



**Operating Instructions**  
**for**  
**Flow sensor model KAL-\*\*\*\*Ex**  
**with**  
**Electronic Analyzer**  
**Model: KAL-E\*\*Ex**



## 1. Contents

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## 2. Note

### 2.1 General

Before unpacking and commissioning the device, the operating instructions and the “General Safety Instructions” document must be read and followed carefully. The general safety instructions, the operating instructions, the data sheet as well as approvals and further information can be downloaded via the QR code on the device or under the respective product on [www.kobold.com](http://www.kobold.com).

Due to technical changes, the device documentation available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email ([info.de@kobold.com](mailto:info.de@kobold.com)) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the device should be used only when the entire machine fulfils the EU machinery directive.

### 2.2 Hazard warnings

The following instructions are intended to ensure your personal safety and to prevent damage to the product described or connected devices. Safety instructions and warnings to prevent danger to the life and health of users or maintenance personnel, or to prevent damage to property, are highlighted in this documentation using the symbols defined here. *The symbols and terms used have the following meaning in the documentation itself:*

Symbol	Explanation	Symbol	Explanation
 Note	Is important information about the product, the handling of the product or the respective part of the documentation to which particular attention should be drawn.	 Caution	Means that minor personal injury or minor property damage may occur if proper precautions are not taken.

Symbol	Explanation	Symbol	Explanation
 Warning	Indicates that serious personal injury or substantial property damage may occur if proper precautions are not taken.	 Danger	Means that death can occur if proper precautions are not taken.
 Warning	Attention: Hot surface!	 Warning	Warning: Dangerous electrical voltage

## 2.3 As per PED 2014/68/EU

For KAL-sensors with fittings model: KAL-11.. and KAL-12..

In acc. with Article 4 Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.

Diagram 8, Pipe, Group 1 dangerous fluids

## 3. Instrument Inspection

These devices are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, since they are responsible for damages during transit.

**The standard scope of supply includes the following components:**

- Sensor with PVC-coated cable
- Electronic analyzer
- 100  $\Omega$   $\pm$ 1% resistor

## 4. Regulation Use

The devices in model series KAL-EX are used to monitor the flow of combustible liquids up to explosion category IIB. They satisfy the European standards EN 60079-0:2012 + A11:2013 and EN 60079:11:2012 for explosion protection and are thus suitable for use in hazardous areas of Zone 0 as per DIN VDE 0165 (applies to the flow sensor only; the electronic analyzer must not be used in hazardous areas).

### Limit contacts

The devices are equipped with relays to monitor the flow speed of liquids. An additional temperature sensor triggers a relay if the set temperature is exceeded.

### Trend indicator

The actual flow value is indicated by a series of constantly illuminated LEDs on the LED strip display. The currently set switching point is indicated on the LED strip display by the individually blinking LED.

### Sensors

These sensors are available as screw-in (insertion style) or in-line versions.

Model KAL-EX devices always consist of two components:

- KAL-...Ex sensor
- KAL-E...Ex electronic analyzer

### Electronics

KAL-E3...Ex electronic analyzer

1 voltage-free changeover contact for temperature

1 voltage-free changeover contact for flow speed

The devices must only be used for liquids that will not damage the sensor housing.

When properly installed and maintained, the sensors are unaffected by dirt and cause essentially no loss of pressure. The length of the device lead should not exceed 100 meters.

 <b>Danger</b>	<p>Errors will result in zone carry-over. Danger of explosion!</p>
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## Switching ranges based on nominal pipe size (NPS).

