



H250 M40 Supplementary instructions

Equipment category II 2G / II 2D , EPL Gb / Db
in equipment protection by flameproof enclosures Ex-d and
in equipment dust ignition protection by enclosure Ex-t



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1.1 General notes

These additional instructions apply to explosion-protected versions of variable area flowmeters with electrical built-ins and the marking II 2 G or II 2 D. They complete the installation and operation instructions for the non-explosion protected versions.

The information given in these instructions contains only the data relevant to category 2 explosion protection. The technical details given in the installation and operation instructions for the non-explosion protected versions apply unchanged unless excluded or superseded by these instructions.

1.2 NEPSI conformity

The H250/M40 variable-area flowmeters series has been approved by NEPSI (National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation in China) under Certification No.

GYJ13.1044X

This certification together with its boundary conditions is required to be observed without fail. The Ex marking is NOT acc. to the ATEX directive 94/9/EC (see also Attachment "Certificate"). Placing the product on the market of the EU for purpose of distribution and/or use in the EU is NOT permitted.

1.3 Security information

Assembly, installation, start-up and maintenance may only be performed by personnel trained in explosion protection!



CAUTION!

The operator respectively his agent is responsible to follow further standards, directives or laws if required due to operating conditions or place of installation. This applies particularly for the use of easy detachable process connections such as SMS or Clamp when measuring flammable mediums.

2.1 Description of device

Variable area flowmeters measure and display the volume flow of flammable and non-flammable gases and liquids. Depending on the device version, electrical limit switch contacts with counter module, reed contacts, a 4...20 mA signal output with HART[®] communication, a Foundation Fieldbus interface or a Profibus PA interface can be installed in the display.

2.2 Description code

The safety description code * consists of the following elements:

H	2	5	0	/		/		/	M	4	0	/		/		/		-	E	x	-		
①					②				③				④				⑤				⑥		

- ① Type series measuring unit H250
H250 - standard version, vertical upwards
H250H - horizontal orientation
H250U - vertical downwards
- ② Measuring unit materials / versions
RR - Stainless Steel
C - PTFE or PTFE/ceramics
HC - Hastelloy C
Ti - Titanium
F - Food
- ③ Heating jacket version
blanc - without heating jacket
B - with heating jacket
- ④ Signal converter version
M40 - Aluminium housing, painted (standard)
M40S - Aluminium housing with added corrosion protection
M40R - Stainless steel housing
M40T - Stainless steel housing with added corrosion protection
- ⑤ High temperature version
blanc - without HT extension
HT - with HT extension
- ⑥ Electrical signal output
blanc - without transmitter
ESK - Electrical signal output 4...20mA (ESK4)
... - optionally available with counter, I/O module and display (ESK4-T) or
... - Foundation Fieldbus (ESK4-FF) or
... - Profibus PA (ESK4-PA)
- ⑦ Limit switches
blanc - without limit switches
K1 - One limit switch
K2 - Two limit switches
R1 - 1 reed switch
R2 - 2 reed switches
- ⑧ Version
Ex - Explosion-protected version
- ⑨ SIL Version
SE - SIL compliant electronic signal output
SK - SIL compliant limit switch

* positions which are not needed are omitted (no blank positions)

2.3 Marking

Type designation of the complete unit is shown on the indicator with the rating plate reproduced below (see also description code).

