

# OPERATING MANUAL



*Instrument for volume flow*

*Type MAGIN-EX<sup>®</sup>*



I M1 Ex ia I Ma

I M2 Ex ia I [ib] Mb



II 2G Ex ia IIA T4 Gb

II 2G Ex ia [ib] IIA T4 Gb

## General Information

*Dear Customer,*

The flow control device is a product of **Grünewald GmbH, 59069 Hamm** and is manufactured as a **MAGIN-Ex<sup>®</sup>** - device for the use for liquid media in closed and filled systems.

To ensure long term and safe operation of the control device, read the operating manual attentively.

If further information is required please do not hesitate to contact our technical support via Grünewald GmbH, Oberallener Weg 7, 59069 Hamm, Tel. +49 (0)2385 922670, Fax +49 (0)2385 922672.

Internet: [www.gruenewald.eu](http://www.gruenewald.eu)

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## 1. Introduction

This operating manual will assist to operate MAGIN-Ex<sup>®</sup> in a safe, proper and economical manner.

Observing the instructions of this manual will:

- Increase reliability and lifespan of the control facility.
- Prevent possible danger.
- Avoid down times caused by failures and repairs.

This manual must:

- be present whilst any installation, maintenance and repair work is performed.
- be read, acknowledged and applied by any person performing tasks to and at the MAGIN-Ex<sup>®</sup>.

Grünewald monitoring and measuring devices are delivered ready for installation. No other preparations of the device are necessary.

The general installation and operating manuals as well as the product information's do therefore refer to the mechanical and electrical data of the individual device or assembly.

**The MAGIN-Ex<sup>®</sup> is manufactured to latest technical and safety relevant standards, rules and regulations. However, abuse and operation of the device within incorrect applications may result in serious injury or death of the user and/or a third party, as well as it may endanger equipment and other property.**



## 2. General

### 2.1 General information to the operating manual

This operating manual contains all necessary information required, to ensure correct and safe installation as well as operation of the device. The manufacturer or distributor must be contacted for further information and assistance, if arising difficulties and problems can not be solved within the operating manual provided information. Changes to specification and design as well as improvements to the device are subject to change without notice and are fully to the discretion of the manufacturer. Users of this operating manual must fulfil required qualification standards. Operating personnel must be trained in accordance to the operating manual.

### 2.2 General safety instructions

**Read the operating manual of the MAGIN-Ex<sup>®</sup> prior commencement of any work and acknowledge instructions during execution and operation.**



The correct condition and operation of the device as well as the compliance with safety rules and regulations is to the full responsibility of the operator. The MAGIN-Ex<sup>®</sup>- Device is manufactured to latest technical and safety relevant standards, rules and regulations. However, abuse and operation of the device within incorrect applications may result in serious injury or death of the user and/or a third party, as well as it may endanger equipment and other property.

Use and operation of the control device is only permitted when:

- **the compliance with the intended purpose of use is granted.**
- **the condition of the device complies with safety relevant rules.**

Take note of the technical data of the MAGIN-Ex<sup>®</sup>. The intended purpose of use of MAGIN-Ex<sup>®</sup> is described with in chapter 8 of this documentation and must be acknowledged. Awareness of the basic safety instructions and rules is the minimal requirement for the safe use and trouble free operation of MAGIN-Ex<sup>®</sup> additionally, all site specific rules and regulations, such as, but not limited to, occupational health and safety rules, rules and standards for erecting and using of electric and mechanical facilities, as well as radio noise suppression rules and standards, must be complied with.

Pay attention and care to tidiness of workspace during performance of repair and maintenance tasks. Do not eat or smoke during work. Unauthorized altering or modifying the equipment will cause loss of any warranty and liability provided by the manufacturer.

Take note of the operating manual and pay special attention to safety symbols and safety instructions on the device and the documentation. Please store the operating manual carefully.

### 3. Obligations of the Operator

It is the full responsibility of the operator that only persons complying with below out lined regulations are authorized to work on and with the devices.

Persons authorised must,

- be confident and trained with rules of occupational health and safety und the handling and operation of the equipment.
- has read, understood and acknowledged the safety instructions and warnings of this operating manual and all other, with the device associated documentations.
- is examined for compliance and consciousness of work place safety rules on regular bases.

Installation, maintenance and repair work must be performed by trained and qualified personnel only. Faults, which may influence safety, must be rectified immediately.

### 4. Obligations of User Personnel

Personnel authorized to fulfil tasks at the MAGINEx<sup>®</sup> must be familiar with the operating manual.

Persons authorized to work on the device must permanently commit them self's to:

- Acknowledge the basic occupational health and safety rules at all times.
- Read and acknowledge safety instructions and warnings of this operating manual.

#### 4.1 Qualified personnel

These are persons, familiar with the installation, assembly, commissioning and operation of the product. Furthermore these persons must be qualified and trained for tasks; these persons are authorized to perform. (E.g. training and obligation to maintain required operating conditions in accordance to regional and site-specific rules and regulations).

Education or training for care and use of safety and protective equipment, according relevant standards of safety techniques.

### 5. Warranty and Liability

Our standard terms and conditions of sale and delivery apply, unless other conditions for warranty and liability were explicitly mutually agreed upon. Claims of warranty or liability leading back to any of the below described causes is not legitimate.

- Using the MAGIN-Ex<sup>®</sup> not in compliance with the intended purpose of use of this item.
- Incorrect installation, commissioning, operation and maintenance of the MAGIN-Ex<sup>®</sup>
- Operation of the MAGIN-Ex<sup>®</sup> in conjunction with defective safety devices or in correctly installed safety and protective devices.
- Neglecting of instructions regarding transportation, storing, installation, commissioning, operation and maintenance of the MAGIN-Ex<sup>®</sup>
- Unauthorized modification or adjustments of the MAGIN-Ex<sup>®</sup>.
- Inappropriate condition monitoring of parts subject to wear.
- Incorrect repairs, inspections and maintenance.
- Catastrophic failures caused by external forces and force majeure.

