

Translation

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

**TÜV NORD**



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

(3) **Certificate Number** TÜV 08 ATEX 554344

(4) for the equipment: Electronic Volume Corrector EK220

(5) of the manufacturer: **Elster GmbH**

(6) Address: Steinern Straße 19-21  
55252 Mainz-Kastel  
Germany

Order number: 8000554344

Date of issue: 2008-04-31

- (7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system 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 No. 08 203 554344.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60079-0:2006**                      **EN 60079-11:2007**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system 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 or protective system must include the following:

**II 2 G Ex ia [ia] IIC T4**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

Schwedt

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(13) **SCHEDULE**

(14) **EC-Type Examination Certificate No. TÜV 08 ATEX 554344**

(15) Description of equipment

The electronic volume corrector type EK220 is an explosion-proof electronic device that meets the requirements of category 2. The device determines and displays the basic volume of a gas volume, which is measured by an external gas meter under service conditions, using the state variables pressure and temperature.

For the different applications the EK220 may be assembled with two, one, or none pressure sensors (0...2 p-sensors) and with one or none temperature.

For the supply a battery is used. A change of the batteries does not impair the Intrinsic Safety. It is possible to supply the device by an external supply and two batteries.

The maximum permissible ambient and gas temperature range is	- 20 °C to + 50 °C
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Electrical data

Supply  
(Internal battery) 1 resp. 2 pc. Lithium batteries type LS 33600, company Saft  
U = 3.6 V, modified accumulator pack of the manufacturer

Supply circuit  
(External supply) in type of protection „Intrinsic Safety“ Ex ia IIC/IIB  
only for connection to certified intrinsically safe circuits with the following maximum values:

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

$I_i$  and  $P_i$  see supply circuit, interface and digital outputs

$$C_i = 12 \text{ nF}$$

The effective internal inductance is negligibly small.

Digital outputs  
(terminals DA1 ... DA4) in type of protection „Intrinsic Safety“ Ex ia IIC/IIB  
maximum values:

$$U_o = 6.6 \text{ V}$$

$$I_o = 0.3 \text{ mA, static (sum current of all digital outputs)}$$

$$I_o = 1.41 \text{ A, dynamic (short-time discharge current per digital output)}$$

$$P_o = 2 \text{ mW}$$

Characteristic line: linear

	Ex ia	IIC	IIB
Max. permissible external inductance per digital output		29,8 $\mu$ H	150 $\mu$ H
Max. permissible external capacitance per digital output		1.45 $\mu$ F	5.75 $\mu$ F

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The digital outputs are also intended for the connection to certified intrinsically safe circuits:

$$U_i = 10 \text{ V}$$

$I_i$  and  $P_i$  see supply circuit, interface and digital outputs

The effective internal inductance and capacitance is negligibly small.

Digital inputs  
(terminals DE1 ... DE3)

in type of protection „Intrinsic Safety“ Ex ia IIC/IIB  
maximum values:

$$U_o = 6.6 \text{ V}$$

$$I_o = 0.07 \text{ mA, static (sum current of all digital outputs)}$$

$$I_o = 0.93 \text{ A, dynamic (short-time discharge current per digital output)}$$

$$P_o = 0.4 \text{ mW}$$

The effective internal inductance  $L_i = 2.3 \text{ } \mu\text{H}$  for each output

The effective internal capacitance is negligibly small.

Characteristic line: linear

Ex ia	IIC	IIB
Max. permissible external inductance per digital output	87.8 $\mu\text{H}$	380 $\mu\text{H}$
Max. permissible external capacitance per digital output	2.35 $\mu\text{F}$	9.15 $\mu\text{F}$

Only for the connection to reed contacts with a cable length up to 35 m or to Wiegandsensor (TÜV 01 ATEX 1776).

Interface  
(terminals T+, DTR / T-, TxD / R+, DCD / R-, RxD / Uext, RI / GND)

in type of protection „Intrinsic Safety“ Ex ia IIC/IIB  
only for connection to certified intrinsically safe circuits with the following maximum values:

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

$I_i$  and  $P_i$  see supply circuit, Interface and Digital outputs

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For the interconnection the following maximum values have to be taken into consideration as well:

$$\begin{aligned}U_o &= 6.6 \text{ V} \\I_o &= 35 \text{ mA} \\P_o &= 231 \text{ mW}\end{aligned}$$

Characteristic line: linear

The effective internal capacitance is negligibly small.  
The effective internal inductance is negligibly small.

or for connection to MTL5051 Intrinsically Safe Serial Data Communications Isolator by the manufacturer MEASUREMENT TECHNOLOGY LIMITED with the EC-Type Examination Certificate No. BAS01ATEX7158 option CON 1 pin 2; CON 2 pins 5, 6 w.r.t CON 1 pin 1 (for connecting to the terminals 1, 2, 5, 6 (see datasheet)).

Supply circuit  
Interface and  
Digital outputs

maximum values (sum values) of these intrinsically safe circuits:

$$\begin{aligned}\sum I_i &= 139 \text{ mA} \\ \sum P_i &= 0.50 \text{ W}\end{aligned}$$

(16) Test documents are listed in the test report No. 08 203 554344.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones