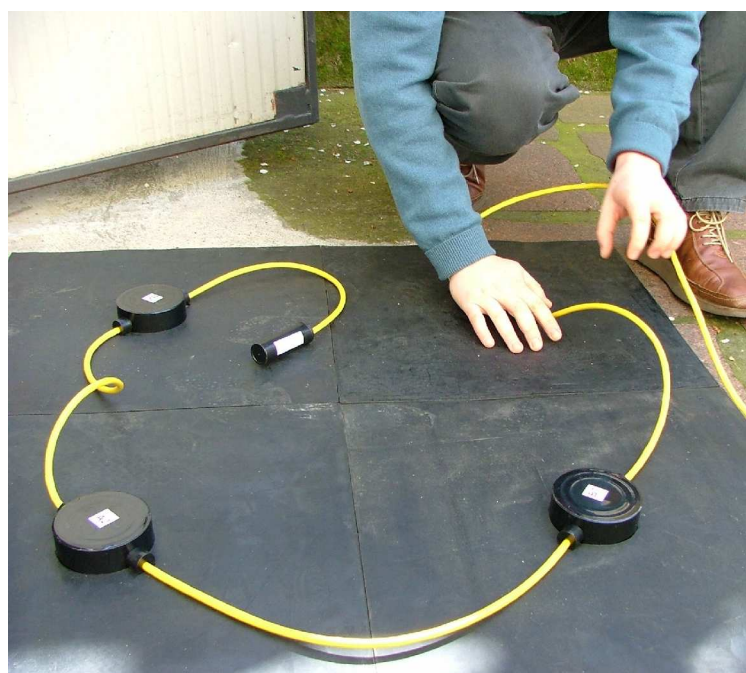


Perimeter protection



security

perimeter protection systems



SISMA CA Installation technical manual

Version 0.0.4

Antintrusion System for paving

Premise

The present document is regularly updated because of the continuous technological development of the product and the constant flow of information acquired by Dea Security's Technicians. Therefore, it is absolutely necessary to keep in touch with Dea Security's technical department and ask for the most updated manual.

Despite the information contained in the present document may lead to a good knowledge of the product, for a correct designing of a plant, an inspection on the spot must be executed by DEA SECURITY's skilled technicians. Thanks to their deep knowledge of the product and their experience coming from many successful installations carried out, they are the only ones who can endorse the realization of the plant.

As a further guarantee to a perfect execution of a plant, DEA SECURITY directly sends a skilled technician of its own, in the quality of supervisor during the installation, the connection and the test of a system.

Have a good job.

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1 Introduction

This document aims at helping technical installers:

- evaluate and choose the best usage solutions of the products;
- design a SISMA CA system;
- follow procedures for the installation of the system;
- test and calibrate the system.

2 Product usage evaluation

SISMA CA is a protection system for concrete paving, generally used for the protection of entries to buildings, by creating an invisible barrier, completely integrated in the paving and therefore not easy to sabotage.

In addition, SISMA CA system is used as integration to the other DEA SECURITY systems, when it is necessary to close a perimeter crossed by a pavement or a carriage way with armoured concrete bottom. In this way, thanks to the use of DEA SECURITY' systems, SISMA CP, SERIR or TORSUS, it is possible to proceed to the protection of perimeters composed of mixed sections: ground, concrete paths, metal fences or rigid metal structures.

The coverage area of the sensor modules changes from a minimum of 1sq m, for CA4 modules, up to a maximum of 4sqm for CA16 modules. Each sensor module individuates a string which can be managed singularly by a processing board type SE SISMA MCA, or by the system SCA CONTROLLER + SCA PUs.

The sensors are fixed to the support layer of the paving (slab) and successively covered by the concrete layer on which the paving will be laid (massetto). The best results will be obtained during the construction of a paving ex-novo, even though it is possible to lay the sensors where a paving is already present.

During the design of the system, it is necessary to evaluate possible disturbing sources, such as: motor vehicles, streets at high traffic and railways.

In case of works on big perimeters and with heterogeneous systems, it is possible to execute the centralized managing of the system through DEA NET, with the use of a normal FTP cable Cat. 5 for the transmission of the data from the peripheral cabinets, containing the single processing boards, to the control panel. Inside the control panel, will be installed a DN Controller, through which you will be able to enter the management of all the boards net connected.

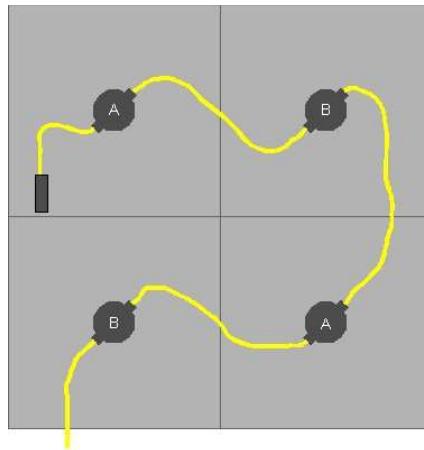
Once SISMA CA sensors have been laid, you have to proceed to the construction of the "massetto" as soon as possible, to minimize possible damages to which the connection cables and the sensors could be subject, if exposed in a building yard for a long time.

3 Draw up a project for the installation of a SISMA CA system

For an accurate project, it is necessary to start with an adequate inspection on the spot to evaluate the client's needs, the installation typologies and the possible presence of disturbing elements.

Here you are some definitions :

- *Sensor-module*, by this term we define a set of SP-01 sensors relative to a single alarm zone. The sensor-module can be composed of 4, 6, 8, 12 or 16 SP-01 sensors and are respectively called CA4, CA6, CA8, CA12 and CA16. The strings cannot be customized, since they have to contain an even number of sensors to optimize the analysis of the signals by the processing board. Each single sensor SP-01 covers an area of 0,25 sqm.



Module CA4

- Alarm zone, it is the smallest area which can be located by the alarm system and corresponds to the area sensed by a sensor-module Cax.

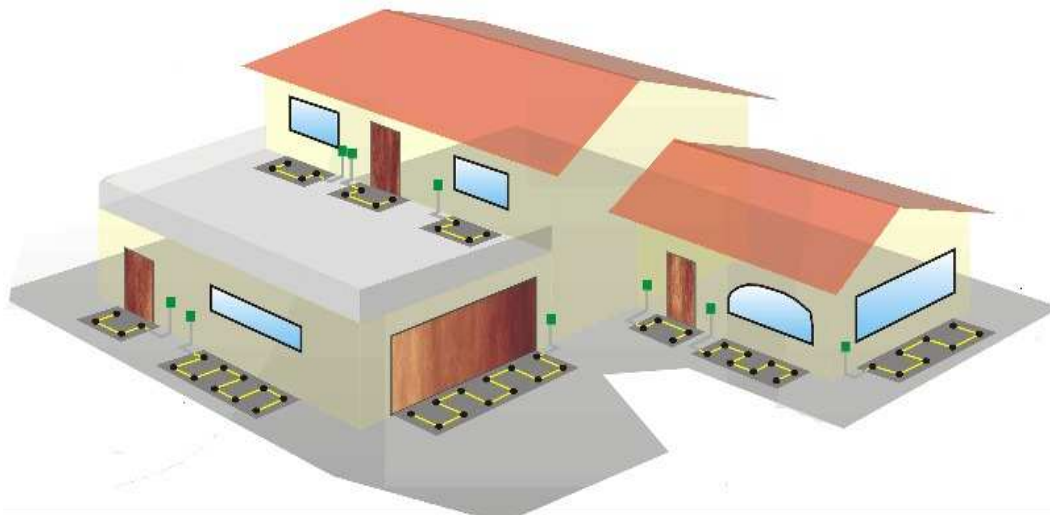


Each management board can manage only one sensor-module. It is not possible to unify 2 or more sensor-modules.

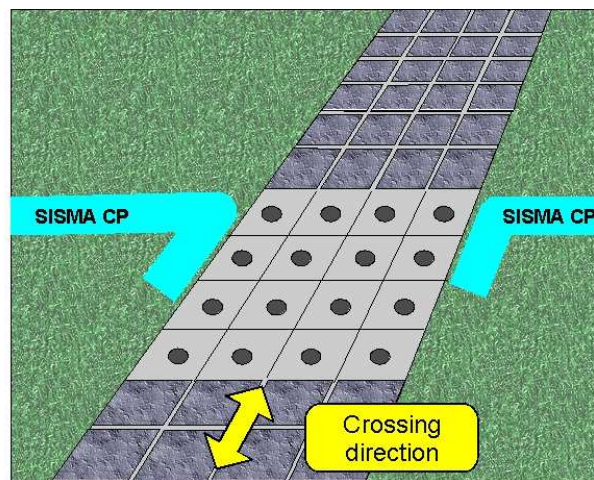
- Stay, in this situation the intruder has to prolong his stay in a determined zone to be able to burglar the door or window frame. The stay can be executed in front of all the entries to a building.
- Crossing, when you want the system to monitor a point of passage, such as a pavement, a carriage way and so on...

3.1 Laying zone determination

SISMA CA system is suitable for the protection of the entries to a site. They can be used as stay detectors in entries to a building or as crossing detectors in carriage, pedestrian ways or pavements.



SISMA CA as stay detector



SISMA CA as crossing detector

First, you have to find the best solution according to the client's needs and the protection you want to obtain. If you choose SISMA CA sensors as stay detectors, it is possible to protect a site only with SISMA CA system, while by using them as crossing detectors it is necessary to integrate it with other Systems, as for example SISMA CP, for grounds, SERIR, for net fences, and TORSUS for grate fences.

When quoting the material, you have to take into account that, generally speaking, heterogeneous surfaces need different modules, since different sensitivity calibrations are necessary. For further information, please refer to paragraph 5 on page 38.

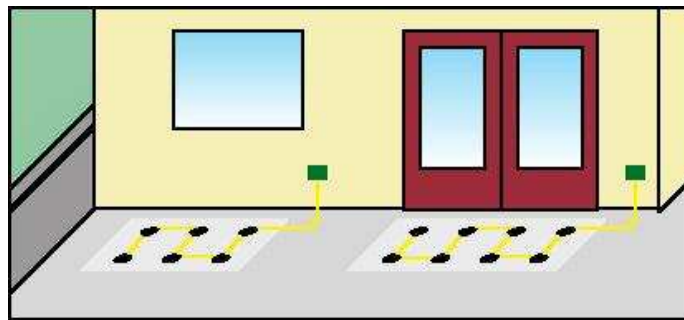
It is therefore important to know the type of paving with which the single zones will be covered and if necessary to divide a sensed area into more modules.

3.1.1 Stay detectors

The stay detection is executed by sensing the part before an access to a building.

The area to be sensed must be as large as the entry and at least one meter depth.

When carrying out the first inspection on the spot, it is thus necessary to individuate all the entries and measure their length. Examples of entries are: doors, windows, glass doors, security exit, garage directly entering the building, etc.....



Stay detection before window or door frames

The size of the sensitive area will have to be rounded to 0,5 m superior. For example if you are in presence of a door 0,80 m wide, the sensitive area will have to be 1m x 1 m (CA4); if you are in presence of a window 1,90 m wide, the sensitive area will have to be 2 m x 1m (CA8).



Protection of door window and glass door



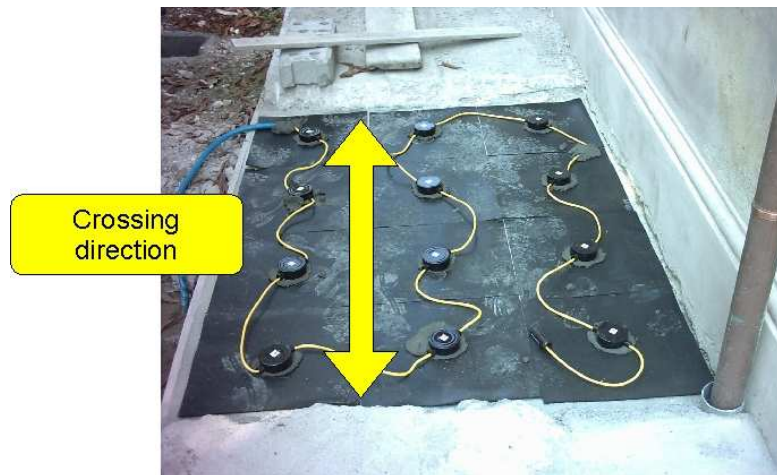
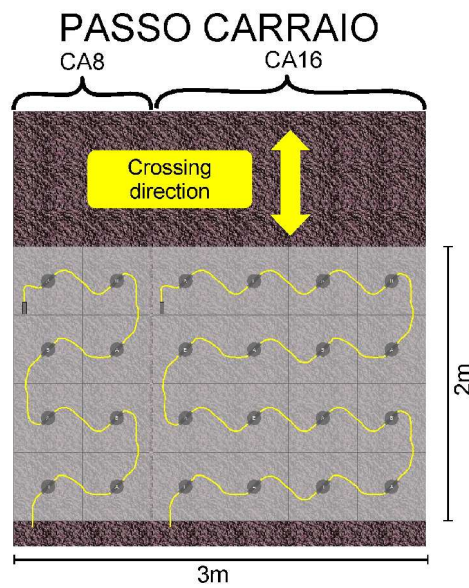
If the use of modules greater than 4m x 1m is necessary, the division into more alarm zones, since the maximum size of the sensor-module is of 4sqm.

3.1.2 Crossing detectors

The detection of a crossing is executed by sensing the pedestrian or carriage ways which need monitoring.

The area to be sensed must contain at least 2 m way in the direction of walking, and for the necessary length.

During the first inspection on the spot it is therefore necessary to locate the passages to be monitored and their length. Examples of entries are: paths made of concrete, pedestrian ways, stairs, corridors between buildings, etc....



Normally, the passages have a well-defined width, which cannot be modified. Therefore, if the passage has not a width multiple of 0,5 m, it is possible to put the sensors near, by cutting the elastomeric membranes provided, so that the passage can be precisely occupied. The number of sensors necessary in length will be rounded to the superior unit in case it is not a multiple of 0,5 m. In the chapter relative to the laying, further details will be given.



If the use of modules with a length superior to 2m x 2m is necessary, the division into more alarm zones is necessary, since the maximum width is of 4 sqm.

3.2 Disturbing elements

During the inspection on the spot, you also have to take into account possible disturbing elements which can be present near the area to be sensed. The disturbing elements are those elements which can create vibrations able to reach the sensors, such as engines, pressure pipes, heavy traffic roads, railways, etc..

In any case it is suggested keeping the security distances between the protected areas and the disturbing elements. In the following list, we specify the distances in question:

DISTURBANCE	DISTANCE (meters)
Roads	5
Heavy traffic roads	10
Railways	50
Pressure pipes	0,30
Engines	1
Vases of big dimensions	1
Unstable structures	1
Animals of medium/big size	Non tollerated

For unstable structures we intend anything which is fixed to the floor and which can swing and transmit vibrations to the sensors. Examples of unstable structures can be posts, rails, furniture, etc..

The pressure pipes, if they have to pass near the string at any cost, must be laid according to the information provided in the paragraphs relative to the installation of SISMA CA.



In addition, even if Dea Security's outdoor perimeter protection systems tolerate the presence of small animals, it is possible, in certain circumstances, that these stress the detection system up to reaching the alarm. As for the other external perimeter systems, Dea Security recommends the installation in enclosed sites where there is no presence of savage animals. In case of domestic animals of medium or big size, these will have to be kept away from the detection area.

3.3 Number and type of processing boards

Each SE SISMA MCA and each SCA PU can manage a sensor module Cax.

