SURROUND YOURSELF with SAFETY

USER AND MAINTENANCE GUIDE

SENSITIVE SAFETY MAT

gamma system

	Date	Description
00	**2010.01.20**	**First edition**
01	**2016.06.01**	**Update reference norme**

1. Foreword

The User must keep this Instruction Manual in a safe place and easily available for further consultation. Before installing and commissioning the safety device, all personnel must have read and understood this Manual in its entirety.

Installation and maintenance procedures are to be performed only by qualified personnel and well trained in safety procedures. The SAFETY MAT assures protection against those risks which can be eliminated by cutting off power supply.

The global safety of the machine and safety MATS depends on the mutual compatibility and integrity of this equipment.

A thorough risk assessment is to be made on the machine to be protected so to decide which measures and safety level are to be adopted in conformity with the dispositions of EN ISO 13849-1 Standard.

2. Important warnings on safety

Read and understand this Instruction Manual before performing any operation on the safety mat or on the controller

This Manual is intended only for the qualified personnel charged with the installation procedures.

GAMMA SYSTEM safety mats are not suitable for use in explosive atmospheres.

This Manual is intended for use in conjunction with the User & Maintenance Manual for GP02/E and GP02RT devices.

The safety mat and the controller are a safety system used to detect the presence of persons in hazardous areas with risk of injury.

To make sure that a specific application of the safety mat in conjunction with a suitable controller used to protect a machine or an installation adheres to the safety rules in force, it is necessary to assess both the risks of the machine/installation and the compatibility with the performance level declared by GAMMA SYSTEM in conformity with the EN ISO 13849-1 Standard.

For pressure sensitive safety mat s used to protect machinery, the performance level is defined by type C Standards or by the risk assessment performer by the machinery manufacturer. The machinery manufacturer assumes the responsibility to establish and adopt the safety level measures associated with the entire control circuit.

Other fundamental requirements to be respected are the installation, maintenance and inspection of proper operation of the safety mat together with the controller.

These assessments are the exclusive responsibility of the machinery manufacturer.

The additional requirements indicated below should be adhered to before using the safety mat and the controller:

- The machine onto which the safety mat and the controller are installed is to be capable of stopping at any point of its working cycle. Any unexpected restart must be prevented until the hazardous conditions have not been eliminated.
- In case the automatic Reset of the controller is planned, the need to perform a Reset operation is the responsibility of the manufacturer of the machinery.
- When a safety mat and the relevant controller are used as a safety device, the machinery manufacturer has the responsibility to ensure that all applicable requirements, regulations, codes and rules are met.
- Further safety measures such as safety partitions or protective guards are required if the safety mat and the relevant controller do not protect all areas accessing the point where hazardous operations are performed.
- The test procedure is to be carried out during the installation phase and after each maintenance work and/or modification/adjustment on the machine. The testing procedure is described in this Manual.
- All wiring should be performed in conformity with the local electrical standards and rules in force.

- The user is obliged to follow all the procedures described in this Manual so to assure the proper use of the GSTS01 safety mats and GP02/E and GP02RT controllers.
- The employer is responsible for the selection and training of the personnel charged with the installation, use and maintenance works and safety system of the machine. Any malfunctioning of the machine, tools and safety devices must be immediately notified by the User. DO NOT OPERATE the machine if the safety devices are faulty.

2.1 Misuse

Do not use the safety mat and the controller in the following conditions:

- On each device with an unsuitable stop time or on unsuitable control instruments/mechanisms.
- In environments capable of degrading the proper operation of the safety mat and/or the controller (e.g.: where corrosive, chemical agents are present).
- In case of defective sensor/s. For instance, if the sensor surface shows cuts or ruptures through which foreign bodies or liquids can penetrate and impair the good working of sensors.
- In places where the passage of heavy means occurs (forklift trucks, trans-pallets, etc…) which can damage the sensor/s.
- To start the machine movement.
- In environments showing a risk of explosion or a risk of being flooded by water.
- Where operations with heavy trucks are expected (forklift trucks, heavy vehicles and similar ones).
- Over the temperature limits: +5°C to +60°C.
- In areas classified as potential explosive areas.

3. NORMATIVES REFERENCES

The safety components

PRESSURE SENSITIVE MAT

Composed of sensor type : **GSTS01**

In combination with the control unit device type: **GP02/E and GP02R.T**

is designed and made in accordance with safety requirements and safeguards of person, especially precepts of design and manufacture contained in **"Machine Directive 2006/42/CE** and the "Electromagnetic compatibility Directive" **2014/30/UE**. Have been as well considered the European standards relative to risk prevention such as **EN ISO 12100:2010** standards and national technical and economic imperatives.

GAMMA SYSTEM SENSITIVE MATS meets precise information mentioned in the following standards:

EN ISO 13856-1:2013	General principles for design and testing of pressure sensitive mats and platforms.
EN ISO 13849-1	Safety related parts of control system.
EN 60204-1	Electrical equipment of machines
CEI EN 60529: 1997 + A1: 2000	Degree of protection provided by enclosure (IP code)
EN ISO 12100:2010	Safety of machinery
For the installation and use of the safety mat please also refer to the following applicable European Standard	
EN ISO 13855	Position of protective equipment with respect to the approach peed of parts of the human body
Others European Directives	
2012/19/UE	(RAEE)
2011/65/UE	(ROHS)
Réglementation (CE) n°1907/2006	(REACH)

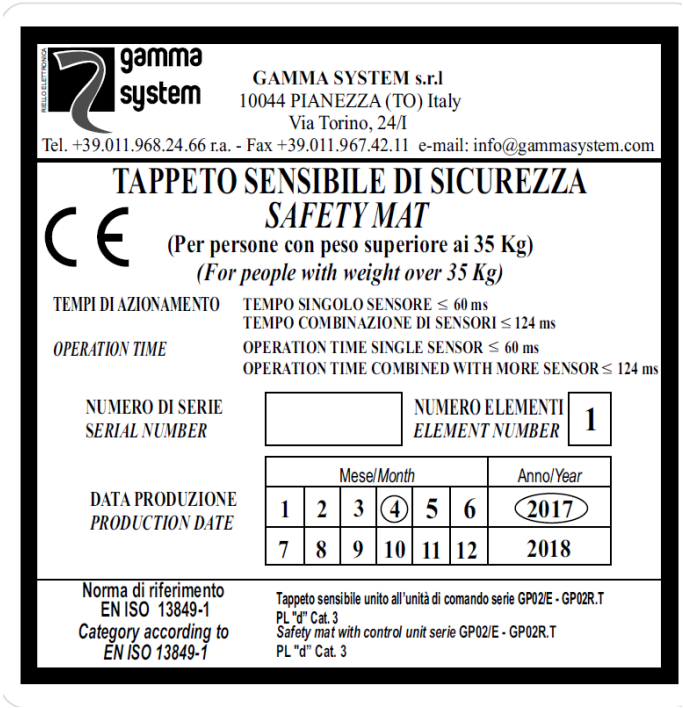
3.1 Approval

The pressure sensitive mats, sensor GSTS01 combined with the unit control device GP02/E and GP02R.T are Conformity with the standard EN ISO 13856-1

The sensor GSTS01 combined with the unit control device GP02/E and GP02R.T is a safety components in CATEGORY 3 PL “d” in conformity on the EN ISO 13849-1

3.2 Indentification label

The sensors are reconized by the following lable



4. Description

Gamma System sensitive mat is a safety component which acts as an electrical pressure sensitive device designed to detect the presence of human body.
The presence of people over 35kg closes a contact inside the sensor.
The state change of the internal sensor (NO to NC) is processed by the control device that sends a machine stop signal and eliminates the danger situation.

