user doc

TSB-31.2-10V100mA

User's manual

dco_11130_a.odt

TETRAEDRE

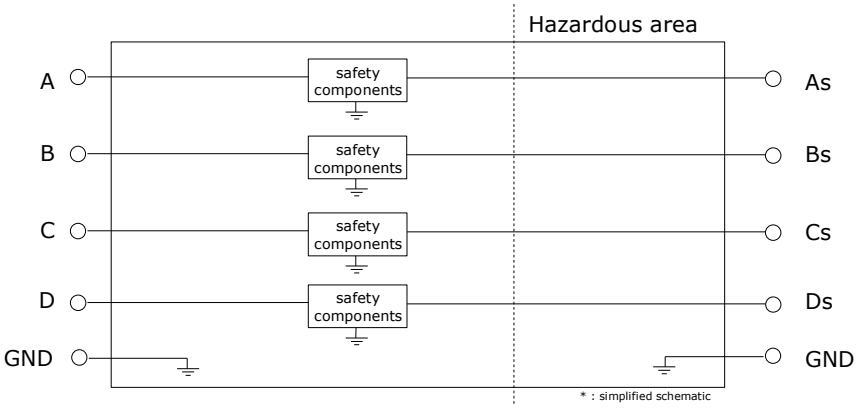
Intrinsic Safety Zener Barrier

Category 3

The TSB-31.2 intrinsic safety barrier provides four independent protected lines

This device is ideally suited to protect RS-232 communication lines. But can also be used to transmit analog and digital signals.

This device is completely passive and requires no power supply.



Specifications

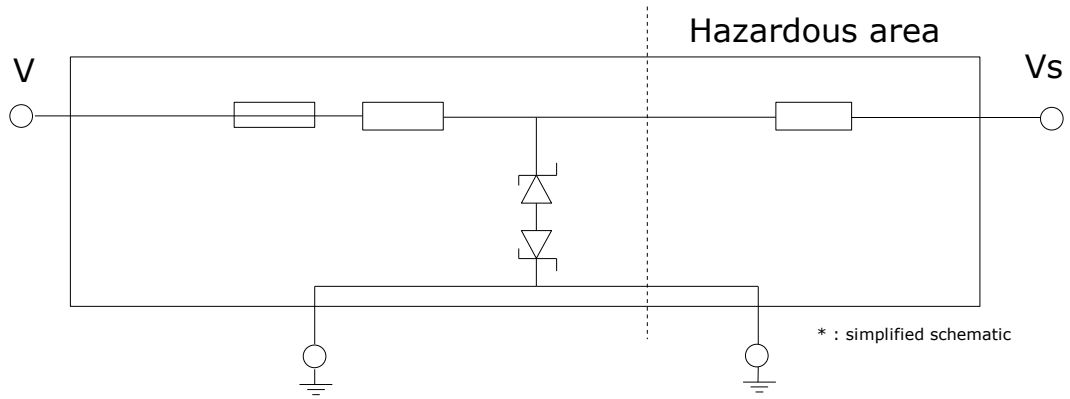
Manufacturer	Tétraèdre S.à r.l. Rue des epancheurs 34b 2012 Auvernier www.tetraedre.com
Case	Polyester IP66 box 210 x 80 x 60mm
Case grounding	The electronics has high resistance connection with the case
Connections	Terminal Block, screw Cable's shield can be connected to the device's GND Permissible cable: Single wire : from ø 0.14mm^2 to ø 1.5mm^2 Stranded wire : from ø 0.14mm^2 to ø 1.5mm^2
Certification	QSI 09 ATEX 2001X CE Ex II 3G Ex ic IIC T4 04/2009 RoHS compliant
Applicable standard	EN 60079-0: 2006 EN 60079-11: 2007
Temperature	Operating : -20°C ≤ T_{amb} ≤ +40°C Storage : -40°C ≤ T_{amb} ≤ +80°C
Air Humidity	Non condensing
Parameters for the not protected area	Um = ±15V
Parameters for the protected area	Uo = ±10V Io = ±100mA Ui = ±15V Ci = 0 Li = 0
Repair	The device cannot and must not be repaired

Electrical specification

Communication line

Each communication line has a protection fuse (50mA), limit resistor (serial resistance of 200 Ω) and redundant array of zener diodes.