Any liability for damages caused by in correct operation of the MAGIN-Ex<sup>®</sup> will be rejected.

## 6. Warnings and Safety relevant Standards

For references to special hazards and uncommon information's signal the terms **DANGER**, **WARNING**, **ATTENTION** and **REMARK** are used within this operating manual.

**DANGER** neglecting may cause danger to life and/or serious damage to property.



**WARNING** neglecting may cause, serious injury and/or damage to property.



**ATTENTION** neglecting may cause, injury and/or damage to property.



**REMARK** indicates that special attention to technical correlations is required.



To prevent injury and damage of property due to failure of the device, the acknowledgement of the not specially marked instructions for transportation, installation, product range and maintenance is an absolute necessity.

## 7. Observing of Environmental Rules and Regulations

Rules and regulations for waste prevention and disposal must be followed at all times when working with or at the MAGIN-Ex<sup>®</sup> measuring Materials that may endanger and pollute water such as:

- Grease, oil and Lubricants
- Hydraulic fluids
- Coolants
- Cleaning fluids containing solvents



must not be emitted to surrounding soil, waters and drains. Such materials must be stored, transported and caught, in suitable containers. For safe and environmentally friendly disposal of hydraulic fluids and with such fluids contaminated materials, national and international laws, rules and regulations must be acknowledged.



## 8. Intended Purpose of Use

The MAGIN-Ex® is exclusively designed to monitor liquid mediums within closed and filled systems.

Any adaptation as well as modification or extension of the device, not complying with the intended purpose of use is prohibited and requires the explicit and exclusive approval of the manufacturer.

Acknowledgement of the operating manual and instructions for inspection and maintenance as well as the observance of inspection and maintenance intervals are subject of the intended purpose of use.

Any damage that may arise out of the incorrect use will not be at the responsibility of the manufacturer. The sole risk devolves at the user.

### 8.1 Range of Application

The usage of the MAGIN-Ex® is only allowed in pipelines which are suitable in diameter and pressure, and are only for water or water like mediums without a great deal of pollution.

Changes to specifications are only permitted prior to consent from Grünewald GmbH, 59069 Hamm.



## 9. Installation / Commissioning / Assembly Instructions

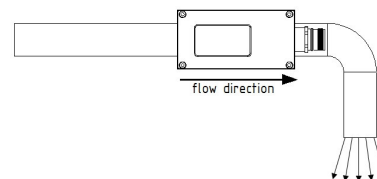
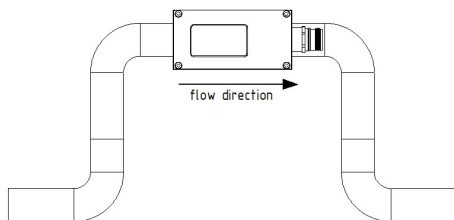
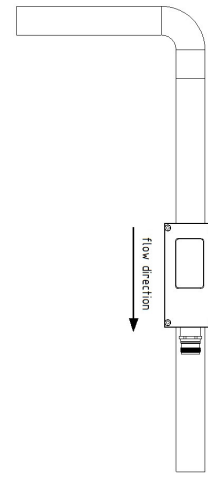
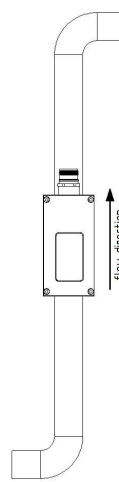
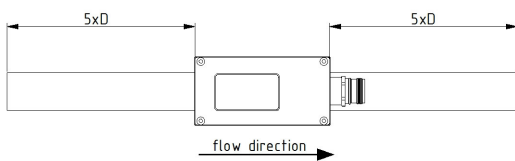
- **DANGER**
  - Take notice of operating pressure and pressure level
  - Use device with fluids specified only
  - Bleed system prior start up
- **WARNING**
  - Do not install directly after a pump
  - **Do not weld with built-in unit!**  
**The device will be destroyed**
- **ATTENTION**
  - Seal during installation
  - Use circuit diagram when wiring
  - Check circuit to prevent overloading
- **NOTE**
  - If required take notice of mounting position
  - Notice the specifications of the switch and gauge tolerances
  - The system pressure must exceed the pressure drop caused by the device
  - Overhead assembly only for clean medium



## 9.1 Installation of the MAGIN-Ex<sup>®</sup> volume flow measuring instrument

To install the MAGIN-Ex<sup>®</sup> volumetric instrument necessarily following installation / commissioning instructions must be observed:

- The measuring instrument may only be operated in filled and fully vented pipe systems
- The measuring instrument may only be operated up to its maximum system pressure
- The measuring instrument may only be operated in a horizontal or vertical (ascending) mounting position
- The meter has to be grounded by means of the attached grounding screw
- The stabilizing section has upstream and downstream  $5 \times D$  amount
- EMI (electromagnetic influence) effects are to be avoided and can influence the measurement!





## 10. Connections

|  | currency-output | voltage-output | frequency-output | limit-output   | CAN- Bus   | RS485      |
|--|-----------------|----------------|------------------|----------------|------------|------------|
| Supply voltage V <sub>cc</sub><br>12V DC | 1               |                |                  |                |            |            |
| Supply voltage GND<br>0V                 | 2               |                |                  |                |            |            |
| Slot M1                                  | ---             | ---            | ---              | ---            | 50, 51, 52 | 60, 61, 62 |
| Slot M2                                  | 10, 11          | 20, 21         | 30, 31           | 40, 41, 42, 43 | ---        | ---        |
| Slot M3                                  | 12, 13          | 22, 23         | 32, 33           | ---            | ---        | ---        |
| Slot M4                                  | 14, 15          | 24, 25         | 34, 35           | ---            | ---        | ---        |
| Slot M5                                  | 16, 17          | 26, 27         | 36, 37           | ---            | ---        | ---        |
| Slot M6                                  | 18, 19          | 28, 29         | 38, 39           | ---            | ---        | ---        |

If not otherwise stated, the supply voltage and the exit signal are not galvanically separated.

