

Supplementary Installation and Operating Instructions

Variable-area flowmeters H250/H54

Signal converter M10 of hazardous-duty design EEx d PTB 01 ATEX 1154



Variable area flowmeters

Vortex flowmeters

Flow controllers

Electromagnetic flowmeters

Ultrasonic flowmeters

Mass flowmeters

Level measuring instruments

Communications engineering

Engineering systems & solutions

Switches, counters, displays and recorders

Heat metering

Pressure and temperature

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1 General safety information

These additional “Ex” Instructions apply to the hazardous-duty versions of H.../.../M10-EEEx variable-area flowmeters. They are supplementary to the Installation and Operating Instructions for the non-hazardous-duty versions.

The information given in these Instructions contains only the data relevant to explosion protection. The technical details given in the Installation and Operating Instructions for the non-hazardous-duty version apply unchanged unless excluded or superseded by these Instructions.

In compliance with European Directive 94/9 EG (ATEX 100a), variable-area flowmeters of the H.../.../M10-EEEx series are certified in conformity with European Standards EN 50xxx for use in hazardous areas under

PTB 01 ATEX 1154

by the Physikalisch-Technische Bundesanstalt (PTB).

This certification together with its boundary conditions is required to be observed without fail (see Attachment A.1 “EC type test certificate”).

IMPORTANT!

Mounting, installation, (initial) startup and maintenance work may only be carried out by personnel who have received "training in explosion protection"!

Maintenance work of a safety-relevant nature within the meaning of explosion protection may only be carried out by the manufacturer, his authorized representative or under the supervision of authorized inspectors.

Note!

For processes involving combustible and highly flammable products, easily removable threaded connections to DIN 11851; SMS; TriClamp (e.g. DIN 32676; ISO 2852 Clamp); are not allowed.

2 Safety-relevant type code

The safety-relevant type code is made up of the following elements: ⁽¹⁾

$$\frac{\text{H } \dots}{1} / \frac{\dots}{2} / \frac{\text{M10}}{3} - \frac{\text{E}}{4} \frac{\text{Ex}}{5}$$

- 1 : Model series : measuring section
H54 : measuring section, Series H54
H250 : measuring section, Series H250
H250C : measuring section, Series H250C
- 2 : Material of wetted parts
RR : stainless steel
HC : Hastelloy
Ti : titanium
PTFE : PTFE, ceramics
- 3 : Model series : indicator section
M10 : signal converter M10
- 4 : Territorial application of the approval
E: Europe (EC, CENELEC area of validity)
- 5 : Safety function
Ex: explosion-protected electrical equipment

⁽¹⁾ places for items not needed may be omitted from the type code

3 Main safety-relevant characteristics

The H.../.../M10-EEEx variable-area flowmeter consists of a combination of signal converter and measuring tube. The main characteristics of the explosion-protected version are described below.

3.1 Process products

Flammable products are allowed provided they are not present in potentially explosive form.

3.2 Category / Zone allocation

The H.../.../M10-EEEx variable-area flowmeter is basically designed in Category 2 for use in Zone 1.

3.3 Type of protection

The H.../.../M10-EEEx variable-area flowmeters bear the following marking: EEx d IIC T6

3.4 Special lock

The sealing covers of the electronics compartment are secured by a special lock. The locking screw requires use of an Allen key (3 mm size).

3.5 Cable entries / sealing plugs

Cable entries and sealing plugs must, in ready-to-operate condition, satisfy the IP Class of Protection IP67 and each be separately certified in conformity with EN 50 018. Any requirements specified in the test certificates of the components shall be observed.

3.6 Power supply

Type H.../.../M10-EEEx variable-area flowmeters do not require any separate power source. The necessary supply is obtained via the current output.