The Zener diodes provides voltage limitation of +10V or -10V.



Parameter	*Description*	*min*	*typical*	*max*	*unit*
V	input voltage	-10 note 1		10 note 2	V
Vout	output voltage	-10		10	V
Rinout	Resistance between V and Vs	190	200	210	Ω

notes:

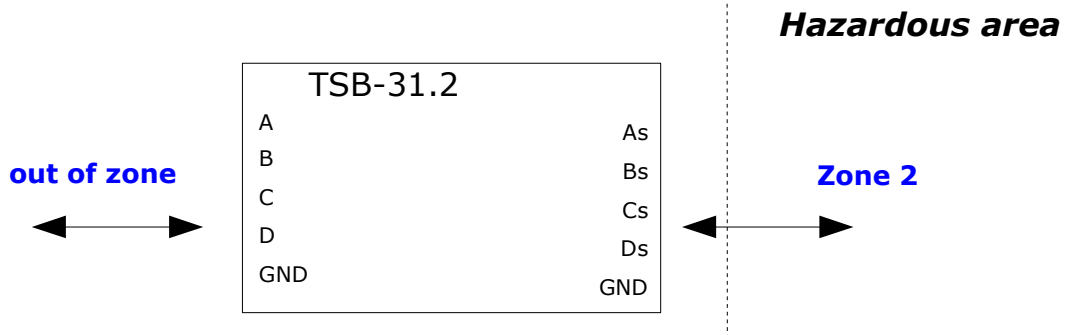
note 1 : The protection diode will start conducting current for voltage below this value

note 3 : The protection diode will start conducting current for voltage above this value

Installation

Zones

The hazardous area must be Zone 2.



Wiring

Wires in the hazardous area must be EX approved cables. These cables are not included with this product.

Standard EN 60079-14 must be applied during installation.

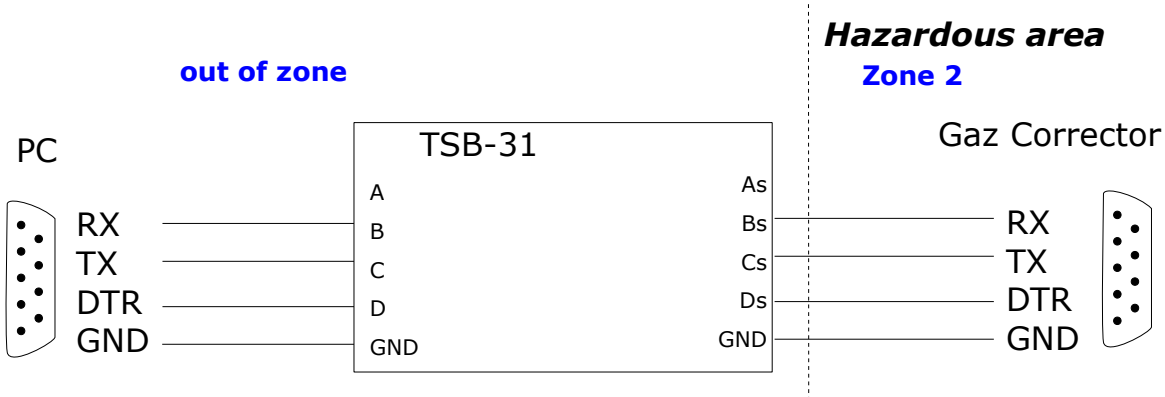
Permissible cable:

- Single wire : from ø 0.14mm^2 to ø 1.5mm^2
- Stranded wire : from ø 0.14mm^2 to ø 1.5mm^2

Tensile load of the wires must be verified after connection.