5. How to dimension a mat

The minimum distance of the dangerous zone must be calculated following the reference number EN ISO13855.
The minimum distance (width) of the mat, must be almost of mm 750 in order to prevent the possibility to cross the mats without activate it.

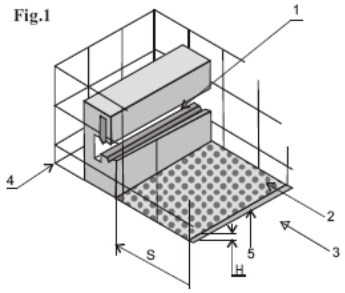
The minimum distance "S" must be calculate as follow:

S = (1600 x T) + 1200

In case the safety sensor is over the step or in a platform, in these case we can reduce the minimum distance of 0,4H, where H is the height of the step in millimetres (mm). The minimum distance from the detection zone to the danger zone can be calculated using the following formula:

S = (1600 x T) +(1200-0,4 H)

Fig.1



H Height of measuring zone over reference table
S Minimum distance
1 Dangerous zone
2 Detection zone
3 Approach direction
4 Stationary cover
5 Start of measuring zone

S=minimum distance in mm, of dangerous zone at the point, axis or plan of the detection zone
T=Global response time in sec

WARNING: Take note that during the dimensioning of the sensor take note in mind is important to consider that the response time of the sensor is given by sum of the time of actuation and the response of the unit control device.

6. TECHNICAL FEATURES

Description	***Mat with PVC coating***	
Material	PVC	
Max thickness	10 mm	
Weight/m2	15 Kg (approx.)	
Operating pressure	< 300 N Ø mm 80 / < 600 N Ø mm 200	
Max admissible load	2000 N / 80 Ø mm (avoid manoeuvres with heavy means such as lift trucks, motor vehicles and alike).	
Response time with Gamma System control units	Single sensor: ≤ 60 ms	
	Combination of sensors: ≤ 124 ms	
Mechanical life of internal contact	2,000,000 operations	
Max operating voltage	24 Vdc/ac	
Max operating current	60 mA / 24 V	
Electric resistance of sensor/m2	1,7 Ω/m2	
Linear resistance of cable	0,056 Ω/m	
Max connection length	100 m	
Connection cable section	min. 0,35 mm^2 For cables with L>20 m min. 1 mm^2.	
Output contact	NO	
Operating temperature	+5°C to 60°C	
Storage temperature	+5°C to 60°C	
Degree of protection	IP65	
Chemical resistance	Oils, hydrocarbons,	
Reference Standards	EN ISO 13856 -1 EN ISO 13849-1	
B_{10D}	2.000.000	
Max dimensions of each safety mat	1500 x 3000 mm	
Dead zone	Welding peripheral zone 15mm	
Safety Parameters of the sensor + unit control device	**GSTS01+ GP02/E**	**GSTS01 + GP02R.T**
Category	3	3
PL	d	d
PFH_D	$9{,}23*10^{-8/h}$	$9{,}23*10^{-8/h}$
N° of operations/max.year	80000	100000
EC-TYPE Certification	10DM4SA108	11DM4SC14
Usage categories	DC13 – 1,5 A AC1 – 3 A	AC15 – 1,2A
Mission time [years]	20	
T_{10D} (years) unit control device*	9,25	9,7
Max controllable surface (m^2	5	10

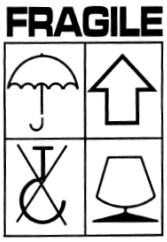
***Considered with max operation number. After the period indicate on the data sheet contact Gamma System Office.

7. Characteristics of the material and resistance to chemical agents

Products	Good Resistance	Medium Resistance	Bad resistance
Hydrocarbons	X		
Aromatic sovents		X	
Chlorinated solvents		X	
Aliphatic hydrocarbons		X	
Acetone			X
Animal oils	X		
Vegetable oils	X		
Water (absorption)	X		
Hydrochloric acid		X	
Beach		X	
Methil ethil ketn (MEK)			X
Nitric acid (70&%)		X	
Ethyl alcohol		X	
Sulfuric acid		X	
Gasoline	X		
Oil category 1			
Weld water	X		
Sodium chloride		X	
bases		X	

8. TRANSPORT AND PACKING

The symbols "ALTO-FRAGILE" (*UP-BRITTLE*) and the gross weight are clearly indicated on the packing cases containing the goods.
In the event the weight exceeds the limits stated by Standards in force for physical individual effort, adequate lifting means shall be used.
On receipt of goods, check that packing shows no evident signs of damage. If so, this must be immediately notified to the forwarder and GAMMA SYSTEM as well.
While opening the cases, be careful not to damage the contents.

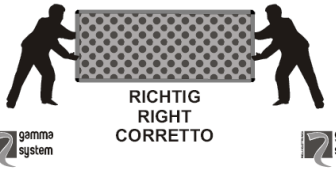


WORNING
Even if not equipped with metal profiles, the safety mat must not be rolled up. It must be handled as indicated in the instructions that you find inside the packing case.
If after unpacking the safety mat is to undergo a period of storage before use, lay it on a flat surface of same dimensions. DO NOT use it as a rest surface for other objects.

WORNING
Do not move the safety mat around dragging it from the electrical cord
Failure to observe these precautions may cause no more reparable damage to the safety mat.

! Achtung	**Attention**	**Attenzione !**
Transporthinweise	**Instruction for transport**	**Istruzioni per il trasporto**
Sicherheitskontaktmatten **nicht** knicken **nicht** werfen **nicht** durchbiegen	Safety Contact Mats **do not** bend **do not** throw **do not** bend back	Tappeti sensibili di sicurezza **non** piegare **non** arrotolare **non** fare cadere

Sicherheitskontaktmatten nicht waagerecht transportieren!
Do not transport Safety Contact Mats in a horizontal way!
Non trasportare i tappeti orizzontalmente!



9. GUIDE FOR CORRECT INSTALLATION

This user guide contains important information. It must be read and understood before any operations.
Installation must be done by qualified staff only.

9.1 Floor-mounted safety mats

The surface receiving the safety mat is to be decided in advance and be suitable for the safety mat installation.
Since roughness of floor, whether holes or protruding parts, greatly diminishes the life of a safety mat, roughness must be kept to a minimum.
Possible floor waviness is also to be checked (no more than 5 mm over a 1m x 1m square are allowed).
The safety mat must not be laid on checkered or pierced plate, grids, traps, or equivalent types.
If in spite of the good floor conditions, the floor still shows small roughness (e.g.; tiling may show levelling differences/protruding parts between tiles), it is recommended that a steel plate is placed between the safety mat and the floor (preferably a zinc-plated plate, 1,5 mm thick minimum).

9.2 Platform-mounted safety mats

Check planarity of the platforms and make sure that the bearing surface is made from flat plate, or wood or any other material provided that it is not uneven. Most important is to make sure that the bearing surface trodden by one or more persons is not subject to bending or warpage.
This could cause false signals to the safety mat thereby shortening its actual life.