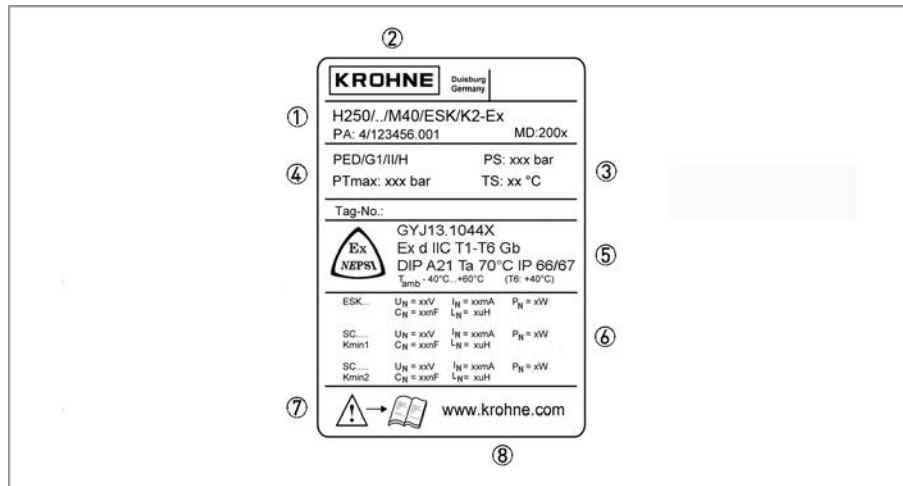


Figure 2-1: Example of a rating plate

- ① Device type
- ② Manufacturer
- ③ Sizing data: temperature & pressure rating
- ④ PED data
- ⑤ Ex data
- ⑥ Electrical connection data
- ⑦ Note on observing documentation
- ⑧ Website of the manufacturer

Additional markings on the housing cover:

- SN - serial number
- SO - sales order / item
- PA - order
- Vxxx / Sxxx - product configurator code
- AC - article code

Additional plate

The association of the housing cover to the device is confirmed by an additional plate with the serial number on the interior of the indicator part.

2.4 Flammable products

Atmospheric conditions:

An explosive atmosphere is a mixture of air and flammable gases, vapours, mists or dusts under atmospheric conditions. The following values define it

$T_{\text{atm}} = -20...+60^{\circ}\text{C} / -4...+140^{\circ}\text{F}$ and $P_{\text{atm}} = 0.8...1.1 \text{ bar}$.

Outside of this range, no key data are available as to ignition behaviour for most mixtures.

Installation conditions:

Variable area flowmeters operate outside of atmospheric conditions, which means that explosion protection – regardless of the zone assignment – is fundamentally not applicable due to the lack of key safety data for the interior of the measuring section.



WARNING!

Operation with flammable products is only permitted as long as no explosive fuel/air mixture builds up on the inside of the flowmeter under operating conditions. The operator is responsible for ensuring that the flowmeter is operated safely as regards the temperature and pressure of the products used. In case of operation with flammable products the measuring units must be included in the periodic pressure tests of the system. When using the device version H250/C... (PTFE-liner, nonconductive) the min. conductivity of the medium must be 10^{-8} S/m , in order to avoid the electrostatic charge.

2.5 Device category

Variable area flowmeters are designed in accordance with GB 3836.1-2010, GB 3836.2-2010 and GB 12476.1-2000.



INFORMATION!

Definition of zone 1 acc. to EN 1127-1, Appendix B:

An area in which an explosive atmosphere may occasionally occur as a result of the mixture of flammable substances in the form of gas, steam or mist with air under normal operation.

Definition of zone 21 acc. to EN 1127-1, Appendix B:

An area in which an explosive atmosphere may occasionally occur in the form of a cloud of flammable dust in the air under normal operation.

2.6 Protection types

The variable area flowmeter is designed using equipment protection by flameproof enclosures and equipment dust ignition protection by enclosure.

The marking is:

Ex d IIC T1-T6 Gb DIP A21 Ta 70°C IP66/67

The marking contains the following information:	
Ex d	Electronics compartment - protection type flameproof enclosure
IIC	Gas group, Suitable for gas groups IIC, IIB and IIA
T1-T6	Temperature class, suitable for temperature classes T1 ... T6
Gb	EPL, suitable for zone 1
DIP	Protection type dust ignition proof
A21	Enclosure suitable for zone 21
Ta 70°C	Maximum surface temperature of the converter housing
IP66/67	Ingress protection

2.7 Ambient temperature / temperature classes

Due to the influence of the product temperature, variable area flowmeters with built-in electrical equipment (electric variants) are not assigned to any fixed temperature class. In fact, the temperature class of a device is a function of the temperature of both the product and the environment. The classification is outlined in the following tables.