At their turn, SCA PU management boards must be connected to an SCA CONTROLLER processing board, which manages the signals they send through SCA NET communication net. Each SCA CONTROLLER can communicate with maximum 24 SCA PU boards. If more than 24 SCA PU boards were necessary, you have to use more than one SCA CONTROLLER board.

Therefore, to quote the number of processing boards you need, it is sufficient to count how many modules Cax have been quoted and then associate a management board to each module.



Each module Cax can manage up to 4 sqm areas. If you have to sense an area bigger than 4sqm, you need more CA modules and therefore more management boards.

For example, if you have foreseen the use of 15 modules CA, then you will need 15 SE SISMA MCA processing boards or 15 management boards SCA PU and an SCA CONTROLLER with relative ER MCP relay expansion boards.

The use of SE SISMA MCA boards or SCA CONTROLLER + SCA PUs depends on economic and practical reasons.

From an economic point of view, if you only take into account the cost of the processing boards, the choice of SE SISMA MCA boards is convenient when you have to manage maximum 7 modules, while the choice of SCA CONTROLLER + SCA PUs is convenient for more than seven modules.

From a practical point of view, SCA CONTROLLER permits having a management and a setting-up of the plant more rapid and efficient. By connecting to the serial port of SCA CONTROLLER, it is possible to manage and calibrate all SCA PU management boards and download the events of all the boards connected to it through a single operation.

By using SE SISMA MCA processing boards, without the help of DEA NET, it is necessary to connect with the PC to the serial port of each board. In addition, the saving of the events must be executed for each board present.

3.4 Processing boards location

The electronic processing boards can be positioned inside the technical room, near the control panel, or inside special peripheral cabinets, set near the sensor modules.

The maximum length of CA cable (CSSC6AB) which can be managed by the processing boards is of 150 m. If the length between CA module and the control panel is more than 150 m, it is necessary to use peripheral cabinets to be set near the sensor modules. When working on big perimeters, this choice becomes necessary, since it is minimized the quantity of cable to connect the sensor modules and the processing boards.

In the following paragraphs, we will analyze some solutions commonly used when the system is used as standing detector or crossing detector.

3.4.1 Standing detection

This solution is used for the protection of entries to buildings. Therefore, there will be sensed areas out of the building near the entries.

The solutions are two:

- Gathering the management boards SE SISMA MCA or SCA PU + SCA CONTROLLER in the control panel.
- Set the management boards SCA PU near the sensor modules.

3.4.1.1 Boards inside the control panel

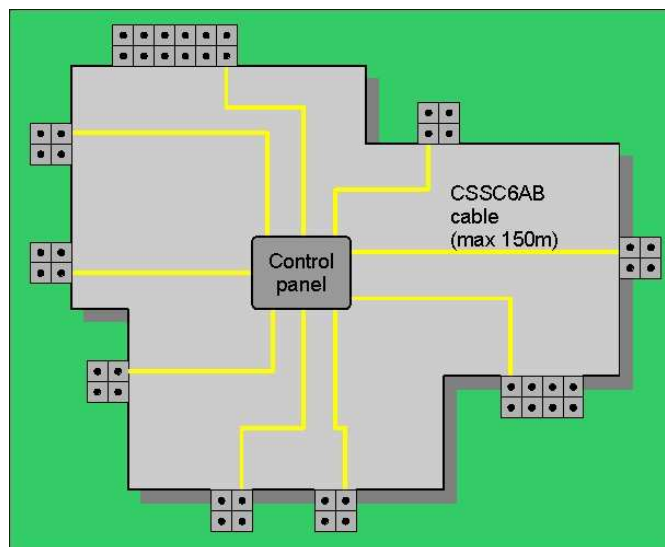
In this case the management boards SE SISMA MCA or SCA PU + SCA CONTROLLER will be set inside the cabinet of the control panel.



For further advice on the choice of the solution with SE SISMA MCA or SCA PU + SCA CONTROLLER, please see paragraph 3.3 on page 13.

All the cables coming from the modules CA will have therefore arrive at the control panel.

This solution is obviously binded to the condition that the route of the cables CSSC6AB is less than 150 meters, which is always present when protecting buildings.



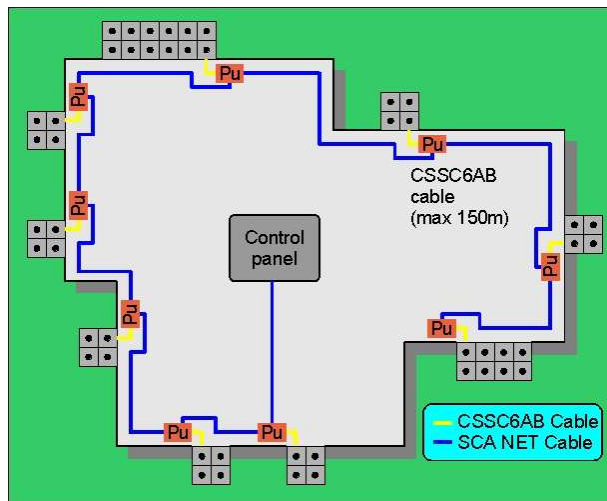
SCA PU in the control panel



SCA PU + SCA CONTROLLER in the control panel

3.4.1.2 SCA PU boards in periphery

With this type of solution it is foreseen the use of SCA CONTROLLER + SCA PU system, by positioning the management boards SCA PU near the sensor modules and SCA CONTROLLER inside the control panel.



SCA PU in periphery

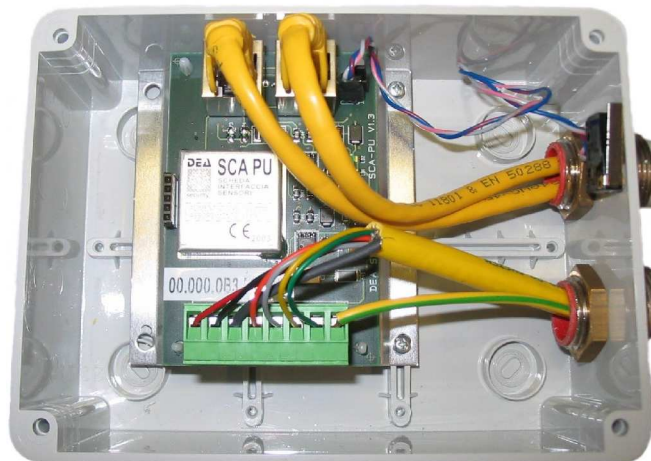
The management boards SCA PU are of limited dimensions and do not need a dedicated power supply unit.

Since each sensor module CA has a connection cable 5 meters long, it is possible to get inside the building without making cable junctions, up to a junction box where SCA PU board will be installed.



The junction box will have to be provided with a tamper device with NC contact. For the connection, please refer to SCA PU technical specifications.

SCA PU will be supplied by the connection cable of the line SCA NET, therefore it will be sufficient to arrive at the junction box with the cable of CA module, the cable of the line SCA NET and a ground conductor.

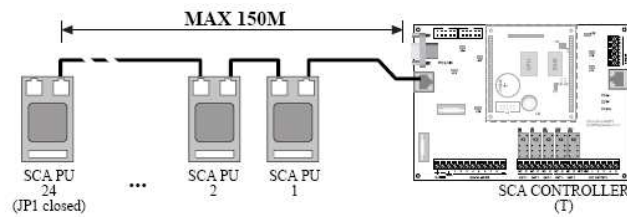


SCA PU inside junction box

SCA NET provides, besides the transfer of data, the power supply to SCA PUs. The cable used is of FTP type (shielded) Cat. 4 with 4 shielded pairs.

The distance which can be attained by SCA NET, with SCA PU power supply directly from SCA CONTROLLER, depends on the number of peripheral boards connected:

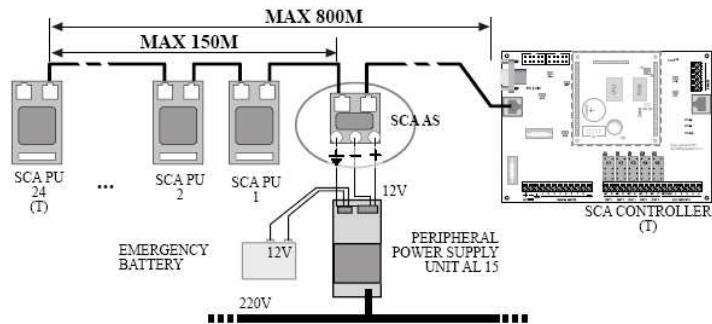
No SCA PUs	Max distance from SCA CONTROLLER
24	150 m
16	200 m
8	300 m



SCA PU supplied by SCA CONTROLLER

To increase the distance of SCA Pus from SCA CONTROLLER, you have to use the supply distribution modules SCA AS, keeping the maximum length of 800 meters as far as SCA NET is concerned and the following maximum distance of SCA PU boards from SCA AS module:

No SCA PUs	Max distance from SCA AS
24	150 m
16	200 m
8	300 m



SCA Pus periphery supplied through SCA AS

For further information, please refer to the paragraph on the electric connections of SCA PU (paragraph 7.2 on page 49).

3.4.2 Crossing detection

This solution is used for the protection of entries to an estate. Thus, there will be sensed areas out of the building near the access ways.

Two solutions are possible:

- Gathering the management boards SE SISMA MCA or SCA PU + SCA CONTROLLER in the control panel.
- Setting the management boards SE SISMA MCA or SCA PU inside the peripheral cabinets near the sensor modules.

3.4.2.1 Boards inside the control panel

In this case the management boards SE SISMA MCA or SCA PU + SCA CONTROLLER will be set inside the cabinet of the control panel. Besides the boards of CA system, will be also present the processing boards belonging to other families of detectors.

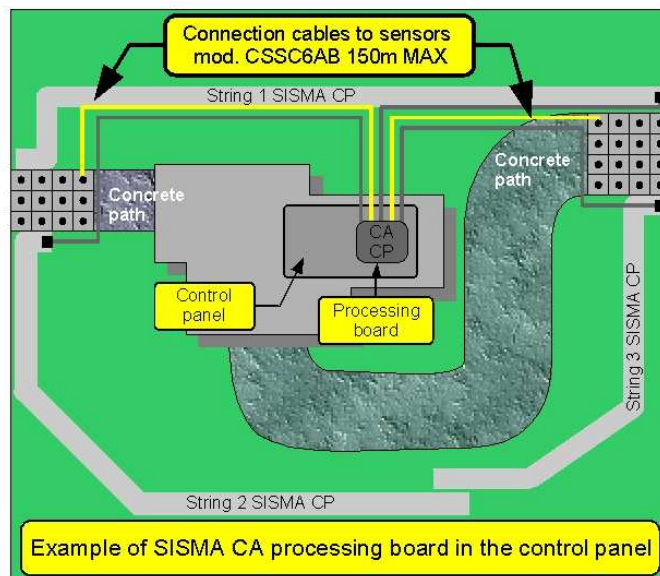


For further advice on the choice of the solution with SE SISMA MCA or SCA PU + SCA CONTROLLER, please see paragraph 3.3 on page 13.



The maximum length of cable CSSC6AB is 150 m. Therefore, if the control panel is at more than 150 m, it is necessary to use peripheral cabinets.

In the figure, you can see an example of integration of SISMA CA antintrusion system with SISMA CP antintrusion system. The processing boards have been positioned inside the control panel.



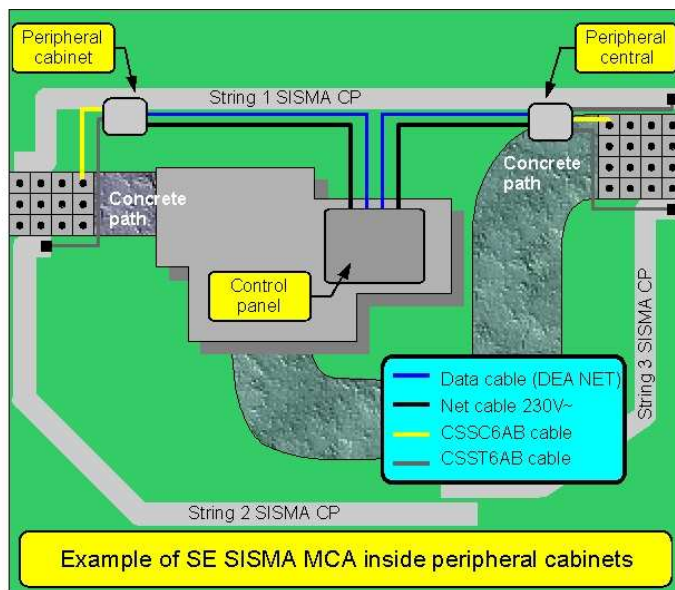
3.4.2.2 Boards inside peripheral cabinets

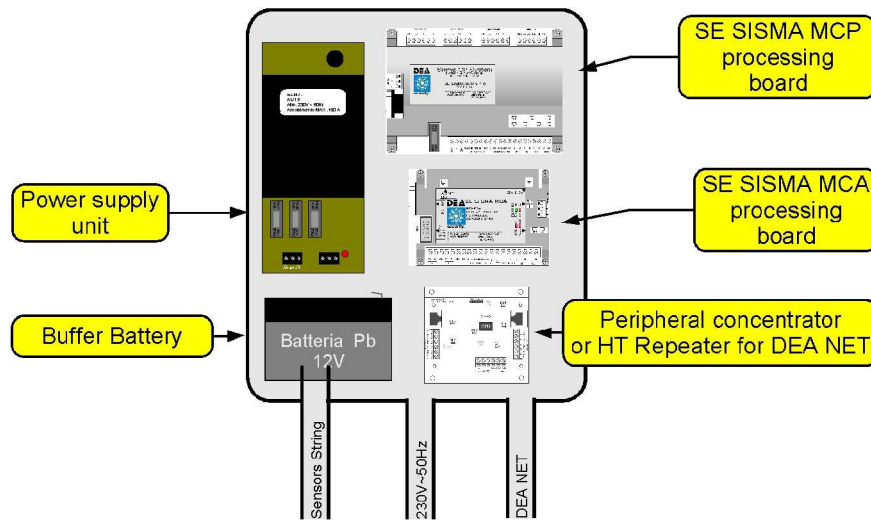
To detect a crossing, the number of zones to be protected will be limited and they will be set at a remarkable distance one from another.

In this case we prefer using SE SISMA MCA processing boards. This is mainly due to the fact that SCA PU boards do not autonomously generate alarm signalings, but only if they are connected to an SCA CONTROLLER through the data communication line SCA NET.

Therefore, to avoid laying two data communication nets (SCA NET and the one of the control panel or DEA NET), we prefer using SE SISMA MCA boards.

In this case SE SISMA MCA processing boards will be set inside peripheral cabinets positioned near the sensor modules. Beyond CA system processing boards, also the processing boards of other detector families will be present.





Example of SE SISMA MCA processing boards inside peripheral cabinets

In the most part of the cases, these peripheral cabinets will be installed outdoors, therefore the processing boards will have to be set inside waterproof polyester cabinets with IP65 protection degree and tamper device. Inside, there will be present the processing boards, a peripheral concentrator of the control panel used or a HT REPEATER for DEA NET communication net, a stabilized linear power supply with an emergency buffer battery.

From the control panel, will have to arrive the supply (230 V) and the cable for data transmission (FTP type cat. 5 if you use DEA NET), each of them with its own canalization. In addition, if the peripheral cabinet is installed under climatic conditions which could make the processing board work at a temperature out of the optimum range, it is necessary to air-condition the cabinet.

3.5 Alarm signals centralization

The processing boards SE SISMA MCA autonomously have relay outputs which can be gathered by possible peripheral concentrators, or they are able to communicate with a communication net called BUS DEA NET which permits centralizing the alarm signals inside one device, called DN CONTROLLER.