9.3 Fastening to floor and platforms

Safety mats are to be fastened to assure their stability and thus protect the determined hazardous zone. Furthermore, fastening also is a good method to prevent the operator from being thrown off his balance and/or eliminate the risk of damage to the safety mats. For fastening the safety mat to the floor, use screw anchors: drill in proper locations of the safety mat contour zones as indicated in this Manual.
For fastening to pierced platforms, use screws, self-tapping screws or screws with nuts, depending on the type of face and type of material. Before performing fastening operations, verify that the platform does not jut out in zones travelled by workshop means or heavy vehicles.
In the event of several safety mats being mounted abreast, check the correct installation; in particular, avoid mounting patterns which leave unprotected spaces between the safety mats in hazardous zones.

9.4 Contour trims

Safety mats are supplied complete with contour rims chosen by the Customer from those catalogue.
Check that passage areas used by the operator are equipped with the sloping strips; this will prevent the operator from being thrown off his balance. Strips must not be close to the hazardous zone since in this case, due to their size, they could allow people to stay in the unprotected zone.

9.5 Output cables

Do not route safety mat output cables with too many bends. Place output cables in raceways, never let them unprotected, specially on the operator's access side. This precaution will avoid damaging cables and will prevent the operator from being thrown off his balance. If not properly seated, cable raceways may serve as true "access walkways" and/or "places to stay" near the hazardous zone .

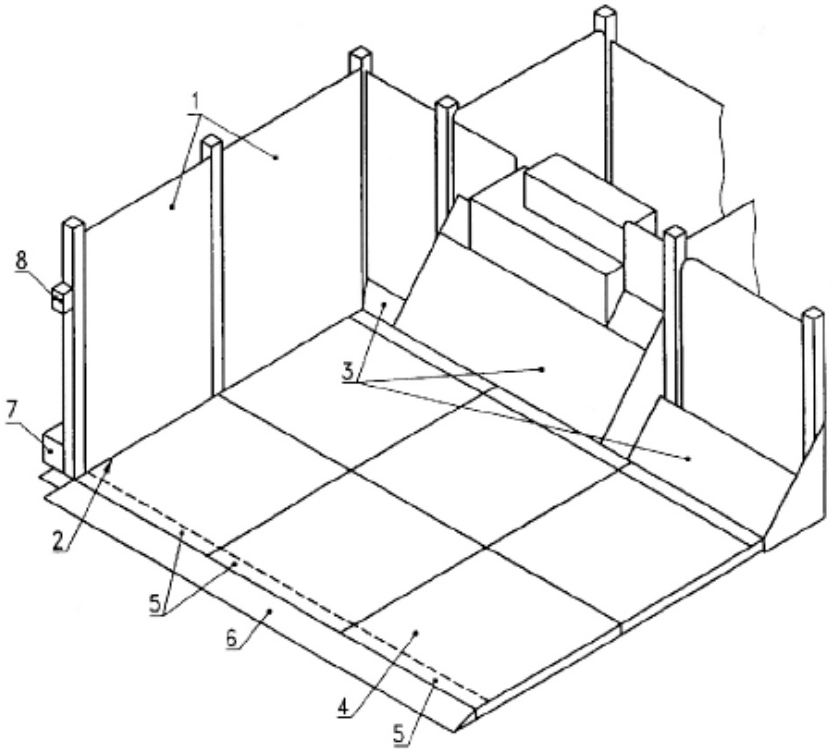
9.6 Installing two or more safety mats connected to a single unit control device

Warning: The installation of the sensor needs to use the personal protective equipment (Ex. Gloves)

Both while installing and testing the safety mats, it is necessary to check that safety mats are properly connected in series between each other according to the diagram supplied by us.

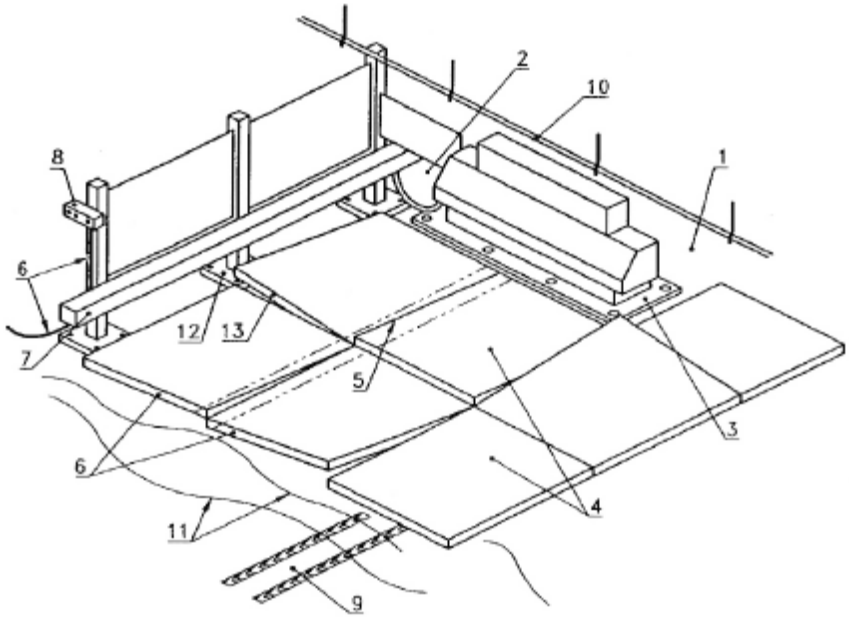
9.7 Properly designed installation

1) Installation of additional, fixed guards to prevent access to the hazardous zone of the machinery.
2) The fixed guard is arranged and designed in such a manner to prevent access to the hazardous zone between the guard itself and sensors. The fixed guard allows access to the hazardous zone only through the sensors.
3) A slant covering plate prevents the operator from staying on the side of the actual sensitive field and in the hazardous zone .
4) Sensors are properly installed
5) Dead surfaces of sensors are positioned in such a way not to compromise the protective function.
6) The risk of stumbling on the sensor edge is reduced thanks to a ramp at the access point. The ramp may also act as a protective mean for the connection cables.
7) Cable raceways are installed external to the fixed guard.
8) The reset pushbutton is located at well protected location from where it is possible to survey the entire hazardous zone .