Typical RS-232 operation

The following wiring diagram shows a typical RS-232 application between a PC and a gaz corrector. The RS-232 communication lines are simply passing through the intrinsic safety barrier before being connected to the gaz corrector.



Note that RS-232 norm specifies that RS-232 voltage can be up to ± 15V. With such voltage, the protection diodes will clamp the voltage and drain a high current and possibly blowing the fuse.

Anyway, standard PC and usual RS-232 enabled device have usually RS-232 voltage not exceeding ± 9V

EC Type-Examination Certificate

(1)

- Translation -

(2) Equipment and protective systems intended for use in potentially explosive atmospheres – **Directive 94/9/EC**

(3) EC Type-Examination Certificate No.:

QSI 09 ATEX 2001X

(4) Equipment: **Intrinsic Safety Zener Barrier TSB-31.1**

(5) Applicant: Tetraedre S.à.r.l.

(6) Address: Rue des epancheurs 34b
CH – 2012 Auvernier

(7) The design of this equipment and the different permissible versions are specified in the schedule to this EC Type-Examination Certificate.

(8) QS Schaffhausen AG, Notified Body No. 1252 in accordance with Article 9 of the Council Directive (94/9/EC) of 23 March 1994, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive 94/9/EC.

The examination and test results are recorded in the confidential **Test report QUINEL T1053-21-9**.

(9) The essential health and safety requirements are fulfilled by compliance with:

EN 60079-0: 2006 EN 60079-11:2007

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions of safe use specified in the schedule to this certificate.

(11) This EC Type-Examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and to the supply of this equipment.

(12) The marking of the equipment or protective system must include the following:

II 2G Ex ic [ib] IIC T4
-20 °C ≤ T_{amb} ≤ + 40 °C

QS Schaffhausen AG Beringen, 18.05.09

Manager of the Certification Body

SCESp 111

Page 1/2

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Certificates without stamp and signature are not valid.
In case of dispute, the German text shall prevail.

QS Schaffhausen AG, Wiesengasse 20, CH-8222 Beringen / Switzerland

(13) **SCHEDULE TO**

EC TYPE-EXAMINATION CERTIFICATE QSI 09 ATEX 2001X

(14) **Description of the equipment**:

The barrier is used to supply electrical equipment (e.g. gas meters, etc.) in potentially explosive atmospheres of Ex-zone 1 or 2 with intrinsically safe extra-low voltages (SELV, RS 232, RS485, etc.).

The barrier itself can be installed in the safe zone or within the Ex-zone 2.

(15) **Technical data:**

Maximum supply voltage	U_0 = ±10 V
Maximum supply data	I_0 = ±50 mA
(protected side)	U_0 = ±15 V
	C_i = 0
	L_i = 0

(16) **Test reports**: **QUINEL T1053-21-9**

(17) **Special conditions**:

- Before installation, the installer must have read and understood the operating instructions
- For the installation, the requirements of EN 60079-14 must absolutely be complied with
- The equipment is marked with "X", since the equipment must be connected to a safety extra-low voltage. (SELV, RS 232, RS 485, etc.)

(18) **Additional note**:

a) Validity of this EC Type-Examination Certificate: This EC Type-Examination Certificate is also valid for the model TSB-31.2. The Ex-marking for this equipment is: Ⓔx II 3G Ex [ic] IIC T4

b) Routine tests: The two safety barriers TSB-31.1 and TSB -31.2, each with 3 diodes, must be subjected to a routine test in accordance with EN 60079-11 Section 11.1.1.

(19) **Essential health and safety requirements:**

are met by:
- the standards listed in Section (9)

Beringen, 18.05.09

Dr. Dieter Scholl
Manager of the Certification Body

SCESp 111

Page 2/2

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