



(1) **EG-Type Examination Certificate**

(2) Equipment or Protective Systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**



(3) **TÜV 98 ATEX 1333 X**

(4) Equipment: Electromagnetic Flowmeters Type DT2. and DT4.

(5) Manufacturer: Bailey-Fischer & Porter GmbH

(6) Address: Dransfelder Straße 2  
D-37079 Göttingen [Germany]

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

(8) The TÜV Hannover/Sachsen Anhalt e.V., TÜV Certification Body No. 0032 in accordance with the Article 9 of the European Community Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Safety and Health Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II of the Directive.

The examination and test results are recorded in the confidential report No. 98/PX1708.

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

**EN 50 014:1977 + A1...A5    EN 50 020:1977 + A1...A5    EN 50 019:1977 + A1...A5**  
**EN 50 018:1977 + A1 ... A3    EN 50 028:1987**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to the 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 or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The markings for the equipment shall include the following:

	or	II 2G EEx em [ib] IIC T3...T6
	or	II 2G EEx emd [ib] IIC T3...T6
	or	II 2G EEx ed IIC T6
	or	II 2G EEx ed [ib] IIC T6

TÜV Hannover/Sachsen-Anhalt e.V.  
TÜV CERT-Certification Authority  
Am TÜV 1  
D-30519 Hannover ;Germany

Hannover, 03 Aug 1998

On behalf Richter

Head of the Certification Body

(13)

## SCHEDULE

(14) **EC-Type Examination Certificate No. TÜV 98 ATEX 1333 X**

(15) Description of the Equipment

The Electromagnetic Flowmeters Types DT2. and DT4. are used for measuring proportionally the flowrate of electrically conductive and flowable fluids. Flammable liquids are allowed when they are free of air or oxygen to such a degree that they do not continuously or for long periods of time form an explosive mixture.

The flowmeters consist of a flowmeter primary in sizes DN 3 to DN 300 [1/8" - 12"] and their accompanying converters.

In reference to explosion protection the following combinations are possible:

**Model DT.6:** Flowmeter primary connected by a signal cable to a converter mounted in a non-explosion hazardous area  
Ignition Class of the flowmeter primary: **EEx em [ib] IIC T3 ... T6**

**Model DT.7:** Compact design with the converter mounted directly on the flowmeter primary  
Ignition Class: **EEx emd [ib] IIC T3 ... T6**

**Model DT.8:** Compact design flowmeter primary connected by a signal cable to a converter (both instruments mounted in the explosion hazardous area)  
Ignition Class of the flowmeter primary: **EEx em [ib] IIC T3 ... T6**  
Ignition Class of the converter: **EEx ed IIC T6**

To the supply circuit and binary output of Models DT.7 and DT.8 Intrinsically Safe circuits can also be connected:

**Model DT.7:** Compact version with the converter mounted directly on the flowmeter primary  
Ignition Class: **EEx emd [ib] IIC T3 ... T6**

**Model DT.8:** Compact version flowmeter primary connected by a signal cable to a converter (both instruments mounted in the explosion hazardous area)  
Ignition Class of the flowmeter primary: **EEx em [ib] IIC T3 ... T6**  
Ignition Class of the converter: **EEx ed [ib] IIC T6**

The ambient temperature range is -20°C ... +60°C.

The maximum allowable fluid temperature [°C] as a function of the temperature class, the maximum allowable ambient temperature, the Model No. and the meter size is listed in the following table:

Model	Size DN	Temperature Class	Maximum Allowable Ambient Temperature			
			40°C [insul.]	50°C [insul.]	60°C [insul.]	Cable Conn.. 80°C [insul.]
Primary DT26+DT28 DT46+DT48	3-40	T3	130 [-]	--	--	--
		T4	110	110 [95]	90 [80]	--
		T5	75	75	75	--
		T6	60	60	60	--
	50-100	T3	135 [-]	135 [-]	120 [-]	--
		T4	115 [110]	115 [95]	115 [-]	--
		T5	85	85	85	--
		T6	70	70	70	--
Primary DT46+DT48	125-300	T3	140 [-]	140 [-]	--	--
		T4	125 [110]	125 [95]	120 [-]	--
		T5	90	90	90 [80]	--
		T6	75	75	75	--
DT27 DT47	3-20	T3	130 [125]	130 [125]	--	130 [120]
		T4	110	110	85	110
		T5	75	75	75	75
		T6	60	60	60	60
	25-32	T3	125	125	--	120
		T4	110	110	85	110
		T5	75	75	75	75
		T6	60	60	60	60
	40-100	T3	135	125	--	120
		T4	115	115	--	115
		T5	80	80	80	80
		T6	70	70	70	70
DT47	125-300	T3	140	140	--	145
		T4	125	125	--	125
		T5	90	90	85 [80]	90
		T6	75	75	75	75