The tables take into account the following parameters:

- Maximum value P_i
- Ambient temperature T_{amb} .
- Product temperature T_m
- Nominal DN
- Standard or high temperature version (HT)
- Standard or heating jacket version
- Heat resistance of the connecting cable



INFORMATION!

The maximum permissible product temperatures listed in the tables are valid under the following conditions:

- *The measuring device is installed and operated in accordance with the manufacturer's installation instructions.*
- *It must be ensured that the flowmeter is not heated by the effects of additional heat radiation (sunshine, neighbouring system components) and thus operated above the permissible ambient temperature range.*
- *Insulation must be limited to the piping.
Unobstructed ventilation of the indicator part must be ensured.
To do this, the variant with a projecting indicator (HT version) is preferable.*
- *For device versions with a heating jacket, that the temperature of the heating medium does not exceed the maximum permissible product temperature.*



INFORMATION!

The following conditions must be met for all versions:

- *Standard connecting cable, temperature resistance min. 70°C / 158°F.*
- *Heat-resistant connecting cable, temperature resistance min. 90°C / 194°F.*

The permitted ambient temperature range is indicated on the nameplate; depending on the device version it is $T_{amb} = -40...+60^{\circ}\text{C}$ / $-40...+140^{\circ}\text{F}$ or $T_{amb} = -20...+60^{\circ}\text{C}$ / $-4...+140^{\circ}\text{F}$.

The minimum product temperature is -40°C / -40°F .

For certain device version, lower values apply due to differing boundary conditions (e.g. lining materials). Here the user should consult the technical data sheet.

Maximum permitted temperatures when using a heat resistant connecting cable

				Maximum permitted product temperature T_m [°C]						
Heating jacket			TK ▶	T6	T5	T4	T3		T2, T1	
none	with	HT version	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	130	185	165	185	165
		x		85	100	135	200	200	300	300

				Maximum permitted product temperature T_m [°F]						
Heating jacket			TK ▶	T6	T5	T4	T3		T2, T1	
none	with	HT version	T_{amb} [°F] ▶	≤ 140	≤ 149	≤ 149	≤ 140	≤ 149	≤ 140	≤ 149
DN15 DN25 DN50	DN15 DN25			185	212	275	392	347	392	347
		x		185	212	275	392	392	572	572
DN80 DN100	DN50 DN80			185	212	275	365	329	365	329
		x		185	212	275	392	392	572	572

Maximum permitted temperatures when using a standard connecting cable

				Maximum permitted product temperature T_m [°C]							
Heating jacket			TK ▶	T6	T5		T4		T3		T2, T1
none	with	HT version	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

				Maximum permitted product temperature T_m [°F]							
Heating jacket			TK ▶	T6	T5		T4		T3		T2, T1
none	with	HT version	T_{amb} [°F] ▶	≤ 140	≤ 140	≤ 149	≤ 140	≤ 149	≤ 140	≤ 149	≤ 140, ≤ 149
DN15 DN25 DN50	DN15 DN25			185	212	167	221	167	221	167	221, 167
		x		185	212	203	275	203	347	203	347, 203
DN80 DN100	DN50 DN80			185	194	167	194	167	194	167	194, 167
		x		185	212	194	275	194	311	194	311, 194

Reference point observation

The permissible product and ambient temperatures may be exceeded or undershot as long as the permissible temperature range of the reference point of the display is not exceeded. The following table contains the permissible maximum values at the reference point. Note:

- Reference point is the connection of the equipotential bonding conductor of the M40 indicator.
- The temperatures at the reference point are to be determined in the most unfavourable operating situation.
- The required measuring uncertainty is max. 2K.
- Measuring conditions and results are to be permanently recorded in a suitable format.
- The measuring unit should be insulated properly.