Devices with 2 combined measuring systems (for example volume flow and pressure measuring), the power supply must be used corporately by one power supply unit exclusively.

When connecting the power supply cable, the earthing from the supply unit must be connected.

## 11. Operation, Maintenance and Repair

Rules and regulations for workplace safety and occupational health and safety apply for the operation of the device.

Modifications, add-ons and / or changes to the MAGIN-Ex<sup>®</sup> may influence safety and must not be performed unless approved by the manufacturer.

The devices are maintenance-free apart from periodically cleaning which depends on the amount of contamination in the medium and the surrounding environment.

- Appropriate workshop equipment is absolutely necessary for the execution of maintenance measures.
- Regulations for electrical equipment must be observed.
- Incorrect use, operation or repair may result in severe injury or death.
- Prior any repair or maintenance task commences local rules and regulations must be acknowledged.

### Special note for the explosion-protection:

- The devices may be installed inside the
  - group 1, category M1
  - group 2, category 2G

The construction of the installation of the intrinsically safe electric circuit is to conduct accordingly of the effective mounting-appointment (by specialists).

(Competence of assembler verified, protected transferring of the intrinsically safe electric circuit, etc.)

- The devices are constructed in the protection category IP54
- The device must only be used according to construction regulations.
- The connection to the power supply must be checked and tested.
- **Fluid technical connection:** before connection to the pipeline, **check pipeline for pollution and contamination.**
- Only after **correct fitting and examination** are the medium supply to be opened.

The electrical connections are to use the connection clamps and/or plug. A professional and secure installation and a continual maintenance of the IP protection is required.

## 12. Transportation / Storage

- Transport temperatures shall not exceed the range of -10°C to 60°C within a dry and clean environment.
- Protect against external forces.
- Storage temperatures shall not exceed the range of -20°C to 60°C within a dry and clean environment.
- Mounting temperature shall not exceed the range of 10°C to 50°C
- To prevent any condensation of water when stored in rooms with a high degree of humidity, measures such as heating of the room or application of drying agents is required.

### 13. Description of the device

The universal measuring device type MAGIN-Ex<sup>®</sup> is an uniformed standardised device for volume flow measuring. The devices are made to withstand very hard and difficult areas of deployment. Because of their very solid construction they are able to withstand very high levels of burden. The mechanical fitting can be optionally be fitted with a thread selectively, flange or a coupling system. The electrical fitting can be optionally fitted with a coupling plug in any chosen form, a PROMOS connector or wire connection in various lengths. For the subsequent measuring value transmission there are various output signals available which are currency and voltage in different ranges.

### 14. Functioning of the MAGIN-Ex<sup>®</sup> -Device

The MAGIN-Ex<sup>®</sup> transforms the physical quantities of the medium (volume flow) into an electrical signal. These measurable quantities are available and stand behind the following superior systems (control system).

The measuring signals can be:

- current: 0/4-20mA
- frequency 5-15Hz
- CAN- Open
- RS485
- limit
- voltage: 0 bis 10V  
(on customers demand like: 1-4V, 0-5V, 0-10V, ...)

### 15. Hazards

To avoid risk of damage or injury, the safety instructions of this operating manual must be applied and carried out!

When fitting or dismantling the device, the safety regulations of the country regarded must be applied by. Especially when working on electrical components, are the work safety rules to be followed. In Germany the ZH 1/94 "Safety handbook for qualified craftsmen" is to be applied.

It is not known that the device concerning the guidelines 89/336/EWG is not affected against electromagnetic disturbance that occur during normal operating procedures.

Special terms, that are given from the EMV-environment are to be applied and the manufacturer is to be notified.

**Dangers that arise whilst fitting and connecting the device are to be considered and the corresponding actions are to be taken and a hazard analysis is to be rendered**



## 16. Technical assistance

For assistance in an event of malfunctioning or failure of the device please contact

**Grünewald GmbH, Oberallener Weg 7, D-59069 Hamm**

**Tel. +49 2385 922670, Fax +49 2385 922672 or mail: [info@gruenewald.eu](mailto:info@gruenewald.eu)**

## 17. Scope of delivery

- MAGIN-Ex<sup>®</sup> measuring device
- Operating manual

# 18. Model Key

MAGINEX<sup>®</sup> — \* / \*

| Kategorie | Zusätzliche Druckmessung | Zusätzliche Temperaturmessung intern | Zusätzliche Temperaturmessung extern | Zusätzliche Temperaturmessung intern | Zusätzliche Temperaturmessung extern | Zusätzliche Temperaturmessung intern | Zusätzliche Temperaturmessung extern | Leichte Netze (mm)                                   | Systemgröße (bar) | Mechanischer Anschluß                                   | Elektronischer Anschluß  | Displayanzeige                         | Sensitivitätsänderung   | Schnittstelle Volumen  | Schnittstelle Temperatur   | Schnittstelle Druck  |
|-----------|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--|-------------------|---|--|--|---|--|--|--|
| V         | P<br>Druckmessung        | T<br>Temperaturmessung intern        | T2<br>Temperaturmessung extern       | 0...***<br>Messbereich               | 0...***<br>Messbereich               | 0...***<br>Messbereich               | 0...***<br>Messbereich               | 30<br>DN50<br>25<br>DN25<br>15<br>DN15<br>10<br>DN10 | 0...***<br>bar    | 0...***<br>Ingenieurgröße<br>Stapel-O<br>Flansch<br>*** | RS485<br>GPIB<br>HARTING<br>JUMO<br>S<br>SOURAU<br>K<br>KODIT<br>***<br>Leitung mit Länge in m<br>Leitung mit Länge in m | A<br>mit Anzeige<br>VA<br>ohne Anzeige | K0<br>Kompakt-groß<br>AS<br>Analog-Sensitivität<br>Länge in m | 50<br>0-20mA<br>54<br>4-20mA<br>55...***<br>Modbus<br>***...<br>F<br>5-19Hz<br>F5<br>5-19Hz<br>F5<br>5-19Hz<br>F5...<br>aktiv<br>F5...<br>aktiv<br>*** | 50<br>0-20mA<br>54<br>4-20mA<br>55...***<br>Modbus<br>***...<br>F<br>5-19Hz<br>F5<br>5-19Hz<br>F5<br>5-19Hz<br>F5...<br>aktiv<br>F5...<br>aktiv<br>*** | 50<br>0-20mA<br>54<br>4-20mA<br>55...***<br>Modbus<br>***...<br>F<br>5-19Hz<br>F5<br>5-19Hz<br>F5<br>5-19Hz<br>F5...<br>aktiv<br>F5...<br>aktiv<br>*** |

\*\* [special] indicates more features and freely selectable options and features taking into account technical and certified parameters.