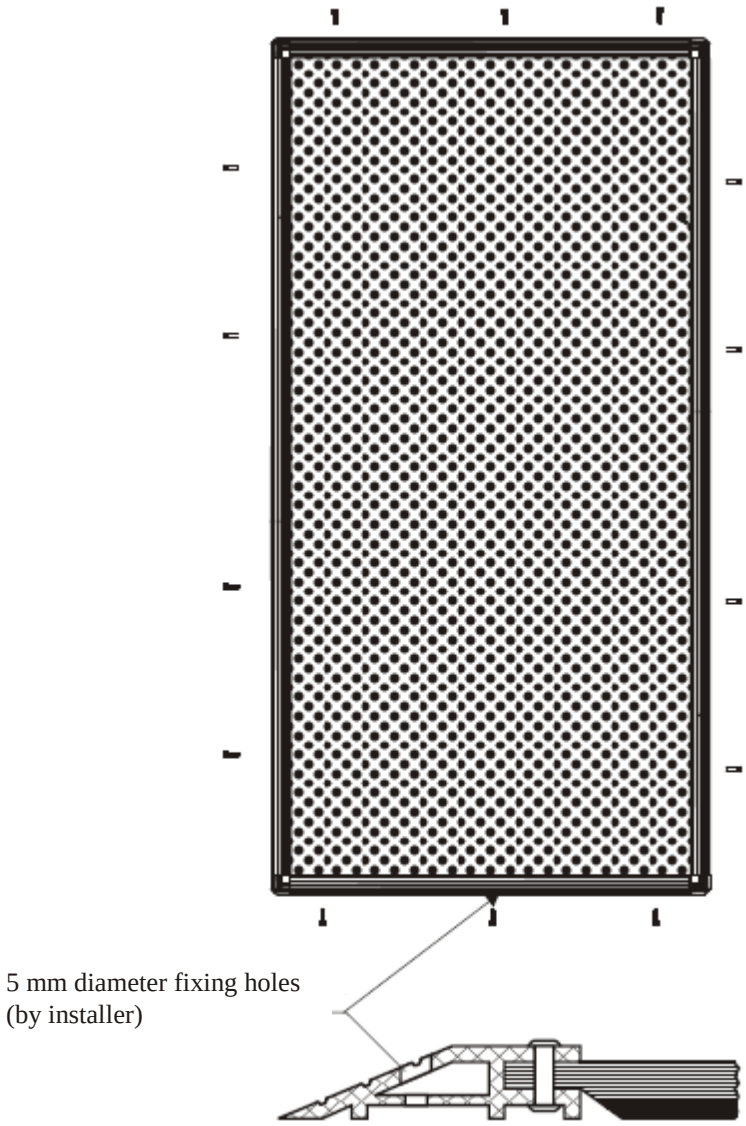
9.8 Wrongly designed installation

1) Fixed guards around the hazardous zone are not enough
2) The hazardous zone is not protected from behind and can be accessed passing over and below the fixed guard, which is too small.
3) The operator can maintain the upright position on the machinery base in the hazardous zone.
4) Sensors are not properly fastened.
5) Dead surfaces of sensors are located in such a way that the operator can reach the hazardous zone.
6) Risk of stumbling because of exposed sensor edges and cables on the floor. Cables on the floor are not protected against mechanical damage.
7) Cable raceways are installed inside the fixed guard and may be used to access in uncontrolled way to the hazardous zone.
8) The controller is installed in a vulnerable position, subject to mechanical damage due to the traffic around the zone.
9) Sensors should not be installed at locations with traffic.
10) The service pipe installed over the sensors can be used to jump on the sensors inside the hazardous zone.
11) Sensor operation and duration is likely to be reduced because of floor uneveness.
12) The fixed guard bases may serve as an access to the hazardous area.
13) The sensor is not fastened. Risk of stumbling.