3.7 I/O functions

When connecting the I/O interfaces of the H.../.../M10-EEEx variable-area flowmeters, the following values need to be taken into account.

| I/O function ⁽¹⁾ | Nominal values of the non-certified receiver instrument | Added restriction |
|---|---|---|
| See Standard Installation and Operating Instructions | See Standard Installation and Operating Instructions | Supply power for receiver instruments max. 253V |
| ⁽¹⁾ Only for connection to circuits with "functional extra-low voltage with protective separation (PELV)" Peak values $U_{AC} \leq 25V$; $U_{DC} \leq 60V$ | | |

3.8 Ambient temperatures / temperature classes

The permissible ambient temperature for the variable-area flowmeters is limited to a value of $T_{amb} \leq 60\text{ °C}$.

With regard to maximum surface temperatures, variable-area flowmeters are exposed to three heat sources:

- Ambient temperature T_{amb}
- Electric power loss P_v
- Process temperature T_m

Accordingly, at a given maximum ambient temperature ($T_{amb} \leq 60\text{ °C}$) and a given maximum power loss ($P_v \leq 3\text{ W}$), we obtain maximum surface temperatures as a factor of the process temperature. For that reason, the devices are not allocated to any specific temperature class; rather, the temperature class of the devices is a function of the actual process temperature and ambient temperature, see table below.

| Temperature class | Ambient temperature in °C | Max. permissible process permanent temperature | | |
|-------------------|---------------------------|--|-------------|-------------|
| | | Wiring 70°C | Wiring 80°C | Wiring 90°C |
| T6 | -40 ... +60 | 85 | 85 | 85 |
| T5 | -40 ... +50 | 100 | 100 | 100 |
| | -40 ... +60 | 85 | 100 | 100 |
| T4 | -40 ... +50 | 135 | 135 | 135 |
| | -40 ... +60 | 85 | 135 | 135 |
| T3 ... T1 | -40 ... +40 | 180 | 200 | 200 |
| | -40 ... +50 | 135 | 190 | 200 |
| | -40 ... +60 | 85 | 145 | 200 |

Table 1 Max. permissible process temperatures

The cable glands and line entries must have the same degree of thermal stability as the connecting cable

4 Marking

The variable-area flowmeters are identified by an adhesive label or metal plate attached to the signal converter. The type code is explained in Section 2. H..../..../M10- EEx, Category 2G

Manufacturer: KROHNE
Year of manufacture: 0044 0102
Type: Type: H..../..../M10/-EEx
 SN: y/nnnnnn.nnn MD: yyyy
 PS: nn bar TS: nnn °C
 ⚠️ Zusätzliche Einschränkungen siehe Manual / additional limits see manual
 Tag-No: xxxxxx
Approval information: Zulassung: PTB 01 ATEX 1154
 Approval: EEx d IIC T6
 T_{amb} -40°C...+60°C
 ⚡ II 2 G
 Wartezeit vor Öffnen der druckfesten Kapselung: 8 min
 Waiting time before opening the flameproof enclosure: (Temperaturklasse T5...T6 / T-class T5...T6)
Technical data of circuits

| SIGNAL OUTPUT | | TERMINAL | U (V) | I (mA) |
|-----------------|-------|----------------------------------|---------|-----------------|
| CURRENT LOOP | | i ₊ , i _L | 24 ±30% | 4 - 20 |
| BINARY OUTPUT 1 | NAMUR | B ₊ , B _N | 8 | ≤0,8(L) ≥2,1(H) |
| | O/C | B ₊ , B _{OC} | 30 | 100 |
| BINARY OUTPUT 2 | NAMUR | B ₊ , B _N | 8 | ≤0,8(L) ≥2,1(H) |
| | O/C | B ₊ , B _{OC} | 30 | 100 |
| RESET COUNTER | | R ₊ , R _L | 30 | ≤ 1 |

Safety info: Zul. Messstofftemp./brennbare Messstoffe siehe Betriebsanleitung 7022471200
 Permitted medium temp./inflammable liquids see instruction manual 7022472200

5 Mounting and installation

Mounting and installation to be carried out in conformity with the valid installation standards for hazardous areas (e.g. EN 60079-14 / VDE 0165) by specialist personnel trained in explosion protection.

