



Prüf- und Zertifizierungsstelle

ZELM Ex



(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:

ZELM 99 ATEX 0008 X

(4) Equipment: **Density Meter DIMF *.* T** ...**

(5) Manufacturer: **Bopp & Reuther Messtechnik GmbH**

(6) Address: **D-68305 Mannheim**

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

(8) The Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0820 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 ZELM Ex 0569815009.

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

EN 50 014: 1997

EN 50 020: 1994

EN 50 284: 1997

(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 and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

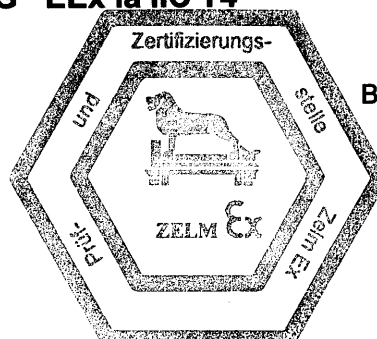
(12) The marking of the equipment shall include the following:



II 1/2 G EEx ia IIC T4

Zertifizierungsstelle **ZELM Ex**


Dipl.-Ing. Harald Zelm



Braunschweig, October 29, 1999

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EC-type-examination Certificates without signature and stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. In case of dispute, the German text shall prevail.



(13)

SCHEDULE

(14) **EC-TYPE-EXAMINATION CERTIFICATE ZELM 99 ATEX 0008 X**

(15) Description of equipment

The density meter is made for continuous measuring of density or concentration of liquids, liquid mixtures or multi-phase fluids.

Essentially it consists of the fork enclosure, made of stainless steel containing the pipe fork or the vibration fork with the measured fluid inside, and the electronical transmitter within a housing of cast aluminium alloy. Variation of the natural frequency of the fork due to density variation of the fluid is measured by the sensor coil and transformed by the transmitter into a density-proportional signal. The transmitter housing is mounted on the fork enclosure with an extension tube or separated as wall mounting. In this case there is a terminal box mounted on the extension tube.

The model DIMF *.* T** ... density meter is intended for use in potentially explosive atmospheres. Its supply circuit must be a certified intrinsically safe supply and signal circuit

The density meter permits bidirectional communication by HART protocol.

Dependent on the measured fluid the fork may be assessed as category 1G. Also a flammable non-explosive medium is possible.

Electrical data

supply- / signal circuit
(KL 1.1 and KL1.2)

type of protection Intrinsic Safety EEx ia IIC

only for connection to certified intrinsically safe circuits with the following max. values:

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

$$I_o = 110 \text{ mA}$$

$$P_o = 825 \text{ mW}$$

effective internal capacitance and inductance:

$$C_i \leq 34 \text{ nF}$$

$$L_i \leq 0,6 \text{ mH}$$

(16) Report No. ZELM Ex 0569815009

(17) Special conditions for safe use

The equipment is fit for an ambient temperature of -40 °C up to +58 °C related to transmitter electronics. Temperature of the measured fluid may come up to +210 °C.

The assignment of temperature class and maximum medium and ambient temperature is shown as follows:



Optional heat insulation may cover the half of the extension tube.
Ambient temperature has to be met just beyond the electronics or terminal housing.
Minimum medium and ambient temperature is $-40\text{ }^{\circ}\text{C}$.

| DIMF *.* TV* (Extension tube) | | | |
|-------------------------------|---|---------------------------------|----------------------|
| Class | T ambient [$^{\circ}\text{C}$] electronics | T medium [$^{\circ}\text{C}$] | Type |
| T2 | 46 | 210 | H |
| T3 | 46 | 200 | High temperature |
| T3 | 49 | 170 | |
| T3 | 50 | 150 | S+H |
| T4 | 52 | 135 | Standard temperature |
| T4 | 54 | 110 | and |
| T4 | 58 | 60 | High temperature |

| DIMF *.* TW* (Wall mounting) | | | |
|------------------------------|--|---------------------------------|----------------------|
| Electronics Ambient temp.: | | 58 $^{\circ}\text{C}$ | |
| Class | T ambient [$^{\circ}\text{C}$] terminal box | T medium [$^{\circ}\text{C}$] | Type |
| T2 | 67 | 210 | H |
| T3 | 68 | 200 | High temperature |
| T3 | 71 | 170 | |
| T3 | 73 | 150 | S+H |
| T4 | 74 | 135 | Standard temperature |
| T4 | 77 | 110 | and |
| T4 | 80 | 80 | High temperature |


Due to these limits the maximum temperature of electronic parts will meet the amount of $60\text{ }^{\circ}\text{C}$.

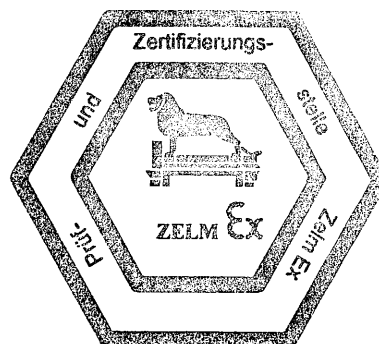
(18) Essential Health and Safety Requirements

met by standards

Zertifizierungsstelle ZELM Ex

Braunschweig, October 29, 1999


Dipl.-Ing. Harald Zelm





Prüf- und Zertifizierungsstelle

ZELM Ex



1. Supplement

(Supplement according to EC-Directive 94/9 Annex III letter 6)

to EC-type-examination Certificate

ZELM 99 ATEX 0008 X

Equipment: **Density Meter DIMF *.* T**...**
Manufacturer: **Bopp & Reuther Messtechnik GmbH**
Address: **D-68305 Mannheim**

Description of supplement

The address is changed to: **D-67346 Speyer**

The Density Meter DIMF *.* T**... will be supplemented by an alternative version with an increased pipe diameter. The type designation of this new version is DIMF 2.1 T**....

The modifications concern to the construction and the type designation of the equipment.

The "Special conditions for safe use" are supplemented.

All further data remain unchanged and are valid also for this 1. Supplement.

Report No.

ZELM Ex 1160415273

Special conditions for safe use

The special conditions of the EC-type-examination Certificate ZELM 99 ATEX 0008 X are valid further on. The following is additionally applied:

For the operation with mediums which require the category 1, impact and friction - for instance by solid parts in the medium - must be safely avoided.

Essential Health and Safety Requirements

The Essential Health and Safety Requirements are further met by adherence to the standards which are given in the EC-type-examination Certificate.

Zertifizierungsstelle ZELM Ex



Braunschweig, October 18, 2004

Adolf Gruber

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2. Supplement

(Supplement according to EC-Directive 94/9 Annex III letter 6)

ZELM ex

to EC-type-examination Certificate

ZELM 99 ATEX 0008 X

Equipment: **Density Meter DIMF *.* T**...**
Manufacturer: **Bopp & Reuther Messtechnik GmbH**
Address: **D-67346 Speyer**

Description of supplement

The conformity of the equipment with the actual standards was reviewed within the scope of the 2. Supplement. The marking was aligned accordingly. There were no additional changes made on the equipment.

The marking in the future is:



II 1/2 G Ex ia IIC T4

All further data as well as the special conditions for safe use according the EC-type examination certificate and the 1. Supplement are not changed, and are also valid for this 2. Supplement. The equipment is allowed to be manufactured in the future also in accordance to this first supplement.

Report No.

ZELM Ex 1621015810

Essential Health and Safety Requirements

The conformity of the equipment with the actual standards was reviewed within the scope of the 2. Supplement. The essential health and safety requirements are still fulfilled by compliance with the following Standards:

EN 60079-0:2009

EN 60079-11:2007

EN 60079-26:2006

Braunschweig, October 15, 2010

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stelle**

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Dipl.-Ing. Harald Zelm**

**ZELM
ex**

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