Operating Instruction

for

Viscosity Compensated Flow Meter and Monitor

Model: VKG

1. Contents

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: 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 instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals 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) 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 against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via 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 measuring unit should be used only when the machines fulfil the EC-machine guidelines.

as per PED 2014/68/EU

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 checked before dispatch and sent away in perfect condition. Should the 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.

Scope of delivery:

- Viscosity Compensated Flow Meter and Monitor model: VKG

4. Regulated Use

Model VKG instruments are used for the measurement and monitoring of viscous liquid flows (max. 760 mm^2/s). Only clean and homogeneous media may be measured, which do not affect the materials used in the instrument casing.
Large measuring errors will occur when using higher viscosity media. Large dirt particles may lead to blocking of the float and therefore to large measurement and signal errors.
Ferritic particles that deposit on the float body (with internal magnet) may also lead to a similar effect.

The instruments are provided as follows:

Flow measurement
The actual flow may be read locally off the instrument. The top of the float indicates directly the flow rate in litres per minute on the scale.

Limit Value Contacts (only for model VKG- 2.. and VKG-3..)
For the monitoring of the flow rate, the instruments may be fitted with one or two adjustable limit value contacts.

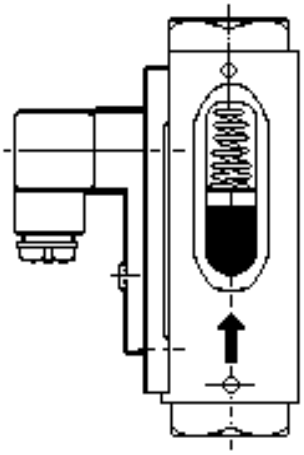
Standard design: Normally open reed contacts (with increasing flow)
Special design: Changeover reed contacts

The contact is adjustable over the full measuring range.

Standard Material Combinations

	Material: Brass	**Material: Stainless Steel**
Outer casing	Aluminium, anodised	Aluminium, anodised
Spring	St. Steel 301	St. Steel 301
Orifice	St. Steel 301 / brass	St. Steel 301
Magnet	Ceramic oxide	Ceramic oxide
Connections	Brass	St. Steel 304
Float	Brass	St. Steel 304
Measuring tube	Borosilicate	Borosilicate
O-rings	NBR	FPM
$T_{max.}$	100 °C	100 °C
$P_{max.}$	12 bar	12 bar

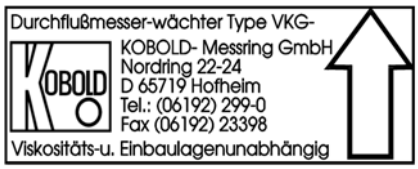
5. Operating Principle



A float with sharp edged orifice apertures is located within a cylindrical glass measuring tube. When a flow occurs, the medium lifts the float against a spring which exerts a force downwards on the float. Each position of the float corresponds to a particular flow throughput, which may be read off the scale marked on the glass measuring tube.
Permanent magnets are mounted on the float which activates reed switches positioned outside of the flow throughput. The activation of the contacts is carried out by means of magnetic field, i.e.: the contact is hermetically separated from the flowing medium.

6. Mechanical Connection

Before installation:



- Please ascertain whether the allowable maximum operating pressure and operating temperature of the instruments will not be exceeded (see table: standard material combinations).
- The instrument may be mounted in any position. No modifications are necessary. The flow takes place in the direction of the arrow (on the label).
- Remove all transport packing and ascertain that no packing material is left in the instrument.
- Sealing of the connection threads should be carried out with Teflon tape or similar.
- During installation of the instrument, it must be checked that no strong forces will be applied to the connections. We recommend fixing the inlet and outlet pipes mechanically at approximately 50 mm from each instrument connection.
- The instrument must not be installed within an induction field.

Attention! The threaded connection of the instrument must be tightened with a suitable size of open ended spanner. Otherwise, the housing may be stressed which could lead to breakage of the instrument.

- If possible, check directly after mechanical installation that the connection thread to pipe is fully sealed (see section commissioning)

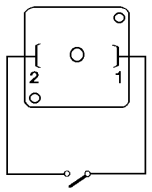
Attention! Please note that when installed in open spaces freezing of the medium can lead to breakage of the glass tube.

7. Electrical Connection

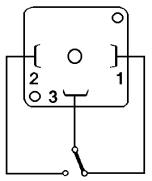
(Only for Models VKG-2.. and VKG-3..)

- Make sure that the supply wires are de-energized.
- Loosen the holding screw of the plug cap and remove the cap from the plug.
- Connect the power cable to the plug cap in accordance with the connection diagram below.
- If the contact has as yet not been adjusted, this should be carried out at this stage (see section 9 commissioning)
- Connect the plug to the contact connections and secure it with the holding screw (see section 9 commissioning).

N/O contact



Changeover contact

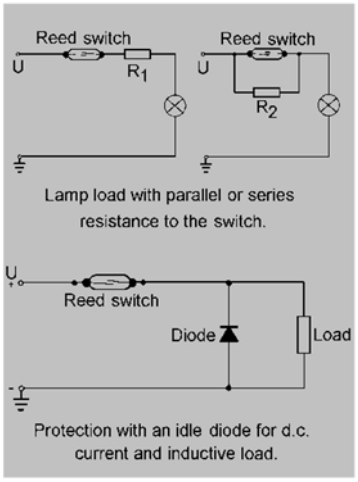


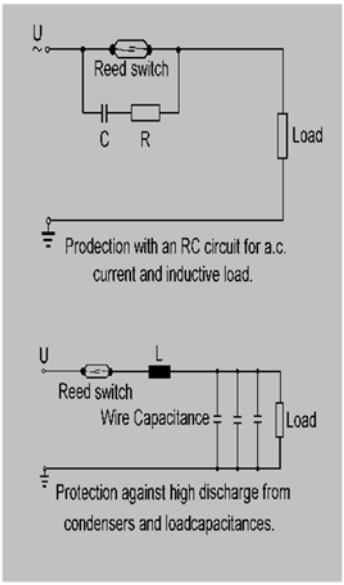
Attention! Electrical values of the reed contacts may not be exceeded even for short periods. For higher switching values we recommend contact protection relays.

Following connection of the external equipment to the output and adjustment of the required switch points, the external power supply to the equipment may be switched on.

Examples for Contact Protection Measures

For capacitive and inductive loads (long cables and relays/protection) we recommend protective switching.





8. Use in hazardous area

8.1. Statement an apparatus not containing an own potential ignition source

Erklärung für Betriebsmittel ohne eigene potentielle Zündquelle in Anlehnung an die Richtlinie 2014/34/EU

TFR 18 HEK_BopZ 0006 Edition 2 **Seite 1 von 2**

Statement an apparatus not containing an own potential source following Directive 2014/34/EU

TFR 18 HEK_BopZ 0006 Edition 2 **Page 1 of 2**

Hiermit erklärt die / *hereby declares*

KOBOLD Messring GmbH, Nordring 22-24, DE 65719 Hofheim

in alleiniger Verantwortung, dass die Ergebnisse, der an den folgenden mechanischem Betriebsmitteln vorgenommenen Prüfungen, die Anforderungen der Richtlinie 2014/34/EU erfüllen.

under the sole responsibility, that the results of the examinations with the mechanical equipment described below comply with the requirements of Directive 2014/34/EU.

Viskositätskompensierten Durchflussmesser / -wächter VKG (siehe auch Seite 2), Identifikations-Nummer siehe Lieferunterlagen

Viscosity Compensated Flowmeter / switch VKG (see also at page 2), Identification number see shipping documents

sind gemäß Richtlinie 2014/34/EU, Artikel 1
a) keine Geräte,
b) keine Schutzsysteme,
c) keine Sicherheits-, Kontroll- oder Regeleinrichtungen,
d) keine Komponenten.

are according to Directive 2014/34/EU, article 1
a) not an equipment,
b) not a protective system
c) not a safety device, controlling device or regulating device
d) not a component.

Die mechanischen Betriebsmittel haben bei bestimmungsgemäßem Betrieb keine eigene potentielle Zündquelle und bekommen **keine Kennzeichnung** im Sinne der ATEX-Richtlinie. Eine interne Zündgefahrenbewertung wurde durchgeführt.
Als Medium wird ein Fluid verwendet.

*When used adequately, this mechanical equipment has no inherent potential ignition source and thus it is **not marked** in accordance with the ATEX- Directive. An internal ignition risk analysis was carried out. The used medium is a fluid.*

Die mechanischen Betriebsmittel können, unter Berücksichtigung der geltenden Einrichtungsbestimmungen für Maschinen, Geräte und Anlagen im Ex-Bereich, z.B. EN 1127-1, EN 60079-14 u.a., folgendermaßen eingesetzt werden:
a) In der Zone 1 (Gas-Ex, Kategorie 2G, EPL Gb) in den Explosionsgruppen IIA, IIB und IIC
b) In der Zone 2 (Gas-Ex, Kategorie 3G, EPL Gc) in den Explosionsgruppen IIA, IIB und IIC
c) In der Zone 21 (Staub-Ex, Kategorie 2D, EPL Db) in den Explosionsgruppen IIIA und IIIB
d) In der Zone 22 (Staub-Ex, Kategorie 3D, EPL Dc) in den Explosionsgruppen IIIA und IIIB

The apparatus can be used as follows in explosive atmospheres in accordance with the applicable erection regulations on machines, devices and plants, such as e.g. EN 1127-1, EN 60079-14, etc.:
a) In Zone 1 (gas hazard, category 2G, EPL Gb) in the explosion groups IIA, IIB and IIC
b) In Zone 2 (gas hazard, category 3G, EPL Gc) in the explosion groups IIA, IIB and IIC
c) In Zone 21 (dust hazard, category 2D, EPL Db) in the explosion groups IIIA und IIIB
d) In Zone 22 (dust hazard, category 3D, EPL Dc) in the explosion groups IIIA und IIIB

Mögliche elektrische Betriebsmittel sind ohne Einfluss auf den mechanischen Zündschutz. Sie müssen den Anforderungen der jeweils vor Ort herrschenden Zonen genügen und sind nicht Bestandteil dieser Erklärung

Any electrical apparatus that may be used here do not impair the mechanical explosion protection. Those apparatus have to comply with the locally applicable zones and are not subject of this statement.