DN CONTROLLER is able to communicate with all DEA SECURITY processing boards provided with microprocessor.

In SCA PU + SCA CONTROLLER system, the centralization of the alarm signals occurs in an autonomous way, thanks to SCA NET communication net.

All the signals coming from the SCA PUs are communicated to SCA CONTROLLER processing board, which signals their state through the use of relay interfaces or by interfacing with BUS DEA NET communication net.

3.5.1 Use of Dea Net

The microprocessor electronic boards of all Dea Security systems are ready to communicate the signals through DEA NET, which offers some advanced functions:

- data transmission through FTP standard cable, shielded cat. 5, which ring connects all the peripheral cabinets;
- real time communication at high velocity;
- bidirectional communication: it is possible not only to receive the information from the peripheral boards, but also to send commands to vary all the functioning and managing parameters (these functions can be entered by authorized personnel only), such as:
 - variation of the sensitivity levels and of the intervention modes;
 - reply graph view in real time;
 - event memory management.

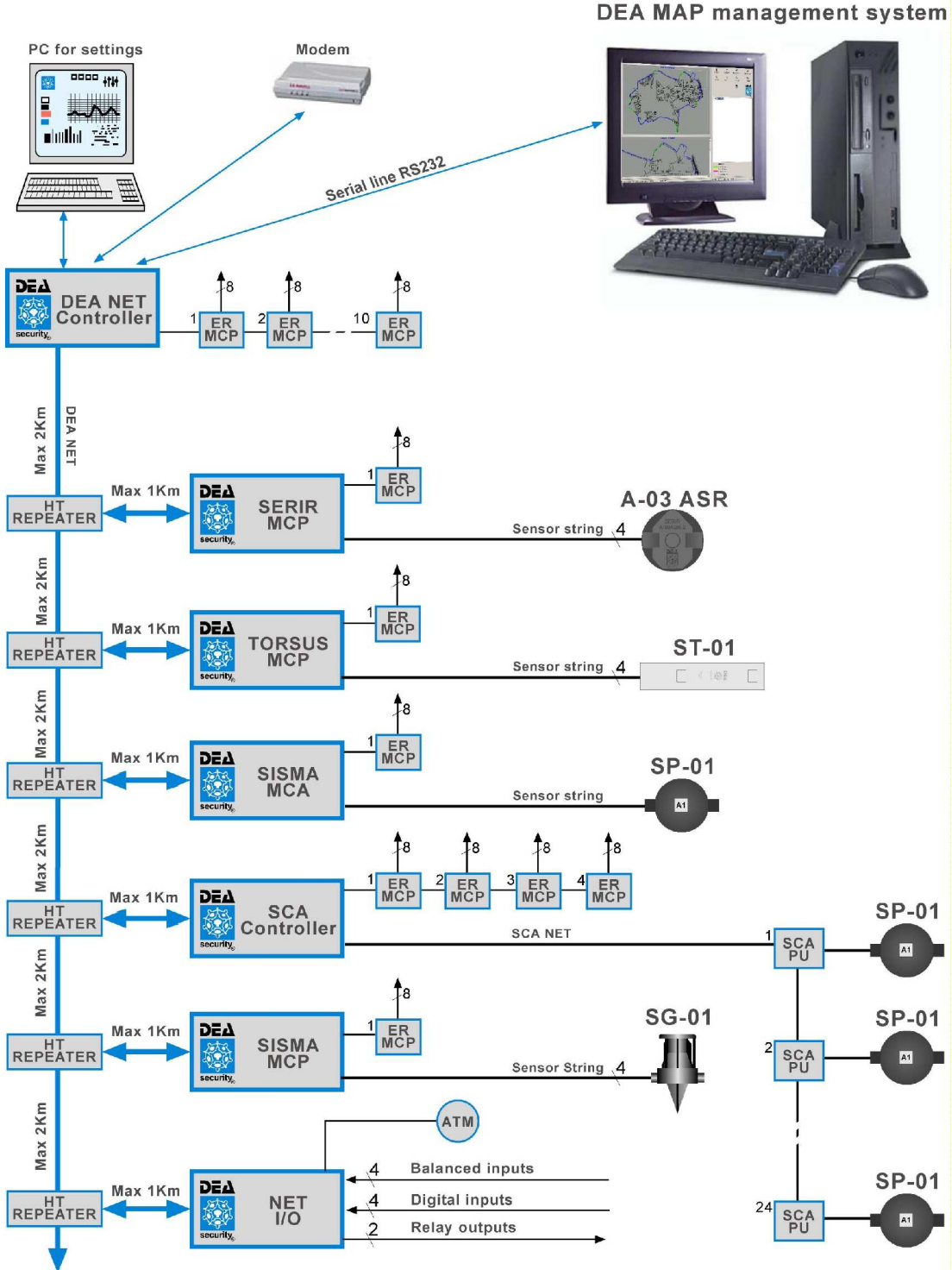
DEA NET makes use of 4 electronic boards:

1. DN CONTROLLER: the board which manages the whole net (up to 200 peripheral boards).
2. HT REPEATER: module for net infrastructure, permits connecting the boards up to theoretic distances of 40,000 m (200 boards for 200 m of perimeter);
3. NET I/O: board which permits inserting in DEA NET signals from systems not compatible (eg. Magnetic contacts) and having relay outputs set along the perimeter, but controlled by DN CONTROLLER. The available inputs are 4 at triple balance and 4 digital, while the outputs are 2 C/NC/NO from relay.
4. ER MCP: expansion module at 8 relays. It is managed by DN CONTROLLER to provide all the necessary outputs.

DEA NET can be used as centralization system to provide signals (from relay) to the control panel, or as infrastructure for a management system developed by Dea Security (DEA MAP).

An example of the capacity of the communication net DEA NET is visible in the following figure.

EXAMPLE OF USE OF DEA NET



3.5.2 Concentrator of the control panel

Inside each peripheral cabinet can be inserted a concentrator of the control panel which transmits, with its own protocol and communication canal, the information read by the relays of SE SISMA MCA board to the control panel.

In addition, you will have to contemplate the signals for low battery, power failure and tamper of the cabinet.

3.6 Necessary resources

For a good installation, it is necessary the presence of at least a Dea Security skilled technician and handworkers for the execution of masonry work.

The skilled technician will have to deal with the laying of membranes and sensors, the execution of the junctions of cables CSSC6AB, the insulation test of the module conductors and in the end the treatment with epoxy. After finishing laying, he will have to take care that the coverage of the sensors are carried out as soon as possible, to avoid damages to the sensor modules, also verifying the execution of the paving according to the information provided by the present manual.

Besides the building material one normally uses for the laying of a piece of paving, it is indicatively necessary:

- Adhesive for the laying of SP 01 sensors, in a quantity equals to 100 gr for each sensor to be positioned. The adhesive suggested is KERAKOLL H40 FLEX;
- A box for electric junctions, model CT2580, for each module CA which will be connected to a processing board at a distance longer than 5 meters (initial string cable provided in each CA module);
- Epoxy type KIT R250 (a kit is for 3 CT2580 boxes).



If you use peripheral cabinets, which are generally set near the sensed zones, the 5 meters of cable provided with the modules are sufficient.

- Wasting material for electric use (cable bands, insulating tape, etc.)

4 Procedures for the installation of SISMA CA

This chapter will deal with:

- the features of the slab;
- the laying of the elastomeric membrane;
- the laying of the sensors;
- the coverage according to the type of paving which will be done.

4.1 Features of the slab

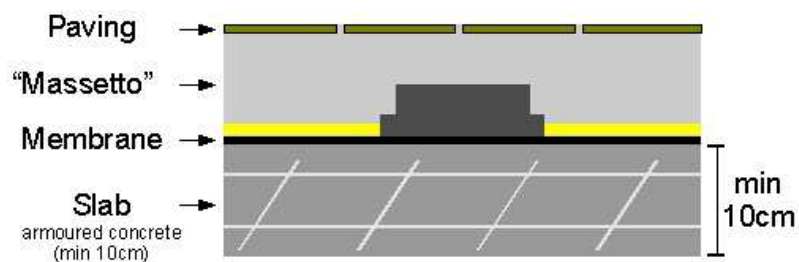
The slab is the layer on which will be laid the “massetto” and the paving. The slab must be rigid: since it is the nominal surface for the sensors, it is very important that the slab does not give way. In fact, the sensor detects the pressure variations between the superior layer (“massetto” plus paving) and the slab. In case there is a settlement of the slab major than the one of the “massetto”, we do not have a correct functioning of the system.

The surface of the slab must be as regular as possible, since when laying the elastomeric membrane, this has to perfectly rest on the slab. In this way, you obtain a uniform distribution of the weight on the membrane and an optimum behaviour of the sensor.

For this reason, particular care must be taken to the construction of the slab, which must be built with armoured concrete at least 10 cm thick.



In the mixing it is not tolerated any other component, such as polystyrene or expanded clay, used to decrease the weight of the concrete cast.



When the slab is pre-existent, since it is not possible to rebuilt it, you have to verify if the slab presents a good rigidity.

In this case you have to pay attention to the fact that the surface is as smooth and regular as possible. If few asperities are present, we suggest eliminating them. On the contrary, if the whole surface is very wrinkled, we suggest executing a levelling cast.

If you have to make the slab waterproof, as it occurs for terraces, terraced roofs, garage roofs, etc., the waterproof layer must be perfectly laid.

Since tar paper must be used in this case, you have to proceed in a very accurate way, taking care that the bituminous layer perfectly adhere to the slab beneath, avoiding the presence of air bubbles. By laying the tar paper accurately, there will be no problem for SISMA CA system.

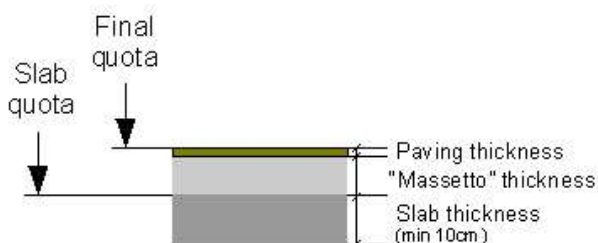


Sensors CA on a waterproof layer

4.1.1 Slab quota

By observing paragraph 5 on page 38, you can see that the thickness of the “massetto” can vary between 6 and 10 centimeters, according to the type of paving which will be chosen. Therefore, as regards the calculation of the final quota of the paving, the only quota which can be varied is the one of the slab.

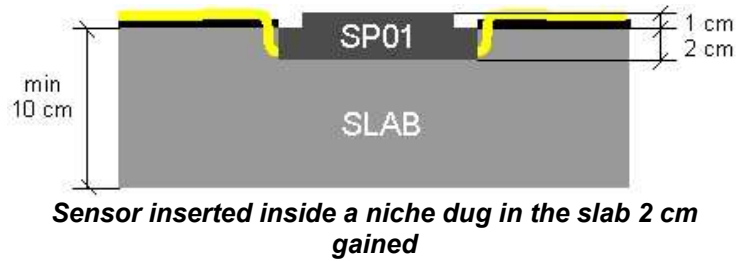
The final quota to which the slab will have to arrive will be:



$$Slab\ Quota = Final\ Quota - Paving\ Thickness - Massetto\ Thickness$$

where the thickness of the “massetto” can be taken from paragraph 5 on page 38.

If we do not manage to have a minimum thickness of 10 cm for the slab, it is possible to gain 2 cm by digging niches maximum 2 cm deep inside which SP01 sensors will be positioned. In this way the sensor will lean out of the quota of the slab for about 1 cm.



The sensor must lean at least 1 cm out of the niche.

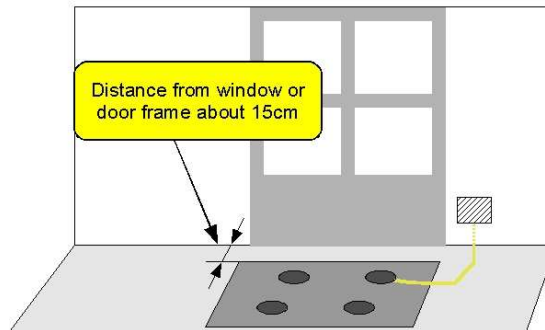
Since the niche will not have a regular surface, the irregularity of the base of the niche has to be balanced with a greater quantity of sensor adhesive (see paragraph 4.4 on page 37).

4.2 Elastomeric membrane laying

Once the perfect conditions of the slab have been checked, you have to locate the position in which the elastomeric membrane will be laid, studied while designing.

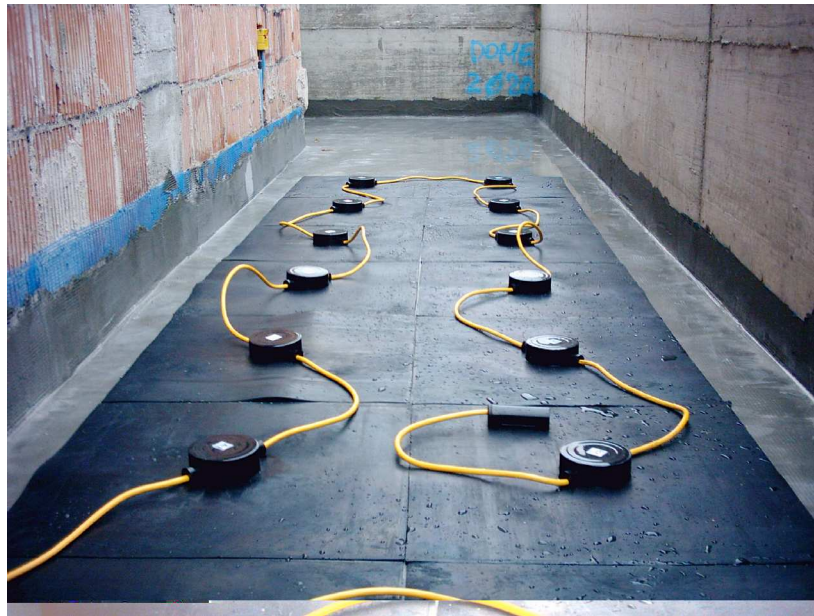


If SISMA CA system is used as standing detector, it is necessary to position the elastomeric membrane at 15 cm from the window or door frame.



Once the laying area of SISMA CA module has been located, you have to temporarily position the membranes by trying to find a position as symmetric and balanced as possible in comparison with the area to be covered.

The membranes will have to be positioned one near the other, well-adherent, but not super-imposed.



CORRECT positioning test



CORRECT positioning test

Another thing to be avoided is the laying of the membrane on a plane which is not perfect, since we could have areas with no perfect adherence of the membrane to the slab, with a consequent wrong distribution of weight and an anomalous functioning of the system.



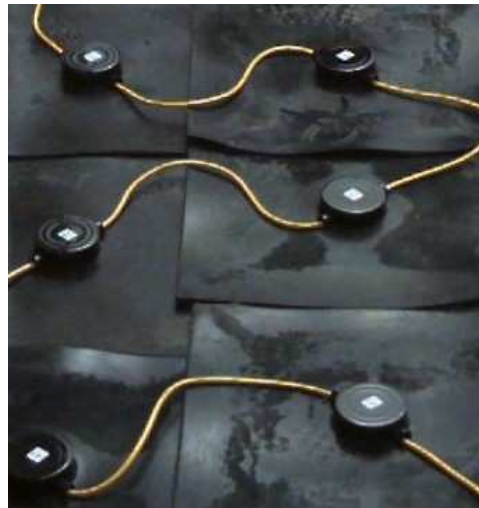
Lay the membrane only on level surfaces.