The indication of the registration "MAGIN-EX<sup>®</sup>" is a non-binding option.

## 19. Nameplate

|  |                      |                                  |                   |
|--|----------------------|----------------------------------|-------------------|
| <b>MAGINEx<sup>®</sup></b><br><b>MAGINEx<sup>®</sup></b> |                      | <b>Grünewald GmbH</b>            |                   |
| <b>Typ:</b>  | MAGINEx-*/**/***     | <b>Oberallener Weg 7</b>         | <b>59069 Hamm</b> |
| <b>Type:</b>   | ***/**/***...        | <b>Tel.: +49 (0) 2385 922670</b> |                   |
| <b>Artikel-Nr.:</b>                                      | *_*_*_*_*_*_*_*_*_*  | <b>Fax: +49 (0) 2385 922672</b>  |                   |
| <b>Article-No.:</b>                                      |                      | <b>Mail: info@gruenewald.eu</b>  |                   |
| <b>Serien-Nr.:</b>                                       | *****                | <b>CE 0158</b>                   |                   |
| <b>Serial-No.:</b>                                       |                      | <b>⊕ I MI Ex ia I Ma</b>         |                   |
| <b>Datum:</b>  | **_*_*_*_*_*_*_*_*_* | <b>⊕ II 2G Ex ia IIA T4 Gb</b>   |                   |
| <b>Date:</b>   |                      | <b>Ta = -50 - +80 °C</b>         |                   |
| <b>Messbereich:</b>                                      | * - ***/min          | <b>BVS 13 ATEX E 061</b>         |                   |
| <b>Measuring range:</b>                                  |                      | <b>IECEX BVS 13.0072</b>         |                   |

The nameplate may contain more and additional supplementary information.

## 20. Technical Details

|                                       |  |
|---------------------------------------|--|
| <b>Nominal voltage:</b>               | 12VDC +15% / -20% $U_i = 14V_{dc}$<br>$I_i = 3,0A$   |
| <b>Output Signal:</b>                 | 5 – 15 Hz      frequency (potential free)<br>GW              limit<br>0 – 10V        active output (non – isolated)<br>0/4 – 20mA    active output (non – isolated)<br>CAN-Open     Bus system<br>RS485         Bus system |
| <b>Signal range:</b>                  | 5 – 15,2Hz, 0/4 – 21,5mA, 0 – max. 10,75V  |
| <b>Weight:</b>                        | depending on type  |
| <b>Environmental Temperature:</b>     | -50 to +80°C    at group I<br>-50 to +80°C    at group II (T4)   |
| <b>Media Temperature:</b>             | -50 to +100°C  |
| <b>Measuring ranges:</b>              | Volume:        different ranges<br>Pressure:       different ranges<br>Temperature:   different ranges   |
| <b>Gauging accuracy:</b>              | ± 1 % FS   |
| <b>EG- verification- certificate:</b> | BVS 13 ATEX E 061<br>IECEX BVS 13.0072   |
| <b>Marking:</b>                       | <div style="display: flex; flex-direction: column; gap: 5px;"> <span>⊕ I M1 Ex ia I Ma</span> <span>  I M2 Ex ia [ib] I Mb</span> <span>⊕ II 2 G Ex ia IIA T4 Gb</span> <span>  II 2G Ex ia [ib] IIA T4 Gb</span> </div>   |

We reserve the right to make changes to our equipment that are due to technical progress.



## 21. EG-Model test certificate

**DEKRA**

### 10 EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG

(3) Nr. der EG-Baumusterprüfbescheinigung: **BVS 13 ATEX E 061**

(4) Gerät: **Durchflussmessgerät Typ MAGN-Ex®**

(5) Hersteller: **Grünewald GmbH**

(6) Anschrift: **Oberallener Weg 7, 59069 Hamm**

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung 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 das Gerät die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang I der Richtlinie erfüllt. Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 13.2116 EG niedergelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:

EN 60773-0:2012 Allgemeine Anforderungen  
EN 60773-11:2012 Einzelanforderung „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) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung des beschriebenen Gerätes in Übereinstimmung mit der Richtlinie 94/9/EG. Für Herstellung und Inverkehrbringen des Gerätes 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 2G Ex ia IIA T4 Gb      | (Kompaktversion ohne              |
| I M1 Ex ia I Mb            | CAN Bus bzw. RS485-Schnittstelle) |
| II 2G Ex ia [ib] IIA T4 Gb | (alle Versionen mit               |
| I M2 Ex ia [ib] I Mb       | CAN Bus bzw. RS485-Schnittstelle) |

DEKRA EXAM GmbH  
Rochum, den 06.09.2013

*[Signature]*  
Zertifizierungsstelle

*[Signature]*  
Fachbereich

Seite 1 von 10 (2) BVS 13 ATEX E 061  
Dieses Zertifikat ist für europäische Unionen und andere Länder gültig.  
DEKRA EXAM GmbH, Oberallener Weg 7, 59069 Hamm, Telefon: +49 238 922670, Telefax: +49 238 922671, www.dekra.com

**DEKRA**

(13) Anlage zur:

(14) EG-Baumusterprüfbescheinigung  
BVS 13 ATEX E 061

(15) 16.1 Gegenstand und Typ  
Durchfluss-Messgerät Typ MAGN-Ex®  
Vollständiger Typenschlüssel  
MAGN-Ex®-atbcbcltghlyjklmnoipqrsstuvwx

| Position | Wert          | Bedeutung   |
|----------|---------------|---|
| a        | =             | Ergänzte Messgröße (Nennspannung)                       |
| b        | T2            | DC 12 V   |
| b        | D-114         | Volumenstrom Messbereich                                |
|          | =             | Wahlwertoption Einheit                                  |
|          | I             | l / min   |
|          | cm            | m <sup>3</sup> / h                                      |
| c        | gpm           | gpm   |
|          | %             | %   |
| d        | bl            | Zusatzmessungen (optional)                              |
| e        | P             | Druckmessung  |
| f        | D-***         | Druck-Messbereich                                       |
| g        | (Stwert)      | Druck-Einheit   |
| h        | T             | Temperatur messen                                       |
| i        | *** 2 G 2-*** | Temperatur-Messbereich                                  |
| j        | (Stwert)      | Temperatur-Einheit                                      |
| k        | T2            | Temperatur extern                                       |
| l        | *** 2 G 2-*** | Temperatur-Messbereich                                  |
| m        | (Stwert)      | Temperatur-Einheit                                      |
| n        | =             | keine Nennweite des Messrohres                          |
| o        | D-***         | Zulässiger System-Druck in bar                          |
| p        | (Stwert)      | Mechanischer Anschluss                                  |
| p        | WA            | Elektronenabstrahl                                      |
|          | AL            | Aluminium   |
|          | TA            | Tantal  |
|          | ni            | ggf. weitere  |
| q        | =             | Zusätzliche Angaben                                     |
| q        | SI            | verifizierte funktionale Sicherheit (gemäß to EN 61508) |
|          | KSI           | keine funktionale Sicherheit                            |
| r        | ---           | ggf. weitere  |
| r        | =             | Elektronischer Anschluss                                |
|          | BIMU/STK      | diverse Steckverbinder                                  |
| s        | L=***m        | fest angeschlossene Leitungslänge in m                  |
| t        | =             | Anzeige   |
| t        | A             | Display   |
|          | KA            | kein Display  |
| t        | =             | Sensoren-Anordnung                                      |
|          | KG            | Kompaktgerät  |
| t        | AS=***m       | Abgesetzte Sensoren mit Leitungslänge in m              |

Seite 2 von 10 (2) BVS 13 ATEX E 061  
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| Position   | Wert              | Bedeutung   |
|------------|-------------------|---|
| u, v, w, x | a                 | Schwellwert $u =$ Volumen, $v =$ Vorlaufzeit, $w =$ Rücklaufzeit, $x =$ Druck |
|            | 50 / 54 / 57, ... | Stromstärke: 0-20 mA / 4-20 mA / ... $xx$ mA - $yy$ mA                        |
|            | U <sup>***</sup>  | Spannungsausgang: $u =$ $xx$ V - $yy$ V                                       |
|            | f                 | Frequenzsignal-Ausgang: 3-15 Hz   |
|            | f <sup>***</sup>  | Frequenzsignal-Ausgang: $xxx$ Hz - $yy$ Hz                                    |
|            | fA                | Frequenzsignal-Ausgang: 3-15 Hz aktiv   |
|            | f <sup>***A</sup> | Frequenzsignal-Ausgang: $xxx$ Hz - $yy$ Hz aktiv                              |
|            | GW                | Grenzwert-Konstante   |
|            | C                 | CAN-Diagnose  |
|            | P                 | RS485 (Profibus)  |

Anmerkungen:  
 - Nicht benötigte Positionen und etwaige Leerstellen können linksbündig aufgeschlüsselt werden.  
 - der Typenschlüssel kann um zusätzliche optional ergänzende, nicht Ex-relevante Angaben erweitert werden.  
 - ...<sup>\*\*\*</sup> bzw. ...<sup>\*\*\*A</sup> Platzhalter für frei wählbare, nicht Ex-relevante Angaben.

**16.2 Beschreibung**

Das Durchfluss-Messgerät Typ MAGN-Ex<sup>®</sup> dient zur Messung der Durchflussrate von flüssigen Medien und ggf. deren Druck und Temperatur in Bereichen mit Kategorie 2G und M1 (EPL, Gb und Ma) Anforderungen.

Das Durchfluss-Messgerät besteht aus einer Elektronik-Einheit, die entweder mit einer Durchfluss-Messkammer zu einer mechanischen Einheit kombiniert oder mit einer abgesetzten Durchfluss-Messeinheit verbunden ist.

Das Gehäuse der Elektronik-Einheit und der Durchfluss-Messeinheit ist aus Metall oder alternativ aus Kunststoff (Oberflächenwiderstand  $\leq 10^7 \Omega$ ).

Die Elektronik-Einheit ist in einem Einbauschirm mit Elektronik-Baugruppen und einem Anschlussraum für die äußeren eigensicheren Stromkreise unterteilt.

In den Seitenwänden des Anschlussraums befinden sich Leitungseinführungen und / oder Steckverbinder für die eigensicheren Stromkreise (Versorgung, Strom- / Spannungsausgänge, Optokoppler-Ausgänge und CAN-Bus / RS485-Bus-Schnittstellen).

Der Deckel des Einbauschirms ist optional mit einer Sichtfläche über dem LCD-Display versehen; unterhalb des Deckels befindet sich eine Taste.

Die abgesetzte Durchfluss-Messeinheit ist mit der Elektronik-Einheit mittels einer bis zu 300 m langen, fest angeschlossenen, oder absetzbar mit Steckverbindern versehenen Anschlussleitung für die eigensichere Versorgung der Durchfluss-Messeinheit und dem eigensicheren CAN-Bus-Kommunikationsstromkreis zwischen Durchfluss-Messeinheit und Elektronik-Einheit verbunden.