Maximum permitted temperatures at reference point

			Maximum permitted temperature at the reference point T_{Ref} [°C]		
Heating jacket		TK ▶	T6...T1	T6	T5...T1
none	with	$T_{Connecting\ cable}$ [°C] ▶	standard (70°C)	Heat resistant (90°C)	
DN15 DN25 DN50 DN80 DN100	DN15 DN25 DN50 DN80		64	74	84

			Maximum permitted temperature at the reference point T_{Ref} [°F]		
Heating jacket		TK ▶	T6...T1	T6	T5...T1
none	with	$T_{Connecting\ cable}$ [°F] ▶	standard (158°F)	Heat resistant (194 °F)	
DN15 DN25 DN50 DN80 DN100	DN15 DN25 DN50 DN80		147	165	183

2.8 Electrical data

Electrical equipment	Rated voltage	Nominal current
Limit switches K1 / K2 OC Output	10 - 30 VDC	≤100 mA
Limit switches K1 / K2 NAMUR Output	5- 25 VDC	≤1 / ≥3 mA
Reed contacts R1 / R2	0 - 32 VDC	≤100 mA
Signal output ESK4	14 - 32 VDC	4...20mA with HART® communication
Switching output ESK4-T OC output	8 - 32 VDC	1...100 mA
Switching output ESK4-T NAMUR output	8 VDC	≤1 / ≥3 mA
Signal input ESK4-T input	8 - 32 VDC	≤2 mA
ESK4-FF Foundation Fieldbus transmitter ①	9 - 32 VDC	16 mA
ESK4-PA Profibus transmitter ②	9 - 32 VDC	16 mA

① Further information and instructions for operation of the ESK4-FF transmitter are provided in separate supplementary instructions.

② Further information and instructions for operation of the ESK4-PA Profibus transmitter are provided in separate supplementary instructions.

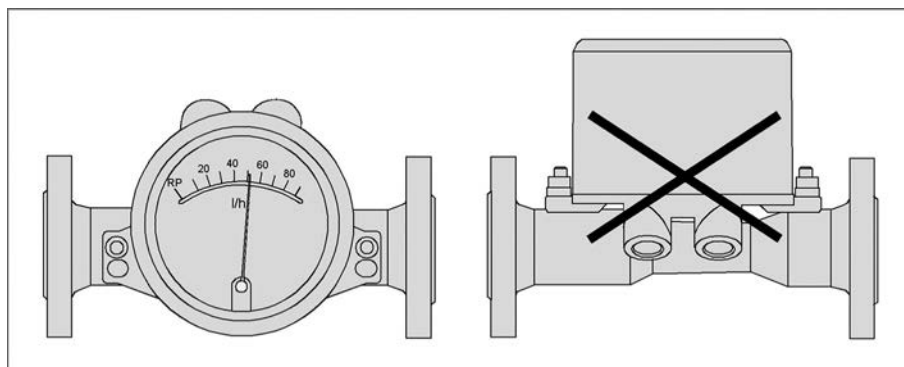
3.1 Installation

Installation and setup must be carried out according to the applicable installation standards by qualified personnel trained in explosion protection. The information given in the Installation and Operation Instructions and the Supplementary Installation and Operation Instructions must always be observed.

Variable area flowmeters must be installed in such a way that

- There are no external forces affecting the indicator part.
- The device is accessible for any visual inspections that are necessary, and can be viewed from all sides.
- The nameplate is clearly visible.
- It can be operated from a location with secure footing.

Take special note of the installation position for the H250/H/... with horizontal flow direction:



In order to comply with thermal parameters and measuring accuracy, flowmeters for horizontal installation are to be installed in the pipeline so that the display is located on the side of the measuring tube. The maximum product and ambient temperatures indicated as well as the measuring accuracy are based on lateral installation of the display.