WRONG LAYING – Membrane astride a step



WRONG LAYING - Membrane bent on the wall



WRONG LAYING - Membrane superimposed



WRONG LAYING – Membranes set after the sensor laying, piled up and on the step

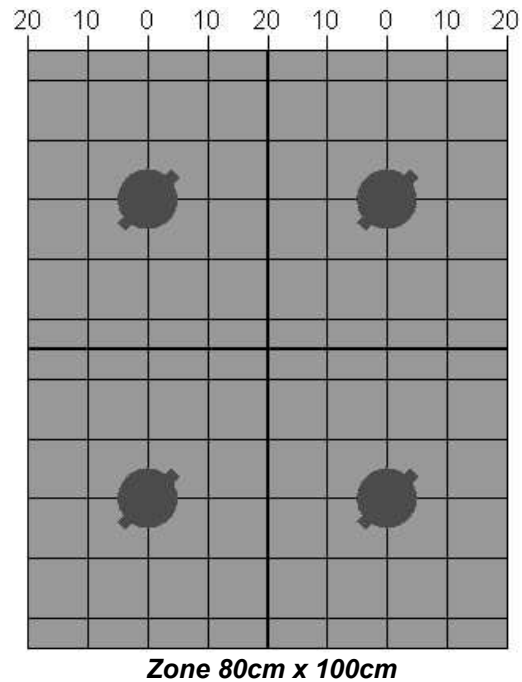
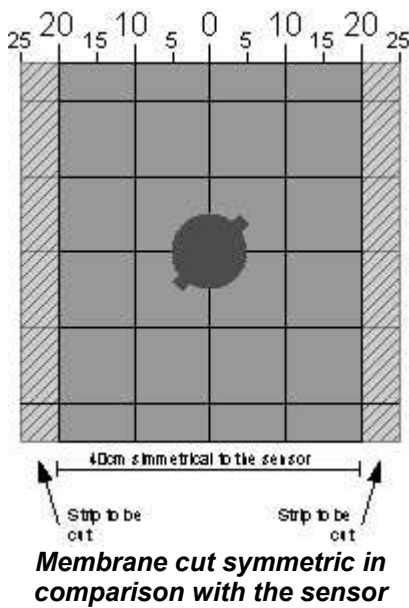
4.2.1 Elastomeric membrane cut

If you are in an area whose dimensions do not permit the complete laying of the elastomeric membranes, it is possible to cut them to make them suitable to the size available. This cut must be always done in a symmetric way and equally distributed for each membrane.



The minimum length of the cut is 35 cm on the side.

For example, if you have to detect a crossing along a path 80 cm wide, you have to cut two membranes so that they become 40 cm wide, by cutting 5 cm on each side.



Before cutting, you have to calculate how much membrane must be cut, taking into account that **N** is the amount of membranes to be positioned and **L** is the width available, then you have to cut the following centimeters:

$$\text{cm to be cut} = \frac{(N \cdot 50\text{cm} - L)}{(2 \cdot N)}$$

The cut must be easily done by working on a smooth surface with a fixed blade cutter and a metal ruler.



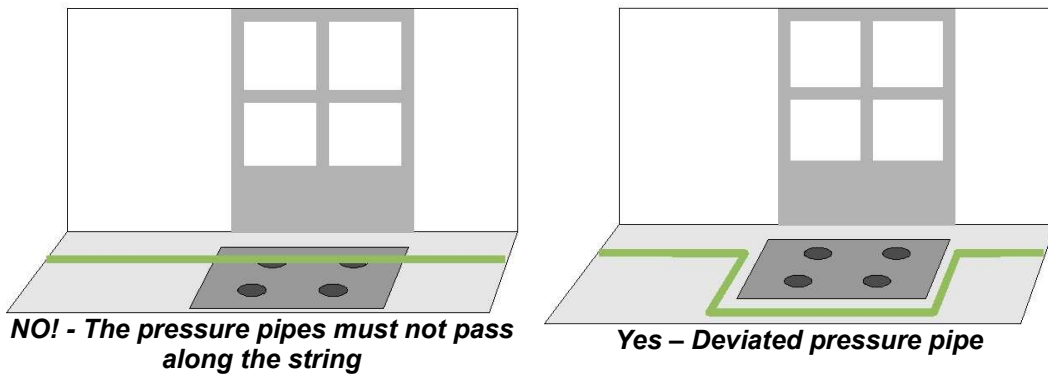
Do not use scissors, since it is very difficult to cut in a rectilinear way due to the thickness of the membrane.



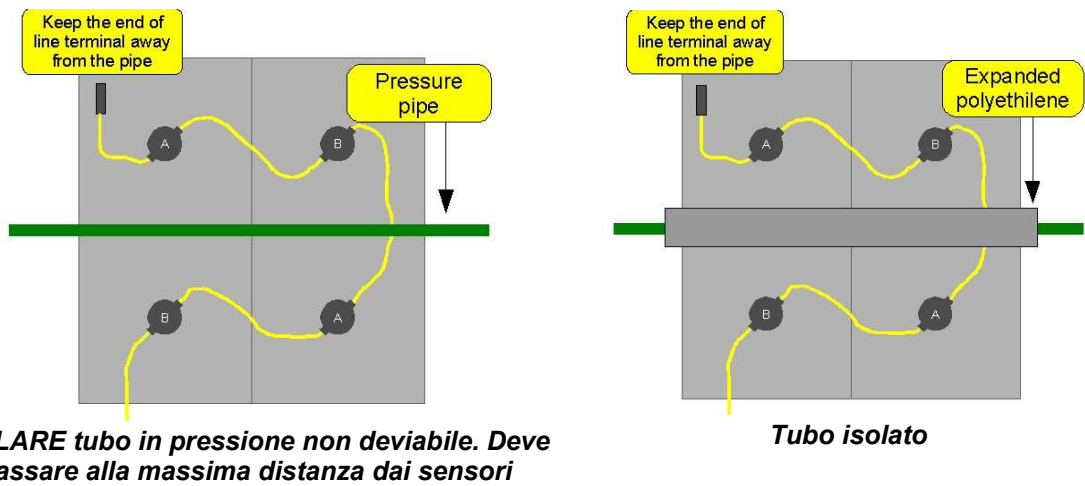
In case of passages less than 80 cm wide, please contact Dea Security for advice.

4.2.2 Pressure pipes along the string

If there are pressure pipes crossing the area to be sensed, it is necessary to deviate, if possible, their way out of the area covered by the elastomeric membranes.



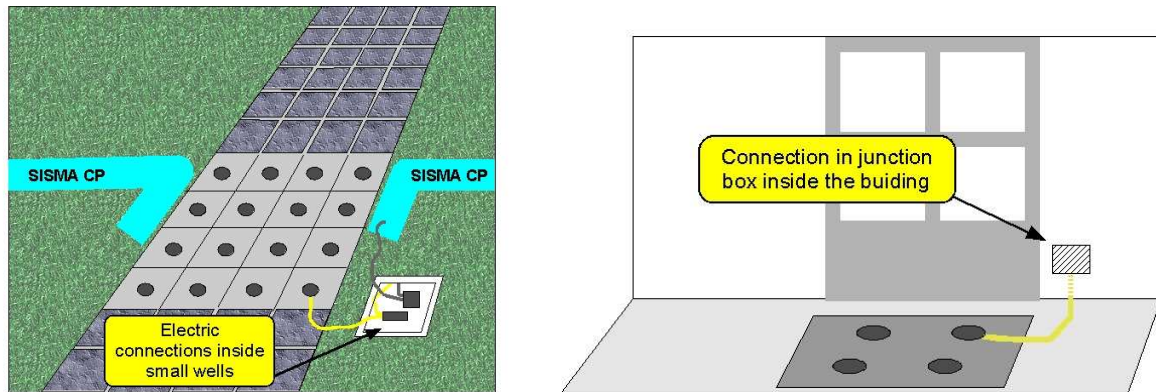
If it is not possible to deviate the pressure pipe, it is necessary to keep it at a distance from the sensors, by passing between two SP01 sensors. Besides this precaution, it is necessary to prevent the pipe from transmitting the vibrations by insulating it with expanded polyethylene, normally used for pipes thermal insulation in hydraulics.



Keep the line terminal distant from the pipe, since the terminal contains a temperature sensor and if the pipe gets hot, this could alter the reading of the thermometer.

4.3 Electric connections of the string

Each module is provided with 5 meters of cable so that the junctions can be executed inside accessible small wells or junction boxes, or, if the processing board is set near the module CA, arrive directly at it without executing any extension of the cable.



The electric connections are necessary to extend the string cable so as to arrive at the processing board SE-SISMA MCA or SCA PU (initial string junction), repair a damaged cable, increase the dimension of the module. The junctions are carried out in special boxes, model CT2580.

In any case, the following recommendations are valid:

- All the connections must be always be soft welded and sealed, inside a CT2580 box, with bicomponent epoxy for electric connections type KIT R250. A kit is sufficient for sealing 3 CT2580 boxes.



DO NOT USE SYLICON FOR SEALING THE ELECTRIC CONNECTIONS. Use only KIT R 250 epoxy, specially studied for the purpose in question.

The sylicon contains solvents which provoke a rapid oxidation and corrosion of the copper conductors present in the string cables, therefore its use for sealing electric coconnections is forbidden.

- Before sealing the connections with epoxy, it is necessary to check the connections and the insulations, as it will be explained later.
- The connection cables of the modules with the processing boards must be put inside pipes.
- The connection of the module cable must be preferably positioned in a special junction box, or small well, for electric use.

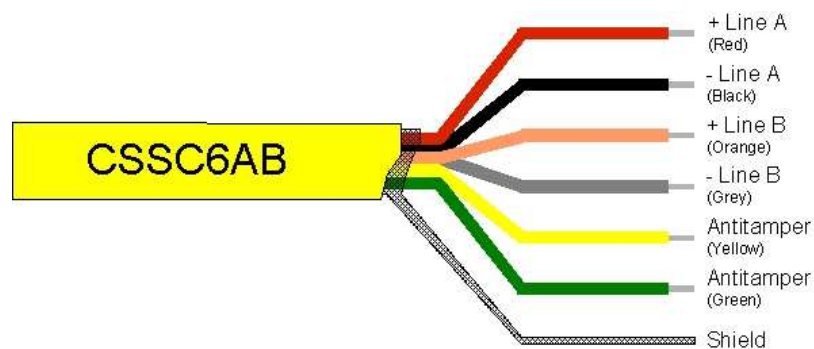
4.3.1 Initial junction, repair and string dimension increase

Once the best laying combination for the elastomeric membranes has been found, you have to proceed to the execution of the electric connections between the cable coming from the module and the one which will have to reach the processing board. This is why, once the sensors have been laid and fixed, you will have to avoid any operation which could lead to an accidental detachment of the sensors of the slab.

Temporarily position the sensors inside the holes of the elastomeric membranes previously set, so as to find the correct position of the signal cable CSSC6AB.

If possible, position the junction inside small boxes or small wells for electric use, by arriving there with CSSC6AB cable of the module and with the cable inside a pipe from the the extension cable side towards the processing board.

For the connection of the sensor-modules, only *Dea Security cable mod. CSSC6AB* must be used. The connections have to be sweat soldered and treated with epoxy inside the box CT2580.



To extend the cable of initial string, to repair the damaged cable, or to increase the quantity of the sensors in the module, the connections must have executed with a colour-colour correspondence.



The length of the connection cable, between the beginning of the module and the processing board, must be 150 meters maximum.

The procedure for the connection is the following one:

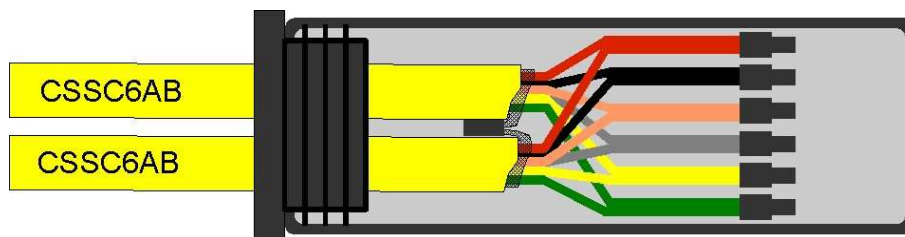
1. Drill the cover of CT2580 box with a 8mm diameter bit at the side of the hole already present.
2. Insert the two cables to be joined inside the holes and proceed to the peeling of the cables taking off 5 cm of external sheath.
3. Cut the shield in length and remove the part of cut shield. Roll up the remaining part of shield.
4. Peel each conductor for about 1 cm. Put the conductors having the same colour side by side and roll up the peeled part of each pair together.
5. Weld each pair by taking care of insulating the welded part with some adhesive tape or thermoshriking sheath.

6. Join the cables with adhesive tape or with a clamp on the external sheath near the beginning of the peeling.
7. Now weld the two metal shields.
8. Check all the connections and the insulations, by verifying first the colour-colour correspondence and then with a tester (bottom scale minimum 1 Mohm) that all the wires are insulated one with the other, except for yellow with green which present a resistance of 3-4 Mohms or 15 – 16 Mohms according to the polarity chosen.
9. Seal the whole with bicomponent epoxy for electric connections. If KIT R 250 is used, it is advisable to prepare the epoxy only after preparing at least three junctions inside CT2580 box so that it can be used soon after its mixing (please see KIT R 250 Data Sheet).



See appendix for modes and usage precautions of KIT R 250.

Cable CSSC6AB module		Cable CSSC6AB extension
Red	———	Red
Black	———	Black
Orange	———	Orange
Grey	———	Grey
Yellow	———	Yellow
Green	———	Green
Shield	———	Shield



CT2580 box – Seal with KIT R250

4.4 SP01 detectors laying

After correctly laying and arranging the membrane and executing the electric connections, you can proceed to the laying of SP01 sensors.

The membranes are pre-punched to lodge the sensors, with the cable positioning direction along one of the two diagonals.



For glueing the sensors to the slab, it is necessary to use the adhesive provided, or something equivalent, type Kerakoll H40 FLEX.

The quantity of adhesive to be used is about 100 gr for each sensor, therefore about 400 gr for each module CA4, 600 gr for each module CA6, etc...

The operative procedure to be followed is the following one:

1. Prepare the sensors, by making some positioning test, to see which the direction of the connection cable has to be.
2. Mix the necessary quantity of adhesive. About 100 gr each sensor.
3. Raise one sensor and slightly wet the slab visible through the hole, without moving the membrane from its position. This operation is necessary to permit the adhesive to perfectly adhere to the slab.
4. Position a small quantity of adhesive on the slab. See the figures above for the correct dose.



Do not exaggerate with the concrete quantity, since an excessive quantity of adhesive can alter the detection capacity of the sensor.

5. Position the sensor, as previously done, and make the right pressure to make it adhere to the slab beneath.
6. Pass to the next sensor and start again from point 3.



Right quantity of adhesive



Fixed sensor



Once the sensors have been fixed, we suggest that you proceed to the paving as soon as possible, since in a building yard it is possible that the sensors and the cables can be carelessly damaged.

For this purpose, we recommend not to cover the sensors and the cable with concrete, so as to protect them, since the detection capability of the string could be compromised.



