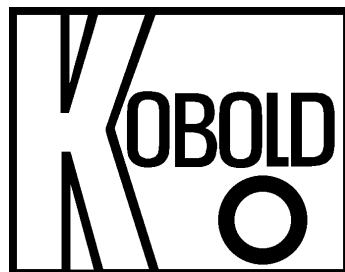


**Operating Instructions**  
**for**  
**Flow sensor model KAL-\*\*\*\*Ex**  
**with**  
**Electronic Analyzer**  
**Model: KAL-E\*\*Ex**



## 1. Contents

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### Manufactured and sold by:

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Internet: [www.kobold.com](http://www.kobold.com)

## 2. Note

---

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

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 measuring unit should be used only when the machines fulfil the EC-machine guidelines.

**as per PED 97/23/EG**

**for KAL-sensors with fittings model: KAL-11.. and KAL-12..**

In acc. with Article 3 Paragraph (3), "Sound Engineering Practice", of the PED 97/23/EC 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.



---

**Caution! Errors will result in zone carry-over. Danger of explosion!**

---

Switching ranges based on nominal pipe size (NPS).

| NPS (mm) | Measuring Range<br>(L/min)<br>Water | NPS (mm) | Measuring Range<br>(L/min)<br>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                         |



**Caution!** In determining the specified measuring ranges the flow speeds were based on nominal pipe sizes. However, please note that the force exerted by the flow speed against the pipe wall is essentially zero. Depending on the nominal pipe size, the sensor installation depth and the flow profile, there may be some significant deviations from the indicated flow values in the actual installation. Any use of the flow sensor, model: KAL-EX, which exceeds the manufacturer's specifications, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

---

## 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

---

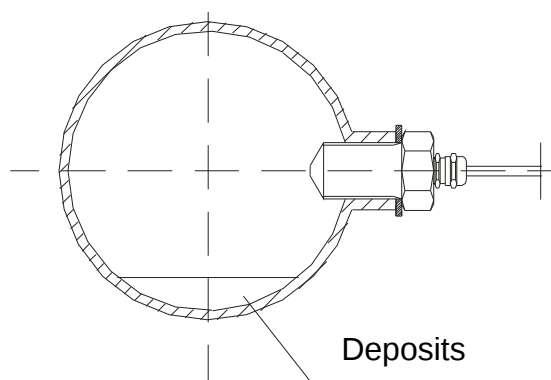
### 6.1 Before installation

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 section 12, "Technical details")

### 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).



---

**Caution: Improper installation can result in zone carry-over.  
Danger of explosion!**

---

## 7. Electrical Connection

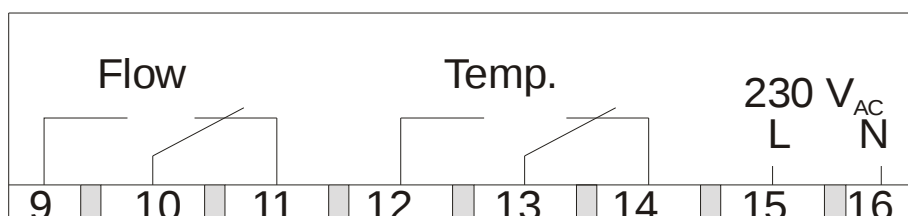
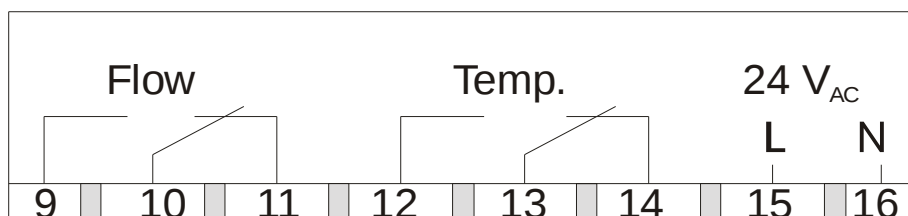
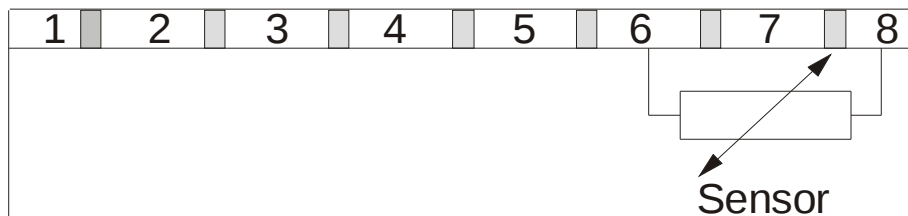