CAUTION!

The manufacturer is not liable for any damage resulting from improper use or use other than the intended purpose. This applies in particular to hazards due to insufficient corrosion resistance and suitability of the materials in contact with product.

3.2 Special conditions

Equipotential bonding

Variable area flowmeters must be included in the equipotential bonding of the hazardous area.

Electronics compartment lock

Lock the dustproof and/or flameproof electronics compartment of the variable area flowmeter during operation. First tighten the cover by hand. Then tighten the cover again by about 90°. The cover for the electronics compartment is secured by means of a lock. Use an WS3 Allen key to turn the screw.

No waiting period is necessary prior to opening the electronics compartment.

4.1 General notes

Rated values for insulation

- The insulation of the H.../.../M40 - Ex variable area flowmeter is rated in compliance with IEC 60 664-1. The following rating parameters are taken into account:
- Overvoltage category for signal and instrument loops: II
- Pollution degree of the insulation: 2

Terminal compartment

The electrical connections for the power supply and I/O functions are made in the electronics compartment of the signal converter. The protection type of the electronics compartment is "d" and/or DIP. Unused openings are to be closed in compliance with applicable standards. The cables may enter the electronics compartment in two different ways.

- Direct entry of the connecting cables by way of approved flameproof cable glands (M20x1.5) into the flameproof terminal compartment ($V \leq 2000\text{cm}^3$). The cable glands require a separate test certificate. Observe the requirements of the test certificate for the cable glands.
- Direct entry of the connecting cables by way of conduits into the flameproof enclosed terminal compartment of the device. Once the conduit has been screwed in, it must form a flameproof joint with the housing with a minimum thread length of 8 mm. A suitable mechanical stopping box must be provided in accordance with installation provisions. The conduit must be installed in compliance with its separate test certificate.
- Direct entry of the connecting cables by way of permitted dustproof cable glands (M20x1.5) into the dustproof terminal compartment ($V \leq 2000\text{cm}^3$). The cable glands require a separate test certificate. Observe the requirements of the test certificate for the cable glands.

Connecting cables

The connecting cables should be selected according to the applicable installation standards and the maximum operating temperature.

- The connecting cables must be fixed and laid so they are sufficiently protected against damage.
- Lay cables so as to ensure that there is sufficient distance between surfaces of the measuring unit and the connecting cable.
- Supplied blind plugs / cable entries guarantee protection against foreign bodies and water (protection category) IP66 / 67 according to IEC 529 in the temperature range
- The outer diameter of the connecting cable must be within the sealing range of the cable entry (7...12 mm / 0.27...0.47").
- Unused cable entries are to be closed in accordance with applicable standards (>IP66 / 67).

Ensure that the seals and cut seals are tight.



CAUTION!

The IP protection category of the signal converter housing is largely determined by the cable gland used and the installation.

4.2 Power supply

The variable area flowmeter does not require a separate power supply. The required supply for the built-in electronics is provided via the 4...20mA current output and the bus connection.

4.3 Inputs/outputs

The terminal assignment of the built-in electrical equipment is described in the Standard Installation and Operation Instructions. The signal circuits of the variable-area flowmeter may only be connected to downstream devices or circuits that satisfy the requirements of protective extra-low voltage (PELV).

Connecting power and I/O functions

- Before connecting or disconnecting the electrical connection cables of the device, make sure that all cables leading to the converter are isolated from the ground of the hazardous area. This also applies to protective ground (PE) and equipotential bonding conductors (PA).
- All connecting cable conductors and shields that are not securely connected to the equipotential grounding system of the hazardous area shall be carefully isolated from one another and from ground (1500Vrms test voltage for non-intrinsically safe cables)