DO NOT cover the cables and the sensors with concrete while waiting for the definitive coverage

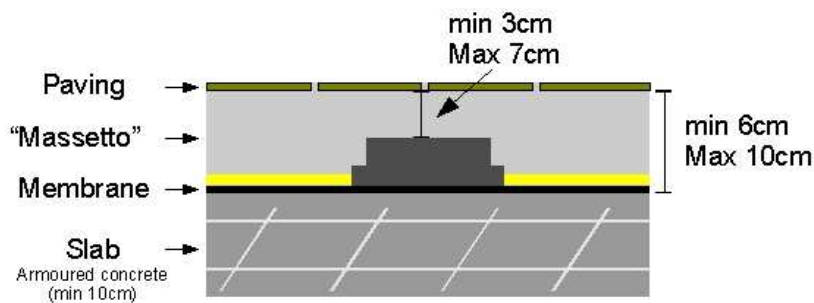
5 Coverage of the string and paving

The thickness of the filling layer which directly rests on the elastomeric membrane is determining for the system yield.

Its height can vary from minimum 6 cm to 10 cm maximum.



The thickness of the filling layer must be constant for each module. Changes of thickness are not admitted.



Since the sensor has a thickness of about 3 cm, the filling above the sensor must have a minimum thickness of 3 cm and a maximum one of 7 cm.



If the minimum filling thickness is higher than the tolerable maximum raising, it is possible to save some centimeters, by lowering the laying plane of the detectors. For further information, please refer to paragraph 4.1.1 on page 26.

Generally, the thickness of the filling layer can be at the maximum level when tiles of small size are used (smaller than 15 cm X 15 cm), while it must be minimum when the size of the tiles is maximum (bigger or equal to 30cm X 30cm).

The filling must be preferably made with concrete, with consequent glueing of the paving. In case it is not possible to use this technique, for example with stones of big dimensions or irregular size, it is possible to use the technique with wet “massetto”, by trying to minimize the thickness.



The execution of the “massetto” above a sensor-module must be done at once, so as to have a homogeneous behaviour of the zone.

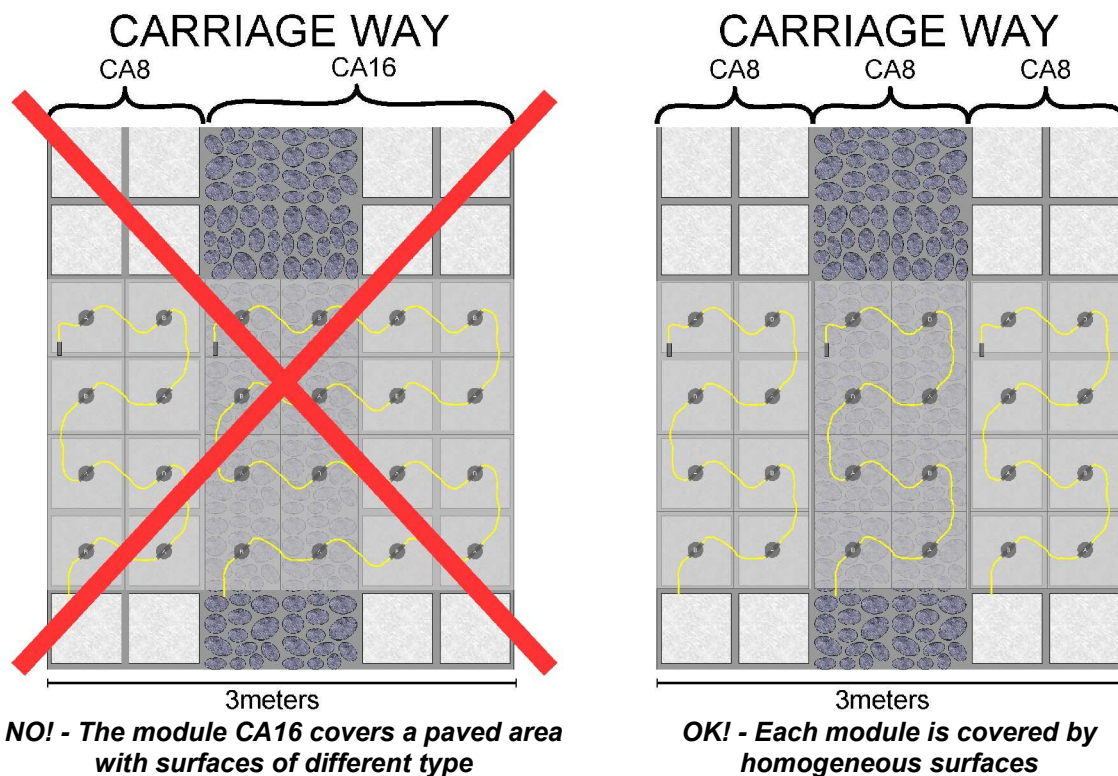
Some examples of paving will be visible in the next paragraphs.

While making the paving, you have to consider that to each string must correspond a coverage of homogeneous type. In fact it is not possible to make a path with side slabs and pavé in the middle by positioning the modules in such a way that they can be covered with pavé and plates.



To each module must correspond a coverage of homogeneous type. Each surface change needs a different calibration.

To make this type of coverage, it is necessary to divide the sensed zones in the same way with which the surface has been divided.

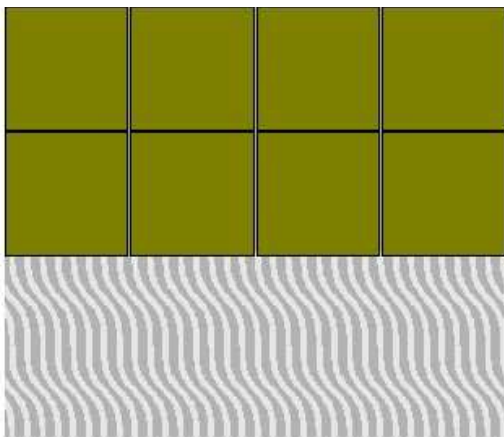


5.1 Tile surface

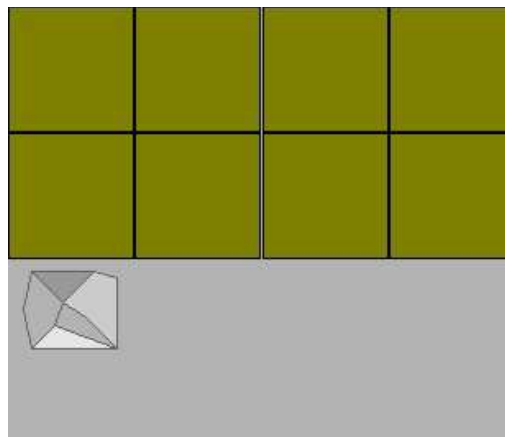
In this case we suggest making the filling with concrete and then proceeding to the glueing of the tiles. In this way the “massetto” is rigid enough to distribute the weight on the sensors in the best way.



With tiles of big dimensions (bigger or equal to 30 cm X 30 cm), we suggest using the thickness of the “massetto” minimum (6 cm).



Tiles glued to the concrete “massetto”



Tiles applied with concrete to the concrete “massetto”

The laying on the wet “massetto” is tolerated, but not suggested. Also in this case you have to keep the thickness suggested.

5.2 Concrete surface

Make the filling with concrete, by using a higher thickness according to the load the surface will have to support. The maximum filling is again 10 cm.

The surface will be able to be painted, or covered with linoleum, moquette, etc...

5.3 Surface with small-medium size stones

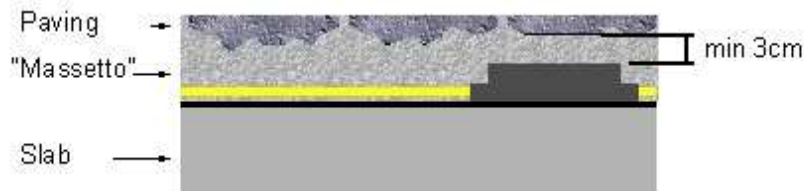
With this type of surface we mean stones with a maximum dimension of 30 cm x 30 cm, regular or irregular and whose thickness is remarkably inferior to the other dimensions (for example to slabs).

Since the stones are heterogeneous (they can have an irregular bottom), we suggest using the laying technique with wet "massetto". In this way you have a better levelling by maximizing the resting surface of the stone on the "massetto". Consequently, you have a uniform distribution of the weight on the sensed area.

Make sure that the stones do not rest directly on the sensor during the laying.



Try to use stones whose bottom is as regular as possible in the proximity of the sensors.



Porphyry on wet "massetto" - Keep the minimum distance from the sensor

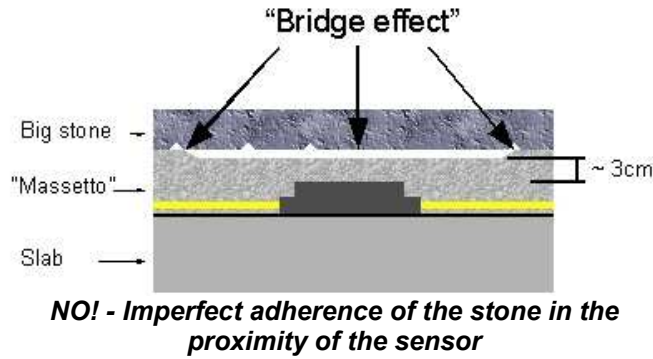


Example of porphyry on wet "massetto"

5.4 Surface with stones of big dimensions

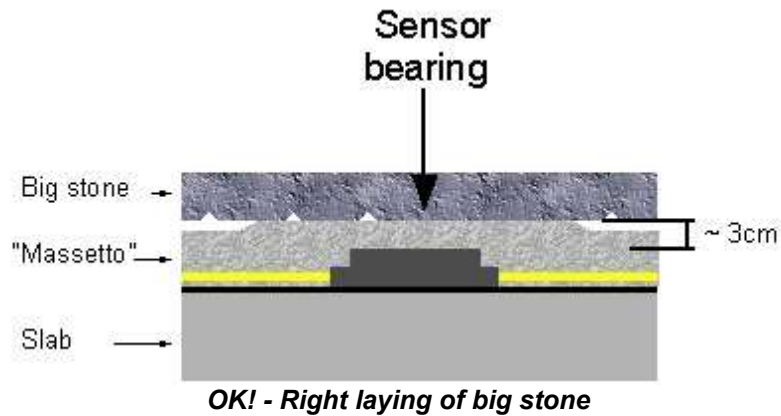
With this type of surface we mean stones with a surface superior to 30 cm x 30 cm, generally regular and whose thickness is remarkably inferior to the other dimensions (for example to slabs).

With stones with such a size, you have to pay attention to the laying of the paving. In fact, in this case we may have the creation of ample zones beneath the stone, with an imperfect adherence to the "massetto" and therefore an imperfect distribution of weight on the sensed area.

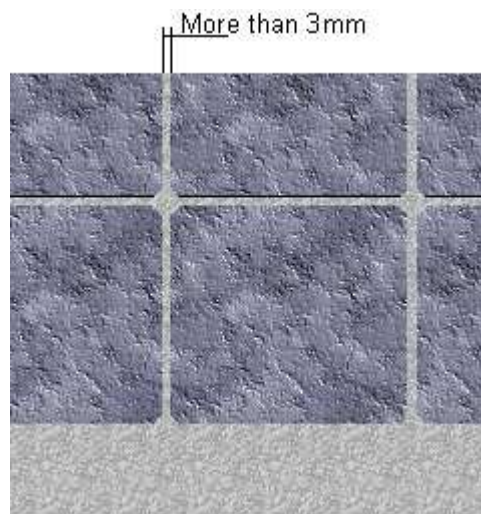


The "bridge effect" has a harmful effect on the detection capacity of SISMA CA system.

While laying, make sure that the stones perfectly rest in the proximity of the sensor, so that the weight of the surface rests on the sensor.



It is very important to avoid that one stone rests on another stone, leaving a bit of space between them. In this way the stones will be independent with one another.




Space among the stones to be filled with “stucco” or “boiaccia”

Then the space will have to be filled with stucco or boiaccia.

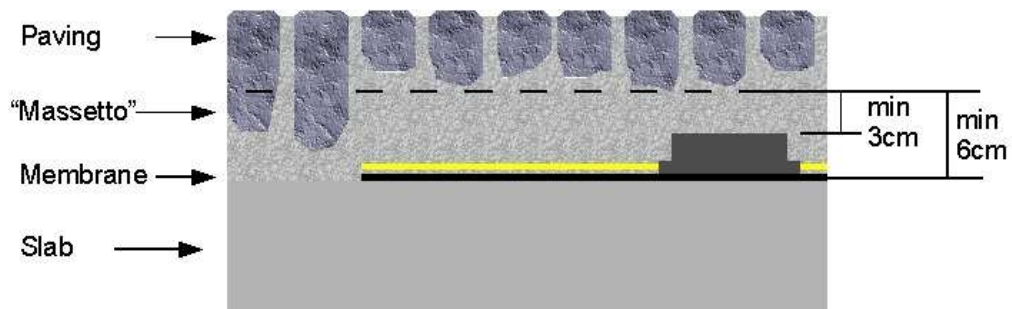
5.5 Surface with porphyry (pavé)

The main feature of the porphyry is not having regular dimensions. The thickness goes from few centimeters to more than ten. Since the stones are heterogeneous, we suggest using the laying technique with wet “massetto”, so as to level the paving in a better way.

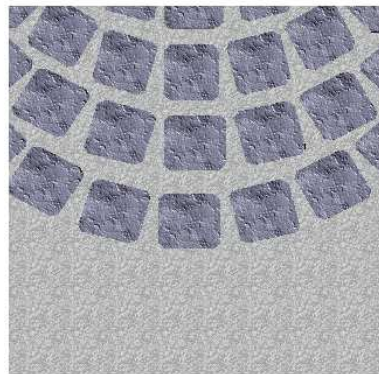
We suggest selecting the porphyry blocks so as not to have an excessive variability of the thickness and so that in the proximity of the sensors (area covered with elastomeric membrane) there is a layer of “massetto” of at least 6 cm, therefore remaining at 6 centimeters at least above the sensor.

 *In the area covered by the sensor, above the elastomeric membrane, keep a thickness of the “massetto” of at least 6 centimeters (see figure).*

In this way the “massetto” has the minimum lift to distribute the weight on the area covered by the sensor.



Porphyry on wet "massetto" - Keep the minimum distance from the sensor



Example of porphyry on wet "massetto"

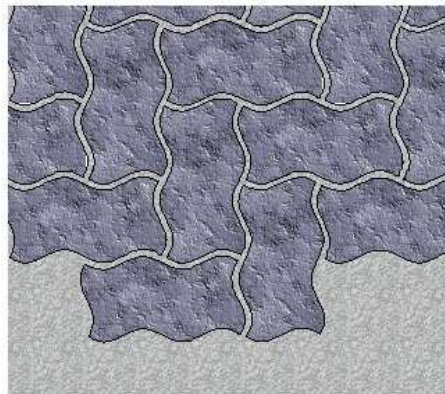
5.6 Other surfaces

The detection system SISMA CA is also applicable when you want to put self-lockings, gravel, sand, soil or asphalt on the surface. To execute these types of installation, some precautions are necessary. They will be dealt in this paragraph.

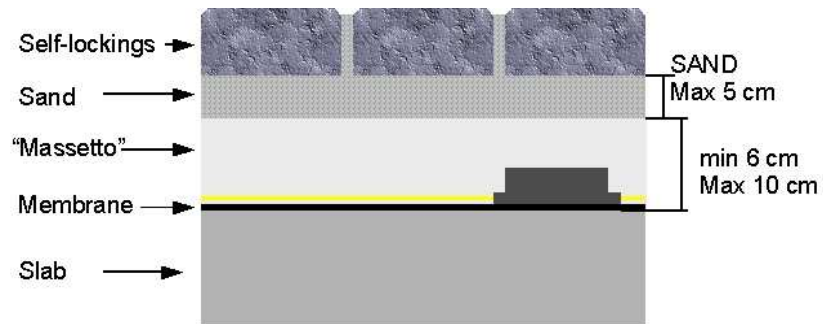
For all these cases, it will be sufficient to execute a concrete "massetto" with a thickness between 6 and 10 centimeters according to the lift it has to have and successively it will have to be covered with the surface needed.