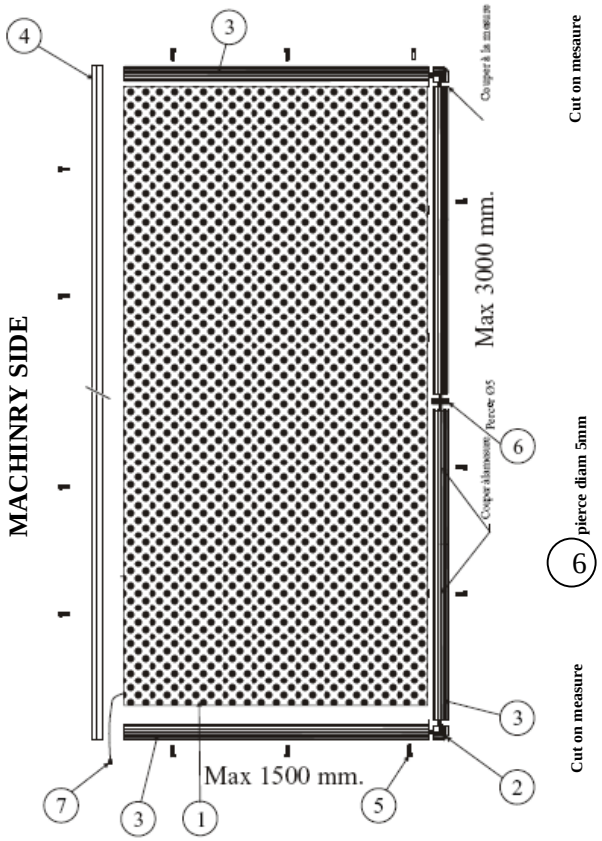


9.9 Assembly drawing "STANDARD MATS" with mounted profiles

Fix the mat on the floor with screw anchor M4 x 20. See drawing

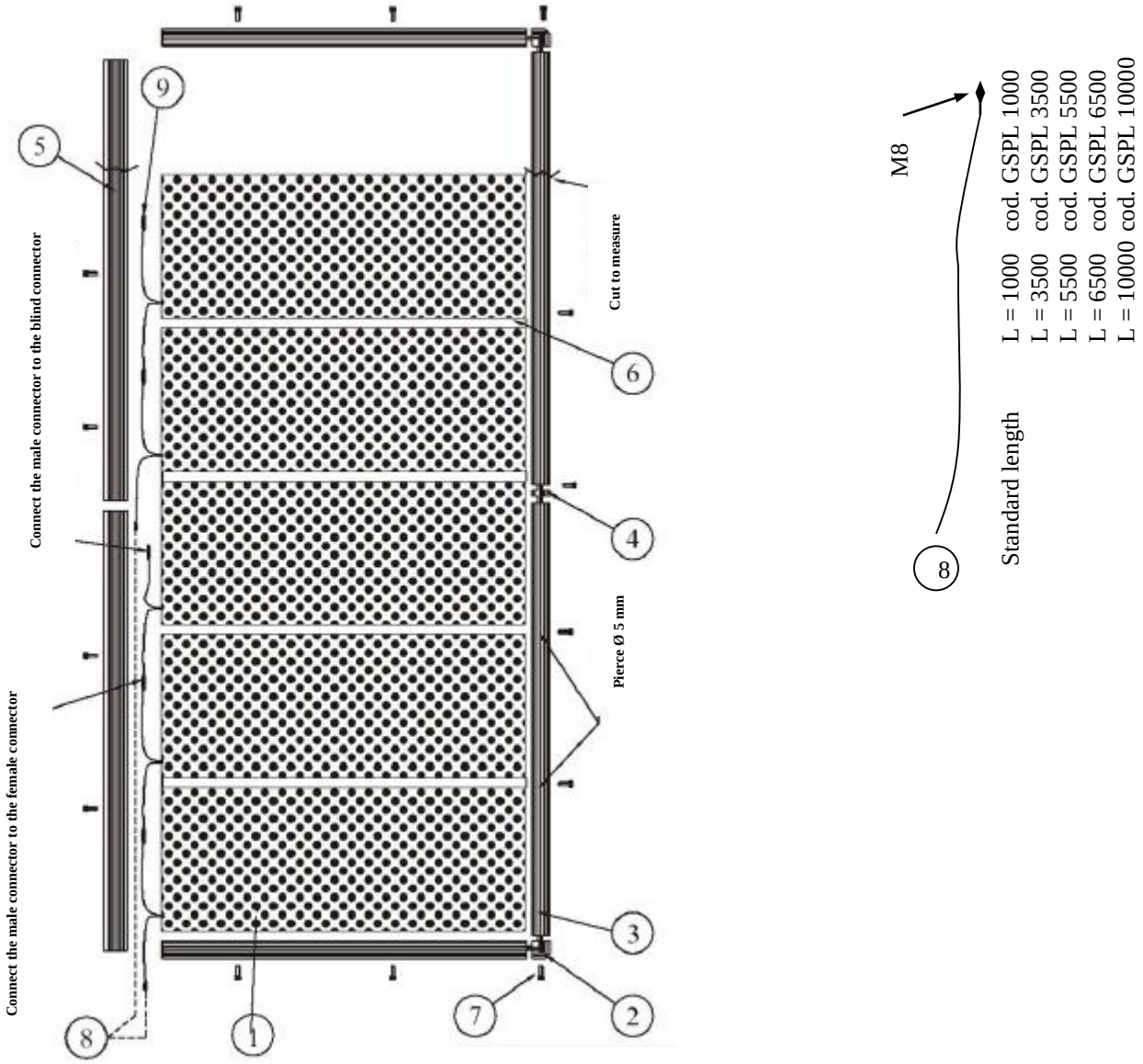


9.10 Assembly drawing "STANDARD MATS" with profiles supply loose



ITEM	DESCRIPTION	MODEL
1	SAFETY MAT	GSTS
2	ANGULAR	GSAN
3	SLOPING PROFILE L = mm 1425	GSPS02
4	CABLE PASSING PROFILES	GSPC
5	SCREW ANCHOR M4x20	GSTA
6	CROSS JOINT	GSCR
7	CABLE OUTPUT	

9.11 Assembly drawing "MODULAR MATS"

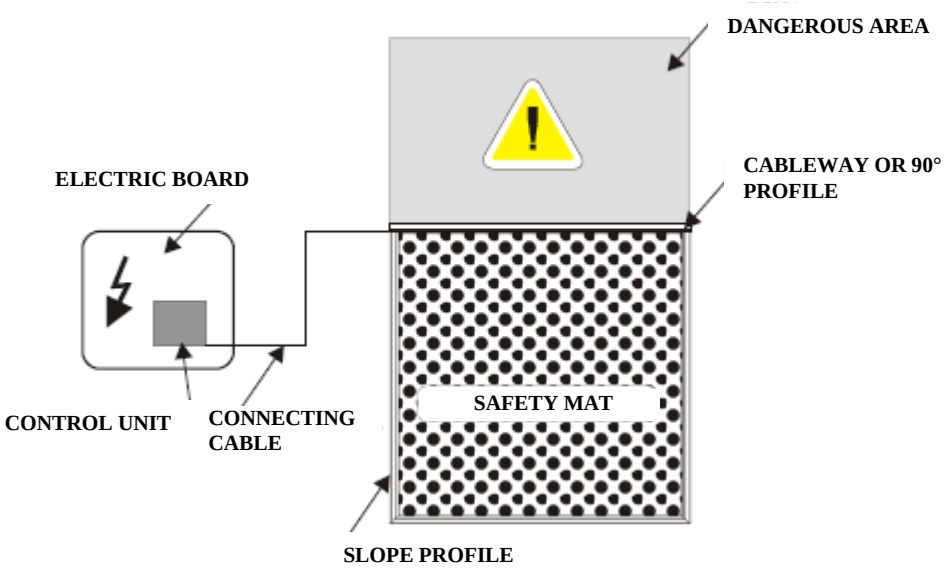


ITEM	DESCRIPTION	MODEL
1	SAFETY MAT	GSTS
2	ANGULAR	GSAN
3	SLOPING PROFILE L = mm 1425	GSPS02
4	CROSS JOINT	GSCR
5	CABLE PASSING PROFILES	GSPC
6	COUPLING PROFILE	GSPAN (BLACK) GSPANG YELLOW)
7	SCREW ANCHOR M4x20	GSTA
8	EXTENSION CABLE	GSPL……
9	CONNECTOR FOR ELECTRIC CIRCUIT CLOSING	GSCMCM8
7	CABLE OUTPUT	

9.12 Example of use and correct installation

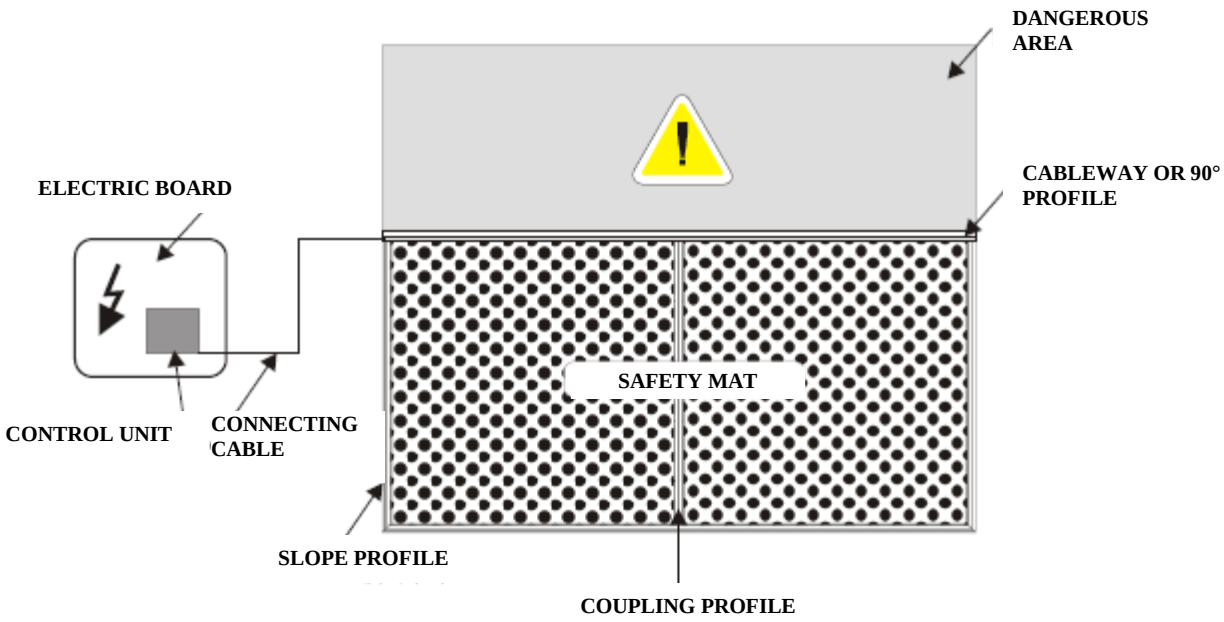
9.12.1 Protection area with a single mat