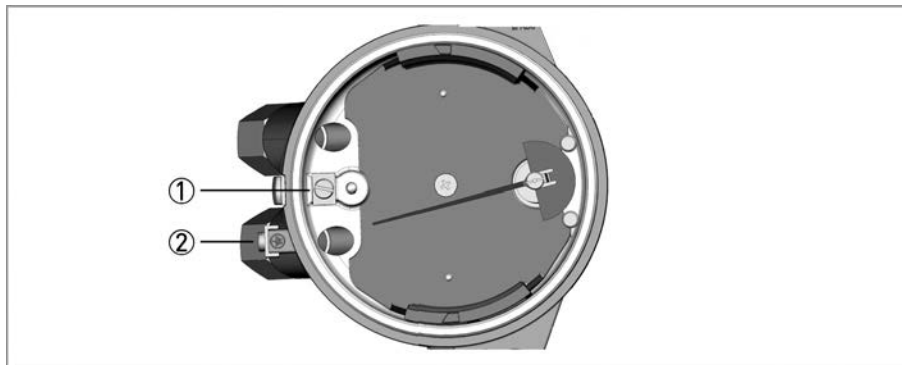
4.4 Grounding and equipotential bonding

The signal converter shall be connected to the equipotential bonding system of the hazardous area via the internal or external grounding connection on the signal converter housing. The measuring unit and the signal converter are electrically connected via an equipotential bonding connection.

Any existing cable shields should be connected to earth according to applicable installation regulations. A terminal connection in the terminal compartment permits a short way earthing of the cable shields.

Alternatively, the equipotential bonding of the signal converter can also take place by way of the measuring tube incorporated into the equipotential bonding of the hazardous area.

The measuring tube can be incorporated into the equipotential bonding system of the hazardous area using the U-clamp mounted on the flange if present, or suitable conductive connections (seals, etc.).



- ① Grounding connection in the indicator
- ② External grounding connection

5.1 Start up

Start-up is only permitted when the variable area flowmeter:

- is correctly installed in the system and connected.
- has been checked for the proper state with regard to its installation and connection requirements.
- and the electronics compartment have been properly closed (pressure-resistant casing or dustproof housing) and the applicable special lock has been fitted.

The user of the system must have it checked before start-up in compliance with the national regulations for checks before startup.

If the device needs to be configured due to the existence of an explosive atmosphere, this can be done using the supplied bar magnets. There is no need to open the housing as it can be done through the glass window of the electronics compartment or digitally via the signal output (HART® interface)

5.2 Operation

Variable area flowmeters must be operated in such a way that they remain within the maximum and minimum permissible temperatures and pressures and the electrical limit values.

Variable area flowmeters may only be operated if the equipment parts necessary for safety are effective in the long run, and are not rendered inoperable during operation.

When it comes to flammable products, the measuring sections must be included in the periodic pressure tests of the system.

Opening the housing of the electronics compartment (equipment protection by flameproof enclosure or dustproof housing) in hazardous areas is only permitted in a de-energised state.



WARNING!

Ignition risks caused by pressure surges, impact or friction must particularly be avoided when titanium measuring units are used.

5.3 Electrostatic charge

In order to avoid ignition hazards due to electrostatic charge, variable area flowmeters may not be used in areas where the following appear:

- processes that generate large charges,
- machines with friction and cutting processes,
- spraying of electrons (e.g. in the vicinity of electrostatic painting systems),

6.1 Maintenance

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

To maintain proper condition, regular inspections are required for systems in hazardous areas.

The following checks are recommended:

- Checking the housing, the cable entries and the feed lines for corrosion and/or damage.
- Checking the measuring unit and the piping connections for leakage.
- Checking the measuring unit and the indicator for dust deposits.
- Including the flowmeter in the regular pressure test of the process line.

6.2 Dismantling

General notes

Removal and installation are the responsibility of the operator.

Due to the modular structure of the variable area flowmeters, from a safety point of view it is possible to exchange complete indicators or their components for identical spare parts.



WARNING!

Only identical indicators or modules from the manufacturer may be used.