In detail, the suggested solutions are the following ones:

- **Self-lockings:** you can use the typical blocks to be installed on a layer of sand which has the function to stabilize its position. Once the "massetto" has been realized, spread a sand layer of maximum 5 centimeters above it. Once the bottom has been prepared, proceed to the installation of a sand layer above it. Once the bottom of sand has been prepared, proceed to the installation of the small blocks.

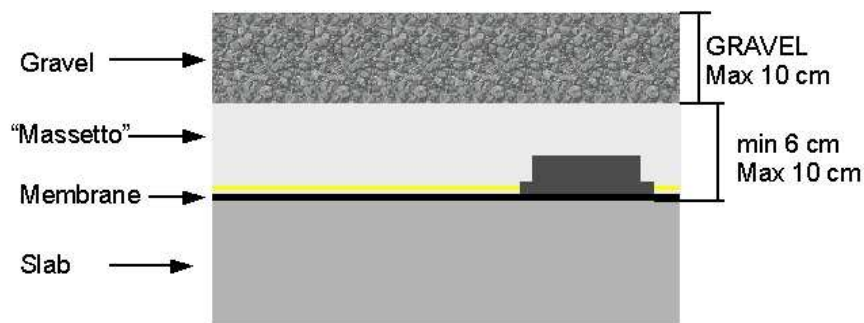


Self-lockings installed on sand above the "massetto"



Self-lockings on "massetto" – Maximum 5 centimeters of sand

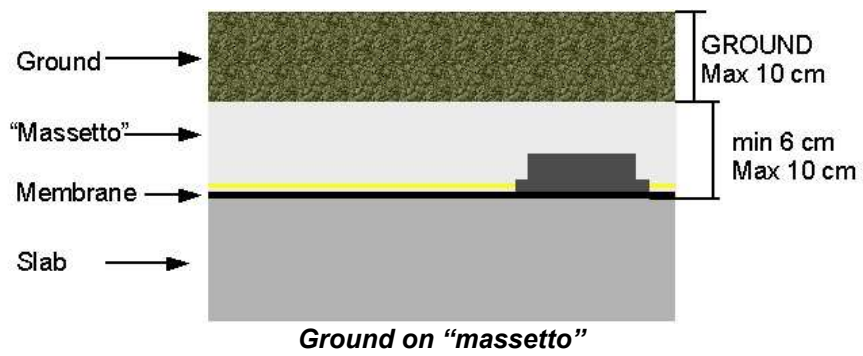
- Gravel: once the "massetto" has been done, spread a layer of gravel of maximum 10 centimeters above it.



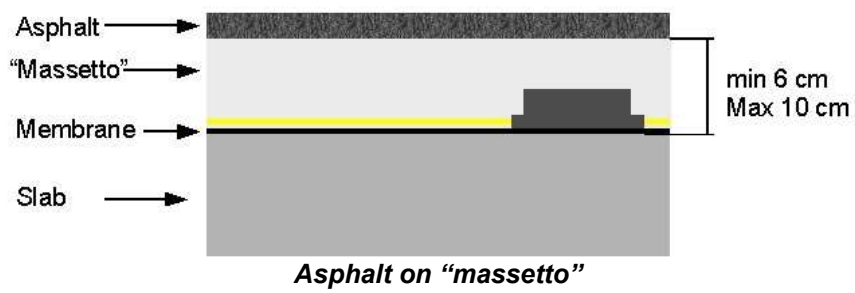
Gravel on "massetto"

●

- Ground: once the "massetto" has been done, spread a layer of sand of maximum 10 centimeters above it.



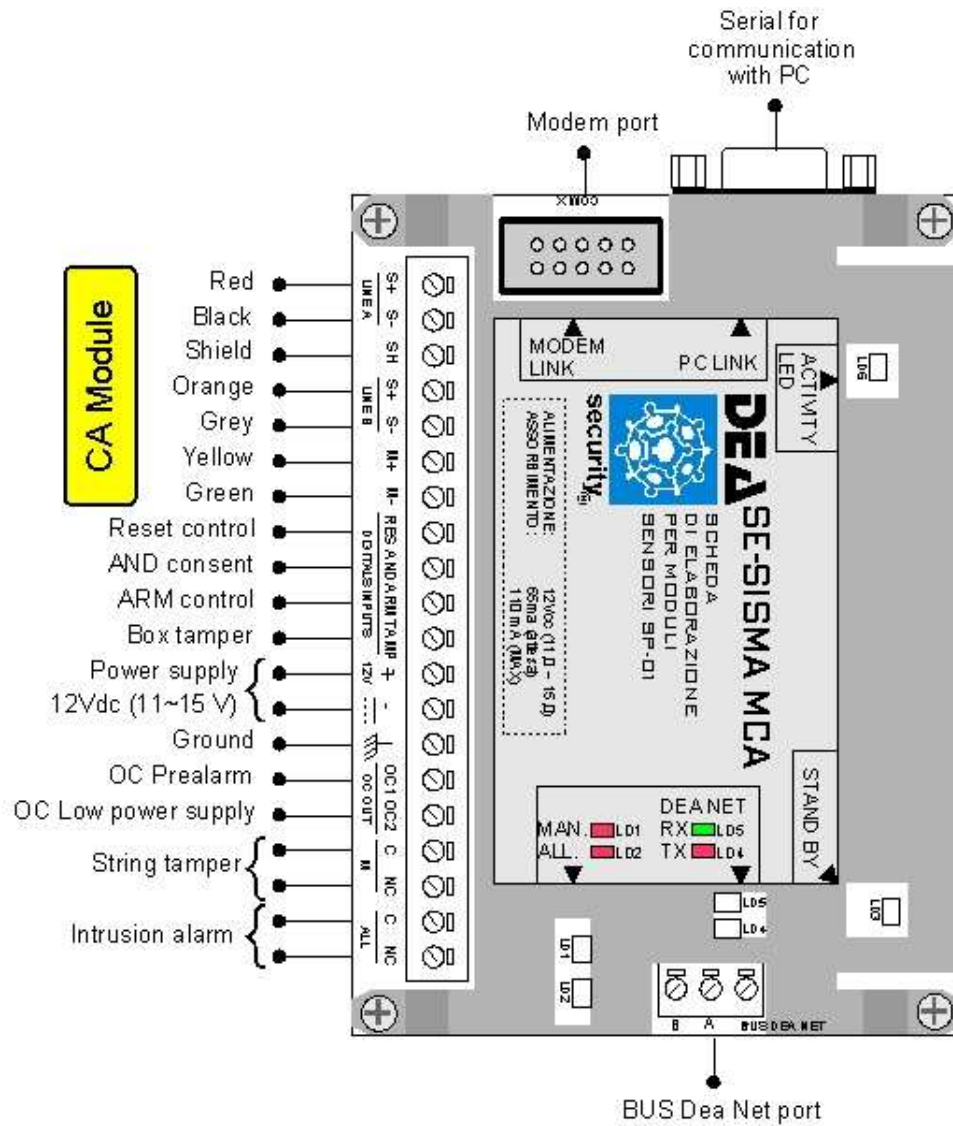
- Asphalt: once the "massetto" has been done, spread a layer of asphalt above it.



7 Electric connections to the processing boards

In the next paragraphs we will analyse the electric connections for the functioning of the processing board SE SISMA MCA and the centralized system SCA PU + SCA CONTROLLER.

7.1 Electric connections SE SISMA MCA



SE SISMA MCA electric connections

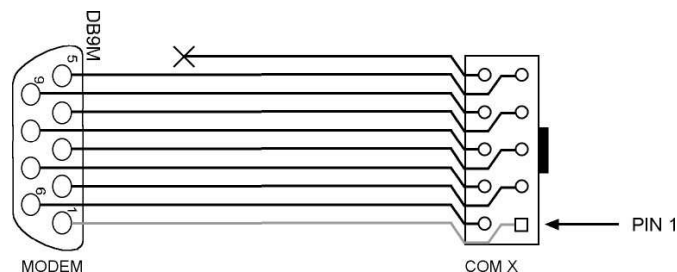
As regards the electric connections in the box, you have to proceed according to the diagram in the figure (for further information see the data sheet of SE SISMA MCA processing board).

- **MODULE CA**, for the connection of the sensor-module you have to arrive at the box with CSSC6AB cable approaching as much as possible the processing board. Peel about 10 centimeters of sheath and separate the shield from the other conductors. Insert the coloured conductors in the ferrite provided, by leaving the shield out.



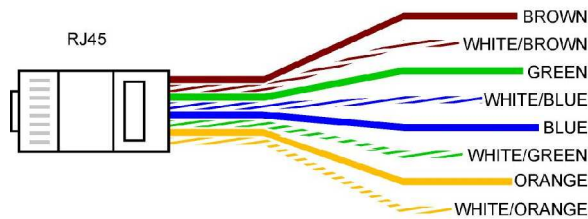
Do not take off more than 10 cm from CSSC6AB cable, in order not to compromise the quality of the signals coming from the sensors.

- **POWER SUPPLY**, the processing board must be supplied with a power-supply unit with 12Vdc output nominal current with maximum output variation from 11,0 V to 15 V. Because of the low intensity of the signals generated by the sensors SP01, we suggest using linear power-supply units (non switching) and stabilized. In addition, remember to connect the special terminal to ground (at the side of the supply terminals).
- **DIGITAL INPUTS**, the digital inputs are all referred to the negative with NO contacts as regards *ARM* and *RESET* and NC as regards *TAMPER* and *AND*, if enabled.
- **OC1, OC2** are open collector digital outputs (OC) referred to positive with NO contacts, which respectively signal the pre-alarm on CA string and power failure.
- **M** is the tamper output relative to CA module with NC relay contacts.
- **ALL** is the alarm output relative to a CA module with NC relay contacts.
- **Modem port**, to connect a modem it is necessary an adapter cable generally provided with the modem. The connection diagram of the adapter is visible in the figure.



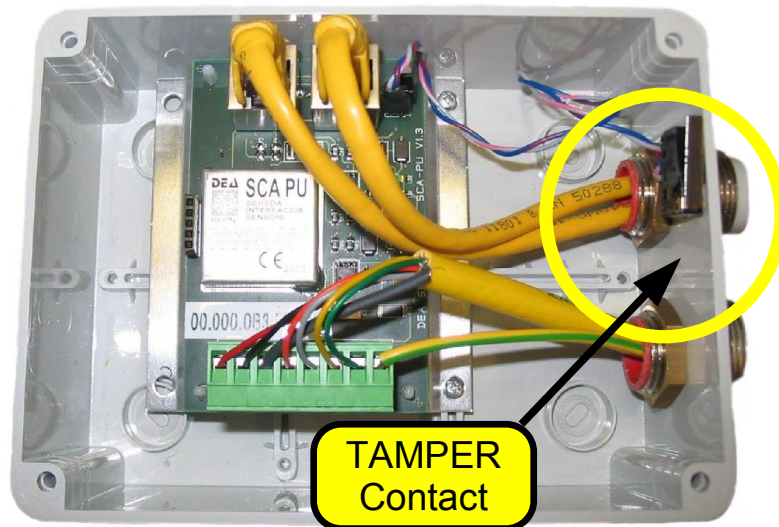
- **BUS DEA NET port**, the connection to BUS Dea Net line must be done by connecting the wires to the processing board terminals with the correspondence A-A, B-B and GND-GND. If it is the last board of the net and the total length of the cable is more than 10 meters, it is necessary to parallel insert a 100Ω 1/4W resistor to the terminals A and B.

- *SCA NET IN*, *SCA NET OUT*, the connection of SCA NET data line must be done through the use of a cable type FTP Cat. 4 or superior with connectors RJ45 crimped according to the standard EIA/TIA 568 (normally used in ethernet network for PC). In *SCA NET IN part*, the cable coming from SCA CONTROLLER must be connected, while in *SCA NET OUT* the cable going towards the successive SCA PU must be connected. If the SCA PU is the last one on the SCA NET data line, jumper JP1 must be closed. See the appendix for a correct crimp of the connectors RJ45.

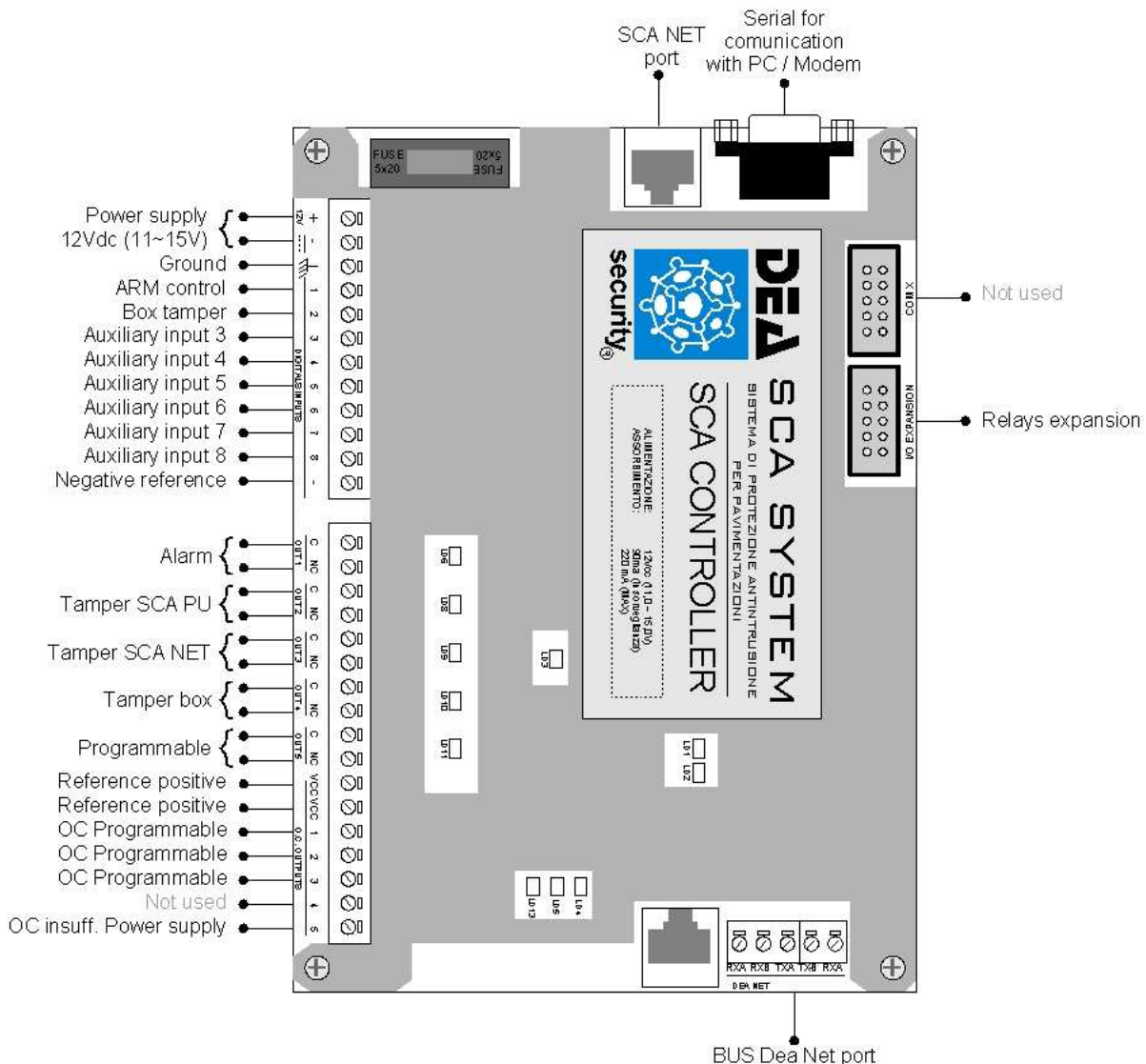


Connection of RJ45 connector according to standard EIA/TIA 568

- JP1, JP2; JP1 contact inserts the termination resistor of SCA NET line. It must be inserted only in the last SCA PU of the net. JP2 is a tamper contact, if SCA PU is inserted alone in a peripheral box. If you need a tamper contact, remove the jumper and connect the two conductors of the tamper contact to the terminals left free by JP2.



