm check on **pages 28 and 32** of this manual.

The ARDEA SF2P100/01-DUST must be calibrated with the **U.T.A.** or with the **ADM adapter.** THE U.T.A or the ADM must have an efficient battery that goes into the back of the instrument. It is advisable to take the battery out after use if you do not intend to use it again for a long period.

a) Insert the **U.T.A.'s or the ADM's** jack into the ARDEA Receiver's socket. **(P**J). If the settings have been carried out with the ADM adapter and a voltmeter, follow the instructions on **pages 26 and 2**7, **but with the values indicated here.**

U.T.A CALIBRATION PROCEDURE

b) Switch on the instrument with switch**«5**». Check the Jack (male) is in good contact with the socket **PJ** on the Receiver unit.

c) Select the **«Detector»** function with button **«6»** . The display shows the ***negative*** values from 1900 divisions onwards

d) The value should quickly increase: 1900 - 1800 - 1500 - 1300 - 800 - 600 - 500 - 200 until they become positive in the space of about one minute.

e) The value in this initial stage must «always» settle at an average positive value around a maximum of 200 divisions. This value could initially be lower**(e.**g. = negative 20 / =positive 140). In this case, pass your hand quickly over the front of the receiver and at the same time observe the growth in the U.T.A. or ADM reading. The value increased by passing the hand over the receiver must return to the normally positive original value in a few seconds.

f) In the**«Detector» (**6) position now look at the display to see all the peak values when the environment is most disturbed for a period of at least 10-15 minutes. For as long as there are various kinds of environmental disturbance, such as dust, heat or steam etc., especially where they occur together.
This stage requires some patience on the user's part. Correct detector calibration depends on careful analysis of the readings obtained. **If the installation position for the ARDEA is suitable, the detector's readings will stay at around 200 divisions on average.** From this average the «peak» values should be noted These may be 800-900 divisions on the UTA (ADM). **Note down these peak readings(see also page 28 "CALIBRATION ERRORS" (a-b-c).**

g) Activate the UTA's **«Fire»** button**(**7). The receiver unit's factory threshold setting is about 450 divisions. This must therefore be the value your read on the instrument.
The reading of 450 divisions on the ARDEA Receiver unit is increased by clockwise turning of the trimmer **«B**». This should only be done **if environmental disturbances caused a false fire alarm** (red led 1 flashing). This threshold should be increased **up to a max. of 500 divisions (mV)**.

h) Now activate the **«Smoke»** button**(**8) on the U.T.A. This value is set in the factory at 1200 divisions in the case of the **Ardea Dus**t receiver unit. An increase in the smoke threshold can be made **up to a maximum of 1500 divisions (mV).** This instrument should only be made if the environmental disturbances have caused a false alarm (red led 2 flashing). The increase should be carried out by degrees.

i) Switch off the U.T.A. or ADM, take the jack out of the receiver, replace the plastic front and cap after removing the protective film.

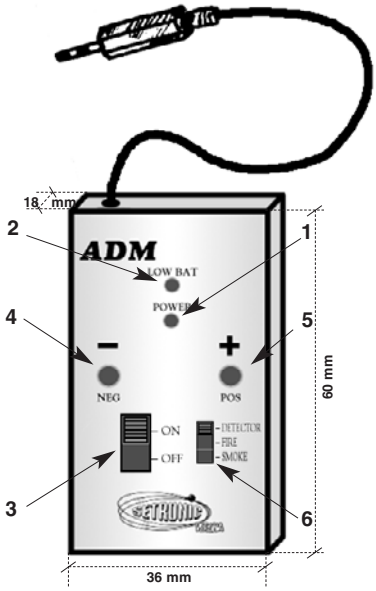
ADM Adapter

CHARACTERISTICS

- **Working tension:** **8-12 V.**
- **Flat battery indicator:** **= 8 V.**
- **Battery format:** **23 A**
- **Typical input:** **2 mA**
- **Absorption:** **1,6-2,2 mA max.**
- **Working time:** **typically 300 hours**
- **Maximum offset:** **(+/-) 5 mV**
- **Maximum length of leads from ADM to Voltmeter (recommended):** **20 m**
- **Jack diameter** **3,5 mm**
- **Size** **36x60(76)x18 mm**

LEGEND

1 Green Led: working adapter
2 red Led: flat battery
3 Red button: switching on/off
4 Negative Voltmeter outlet
5 Positive Voltmeter outlet
6 Three-position switch: Detector - Fire – Smoke