Folgende harmonisierte Normen/Spezifikationen sind in der am Unterschriftsdatum aktuellen Fassung angewandt worden:

- EN 1127-1 Explosionsfähige Atmosphären, Explosionsschutz, Teil 1: Grundlagen und Methodik

The following harmonised standards and specifications were referred to in their version applicable on the date of signature:

- *EN 1127-1 Explosive atmospheres, Explosion prevention and protection, Part 1: Basic concepts and methodology*

Wichtige Hinweise:

a) Die vom Hersteller erstellten Einbau und Bedienungsanleitungen sind zwingend zu beachten.
b) Die im Anwenderland geltenden Errichtungsbestimmungen sind zu beachten.
c) Die mechanischen Komponenten der VKG-Baureihe sind für Umgebungstemperaturen von:
mit Perbunan-Dichtung -20 °C .. 70 °C
mit Viton-Dichtung -20 °C .. 100 °C geeignet.

Please note:

a) The installation and operating instructions provided by the manufacturer are to be considered compellingly.
b) The installation regulations valid in the designated country of use are to be observed.
c) The VKG series with its mechanical components is suitable for ambient temperatures of
with Perbunan-seal -20 °C .. 70 °C
with Viton-seal -20 °C .. 100 °C.

Erklärung für Betriebsmittel ohne eigene potentielle Zündquelle in Anlehnung an die Richtlinie 2014/34/EU

TFR 18 HEK_BopZ 0006 Edition 2 **Seite 2 von 2**

d) Bei bestimmungsgemäßem Betrieb wird außen eine Erwärmung < 10 K erwartet; die Temperaturklasse T4 wird eingehalten.
e) Die Geräte können elektrostatisch aufgeladen werden. Es sind geeignete Maßnahmen - elektrostatisch erden, „nur feucht reinigen" und Aufladungsprozesse vermeiden - einzuhalten, um eine Gefährdung auszuschließen. Eine Warnkennzeichnung ist beispielhaft auf verschiedenen Geräten angebracht.
f) Sämtliche außen liegenden Werkstoffe bestehen aus geeigneten funkenarmen Materialien, kein Leichtmetall. Der Betreiber ist jedoch für die Überprüfung der Zündgefahr durch Funken beim Betrieb der kompletten Maschine selbst verantwortlich.
g) Die mechanischen Komponenten des VKG müssen in den Potentialausgleich einbezogen werden.
h) Anschlussleitungen von elektrischen Betriebsmitteln sind geschützt zu verlegen.
i) An Bauteilen dürfen in der Explosionsgruppe IIC und der Zone 1 keine projizierten Oberflächen von Kunststoffen > 20 cm² vorhanden sein; bei IIB oder im Staub dürfen 100 cm² erreicht werden. Die Geräte dürfen nicht dort eingesetzt werden, wo damit zu rechnen ist, dass dort starke elektrostatische Aufladungen (Gleitstielbüschelentladungen) provoziert werden (durch menschliche Aufladung nicht möglich)
j) Wenn isolierende Anschlussschläuche verwendet werden, dann sind Typen mit einem Durchmesser < 20 mm (IIC) oder < 30 mm (IIA, IIB, Staub) zulässig.
k) Staubablagerungen sind regelmäßig zu entfernen.
l) Bei Undichtigkeit des Gehäuses darf das Betriebsmittel nicht weiter betrieben werden
m) Die Verwendung von brennbarem oder explosionsfähigen Medien ist nicht zulässig.
n) Streuströme (z.B. in Anlagen mit elektrischem Korrosionsschutz) dürfen nicht über die Bauteile geführt werden
o) Bei Montagen im Ex-Bereich ist unbedingt die EN 1127-1 Anhang A zu beachten (ggf. funkenarmes Werkzeug benutzen!)

Ausgefertigt in Hofheim am 26. Februar 2024
Unterzeichnet für und im Namen der KOBOLD Messring GmbH
Ort und Datum

Joseph Burke Compliance Manager/ *authorized signatory*

Statement an apparatus not containing an own potential source following Directive 2014/34/EU