7.3 Electric connections SCA CONTROLLER



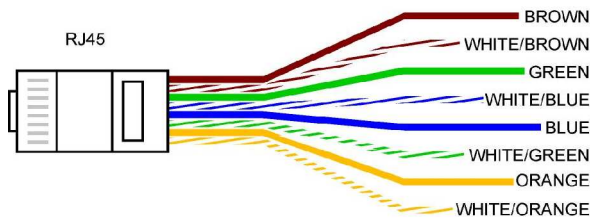
Electric connections SCA CONTROLLER

As regards the electric connections in the box, you have to proceed according to the diagram in the figure (for further information please refer to the data sheet of SCA CONTROLLER processing board).

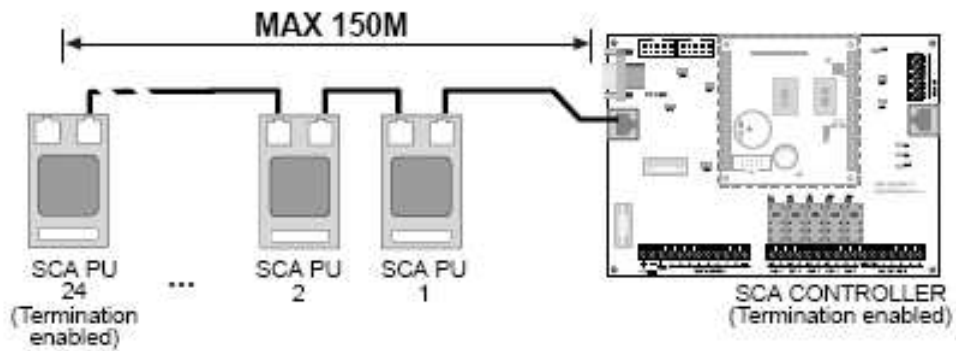
- **POWER-SUPPLY**, the board must be supplied with a power-supply unit with 12 Vdc output nominal current with maximum variation of the output from 11,0 V to 15 V. In addition, remember to connect the special terminal to ground (at the side of the power-supply terminals).
- **DIGITAL INPUTS**, the digital inputs all refer to the negative. Input 1 is the ARM control with NO contacts, input 2 is the tamper of the board and has NC contacts. The other in-

puts are available and can be used for other purpose. Please refer to *SCA CONTROLLER Software Manual for further information.*

- OUT1, OUT5 are relay outputs default set in this way:
 - OUT1: shows the general alarm. It is active when any of SCA PUs used as alarm cause generates an alarm.
 - OUT2: shows the tamper of CA modules or the tamper of SCA PU boards.
 - OUT3; shows the tamper of line SCA NET.
 - OUT4; shows the tamper of the tamper contact of SCA CONTROLLER board.
 - OUT5; it is programmable according to the user's needs.
- OC OUTPUTS, open collector (OC) digital outputs referred to positive with NO contacts. The first three ports are programmable and not default assigned. Port 4 is not used, and port 5 shows supply failure with NC contact.
- *SCA NET Port*, the connection of SCA NET data line must be done through the use of a cable type FTP Cat. 4 or superior with connectors RJ45 crimped according to the standard EIA/TIA 568 (normally used in ethernet network for PC). In *SCA NET PORT* the first SCA PU of SCA NET line must be connected.



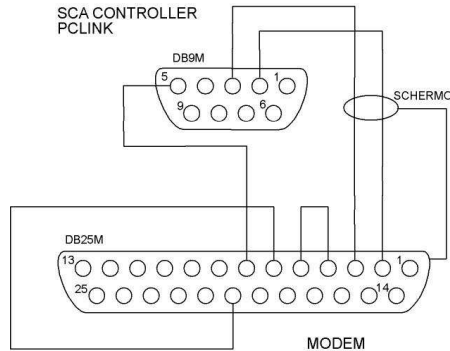
Connection of the connector RJ45 according to standard EIA/TIA 568



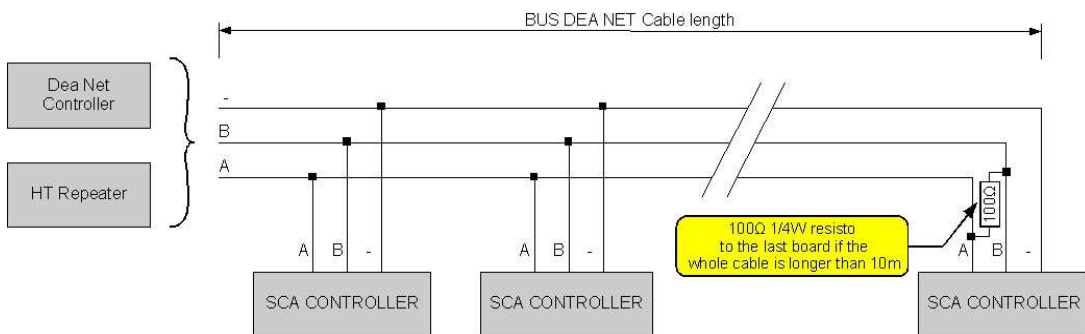
Struttura SCA NET

- Relay expansion module; it permits connecting up to 3 relay expansions ER MCP directly supplied by SCA CONTROLLER.

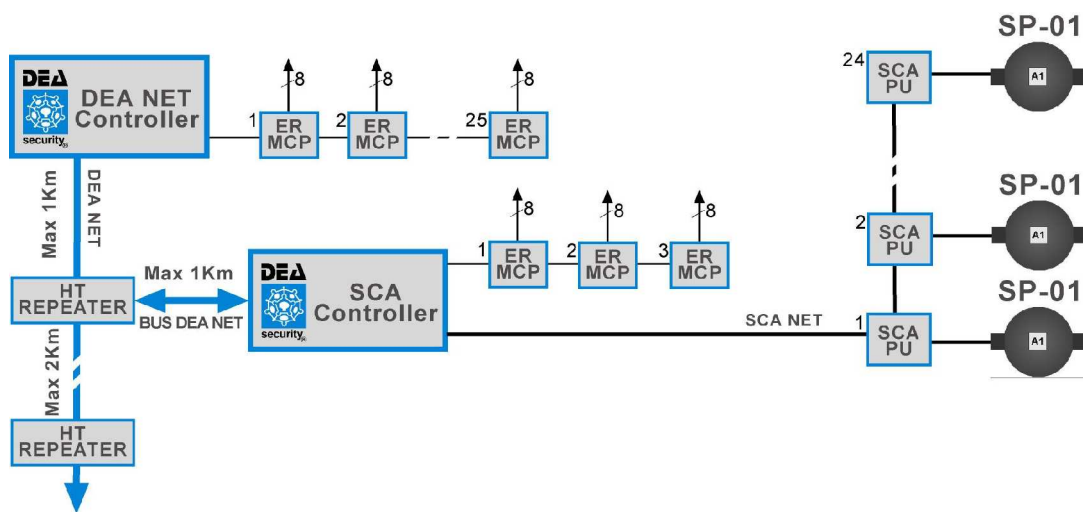
- Modem port; to connect a modem it is necessary an adapter cable normally provided with the modem. The connection diagram of the adapter is visible in the figure. For the usage of the modem and the setting of the processing board, please refer to the data sheet of SCA CONTROLLER processing board and its relative software manual.



- **BUS DEA NET Port**, the connection of BUS Dea Net line must be done by connecting the wires to the terminals of the processing board with a correspondence RXA-A, RXB-B and GND-GND. If it is the last board of the net and the total length of the cable is more than 10 meters, it is necessary to parallel insert a 100Ω 1/4W resistor to the terminals A and B.



Connection of the processing board to BUS Dea Net



Connection of SCA CONTROLLER to DEA NET

8 Sensitivity calibration

For the calibration of the sensitivity, please refer to the relative software manuals: *SISMA MCA software manual* or *SCA CONTROLLER software manual*.

9 Maintenance

SISMA CP sensor strings do not need any type of maintenance.

The processing board, as all the electronic devices, can be subject to breakdowns, therefore it needs periodical verifications of functioning.

10 Assistance

Dea Security's service department is at your disposal for advice and technical assistance at:

Massa – Headquarters

Via Magenta, 9

Tel 0585 43436 – Fax 0585 43437 – Email: dea@deasecurity.com

Montecchio Maggiore (VI) – Branch in Veneto

Viale Trieste, 1

Tel/Fax 0444 493322 – Email: deaveneto@deasecurity.com

Web : www.deasecurity.com

Appendix A - RJ45 connector crimp

For a correct crimp of RJ45 connector to the cable FTP, some instructions have to be followed.

First, it is necessary to peel at least 1,5 cm of cable, by taking away the aluminium shield and the plastic film. There will remain only the continuity conductor for the shield, which will have to be turned backwards, as in the picture on your right.

Once the cable has been peeled, the four twisted pairs of coloured conductors will be visible.

Try to draw the wires as much as possible and set them in colour order:

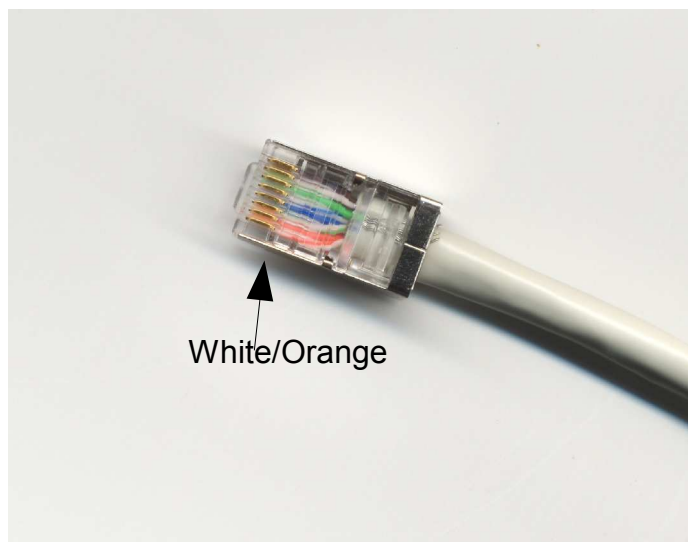
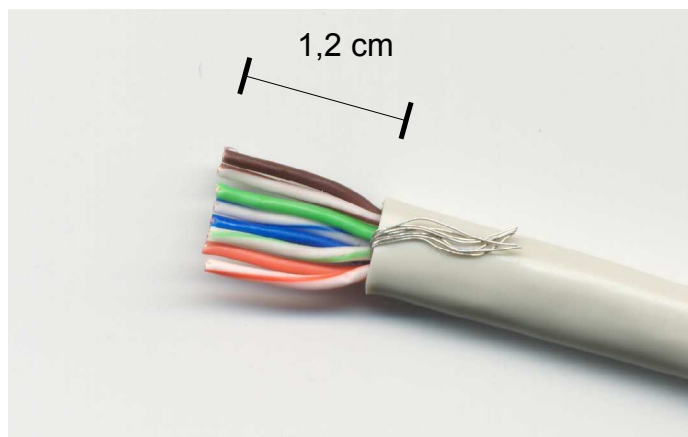
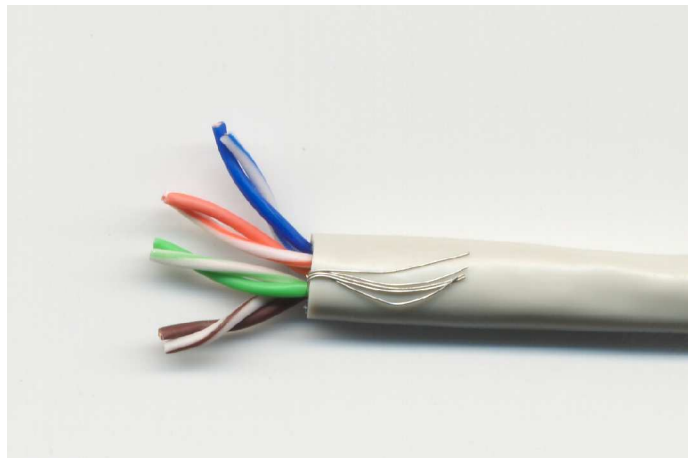
- White/Orange
- Orange
- White/Green
- Blue
- White/Blue
- Green
- White/Brown
- Brown

After arranging them in this order, make sure that they are stretched out in a good way and not twisted, as you can see in the picture on your right.

Cut the conductors set in this way at a distance of 1,2 cm from the sheath, with a cut as perpendicular as possible to the direction of cable FTP.

Insert the connector RJ45 shielded as in the picture, making the conductors arrive up to the bottom of the location. Visibly check that the conductors are still in the same colour order.

In the end, crimp the connector with the special crimping machine.



Appendix B - Usage modes of KIT R250 epoxy

Here you are the instructions and the usage precautions of KIT R250 epoxy, provided by the producer.

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 Parizanska cesta 75, SI - 6210 Sezana, Slovenija
 Tel.: +386 (0)4 75 12 281, Fax: +386 (0)4 75 12 300, 73 12 281
 e-mail: info@mitol.si, http://www.mitol.si

MITOL **ISO 9001** **ISO 14001** **ISO 45001**

Cleaning: Prolonged immersion in ethyl acetate or acetone

APPLICATION
 Both components should be mixed well separately, then dosed in the correct mixing ratio (mix ratio by weight, A:B=4:1) and mixed into homogeneous mixture. The surfaces to be in contact should be dry, clean, free from fat and dust. Curing time depends on temperature and size of casting. A shorter curing time can be achieved by larger casting volume and higher temperatures. Casting on lower temperatures than +5 °C is not recommended. If unavoidable, take precaution time of mixture at optimal curing temperatures until exothermic effect of reaction process started. Aluminium surfaces should be treated chemically.

PACKING
 EPOKOL 903 ZMA in 20kg tins.
 EPOKOL 903 ZMB in 5 kg tins.

STORAGE
 In original closed packing at +5 and +25 °C.
 If stored correctly, the shelf life is:
 12 months for EPOKOL 903 ZMA and
 18 month for EPOKOL 903 ZMB.

DANGEROUS GOOD CLASSIFICATION risk and safety phrases

EPOKOL 903 ZMA
 R 36/38 Irritating to eyes and skin.
 R 43 May cause sensitisation by skin contact.
 R 51 Toxic to aquatic organisms.
 R 53 May cause long-term adverse effects in the aquatic environment.

S 28 After contact with skin, wash immediately with plenty of water and soap.
 S 37/39 Wear suitable gloves and eye/face protection.
 S 61 Avoid release to the environment. Refer to special instructions / Safety data sheets

EPOKOL 903 ZMB
 R 20/21/22 Harmful by inhalation, in contact with the skin and if swallowed
 R 34 Causes burns
 R 43 May cause sensitisation by skin contact.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
 S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
 S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

HEALTH & SAFETY
 For more information safety data sheet can be obtained on request.