The information given in the standard Installation and Operating Instructions, the Supplementary Installation and Operating Instructions (Ex) and also in the EC type test certificate (see Attachment A.1) must be observed without fail.

Verify that the variable-area flowmeter is suitable for the application in question by comparing the details on the nameplate with those in Section 3.2 (Categories / Zone allocation), Section 2 (Type code) and Section 4 (Marking).

When installing, please pay special attention to the following points.

5.1 Electrical connection

5.1.1 General

Insulation rating

The insulation of variable-area flowmeters H.../.../M10 - EEx is rated in conformity with VDE 0110-1/04.97, equivalent to IEC 60 664-1, and takes into account the following ratings:

- Overvoltage category for signalling and measurement circuits: II
- Insulation contamination level: 2

HAZARDOUS-DUTY Systems

- The signal converter to be incorporated in the equipotential bonding system via the **external PA (equipotential bonding) connection**.
- The **electrical connection** of the variable-area flowmeters to be made as a fixed installation.

5.1.2 Terminal compartment

The electrical connection of the power supply and I/O functions is made in the integrated terminal compartment of the signal converter. The terminal compartment is designed in EEx d type of protection. Unassigned openings to be sealed in conformity with EN 50 018.

The cables can basically be routed into the flameproof terminal compartment in one of two ways.

- Direct entry of the connecting cables by way of certified flameproof cable glands into the flameproof terminal compartment ($V \leq 2000 \text{ cm}^3$). The cable glands must possess a separate test certificate to EN 50 018. The requirements specified in the test certificate for the cable gland need to be observed.
- Direct entry of the power cables by way of conduits into the flameproof terminal compartment of the device. After the conduit has been screwed in, this must together with the housing form a flameproof joint with a minimum of 8mm depth of engagement. A suitable stopping box shall be provided in accordance with the regulations for electrical installations. Installation of the conduit must be carried out in compliance with its separate test certificate.

5.1.3 Connecting cables

The connecting cables shall be selected in keeping with the valid installation standards (e.g. EN 60079-14 / VDE 0165). The outside diameter of the cables must match the cable clamping area for the cable entries.

5.1.4 Connection of power and I/O function

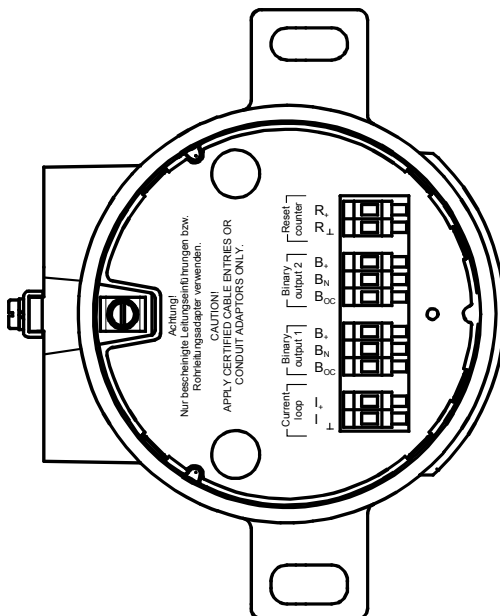
- Before connecting or disconnecting the electrical interconnecting cables of the device, make sure that all cables leading to the signal converter are isolated from the ground (reference potential) of the hazardous area. This also applies to safety conductors (PE) and equipotential bonding conductors (PA).
- All cores and shields of the connecting cables not safety-connected to the equipotential bonding system for the hazardous area should be carefully insulated from each other and from ground (test voltage $1500V_{\text{rms}}$ for conductors of non-intrinsically safe cables).

- Connect the shields by the shortest possible route to the press-fitted U-clamp terminal (PE) in the terminal compartment. If shields are to be grounded at both ends (e.g. for EMC reasons), adequate equipotential bonding is required between the two shield ends to avoid unacceptable equalizing currents.
- The signal converter must be incorporated in the equipotential bonding system of the hazardous area. The cable is to be connected to the outer press-fitted U-clamp terminal in the converter housing.
- The measuring tube can be incorporated in the equipotential bonding system of the hazardous area by means of the U-clamp terminal (if provided) in the flange or by means of conductive connections (gaskets, etc.).