TFR 18 HEK_BopZ 0006 Edition 2 **Page 2 of 2**

d) At intended operation the temperature rising outside is < 10 K; Temperature class T4 is kept.
e) The apparatus is electrostatically chargeable. Thus appropriate measures have to be taken – grounded electrostatically, "only cleaning with a damp cloth" and avoiding charging processes – that will prevent hazards. Warning signs are fixed exemplary on the outside of some apparatus.
f) All exterior materials consist of suitable low-sparking components no alloy. The operator himself, however, is responsible for checking the risk of ignition caused by sparks during the operation of the complete machine.
g) The mechanical components of the VKG have to be integrated in the equipotential bonding.
h) Connecting cables of electrical apparatus have to be installed in a protected manner.
i) At apparatus in explosion group IIC and in Zone 1 no projected surfaces of plastics are permitted that exceed 20 cm²; in IIB or dust hazardous atmospheres 100 cm² may be reached. The products should not be used where strong electrostatic charges are present which provokes propagating brush discharges (by human charging it is not possible).
j) If insulated connection hoses are used, only types with a diameter < 20 mm (IIC) or < 30 mm (IIA, IIB, Dust) may be used.
k) Dust deposits are to be removed regularly.
l) If the enclosure shows signs of leakage, the apparatus may be not operated further.
m) The use of any flammable or explosive flow medium is not permitted.
n) Leakage currents (e.g. in plants with electrical anti-corrosion protection) may not be led over the parts.
o) When mounting the apparatus inside an explosive area, Annex A of standard EN 1127-1 has to be adhered to (if necessary, low-sparking tools have to be used).

Issued at Hofheim on February 26th, 2024
Signed for and on behalf of KOBOLD Messring GmbH

HEK_18 BopZ 0006 Ed 2 Kobold VKG.odt

Folgende VKG-Betriebsmittel wurden in die Bewertung einbezogen / *The following VKG series was considered for the assessment:*

Typenschlüssel Serie VKG / *Type key series VKG*		
VKG-1***	Durchflussmesser	*Flowmeter*
VKG-2***	Das Magnetfeld betätigt einen außerhalb angebrachten Kontakt	*The magnetic field actuates an external contact*
VKG-3***	Das Magnetfeld betätigt eine außerhalb angebrachte Anzeigevorrichtung	*The magnetic field actuates an externally applied display device*
VKG-4***	Das Magnetfeld betätigt eine außerhalb angebrachte Anzeigevorrichtung und einen Kontakt.	*The magnetic field actuates an externally applied display device and a contact.*

8.2. ATEX reed contact 41R57**

ATEX N/O contact 41R57

II 3G Ex ic IIC T4 Gc
II 3 D Ex ic IIIC T125 °C Dc
-20 °C ≤Ta≤80 °C
max. 250 $V_{AC/DC}$/1.5 A/100 W/100 VA

ATEX changeover contact 41R57U

II 3G Ex ic IIC T4 Gc
II 3 D Ex ic IIIC T125 °C Dc
-20 °C ≤Ta≤80 °C
max. 250 $V_{AC/DC}$/1 A/30 W/60 VA

Ex-relevant excerpt of the operating instructions of the reed contact 41R57 **

1. Preambel

This excerpt of the operating instructions only represents the ex-relevant aspects. It is copied into the original operating manual in the same or analogous form; Textual changes are permitted, the ex-relevant statements remain.
To ensure the function and for your own safety, please read the enclosed operating instructions carefully before you begin the installation. If you have any questions, please contact the KOBOLD Messring GmbH, Hofheim. It applies with the original operating instructions.
The following standard issues were considered in the evaluation of the product:

a) IEC 60079-0:2017 Ed. 7 / EN 60079-0:2018 Explosive atmospheres – Part 0: Equipment - General requirements
b) IEC 60079-11:2011 Ed. 6 + Corr. 2012 / EN 60079-11:2012 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

2. General information on explosion protection

The reed switches work together with various KOBOLD products and serve there for monitoring. It is available as N/O contact or changeover contact.
The electrical connection is made via a plug - only in intrinsically safe systems.
The reed switch is intended for commercial use and may only be used in accordance with the specifications in the technical documentation of Kobold and the information on the nameplate. It is only operated together with certified products via an intrinsically safe circuit. They comply with the valid standards and regulations.
The installation regulations (e.g. EN 60079-14) for systems in potentially explosive atmospheres must be observed.

Further important details can be found in the corresponding EC-type examination certificate.

Permitted use

- The intrinsically safe reed switch can be used as follows:
  - In Zone 2 (Gas-Ex, EPL Gc) in explosion groups IIA, IIB and IIC
  - In Zone 22 (Dust-Ex, EPL Dc) in explosion groups IIIA, IIIB and IIIC
- The requirements for simple electrical equipment for use in intrinsically safe circuits in zones 1/21 are fulfilled.
- The qualification regarding the surface temperature is T4. For all gases, vapors, mists with an ignition temperature> 135 ° C the equipment is not an ignition source.
  - In the dust Ex area, 125 ° C is the reference temperature for further consideration regarding the safety distance from the smoldering temperature.
- The ambient temperature range is -20 ° C ≤ Ta ≤ 80 ° C.

2.1. Electrical characteristics for Ex i

Electrical data:

- Rated voltage up to 45 volt AC / DC
- Rated current up to 2 A
- U_{iIC} ≤ 30 V AC / DC, I_{iIIC} ≤ 250 mA
- U_{iIIB} ≤ 45 V AC / DC, I_{iIB} ≤ 2 A
- U_{iIIIC} ≤ 45 V AC / DC, I_{iIIIC} ≤ 250 mA
- L_i = negligible, Ci = negligible
- Heating on the outer housing <15 K

2.2 Type code

The equipment is identified by the following type code:

Type	Description	Item-No.	Remarks
41R57 A B	Type coding		
41R57	Contact device		
A	N/O contact (2 wires), Plug with black cap Change-over contact (3 wires), Plug with grey cap		
B	70 – 75 with marking (not ex-relevant)	202.289	N/O
	45 – 50 with marking	202.285	N/O
	50 – 55 with marking	202.286	N/O
	60 – 65 with marking	202.287	N/O
	70 – 75 with marking	202.288	Change-over
	60 – 65 change-over contact	202.290	Change-over

2.3 Temperature class

The reed switch is suitable for temperature class T4 / T125 ° C.