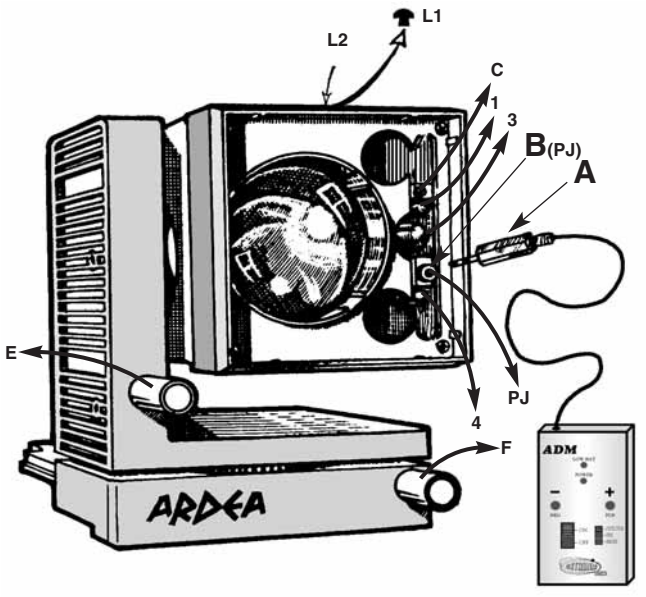


NOTE 1 From the ADM adapter and using added leads up to a max length of 20 m, it is possible to use an analogue tester to read the working conditions and calibrate the Ardea detector's sensitivity level.

NOTE 2 The ADM adapter**(**A) is inserted into the female jack socket **(B-P**J) of the ARDEA S/2 or SF in the position indicated in the figures below. The adapter has a cable and jack to connect to the receiver.

NOTE 3 The ADM adapter lasts indefinitely and is not likely to suffer any kind of fault.

NOTE 4 The ADM permits oscilloscope readings of all peak environmental disturbances, generally responsible for false alarms. There are also therefore brackets available to support the ADM for long periods. These brackets attach to the receiver unit.



L1 - Plastic front eject slot cap
L2 - Plastic front eject slot
C - Threshold selection trimmer for SMOKE
1 - RED fire alarm Led
3 - YELLOW Infrared beam intensity level Led
PJ - female connector for UTA or ADM + digital tester input
4 - Green Led showing electrical supply on
A - Male jack for ADM adapter
B - Ardea PJ jack socket
E - elevation movement
F - fault movement

ADM Adapter

The adapter has been designed to efficiently carry out the sensitivity levels management functions sometimes necessitated by environmental disturbances found in buildings protected by the various **Arde**a models.

The **ARDEA S/2 and SF** are **OFFICIALLY CERTIFIED** by the German test laboratory, VdS and our company has set out with the aim of enabling all our customers to obtain the best possible performance from the two models through the use of a simple, inexpensive, practical adapter that can be used by anyone in conjunction with a simple tester. THOUGH THE ADM ADAPTER PERFORMS SIMILARLY TO THE U.T.A., **IT DOES NOT TAKES ITS PLACE ADM USE AND ARDEA CALIBRATION PROCEDURE**

A) First check there is a good charged battery in the ADM.

B) Use a Voltmeter (preferably digital).

C) Firmly insert the ADM jack into the PJ of the Receiver unit **(A-B** figure alongside).
The tester's rod bushes and three-position switch will be easily accessible on the ADM. Brackets for the different models are available to attach the ADM to the detector.

D) Insert the tester's rods in the ADM's sockets, observing the correct polarity**(+/-**).

E) Select the button activate. The green Led will be dimly illuminated on the ADM. If the led is «brightly» illuminated the adapter is not properly connected, or the contact is not secure, or finally the jack may have short circuited.

F) If the green led is off the red led red is on. This means the ADM battery is flat. If both leds are off it means:
- the battery is missing or completely flat.
- the battery is inserted with its poles reversed.
- one or other of the battery contacts is not clean or working properly.

If the red batter flat led is on there may be errors in the Voltmeter readings. It may also be that the adapter is not accepting any switching. In this case replace the battery and start again from «C» above.