The terminal assignment is listed in the following table:

| Function | | Terminal designation (see sketch) | |
|--|---------|--------------------------------------|-----------------|
| Signal output | | | |
| Current output HART (current loop) | | I ₊ | I _⊥ |
| Status output (1) (binary output 1) | NAMUR | B ₊ | B _N |
| | O/C-PNP | B ₊ | B _{OC} |
| Status output (2) (binary output 2) | NAMUR | B ₊ | B _N |
| | O/C-PNP | B ₊ | B _{OC} |
| Status input (reset counter) | | R ₊ | R _⊥ |

Note the electrical data of the circuits given in Section 3.7! Even when operated in the non-hazardous area, the requirements pertaining to the signal output circuits need to be met.



6 Initial startup

Check the following points before initial startup:

- Suitability of the materials used for the measuring tube and gaskets for adequate resistance to corrosion through the process product.
- Compare the data on the nameplate on the signal converter with the existing operating data.
- Check that the measuring tube has been correctly installed in the pipeline.
- Check that the equipotential bonding system is properly connected.
- Check correct connection of the power cables.
- Check that the cover(s) of the electronics compartment is firmly in place, that the special lock is tightened down.

7 Operation

It is not permitted to open the cover of the electronics compartment during operation and in the presence of an explosive atmosphere.

Should parameterization of the device become necessary in the presence of an explosive atmosphere, this can be done by applying the supplied programming bar magnet to the glass window of the electronics compartment, without opening the housing, or digitally by way of the signal output (HART interface).

In the case of flammable products, the measuring sections shall be included in the periodic pressure testing of the plant.

8 Preventive maintenance

8.1 Maintenance

The signal converter does not require any maintenance under normal operating conditions and when used for the intended purpose. Within the scope of checks required to be carried out in hazardous areas to maintain systems in proper working order, the following visual inspections should be carried out at regular intervals:

- Inspection of the housing, cable entries and incoming cables for signs of corrosion and damage,
- Check of pipe connections for leakages.

8.2 Dismantling

8.2.1 General

Should it prove necessary to open the Flameproof Enclosure of the electronics compartment in the presence of an explosive atmosphere, the device must first be disconnected from supply. Be sure to allow the waiting time printed on the nameplate of the signal converter of:

- 8 minutes for temperature classes T6 and T5

to elapse before opening the Flameproof Enclosure. There is no waiting time for any of the other temperature classes.

Before connecting or disconnecting the device interconnecting cables, make sure that all cables leading into the signal converter are isolated from the ground (reference potential) of the hazardous area. This also applies to safety conductors (PE), functional ground (FE) and the equipotential bonding conductor (PA).

After any maintenance work has been carried out, be sure to regrease the thread of the flameproof cover of the signal converter, including cover gaskets, with a resin-free and acid-free all-purpose grease.

8.2.2 Replacement of signal converter / display

Disconnect the device from supply before opening the Flameproof Enclosure. Be sure to follow the procedure described in Section 8.2.1.

Note : Only same-type displays and complete converter housings may be replaced. Individual device inserts may not be replaced! Compare nameplates when replacing the signal converter. Only same-type signal converters to be replaced.

The display can be replaced after opening the Flameproof Enclosure of the electronics compartment. To replace a complete display, take note of the information given in Section 5.1.4. The measuring tube of the variable-area flowmeter can in both cases remain in the pipeline, also when product is flowing.

Note : Always renew defective fastening clips (prisms) between measuring tube and display housing.