**Caution!** Make sure that the supply voltage of your system is the same as that specified on the device nameplate.

- 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.



**Caution:** The relays are shown in the rest positions. The intrinsically safe input from electronic analyzer should only be connected to a KAL-...Ex sensor.



### 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 7 Electrical Connection).
- Fill the piping with liquid.



---

**Caution! There must be no air bubbles present at the sensor tip. The flow speed must be 0.**

---

### 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)

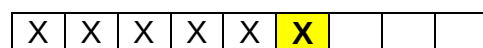
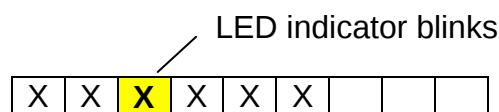
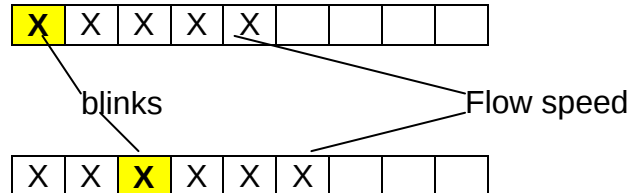
- Rotate the flow potentiometer (1) clockwise as far as it will go (to the right-hand stop).
- Rotate the temperature potentiometer (2) counterclockwise as far as it will go (to the left-hand stop).
- Press and hold the SET button (5) until the flow LED stops flashing
- The device is now reset to its 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<br>Flow LED lights |
| flow = setpoint | Flow relays activated<br>Flow LED lights |
| flow < setpoint | Flow relays deactivated<br>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.



