



(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:

PTB 02 ATEX 2166 X

(4) Equipment: Measuring sensors, types MFS 7000-EEEx and MFS 7100-EEEx

(5) Manufacturer: KROHNE Ltd.

(6) Address: Rutherford Drive, Park Farm South Ind. Est.
Wellingborough, Northants NN8 6AE, Great Britain

(7) This equipment and any acceptable variation thereto are 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 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 PTB Ex 02-22200.

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

EN 50014:1997 +A1 +A2

EN 50020:1994

(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 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 shall include the following:

 **II 2 G EEx ib IIC T6**

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, November 04, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



SCHEDULE

(13)

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2166 X**

(15) Description of equipment

The measuring sensors, types MFS 7000-EEEx and MFS 7100-EEEx are used as part of a measuring system to determinate the flow rate of flammable and non-flammable liquids and gases. The sensor signals are processed in the built-in separately certified electronic assembly and transmitted to the certified measuring transducer, type MFC050F-EEEx or MFC051F-EEEx, which also supplies the sensors with auxiliary power. The measuring sensor may be operated either permanently mounted onto the measuring transducer (as separately certified "Compact-device") or as spatially isolated unit ("Remote").

The maximum permissible ambient and medium temperatures depending on the temperature class for remote operation shall be taken from the following tables:

Table 1: variant without thermal insulation

Temperature class	maximum medium temperature	permissible range of ambient temperature
T6	70 °C	- 40 °C ... + 40 °C
T5	90 °C	
T4	130 °C	
T3 ... T1	150 °C	
T6	70 °C	- 40 °C ... + 50 °C
T5	85 °C	
T4	130 °C	
T3 ... T1	150 °C	
T5	85 °C	- 40 °C ... + 60 °C
T4	125 °C	
T3 ... T1	150 °C *)	

*) heat-resistant connecting cable (≥ 80 °C) required

Table 2: Thermally insulated/heated variant

Temperature class	maximum medium temperature	permissible range of ambient temperature
T6	65 °C	- 40 °C ... + 50 °C
T5	80 °C	
T4	115 °C *)	
T3 ... T1	150 °C *)	
T5	80 °C	- 40 °C ... + 60 °C
T4	115 °C *)	
T3 ... T1	150 °C *)	

*) heat-resistant connecting cable (≥ 100 °C) required

Electrical Data:

Supply circuit, Compact

(terminals +, - on PCB Sensor-Con)

type of protection Intrinsic Safety EEx ib IIC
for connection to an intrinsically safe circuit only

Maximum values:

$$U_i = 16.5 \text{ V}$$

$$I_i = 630 \text{ mA}$$

$$P_i = 2.6 \text{ W}$$

$$C_i = 25 \text{ nF}$$

$$L_i = 10 \text{ } \mu\text{H}$$

The circuit has to be protected by a fuse ($\leq 200 \text{ mA}$,
in accordance with IEC 127).

or

Supply circuit, Remote

(terminals +, - on PCB Sensor-Con)

type of protection Intrinsic Safety EEx ib IIC
for connection to an intrinsically safe circuit only

Maximum values:

$$U_i = 16.5 \text{ V}$$

$$I_i = 340 \text{ mA}$$

$$P_i = 1.3 \text{ W}$$

$$C_i = 25 \text{ nF}$$

$$L_i = 10 \text{ } \mu\text{H}$$

Data circuit

Compact / Remote

(terminals A, B on PCB Sensor-Con)

type of protection Intrinsic Safety EEx ib IIC

for connection to an intrinsically safe circuit only

Maximum values:

$$U_i = 11 \text{ V}$$

$$I_i = 40 \text{ mA}$$

$$P_i = 90 \text{ mW}$$

$$C_i = 25 \text{ nF}$$

$$L_i = 10 \text{ } \mu\text{H}$$

Sensor-circuit,

Driver-circuit and

RTD / DMS-circuit

internal circuits in type of protection Intrinsic Safety
EEx ib IIC

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2166 X

(16) Test report PTB Ex 02-22200

(17) Special conditions for safe use

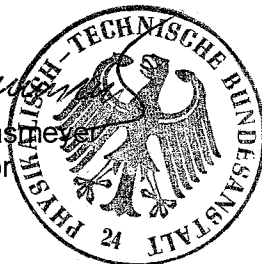
1. The assignment of maximum medium temperature and permissible range of ambient temperature to the temperature class for remote operation shall be taken from tables 1 and 2.
2. The measuring sensor has to be included in the equipotential bonding system of the hazardous area.

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, November 04, 2002


1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2166 X

(Translation)

Equipment: Measuring sensors, types MFS 7000-EEEx and MFS 7100-EEEx

Marking:  II 2 G EEx ib IIC T6

Manufacturer: KROHNE Ltd.

Address: Rutherford Drive, Park Farm South Ind. Est.
Wellingborough, Northants NN8 6AE, Great Britain

Description of supplements and modifications

The measuring sensors of type series MFS 7000-EEEx and MFS 7100-EEEx are extended for type MFS 7200-EEEx. For this type the permissible ambient and medium temperatures, the temperature classes as well as a part of the „Electrical data“ (terminal designations) change as follows:

Type MFS 7200-EEEx

Temperature class	maximum medium temperature	permissible range of ambient temperature
T4	86 °C	- 40 °C ... + 60 °C
T3 ... T1	93 °C	

Electrical data:

Supply circuit, Remote
(terminals +, - on PCB Sensor-Con
or
Pin 11, 12 on PCB Backplane-FE)

type of protection Intrinsic Safety EEx ib IIC
for connection to a certified intrinsically safe circuit
only

Maximum values:

$U_i = 16,5 \text{ V}$

$I_i = 340 \text{ mA}$

$P_i = 1,3 \text{ W}$

$C_i = 25 \text{ nF}$

$L_i = 10 \text{ } \mu\text{H}$

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2166 X

All further „Electrical data“ and specifications as well as the „Special conditions“ are valid without changes.

Test report: PTB Ex 03-23323

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, October 20, 2003


Dr.-Ing. U. Gerlach