8.2.3 Replacement of complete device

Please refer to Sections 8.2.1 and 8.2.2. In addition, make sure that all process connections and the pipeline are non-pressurized and free of product. In the case of environmentally critical substances, carefully decontaminate the wetted parts of the flange system after dismantling.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin



EG-Baumusterprüfbescheinigung

- (1)
- (2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**
- (3) EG-Baumusterprüfbescheinigungsnummer
PTB 01 ATEX 1154
- (4) Gerät: Schwebekörper-Durchfluss-Messgerät H.../.../M10-EEEx
- (5) Hersteller: KROHNE Messtechnik GmbH & Co. KG
- (6) Anschrift: Ludwig-Krohne-Str. 5, 47058 Duisburg, Deutschland
- (7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage und den darin aufgeführten Unterlagen zu dieser Baumusterprüfbescheinigung festgelegt.
- (8) Die Physikalisch-Technische Bundesanstalt bescheinigt als benannte Stelle Nr. 0102 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.
Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht PTB Ex 01-11294 festgehalten.
- (9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit
EN 50014:1997 + A1 + A2 **EN 50018:2000**
- (10) Falls das Zeichen „X“ hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.
- (11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Prüfung des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden nicht durch diese Bescheinigung abgedeckt.
- (12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:



II 2 G EEx d IIC T6 ... T1

Zertifizierungsstelle Explosionsschutz

Braunschweig, 30. September 2002

Im Auftrag

Dr.-Ing. U. Klausmeyer
Regierungsdirektor



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**Physikalisch-Technische Bundesanstalt
Brunswick and Berlin**

PTB

(1) **EC Type Test Certificate**

(2) Devices and protective systems for use as prescribed
in hazardous areas - **Directive 94/9/EC**

(3) EC Type Test Certificate Number

PTB 01 ATEX 1154

(4) Device: Variable-area flowmeter H.../.../M10-EEEx

(5) Manufacturer: KROHNE Messtechnik GmbH & Co. KG

(6) Address: Ludwig-Krohne-Str. 5, 47058 Duisburg, Germany

(7) The design of this device as well as the variously approved versions are defined in the
Schedule to this Type Test Certificate and in the documents listed in the Schedule.

(8) The Physikalisch-Technische Bundesanstalt, being the notified body No. 0102 in
accordance with Article 9 of the Council Directive of European Communities dated
23rd March 1994 (94/9/EC), certifies that the basic health and safety requirements
have been satisfied for the conception and construction of devices and protective
systems for use as prescribed in hazardous areas in accordance with Appendix II of
said Directive.

The results of the test are specified in the confidential test report PTB Ex 01-11294.

(9) The basic health and safety requirements are satisfied by conformity with

EN 50014:1997 + A1 + A2

EN 50018:2000

(10) If the character "X" is appended to the certificate number, this refers to special
conditions for the safe application of the device as given in the Schedule to this
Certificate.

(11) This EC Type Test Certificate applies only to the conception and construction of the
defined device in accordance with Directive 94/9/EC. Further requirements of said
Directive apply to the manufacture of that device and to putting it on the market. Such
requirements are not covered by this Certificate.

(12) The marking of the device must include the following details:

 **II 2 G EEx d IIC T6 ... T1**

Certification Agency for Explosion Protection
on behalf of
(signed)
Dr.-Ing. U. Klausmeyer
Regierungsdirektor

Brunswick, 30st September 2002

Official stamp
of the PTB

(13) **Anlage**

(14) **EG-Baumusterprüfbescheinigung PTB 01 ATEX 1154**

(15) Beschreibung des Gerätes

Das Schwebekörper-Durchfluss-Messgerät H.../.../M10-Ex dient zur Messung des Volumendurchflusses von brennbaren und nichtbrennbaren Gasen und Flüssigkeiten in vertikal verlaufenden Rohrleitungen. Bei Durchströmung des Meßrohres von unten nach oben stellt sich der geführte Schwebekörper so ein, daß die auf ihn einwirkende Auftriebskraft, der Formwiderstand und sein Gewicht im Gleichgewicht sind. Jede Höhenstellung des Schwebekörpers entspricht dabei einer bestimmten Durchflußmenge. Elektromagnetische Positionssensoren im Anzeigenteil formen die Höhenstellung des Schwebekörpers in ein geeignetes elektrisches Ausgangssignal um.