Converter for flowmeter primary Models DT 28 and DT 48: Temperature Class T6 at  $T_{amb} = 60^{\circ}\text{C}$

Comments:

The values in brackets refer to the thermal behavior of insulated pipelines; cells without bracketed values apply to both designs.  
 The lowest allowable fluid temperature is  $-25^{\circ}\text{C}$ .

Electrical Specifications

**Model DT.6 and Flowmeter Primary of the Compact Version Model DT.8**

Signal circuit ..... (Connection terminals 1 and 2)	non-Intrinsically Safe circuit max. Voltage: $U_m = 60\text{ V}$ operating values: $U_b = 5\text{ V}$ , $I_b = 50\text{ mA}$
Shield of the Signal circuit ..... (Connection terminals 1S and 2S)	non-Intrinsically Safe circuit max. Voltage: $U_m = 60\text{ V}$ operating values: $U_b = 5\text{ V}$ , $I_b = 0.5\text{ mA}$
Ground ..... (Terminal 3)	connected to potential equalization
Excitation circuit ..... (Connection terminals M1 and M2)	non-Intrinsically Safe circuit max. Voltage: $U_m = 60\text{ V}$ operating values: $U_b = 15\text{ V}$ , $I_b = 100\text{ mA}$
Outer shield ..... (Clamp terminal SE)	non-Intrinsically Safe circuit

**Models DT.7 and DT.8 with Non-Intrinsically Safe Circuits**

Supply circuit ..... (Connection terminals TW+ and TW-)	operating values: $14\text{ V} \leq U_b \leq 55\text{ V}$ $3.8\text{ mA} \leq I_b \leq 22\text{ mA}$ max. Voltage: $U_m = 60\text{ V}$
Binary output ..... (Connection terminals V8 and V9)	Operating values: $19\text{ V} \leq U_b \leq 33\text{ V}$ $2\text{ mA} \leq I_b \leq 110\text{ mA}$ max. Voltage: $U_m = 60\text{ V}$

**Models DT.7 and DT.8 with Intrinsically Safe Circuits**

Supply circuit..... (Connection terminals TW+ and TW-)	in Ignition Type Intrinsically Safe EEx ib IIC/IIB for connection to a certified Intrinsically Safe circuit with the following maximum values: $U_i = 30\text{ V}$ $I_i = 100\text{ mA}$ $P_i = 760\text{ mW}$ effective internal capacitance: $13\text{ nF}$ The effective internal inductance is negligibly small.
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Binary output .....  
(Connection terminals V8 and V9)

in Ignition Type Intrinsically Safe EEx ib IIC/IIB  
for connection to a certified Intrinsically Safe circuit  
with the following maximum values:

$$U_i = 20 \text{ V}$$

$$I_i = 30 \text{ mA}$$

$$P_i = 150 \text{ mW}$$

effective internal capacitance: 2.4 nF

effective internal inductance: 67 µH

The supply circuit and the binary output in the versions of Models DT.7 and DT.8 with Intrinsically Safe circuits are connected to the potential equalization.

All specified voltage values of  $U_m = 60 \text{ V}$  are the maximum values, for safety reasons, which can be applied to the connection terminals without compromising the intrinsic safety.

#### 100% Tests

The 100% pressure tests required by EN 50 018 can be eliminated because in accordance with Paragraph 15.2 a type test with four times the reference pressure was successfully completed.

(16) Test documentation consisting of 13 pages including 13 drawings, a EC-Type Examination Certificate and a Certificate of Compliance are listed in the Examination Report.

(17) Special Conditions

1.

All external ground connections terminals are to be connected to the potential equalization in the explosion hazardous area. The installation requirements currently in effect are to be observed.

2.

When the pipeline is insulated the corresponding values in the table are to be observed.

3.

Since the Intrinsically Safe circuit is grounded during operation, all the Intrinsically Safe circuits in the entire region of the installation must be at the equalization potential.

(18) Standard Safety and Health requirements

No additional