---

**Caution! Be sure to switch off the power supply**

---

- 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

---

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

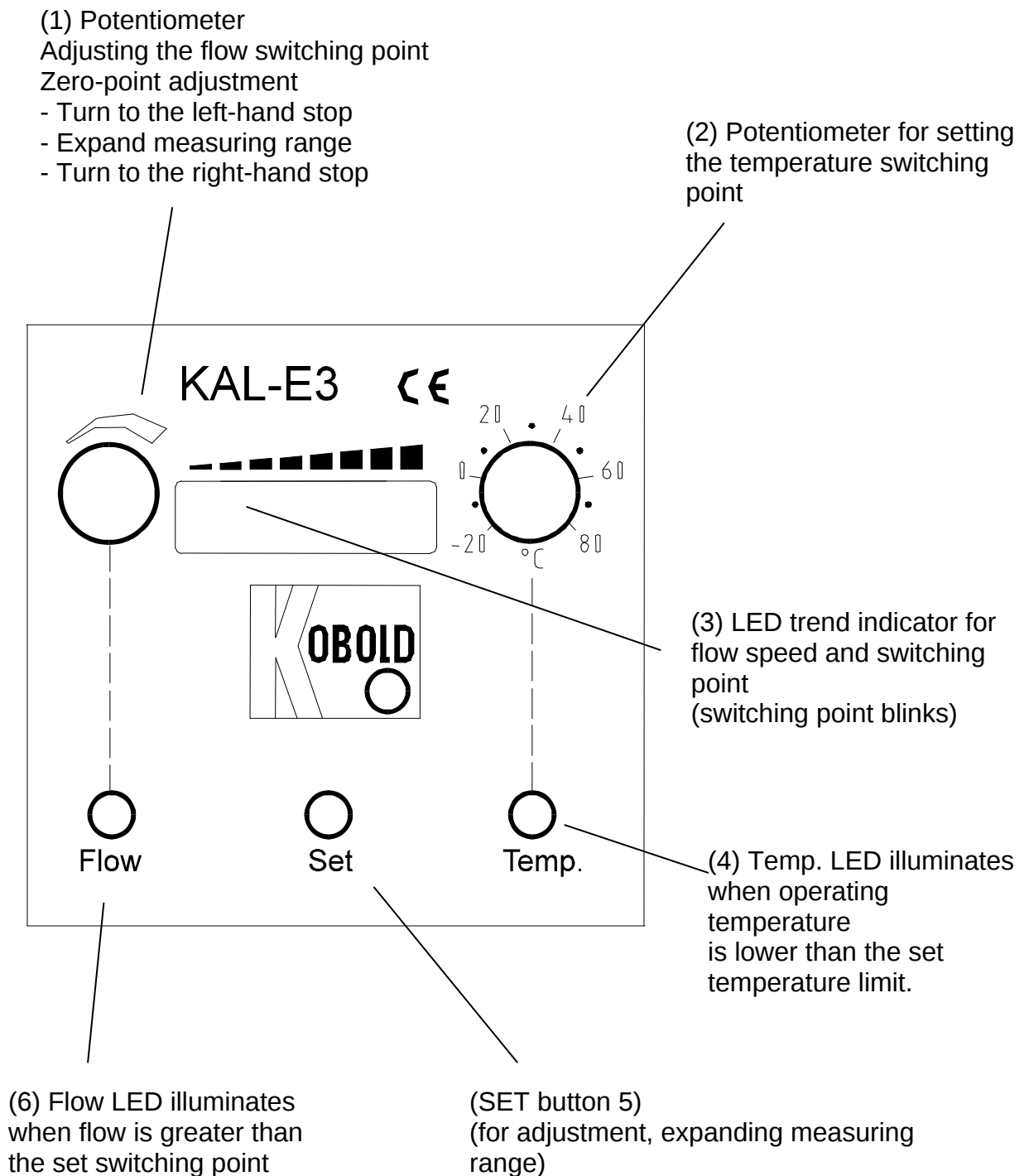
- Actual value < Setpoint value
- Short circuit (at sensor)
- Line break
- Power failure

## 10. Maintenance

---

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



## 12. Technical Data

---

ATEX-Approval:  
Marking:



DMT 99 ATEX E096  
II 1G Ex ia IIB T4 Ga (sensor)  
II (1)G [Ex ia Ga] IIB (electronic)  
IECEX BVS 15.0027  
Ex ia IIB T4 Ga (sensor)  
[Ex ia Ga] IIB (electronic)

IECEX-Approval:  
Marking:

### Sensor KAL-... Ex

Housing:  
Cable gland:  
Cable:

Stainless steel 1.4301 or 1.4571  
MS nickel-plated: conduit thread 7  
2 m PVC cable, 2 x 0.56 mm<sup>2</sup>  
max. line length 100 m  
Switching ranges: 4 cm/s to 200 cm/s  
Liquid temperature: -20 to +80 °C  
Max. pressure: 100 bar, except KAL-1132/KAL-1140: 25 bar  
Protection type (DIN 40050): IP 68

### Electronic analyzer KAL-E3..-Ex

Power consumption:  
Switching capacity:

max. 3.6 W  
max. 250 V<sub>AC</sub> / 2 A, 125 V<sub>AC</sub> / 3 A,  
30 V<sub>DC</sub> / 3 A

Switching points compensation:  
Switching function:

at potentiometer  
relay is operated with flow,  
(terminal 9+10 closed, LED illuminated)  
relay is operated when temperature is  
exceeded, LED illuminated,  
(terminal 12+13 closed)  
2 relays, each with 1 changeover contact  
LED indication  
max. 12 s.  
-20 °C to +55 °C  
DIN EN 50022 and DIN 46277  
IP 40  
IP 20  
Polycarbonate  
Intrinsically safe  
Detected as loss of flow, flow LED blinks  
Calibration data remain stored over 10 years,  
without battery