Technische Daten

Speisung (Funktionskleinspannung PELV, $U_{DC} \leq 60 V$)

| | |
|--------------------------------------|--|
| Signalausgang 4 – 20 mA | $U_N = 24 V DC \pm 30 \%$, 2-Leiteranschluß mit |
| (Klemme I_+ , I_-) | HART-Kommunikation |
| Signalausgang 1 & 2 | NAMUR Stromkreis |
| Ausgang 1 (Klemme B_+ , B_N) | $U_N = 8 V DC$, je nach Schaltstellung $\leq 0,8 mA$ bzw. |
| Ausgang 2 (Klemme B_+ , B_N) | $\geq 2,1 mA$; $R_i = 1 k\Omega$ |
| | bzw. |
| Ausgang 1 (Klemme B_+ , B_{OC}) | Open Collector (pnp-Ausgang) |
| Ausgang 2 (Klemme B_+ , B_{OC}) | $U_N = 8 \dots 30 V DC$; $I_i \leq 100 mA$; |
| | U_i bei durchgeschaltetem Ausgang $\leq 3 V$ |
| Stauseingang | : $U_N = 8 \dots 30 V DC$; $I_i \leq 1 mA$ |
| (Klemme R_+ , R_-) | |
| Fremdkörper- und Wasserschutz | : IP 67 nach EN 60529 |

(16) Prüfbericht PTB Ex 01-11294

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(13)

Schedule

(14)

EC Type Test Certificate PTB 01 ATEX 1154

(15)

Device description

The H.../.../M10-EEEx variable-area flowmeter is designed to measure the volume rate of flow of flammable and non-flammable gases and liquids in vertical pipe runs. The flow through the measuring tube is from bottom to top, and the guided float adjusts so that lifting force, form resistance and float weight are in equilibrium. Every vertical position of the float thus corresponds to a specific flow rate. Electromagnetic position sensors in the display section convert the position of the float into an appropriate electrical output signal.

Technical data

Supply (functional extra-low voltage PELV, $U_{DC} \leq 60 \text{ V}$)

| | |
|--|--|
| Signal output 4 – 20 mA (terminal I ₊ , I _L) | $U_N = 24 \text{ V DC} \pm 30\%$, 2-wire connection with HART communication |
| Signal output 1 & 2 | NAMUR circuit |
| Output 1 (terminal B ₊ , B _N) | $U_N = 8 \text{ V DC}$, depending on switch position $\leq 0.8 \text{ mA}$ or |
| Output 2 (terminal B ₊ , B _N) | $\geq 2.1 \text{ mA}$; $R_i = 1 \text{ k}\Omega$ |
| | or |
| Output 1 (terminal B ₊ , B _{OC}) | open collector (pnp output) |
| Output 2 (terminal B ₊ , B _{OC}) | $U_N = 8 \dots 30 \text{ V DC}$; $I_i \leq 100 \text{ mA}$; U_i with effectively conducting output $\leq 3 \text{ V}$ |
| Status input (terminal R ₊ , R _L) | $U_N = 8 \dots 30 \text{ V DC}$; $I_i \leq 1 \text{ mA}$ |

Protection against ingress of foreign bodies and water

IP 67 in conformity with EN 60529

(16)

Test report PTB Ex 01-11294

(17) Besondere Bedingungen

keine

Zusätzliche Hinweise für den sicheren Betrieb:

Anschlußbedingungen

1. Das Schwebekörper-Durchfluss-Messgerät H.../.../M10-EEx ist über dafür geeignete Kabel- und Leitungseinführungen bzw. Rohrleitungssysteme anzuschließen, die den Anforderungen der EN 50018 Abschnitte 13.1 und 13.2 entsprechen und für die eine gesonderte Prüfbescheinigung vorliegt.
2. Kabel- und Leitungseinführungen (Pg-Verschraubungen) sowie Verschlussstopfen einfacher Bauart dürfen nicht verwendet werden. Bei Anschluß des Schwebekörper-Durchfluss-Messgerätes H.../.../M10-EEx über eine für diesen Zweck zugelassene Rohrleitungseinführung muß die zugehörige Abdichtungsvorrichtung direkt am Gehäuse angeordnet sein.
3. Nicht benutzte Öffnungen sind entsprechend EN 50018 Abschnitt 11.9 zu verschließen.
4. Die Anschlußleitung des Schwebekörper-Durchfluss-Messgerätes ist fest und so zu verlegen, daß sie hinreichend gegen Beschädigung geschützt ist.