Die Elektronik-Baugruppen in der Elektronik-Einheit und der Durchfluss-Messeinheit sind in Vergussmasse eingebettet, mit Ausnahme des Displays und der Taste.

Bei Ausführungen mit galvanisch getrennten Signal-Ausgängen werden die Signalausgänge und der Versorgungsstromkreis in getrennten Anschlussteilungen geführt bzw. auf separate Steckverbinder aufgelegt.

Brennbare flüssige Medien dürfen verwendet werden, sofern sie sowie frei von Sauerstoff sind, das sie kein explosionsfähiges Gemisch bilden.

**16.3 Kenngrößen**

**16.3.1 Ausführungen mit Signal-Schnittstellen ohne galvanische Trennung**

**16.3.1.1 Analoger Stromausgang**

| Parameter  | Durchflussmessgerät                            |                          |
|--|--|--------------------------|
|  | Typ MAGN-Ex <sup>®</sup>                       | Typ MAGN-Ex <sup>®</sup> |
|  | u, v, w, x = 52 oder 54 oder 57 <sup>***</sup> |                          |
|  | Verorgungsstromkreis                           |                          |
|  | $r = B, H, J, S, K$                            | $r = L$ <sup>***</sup>   |
|  | Signalkreis                                    |                          |
|  | $r = B, H, J, S, K$                            | $r = L$ <sup>***</sup>   |
| Zündschutzart  | Ex ia IIB T1                                   | Ex ia IIB T1             |
| Spannung U <sub>0</sub>  | DC 14 V  | DC 14 V                  |
| Stromstärke I <sub>0</sub>   | 3 A  | N/A                      |
| Leistung P <sub>0</sub>  | - / -  | N/A                      |
| Spannung U <sub>1</sub>  | N/A  | DC 0 V                   |
| Stromstärke I <sub>1</sub>   | N/A  | 80 mA                    |
| Leistung P <sub>1</sub>  | N/A  | 200 mW                   |
| wirksame innere Kapazität C <sub>1</sub>                                 | vernachlässigbar                               | vernachlässigbar         |
| wirksame innere Induktivität L <sub>1</sub>                              | vernachlässigbar                               | vernachlässigbar         |
| wirksame innere Kapazität C <sub>2</sub> (fest angeschlossenes Kabel)    | N/A  | 185 pF/n                 |
| wirksame innere Induktivität L <sub>2</sub> (fest angeschlossenes Kabel) | N/A  | 0,8 µH/n                 |
| Umgebungs-temperatur-<br>-bereich  | -50 °C ≤ T <sub>a</sub> ≤ +80 °C               |                          |

Anmerkungen:  
 - / optional anderer geeigneter Steckverbinder gemäß Herstellerdokumentation  
 - / oder Klammern 1 (1) 2 (GND)  
 - / beliebiger Wert oder gleich der eigensicheren Versorgung  
 - N/A = nicht anwendbar

15.3.1.2 Analoges Spannungsausgang

Durchflussmessgerät  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>

u, v, w, x = U<sup>1</sup> oder F<sup>1</sup> K<sup>1</sup>

| Parameter  | Versorgungsbatterie                                |                      | Signalbatterie                                     |                      |
|--|--|----------------------|--|----------------------|
|  | r = B, H, J, S, K, M <sup>1</sup> / J <sup>1</sup> | r = L <sup>1</sup> m | r = B, H, J, S, K, M <sup>1</sup> / J <sup>1</sup> | r = L <sup>1</sup> m |
| Zündschutzart  | Ex ia IIA / I                                      |                      | Ex ia IIA / I                                      |                      |
| Spannung U <sub>0</sub>  | DC 14 V  |                      | DC 14 V  |                      |
| Stromstärke I <sub>0</sub>   | 3 A  |                      | N/A  |                      |
| Leistung P <sub>0</sub>  | - J <sup>1</sup>                                   |                      | - J <sup>1</sup>                                   |                      |
| Spannung U <sub>1</sub>  | N/A  |                      | 4.5 V ± 0.5 V                                      |                      |
| Stromstärke I <sub>1</sub>   | N/A  |                      | 12 mA  |                      |
| Leistung P <sub>1</sub>  | N/A  |                      | 35 mW  |                      |
| wirksame innere Kapazität C <sub>1</sub>                                 | vernachlässigbar                                   |                      | vernachlässigbar                                   |                      |
| wirksame innere Induktivität L <sub>1</sub>                              | vernachlässigbar                                   |                      | vernachlässigbar                                   |                      |
| wirksame innere Kapazität C <sub>2</sub> (best angeschlossenes Kabel)    | N/A  | 185 pF/m             | N/A  | 185 pF/m             |
| wirksame innere Induktivität L <sub>2</sub> (best angeschlossenes Kabel) | N/A  | 0.8 µH/m             | N/A  | 0.8 µH/m             |
| Lüftungsbereich  | -55 °C ≤ T <sub>1</sub> ≤ +55 °C                   |                      |  |                      |

Anmerkungen:  
- J<sup>1</sup> optional anderer geeigneter Steckverbinder gemäß Herstellerdokumentation  
- J<sup>1</sup> oder Klammern 1 (+) 2 (GND)  
- J<sup>1</sup> oder Klammern, wie in der Betriebsanleitung festgelegt  
- J<sup>1</sup> beliebiger Wert oder gleich der eigentlichen Versorgung  
- N/A = nicht anwendbar

Zelle 3 von 10 ab 06/13/ATEX 0 081  
Daten-Zertifiz. durch TÜV SÜD (010) ist abschließend weiterzuleiten worden.  
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15.3.1.3 5 - 10 Hz Frequenz-Signal (aktiv) / 50 Hz - 99 Hz Frequenz-Signal (aktiv)