Output:  
Output state indicator:  
Time delay before availability:  
Temperature range:  
Top-hat rail mounting:  
Protection type housing:  
Protection type terminals:  
Material:  
Sensor output:  
Cable break or short circuit:  
Power failure:

Trend indication:  
Reproducibility:  
Response time:  
Accuracy temperature limit value:  
Floating voltage:  
Short-circuit current:

Accuracy of approx. 10%  
Approx. 2%  
Typically 5 sec., max 12 sec.  
± 2 °C  
 $U_0 \leq 16 \text{ V}_{DC}$   
 $I_0 \leq 1.1 \text{ A}$

## 13. Ordering details

A KAL-Ex measuring system always consists of a sensor and an electronic analyzer.

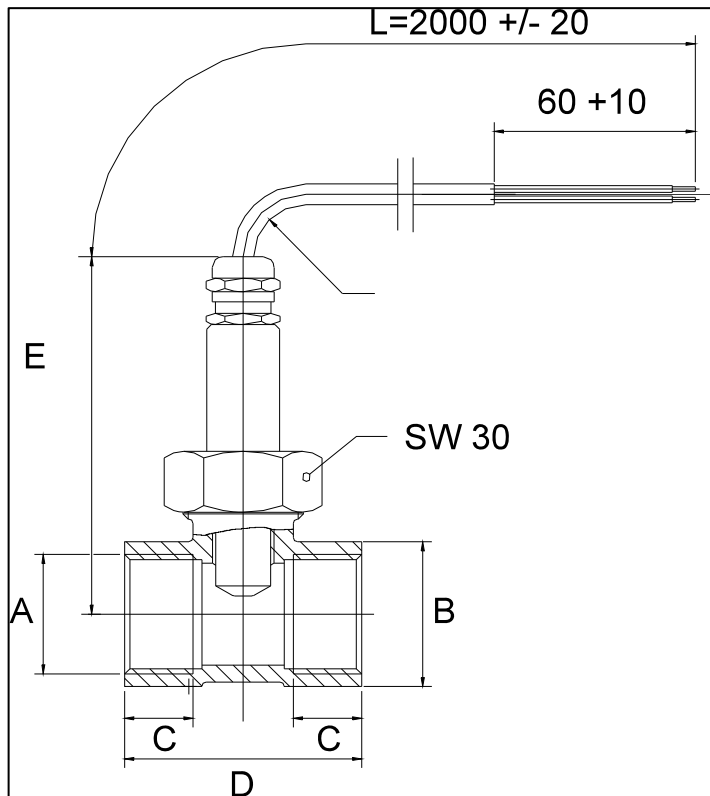
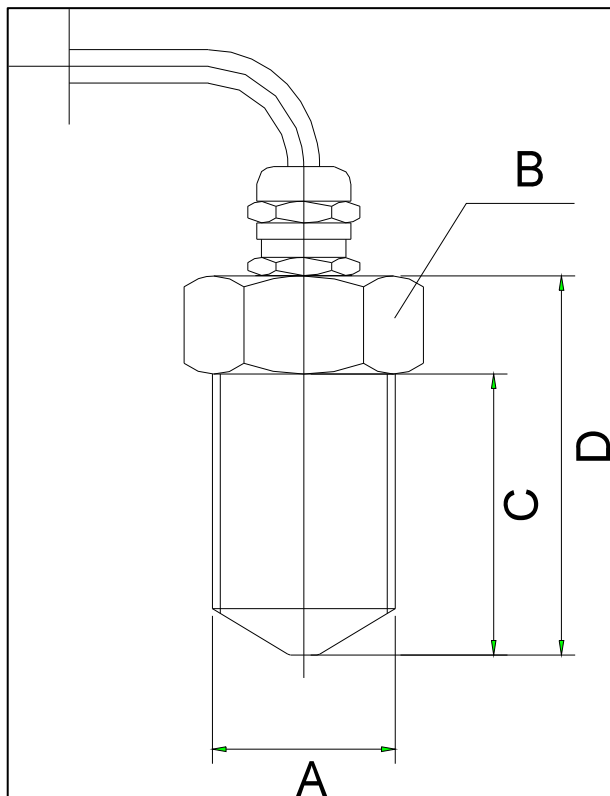
### Senor order details (example: KAL-1308 Ex)