Diese Hinweise sind jedem Betriebsmittel in geeigneter Form beizufügen.

Potentialausgleich

Das Schwebekörper-Durchfluss-Messgerät H.../.../M10-EEx ist in den örtlichen Potentialausgleich einzubeziehen.

Zulässige Umgebungs- und Meßstofftemperaturen in Abhängigkeit von der Temperaturklasse

| Temperaturklasse | Umgebungs-temperaturbereich in °C | Höchstzulässige Meßstofftemperatur in °C für Dauergebrauchstemperatur | | |
|------------------|-----------------------------------|---|---------------|---------------|
| | | Leitung 70 °C | Leitung 80 °C | Leitung 90 °C |
| T6 | -40 ... +60 | 85 | 85 | 85 |
| T5 | -40 ... +50 | 100 | 100 | 100 |
| | -40 ... +60 | 85 | 100 | 100 |
| T4 | -40 ... +50 | 135 | 135 | 135 |
| | -40 ... +60 | 85 | 135 | 135 |
| T3 ... T1 | -40 ... +40 | 180 | 200 | 200 |
| | -40 ... +50 | 135 | 190 | 200 |
| | -40 ... +60 | 85 | 145 | 200 |

Die Kabel- und Leitungseinführungen müssen die gleiche Temperaturbeständigkeit wie die Anschlussleitung gewährleisten.

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Schedule to EC Type Test Certificate PTB 01 ATEX 1154

- (17) Special conditions
none.

Additional directions for safe operation

Connection conditions

1. The H..../..../M10-EEEx variable-area flowmeter shall be connected up via suitable cable glands and/or conduit systems that satisfy the requirements of EN 50018 Sections 13.1 and 13.2 and for which a separate test certificate is to hand.
2. Cable glands and entry fittings (screwed conduit entries) as well as blanking plugs of simple design may not be used. On connection of the H..../..../M10-EEEx variable-area flowmeter using a conduit entry approved for the purpose, the associated sealing facility must be arranged directly on the housing.
3. Unused openings shall be closed off as defined in EN 50018 Section 11.9.
4. The connecting cable of the variable-area flowmeter shall be permanently installed and in such a manner as to be adequately protected against damage.

These directions shall in suitable form accompany each apparatus.

Equipotential bonding

The H..../..../M10-EEEx variable-area flowmeter shall be incorporated in the local equipotential bonding system.

Permissible ambient and process temperatures as a factor of the temperature class

| Temperature class | Ambient temperature in °C | Max. permissible process permanent temperature | | |
|-------------------|---------------------------|--|-------------|-------------|
| | | Wiring 70°C | Wiring 80°C | Wiring 90°C |
| T6 | -40 ... +60 | 85 | 85 | 85 |
| T5 | -40 ... +50 | 100 | 100 | 100 |
| | -40 ... +60 | 85 | 100 | 100 |
| T4 | -40 ... +50 | 135 | 135 | 135 |
| | -40 ... +60 | 85 | 135 | 135 |
| T3 ... T1 | -40 ... +40 | 180 | 200 | 200 |
| | -40 ... +50 | 135 | 190 | 200 |
| | -40 ... +60 | 85 | 145 | 200 |

The cable glands and line entries must have the same degree of thermal stability as the connecting cable.

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Allgemeine Hinweise

Brennbare Meßstoffe sind zulässig, sofern dadurch kein explosionsgefährdetes Gasgemisch im Inneren der Anlage gebildet wird. Bei Betrieb mit brennbaren Meßstoffen sind die Meßteile in die wiederkehrende Druckprüfung der Anlage einzubeziehen.