Panoramic and functional diagram of single mat installation



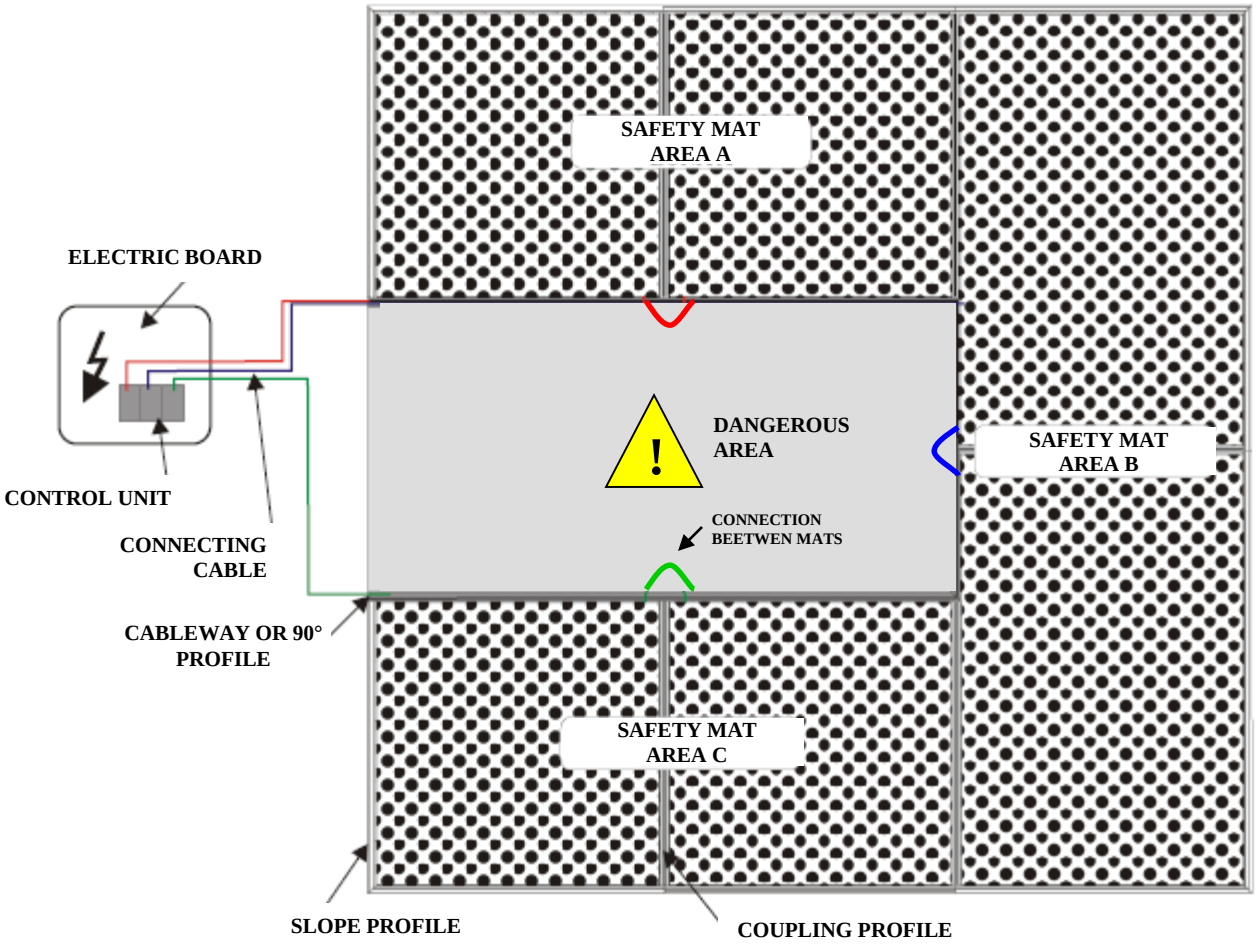
9.12.2 Protection area with two coupled mats

Panoramic and functional diagram of single mat installation divided into two pieces

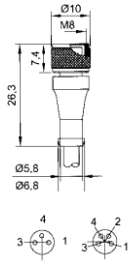


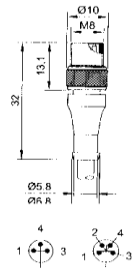
9.12.3 Protection area with more completed mats with various working areas

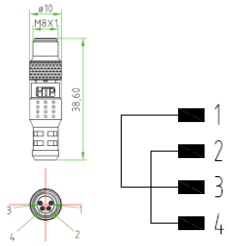
Panoramic and functional diagram of single mat installation with various working areas



9.13 Wires connection
9.13.1 Wires connection to the connector 4 pole

Code Female M8	
	**Pin connections** Pin 1 - Brown wire (C) Pin 2 - White wire (C1) Pin 3 - Blue wire (A) Pin 4 –Black wire (B)

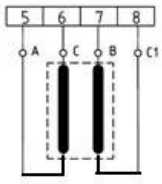
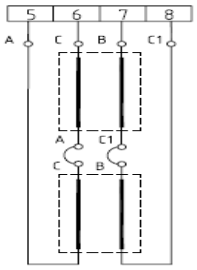
Code. Male. M8	
	**Pin connections** Pin 1 - Brown wire (A) Pin 2 - White wire (B) Pin 3 - Blue wire (C) Pin 4 –Black wire (C1)

GSCMCM8 – Connector for electric circuit closing Male M8	
	**Pin connections** Pin 1 - Brown wire (A) Pin 2 - White wire (B) Pin 3 - Blue wire (C) Pin 4 –Black wire (C1)

9.13.2 Wires connection without connector

In case the sensors have the cable without connector, the wire connection must be made by using the proper terminal complies with local regulations.

Exemple of wires connection with sensor and Gamma System control unit (see the manual of Unit control device))

Connectiondiagram	Connection diagram of two mats	
 **A** (wire brown) - **C1**(wire black) Power sensor **C** (wire blue) –**B** (wire black) Fedback sensore		**A** (wire brown) Power sensor **B** (wire black) Feedback sensor **C** (wire blue) Sensor 1 in serie with **A**(wire brown) Sensor 2 **C1**(wire black) Sensor 1 in serie with **B**(wire black) Sensor 2 **C** (wire blue) Feedback sensor **C1**(wire black) Power sensor

10. CONTROL UNIT / DEVICE

The control unit is a device that controls the function of a sensor (mat, edge or shock absorber) by blade contacts.
The blade contact is a NO (Normal Open) contact that closes, causing the opening of the outlet contact of the control unit.
The control unit controls the operation of the sensor and the connection circuit.
A control device can control several sensors, but cannot perform the auto-diagnose indicating which sensor is faulty. If more sensors are used, use a control unit every 3-4 sensors.

MODELS AVAILABLE:

GP02E
GP02R.T

For further information see the manual guide.

11. START UP

ADVISE: the global security of the machine and of its security device depends on the quality, on the reliability and on the correct installation of the relative interfaces.

Once installed, please follow this manual assembly instructions, before starting the machine or plant production especially after the periodical inspections (once a month). The person in charge must guarantee all the integrity verifications of the safety system and the mat proper feedback of the machine or of the specific plant will be issued in accordance with the following manuals.

11.1 Functional test

The activation of the sensible mat on the pressure during a dangerous phase of the operation cycle should produce the stopping of the movement of the dangerous parts, or it should employ another security condition. It should not be possible the repeated movement of the dangerous parts unless the security function has not been restored.