| Sensor order details (example: KAL 1208 Ex)                                                                                                                                 |            |                               |          |                                  |                                  |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------|----------|----------------------------------|----------------------------------|--------------------------------------|
| <br><br> | Connection | Order numbers                 |          |                                  |                                  | Electrical connection/<br>version    |
|                                                                                                                                                                             |            | Sensor with insertion fitting |          | Sensor with inline fitting       |                                  |                                      |
|                                                                                                                                                                             |            | 1.4301                        | 1.4571   | Fitting brass /<br>Sensor 1.4301 | Fitting 1.4301/<br>Sensor 1.4301 |                                      |
|                                                                                                                                                                             | G 1/4      | KAL-1308                      | KAL-1408 | KAL-1108                         | KAL-1208                         | 00=2 m PVC cable                     |
|                                                                                                                                                                             | G 3/8      | -                             | -        | KAL-1110                         | KAL-1210                         | HT=2 m Silicone cable                |
|                                                                                                                                                                             | G 1/2      | KAL-1315                      | KAL-1415 | KAL-1115                         | KAL-1215                         | YP=PVC cable/<br>special length      |
|                                                                                                                                                                             | G 3/4      | KAL-1320                      | KAL-1420 | KAL-1120                         | KAL-1220                         | YS=Silicone cable/<br>special length |
|                                                                                                                                                                             | G 1        | -                             | -        | KAL-1125                         | KAL-1225                         | YY=Special cable/<br>special length  |
|                                                                                                                                                                             | G 1 1/4    | -                             | -        | KAL-1132                         | KAL-1232                         | Ex=Ex-Sensor,<br>PVC cable           |
|                                                                                                                                                                             | G 1 1/2    | -                             | -        | KAL-1140                         | KAL-1240                         | ATEX/IECEX<br>(specify cable length) |
|                                                                                                                                                                             | M 12 x 1   | KAL-0312                      | -        | -                                | -                                |                                      |
|                                                                                                                                                                             | 1/4 NPT    | KAL-5308                      | KAL-5408 | KAL-5108                         | KAL-5208                         |                                      |
|                                                                                                                                                                             | 3/8 NPT    | -                             | -        | KAL-5110                         | KAL-5210                         |                                      |
|                                                                                                                                                                             | 1/2 NPT    | KAL-5315                      | KAL-5415 | KAL-5115                         | KAL-5215                         |                                      |
|                                                                                                                                                                             | 3/4 NPT    | KAL-5320                      | KAL-5420 | KAL-5120                         | KAL-5220                         |                                      |

### Electronics order details (example: KAL-E30Ex)

|                                                                                     | Field of<br>application | Flow trend<br>indication | Temperature<br>monitoring | Supply voltage     |                    |                     |                     |
|-------------------------------------------------------------------------------------|-------------------------|--------------------------|---------------------------|--------------------|--------------------|---------------------|---------------------|
|                                                                                     |                         |                          |                           | 24 V <sub>DC</sub> | 24 V <sub>AC</sub> | 110 V <sub>AC</sub> | 230 V <sub>AC</sub> |
|                                                                                     |                         |                          |                           |                    |                    |                     |                     |
|  | Flow                    | -                        | -                         | KAL-E13            | KAL-E12            | KAL-E11             | KAL-E10             |
|                                                                                     |                         |                          |                           | KAL-EH13           | KAL-EH12           | KAL-EH11            | KAL-EH10            |
|                                                                                     | Flow                    | 8-LEDs                   | -                         | KAL-E23            | KAL-E22            | KAL-E21             | KAL-E20             |
|                                                                                     |                         |                          |                           | KAL-EH23           | KAL-EH22           | KAL-EH21            | KAL-EH20            |
|                                                                                     | Flow/<br>Temperaturw    | 8-LEDs                   | -20...+80°C               | KAL-E33            | KAL-E32            | KAL-E31             | KAL-E30             |
|                                                                                     |                         |                          | 0...+120°C                | KAL-EH33           | KAL-EH32           | KAL-EH31            | KAL-EH30            |
|                                                                                     | Flow/<br>Temperature    | 8-LEDs                   | -20...+80°C               | -                  | KAL-E32Ex          | -                   | KAL-E30Ex           |
|                                                                                     |                         |                          |                           |                    |                    |                     |                     |