Vor dem Öffnen der Druckfesten Kapselung des Elektronikraumes ist bei den Temperaturklassen T5 und T6 eine Wartezeit von mindestens 8 Minuten einzuhalten.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

Erfüllt durch die Übereinstimmung mit den vorgenannten Normen.

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Braunschweig, 30. September 2002


Dr.-Ing. U. Klaus
Regierungsdirektor



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General directions

Flammable products are allowed provided they do not form any potentially explosive gas mixture inside the plant. When operated with flammable products, the measuring sections shall be included in the routine plant pressure tests.

Before the Flameproof Enclosure of the electronics compartment is opened, a waiting time of at least 8 minutes shall be allowed to elapse in respect of temperature classes T5 and T6.

(18) Basic health and safety requirements

are satisfied by conformity with the afore-mentioned standards.

Certification Agency
for Explosion Protection

Brunswick, 30st September 2002

On behalf of
(signed)

Official stamp
of the PTB

Dr.-Ing. U. Klausmeyer
Regierungsdirektor

DECLARATION OF CONFORMITY

Konformitätsbescheinigung | Déclaration de Conformité



The Level and Flow Company

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Str. 5

D-47058 Duisburg
Germany

We declare herewith under sole responsibility that the product(s):
Wir erklären in alleiniger Verantwortung, dass das Produkt / die Produkte:
Nous déclarons sous notre seule responsabilité que le(s) produit(s) :

H ... / ... /M10 - EEx

Variable Area Flow Meter /Schwebekörper Durchflussmesser / Débitmètre à Section Variable

complies with the directive on devices and protective systems designated for use in areas subject to explosion hazards:
der Richtlinie über Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen entspricht:
est en accord avec la directive sur les instruments et systèmes protectifs conçus pour l'utilisation dans des endroit à risques d'explosion :

Directive 94/9/EG

The stipulated safety and public health safety requirements are fulfilled in accordance with:
Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:
Les obligations à l'encontre de la sécurité et de la santé publique sont remplies en accord avec :

EN 50014: 1997 + A1 + A2

EN 50018: 2000

The equipment type plates contain the following:
Die Kennzeichnung des Gerätes enthält folgende Angaben:
L'inscription de type de l'équipement contient des informations suivantes:

Ex II 2 G EEx d IIC T6 ... T1

PTB 01 ATEX 1154

Duisburg, Nov 11th, 2002

General Management / Geschäftsführung / Chef d'entreprise

If you need to return a device for testing or repair to KROHNE

Your instrument has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, your instrument will rarely present any problems. Should you nevertheless need to return an instrument for checkout or repair, please pay strict attention to the following points:

Due to statutory regulations concerning protection of the environment and safeguarding the health and safety of our personnel, KROHNE may only handle, test and repair returned instruments that have been in contact with liquids if it is possible to do so without risk to personnel and environment.

This means that KROHNE can only service your instrument if it is accompanied by a certificate in line with the following model confirming that the instrument is safe to handle.

Specimen certificate

Company: Address:

Department: Name:

Tel. No.: Fax No.:

The enclosed instrument

Type: :

KROHNE Order No. or Series No :

has been operated with the following process liquid

Because this process liquid is
water-endangering * / toxic * / caustic * / flammable*
we have

- checked that all cavities in the instrument are free from such substances *
- flushed out and neutralised all cavities in the instrument *

(* delete where not applicable)

We confirm that there is **no** risk to man or environment through any residual liquid contained in the instrument.

Date: Signature

.....
Company stamp:

If the instrument has been operated with toxic, caustic, flammable or water-endangering liquids, you are kindly requested

- to check and ensure, if necessary by rinsing or neutralising, that all cavities in the instrument are free from such dangerous substances.
(Directions on how you can find out whether the primary head has to be opened and flushed out or neutralised are obtainable from KROHNE on request.)
- to enclose a certificate with the instrument confirming that the instrument is safe to handle and stating the liquid used.

KROHNE regret that they cannot service your instrument unless it is accompanied by such a certificate.