



ATEX SAFETY MATS

CODE SERIES **GSTSPATEXR_x**

The GSTSPATEXR_x series safety mats are "simple equipment" for use in intrinsically safe systems, in accordance with the provisions of EN 60079-11 and EN 60079-25 standards.

The devices do not contain potential sources of ignition of explosive atmospheres, and therefore do not fall within the scope of the European Directive 2014/34/EU (ATEX).

The internal contacts of the carpets have been assigned the temperature class T5/T100°C and can be inserted in intrinsic safety systems with protection level "ia", for substances in groups IIA, IIB and IIC (flammable gases or vapours) and /or groups IIIA, IIIB and IIIC (combustible dust).

Depending on the types of expected Associated Apparatuses, these systems can feature the characteristics indicated below, in conformity with the EN 60079-0, 60079-11 and 60079-25 Standards and with the essential requests of the European Directive 2014/34/EU (ATEX).

CE II 2GD Ex ia IIC T5 Gb / Ex ia IIIC T100°C Db

Here below is a short legend / description of the code and peculiarities of the system into which our product can be incorporated.

TYPE OF USE

II = Apparatus / system groups for use in surface industries (no mines).

2 = ATEX category corresponding to "high" protection level.

ZONES OF USE/POSITIONING

Zone 1 - 21 zones with possible risk of explosive atmosphere during the normal operation of the installation / process.

Zone 2 - 22 zones with possible risk of explosive atmosphere ONLY in case of malfunctions or faults of the installation / process.

SUITABLE FOR USE IN THE PRESENCE OF FLAMMABLE SUBSTANCES / COMBUSTIBLES

GD: G = Gas/Flammable vapours and D = Combustible dusts.

E.g.: Product protected against potentially explosive atmospheres.

PROTECTION LEVEL OF INTRINSIC SAFETY

ia: The electric circuit assures safety when power fed within the defined voltage, current and power limits, under normal working conditions, in the presence of ONE single FAULT and in the presence of TWO simultaneous and independent FAULTS.

SUBSTANCES WHICH CAN BE PRESENT WHERE THE PRODUCT IS USED / POSITIONED

Gas or flammable vapours of **IIA, IIB** and/or **IIC** Groups.

Combustible dusts of **IIIA, IIIB** and/or **IIIC**.

TEMPERATURE CLASS / MAXIMUM SURFACE TEMPERATURE

T5 / T100°C

PROTECTION LEVEL OF THE APPARATUS (EPL) / ZONE OF POSSIBLE USE

Gb = high protection level (for gas and/or vapours) – can be used in Zone 1 (and 2)

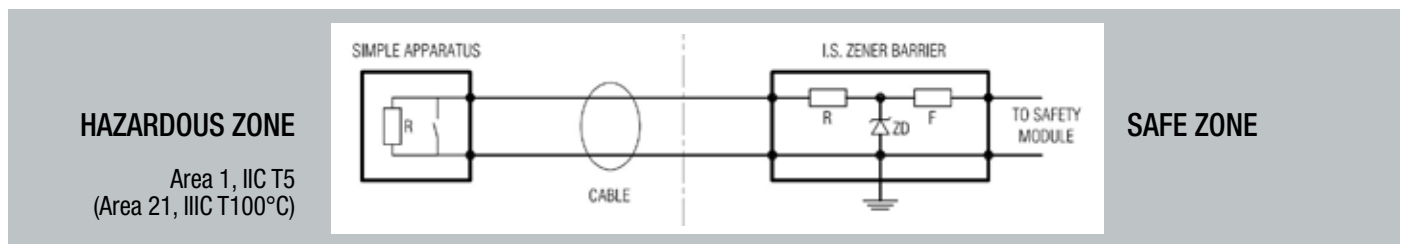
Db = high protection level (for dusts) – can be used in zone 21 (and 22).

The mat, with the electrical contacts and the 8.2 kΩ - 0.5 W end-of-line resistor, is inserted in an "intrinsically safe" circuit / system, interfaced with an appropriate "Associated Equipment" (Safety barrier passive), appropriately certified ([Ex ia Ga] IIC / [Ex ia Da] IIIC), and positioned in a "safe area". The barrier is installed between the contacts and the GP02R type safety module.

ATTENTION: In order to avoid the accumulation of electrostatic charges, the 4 parts making up the aluminum frame must be made equipotential, and connected to earth at a point, highlighted by the symbol. If a metal sheet is used to cover/protect the carpet, this must be earthed at a point, highlighted by the symbol.

SAFETY APPLICATIONS IN COMPLIANCE WITH THE MACHINERY DIRECTIVE IN ENVIRONMENTS WITH HAZARD OF EXPLOSION

PRESSURE SENSITIVE MAT (INTERNAL CONTACTS)



Simple Equipment ⁽¹⁾		Cable	Barrier (1 - 2 channels)	
Builder: Gamma System S.r.l.		Builder: Lapp Group	Builder: Pepperl+Fuchs Group	
Type: GSTSPATEXR		Type: ÖLFLEX® EB CY 300/500 V	Type: Z728	
Nominal electrical characteristics Un: 24 Vcc - In: until 60 mA		Training: 4 x 0,75 mm ²	Protection mode: [Ex ia Ga] IIC [Ex ia Da] IIIC	
SAFETY PARAMETERS		Capacity: 160 pF/m ⁽²⁾ Capacity: 250 pF/m ⁽³⁾	Certificate: BAS 01ATEX7005-Issue 10	
Ui: 28 V		Inductance: 0,52 µH/m	Um: 250 V	Uo: 28 V
Ii: 95 mA	Pi: N.A. ⁽⁴⁾	Length: ≤ 20 m	Io: 93 mA	Po: 650 mW
Ci: negligible	Li: negligible	Total Capacity (Cc) = 13,2 nF ⁽⁵⁾ Total inductance (Lc) = 10,4 µH	Co: 0,083 µF	Lo: 4,11 mH

(1) Pressure sensitive contacts + 8.2 kΩ end-of-line resistor - 0.5 W, inside the Carpets.