## 14. Dimensions



Note: "SW" indicates the wrench size in mm across flats

| A       | B     | C  | D  |
|---------|-------|----|----|
| M 12x1  | SW 19 | 23 | 43 |
| G 1/4   | SW 19 | 26 | 43 |
| G 1/2   | SW 27 | 43 | 58 |
| G 3/4   | SW 32 | 43 | 58 |
| 1/4 NPT | SW 19 | 26 | 43 |
| 1/2 NPT | SW 27 | 43 | 58 |
| 3/4 NPT | SW 32 | 43 | 58 |

| A       | B     | C  | D  | E    |
|---------|-------|----|----|------|
| G 1/4   | SW 27 | 10 | 50 | 81   |
| G 1/2   | SW 27 | 10 | 50 | 81   |
| G 3/4   | SW 32 | 15 | 52 | 82.5 |
| G 1     | SW 39 | 15 | 56 | 85   |
| G 1 1/4 | SW 46 | 15 | 50 | 90   |
| G 1 1/2 | SW 55 | 15 | 50 | 92.5 |

## **15. Declaration of conformance**

---

We, KOBOLD-Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the products **KAL-\*\*\*\*Ex Flow sensor** and **KAL-E\*\*Ex electronic analyzer**

to which this declaration relates is in conformity with the standards noted below:

**EN 61000-6-4:2011** Electromagnetic compatibility - Basic specification:  
Interference emission

**EN 61000-6-2:2011** Electromagnetic compatibility - Basic specification:  
Noise immunity

**EN 61010:2010** Safety requirements for electrical measuring,  
control, regulating, and laboratory instruments

**EN 60079-0:2012 + A11:2013** General regulations

**EN 60079-11:2012** Intrinsic Safety "I"

Also the following EC guidelines are fulfilled:

**2004/108/EC** EMC Directive

**2006/95/EC** Low Voltage Directive

**94/9/EG** Equipment and Protective systems intended for  
use in a potentially Explosive Atmospheres (ATEX 100a)

**Quality Management Production**

Certificate number: BVS 09 ATEX ZQS / E110

Notified body: DEKRA Exam GmbH

Identification number: 0158

Hofheim, 21. June 2015



H. Peters  
General Manager



M. Wenzel  
Proxy Holder

## 16. EC-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**  
**II (1)G [Ex ia Ga] IIB**

für Typ KAL-\*\*\*\* Ex  
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



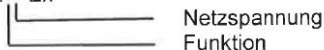
- (13) Anlage zum
- (14) **1. Nachtrag zur EG-Baumusterprüfbescheinigung  
DMT 99 ATEX E 096**
- (15) 15.1 Gegenstand und Typ

Durchflusssensor 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

max. Spannung

$U_m$

AC

230 V

AC

253 V

bei Typ KAL-E\*1-Ex

Nennspannung

max. Spannung

$U_m$

AC

110 V

AC

140 V

bei Typ KAL-E\*2-Ex

Nennspannung

max. Spannung

$U_m$

AC

24 V

AC

30 V

bei Typ KAL-E\*4-Ex

Nennspannung

max. Spannung

$U_m$

AC

115 V

AC

140 V

bei Typ KAL-E\*5-Ex

Nennspannung

max. Spannung

$U_m$

AC

42 V

AC

60 V

Seite 2 von 3 zu BVS 99 ATEX E 096 / N1

Dieses Zertifikat darf nur vollständig und unverändert weiterverbreitet werden.