2.4 General requirements

2.4.1 Intended Use

a) To ensure safe operation, the products may only be used according to the instructions in the assembly instructions. During use, the legal and safety regulations required for the respective application must be observed in addition. This applies analogously when using accessories.
b) Failure to comply with the instructions given in this excerpt or in the case of improper handling of the product will render our liability null and void. In addition, the warranty on products and spare parts is void.
c) The products are not safety elements in terms of their intended use.
d) Only original parts of the manufacturer may be used.

2.4.2 General safety instructions

The reed switch corresponds to the state of the art and is reliable. The reed switch may pose a residual hazard if improperly used and operated by untrained personnel.
Every person, responsible for the installation, commissioning, maintenance or repair of the reed switch, must have read and understood the assembly instructions and in particular the safety instructions.

a) Follow the general rules of technology for the selection and proper operation of a product.
b) All connected electrical and mechanical equipment must be suitable for the respective application.
c) Observe the notes in these operating instructions as well as the conditions of use and permissible data that appear from the imprints / nameplates of the respective products.
d) It must be ensured that only product protection types corresponding to the zones are installed!
e) The product is only approved for proper and intended use in a normal industrial atmosphere. Immersion in liquids is not permitted.
f) It must be ensured that no falling objects can hit the product.
g) The operator must ensure the lightning protection for the entire system in accordance with local regulations.
h) It is the responsibility of the installer to ensure that the function of the reed switch in conjunction with the individual evaluation devices functions properly and is approved for the intended use.
i) The intrinsically safe connection - including the reed switches - must be made via approved / tested evaluation devices, which may need to be equipped with suitable zener barriers or switching amplifiers.

3. Commissioning, installation

Depending on the IP degree of protection, the time for cleaning the equipment (dust deposits) must be specified. Other important facts:

a) The product may be put into operation in Zone 2 (Cat. 3G, EPL Gc) or in Zone 22 (Cat. 3D, EPL Dc in intrinsically safe circuits only by specialists with a qualification similar to a qualified person according to TRBS 1203.
b) The requirements for simple electrical equipment that apply to the hazardous area of Zones 1/21 according to EN 60079-11 are fulfilled.
c) The products may only be used in the usual industrial atmosphere. In the presence of aggressive substances in the air, the manufacturer must always be consulted. The products must be adequately protected in adverse environmental conditions.
d) Operation of the product is only permitted in fully assembled and undamaged enclosures. In case of possible damage, a zone carryover may have to be considered by the operator; Moreover, operation of the housing is not permitted if the housing is damaged.
e) The environmental conditions specified in the operating instructions must be adhered to and protected against adverse environmental conditions.
f) Heat radiation from foreign products / components must also be considered.
g) The reed switch must be protected against inadmissible access of liquids and / or soiling.
h) Fixed parts (e.g. due to frost or corrosion) must not be loosened by force in the presence of an explosive atmosphere. Icing must therefore be avoided.
i) The reed switch may only be subjected to minor vibrations, see also IEC 34-14.
j) To ensure the discharge of electrostatic charges, the national requirements must be considered.
k) In particular, isolated capacities must be prevented.
l) Only those zener barriers or switching amplifiers may be used whose output circuits are approved / tested for use in potentially explosive atmospheres. In Europe, use in Zones 1/21 requires an EC type-examination certificate for the equipment concerned issued by a body designated for explosion protection.
m) The voltage of the supply units must be less than or equal to the voltage Ui of the reed switch.
n) The total current Io of the supply units must be less than or equal to the current Ii of the reed switch.
o) For the installation of the intrinsically safe circuit, a control drawing (system description) to be created by the installer / operator is required.
p) Equipotential bonding must be established along the intrinsically safe circuit when using a grounded supply.
q) The certificates must be taken into account, including the special conditions specified therein.
r) Resistant parts of the product (e.g. due to frost or corrosion) must not be forcibly loosened in the presence of an explosive atmosphere.

s) Within the potentially explosive area, installation may only be carried out taking into account the locally applicable installation regulations. The following conditions must be observed (incomplete):
t) Installation and maintenance may only be carried out in an explosion-free atmosphere and in compliance with the regulations in force in the country of the operator.
u) Additional precautions must be taken if the presence of hydrogen sulphide, ethylene oxide and / or carbon monoxide is to be expected: these substances have very low ignition energy!
v) In the presence of these substances and in the presence of a substance of the explosion group IIC and in the case of presumably existing potentially explosive atmosphere, only spark-free tools may be used!

4. Maintenance, servicing
Definition of terms according to IEC 60079-17:

Maintenance and Repair: A combination of all activities performed to maintain or recover an item in a condition that meets the requirements of the specification in question and ensures the performance of the required functions.