If it is absolutely necessary to open the flameproof enclosure or the dustproof electronics compartment in the presence of a potentially explosive atmosphere, the device must be de-energised.

Before connecting or disconnecting the electrical connection cables of the device, make sure that all cables leading to the converter are isolated from the ground of the hazardous area. This also applies to protective earth (PE) or functional earth (FE) and equipotential bonding conductors (PA).

After opening the converter, grease the converter's flashback resistant cover threads including the cover seals if necessary. Use the multi-purpose grease NONTRIBOS[®], type Li EP2.

Replacing the indicator / modules

When exchanging a complete indicator or individual modules, refer to the section "Connecting power and I/O functions". In both cases, the measuring tube of the variable area flowmeter can remain in the pipeline. This also applies to line systems carrying product.



CAUTION!

*There may be a loss of measuring accuracy!
Faulty prisms between the measuring tube and the display housing should be replaced.*

Exchanging the entire device

Observe the information above. Also, ensure that all process connections and the pipeline are depressurized and free of product. Where environmentally critical products are concerned, carefully decontaminate the wetted parts of the flange system after dismantling.

***WARNING!***

- Pressurized pipes have to be depressurized before removing the measuring unit.
- In the case of environmentally critical or hazardous products, appropriate safety precautions must be taken with regard to residual liquids in the measuring unit.
- New gaskets have to be used when re-installing the device in the piping.



EXPLOSION PROTECTION CERTIFICATE OF CONFORMITY

Cert NO.GYJ13.1044X

This is to certify that the product

Variable Areas Flowmeter

manufactured by KROHNE Messtechnik GmbH

(Address:Ludwig - Krohne Strasse 5, Duisburg, Germany)

which model is H250/a/b/c/M40/d/e/f/g-Ex-h

Ex marking Ex d II C T1~T6 Gb DIP A21 T_A 70°C IP66/67

product standard /

drawing number APPR GD 821037-01

has been inspected and certified by NEPSI, and that it conforms
to GB 3836.1-2010,GB 3836.2-2010,GB 12476.1-2000

This Approval shall remain in force until 2018.03.17

Remarks

- 1.Conditions for safe use are specified in the attachment to this certificate.
- 2.Symbol "X" placed after the certification number denotes specific conditions of use, which are specified in the attachment to this certificate.
- 3.Model designation is specified in the attachment to this certificate.

Director

National Supervision and Inspection Centre for
Explosion Protection and Safety of Instrumentation

Issued Date 2013.03.18

This Certificate is valid for products compatible with the documents and samples approved by NEPSI.

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Edition 05

国家级仪器仪表防爆安全监督检验站

National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation

(GYJ13.1044X)

(Attachment I)

Attachment I to GYJ13.1044X

Variable areas flowmeter typed H250/a/b/c/M40/d/e/f/g-Ex-h, manufactured by Krohne Messtechnik GmbH has been certified National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI).

Variable areas flowmeter accords with following standards:

GB 3836.1-2010 Explosive atmospheres Part 1: Equipment-General requirements

GB 3836.2-2010 Explosive atmospheres Part2: Equipment protection by flameproof enclosures 'd'

GB 12476.1-2000 Electrical apparatus for use in the presence of combustible dust—Part 1-1:Electrical apparatus protected by enclosures and surface temperature limitation—Specification for apparatus

Variable areas flowmeter has the Ex-marking Ex d II C T1~T6 Gb DIP A21 T_A 70℃ IP66/67.

Following products are covered by this certificate.

H250/a/b/c/M40/d/e/f/g-Ex-h

a: H, U, blank

b: RR, HC, C, Ti, F

c: B, blank

d: S, R, T, blank

e: HT, blank

f: ESK

g: K1, K2, R1, R2

h: SE, SK

1. Special condition for safe use

Symbol "X" denotes special condition for safe use: Contact Krohne Messtechnik GmbH for information on the dimensions of the flameproof joints.