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## 17. IECEx-certificate

|                                                                                                                                                                                                                                     |                                                                                      | <h3>IECEx Certificate of Conformity</h3>                                                                       |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------|
| <b>INTERNATIONAL ELECTROTECHNICAL COMMISSION</b><br><b>IEC Certification Scheme for Explosive Atmospheres</b><br><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><br>Nordring 22-24<br>65719 Hofheim/Ts.<br>Germany        |                                                                                                                |                      |
| Electrical Apparatus:                                                                                                                                                                                                                                                                                                | Flow sensor type KAL-**** Ex with Flow monitor type KAL-E**-Ex                       |                                                                                                                |                      |
| Optional accessory:                                                                                                                                                                                                                                                                                                  |                                                                                      |                                                                                                                |                      |
| Type of Protection:                                                                                                                                                                                                                                                                                                  | Equipment protection by intrinsic safety "i"                                         |                                                                                                                |                      |
| Marking:                                                                                                                                                                                                                                                                                                             | Flow sensor type KAL-**** Ex<br>Ex ia IIB T4 Ga                                      | Flow monitor type KAL-E**-Ex<br>[Ex ia Ga] IIB                                                                 |                      |
| Approved for issue on behalf of the IECEx Certification Body:                                                                                                                                                                                                                                                        | H.-Ch. Simanski                                                                      |                                                                                                                |                      |
| Position:                                                                                                                                                                                                                                                                                                            | Head of Certification Body                                                           |                                                                                                                |                      |
| Signature:<br>(for printed version)                                                                                                                                                                                                                                                                                  |  |                                                                                                                |                      |
| Date:                                                                                                                                                                                                                                                                                                                | 13.3.2015                                                                            |                                                                                                                |                      |
| 1. This certificate and schedule may only be reproduced in full.<br>2. This certificate is not transferable and remains the property of the issuing body.<br>3. The Status and authenticity of this certificate may be verified by visiting the <a href="http://Official IECEx Website">Official IECEx Website</a> . |                                                                                      |                                                                                                                |                      |
| Certificate issued by:<br><b>DEKRA EXAM GmbH</b><br>Dinnendahlstrasse 9<br>44809 Bochum<br>Germany                                                                                                                                                                                                                   |                                                                                      | <br><b>DEKRA EXAM GmbH</b> |                      |



## IECEx Certificate of Conformity

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Date of Issue: 2015-03-13

Issue No.: 0

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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:

|                                            |                                                                               |
|--------------------------------------------|-------------------------------------------------------------------------------|
| <b>IEC 60079-0 : 2011</b><br>Edition: 6.0  | Explosive atmospheres - Part 0: General requirements                          |
| <b>IEC 60079-11 : 2011</b><br>Edition: 6.0 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I" |

*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](#)

|              |                   | <b>IECEX Certificate<br/>of Conformity</b> |  |
|-----------------------------------------------------------------------------------------------|-------------------|--------------------------------------------|--|
| Certificate No.:                                                                              | IECEX BVS 15.0027 |                                            |  |
| Date of Issue:                                                                                | 2015-03-13        | Issue No.: 0                               |  |
|                                                                                               |                   | Page 3 of 4                                |  |
| <b>Schedule</b>                                                                               |                   |                                            |  |
| <b>EQUIPMENT:</b><br><i>Equipment and systems covered by this certificate are as follows:</i> |                   |                                            |  |
| <b>General product information:</b><br>See Annex                                              |                   |                                            |  |
| <b>CONDITIONS OF CERTIFICATION: NO</b>                                                        |                   |                                            |  |



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### EQUIPMENT(continued):

#### Parameters

|     |                                                                         |          |                     |  |
|-----|-------------------------------------------------------------------------|----------|---------------------|--|
| 1   | Flow monitor type KAL-E**-Ex                                            |          |                     |  |
| 1.1 | Power supply circuit (terminals 15 and 16)<br>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 | 18 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                                    | $T_s$    | -20 °C up to +85 °C |  |

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



## IECEx Certificate of Conformity



**Certificate No.:** IECEx BVS 15.0027  
**Annex**  
**Page 1 of 1**

### 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