Inspection: An activity involving the careful examination of an object, with the aim of obtaining a reliable statement of the condition of the object, carried out without disassembly or, if necessary, with partial disassembly, supplemented by measures such as measurements becomes.

Visual inspection: A visual inspection is a test that detects visible faults, such as missing screws, without the use of access devices or tools.

Close-up Test: A test that identifies, in addition to the aspects of visual inspection, such errors, such as loose screws, which can only be obtained by using access devices, such as a screwdriver, e.g. steps (if necessary), and tools are visible. For close-up tests, housing usually does not need to be opened or the equipment must be de-energized.

Detail test: A test that detects, in addition to the aspects of close-up testing, such defects as, for example, loose connections that can only be recognized by opening housings and / or, if necessary, using tools and test equipment.

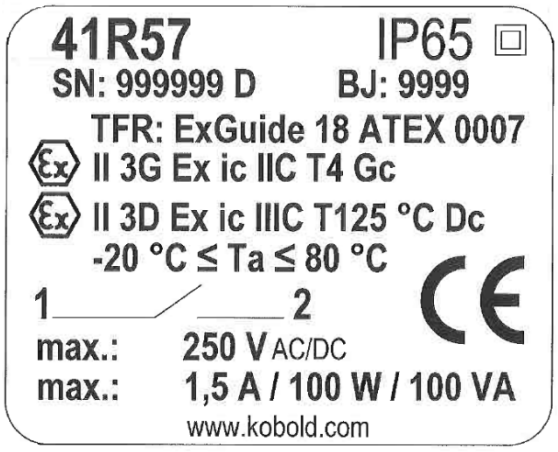
a) Maintenance measures may only be carried out by qualified persons.
b) Only use accessories in potentially explosive atmospheres that comply with all requirements of European directives and national legislation.
c) Maintenance measures with dismantling of the reed switch may only be carried out in an ex-free atmosphere.
d) The replacement of components may only be carried out with original spare parts, which are also approved for use in potentially explosive areas.
e) The products must be regularly maintained and cleaned in the Ex area. The intervals are set by the operator according to the environmental demands on site.

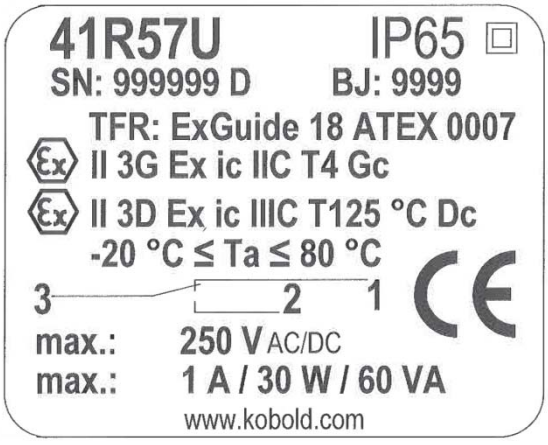
	Activity	visual inspection per month	Close inspection every 6 months	detailed inspection every 12 months
1	Visual inspection of the reed switch for damage, remove dust deposits	•		
2	Check for integrity and function			•
3	Testing the entire system	The responsibility of the operator		

5. Troubleshooting
Products operated in conjunction with potentially explosive atmospheres must not be modified. Repairs to the product may only be performed by specially trained and authorized personnel.

6. Disposal
Disposal of the packaging and used parts must be in accordance with the regulations of the country in which the product is installed.

7. Marking of the reed switch (nameplate)





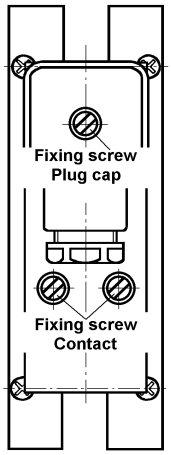
In the serial number the year of manufacture can be coded; optionally, it can also be specified as plain text.

As a rule, a readable marking has been made for the type of explosion protection required in field use - even before the product is put into operation for the first time.

A reed switch that has already been operated in non-intrinsically safe circuits may no longer be used in intrinsically safe circuits later on.

9. Commissioning

When used in machines, according to guideline 89/392/EWG, the measuring unit should be used only when the machines fulfil the EWG-machine guidelines.



Adjustment of the limit values

- Loosen the two fixing screws on the contact base with a screwdriver.
- Slide the switch housing to the bottom stop.
- After loosening the holding screw, remove the plug cap from the contact base.
- Connect a suitable continuity meter to PIN 1+2 (changeover switch PIN 2+3). (see page 5).
- In case the instrument is installed, open the inlet line and introduce the medium slowly until the top edge of the float indicates the required minimum flow volume. The reed contact is now closed (electrical continuity).

Attention! Sudden opening of the flow can lead to pressure peaks which can exceed the operating pressure. Water hammer can lead to breakage of the measuring glass tube.

