



## (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 12 ATEX 1025**

(4) Equipment: Variable-area flowmeter, type H250.../M40.../...../..-Ex-.. and indicator, type M40.../...../..-Ex-..

(5) Manufacturer: KROHNE Messtechnik GmbH

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

(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 test report PTB Ex 12-12134.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60079-0:2009 EN 60079-1:2007 EN 60079-31:2009**

(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 Ex d IIC T6 ... T1 Gb / Ex d IIB T6...T1 Gb**

**II 2 D Ex t IIC T70 °C Db**

Zertifizierungssektor Explosionsschutz  
On behalf of PTB:

Braunschweig, May 14, 2012

Dr.-Ing. U. Klausmeyer  
Direktor und Professor



(13)

## SCHEDULE

(14)

### EC-TYPE-EXAMINATION CERTIFICATE PTB 12 ATEX 1025

(15) Description of equipment

The H250.../M40.../...../...-Ex-.. variable-area flowmeters are intended for measuring volumetric flow rates of flammable and non-flammable gases and liquids in pipelines. A metering float in the measuring section adjusts its position so that the forces acting on it are in equilibrium. Permanent magnets provided inside the metering float transmit the position of the metering float to a sequential magnet in the display section. Electromagnetic position sensors in the display section convert the position of the metering float into a suitable electrical output signal.

Metering units of the H250. series are used; the initiator is an M40 series unit. The M40 unit consists of the MH40 enclosure, which has been certified under PTB 11 ATEX 1015 U component certificate, and electronic elements for signal evaluation.

#### Technical data

Operating pressure at metering unit H250 (depending on construction):	16 ... 40 (200) bar
Medium temperature (depending on model):	-40 °C up to +300 °C
Temperature at reference point (ext. PA connection at M40 ):	-40 (-25) °C up to +88 °C
Ambient temperature (depending on model):	-40 (-25) °C up to +65 °C
Ingress protection	IP 66 / 67 in accordance with EN 60529

## Electrical data

Power supply (protective-extra-low-voltage PELV)

### **M40 / ESK indicator**

with ESK4... signal output  
Terminals 11, 12

$U_N = 14 - 32 \text{ V}$   
 $I_N = 4 - 20 \text{ mA}$   
standardized 4...20 mA power signal with  
superposed HART® communication signal  
as 2-conductor connection

### **M40 / ESK indicator**

with ESK4... converter  
terminals 11, 12

$U_N = 14 - 32 \text{ V}$   
 $I_N = 4 - 20 \text{ mA}$   
standardized 4...20 mA power signal with  
superposed HART® communication signal  
as 2-conductor connection

and I/O module

binary output 1, terminals 1, 3 (OC)

binary output 2, terminals 4, 6 (OC)

or

binary output 1, terminals 1, 3 (NAMUR)

binary output 2, terminals 4, 6 (NAMUR)

and

status input, terminals 7, 8 (input)

nominal value per circuit:

$U_N = 8 - 32 \text{ V}$  (open collector, pnp output)

$I_N \leq 100 \text{ mA}$

$U_N = 8 \text{ V}$  (depending on switching position)

$I_N \leq 1 / \geq 3 \text{ mA}$

$U_N = 8 - 32 \text{ V}$

$I_N < 2 \text{ mA}$

### **M40 / ESK indicator**

with ESK4-FF converter or  
ESK4-PA converter

bus connection, terminals D, D<sub>⊥</sub>

for connection to fieldbus system

$U_N = 9 - 32 \text{ V}$

$I_N = 16 \text{ mA}$

Manchester coded current output

for connection to Foundation fieldbus

or Profibus-PA

### **M40 / K. indicator**

limit switch (2-wire type)

terminals 1, 2 / 4, 5

or

limit switch (3-wire type)

terminals 1, 2, 3 / 4, 5, 6

nominal value per circuit:

$U_N = 5 - 25 \text{ V}$

$I_N \leq 1 / \geq 3 \text{ mA}$  (depending on switching position)

$U_N = 10 - 30 \text{ V}$

$I_N < 100 \text{ mA}$  (depending on switching position)

### **M40 / R. indicator**

with Reed contact

terminals 1, 2, 3 / 4, 5, 6

nominal value per circuit:

$U_N = 0 - 32 \text{ V}$

$I_N \leq 100 \text{ mA}$  (depending on switching position)

## Temperatures

Heating jacket			Permitted measuring temperature $T_m$ [°C]									
		HT version	TK ▶	T6	T5		T4		T3		T2 ... T1	
with-out	with		$T_{amb}$ [°C] ▶	≤ 60	≤ 60	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65
DN15, DN25, DN50	DN15, DN25			85	100	75	105	75	105	75	105	75
		X		85	100	95	135	95	175	95	175	95
DN80, DN100	DN50, DN80			85	90	75	90	75	90	75	90	75
		X		85	100	90	135	90	155	90	155	90