NPS (mm)	Measuring Range (L/min) Water	NPS (mm)	Measuring Range (L/min) Water
8	0.12 - 6.0	40	3.0 - 150
10	0.19 - 9.4	50	4.7 - 235
15	0.42 - 21.8	60	6.8 - 340
20	0.75 - 37.7	80	12.0 - 603
25	1.18 - 59.0	100	18.8 - 942
30	1.7 - 84.8	150	42.4 - 2120

 <p>Note</p>	<p>For the specified measuring ranges, the flow velocity was converted to the nominal pipe diameter.</p> <p>It should be noted, that the flow velocity within the pipe tends towards the wall to drop close to 0.</p> <p>Depending on the nominal pipe diameter, the sensor screw-in depth, and the flow profile, significant deviations from the specified flow values may occur.</p>
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## 5. Operating Principle

The operation of the model KAL-EX electronic flow monitor is based on the calorimetric principle. The sensor tip is heated to a few degrees above the temperature of the flowing liquid. When the liquid is flowing, the heat generated in the sensor is transferred to it, i.e. the sensor is cooled. The rate-of-cooling process is an accurate measure of the flow speed.

The sensor signal is compared with the reference data (set threshold value) and stored in a microcontroller. If the actual flow speed is less than the desired flow speed, the electronic analyzer actuates an output relay. The microcontroller in the flow monitor permits easy calibration, allowing ideal temperature compensation of the device.

## 6. Mechanical Connection

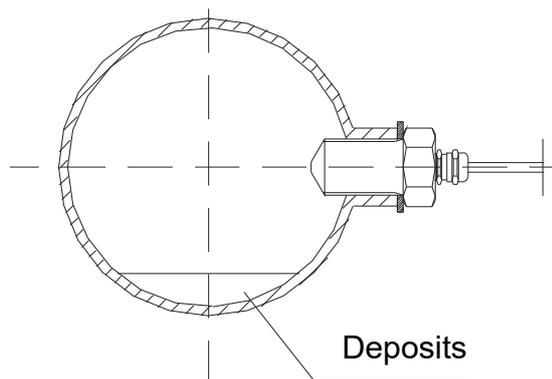
### 6.1 Before installation

Make sure that the actual flow speed corresponds to the switching range of the device. Make sure that the maximum process pressures and service temperatures specified for the device will not be exceeded. (See data sheet, Technical Details via the QR code on the device or via [www.kobold.com](http://www.kobold.com))

### 6.2 Installation

Mount the sensor in the piping and ensure that the tip is covered by the liquid to be monitored. The sensor tip must extend at least 5 mm (better > 5 mm) into the pipe (see below).

### 6.3 Mounting position



The sensors can be mounted in any position, provided that the piping is completely filled with the liquid to be monitored. The installation position must be free of swirling and turbulence (the recommended inlet and outlet area: 4x the diameter of the pipe with straight pipe sections immediately upstream and downstream of the sensor). If it is expected that the liquid will leave deposits in the piping, the illustrated mounting position is recommended (see figure at the left).

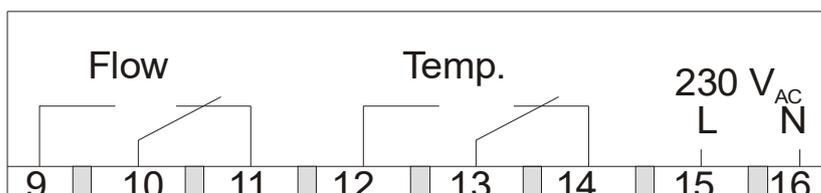
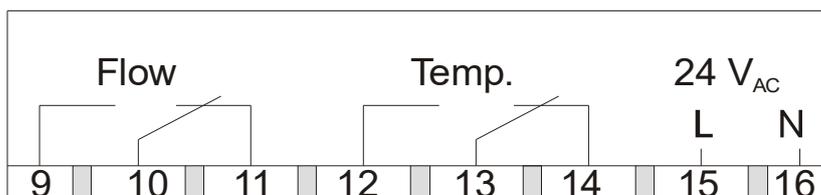
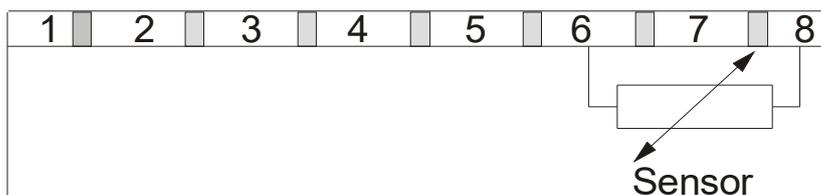
 <b>Danger</b>	<p>Improper installation can result in zone carry-over.            Danger of explosion!</p>
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## 7. Electrical Connection

 NOTE	<p>Make sure that the supply voltage of your system is the same as that specified on the device nameplate.</p>
Note	

- Make sure that the electrical supply lines are de-energized when connecting the device.
- Connect the sensor cable to terminals 6 and 8 of the electronic analyzer.
- Connect the supply line (power supply) to terminals 15 and 16.

 NOTE	<p>The relays are shown in the rest positions. The intrinsically safe input from electronic analyzer should only be connected to a KAL...Ex sensor.</p>
Note	



### AC power supply:

230 V<sub>AC</sub>, ± 10%, 50-60 Hz  
 24 V<sub>AC</sub>, ± 10%, 50-60 Hz

## 8. Operation / Configuration / Adjustments

### 8.1 Putting in operation

- Install the sensor in the piping (be sure the installation position is correct. Refer to Section 6 Mechanical Connection).
- Connect the sensor cable to the electronic analyzer. (Refer to section 8 Electrical Connection).
- Fill the piping with liquid.

 <p>Note</p>	<p>There must be no air bubbles present at the sensor tip. The flow speed must be 0.</p>
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### 8.2 Zero-point adjustment

- Place the electronic analyzer in operation (switch on the supply voltage)  
Rotate the flow potentiometer (1) (refer to section 11, “Brief operating instructions”) counterclockwise as far as it will go (to the left-hand stop).
- Rotate the temperature potentiometer (2) counterclockwise as far as it will go (to the left-hand stop).
- Briefly press the SET button for the zero-point adjustment (5)  
(press it with a suitable object, such as a ball point pen)
- The flow LED (6) will blink for approximately 30 seconds.  
After this time has expired, the flow LED (6) will stop blinking.
- If the system is not functioning properly, the flow LED (6) will blink continuously. In this case, press the SET button (5) once again. The device then switches back to measuring mode. Before continuing, inspect the mechanical and electrical installation. Then follow the “Putting in operation” instructions once again.
- Switch on the system and set the maximum rated flow rate.  
If the whole LED strip display is not illuminated, then the display can be expanded so that the range from 0.25 to 1.8 m/s extends across the entire LED strip display (see section 8.3 below).

### 8.3 Expanding the trend indicator

- Rotate the flow potentiometer (1) (see illustration) clockwise as far as it will go (to the right-hand stop). Then rotate the temperature potentiometer (2) counterclockwise as far as it will go (to the left-hand stop).
- Briefly press the SET button (5).
- The flow LED (6) will blink for approximately 30 seconds. After this time has expired, the flow LED (6) will stop blinking.

## 8.4 Resetting the adjustment

You can reset the electronic analyzer so that it once again uses its full range (0 - 2.0 m/s)

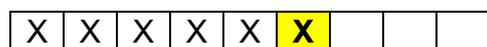
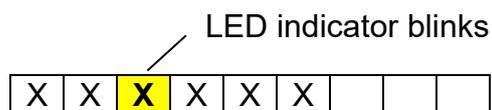
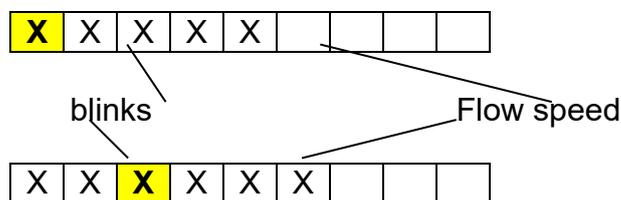
- Rotate the flow potentiometer (1) clockwise as far as it will go (to the right-hand stop).
- Rotate the temperature potentiometer (2) counterclockwise as far as it will go (to the left-hand stop).
- Press and hold the SET button (5) until the flow LED stops flashing
- The device is now reset to its initial state (0 - 2 m/s).