- Push the switch housing to the top until the reed contact just opens (no electrical continuity).
- Fix the switch in this position by tightening the fixing screws. Replace the plug cap. The instrument is now ready for operation.
- With correct adjustment of the limit switches a bistable switch characteristic is achieved, i.e. the contact remains closed when the float rises above the set limit value (PIN 1+2, or alternatively PIN 2+3 with option of changeover contact.

Hysteresis

Hysteresis is characterised by the difference between the switching on and switching off points of the contact. By matching the magnet and reed contact strength (AW Number) a hysteresis of approx. 3.5 mm of float movement is achieved. At the same time it may be assured that the contacts have a bi-stable switching characteristic.

Exceeding the Measuring Range

The flow range may be exceeded by a large margin with a non-pulsating flow. Only a certain increase in pressure loss is experienced (The permissible maximum operating pressure must not be exceeded).

Viscosity range

The instrument scale is suitable for a viscosity range from 1 to 760 mm^2/s. Within this range there is no necessity for recalibration.

10. Maintenance

For measured media without contamination, the VKG instruments are almost maintenance free. Where contamination or calcium or algae deposits are found on the internal parts, the instrument should be regularly cleaned.
After removal of the upper four grub screws, the threaded connection may be taken out of the instrument. The internal parts may be removed for cleaning. The measuring glass may be cleaned with a suitable brush.
After cleaning, the instrument should be reassembled in the correct manner. Please ensure that the spring is inserted into the nipple of the top threaded connection. The float end with the inserted orifice must be positioned on the flow medium inlet side.

11. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Ordering Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Recommended Spare Parts

Only the instrument parts and materials are listed.
Depending on the instrument type, the parts are available in different sizes.
(When ordering, please give the instrument type).

1.1) Float brass
1.2) Float Stainless Steel
2.1) Spring
3.1) O ring set NBR
3.2) O ring set FPM
4.1) Contact (Normally Open)
4.2) Contact (Changeover switch)
5.1) Spare glass with scale
6.1) Spare part package (glass, spring, brass float)
6.2) Spare part package (glass, spring, stainless steel float)

We recommend the use of a combined spring, glass and float to maintain measuring accuracy.

14. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

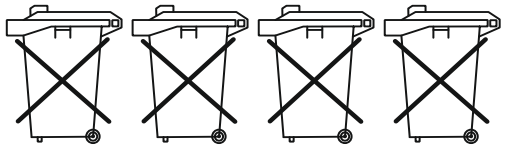
15. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

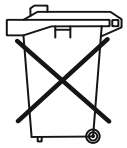
Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



Cd[1] Hg[2] Pb[3] Li[4]

1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



16. EU Declaration of Conformance (VKG)

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

Flowmeter and switch **Model: VKG-...**

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

2011/65/EU **RoHS** (category 9)
2015/863/EU Delegated Directive (RoHS III)

Additionally, for VKG with contact:

2014/35/EU Low Voltage Directive

Also, the following standards are fulfilled:

EN 60529:2014
Degrees of protection provided by enclosures (IP Code)

EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Additionally, for VKG with contact:

EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

Hofheim, 05. March. 2024

H. Volz
General Manager

J. Burke
Compliance Manager

17. UK Declaration of Conformity (VKG)

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

Viscosity-Compensated Flowmeter and Switch model: VKG -...

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

S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Additionally, for VKG with contact:

S.I. 2016/1101 Electrical Equipment (Safety) Regulations 2016

Also, the following standards are fulfilled:

BS EN 60529:1992+A2:2013
Degrees of protection provided by enclosures (IP Code)

BS EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Additionally, for VKG with contact:

BS EN 61010-1:2010+A1:2019
Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

Hofheim, 05. March. 2024

H. Volz
General Manager

J. Burke
Compliance Manager

18. EU Declaration of Conformance (Reed contact 41R57**)

EU-KONFORMITÄTSERKLÄRUNG zur Bestätigung der Übereinstimmung einer Baugruppe mit der Richtlinie 2014/34/EU

EU DECLARATION OF CONFORMITY to confirm the conformance of a device with the Directive 2014/34/EU

Der Hersteller

The manufacturer

KOBOLD Messring GmbH, Nordring 22-24, DE 65719 Hofheim

erklärt hiermit in alleiniger Verantwortung, dass die nachfolgende Maschine oder Baugruppe

hereby declares under sole responsibility, that the machinery or subassembly equipment described below

Bezeichnung

Description

Reed-Schalter / *Reed contact* 41R57**

Kennzeichnung / Marking: Ⓔx II 3G Ex ic IIC T4 Gc or Ⓔx II 3D Ex ic IIIC T125 °C Dc

Fertigungs-Nummer lt. Lieferpapieren und Typenschild

Serial number see shipping documents and type label

mit den Bestimmungen folgender harmonisierter Normen der Europäischen Union:

- IEC 60079-0:2018 Explosionsgefährdete Bereiche –Teil 0: Betriebsmittel - Allgemeine Anforderungen
- EN 60079-11:2012 Explosionsgefährdete Bereiche – Teil 11: Geräteschutz durch Eigensicherheit "i"

conforms with the provisions of the following harmonized standards in the version of the European Union:

- *IEC 60079-0:2018 Explosive atmospheres –Part 0: General Requirements*
- *EN 60079-11:2012 Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