**Table 1** Measuring and ambient temperatures H250.../M40.../...../-Ex-..  
Continuous operation temperature of connection cable and cable gland min. 90°C

Heating jacket			Permitted measuring temperature $T_m$ [°C]									
		HT version	TK ▶	T6	T5		T4		T3		T2 ... T1	
with-out	with		$T_{amb}$ [°C] ▶	≤ 60	≤ 60	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65
DN15, DN25, DN50	DN15, DN25			85	100	75	105	75	105	75	105	75
		X		85	100	95	135	95	175	95	175	95
DN80, DN100	DN50, DN80			85	90	75	90	75	90	75	90	75
		X		85	100	90	135	90	155	90	155	90

**Table 2** Measuring and ambient temperatures H250.../M40.../...../-Ex-..  
Continuous operation temperature of connection cable and cable gland min. 70°C

Heating jacket			Permitted measuring temperature $T_{Ref}$ [°C]			
		TK ▶	T6 ... T1		T6	T5 ... T1
with-out	with	$T_{connection\ cable}$ [°C] ▶	standard (70 °C)		heat resistant (90 °C)	
DN15, DN25, DN50, DN80, DN100	DN15, DN25, DN50, DN80		64		74	84

**Table 3** Highest permitted temperature at the reference point H250.../M40.../...../-Ex-.. and indicator type M40.../...../-Ex-..  
Continuous operation temperature of connection cable and cable gland 70°C and 90°C, resp.

(16) Test report PTB Ex12-12134

(17) Special conditions for safe use

Does not apply

Additional notes for safe operation:

Components attached or installed (e.g. terminal compartments, bushings, cable glands, connectors) shall be of a technical standard that complies with the specifications on the cover sheet. They shall be suited for the operating conditions and have a separate examination certificate. The special conditions specified for the components shall be complied with, and the components shall be included in the type test, if necessary. This equally applies to the components mentioned in the technical description.

**Connection conditions**

- 1 The H250.../M40.../...../-Ex-.. variable-area flowmeter and M40.../...../-Ex-.. indicator shall be connected with suitable cable glands or conduit systems that meet the requirements set forth in EN 60079-1, sections 13.1 and 13.2, and for which a separate test certificate has been issued. If the H250.../M40.../...../-Ex-.. variable-area flowmeter and M40.../...../-Ex-.. indicator are connected to conduit systems, the required sealing device shall be provided immediately at the enclosure.
2. Cable glands (Pg-type glands) and blanking plugs of a simple design must not be used.
3. Openings that are not used shall be sealed in compliance with the specifications in EN 60079-1, section 11.9.
4. If connection is made in the potentially explosive area, the connecting wire of the H250.../M40.../...../-Ex-.. variable-area flowmeter and M40.../...../-Ex-.. indicator shall be connected in an enclosure that meets the requirements of an approved type of protection in accordance with EN 60079-0, section 1.
5. The connecting wire of the H250.../M40.../...../-Ex-.. variable-area flowmeter and M40.../...../-Ex-.. indicator shall be fixed and routed so that it will be adequately protected against mechanical damage.
- 6 If the temperature at entry fittings exceeds 70 °C, temperature-resistant connecting cables shall be used.
7. The H250.../M40.../...../-Ex-.. variable-area flowmeter and M40.../...../-Ex-.. indicator shall be included in the local equipotential bonding solution of the potentially explosive location.

These notes and instructions shall accompany each device in an adequate form.

To avoid the risk of ignition as a result of electrostatic charging, variable-area flowmeters must not be used in locations in which

- high charge generating processes,
- mechanical friction and separation processes,
- electron emission (e.g. near electrostatic coating equipment), may occur.

Operation with flammable media is permitted only, if under operating conditions no potentially explosive fuel/air mixture is formed inside the flowmeter. If flammable media are used, the metering units shall be included into the recurring pressure test for the system.

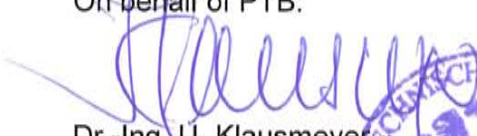
For the H250/C... version (PTFE design, non-conductive), the medium must have a conductivity of at least  $10^{-8}$  S/m, in order to avoid the risk of electrostatic charging.

(18) Essential health and safety requirements

Met by compliance with the afore-mentioned Standards.

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