The information provided herein, especially recommendations for the usage and application of our products, is based on our knowledge, results of laboratory tests and practical experience gained to date.
 We guarantee a consistent quality of our products in accordance with technical specifications. Technical advice of our application department is available without charge. We reserve the right to change our products in its own responsibility with respect to their suitability for marked application and without prior notice.
 Such an evaluation should be repeated if materials are changed in any way or bought from a different source.
 We do not accept any liability with regard to above information or with regard to any verbal recommendation since different materials used in conjunction with our products as well as varying working conditions are beyond our control.

2/2 EPOKOL 903 ZM A+B 02/04

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 e-mail: info@mitol.si, http://www.mitol.si

MITOL **ISO 9001** **ISO 14001** **ISO 45001**

Cleaning: Prolonged immersion in ethyl acetate or acetone

TECHNICAL DATA

EPOKOL 903 ZM A+B

Epoxy based casting compound

DESCRIPTION
 EPOKOL 903ZM A+B is a two component, black colour, solvent free, epoxy based casting, moulding and encapsulating compound.

FIELDS OF APPLICATION
 EPOKOL 903ZM A+B is mainly used in electro industry. It has excellent adhesion to metals, synthetic resins (except polyethylene, polypropylene and Teflon), ceramics, wood, glass, cement, etc. Cured casting resin has excellent weather resistance, resistance to water, oil and many chemicals in temperature range between -40 and +120 °C.

CHARACTERISTICS - PROPERTIES OF COMPONENTS:

PROPERTY	903 ZMA - comp. A		903 ZMB - comp. B	
	TYPICAL VALUE	4000 - 9000	TYPICAL VALUE	400 - 600
Viscosity at 20 °C (Brookfield) (mPa.s)				
Density (kg/dm ³)	1.5		1	
Colour of components	black		colourless	
Mix ratio by weight A : B	4		1	
Cleaning:	Hot water and detergent			

PROPERTIES OF UNCURED MIXTURE:

PROPERTY	TYPICAL VALUE
Viscosity at 20 °C (Brookfield) (mPa.s)	2000 - 4000
For life (curing time, gel time) 100 g of mixture at 20°C (minutes)	30 - 150
Operating temperature range	+15 °C to +30 °C
Setting time at optimal curing temperature	Approx. 2 days
Density of mixture (kg/dm ³)	1,35 - 1,4
Colour of mixture	black
Cleaning:	Hot water and detergent

PROPERTIES OF CURED MIXTURE:

PROPERTY	TYPICAL VALUE
Decomposition temp. (°C)	370 - 380
Surface resistivity IEC 93 (Ω.cm)	2 x 10 ¹³
Volume resistivity IEC 93 (Ω.cm)	1,3 x 10 ¹⁵
Relative dielectric constant IEC 250	3,4
Track resistance (CTI) IEC 112	600
Dielectric strength DIN 53481 (VDE 0303 part 2), thickness 0,2 - 0,3 mm	
RH=50%, T=23°C	KV/mm 50
RH=92%, T=23°C	KV/mm 30
SHORE hardness (DIN 53505) at 23 °C	SHORE D 70 - 100
SHORE hardness (DIN 53505) at 150 °C	SHORE D 20 - 40

1/2 EPOKOL 903 ZM A+B 02/04
 Slovenska republika: 140531100 Oskotina: sodišča v Kopru, Cimosnoh: hri: 687.000.000 SIT, Presejalnik: nadzorna: sveta, mag. Jekzo Čuk.

SAFETY DATA SHEET

Last revision date: 29.09.2003
Supersedes SDS of the: 28.02.2002

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY: (#)

Identification of product

Trade name:

Supplier:

Emergency:

EPOKOL 903 ZMA

MITOL, TOVARNA LEPIL, d.d.

Partizanska c. 78, Sežana, SLOVENIJA

tel.: +386 (0)5 73 12 300

fax: +386 (0)5 73 12 390, 73 12 391

CENTERZA ZASTRUPITVE (NATIONAL POISONING CENTRE)

2. SESTAVA S PODATKI O NEVARNIH SESTAVINAH:

Name	Content %	Indeks No.	EC No.	Cas. No.	symbol	R phrases	S phrases
Reaction product: Bisphenol-A epichlorhydrin resin – average molecular weight ≤ 700	25–50	603–074–00–8	500–033–5	25068–38–6	Xi,N	36/38–43–51/53	(2)–28–37/39–61
ECH/BPF resin	50 – 100			28064–14–4	Xi, N	43–51/53	/
2,3 epoxypropyl neodekanate	2,5–10	/	/	26761–45–5	Xi,N	43–51/53	(2)–28–37–61

3. HAZARD IDENTIFICATION:

Irritating to eyes and skin. May cause sensitisation by skin contact. Toxic to aquatic organisms. May cause long-term adverse effect to the aquatic environment.

4. FIRST AID MEASURES:

General: Contaminated clothing should be removed immediately

Inhalation: Remove patient from exposure, keep warm and at rest. Obtain medical attention. If breathing is laboured, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing.

Skin contact: Remove contaminated clothing. Wash immediately with water followed by soap and water. If symptoms develop seek medical attention.

Eye contact: Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention

Ingestion: Wash out mouth and give water to drink. Do not induce vomiting. Obtain medical attention.

Further medical Treatment: /

5. FIRE FIGHTING MEASURES(#):

Not - flammable, but it will burn if involved in fire. If involved in a fire (specially in case of insufficient air supply) could emit toxic fumes: combustion products are carbon oxides (CO, CO₂, hydrocarbons etc...). Material does not contain any halogenic fire retardants or solvents (F,Cl or Br compounds). The same Fire fighting measures are valid for hardened (with Epokol 510B) material.

Extinguishing media:

Use dry powder, foam or CO₂. Water may be used if no other available and then in copious quantities

Protective equipment:

Use suitable respiratory protection with full face piece and positive air supply. PVC boots, gloves and protective clothing be worn.

6. ACCIDENTAL RELEASE MEASURES:

Clean-up should only be performed by trained personnel. People dealing with major spillage should wear full protective clothing including respiratory protection.

Environmental precaution: Prevent further leakage, spillage or entry into drains.

Methods for cleaning up:

Major spills should be adsorbed onto sand, earth or suitable adsorbent material and collected into open –top drums for further decontamination. Flush ground with detergent and water.

7. HANDLING AND STORAGE:

Handling: The sufficient ventilation must be provided. Wash thoroughly with soap and water at the end of work.

Storage: Keep containers properly closed and store indoors in a well ventilated area at temperature between +5°C and +25°C.


8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

Respiratory protection: Suitable respiratory equipment with positive air supply should be used in cases of insufficient ventilation. Appropriate local exhausting system is recommended at work above 40 °C, or if product is sprayed.

Eye protection: Chemical safety glasses.

Skin protection: Use protective gloves (neoprene, nitrile butadiene or butyl rubber, PVC) and protective clothing.	
Exposure limit: NA	
9. PHYSICAL AND CHEMICAL PROPERTIES:	
Physical state: viscous liquid	Explosion limits: NA
Colour: black	Vapour pressure: 0,1 Pa (20°C)
Odour: /	Solubility in water: not soluble
Smell perceiving level: /	Solubility-other: soluble in most organic solvents
Boiling point: > 200 °C	Density: approx. 1,5g/cm ³ at 25 °C
Flash point: NA	Viscosity: 4000 – 9000 mPa.s at 25 °C
Ignition temperature: > 200 °C	
10. STABILITY/REACTIVITY:	
Condition to avoid: Chemically stable at room temperature.	
Materials to avoid: may reacts with considerable heat build up with amines, mercaptanes, acids	
Hazardous decomposition products: Carbon monoxide, carbon dioxide, nitrogen oxydes...	
11. TOXICOLOGICAL INFORMATION:	
Basis for assessment: /	
Inhalation: /	
Skin contact: irritant to skin LD ₅₀ dermal > 2000 mg/kg	
Eye contact: Irritant	
Ingestion: Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract	
LD ₅₀ oral: > 2000 mg/kg	
Long term exposure: NA	
12. ECOLOGICAL INFORMATION:	
Mobility: /	
Degradability: Not readily biodegradable	
Bioaccumulation: bioaccumulation is possible	
Ecotoxicology: NA	
13. DISPOSAL CONSIDERATIONS:	
The generation of waste should be avoided or minimised wherever is possible. Untreated material is not suitable for disposal. Small quantities and empty drums – should be hardened with component B (see Technical data) prior to disposal.	
14. TRANSPORT INFORMATION:	
Road transport:	
ADR/RID class number/letter : 9/11/c	
UN No.:	3082
Marine transport:	
IMDG class	9
UN No.:	3082
Packaging group:	III
Air transport:	
ICAO/IATA	9
UN No.:	3082
15. REGULATORY INFORMATION:	
EC classification (Danger symbol/s): Xi – irritant, N – dangerous for the environment	
R(risk) and S(safety) phrases:	
R36/38 Irritating to eyes and skin	
R43 May cause sensitisation by skin contact	
R 51 Toxic to aquatic organism	
R53 May cause long-term adverse effects in the aquatic environment	
S24/25 Avoid contact with skin and eyes	
S28 After contact with skin, wash immediately with plenty of warm soapy water	
S 37/39 Wear suitable gloves and eye/face protection	
S 61 Avoid release to the environment. Refer to special instructions / material safety data sheet	
WARNING. Contains epoxy ingredients	
16. OTHER INFORMATION:	
(#) The symbol means that information has been updated at the revision issue.	
The data is based on the present state of knowledge and experience. The Safety Data Sheet serves to describe the product	

only with regard to the safety requirements. These data do not constitute a specification. The existing regulations are to be observed by customers at their own responsibility.

 MITOL, tovarna lepil
d.d., Sežana

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SAFETY DATA SHEET

Last revision date: 25.02.2004
Supersedes SDS of the: 29.09.2003

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY:

Identification of product

Trade name:

EPOKOL 903 ZMB

Supplier:

MITOL, TOVARNA LEPIL, d.d.
Partizanska c. 78, Sežana, SLOVENIJA
tel.: +386 (0)5 73 12 300
fax: +386 (0)5 73 12 390, 73 12 391

Emergency:

CENTER ZA ZASTRUPITVE (NATIONAL POISONING CENTRE)

2. COMPOSITION / INFORMATION ON INGREDIENTS:

Ingredients:	Conc. %	Index No.	EC No.	Cas. No.	symbol	R phrases	S phrases
Benzyl alcohol	25-50%	603-057-00-5	202-859-9	100-51-6	Xn	20/22	(2)-26
Isophorone diamine	25-50%	612-067-00-9	220-666-8	2855-13-2	C	21/22-34-43-52/53	(1/2)-26-36/37/39-45-61
Nonyl phenol	2,5-10%	/	/	25154-52-3	C	22-34	/
2,4,6-tri(dimethylaminomethyl) phenol	2,5-10%	603-069-00-0	202-013-8	90-72-2	Xn	R 22-36/38	S 26-28-36

3. HAZARD IDENTIFICATION:

Harmful by inhalation in contact with skin and if swallowed. May cause burns and sensitisation by skin contact.

4. FIRST AID MEASURES:

General: Contaminated clothing should be removed immediately

Inhalation: Remove patient from exposure, keep warm and at rest. Obtain medical attention. If breathing is laboured, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing.

Skin contact: Remove contaminated clothing. Wash immediately with water followed by soap and water. If symptoms develop seek medical attention.

Eye contact: Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention

Ingestion: Wash out mouth and give water to drink. Do not induce vomiting. Obtain medical attention.

Further medical Treatment: /

5. FIRE FIGHTING MEASURES:

Not - flammable, but it will burn if involved in fire. If involved in a fire (specially in case of insufficient air supply) could emit toxic fumes: combustion products are carbon oxides (CO, CO₂, hydrocarbons etc...). Material does not contain any halogenic fire retardants or solvents (F,Cl or Br compounds). The same Fire fighting measures are valid for hardened (with Epokol 903 ZMA) material.

Extinguishing media:

Use dry powder, foam or CO₂. Water may be used if no other available and then in copious quantities

Protective equipment:

Use suitable respiratory protection with full face piece and positive air supply. PVC boots, gloves and protective clothing be worn.

6. ACCIDENTAL RELEASE MEASURES:

Clean-up should only be performed by trained personnel. People dealing with major spillage should wear full protective clothing including respiratory protection.

Environmental precaution: Prevent further leakage, spillage or entry into drains.

Methods for cleaning up:

Major spills should be adsorbed onto sand, earth or suitable adsorbent material and collected into open -top drums for further decontamination. Flush ground with detergent and water.

7. HANDLING AND STORAGE:

Handling: The sufficient ventilation must be provided. Wash thoroughly with soap and water at the end of work.

Storage: Keep containers properly closed and store indoors in a well ventilated area at temperature between +5°C and +25°C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:	
Respiratory protection: Suitable respiratory equipment with positive air supply should be used in cases of insufficient ventilation. Appropriate local exhausting system is recommended.	
Eye protection: Chemical safety glasses.	
Skin protection: Use protective gloves (neoprene, nitrile butadiene or butyl rubber, PVC) and protective clothing.	
Exposure limit: NA	
9. PHYSICAL AND CHEMICAL PROPERTIES:	
Physical state: liquid	Explosion limits: NA
Colour: light yellow	Vapour pressure: approx.: 0,4 Pa (20°C)
Odour: like amines	Solubility in water: partly soluble
Smell perceiving level: /	Solubility-other: soluble in most organic solvents
Boiling point: > 200 °C	Density: approx.. 1 g/cm3 at 25 °C
Flash point: NA	Viscosity: 400 – 800 mPa.s at 25 °C
Ignition temperature: > 200 °C	
10. STABILITY/REACTIVITY:	
Condition to avoid: Chemically stable at room temperature.	
Materials to avoid: may reacts with, alkalis and acids	
Hazardous decomposition products: Carbon monoxide, carbon dioxide, nitrogen oxides...	
11. TOXICOLOGICAL INFORMATION:	
Basis for assessment: /	
Inhalation: /	
Skin contact: LD ₅₀ dermal: = 2000 mg/kg (rbt); Corrosive, may cause burns.	
Eye contact: corrosive, may cause burns	
Ingestion: Benzyl alcohol - LD ₅₀ oral: = 1230 mg/kg (rats) Isophorone diamine LD ₅₀ oral: = 1000 mg/kg (rats)	
Long term exposure: NA	
12. ECOLOGICAL INFORMATION:	
Mobility: NA	
Degradability: NA	
Bioaccumulation: NA	
Ecotoxicology: NA	
13. DISPOSAL CONSIDERATIONS :	
The generation of waste should be avoided or minimised wherever is possible. Untreated material is not suitable for disposal. Small quantities and empty drums – should be hardened with component A (see Technical data) prior to disposal.	
14. TRANSPORT INFORMATION:	
Road transport:	
ADR/RID class number/letter : 8/53/c	
UN No.:	2289
Marine transport:	
IMDG class	8/8188
UN No.:	2289
Packaging group:	III
Air transport:	
ICAO/IATA	8
UN No.:	2289
15. REGULATORY INFORMATION:	
EC classification (Danger symbol/s): C - corrosive	
R(risk) and S(safety) phrases:	
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.	
R 34 causes burns.	
R43 May cause sensitisation by skin contact.	
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.	
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.	
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).	
16. OTHER INFORMATION:	
(#) The symbol means that information has been updated at the revision issue.	

The data is based on the present state of knowledge and experience. The Safety Data Sheet serves to describe the product only with regard to the safety requirements. These data do not constitute a specification. The existing regulations are to be observed by customers at their own responsibility.



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Dea Security reserves the right to vary, at any moment and without notice, the technical features herein.

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