Ebenfalls mit folgenden Europäischen und nationalen Normen und technischen Vorschriften, in der zum Unterschriftsdatum gültigen Fassung, übereinstimmt:

- Technische Regeln für Gefahrstoffe (TRGS) 727:2016, Vermeidung von Zündgefahren infolge elektrostatischer Aufladungen

Also conforms with the following European and National Standards and technical provisions in the version, valid at signature date:

- *Technical rules for hazardous substances TRGS 727:2016, Avoidance of ignition hazards as consequence of electrostatic charging*

Ausgefertigt in Hofheim am 23. November 2023

done at Hofheim on November, 23, 2023

Name des Unterzeichners

Name of signatory

Joseph Burke
Compliance Manager/ *authorized signatory*
Unterzeichnet für und im Namen der / *Signed for and on behalf of KOBOLD Messring GmbH*

Unterschrift / signatur

KEEX68180503

19. Statement of conformity reed contact 41R57**

EXGUIDE TECHNOLOGY

STATEMENT OF CONFORMITY

(1)

(2) Equipment and protective systems intended for use in potentially explosive atmospheres – **directive 2014/34/EU**

(3) Document No.

ExGuide 18 ATEX 0007 Edition 2

(4) Equipment: **Reed contact type 41R57****

(5) Manufacturer: **KOBOLD Messring GmbH**

(6) Address: **Nordring 22-24**
65719 Hofheim, Germany

(7) The design of this product and the various permissible versions are specified in the annex to this certificate and the documents listed therein.

(8) ExGuide Technology - Geoffrey Stenzel, as a certified engineering company, certifies that the product meets the basic safety and health requirements for the design and construction of category 3 equipment for use in potentially explosive atmospheres in accordance with Annex II of Directive 2014/34/EU. The results of the test are documented in the confidential test report No. P20220024PB01.

The QM system of the engineering offices ExGuide Technology - Geoffrey Stenzel is monitored according to ISO 9001:2015 by AJA Europe Ltd. and listed under certificate No. AJ AEU/19/15703.

(9) The essential health and safety requirements are met by compliance with:

EN IEC 60079-0: 2018 **EN 60079-11:2012**

(10) If the sign "X" is placed after a certificate number, special conditions for the safe use of the equipment are indicated in the appendix to this certificate. If no certificate number according to (3) is applied to the device, the sign "X" must be placed after the Ex marking according to (12).

(11) This statement of conformity refers only to the design and specifications for the construction of the device according to directive 2014/34/EU. Further requirements apply to the manufacture and placing into market of this product. These requirements are not covered by this certificate.

(12) The Ex-marking of the product must contain the following information:

II 3G Ex ic IIC T4 Gc
II 3D Ex ic IIIC T125°C Dc

ExGuide Technology – Geoffrey Stenzel
Katernberger Str. 107
45327 Essen, Germany

Essen, dated 18 January 2023

Dipl.-Ing. Geoffrey Stenzel

EXGUIDE TECHNOLOGY

(13) Annex

(14) **ExGuide 18 ATEX 0007** Edition 2

(15) Description of the product

15.1 Subject and type designation

Reed contact type 41R57**

Explanation of the type designation

41R57 **Reed contact**

1. Asterisk **Contact type**

3 = N/O contact (2 wires), Plug with black cap

6 = Change-over contact (3 wires), plug with grey cap

2. Asterisk Not Ex relevant

15.2 Description

The reed contact work with different devices and serve there values for monitoring. They are available as N/O or change-over contacts. Standard electrical connection is made through a permanently connected cable inside between the reed contact and the pins of the plug.

Changes

Application of harmonized standard EN IEC 60079-0:2018.

15.3 Technical data

15.3.1 Thermal data

Abient temperature range	T_a	-20 °C to +80 °C	
Heating at the outer enclosure	ΔT	<15 K	

15.3.2 Electrical data

Maximum input voltage	U_i	30 V AC/DC 45 V AC/DC	for IIC for IIB and IIIC
Maximum input current	I_i	250 mA 2 A	for IIB and IIIC for IIB
Effective internal inductance	L_i	negligible	
Effective internal capacitance	C_i	negligible	

EXGUIDE TECHNOLOGY

15.4 Minimum marking requirements on this equipment

Manufacturer's name and postal address	KOBOLD Messring GmbH Nordring 22-24 65719 Hofheim, Germany
Type designation	41R57**
Serial No.	
Year of manufacturer	
Ex symbol	Ex
Ex marking	II 3G Ex ic IIC T4 Gc II 3D Ex ic IIIC T125 °C Dc
CE marking	CE
Ambient temperature range	-20 °C ≤ T_a ≤ +80 °C

(16) Test and assessment report No. P20220024PB01, dated 18 January 2023

(17) Special conditions for safe use

None

(18) Essential health and safety requirements

Fulfilled by compliance with the above-mentioned standards.

ExGuide Technology – Geoffrey Stenzel
Katernberger Str. 107
45327 Essen, Germany

Essen, dated 18 January 2023

Dipl.-Ing. Geoffrey Stenzel