CERTIFICATE

(1) EC-Type Examination

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

(3) EC-Type Examination Certificate Number: **KEMA 02ATEX2340 X** Issue Number: **3**

(4) Equipment: **Thermometer Omnigrad S, Type TMT142.-. and Type TMT162.-.**

(5) Manufacturer: **Endress+Hauser GmbH+Co.KG**

(6) Address: **Obere Wank 1, 87484 Nesselwang, Germany**

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

(8) DEKRA Certification B.V., notified body number 0344 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 confidential test report number 209298400, Issue 3.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2009 **EN 60079-1 : 2007** **EN 60079-11 : 2012**
EN 60079-26 : 2007 **EN 60079-31 : 2009**

(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 according 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 2 G **Ex d IIC T6...T1 Gb** or
II 1/2 G **Ex d IIC T6...T1 Ga/Gb** or
II 2 D **Ex tb IIIC T85 °C…T450 °C Db** or
II 1/2 D **Ex ta/tb IIIC T85 °C…T450 °C Da/Db** or
II 1 G **Ex ia IIC T6...T1 Ga** or
II 1/2 G **Ex ia IIC T6...T1 Ga/Gb** or
II 1/2 D **Ex ia IIIC T85 °C…T450 °C Da/Db**

This certificate is issued on 31 March 2015 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

R. Schuller
Certification Manager

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(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 02ATEX2340 X** Issue No. **3**

(15) **Description**

The Thermometer Omnigrad S, Type TMT142.-. and Type TMT162.-. consist of an enclosure, made of aluminium or stainless steel, containing electronic circuits, terminals and optionally a display. The thermometer is used to convert the measurement signal of the integral temperature sensor (RTD or thermocouple) into an output signal. The thermometer may be provided with a thermowell for mechanical protection. Depending on the version, the thermometer provides a 4 - 20 mA current output signal with HART communication or is connected to a fieldbus (Profibus PA or Foundation Fieldbus).

The temperature class and maximum surface temperature depends on thermometer version and ambient temperature range as is listed in the table below:

Thermometer version in type of protection	Temperature class	Maximum surface temperature	Ambient temperature range*
• flameproof enclosures ○ Ex d IIC ○ Ex tb IIIC	T6	T85 °C	-40 °C to +55 °C
	T5	T100 °C	-40 °C to +70 °C
	T4	T110 °C	-40 °C to +80 °C
• intrinsic safety ○ Ex ia IIC ○ Ex ia IIIC	T6	T85 °C	-40 °C to +55 °C
	T5	T100 °C	-40 °C to +70 °C
	T4	T110 °C	-40 °C to +85 °C
* The enclosure shall not exceed the temperature limits of the ambient temperature range taking into account e.g. the influence of the process temperature.			

The temperature class and maximum surface temperature of the assembly in type of explosion protection intrinsic safety "i" depends on the process temperature, as listed in the table below.

Sensor diameter	Temperature class	Maximum surface temperature	Process temperature range
3 mm or 6 mm dual	T6	T85 °C	-50 °C to 55 °C
	T5	T100 °C	-50 °C to 70 °C
	T4	T135 °C	-50 °C to 105 °C
	T3	T200 °C	-50 °C to 170 °C
	T2	T300 °C	-50 °C to 265 °C
	T1	T450 °C	-50 °C to 415 °C
6 mm	T6	T85 °C	-50 °C to 68 °C
	T5	T100 °C	-50 °C to 83 °C
	T4	T135 °C	-50 °C to 118 °C
	T3	T200 °C	-50 °C to 183 °C
	T2	T300 °C	-50 °C to 278 °C
	T1	T450 °C	-50 °C to 428 °C

The enclosure of the thermometer provides a degree of protection IP66 / IP67 in accordance with EN 60529.

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Type designation

Thermometer	Transmitter	Sensor	Neck Tube	Thermowell
TMT162R	iTemp TMT162	TET300	L	TW10
TMT142R	iTemp TMT142		LU	TW11
TMT162C	iTemp TMT162	TEC300	LC	TW12
TMT142C	iTemp TMT142		LUN	TW13
			LCN	TW15
				TA540
				TA550, TA555, TA557
				TA560, TA565
				TA576

Marking

The marking of a Thermometer in type of protection flameproof enclosure “d” with thermowell includes the following:

- Ⓔx II 1/2 G Ex d IIC T6...T1 Ga/Gb or
- Ⓔx II 1/2 D Ex ta/tb IIIC T85 °C...T450 °C Ga/Gb

The marking of a Thermometer in type of protection flameproof enclosure “d” without thermowell includes the following:

- Ⓔx II 2 G Ex d IIC T6...T1 Gb or
- Ⓔx II 2 D Ex tb IIIC T85 °C…T450 °C Db

The marking of a Thermometer in type of protection intrinsic safety "i" includes the following:

- Ⓔx II 1 G Ex ia IIC T6...T1 Ga or
- Ⓔx II 1/2 G Ex ia IIC T6...T1 Ga/Gb or
- Ⓔx II 1/2 D Ex ia IIIC T85 °C…T450 °C Da/Db

Electrical data

Thermometers in type of protection Ex d IIC and Ex tb IIIC

4 - 20 mA current output
Supply and output circuit (terminals + and -):
U ≤ 40 Vdc; P ≤ 3 W

Fieldbus connection
Fieldbus circuit (terminals + and -):
U ≤ 35 Vdc; P ≤ 3 W

Thermometers in type of protection Ex ia IIC and Ex ia IIIC

4 - 20 mA current output
Supply and output circuit (terminals + and -):
- in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values:
  U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 5 nF; L_i = 0 mH.

Sensor circuit (internal circuit): in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC

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Fieldbus connection
Supply and output circuit Profibus PA or Foundation Fieldbus (terminals + and -):
- in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, for connection to a certified intrinsically safe Fieldbus according to the FISCO Model, with following maximum values:
  U_i = 17,5 V; I_i = 500 mA; P_i = 5,32 W; C_i = 5 nF; L_i = 10 µH;
- in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, for connection to a certified intrinsically safe circuit, with following maximum values:
  U_i = 24 V; I_i = 250 mA; P_i = 1,2 W; C_i = 5 nF; L_i = 10 µH.

Sensor circuit (internal circuit): in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC.

Installation instructions

The instructions provided with the equipment shall be followed in detail to assure safe operation.

(16) **Test Report**

No. 209298400, Issue 3.

(17) **Special conditions for safe use**

If a Thermometer with an enclosure of aluminium alloy is used in a potentially explosive atmosphere requiring EPL Ga, the assembly must be installed so, that even in the event of rare incidents, ignition hazards due to impact or friction are avoided.

If a temperature sensor is used in a potentially explosive atmosphere requiring EPL Ga, Gb or Da the temperature sensor shall be mechanically protected by a Thermowell so that even in the event of rare incidents, ignition hazards due to impact or friction are avoided.

If a Thermometer with a TW15 Thermowell of Titanium 3.7035 is used in a potentially explosive atmosphere requiring EPL Ga or Gb, the assembly must be installed so, that even in the event of rare incidents, ignition hazards due to impact or friction are avoided.

The cylindrical process connection joint has a minimal length of 28 mm in which the maximum gap of 0,15 mm must be kept.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 209298400, Issue 3.