Durchflussmessgerät  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>  
Typ MAGIN-Ex<sup>®</sup>

u, v, w, x = FA oder F<sup>1</sup> K<sup>1</sup>

| Parameter  | Versorgungsbatterie                                |                      | Signalbatterie                                     |                      |
|--|--|----------------------|--|----------------------|
|  | r = B, H, J, S, K, M <sup>1</sup> / J <sup>1</sup> | r = L <sup>1</sup> m | r = B, H, J, S, K, M <sup>1</sup> / J <sup>1</sup> | r = L <sup>1</sup> m |
| Zündschutzart  | Ex ia IIA / I                                      |                      | Ex ia IIA / I                                      |                      |
| Spannung U <sub>0</sub>  | DC 14 V  |                      | DC 14 V  |                      |
| Stromstärke I <sub>0</sub>   | 3 A  |                      | - J <sup>1</sup>                                   |                      |
| Leistung P <sub>0</sub>  | - J <sup>1</sup>                                   |                      | - J <sup>1</sup>                                   |                      |
| Spannung U <sub>1</sub>  | N/A  |                      | N/A  |                      |
| Stromstärke I <sub>1</sub>   | N/A  |                      | N/A  |                      |
| Leistung P <sub>1</sub>  | N/A  |                      | N/A  |                      |
| wirksame innere Kapazität C <sub>1</sub>                                 | vernachlässigbar                                   |                      | vernachlässigbar                                   |                      |
| wirksame innere Induktivität L <sub>1</sub>                              | vernachlässigbar                                   |                      | vernachlässigbar                                   |                      |
| wirksame innere Kapazität C <sub>2</sub> (best angeschlossenes Kabel)    | N/A  | 185 pF/m             | N/A  | 185 pF/m             |
| wirksame innere Induktivität L <sub>2</sub> (best angeschlossenes Kabel) | N/A  | 0.8 µH/m             | N/A  | 0.8 µH/m             |
| Lüftungsbereich  | -50 °C ≤ T <sub>1</sub> ≤ +60 °C                   |                      |  |                      |

Anmerkungen:  
- J<sup>1</sup> optional anderer geeigneter Steckverbinder gemäß Herstellerdokumentation  
- J<sup>1</sup> oder Klammern 1 (+) 2 (GND)  
- J<sup>1</sup> oder Klammern, wie in der Betriebsanleitung festgelegt  
- J<sup>1</sup> beliebiger Wert oder gleich der eigentlichen Versorgung  
- N/A = nicht anwendbar

Zelle 4 von 10 ab 06/13/ATEX 0 081  
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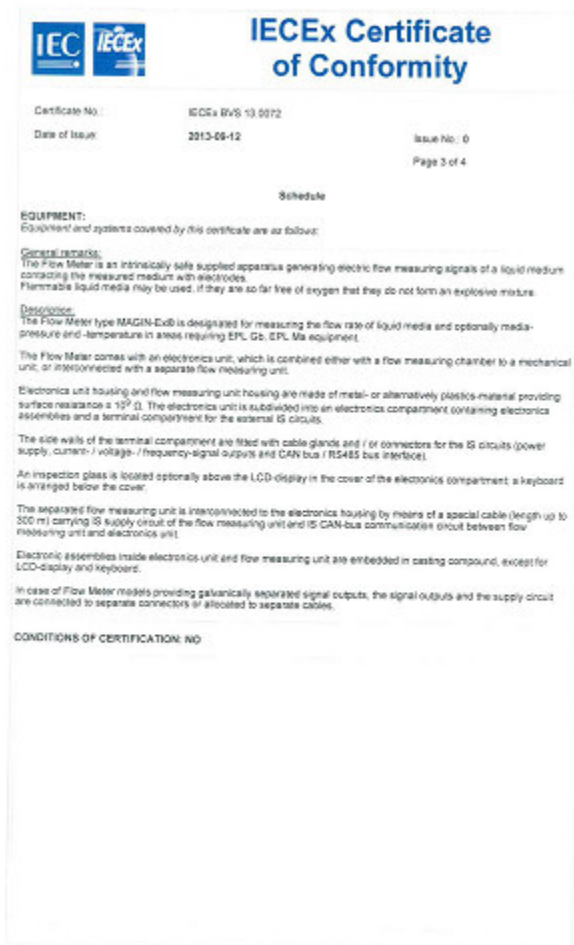
## 21.2 IECEx – Certificate

| IECEx Certificate of Conformity  |  |             |
|--|--|-------------|
| INTERNATIONAL ELECTROTECHNICAL COMMISSION<br>IEC Certification Scheme for Explosive Atmospheres<br><small>for rules and details of the IECEx Scheme visit www.iecex.com</small>  |  |             |
| Certificate No.:   | IECEx BVS 13.0072  | Issue No. 0 |
| Status:  | Current  |             |
| Date of issue:   | 2013-09-12   | Page 1 of 4 |
| Applicant:   | Grünewald GmbH<br>Oberallener Weg 7<br>59069 Hamm<br>Germany   |             |
| Electrical Apparatus:  | Flow Meter type M40R-ExB-*****   |             |
| Optional accessory:  |  |             |
| Type of Protection:  | Equipment protection by intrinsic safety "i"   |             |
| Marking:   | Ex ia I A T4 Gb and / or Ex ia I Ma (models not providing CAN bus or RS485 interface)<br>Ex ia (b) I A T4 Gb and / or Ex ia (b) I Mb (models providing CAN bus or RS485 interface) |             |
| Approved for issue on behalf of the IECEx Certification Body:  | H.-Ch. Simanski  |             |
| Position:  | Head of Certification Body   |             |
| Signature:<br>(for printed version)  |  |             |
| Date:  | 12.9.2013  |             |
| <p>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 Official IECEx Website.</p> |  |             |
| Certificate issued by:   | <br>DEKRA EXAM GmbH<br>Dinnendahlstrasse 9<br>44169 Bochum<br>Germany  |             |