G) On the adapter front **(pos.** 6) there is a 3 position selector. Each position corresponds to the following functions: **Detector** (detection of disturbances); **Fire** (fire sensitivity threshold); **Smoke** (smoke sensitivity threshold). In detail tester position indicates the following:
DETECTOR: the amount of the environmental disturbances read by the Receiver unit regarding changes resulting from changes in temperature, sunlight or artificial light, electromagnetic fields, air movements etc.
FIRE: identifies the fire setting threshold (from the origin **400 mV** = 400 divisions UTA) ARDEA SF
SMOKE: identifies smoke setting threshold (from the origin **600 mV** = 600 divisions UTA)

H) By using the trimmers on the Receiver units (S/2 or SF) the (Fire/Smoke) sensitivity thresholds can be set at different levels from those set in the factory (where they are set at 400 mV for Fire and 600 mV for Smoke in the case of the Ardea SF. Such changes can be made where environmental disturbances are particularly intense and seriously affect the detector such as to cause false alarms. **You are reminded that in the case of the Ardea S/2 only the smoke threshold is available and in the case of Ardea Dust the sensitivity thresholds are specific.**

I) After the calibration procedure switch the ADM adapter off pressing the button **(**3) and take out the jack **(P**J).

L) If the adapter will not be used for a long time it is advisable to remove the battery. Check that no false alarms occur over the following week. If necessary repeat the calibration procedure from D above, raising the threshold where required.

NOTES: to remove the battery from the ADM you have to pull on the plastic box's two shells. Press to reclose. The whole adapter is shock resistant to being dropped from up to 2 m.
Take care not to force the battery closing contacts when inserting it.

COMMON ARDEA CALIBRATION ERRORS WHEN USING THE U.T.A. OR ADM

The **U.T.A. and/or ADM** readings may change very rapidly during the suggested time for measuring environmental disturbances (10 min). Transients bringing sudden peaks in*«background noise»* as shown on the **UTA and/or ADM** may also be natural to that environment. Nevertheless, if these readings go above 800-900 divisions (mV) on the Ardea SF or S/2, for times generally exceeding three seconds, so as to switch on the leds «1» and «2» of the Receiver, you must distrust that line **as such readings are usually errors**, that may be due to the following reasons:

a) The positions of the detection units may be bad, or in any case not suited to the environmental conditions for one or more of the reasons considered in the general part of the booklet (from age 3 to page 16).

b) The level of intensity of the infrared beam from the Transmitter is insufficient or there is an obstacle between Transmitter and Receiver (possibly vibrating **e.g.** a wire, cable, steel tie-bar etc.) that is modulating the infrared received by the Receiver unit.

c) Industrial activity in the building, generating interference from sources of heat, fumes, dust or steam means that it is necessary: either to find alternative positions for the units, or a different detector is required **(e.g.** Ardea Dust). If this is the case please read Volume 2 **(Copyright 200**2) on specific cases or contact our regional assistance or, if you prefer, contact our technical department directly. In such cases we remind you *to send us a fax showing the plan and a cross section of the building, a description of the industrial activity carried out and the type of problem being encountered.*

The U.T.A or ADM adapter has a flat battery. In this situation it may be that the two instruments are only reading the «Detector» position and that in the other positions, even though they are selected with the buttons, still only give the **Detecto**r reading.

ALARM ALARM

The alarm test **should always be carried out with a small scale simulation of a real fire in the protected environment (page 30).** You also however need to be sure that the electrical connections have been done properly and in accordance with the instructions. Once you are sure the connections are correct you also need to know that the equipment is «optically" able to provide the fire alarm. For this purpose Setronic Verona will shortly be making available a fire and smoke simulation device called the **SAC 200**2.

This device will provide a fire and smoke «instrument» for the optical plane able to be calibrated to the working environmental conditions so sensitivity levels can be managed for detectors at work. When the device is used with the ARDEA detector it will produce scientifically realistic fire conditions resulting in a smoke and/or fire alarm.

FIRE ALARM CHECK USING AN ATTENUATING FILTER (STF3)

It should be made clear that although attenuating filters are useful in producing an alarm state in the equipment, they do not correspond to the smoke detection principles upon which the ARDEA is based, nor are they based any real scientific principle as such. This said, when the installer has finished aligning and calibrating the apparatus he does at least need to know that the apparatus will produce an alarm, and this is a practical and inexpensive way of checking.

We have therefore made the STF 3 filter available.