(2) Conductor / conductor.

(3) Conductor / shielding.

(4) Not applicable. (See doc. N. GS-SAF02/24-02)

(5) Considered as "parallel" of 3 capacities: conductor / conductor + 2 x conductor / shielding.

SYSTEM SECURITY VERIFICATION

$U_i \geq U_o \rightarrow 28 = 28 \text{ V} \rightarrow \text{OK}$

$I_i \geq I_o \rightarrow 95 > 93 \text{ mA} \rightarrow \text{OK}$

$P_i \geq P_o \rightarrow \text{N.A.} \rightarrow \text{OK}$

$L_i + L_c \leq L_o \rightarrow 0,0104 \ll 4,11 \text{ mH} \rightarrow \text{OK}$

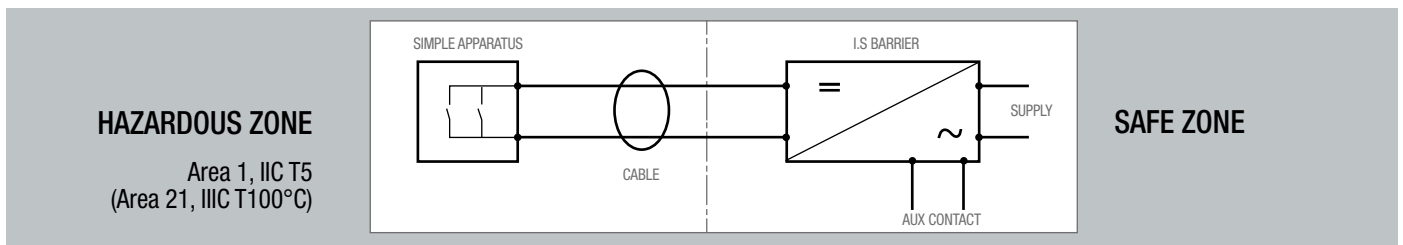
$C_i + C_c \leq C_o \rightarrow 0,0132 < 0,083 \text{ }\mu\text{F} \rightarrow \text{OK}$

Minimum requirement: **Ex ib IIC T5 / Ex ib IIIC T100°C**

Requirement met: **Ex ia IIC T5 / Ex ia IIIC T100°C**

APPLICATION IN ENVIRONMENTS WITH EXPLOSION HAZARD

The product must be inserted in an "intrinsic safety" circuit / system, interfaced with appropriate "Associated Equipment" (Safety barrier) for the management of electrical contacts (such as our product type D5030S - D5030D), positioned in a "safe area", or inside an appropriately certified "Ex d explosion-proof" enclosure.



Simple Equipment ⁽¹⁾		Cable	Barrier (1 - 2 channels)	
Builder: Gamma System S.r.l.		Builder: Lapp Group	Builder: G.M. International S.r.l.	
Type: GSTSPATEX		Type: ÖLFLEX® EB CY 300/500 V	Type: D5030S (1 channels) D5030D (2 channels)	
Nominal electrical characteristics Un: 24 Vcc - In: until 60 mA		Training: 4 x 0,75 mm ²	Protection mode: [Ex ia Ga] IIC	
SAFETY PARAMETERS		Capacity: 160 pF/m ⁽²⁾ Capacity: 250 pF/m ⁽³⁾	Certified: BVS 10 ATEX E 113 X	
Ui: 24 V		Induttanza: 0,52 µH/m	Um: 253 V	Uo: 10,5 V
Ii: 30 mA	Pi: N.A. ⁽⁴⁾	Lunghezza: ≤ 20 m	Io: 22 mA	Po: 56 mW
Ci: negligible	Li: negligible	Total capacity (Cc) = 13,2 nF ⁽⁵⁾ Total inductance (Lc) = 10,4 µH	Co: 2,4 µF	Lo: 78,3 mH

(1) Pressure sensitive contacts inside the carpets.

(2) Conductor / conductor.

(3) Conductor / screen.

(4) Consistent, obviously, with Intrinsic Safety; Not Applicable to simple contacts.

(5) Considered as "parallel" of 3 capacitances: conductor/conductor + 2 x conductor/shield.

SYSTEM SECURITY VERIFICATION

$U_i > U_o$: OK

$I_i > I_o$: OK

$C_i + C_c \ll C_o$: OK

$L_i + L_c \ll L_o$: OK

Minimum requirement: **Ex ib IIC T5 / Ex ib IIIC T100°C**

Requirement met: **Ex ia IIC T5 / Ex ia IIIC T100°C**