2. Condition for safe use

2.1 The external earth connection facility shall be connected reliably.

2.2 The ambient temperature of variable area flowmeter for explosive gas atmosphere is (-40~+65)℃.

The relation among temperature class, ambient temperature and maximum temperature of process medium is as following.

(GYJ13.1044X)

(Attachment I)

Table 1 Using a heat resistant connecting cable (above 90°C)

		Maximum permitted product temp. (°C)							
		Temp. Class	T6	T5	T4	T3		T2, T1	
Without heating jacket	With heat jacket	Ambient temp.	≤60°C	≤65°C	≤65°C	≤60°C	≤65°C	≤60°C	≤65°C
DN15	DN15	Not HT	85	100	135	200	175	200	175
DN25	DN25	HT	85	100	135	200	200	300	300
DN50									
DN80	DN50	Not HT	85	100	130	185	165	185	165
DN100	DN80	HT	85	100	135	200	200	300	300

Table 2 Using a standard connecting cable (above 70°C)

		Maximum permitted product temp. (°C)									
		Temp. Class	T6	T5		T4		T3		T2, T1	
Without heating jacket	With heat jacket	Ambient temp.	≤60°C	≤60°C	≤65°C	≤60°C	≤65°C	≤60°C	≤65°C	≤60°C	≤65°C
DN15	DN15	Not HT	85	100	75	105	75	105	75	105	75
DN25	DN25	HT	85	100	95	135	95	175	95	175	95
DN50											
DN80	DN50	Not HT	85	90	75	90	75	90	75	90	75
DN100	DN80	Not HT	85	100	90	135	90	155	90	155	90

2.3 The ambient temperature of variable area flowmeter for combustible dust atmosphere is (-40~+65) °C. The relation between ambient temperature and maximum temperature of process medium is as following.

Table 3 Using a standard connecting cable (above 70°C)

			Maximum permitted product temp. (°C)	
Without heating jacket	With heat jacket	Ambient temp.	≤60°C	≤65°C
DN15	DN15	Not HT	105	75
DN25	DN25	HT	175	95
DN50				
DN80	DN50	Not HT	90	75
DN100	DN80	Not HT	155	90

2.4 For explosive gas atmosphere installation, cable gland and blanking plug, certified to GB 3836.1-2010 and GB 3836.2-2010 with Ex marking Ex d IIC Gb shall be used. The engaged

(GYJ13.1044X)

(Attachment I)

threads shall be no less than 5.

2.5 For combustible dust atmosphere installation, cable gland and blanking plug, certified to GB 12476.1-2000 with marking IP66/67 shall be used.

2.6 End user is not permitted to change any components insides.

2.7 When installation, use and maintenance of Variable areas flowmeter, observe following standards.
GB3836.13-1997 Electrical apparatus for explosive gas atmospheres Part 13:Repair and overhaul for apparatus used in explosive gas atmospheres

GB3836.15-2000 Electrical apparatus for explosive gas atmospheres Part 15:Electrical installations in hazardous area (other than mines)

GB 3836.16-2006 Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation in hazardous areas (other than mines)

GB 50257:1996 Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering

GB 12476.2-2010 Electrical apparatus for use in the presence of combustible dust – Part 2: Selection and installation

GB 15577-2007 Safety regulations for dust explosion prevention and protection


3. Manufacturer's Responsibility

2.1 Special condition for safe use specified above should be included in the instruction manual.

2.2 Manufacturing should be done according to the documentation approved by NEPSI.

2.3 Any modification with influence on the type of protection should be submitted to NEPSI before application.

2.4 Following items should be added to the nameplate

- a) NEPSI log 
- b) Ex marking
- c) Number of certificate
- d) Ambient temperature range

National Supervision and Inspection Center
for Explosion Protection and Safety of Instrumentation

March 18, 2013





KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Products and systems for the oil & gas industry
- Measuring systems for the marine industry

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