When using the filter, note that:

a) The filter can be used with any of our Company's products irrespective of the distance over which they have to operate.

b) The filter must be used strictly and exactly according to the procedure.
Incorrect use of the filter will mean that it will not achieve its object, i.e.: *«to see if the detector will switch to a fire or fault state under certain conditions*«. It is clear that this must be clearly borne in mind by the installing technician.

c) The filter should always be used on the **Receiver unit**, and never on the Transmitter unit. In should also be used when you are certain that the detector has been correctly aligned and calibrated in accordance with the indicated procedures.

d) The filter's metacrylic support has parallel lines arranged over two areas of varying density, as well as an area that is completely infrared transparent. Such areas are produced by a photographic process and are arranged as follows: to the left of the filter it is transparent; the line spacing is wide in the centre; to the right the spacing is narrower

e) The filter is particularly delicate: It should be kept dry and not handled with dirty fingers or cleaned with detergents or alcohol. It cannot tolerate abrasive cleaning and must never be bent in any way. ***The filter and its instructions are supplied on request.***

CONVENTIONAL INSTALLATION

The Transmitter and Receiver units of the ARDEA SF, S/2, and DUST are connected to an interface by cable with 3 shielded leads. **The use of shielded cable is obligatory**. The Transmitter and Receiver are supplied with current by a Male / Female connector. The connector has seals that provide an IP 5X rating, and the two sides are securely joined by a tightened screw. When the connector is taken out the device pulls off the bracket without the used of tools. This means that if repairs are being made, for example, electrically and mechanically compatible equipment can be put in its place. The electrical supply and signal return cables leave run from the interface (normally the universal **INT 8/B**A) and go to the Transmitter and Receiver units. There is a «block» diagram in the figures below.

FEMALE CONNECTOR

The following figures also show how to separate the connector. The first section of cable connected to the connector is a certified shielded type and is supplied with a each unit up to a length of about 1 metre. **Longer lengths are available on request.** There is an excellent seal between the male and female connector

MAXIMUM RECOMMENDED CABLE LENGTHS AND BLOCK DIAGRAM

for CEI 2022 cables
Admissible shield length = to 1000 m
Shield braiding density = 95%

ISO 9002 CERTIFIED PACKAGING CONTENTS

①② Pair of brackets packed separately in cardboard

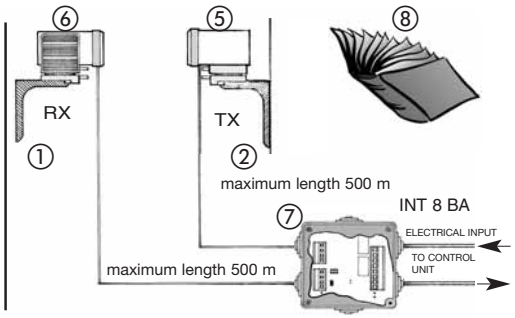
③④ Pair of Transmitter Receiver unit connectors packed in cardboard in sealed plastic bag