11.2 Verification of the system integrity

- Check the machine controls and the links to the sensible device to the pressure in order to guarantee that there has not been any change that could affect negatively the system and that the right changes have been considered;
- Check the efficiency of the sensible device to the pressure with the supply connected and with the machine retired;
- Where the restart function is set up, check that the machine would not work until the system has not been restarted;
- Check that the device is suitable to the environmental conditions;
- Check that the device is strongly fixed;
- Check the nominal values and the features of each input/output, for example the nominal values of the fusible;
- Check that the removals of the energy supply of the sensible mat to the pressure could prevent the dangerous working of the machine. The dangerous parts of the machine should not be reactivated until the security function has not been restored;
- The movement of the dangerous parts should not be possible while a force of activation to the actual sensible surface is applied;
- Check that the sensor has been installed in order to guarantee the protection from every predictable direction of activation and the dead zones do not increase the risk of lesions;
- The activation of the sensible mat to the pressure during a dangerous phase of the functioning cycle should cause the stopping of the movement of the dangerous parts, or where it is appropriate it should assume another security condition. The repeated movement of the dangerous parts should not be possible unless the security function has not been reactivated;
- Make sure that the additional protection have been installed where necessary in order to prevent the access to the dangerous parts of the machine from any direction not protected by the sensible device to the pressure;
- A feature which is important for the security of the machine is the interface between the same machine and the security device; make sure that all the parts of the machine, included the device, the control circuit and the links of the security device comply with the results of the risk evaluation and with the categories established in the relevant rule/rules (complying with UNI EN ISO 13849-1:2008);

- Submit to verification every exclusion device if it is previewed, following the requirements established in the point 5.2.5 of UNI EN ISO 13849-1:2008
- Check that all the lights work correctly;
- Check that the sensibility of the mat to the pressure on the actual entire surface complying with the producer instructions;
- Moreover, other controls can be required complying with the type C rules about the applications;
- Verification of the overcourse following the modality of the proof described in the chapter regarding the correct choice of the device.

11.3 Test

The test procedure must be realized by qualified personnel during the installation of one or more sensible mats with one or more control device and after any maintenance intervention to the machine and/or to the circuit of the machine control.
Verify the ohmic resistance values of the sensor as suggested in the next points.

The test makes sure that the sensible mats, the control unit , the machine and the circuit of the machine control work correctly in order to stop the dangerous movements of the same machine when necessary.

12. MAINTENANCE

The instructions for the use must be read in full before starting any intervention of maintenance. The tasks require a technical knowledge and/or particular competences and therefore must be realized only by the qualified personnel specially trained.
After the replacement of any part, verify that the device work correctly realizing again the integrity verification and the inspection procedures .

ADVISE: the security device must be maintained in efficient work conditions following the producer instructions.

In order to guarantee a long duration of the *GAMMA SYSTEM* sensible mats, please respect the following instructions:

- Remove possible accumulation of *chips and scraps* from the trampling surface. They can damage it causing stopping signals not desidered.
- Do not use the trampling surface as a normal support for tools. They can damage it causing stopping signals not desidered.
- In case of deep cuttings on the trampling surface or on the lower part, send the mat to GAMMA SYSTEM for repairing and for verifying if there are some other damages in the internal contacts**.**

GAMMA SYSTEM sensible mats are not damaged by common mineral oils or emulsions and by all kind of chemical products used for cleaning. It is necessary a minimum of precaution during the cleaning using a great quantity of water; please avoid prolonged throws by sprayer in the exit cables zones.
Inform GAMMA SYSTEM about any kind of anomalies not immediately identifiable.

If, for cleaning the contour profiles or the junction elements are removed, we recommend a correct repositioning; in the contrary case, the original features of the mats could not be satisfied.

We remind you that all GAMMA SYSTEM sensible mats preserve its original CE certification features only in case of replacement of the damaged or failed parts, GAMMA SYSTEM original spare parts will be used.

Maintenance must be realized only by qualified personnel.

12.1 Periodical inspection and tests.

It is necessary to realize controls on the safety device according to the periodicity described as follows.

Functional test:
Periodically (at least every three month) the sensor shall be tested in regular time intervals with a static force of 300N and an effective sensing area with 80 mm diameter at optional test location.
The test interval depends on the use of the pressure-sensitive mat.

Every month:

- Check the correct functioning of the sensor realizing the integrity verification of the system
- Check if the sensor is clean

Every three months:

- Check the deterioration or the presence of eventual deformations OF THE SENSOR.
  - disassemble the mat and check visually that there are not any superficial cutting on the trampling surface (PVC type): clean the support surface.
  - control the machine in order to make sure that there is no other mechanical or structural aspect that could prevent the stopping machine or the development of any other security function after the stopping of the sensible mat to the pressure.
  - control the commands and the links of the machine referring the sensible mat and the pressure in order to make sure that any change, that could have affected negatively on the system, has realized and also that every necessary change has been duly registered.
  - check the condition of the sensor surface, of the cover and the relative links in order to make sure that any kind of damage has occurred in order to avoid damages that could prevent the functioning of the system as designed.
  - submit to a test the efficiency of the sensible mat to the pressure connecting the supply but stopping the machine. The start up point must be changed in order to make sure that the whole sensible surface is submitted to a test during a defined period of time.
  - in case of manual reset, verify that the machine cannot be started up until the reset has not been realized.
  - check that all the envelopes of the command unity are closed and in good conditions and that can be open only by keys or other tools. Check that the key/s has/have been removed and preserved by qualified personnel only.

Attention:
Only the parts that have been approved by Gamma System can be replaced from the user. If the user employs spare parts not approved or if there have been not approved changes, the device could be compromised leading to an end of the warranty and of the certification. Anyway contact GAMMA SYSTEM assistance for any support.

12.2 Inspection and tests after maintenance.
After all kind of replacements or changes (for instance a change in the reset), according to Gamma System, all the operations described in the previous point must be realized (periodical inspections, etc). Verify the ohmic resistance values of the sensor as indicated in the next points. For technical assistance please contact Gamma System Office GAMMA SYSTEM sensible mats are not damaged by common mineral oils or emulsions neither by all kind of chemical products for cleaning (see chemical compatibility table). During the cleanings, avoid water shoots on the whole surface of the sensor.

Report to Gamma about any kind of anomaly not immediately identifiable

13. FAILURES AND POSSIBLE CAUSES

In case of damage, please verify the possible cause practicing the instructions of the following tables.
The operations must be realized by qualified personnel.
In the case in which no personnel is available, please call GAMMA SYSTEM.