## 8.5 Switching point setting

After the device is adjusted to the specific liquid being measured (see above), you can then set the switching point.

- Adjust the flow rate.
- Rotate the flow potentiometer (1) counterclockwise as far as it will go (to the left-hand stop). The first LED in the LED strip display (3) starts to blink.
- Any number of LEDs in the LED strip display (3) is illuminated constantly.
- Rotate the flow potentiometer (1) clockwise to the desired switching point. The switching point selected is indicated by the blinking LED.

### Display 3



explanation	output
flow > setpoint	Flow relays activated Flow LED lights
flow = setpoint	Flow relays activated Flow LED lights
flow < setpoint	Flow relays deactivated Flow LED off

## 8.6 Temperature compensation

If the length of the cable connecting the sensor and the electronic analyzer is greater than 10 meters or if increased accuracy in temperature measurement is desired, we recommend that device be compensated as described below.

 Warning	Be sure to switch off the power supply
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- Connect the entire length of the cable to be used to terminals 6 and 8. Instead of the sensor, connect a 100 ohm  $\pm 1\%$  resistor (included in the delivery).
- Set the temperature potentiometer (2) to 80° C (rotate to right-hand stop) Switch on the power source and place the electronic analyzer in operation.
- Briefly press the SET button (5).  
The temperature LED and the flow LED will start to blink. After 10 seconds, they will go out.
- If the system is not functioning properly, the flow LED (6) will blink continuously. In this case, press the SET button (5) once again. The device then switches back to measuring mode. Before continuing, inspect the mechanical and electrical installation. Then follow the “Temperature compensation” instructions once again.
- If the temperature LED blinks faster, then the error could be caused because the sensor is still connected instead of the 100 ohm resistor.
- Finally, remove the 100 ohm resistor and reconnect the sensor.

## 9. Fault alarms

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In alarm mode the current relay stops functioning.  
This occurs under the following conditions:

- Actual value < Setpoint value
- Short circuit (at sensor)
- Line break
- Power failure

## 10. Maintenance

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This device is maintenance-free. Once a month, the sensor tip should be checked for the presence of mineral deposits (lime, etc.) and cleaned if necessary.