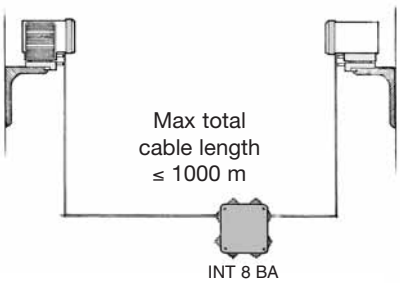
⑤ Transmitter unit

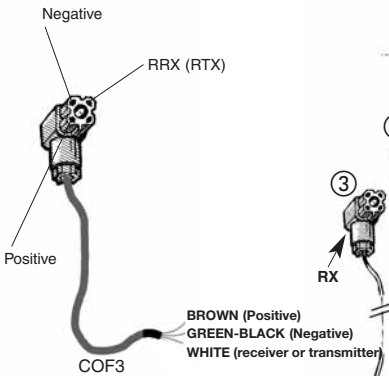
⑥ Receiver unit

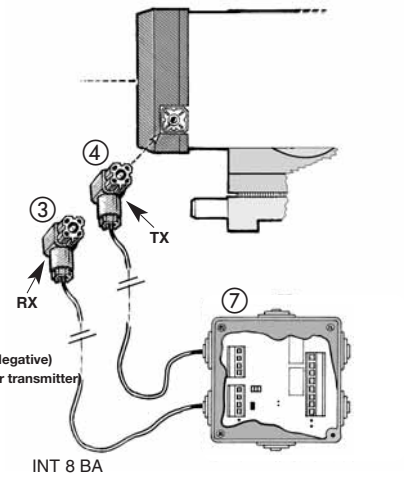
⑦ Universal interface INT8BA

⑧ Installation manual









UNIVERSAL INT8BA INTERFACE IN PLASTIC IP 55 BOX

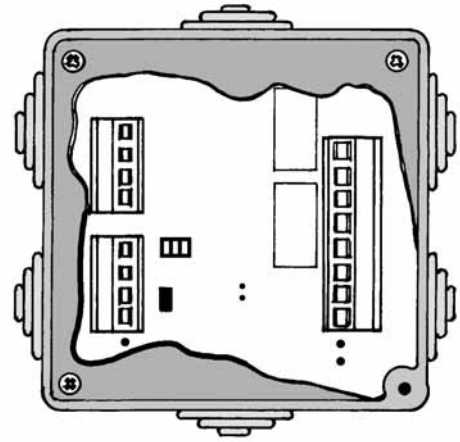
CERTIFICATION GERMAN VdS N° G 294043.

Unità Trasmittente

RTX	9
Positivo	10
Negativo	11
Calza	12

Unità Ricevente

RRX	9
Positivo	10
Negativo	11
Calza	12



1	24v	Alimentazione 24 V CC
2	GND	
3	NO	Relay di guasto
4	C	
5	NC	
6	NO	Relay d'allarme
7	C	
8	NC	

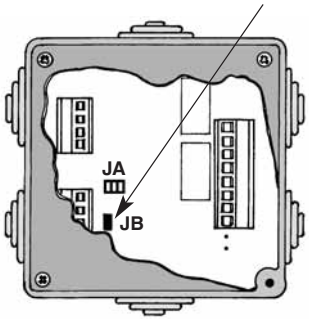
FIRE ALARM RELAY STATUS

The fire alarm relay is not normally energised and **in this condition it cannot be altered.**

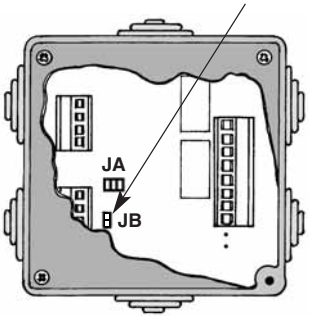
FAULT (ANOMALY) RELAY OUTPUT CONDITIONS

The fault relay can normally be energised or non energised according to a selection on **Jumper «B»**, as shown in the figures below. By NORMALLY we mean that the Receiver unit is in normal working mode.

FAULT RELAY NORMALLY NOT ENERGISED «JB» ON (inserted)



FAULT RELAY NORMALLY ENERGIZED «JB» NOT **ON (inserted)**



TIMER FAULT OUTPUT OPTIONS FOR INTERFACE INT8/BA

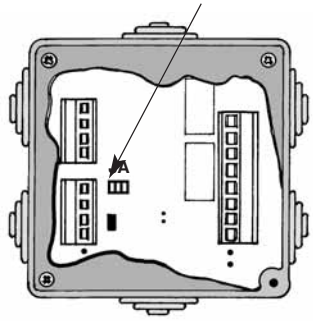
Many control units on the market can also have a fault memory with a linked sounder at the control unit and possibly also remote sounders. To avoid unnecessary fault episodes Control unit can have timer delay devices, especially useful where fault episodes occur frequently because of obstructions between Transmitter and Receiver,(see also pages **11 and 1**4). Timer delay for fault output depends on the position of the Jumper **«A»**.

POSIZIONE 1
Uscita guasto immediata

POSIZIONE 2
Uscita guasto ritardo 30 "

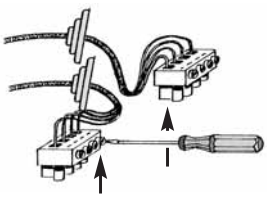
POSIZIONE 3
Uscita guasto ritardo 60"

POSIZIONE 4
Uscita guasto ritardo 90"

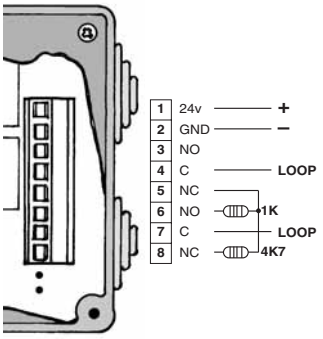


EXTRACTABLE TERMINALS

The terminals can simply be pulled out and replaced by pressing in.

