



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 2167 X

(4) Equipment: Flow meters, types MFM 705. K-EEEx and MFM 715. K-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 02-22198.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 +A1 +A2 EN 50018:2000 EN 50019:2000 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 (1) G EEx de [ia/ib] IIC T6 resp. EEx d [ia/ib] IIC T6 resp.
II 2 G EEx de [ib] IIC T6 resp. EEx d [ib] IIC T6

Zertifizierungsstelle Explosionsschutz

Braunschweig, November 04, 2002

By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



SCHEDULE

(13)

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2167 X**

(15) Description of equipment

The flow meters, types MFM 705. K-EEEx and MFM 715. K-EEEx are used to directly determinate and display the flow rate of flammable and non-flammable liquids and gases. The apparatus consists of a sensor unit and a measuring transducer which are assembled as compact device. Thus the electrical connections between sensor and transducer become internal connections designed for type of protection Intrinsic Safety. The sensor unit and the measuring transducer are certified separately.

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

Table 1: variant without thermal insulation

Temperature class	maximum medium temperature	permissible range of ambient temperature
T6	55 °C	- 40 °C ... + 40 °C
T5	75 °C	
T4	120 °C	
T3 ... T1	150 °C	
T5	70 °C	- 40 °C ... + 55 °C
T4	115 °C	
T3 ... T1	150 °C	

Table 2: Thermally insulated/heated variant

Temperature class	maximum medium temperature	permissible range of ambient temperature
T6	50 °C	- 40 °C ... + 40 °C
T5	70 °C	
T4	105 °C	
T3 ... T1	150 °C	
T5	65 °C	- 40 °C ... + 55 °C
T4	105 °C	
T3 ... T1	150 °C *)	

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

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2167 X

Electrical data:

Auxiliary power
(dependent on design)
(terminals 11, 12)

24 ... 230 V AC +10% / -15%, max. 20 VA
24 V DC +30% / -25%, max. 12 W
 $U_m = 253 \text{ V}$

Signal- inputs / outputs
(terminals 4, 4.1, 4.2, 5, 6)

rated voltage: 25 V AC / 60 V DC
 $U_m = 253 \text{ V}$

or

Current output and / or frequency / status
(terminals I, I \perp , B, B \perp)

type of protection Intrinsic Safety EEx ia IIC
resp. EEx ib IIC
for connection to certified intrinsically safe circuits only

Maximum values:
 $U_i = 30 \text{ V}$
 $I_i = 250 \text{ mA}$
 $P_i = 1 \text{ W}$
 $C_i = 5 \text{ nF}$
 L_i negligibly low

and / or Fieldbus
(terminals D, D \perp)

type of protection Intrinsic Safety EEx ia IIC
resp. EEx ib IIC
suitable for connection to an intrinsically safe fieldbus-system

Maximum values:
 $U_i = 30 \text{ V}$
 $I_i = 300 \text{ mA}$
 $P_i = 4,2 \text{ W}$
 $C_i = 5 \text{ nF}$
 L_i negligibly low

Supply circuit
Data circuit
Driver circuit
Sensor circuit
RTD / DMS circuit

internal
type of protection Intrinsic Safety
EEx ib IIC

The intrinsically safe current output / frequency / status and the intrinsically safe fieldbus circuit are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2167 X

(16) Test report PTB Ex 02-22198

(17) Special conditions for safe use

1. The assignment of maximum medium temperature and permissible range of ambient temperature to the temperature class shall be taken from tables 1 and 2.
2. The terminal for the equipotential bonding conductor has to be connected to the equipotential bonding conductor of the hazardous area.
3. The connecting cables shall be installed as fixed wiring and in such a way that they are sufficiently protected against damage.
4. Opening the apparatus inside the hazardous area is only permissible in a de-energized state and with keeping a waiting time afterwards (warning label).

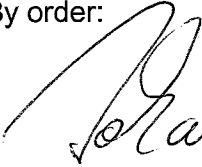
This waiting time is: 25 minutes for temperature class T6
and 10 minutes for temperature class T5
The waiting time may be omitted for temperature class T4 ... T1.

(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 2167 X

(Translation)

Equipment: Flow meters, types MFM 705. K-EEEx and MFM 715. K-EEEx

Marking:  II (1) 2 G EEx de [ia/ib] IIC T6 or EEx d [ia/ib] IIC T6 or
II 2 G EEx de [ib] IIC T6 or EEx d [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 flow meters of type series MFM 705. K-EEEx and MFM 715. K-EEEx are extended for type MFM 725. K-EEEx. For this type the permissible ambient and medium temperatures and the temperature classes change. For all types a part of the „Electrical data“ change as follows:

Typ MFM 725. K-EEEx

Temperature class	maximum medium temperature	permissible range of ambient temperature
T4	46 °C	- 40 °C ... + 40 °C
T3 ... T1	93 °C	- 40 °C ... + 55 °C

All types

Electrical data:

Signal- Ein/Ausgang

Feldbus

(Klemmen D, D)

type of protection Intrinsic Safety EEx ia IIC
or EEx ib IIC

only for connection to a certified intrinsically safe circuit in accordance with the FISCO-model

Maximum values:

$U_i = 30 \text{ V}$

$I_i = 380 \text{ mA}$

$P_i = 5,32 \text{ W}$

$C_i = 5 \text{ nF}$

L_i negligibly low

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2167 X

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

Test report: PTB Ex 03-23324

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, October 20, 2003


Dr.-Ing. U. Gerlach