## 11. Brief operating instructions commissioning

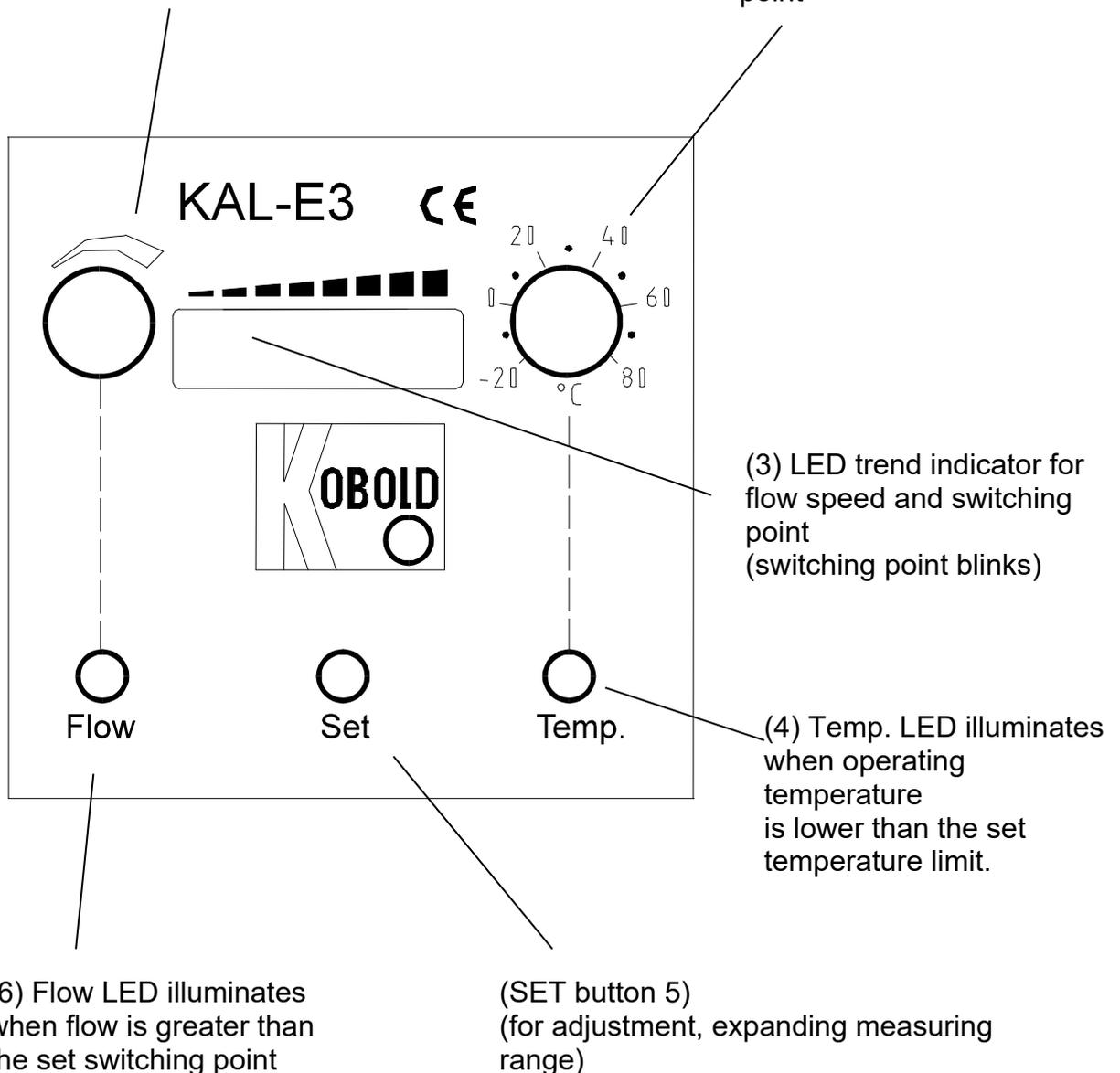
(1) Potentiometer

Adjusting the flow switching point

Zero-point adjustment

- Turn to the left-hand stop
- Expand measuring range
- Turn to the right-hand stop

(2) Potentiometer for setting the temperature switching point



## 12. Technical Information

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 13. Order Codes

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 14. Dimensions

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 15. Disposal

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See "General Safety Instructions" - via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 16. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

**Device:**            *Flow sensor type KAL-\*\*\*\* Ex*  
                          *Flow monitor type KAL-E\*\*-Ex*

to which this declaration relates is in conformity with the following EU directives stated below:

<b>2014/30/EU</b>	<b>EMC Directive</b>
<b>2011/65/EU</b>	<b>RoHS (category 9)</b>
<b>2015/863/EU</b>	<b>Delegated Directive (RoHS III)</b>

Additionally for devices with mains voltage 110 V<sub>AC</sub> and 230 V<sub>AC</sub>:

<b>2014/35/EU</b>	<b>Low Voltage Directive</b>
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Also, the following standards are fulfilled:

**EN IEC 61326-1:2021**

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

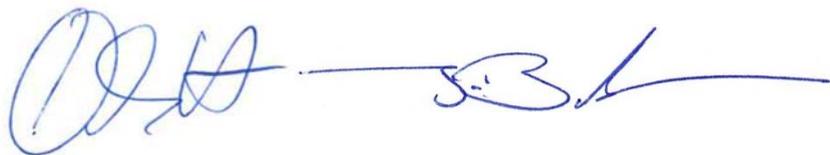
**EN IEC 63000:2018**

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Additionally for devices with mains voltage 110 V<sub>AC</sub> and 230 V<sub>AC</sub>:

<b>EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019</b>	<b>Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements</b>
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Hofheim, 04 Jan. 2024



H. Volz  
General Manager

J. Burke  
Compliance Manager

## 17. EU Declaration of Conformance (ATEX)

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We, Kobold Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, hereby declare under our sole responsibility and with the aim of traceability that the product

Product type:                   **Flow sensor Type: KAL-\*\*\*\*-Ex**  
  **Flow monitor type KAL-E\*\*-Ex**

EU type examination certificate:     **DMT 99 ATEX E 096**

Complies with all relevant requirements of the following directive(s):

**2014/34/EU**                   Equipment and Protective systems intended for use  
  in potentially Explosive Atmospheres

The following harmonized standards were applied for conformity assessment:

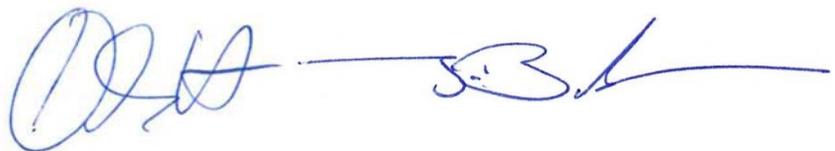
**EN IEC 60079-0:2018** Equipment – General requirements  
**EN 60079-11:2012**     Device protection through intrinsic safety “i”

The above-mentioned product complies with Directive 2014/34/EU. New editions may have already replaced one or more of the standards mentioned in the EU type examination certificates. Kobold Messring declares that the product mentioned in this declaration of conformity either meets the requirements of the new editions or is not affected by the changes.

The notified body DEKRA Testing and Certification GmbH, identification number: 0158, was activated, in accordance with Article 17 of Directive 2014/34/EU, to monitor quality assurance related to the production process.

Certificate:            BVS 24 ATEX ZQS/E110

Hofheim, 28 March 2025



H. Volz  
General Manager

J. Burke  
Compliance Manager

## 18. EU-type examination certificate



### (1) 1. Nachtrag zur EG-Baumusterprüfbescheinigung

- (2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG  
Ergänzung gemäß Anhang III Ziffer 6
- (3) Nr. der EG-Baumusterprüfbescheinigung: **DMT 99 ATEX E 096**
- (4) Gerät: **Durchflusssensor Typ KAL-\*\*\*\* Ex mit Auswertegerät Type KAL-E\*\* Ex**
- (5) Hersteller: **KOBOLD Messring GmbH**
- (6) Anschrift: **Nordring 22-24, 65719 Hofheim/Ts.**
- (7) Die Bauart dieser Geräte sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu diesem Nachtrag festgelegt.
- (8) Die Zertifizierungsstelle der DEKRA EXAM GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass diese Geräte die 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 erfüllen. Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 99.2086 EG niedergelegt.
- (9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

**EN 60079-0:2012 + A11:2013 Allgemeine Anforderungen  
EN 60079-11:2012 Eigensicherheit „i“**

- (10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.
- (11) Dieser Nachtrag zur EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung der beschriebenen Geräte in Übereinstimmung mit der Richtlinie 94/9/EG. Für Herstellung und Inverkehrbringen der Geräte sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.
- (12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

 **II 1G Ex ia IIB T4 Ga** für Typ KAL-\*\*\*\* Ex  
**II (1)G [Ex ia Ga] IIB** für Typ KAL-E\*\* Ex

DEKRA EXAM GmbH  
Bochum, den 11.03.2015



Zertifizierungsstelle



Fachbereich



Seite 1 von 3 zu BVS 99 ATEX E 096 / N1  
Dieses Zertifikat darf nur vollständig und unverändert weiterverbreitet werden.

DEKRA EXAM GmbH, Dinnendahlstraße 9, 44809 Bochum, Deutschland  
Telefon +49 234 3696-105, Telefax +49 234 3696-110, zs-exam@dekra.com



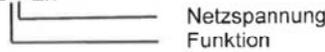
- (13) Anlage zum
- (14) **1. Nachtrag zur EG-Baumusterprüfbescheinigung  
DMT 99 ATEX E 096**
- (15) 15.1 Gegenstand und Typ

Durchflusswächter Typ KAL-\*\*\*\* Ex mit  
Auswertegerät Typ KAL-E\*\*-Ex

Anstelle der \*\*\* werden in den vollständigen Benennungen Ziffern eingefügt, die folgende Bedeutungen haben:

Durchflusssensor Typ KAL-\*\*\*\* Ex  
Die anstelle der \*\*\* eingesetzten Ziffern kennzeichnen die Gewindegröße, das Gehäusematerial und die Befestigungsart und haben keinen Einfluss auf den Explosionsschutz.

Auswertegerät Typ KAL-E\*\*-Ex



### 15.2 Beschreibung

Der Durchflusssensor und das Auswertegerät können auch nach den im zugehörigen Prüfprotokoll aufgeführten Prüfungsunterlagen gefertigt werden.

Grund des Nachtrags ist die Prüfung der Übereinstimmung der Geräte mit den aktuellen Normenfassungen EN 60079-0:2012 + A11:2013 und EN 60079-11:2012, daraus resultiert eine geänderte Kennzeichnung.

Die Anforderungen der bisher zitierten Norm EN 60079-26:2007 sind durch die Anwendung der EN 60079-0:2012 mit erfasst.

### 15.3 Kenngrößen (unverändert)

#### 15.3.1 Auswertegerät Typ KAL-E\*\* Ex

##### 15.3.1.1 Versorgungsstromkreis (Klemmen 15 und 16)

bei Typ KAL-E\*0-Ex

Nennspannung		AC	230	V
max. Spannung	$U_m$	AC	253	V

bei Typ KAL-E\*1-Ex

Nennspannung		AC	110	V
max. Spannung	$U_m$	AC	140	V

bei Typ KAL-E\*2-Ex

Nennspannung		AC	24	V
max. Spannung	$U_m$	AC	30	V

bei Typ KAL-E\*4-Ex

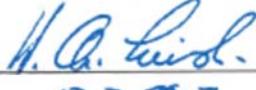
Nennspannung		AC	115	V
max. Spannung	$U_m$	AC	140	V

bei Typ KAL-E\*5-Ex

Nennspannung		AC	42	V
max. Spannung	$U_m$	AC	60	V



## 19. IECEx-certificate

		<h1>IECEx Certificate of Conformity</h1>	
<b>INTERNATIONAL ELECTROTECHNICAL COMMISSION</b> <b>IEC Certification Scheme for Explosive Atmospheres</b> <small>for rules and details of the IECEx Scheme visit <a href="http://www.iecex.com">www.iecex.com</a></small>			
Certificate No.:	IECEx BVS 15.0027	issue No.:0	Certificate history:
Status:	Current		
Date of Issue:	2015-03-13	Page 1 of 4	
Applicant:	<b>KOBOLD Messring GmbH</b> Nordring 22-24 65719 Hofheim/Ts. Germany		
Electrical Apparatus: Optional accessory:	Flow sensor type KAL-**** Ex with Flow monitor type KAL-E**-Ex		
Type of Protection:	Equipment protection by intrinsic safety "I"		
Marking:	Flow sensor type KAL-**** Ex Ex ia IIB T4 Ga	Flow monitor type KAL-E**-Ex [Ex ia Ga] IIB	
Approved for issue on behalf of the IECEx Certification Body:	H.-Ch. Simanski		
Position:	Head of Certification Body		
Signature: (for printed version)			
Date:	13.3.2015		
1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the <a href="http://www.iecex.com">Official IECEx Website</a> .			
Certificate issued by: <b>DEKRA EXAM GmbH</b> Dinnendahlstrasse 9 44809 Bochum Germany		 <b>DEKRA EXAM GmbH</b>	



## IECEX Certificate of Conformity

Certificate No.: IECEx BVS 15.0027  
Date of Issue: 2015-03-13  
Issue No.: 0  
Page 2 of 4

Manufacturer: **KOBOLD Messring GmbH**  
Nordring 22-24  
65719 Hofheim/Ts.  
Germany

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

**IEC 60079-0 : 2011** Explosive atmospheres - Part 0: General requirements  
Edition: 6.0  
**IEC 60079-11 : 2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"  
Edition: 6.0

*This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

### TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:  
[DE/BVS/ExTR15.0023/00](#)

Quality Assessment Report:  
[DE/BVS/QAR09.0001/06](#)



# IECEx Certificate of Conformity

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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

### General product information:

See Annex

### CONDITIONS OF CERTIFICATION: NO



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### EQUIPMENT(continued):

#### Parameters

1	Flow monitor type KAL-E**-Ex			
1.1	Power supply circuit (terminals 15 and 16) for type KAL-E*0-Ex			
	Rated voltage		AC	230 V
	Max. voltage	$U_m$	AC	253 V
	for type KAL-E*1-Ex			
	Rated voltage		AC	110 V
	Max. voltage	$U_m$	AC	140 V
	for type KAL-E*2-Ex			
	Rated voltage		AC	24 V
	Max. voltage	$U_m$	AC	30 V
	for type KAL-E*4-Ex			
	Rated voltage		AC	115 V
	Max. voltage	$U_m$	AC	140 V
	for type KAL-E*5-Ex			
	Rated voltage		AC	42 V
	Max. voltage	$U_m$	AC	60 V
1.2	Relay contact circuit (terminals 9 -11 and 12 - 14)			
	Switching voltage		AC	250 V
	Switching current			2 A
	Switching voltage		AC	125 V
	Switching current			3 A
	Switching voltage		DC	30 V
	Switching current			3 A
2	Circuit to the sensor level of protection Ex ia IIB (terminals 6 and 8)			
	Voltage	$U_o$	DC	16 V
	Current	$I_o$		1.1 A
3	Ambient temperature range			
	for the flow monitor type KAL-E**-Ex	$T_a$		-20 °C up to +55 °C
	for the flow sensor type KAL-****-Ex	$T_a$		-20 °C up to +85 °C

Annex: BVS\_15\_0027\_KOBOLD\_Annex.pdf



## IECEX Certificate of Conformity



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**Annex**  
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**General product information:**

The flow sensor in conjunction with the flow monitor is used for continuously monitoring of liquid media.

The electrical components of the flow monitor are placed inside a plastic enclosure, which will be mounted outside the hazardous area. On top of the enclosure terminals for the connection of the intrinsically safe and the non-intrinsically safe circuits are located.

The electrical components of the flow sensor are completely encapsulated inside a metallic enclosure. The connection of the sensor is done by an up to 100 m long permanently connected cable with the relevant terminals of the flow monitor.

Instead of the \*\*\* in the complete denomination numerals will be inserted which characterize different versions:

Flow sensor type KAL-\*\*\*\* E

The numerals instead of the \*\*\* characterize the thread size, material of the enclosure and kind of mounting and have no influence on explosion protection.

If the flow sensor will be installed in areas requiring EPL Ga equipment, the connecting cable has to be fixed and installed in a way that electrostatic charges / discharges are excluded.

Flow monitor type KAL-E\*\*-Ex



Power supply  
function