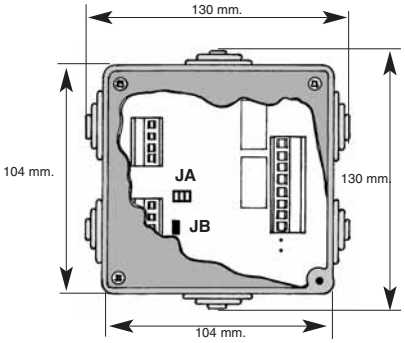


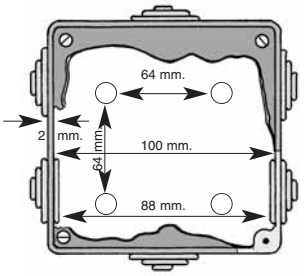
CONVENTIONAL CONNECTION TO CONTROL UNIT (Example)



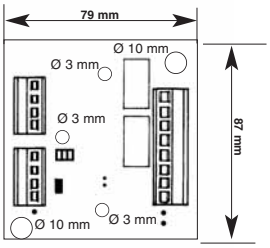
For suitable resistive values, see the control unit's specifications (make, type etc.)

INT8BA VIEW AND DIMENSIONS OF IP55 RATED BOX AND INTERFACE PRINTED CIRCUIT

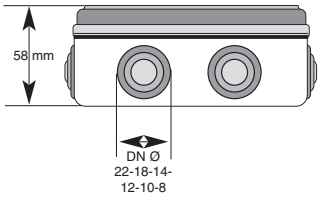




Weight INT8C 0,240 Kg



Weight INT8N 0,085 Kg



IMPORTANT

1) When carrying out any checks or maintenance work at height remember than you cannot get any instant fault alarm **at the control unit if you have left the interface with a timer selection We therefore recommend putting Jumper «A» to position 1 before starting to do any work aloft**.

2) We are well aware how easy it is to make involuntary errors. Often they are the result of carrying out operations that are often repeated and familiar. We suggest that before you activate the systems you check the interface connections to and from the control unit before switching on the Transmitter and Receiver units. As well as saving time in case of error this also prevents possibly damaging the equipment in the field, where they are often difficult to reach.

3) Before carrying out any work aloft, we would remind you that as you will be many metres above ground, you should check the step-ladder, scaffolding or hoists are certified and especially that they are intact and in good working order. Use safety belts, shoes and a helmet and any other accessory that may be required for your safety. Avoid placing step-ladders etc in front of doors. If this is unavoidable make sure that the doors are properly closed before going aloft. Avoiding placing scaffolding or ladders in the aisles used by fork-lift trucks or anywhere that goods are likely to be in transit and could bump into whatever is supporting you while you work. If in doubt place barriers across any pathways.

4) Make sure you have all the tools you will need before going aloft, including the parts you have to install. We recommend you tie a trimmer screwdriver to your wrist so that you can't drop it, possible to lose it or even find it ends up somewhere where it can't be retrieved. While working aloft make sure that there is nobody below you or close to the ladder or hoisting equipment. A dropped tool could severely injure a workmate.

5) Remember scaffolding with wheels may be subject to vibration when moved. The vibrations could cause anything placed on the platform to fall. If the **ARDEA or the U.T.**A. falls, for example, at best you will certainly have broken the product. We therefore suggest that before moving the scaffolding you make all objects, tools and equipment secure.

HOW TO CHOOSE ARDEA SYSTEM MODELS

The ARDEA system consists of a Transmitter unit and a Receiver unit and normally has three models. They should be selected according to the following:

a)- ARDEA «S/2» SMOKE DETECTION ONLY

b)- ARDEA SF (SMOKE AND FIRE) detects fire with the main characteristics of the development of **smoke** followed by **a lively and irregular fire**. This occurs, for example, in the case of fire or combustion of plastics, that may also produce noxious fumes.

c)- ARDEA DUST detects fire and smoke in dusty environments and/or from special forms of combustion.

MODEL ARDEA SF 2P100/01 - S/2 - DUST SIZE

INCLUDING BRACKET
224x119x313 mm
(Measurements in mm)

NOT INCLUDING BRACKET
200x119x148 mm
(Measurements in mm)

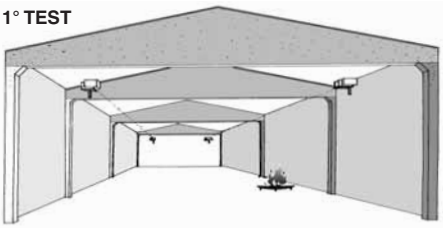
GENERAL CHARACTERISTICS OF THE ARDEA MODELS

Brackets	cast and aluminium coated
Tx-Rx container	extruded anodised aluminium
Mechanical parts	ABS loaded glass + self-extinguishing
Gearing	extruded and processed PVC
Worm screws	Extruded and processed Derling
Optical apparatus	optical crystal
PCB	hybrid construction
Working temperature	– 20°C / +55°C
Electromagnetic Disturbances Input	**EMC** 10 V/m da 80 MHz a 2 GHz 30 V/m 415÷466 MHz 890÷960 MHz
Detector protection rating	IP 44
Connector protection rating	IP 5X
Weight per unit kg	Transmitter 1,257 - Receiver 1,447
Weight of brackets kg	0,475 each
Total weight	about 4 kg
Acid agent	HB 9
Saline agent	high.

ARDEA FIRE ALARM TEST WITH REAL SIMULATION.

After installation, whenever possible, it is advisable to carry out a real small scale fire test at least with one of the fire types provisionally provided for by **EN 54/9-12**. Preferably fires should always be those similar to **TF 4 - 5** of EN 54-12 when the height of the building exceeds 6 m, whatever the actual roof type (flat, double sloping, shed type, with full thickness beams etc.).

1° TEST



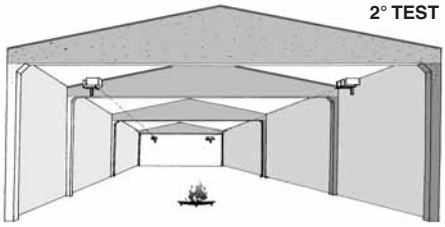
Excellent operational tests are those that involve half a cup of normal petrol placed in a metal container on the floor of at least 40 cm x 40 cm (1,600 square cm or equivalent circular area). This should be increased to a whole coffee cup if the height of the building is from 7 to 11 m.

This where several detectors making up the alarm system each have approximately equal Receiver unit alarm signal threshold selection.

Two tests should always be carried out for each detector.

The first vertically and the second about 5 m off the vertical.

2° TEST



The place for the test may be close to the Transmitter or close to the Receiver unit or midway between the two. (preferred position).

The alarm should (generally) involve both the fire alarm and the smoke alarm in the case of ARDEA SF 2P100/01, or just smoke in the case of ARDEA S/2 2P100. Between one test and another the original environmental conditions must be restored as they were before the first test. Before starting the test it is good practice to obtain authorisation first and have an extinguisher handy near to the scale fire. Choose a test position well away from inflammable materials that may be in the protected building (see point «3» page 7).

You are advised that as Setronic Verona constantly strives to improve its products it reserves the right to make any changes it considers necessary without prior warning. The same reservation applies to any corrections of printing errors including of details and measurements that may have found their way into this booklet.
Any recommendations made in this booklet, must be considered as replaced by any conflicting Italian or European regulations that may come into force in the future, as of the date these come into force.
Since the products herein are sold outside the country in which they are manufactured, we must point out that any installation regulations in force in the country of installation must be followed, even where they do not accord with our suggestions. We shall consider any such regulations as having been followed, as from the date they come into force.

Keep this booklet close to hand for future reference.
The information contained in this booklet is available in PDF files at our Website: www.setronicverona.com

- Reference edition MIA.I - Rev. 02 -

The products described herein are guaranteed for one year. Our Company's contractual guarantee terms are available on request and run from the date of delivery of the goods. The normally and universally used guarantee terms apply to the products described.

MINISTERIAL APPROVAL 1293-3409/44
MINISTERIAL TEST REPORT N° 3409/4
DETECTOR CONFORM TO UNI - DIN 43700
EQUIPMENT BUILT IN ACCORDANCE WITH CEI REGULATIONS
IN ACCORDANCE WITH EUROPEAN REGULATIONS EN 54/9
EN 54/12 - EN54/14
APPROVED
VdS Zertifikat: N° G 294043
RUSSIAN POJTEST: N° B03881

CE
0786-CPD-20214

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