



(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 13 ATEX 2001 X



(4) Equipment: Industrial Thermometers with replaceable measuring inserts, types OPTITEMP TRA-.../TRA-...Plus and TCA-.../TCA-...Plus

(5) Manufacturer: INOR Process AB

(6) Address: Travbanegatan 10
SE-21377 Malmö, Sweden

(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 test report PTB Ex 13-22339.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2009 EN 60079-11:2012 EN 60079-26:2007

(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 Ex ia IIC T6 Ga or II 1/2 G Ex ia IIC T6 Ga/Gb or
 II 1 D Ex ia IIIC T...°C Da IP65

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, February 27, 2013

Dr.-Ing. U. Johannsmeyer
Direktor und Professor



(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE PTB 13 ATEX 2001 X

(15) Description of equipment

The Industrial Thermometers with replaceable measuring inserts, types OPTITEMP TRA-.../TRA-...Plus and TCA-.../TCA-...Plus are used for temperature measurement of flammable and non-flammable gases and liquids and for the application in hazardous areas due to combustible dusts. The thermometers consist of a thermometer-armature which is assembled from various connection heads and protective tubes. The measuring element, which can be designed as a Pt100- measuring resistor or a thermocouple, is inserted into this thermometer-armature. The measuring elements are provided with different connection sockets which are also available with a transmitter mounted as an option. The connection head, the measuring elements and the transmitter are each separately certified components.

Operation as category-1 or 1/2-equipment:

For applications requiring category-1 or category-1/2 equipment, the process pressure of the media shall range from 0.8 bar up to 1.1 bar and the process temperatures from -20 °C up to +60 °C. In case of a deviation from these abovementioned operating conditions it shall be considered that the values specified in tables 1 and 2 are not exceeded at the sensor (not even in the event of a fault) and that the operating company is responsible for the safe operation of the system with respect to the pressures / temperatures of the media used. The manufacturer's specifications shall be observed here.

Operation as category-2 equipment:

The permissible range of the ambient temperature is: -40 °C ... +100 °C

Maximum permissible medium temperatures:

For relationship between maximum permissible medium temperatures, temperature class and supplied power, reference is made to the following tables:

Temperature class	Maximum permissible medium temperature [°C] depending on P _i [mW]							
	50	100	200	500	650	750	800	1000
T1	436	432	425	402	391	383	380	365
T2	286	282	275	252	241	233	230	215
T3	191	187	180	157	146	138	135	120
T4	126	122	115	92	81	73	70	55
T5	91	87	80	57	46	---	---	---
T6	76	72	65	42	---	---	---	---

Table 1: Maximum permissible medium temperature for wound measuring resistances

Temperature class	Maximum permissible medium temperature [°C] depending on P_i [mW]							
	50	100	200	500	650	750	800	1000
T1	436	432	423	398	386	377	373	356
T2	286	282	273	248	236	227	223	206
T3	191	187	178	153	141	132	128	111
T4	126	122	113	88	76	67	63	46
T5	91	87	78	53	41	---	---	---
T6	76	72	63	---	---	---	---	---

Table 2: Maximum permissible medium temperature for thin-film measuring resistances

Electrical data

Measuring circuit
(clamp terminals)

type of protection Intrinsic Safety Ex ia IIC
only for connection to a certified intrinsically safe circuit

Maximum values:

$$U_i = 30 \text{ V}$$

$$I_i = 140 \text{ mA}$$

$$P_i = 1 \text{ W}$$

For relationship between effective internal reactances, type of sensor and length of sensor, reference is made to the following table:

Type of sensor	Length of sensor			
	up to 5 m		up to 30 m	
	C_i [nF]	L_i [μ H]	C_i [nF]	L_i [μ H]
TR100, 1xPt100, 2-, 3-, 4-wire connection	3.5	65	21	390
TC100, 1xTCK (Typ K)	2.5	25	14	150
TC100, 1xTCJ (Typ J)	2	49	11.5	290
TR100, 2xPt100, 3-wire connection	4.7	77	28.5	464
TR100, 2xPt100, 4-wire connection	1.7	23	10.2	135
TC100, 2xTCK (Typ K)	1.2	25	7.3	150
TC100, 2xTCJ (Typ J)	1.5	36	8.7	216

The maximum values for Industrial Thermometers with built-in temperature transmitter are determined by the respective type of temperature transmitter used. Its maximum power P_o also determines the assignment to a temperature class.

(16) Test report PTB Ex 13-22339

(17) Special conditions for safe use

1. The permissible range of the ambient temperature is specified in the operating instruction manual. For maximum permissible temperatures at the process connector for various designs and the cables used, reference is made to the tables given in the operating instructions.
2. The Industrial Thermometers, types OPTITEMP TRA-.../TRA-...Plus and TCA-.../TCA-...Plus shall be included into the local equipotential bonding system.
3. For operation with flammable media the thermometer armature shall be included in the recurring pressure test of the system.
4. Further specifications and safety instructions given in the operating instructions shall be considered correspondingly.
5. Equipment variants not provided with a protective tube are not suitable for the application as category-1/2 equipment.

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungssektor Explosionsschutz
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