Kirchner und Tochter
Durchflussmesstechnik seit 1951

Supplementary Installation and Operating Instructions

Flap type flow meter
KLA Ex
KLA-GS Ex
KLA-IK1 Ex
KLA-IK2 Ex
KLA-V4A Ex
KLA-V4A-IK1 Ex
KLA-V4A-IK2 Ex

Category:
II 2G Ex T6

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Version 1.5

Contents

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1 General safety directions

This supplement to the installation and operating instructions is valid for explosion protection designs of variable area flow meters of the following series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

It supplements the installation and operating instructions for the designs not for protection from explosions.

The information in these instructions only contains data that are related to explosion protection.

The technical information of the installation and operating instructions for the designs not for protection against explosions remain valid unchanged, as long as they are not excluded or replaced by these instructions.

The variable area flow meters of the series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

are not subject to European Directive 2014/34/EU (ATEX) under the stated operating conditions.

→ TÜV Rheinland test report: 557 / Ex 689.01 / 08

Danger!
Danger of explosion can result from incorrect handling. Installation, set up, commissioning and service of explosion protected operating material must only be performed by personnel trained in explosion protection („competent person“).

2 Main safety features

2.1 Category/zone

Variable area flow meters of type

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

are designed for use in Category 2 according to Directive 2014/34/EU and are suitable as per EN 60079/14 for use in Zone 1 and Zone 2 - also refer to section 9.1 to 9.4.

2.2 Ignition protection types

The electrical circuits of the limit indicator are designed in the ignition protection type „intrinsically safe“ of category „ia“. They may only be operated with approved and suitable switch amplifiers, whereby the connection values are limited according to Namur - see section 4.1.

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2.3 Temperature classes

Highest permitted ambient/measurement material temperatures for flap type flow meters of the series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

in °C for use in temperature class T6-T1:

The tables take into consideration the following parameters for determining the permissible temperature class

- Ambient temperature T_{amb}
- Medium temperature T_m

Temperature class							
T6		T5		T4		T3-T1	
T_{amb}:	< 40 °C	T_{amb}:	< 40 °C	T_{amb}:	< 40 °C	T_{amb}:	< 40 °C
T_m:	< 70 °C	T_m:	< 85 °C	T_m:	< 120 °C	T_m:	< 150 °C

2.4 Operating pressure

The following table shows the maximum permitted operating pressures. In addition this is always imprinted on the rating plate of the device as well.

Series	DN	max. operating pressure [bar]
KLA, KLA-V4A, ... IK	15 - 200	10
KLA-GS	15	10
KLA-GS	20	10
KLA-GS	25	10
KLA GS	32	9
KLA GS	40	9
KLA GS	50	9
KLA GS	65	10
KLA GS	80	10
KLA GS	100	10
KLA GS	125	7
KLA GS	150	6,5

2.5 Static electricity

With variable area flow meters it is basically possible for the electrostatic field, which is generated in the interior of the measuring tube, to reach to the exterior of the device.

Flap type flow meters of the series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

are therefore to be permanently grounded (see section 4).

Danger!
Danger of explosion can result from incorrect connection. The operating company is responsible for installing error free grounding of the process line.

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2.6 Static discharge

Surfaces can be electrostatically and combustibly charged during cleaning (e.g. Plexiglas protection on viewing window). These surfaces are marked with the shown adhesive label.

Caution! Measures against static charging
Do not rub the plastic surface.
Clean surfaces only with a damp cloth.

The marked locations may be cleaned only with a damp, lint-free cloth.

In addition, caution should be taken not to rub against these surfaces with clothing, since static charge can occur at any time.

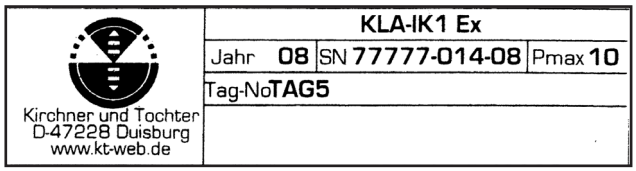
Dust deposits on the housing of the variable area flow meter are also to be removed with a damp cloth.

