



(1) **EU-TYPE-EXAMINATION CERTIFICATE**
(Translation)

(2) Equipment or Protective Systems Intended for Use in
 Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 12 ATEX 1025

Issue: 1

(4) Product: 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 product and any acceptable variation thereto is 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 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products 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 17-27144.

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

EN 60079-0:2012 + A11:2013

EN 60079-1:2014

EN 60079-31:2014

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:



II 2 G Ex db IIC T6 ... T1 Gb

or

II 2 D Ex tb IIIC T70°C ... T300°C Db

Konformitätsbewertungsstelle, Sektor Explosionsschutz
 On behalf of PTB:

Braunschweig, January 17, 2018

Dr.-Ing. F. Lienesch
 Direktor und Professor



sheet 1/6

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

SCHEDULE

(13)

(14) **EU-Type Examination Certificate Number PTB 12 ATEX 1025, Issue: 1**

(15) Description of Product

The variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. are intended for measuring volumetric flow rates of flammable and non-flammable gases and liquids in pipelines. A float in the measuring unit adjusts itself to a position where the forces acting on the float are balanced. Permanent magnets provided inside the float transmit its position to a sequential magnet in the display unit. Electromagnetic position sensors in the display unit convert the position of the float into an appropriate electrical output signal.

Metering units of the H250.-type series and the indicator of M40-type series are applied. The M40 display consists of the MH40 enclosure certified under PTB 11 ATEX 1015 U component certificate, and electronic elements for signal analysis.

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 display)	-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

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 12 ATEX 1025, Issue: 1

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 current signal with
superimposed HART® communication signal
designed as 2-wire 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 current signal with
superimposed HART® communication signal
designed as 2-wire connection

and I/O module

nominal value per circuit:

binary output 1, terminals 1, 3 (OC)
binary output 2, terminals 4, 6 (OC)

$U_N = 8 - 32 \text{ V}$ (open collector, pnp output)
 $I_N \leq 100 \text{ mA}$

or

binary output 1, terminals 1, 3 (NAMUR)
binary output 2, terminals 4, 6 (NAMUR)

$U_N = 8 \text{ V}$ (depending on switching position)
 $I_N \leq 1 / \geq 3 \text{ mA}$

and

status input, terminals 7, 8 (input)

$U_N = 8 - 32 \text{ V}$
 $I_N < 2 \text{ mA}$

M40 / ESK indicator

with ESK4-FF signal output or
ESK4-PA signal output
bus connection, terminals D, D_⊥

for connection to fieldbus systems
 $U_N = 9 - 32 \text{ V}$
 $I_N = 16 \text{ mA}$
Manchester coded current signal
for connection to Foundation Fieldbus
or Profibus-PA

M40 / K. indicator

limit switch (2-wire type)
terminals 1, 2 / 4, 5

nominal value per circuit:
 $U_N = 5 - 25 \text{ V}$
 $I_N \leq 1 / \geq 3 \text{ mA}$ (depending on switching position)

or

limit switch (3-wire type)
terminals 1, 2, 3 / 4, 5, 6

$U_N = 10 - 30 \text{ V}$
 $I_N < 100 \text{ mA}$ (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)

sheet 3/6

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 12 ATEX 1025, Issue: 1

Temperatures

			Permitted measuring temperature T_m [°C]							
Heating jacket		HT version	TK ►	T6	T5	T4	T3		T2 ... T1	
with-out	with		T_{amb} [°C] ►	≤ 60	≤ 65	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65
DN15, DN25, DN50	DN15, DN25			85	100	135	200	175	200	175
		X		85	100	135	200	200	300	300
DN80, DN100	DN50, DN80			85	100	135	185	165	185	165
		X		85	100	135	200	200	300	300

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

			Permitted measuring temperature T_m [°C]									
Heating jacket		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 operating temperature of connection cable and cable gland min. 70°C

			Permitted measuring temperature T_{Ref} [°C]		
Heating jacket		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 Maximum permitted temperature at the reference point H250.../M40.../...../...-Ex-.. and indicator, type M40.../...../...-Ex-..
Continuous operating temperature of connection cable and cable gland 70°C or 90°C, respectively.

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 12 ATEX 1025, Issue: 1

Changes with respect to previous editions

- Adaption to the current state of standards
- Alteration of the marking according to state of standards; the specification of gas group IIB does no longer apply
- Revision of the type label
- Revision of the operating instructions manual

These changes are presented in summary together with still applicable specifications from the initial certificate.

(16) Test Report PTB Ex 17-27144

(17) Specific conditions of use

none

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 applies also to components already mentioned in the technical description.

Connection conditions

1. The variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. shall be connected by suitable cable glands or conduit systems that meet the requirements of EN 60079-1, sections 13.1 and 13.2, and for which a separate examination certificate has been issued. If the variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. are connected to conduit systems, the associated sealing device shall be mounted directly onto the enclosure.
2. Cable glands (screwed conduit entries) and blanking plugs of a simple design shall not be used.
3. Openings that are not used shall be sealed according to EN 60079-1, section 11.9.
4. If connection is made in the hazardous area, the connecting cable of the variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. shall be connected inside of an enclosure that meets the requirements of an approved type of protection in accordance with EN 60079-0, section 1.

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 12 ATEX 1025, Issue: 1

5. The connecting cable of the variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. shall be laid as permanent installation and as such, that it is sufficiently protected against mechanical damage.
6. If the temperature at the entry fittings exceeds 70 °C, temperature-resistant connecting cables shall be used.
7. The variable-area flowmeter, type H250.../M40.../...../-Ex-.. and the indicator, type M40.../...../-Ex-.. shall be included into the local equipotential bonding system of the hazardous area.

These notes and instructions shall accompany each device in an appropriate 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 medium/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 shall have a minimum conductivity of 10^{-8} S/m, in order to avoid the risk of electrostatic charging.

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, January 17, 2018


Dr.-Ing. F. Lienesch
Direktor und Professor



sheet 6/6



(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 IIIC T70 °C Db**

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 14, 2012

Dr.-Ing. U. Klausmeyer
Direktor und Professor



sheet 1/6

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

(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_⊥

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

			Permitted measuring temperature T_m [°C]							
Heating jacket		HT version	TK ►	T6	T5	T4	T3		T2 ... T1	
with-out	with		T_{amb} [°C] ►	≤ 60	≤ 65	≤ 65	≤ 60	≤ 65	≤ 60	≤ 65
DN15,	DN15,			85	100	135	200	175	200	175
DN25,	DN25	X		85	100	135	200	200	300	300
DN50										
DN80,	DN50,			85	100	135	185	165	185	165
DN100	DN80	X		85	100	135	200	200	300	300

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

			Permitted measuring temperature T_m [°C]									
Heating jacket		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,	DN15,			85	100	75	105	75	105	75	105	75
DN25,	DN25	X		85	100	95	135	95	175	95	175	95
DN50												
DN80,	DN50,			85	90	75	90	75	90	75	90	75
DN100	DN80	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

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

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.

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 14, 2012

Dr.-Ing. U. Klausmeyer
Direktor und Professor