13.1 Test sensor

N°operations	Necessary tools	Operation Type	Resistance value	Possible defect in case of different values
1	Screwdriver Diameter 3,5	Disconnect the wires A, B, C , C1 wires from the device	-	-
2	Tester	Set up on the ohm scale	-	-
3	Tester	**Without going up** on the sensor touching by the tips A-B	Infinitive	<Mohm 20: defective sensor
		Without going up on the sensor touching by the tips C-C1 wires	Infinitive	<Mohm 20: defective sensor
		Without going up on the sensor touching by the tips A-C wires	<ohm 30	>ohm 100: interrupted circuit
		Without going up on the sensor touching by the tips B-C1 wires	<ohm 30	>ohm 100: interrupted circuit
4	Tester	**Going up on the** sensor touching by the tips A-B wires	<ohm 40	>ohm 100: defective sensor
		Going up on the sensor touching by the tips C-C1 wires	<ohm 40	>ohm 100: defective sensor
		Going up on the sensor touching by the tips A-C wires	<ohm 40	>ohm 100: interrupted circuit
		Going up on the sensor touching by the tips B-C1 wires	<ohm 40	>ohm 100: interrupted circuit

13.2 Test sensor +unit control device GP02/E

N. operations	Necessary tools	Operation Type	Leds state	Contacts NO-NO State	Possible defect of signal leds different from the correct one
1	-	Supply the 24 Vcc form respecting the polarities	Led supply on Led alarm on Led ready off	Open	Led supply off: lack of power supply or inverted polarities
2	-	Start up the reset button of the machine	Led supply on Led alarm off Led ready off	Closed	Led alarm on: failure control
3	-	Start up the sensor	Led supply on Led alarm on Led ready off	Open	
4	-	Release the sensor and start up the reset button	Led supply on Led alarm off Led ready off	Closed	Led alarm on: failure control or short circuit sensor

13.3 Test sensor + safety control device GP02R.T

N. operations	Necessary tools	Operation Type	Leds state	Contacts NO-NO NO1-NO1 State	Possible defect of signal leds different from the correct one
1	-	Supply the 24 Vcc form respecting the polarities	Green L1 on Red L2 off Red L3 off	Open	L1 off: lack of power supply or inverted polarities
2	-	Start up the reset button of the machine	Green L1 on Red L2 on Red L3 on	Closed	L2 and/or L3 off: failure control or cable jumpers not well connected
3	-	Start up the sensor	Green L1 on Red L2 off Red L3 off	Open	- - - -
4	-	Release the sensor and start up the reset button	Green L1 on Red L2 on Red L3 on	Closed	L2 and/or L3 off: failure control, interrupted circuit or sensor

14 ALERT OF DEFECTS AND POSSIBLE REMEDIES

ALERT GP02/E	ALERT GP02R.T	CAUSE	REMEDY
Green led Supply off	L1 off	Lack of power supply	Verify the connections on the electrical panel
		Inverted Polarity	Control and possibly invert
		Burned led	Replace the form and send it to Gamma System
		Power supply cable not well connected	Close the screws by a wire in the connector
Red led alarm on	L2 and/or L3 off	Started up sensor	Remove possible weights or deformations caused by the floor or by pieces filled under the sensor
		Damaged internal sensor	Replace the sensor and send it to Gamma System for repairing
Red led alarm on	L2 and/or L3 off	Temporary form stopping	Going on the sensor and start up the reset button
		Defect in the internal control	Replace the control and send it to Gamma System
Red led alarm on	L2 and/or L3 off	Interrupted circuit sensor link	Verify the connections
	L1 off	Inverted polarities	Verify the accuracy of the A-B and C-C1 wires connection
	L2 and/or L3 off	Interrupted internal sensor link	Replace the sensor and send it to Gamma System

15 GUARANTEE TERMS

Gamma System s.r.l guarantees that its products, under normal use, are free from defects due to materials and workmanship. Guarantee for Gamma System safety component consisting in the pressure sensitive mat and control device.

GUARANTEE
Guarantee covers defects in materials and workmanship and has a validity of 12 months as from the date of the invoice.

When no invoice referring univocally to Gamma System can be found, in this case the period of 12 months will start from the date of manufacture.
For the verification of guarantee coverage, the date when Customer notifies the defect applies.

The validity of the guarantee is conditionally based on the following points:

- In the event of a failure, the Customer must give Gamma System prompt notice thereof in writing (by fax message) indicating the serial number of the safety mat together with the failure details. To make use of the guarantee, this written notification must be received before the expiry date thereof. The return of the defective bumpers shall be agreed with Gamma System which will provide a specific return authorisation code.
  This code must be indicated in the shipping note which accompanies the goods. All defective parts to which the guarantee applies, will be repaired or replaced, free of charge, by Gamma System.

- The fault or defect has not been caused directly or indirectly by:
  - improper use
  - use in conditions or for purposes other than those indicated
  - failure to observe the instructions for use
  - carelessness, inexperience, incorrect and/or negligent maintenance
  - repair, modifications, adaptation not carried out by Gamma System staff, tampering, etc
  - accidents or impacts (also due to transport or causes of Force Majeure)
  - other reasons not due to Gamma System

The guarantee provides for the replacement of the defective components free of charge to you. Any possible visit at the installation site by engineers is at the discretion of Gamma System.

Regarding transport costs for materials under guarantee, the following terms and conditions apply:

from the Customer to Gamma System at Customer charge

from Gamma System to Customer at Gamma System charge

Transports costs by express courier or for equipment shipped to a different address from the one of the customer to whom Gamma System has invoiced the equipment shall, in any case, be charged for.

Except for the hereinbefore express warranties, Gamma System does not recognize any other guarantee or right, no claims for damages may be submitted for expenses, interruption of production or other events or circumstances in any way related to the failure of the product or one of its parts.

Gamma System s.r.l Customer

Azienda Certificata UNI EN ISO 9001:2000
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Tel: +39.011.968.24.66 r.a – Fax: +39.011.967.42.11-
E-mail: info@gammasystem.com
Capitale Sociale € 10.400 i.v. – REA 553355 –R.I. n° 4121/81
Codice fiscale e partita IVA 02363550019

Spett.le Ditta / To:

Alla c.a./ attention: Quality Department

Numero Ordine/ *Order number*	**Numero Matricola Gamma System/** *Identification number Gamma System*	**Codice/** *Code*
_____	_____	_____

Riferimento Documento di trasporto n°
Delivery note n°

DICHIARAZIONE CE DI CONFORMITÀ
EC DECLARATION OF CONFORMITY

(lingua originale ITALIANO)		*(translation from the original language)*
Noi	**GAMMA SYSTEM S.R.L.** **Via Torino, 24/I** **10040 PIANEZZA (TO)-Italy**	*We*

in qualità di costruttore e persona giuridica stabilita nella comunità e autorizzata a costituire il fascicolo tecnico, dichiariamo sotto la nostra esclusiva responsabilità che il componente di sicurezza Tappeto sensibile alla pressione composto da: Sensore **GSTS01** in abbinamento alle unità di comando **GP02E; GP02R.T** risponde alle disposizioni previste dalle direttive alle quali questa dichiarazione si riferisce:		*as manufacturer and person authorised to compile the technical file and established in the Community, declare on our sole responsibility that the safety component Pressure sensitive mat composed of:* *Sensor **GSTS01*** *Combined with the control device* **GP02E; GP02R.T**, *meets the requirements of the following standard directives:*

2006/42/CE – 2014/30/UE **2012/19/UE (RAEE) - 2011/65/UE (ROHS) - Regulation (EC) n°1907/2006 (REACH)**	
Sono state utilizzate le seguenti norme	*The following standards have been applied*:
EN ISO 13856-1	
CERTIFICATO DI ESAME "CE" DI TIPO	*"EC"TYPE EXAMINATION CERTIFICATE*
N° 16CMAC0042 (GSTS01+GP02/E) N° 16CMAC0043 (GSTS01+GP02R.T)	
EMESSO DALL'ORGANISMO NOTIFICATO	*ISSUED BY THE NOTIFIED BODY*:
I.C.E.P.I S.p.a Via Belizzi, 31 – 29122 PIACENZA- Italia Numero identificazione 0066 / *Identification number* 0066	
Luogo e data:: *Place and Date:* Pianezza,	Firma

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