The deposits must not exceed a thickness of 3 mm.

3 Labelling

The identification of the entire device is done on the sleeve parallel to the viewing window with the following rating plates:

KLA-IK1 Ex:



Year	Year of manufacture
P max	Max. allowable operating pressure
Tag No.	Measurement point marking
SN	Serial number

Composition of the serial number XXXXX-YYY-ZZ

Example:

77777-014-08	Order number 77777 Device no. 14 in order with year of manufacture 2008

4 Installation and setup

Danger!

Danger of explosion can result from incorrect handling. Installation and setup of explosion protected operating material must only be performed by personnel trained in explosion protection.

The instructions of the installation and operating instructions and the supplement to the installation and operating instructions are absolutely to be followed here.

Calibration of the variable area flow meters with respect to the area of use is to be checked by inspection of the rating plate.

Flap type flow meters must be grounded - also refer to the illustration in section 4.4 for this.

If the equipment is not sufficiently grounded via the process line, an additional ground connection is to be created via the ground connection on the back of the sleeve. The connection only guarantees an electrostatic connection of the equipment and does not meet the requirements of a potential equalization connection.

The equipment must be operated with an upstream throttle valve, if possible pressure surges in the piping cannot be operationally avoided.

4.1 Electrical connection

The simple, intrinsically safe reed contact is fastened to the variable area flow meter.

This reed contact must only be done by a type-approved, suitable switch amplifier with intrinsically safe electrical circuits. The following maximum values must be observed:

	Characteristic data	
Built in limit value switch	Ui [V]	Ii [mA]
BI1-HS540-Y1	8 VDC	1,2 mA / 2,1 mA
SJ 3,5N	8 VDC	1 mA / 3 mA
SC 3,5-N0-BU	8 VDC	1 mA / 3 mA

These limit value switches do not assume safety relevant functions within the system.

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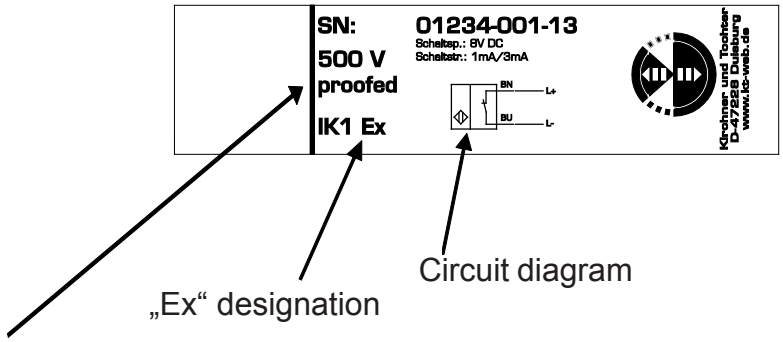
4.2 Pin assignments

The electrical connection of the installed intrinsically safe reed contact is described in the installation and operating instructions and pictured on the contact plug.

For the „Ex“ design, the remark „500 V proofed“ must be on the contact label as shown in the following illustration. In addition, the type designation also contains „Ex“. Only equipment with this tested and marked contact is allowed for operation in the „Ex area“. The operating company of the system must ensure that the contact label shown below is present on the reed contact



Warning!
This remark must be present on the label to be allowed to operate the equipment in the „Ex” area

