



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

(2) Equipment or Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 07 ATEX 2044 X

Issue: 1

(4) Product: Optcal dewpoint Sensor Hygrophil DT / DTP / HCDD Typ 1510-..

(5) Manufacturer: Bartec Benke GmbH

(6) Address: Schulstraße 30, 94239 Gotteszell, Germany

(7) This product and any acceptable variation thereto is 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 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products 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 18-27025.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-26:2015, EN 60079-28:2015

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

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



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Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, January 18, 2018

Dr.-Ing. F. Lienesch
Direktor und Professor



(13)

SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 07 ATEX 2044 X, Issue: 1**

(15) Description of Product

The optical dewpoint sensors Hygrophil DT / DTP / HCDT type series 1510-.. are part of a humidity measurement system of gases in pipes, containers or tanks in hazardous areas. They consist of a measuring unit (transmitter) with a remote sensor.

The measuring unit is installed in hazardous areas that require category-2-equipment. The fitting of the sensor is mounted into the partition wall, which separates areas from each other that require category-2 and category-1 equipment. The sensor element can be operated in hazardous areas that require category-1 equipment. The process pressure of the media shall range between 0.8 bar to 1.1 bar, when used in applications that require category-1-equipment.

The permissible ambient temperature range is $-20\text{ °C} \dots +60\text{ °C}$

For operation conditions without explosive mixtures reference is made to the manufacturer's specifications (pressure $p_{\max} = 40\text{ bar}$).

Electrical data

Power supply circuit
(terminals KL2/SL2, (1 +, 2 +, 3 -, 4 -))

Type series 1510-10 und 1510-11

type of protection Intrinsic Safety Ex ia IIC
For connection to a certified intrinsically safe circuit.
Maximum values:

$$U_i = 12\text{ V}$$

$$I_i = 2.6\text{ A}$$

maximum internal capacitance $C_i = 200\text{ nF}$

maximum internal inductance L_i is negligible low

Analog output circuit
(0/4 ... 20 mA)
(terminals KL3/SL3, (1 +I_OUT,
2 +I_OUT, 3 -I_OUT, 4 -I_OUT))

Type 1510-10

type of protection Intrinsic Safety Ex ia IIC
Maximum values:

$$U_o = 12\text{ V}$$

$$I_o = 167\text{ mA}$$

$$P_o = 500\text{ mW}$$

$$R_i = 72\ \Omega$$

linear characteristic

maximum internal capacitance $C_i = 0.25\ \mu\text{F}$

maximum internal inductance L_i is negligible low

sheet 2/4

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 07 ATEX 2044 X, Issue: 1

Maximum values for separately exist external reactances, taking into account L_i and C_i :
(according to EN 60069-11, Annex A)
Capacitance $C_o = 1.15 \mu\text{F}$
Inductance $L_o = 1.0 \text{ mH}^*$
* reduced value

The permissible values for the external connectable capacitance C_o and inductance L_o , which result from the combination of C_o and L_o , are shown in the following table. The values of effective internal capacitance and inductance were taken into account. (the following values were calculated with the program ISPAK 6.2).

| | | |
|-------|--------------------|-----------------|
| C_o | 1.15 μF | 1 μF |
| L_o | 0.05 mH | 0.1 mH |

Type series 1510-10 und 1510-11

type of protection Intrinsic Safety Ex ia IIC
For connection to a certified intrinsically safe circuit.

Maximum values:

$$U_i = 8 \text{ V}$$

$$I_i = 0.5 \text{ A}$$

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

maximum internal capacitance $C_i = 2.6 \mu\text{F}$

maximum internal inductance $L_i = 5 \mu\text{H}$

Type series 1510-10 und 1510-11

type of protection Intrinsic Safety Ex ia IIC

Each for connection to a certified intrinsically safe circuit.

Maximum values of each circuit:

| | | | | |
|-------|-------|----|-------|-----|
| U_i | 30 V | or | U_i | 8 V |
| P_i | 55 mW | | P_i | 1 W |

maximum internal capacitance C_i is negligible low

maximum internal inductance L_i is negligible low

Type series 1510-10 und 1510-11

type of protection Intrinsic Safety Ex ia IIC

The length of cable between measuring unit (transmitter) and sensor is 0,7 m

Data circuit
(terminals KL4/SL4, (1 +U, 2 -GND, 3 T_A, 4 T_B, 5 R_A, 6 R_B))

Digital output circuit
(terminals KL5/SL5, (1 +OUT1, 2 -OUT1) and (5+ OUT2, 6 -OUT2)) respectively

Internal intrinsically safe sensor circuit and intrinsically safe peltier circuit
(terminals KL1/SL1, (1 ...8, 10, 11))

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 07 ATEX 2044 X, Issue: 1

The power supply circuit is galvanically connected with analog (0/4-20 mA) output circuit and is galvanically isolated from the data circuit and the digital output circuits.
The data circuit and the digital output circuits are galvanically isolated from each other.

Modifications in relation to previous issues

The changes affect among other the application of the said standards and modification of the external and internal structure as well as the marking.

(16) Test Report PTB Ex 18-27025

(17) Specific conditions of use

1. The cable between the sensor and the measuring unit (transmitter) has to be installed fixed. It has to be protected against mechanical damages (see also EN 60079-14: 2014, clause 16.2.2.8 dash type B).
2. The sensor with the cable is connected permanently to the measuring unit. The cable between the sensor and the measuring unit may be dismantled and replaced by the manufacturer only.
3. In those cases, where the enclosure of the sensor cannot be connected to the local equipotential bonding (electrically insulated installation), it has to be connected over the shield of the cable with the measuring unit and the enclosure of the measuring unit has to be included in the equipotential bonding.

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz

Braunschweig, January 18, 2018

On behalf of PTB:


Dr.-Ing. F. Lienesch
Direktor und Professor

