



(1) **EC-TYPE-EXAMINATION CERTIFICATE**
(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**



(3) EC-type-examination Certificate Number:

PTB 01 ATEX 2200 X

(4) Equipment: Temperature sensor, type SensyTemp MI and IS

(5) Manufacturer: ABB Automation Products GmbH

(6) Address: Borsigstr.2, 63755 Alzenau, Germany

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 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.

The examination and test results are recorded in the confidential report PTB Ex 01-21394.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 + A1 + A2 EN 50020:1994 EN 1127-1:1997 EN 50284:1999

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

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 1 G EEx ia IIC T6 or II 2 G EEx ib IIC T6 or II 1/2 G EEx ib IIC T6

Zertifizierungsstelle Explosionsschutz

Braunschweig, January 17, 2002

By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2200 X

(15) Description of equipment

The thermocouples or resistive thermometers are used for temperature measurements in various applications. The temperature sensors may be used with or without isolating element (protective tube). The temperature sensors may be manufactured with diameters of 3 mm to 8 mm. For diameters of 6 mm or more 2 intrinsically safe circuits may exist in one temperature sensor. Thermocouples may be connected as follows, single thermocouple and double thermocouple. Resistive thermometers may be connected in 2-wire, 3-wire and 4-wire connection. For diameters of 6 mm or more double 2-wire and double 3-wire circuits may be connected.

Electrical data

Supply

$U_i =$	30	V
$I_i =$	101	mA
$P_i =$	see operating instructions table I through X	
$L_i =$	15	μ H per meter
$C_i =$	280	pF per meter

(16) Test report PTB Ex 01-21394

(17) Special conditions for safe use

The temperature sensors may only be operated with intrinsically safe circuits of category "ia" or "ib".

When two intrinsically safe circuits are used summation of voltage or current shall be taken into consideration due to the small distances. The total voltage must not exceed 30 V and the total current must not exceed 101 mA.

Only certified measuring transducers with the maximum values specified in the operating instructions may be connected to the temperature sensors.

When two transducers with two intrinsically safe circuits are used the total values must not exceed the maximum values specified in the operating instructions.

The maximum permissible power and the maximum permissible surface temperature for the individual temperature classes shall be taken from the tables I through X of the operating instructions.

Near the terminals the ambient temperature may range from -40 °C up to $+80$ °C at a maximum.

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Temperature sensors of category 1G may only be connected to one intrinsically safe circuit of category "ia".

In combination with an isolating element or protective tube with a wall thickness of ≥ 1 mm for stainless steel or ≥ 3 mm for other steels the temperature sensors connected to intrinsically safe circuits of category "ib" may also be assigned to category 1.

Temperature sensors of category 2G may be connected to one or two intrinsically safe circuits. Two intrinsically safe circuits in 2- or 3-wire connection may be used only for diameters of 6mm or more.

When using non-metallic enclosures the material shall have a surface resistance of $< 10^9 \Omega$ according to EN 50014.

When using light metal as enclosure material the Mg-content of the alloy must not exceed 6 %.

Separately certified cable glands are usually used as entries.

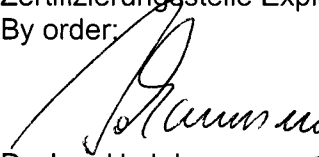
The temperature sensors shall be integrated in the local equipotential bonding system.

(18) Essential health and safety requirements

covered by the standards mentioned above

Zertifizierungsstelle Explosionsschutz

By order:


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, January 17, 2002


1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2200 X

(Translation)

Equipment: Temperature sensors, types Sensy Temp MI and IS

Marking:  II 1 G EEx ia IIC T6 or II 2 G EEx ib IIC T6 or II 1/2 G EEx ib IIC T6

Manufacturer: ABB Automation Products GmbH

Address: Borsigstr.2
63755 Alzenau, Germany

Description of supplements and modifications

In the future the temperature sensors, types Sensy Temp MI and IS may also be operated with the following electrical data:

Supply $U_i = 25 \text{ V}$
 $I_i = 158 \text{ mA}$
 $P_i = \text{cf. operating instructions, tables I through X}$
 $L_i = 15 \mu\text{H per meter}$
 $C_i = 280 \text{ pF per meter}$

$U_i = 20 \text{ V}$
 $I_i = 309 \text{ mA}$
 $P_i = \text{cf. operating instructions, tables I through X}$
 $L_i = 15 \mu\text{H per meter}$
 $C_i = 280 \text{ pF per meter}$

The temperature sensors of category 2 may also be operated according to the documents listed in the test report.

Test report: PTB Ex 05-25135

Zertifizierungsstelle Explosionsschutz

Braunschweig, June 16, 2005

By order:

(signature)

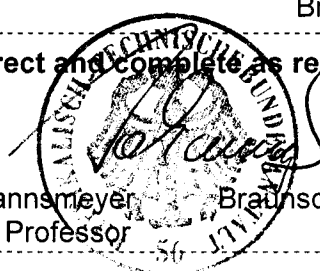
Dr.-Ing. U. Johannsmeyer
Direktor und Professor

1 page, correct and complete as regards content.

By order:

Dr.-Ing. Johannsmeyer
Direktor und Professor

Braunschweig, February 8, 2007




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2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2200 X (Translation)

Equipment: Temperature sensors, types TSP..

Marking:  II 1 G EEx ia IIC T6 or II 2 G EEx ib IIC T6 or
II 1/2 G EEx ib IIC T6

Manufacturer: ABB Automation Products GmbH

Address: Borsigstr.2, 63755 Alzenau, Germany

Description of supplements and modifications

In the future the temperature sensors, types TSP.. (formerly types SensyTemp MI and IS) may also be manufactured according to the test documents listed in the test report.

The modifications concern the internal and external construction.

The temperature sensors of category 2 with a diameter of 3 mm may be designed with 2 x Pt100 (wire-wound measuring resistor) or a double thermocouple. For diameters of 4.5 mm single or double thermocouples can be assembled. For sensor diameters of 6 mm 4-wire circuitries designed as wire-wound or sheet measuring resistance as well as double thermocouples may be installed twice.

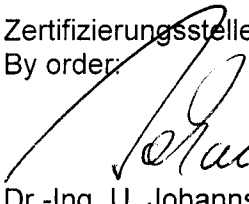
The type series of the connection heads is supplemented by further variants.

The special conditions, the electrical data and all other specifications apply without changes also for this 2. supplement.

Test report: PTB Ex 06-25345

Zertifizierungsstelle Explosionsschutz

By order:


Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, December 18, 2006

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