4.3 Connection cable

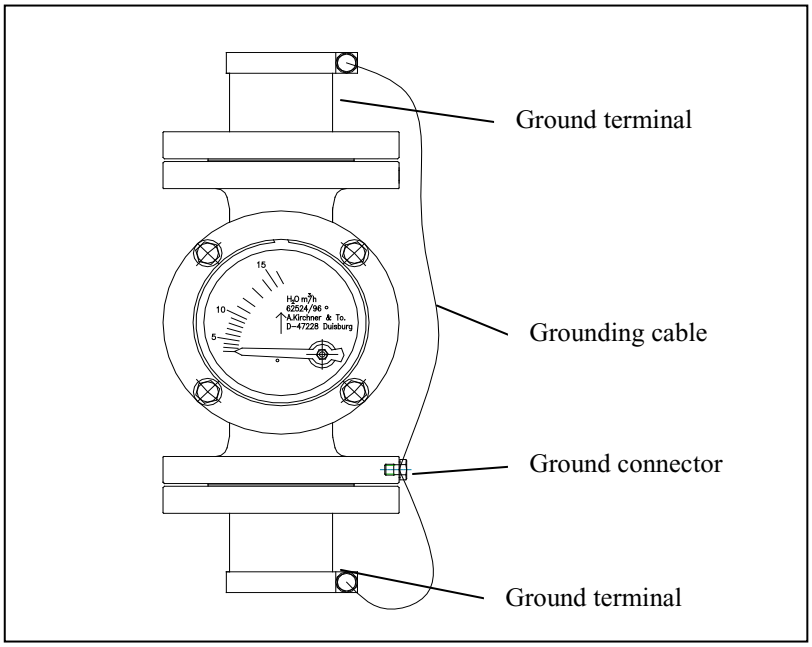
The connection cable for the intrinsically safe electrical circuits is to be selected according to the valid installation standard (e.g. EN 60079-14). Summed current generation between different, intrinsically safe electrical currents of the variable area flow meter is to be avoided.

4.4 Ground connector

The following illustration shows a principle sketch of the connection of the ground cable with the process line.

This ground cable must be connected with the process line before commissioning of a flap type flow meter in the series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex



5 Start-up

Before start-up, the following tests are to be performed:

1. Qualification testing for sufficient corrosion resistance to the measuring media of the materials used for measurement parts and the used sealing materials.
2. Connect the installed, intrinsically safe reed contacts correctly.
3. Electronically ground the measurement equipment - also see the illustration in section 4.4.
4. To prevent pressure surges, the operating company must ensure that the device is run with a continuous volume flow (do not use solenoid valves).

6 Service

The flap type flow meters of the series

- KLA Ex
- KLA-GS Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-V4A Ex
- KLA-V4A-GS Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex

are maintenance free under normal operating conditions and proper usage.

In unfavourable operating modes, adverse measurement functions can occur due to soiling of the measuring glass or the variable area flow meter. In this case a cleaning of the measurement glass and the variable area flow meter is to be performed according to the installation and operating instructions. Alternatively, the device can be sent to Kirchner und Tochter GmbH for cleaning.

Danger!
Danger of explosion can result from incorrect handling. The service of explosion protected operating material must only be performed by personnel trained in explosion protection.

Systems in potentially explosive areas must be regularly inspected for their proper condition. The following tests must be performed regularly:

- Visual inspection of the housing, measurement glass and connection pieces for damage or corrosion.
- Check the measurement parts for leaks.
- Include the flap type flow meter in the regular pressure tests of the process line.
- Dust deposits on the equipment must not exceed a thickness of 3 mm.
- The equipment is to be thoroughly cleaned with a damp cloth.

7 Dismantling

7.1 Electrical connection

The disassembly should preferably be carried out in a voltage-free state. If this is not possible, the basic conditions for intrinsic safety (e.g. no grounding or connection of different intrinsically safe electrical currents) must be observed during disassembly.

7.2 Process connections

Danger!
Danger of injury due to media escaping under pressure. The lines in which the flap type flow meter is installed are to be discharged before disassembly.

Depending on the medium, damage to the respiratory system or the skin may occur, for example Uncontrolled discharge of residual liquid from the flap type flow meter is to be avoided.

For environmentally critical measuring media, all parts which have been in contact with the media are to be decontaminated carefully after removal. Removal and installation is the responsibility of the operating company.

8 Maintenance

Maintenance, which is relevant to safety in regards to explosion protection, is only to be performed by the manufacturer, their agents or supervised by authorised technicians.

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9 Annex

9.1 TÜV Statement (Technical control board)

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Stellungnahme zur Anwendbarkeit der RL 2014/34/EU (ATEX)

Für Geräte und Komponenten zur Verwendung in explosionsgefährdeten Bereichen

Statement for application of directive 2014/34/EU

for Equipment and Components intended for Use in Potentially Explosive Atmospheres

Gegenstand: Gerät/Komponente Typ Subject: Equipment/Component type	**Klappendurchflussmessgeräte der Baureihe KLA in explosionsgeschützter Ausführung** **Flap-type flowmeters of the KLA series in explosion-proof design**
Hergestellt und zur Prüfung vorgelegt Manufactured and submitted for examination	**A. Kirchner & Tochter GmbH**
Anschrift Address	**Dieselstraße 17, D-47228 Duisburg**
Prüfgrundlage Basis for examination	**Anhang II der Richtlinie 2014/34/EU** **Annex II of Directive 2014/34/EU**
Verwendete Normen Standard basis	**EN 1127-1:2011, DIN EN ISO 80079-36:2016**
Schutzartkennzeichen Code for type of protection	**Keine** **None**
Prüfergebnis: Examination result	**Das Gerät fällt unter den weiter unten genannten Bedingungen nicht in den Anwendungsbereich der Richtlinie 2014/34/EU.** **The device does not fall within the scope of Directive 2014/34/EU under the conditions set out below.**
Prüfbericht-Nr: Assessment number	**557/Ex689.01/08**

TÜV Rheinland Industrie Service GmbH
Certification body for explosion-proof products
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Genau. Richtig.

1. Object and type

Flap-type flow meters of the KLA series

- KLA Ex
- KLA-IK1 Ex
- KLA-IK2 Ex
- KLA-GS Ex
- KLA-V4A Ex
- KLA-V4A-IK1 Ex
- KLA-V4A-IK2 Ex
- KLA-V4A-GS Ex

2. Description

The meters are designed to measure the flow of liquids on the flap-type flow measurement principle and are intended for installation in horizontal or vertical pipes. The installation must be carried out according to the manufacturer's instructions in the operating manual.
The KLA-IK2 Ex/KLA-V4A-IK2 Ex devices are equipped with two adjustable proximity switches that are used to monitor the measured value. The KLA-IK1 Ex/KLA-V4A-IK1 Ex devices are equipped with a cylindrical inductive limit switch or a proximity switch. The sensors are certified by EC-type examination certificates KEMA 02 ATEX 1090 X and PTB 99 ATEX 2219 X.

3. Technical data

Ambient temperature:	0 °C to 40 °C
Nominal voltage:	20 V DC
Max. operating pressure:	10 bar
Protection rating:	IP 54

4. Test result

The flap-type flow meters listed in section 1 do not fall within the scope of Directive 2014/34/EU because, when used as intended, they do not have their own potential ignition sources and do not cause any potential ignition sources in the potentially explosive atmosphere.

5. ATEX marking

Not required

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6. Conditions for safe use or instructions for use

- **Electrostatic charge**
  The operator must avoid electrostatic charging of the device according to the manufacturer's instructions.
- **Dust deposits**
  Dust deposits must be avoided. The maximum layer thickness must not exceed 3 mm.
- **Electrical connection**
  The flow meter can be equipped with a limit switch in order to implement a device display with a monitoring function (type KLA-IK Ex/KLA-V4A-IK Ex). The sensor must only be connected to intrinsically safe circuits. The following maximum values must be observed:

Device	Type	Ui (NAMUR)	Ii
Inductive sensor	BI-HS540-Y1	8 V DC	1.2mA/2.1mA
Inductive proximity sensor	SJ 3.5N	8 V DC	1mA/3mA
Inductive proximity sensor	SC 3.5-N0-BU	8 V DC	1mA/3mA

The manufacturer must ensure that the electrical data determined during the test are permanently set and complied with.

TÜV Rheinland Industrie Service GmbH
Certification body for Ex products
Alfredstrasse 81
D-45130 Essen, Germany

Essen, 29/10/2019

M.Sc. Svetlana Stolarski
Expert

Stefanie Schwarz
Expert

TÜV Rheinland Industrie Service GmbH
Certification body for explosion-proof products

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9.2 Declaration of conformity

Kirchner und Tochter
Durchflussmesstechnik seit 1951

Konformitätserklärung
Declaration of Conformity

A. Kirchner & Tochter GmbH, Dieselstr. 17, 47228 Duisburg, Deutschland

Wir erklären hiermit unter alleiniger Verantwortung, dass folgende Produkte
We declare herewith under sole responsibilty that the products

KLA / KLA-GS / KLA-IK1 / KLA- IK2 / KLA-V4A / KLA-V4A-IK1 / KLA-V4A-IK2 / KLA Ex / KLA-GS Ex / KLA-IK1 Ex / KLA-IK2 Ex / KLA-V4A-Ex/ KLA-V4A-IK1 Ex / KLA-V4A-IK2 Ex
Klappendurchflussmessgerät / Flap Type Flow meter

konform sind mit den Schutzzielen der Richtlinien des europäischen Parlaments und des Rates (soweit zutreffend).
are in conformity with the protection requirements of the European Parliament and of the Council (as far as applicable).

Der geforderte Sicherheits- und Gesundheitsschutz wird erfüllt in Übereinstimmung mit den harmonisierten Standards oder den angeführten technischen Normen (soweit zutreffend):
The stipulated safety and public health safety requirements are fulfilled in accordance with the harmonised standards or mentioned technical specifications (as far as applicable):

Richtlinie / Directive		**Harmonisierte Normen/ Harmonised standards**	**Angewendete nationale Normen und Vorschriften/ Applied national standards and specifications**
2014/68/EU	Druckgeräterichtlinie Pressure Equipment Directive	EN 12266-1:2012-06	–

Laut Stellungnahme zur Anwendbarkeit der RL 94/9/EG des TÜV Rheinland, fallen die Geräte nicht unter den Anwendungsbereich der Richtlinie 94/9/EG (ATEX) bzw. 2014/34/EU. Sie haben keine eigenen Zündquellen.
Laut Prüfbericht des TÜV Rheinland mit der Nr. 194/ex689.00/08 vom 22.12.2008 zur Anwendbarkeit der RL 94/9/EG dürfen die oben genannten Geräte in Zone 1, Explosionsgruppe IIC eingesetzt werden.
According to the opinion on applicability of the Directive 94/9/EC by the TÜV Rheinland the devices do not fall under the scope of Directive 94/9/EC (ATEX) resp. 2014/34/EU. They have no own sources of ignition.
According to the test report of TÜV Rheinland with the No. 194/ex689.00/08 from 2008-12-22, to the applicability of Directive 94/9/EC the devices mentioned above may be used in Zone 1, explosion group IIC.

		Kennzeichnung / Marking			
Richtlinie/ Directive	**Konformitäts-bewertung/ Assessment**	**Registrier Nr./ EC Type Approval**	**Kategorie/ Category**	**Benannte Stelle/ Notified body**	**Nr./ No.**
2014/68/EU	Art 4.3 SEP	–	Art 4.3	–	–

Die Geräte werden übereinstimmend mit der Druckgeräterichtlinie 2014/68/EU nach guter Ingenieurspraxis Art. 4.3 ausgelegt, hergestellt und dürfen kein CE Zeichen tragen. Unabhängig von der Einstufung werden die Geräte nach Modul A1 der DGRL den entsprechenden Druckfestigkeitsprüfungen unterzogen.
In accordance with the Pressure Equipment Directive 2014/68/EU, the devices are designed and produced following good engineering practice art. 4.3 and may not have a CE mark. Regardless of the classification, the devices are subjected to the corresponding pressure strength tests according to module A1 of the PED.

Duisburg, 21.09.2016

Torsten Krawczyk
Geschäftsführer/
Managing Director

i.V. Stanislaw Wosmiller
Konstruktion/
Engineering

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Geschäftsführende Gesellschafterin: Almuth Anne Römer
Amtsgericht Duisburg

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Notes

Notes

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Notes

The devices from **Kirchner und Tochter** have been tested in compliance with applicable EC/EU CE-regulations of the European Community.

The respective declaration of conformity is available on request. Subject to change without notice. The current valid version of our documents can be found at www.kt-flow.de.

The **Kirchner und Tochter** QM-System is certified in accordance with DIN EN ISO 9001:2015. The quality is systematically adapted to the continuously increasing demands.

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