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| IECEx Certificate of Conformity  |  |             |
|--|--|-------------|
| Certificate No.:   | IECEx BVS 13.0072  | Issue No. 0 |
| Date of issue:   | 2013-09-12   | Page 2 of 4 |
| Manufacturer:  | Grünewald GmbH<br>Oberallener Weg 7<br>59069 Hamm<br>Germany |             |
| Additional Manufacturing location (s):   |  |             |
| <p>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 Q2 and Operational Documents as attached.</p> |  |             |
| <p><b>STANDARDS:</b><br/>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:</p>  |  |             |
| <p><b>IEC 60079-0 : 2011</b> Explosive atmospheres - Part 0: General requirements<br/>Edition: 6.0</p>   |  |             |
| <p><b>IEC 60079-11 : 2011</b> Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"<br/>Edition: 6.0</p>   |  |             |
| <p>This Certificate <b>does not</b> indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.</p>   |  |             |
| <p><b>TEST &amp; ASSESSMENT REPORTS:</b><br/>A sample(s) of the equipment listed has successfully met the evaluation and test requirements as recorded in:</p>   |  |             |
| <p><b>Test Report:</b><br/>DG-BVS-EXTR13.0069/00</p>   |  |             |
| <p><b>Quality Assessment Report:</b><br/>DE-BVS-QAR08.0054/02</p>  |  |             |

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**Type Code**

Flow Meter type MAGIN-Ex®

Type code completed

MAGIN-Ex®-XXXXXXXXXXXXXXXXXXXXXXXXXXXX

MAGIN-Ex®-a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x

| Position | Value            | Parameter  |
|----------|------------------|--|
| a        | =                | Intrinsically safe power supply (rated voltage)  |
| b        | 0-***            | DC 12 V  |
| b        | 0-***            | Flow rate measuring range                        |
| c        | =                | Flow rate unit                                   |
|          | l                | l / min  |
|          | cbm              | m <sup>3</sup> / h                               |
|          | ppm              | ppm  |
|          | %                | %  |
| d to l   |                  | Additional measured parameters (optional)        |
| d        | p                | Pressure   |
| e        | 0-***            | Pressure range                                   |
| f        | (various)        | Pressure unit                                    |
| g        | T                | Temperature internal                             |
| h        | ..*** ≤ 0 ≤ +*** | Temperature-range                                |
| i        | (various)        | Temperature-unit                                 |
| j        | T2               | Temperature external                             |
| k        | ..*** ≤ 0 ≤ +*** | Temperature-range                                |
| l        | (various)        | Temperature-unit                                 |
| m        | (various)        | Rated width of the measuring tube                |
| n        | 0-***            | Permitted system-pressure in bar                 |
| o        | (various)        | Mechanical connection                            |
| p        | =                | Material of electrodes                           |
|          | VA               | Stainless steel                                  |
|          | AL               | Aluminium  |
|          | TA               | Tantalum   |
|          | **               | further options                                  |
| q        | =                | Additional features (not subject to test report) |
| r        | =                | Electrical connection facilities                 |
|          | B H U S K        | Various connectors                               |
|          | L***m            | Permanently connected cable, length in m         |
| s        | =                | Indicator  |
|          | A                | Display  |
|          | KA               | Display not provided                             |
| t        | =                | Sensor arrangement                               |
|          | K G              | Compact version                                  |
|          | AS***m           | Separated sensor unit, *** = cable length in m   |



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| Position   | Value      | Parameters  |
|------------|------------|---|
| u, v, w, x | =          | Interfaces: u = Flow rate, v = forward flow temperature<br>w = reverse flow temperature, x = Pressure |
|            | S0/S4/S*** | current loop: 0-20 mA / 4-20 mA / *** = xx mA - yy mA   |
|            | U***       | Voltage output: *** = xx V - yy V   |
|            | F          | Frequency signal output: 5-15 Hz  |
|            | F**        | Frequency signal output: ** = xx Hz - yy Hz   |
|            | FA         | Frequency signal output: 5-15 Hz active   |
|            | F***A      | Frequency signal output: *** = xx Hz -yy Hz active  |
|            | GW         | Maximum- / minimum-alarm contact  |
|            | C          | CAN Open  |
|            | P          | RS485 (Profibus)  |

Remarks:  
- positions not used or empty position are closed up by moving the other elements to the left  
- the type code may be enhanced optionally with further non Ex-relevant parameters  
- \*\*\* or \*\*\*,\* : spacer for free defined non Ex-relevant parameters

| Allocation of Ex marking to model |  |
|-----------------------------------|--|
| Ex marking                        | Model: MAGIN-Ex®-XXXXXXXXXXXXXXXXXXXXXXXXXXXX<br>MAGIN-Ex®-a b c d e f g h i j k l m n o p q r s t u v w x   |
| Ex ia IIA T4 Gb                   | position Y = KG<br>in combination with position 'u' or 'v' or 'w' or 'x'<br>= S0 or S4 or S*** = U***<br>= FA or F**A = F or F*** = GW             |
| Ex ia [ib] I Mb                   | position Y = KG**<br>in combination with position 'u' or 'v' or 'w' or 'x'<br>= C, = P   |
| Ex ia [ib] IIA T4 Gb              | position Y = AS**<br>in combination with position 'u' or 'v' or 'w' or 'x'<br>= S0 or S4 or S*** = U***<br>= FA or F**A = F or F*** = GW, = C, = P |



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**Ratings**

1. Models providing signal interfaces without galvanic separation  
1.1 Analogue current output

| Parameter   | Supply circuit                   |           | Signal circuit         |           |
|---|----------------------------------|-----------|------------------------|-----------|
|   | r = B, H, J, S, K, **)           | r = L***m | r = B, H, J, S, K, **) | r = L***m |
| level of protection   | Ex ia IIA / I                    |           | Ex ia IIA / I          |           |
| Voltage U <sub>i</sub>  | DC 14 V                          |           | DC 14 V                |           |
| Current I <sub>i</sub>  | 3 A                              |           | N / A                  |           |
| Power P <sub>i</sub>  | -)                               |           | N / A                  |           |
| Voltage U <sub>o</sub>  | N / A                            |           | DC 9 V                 |           |
| Current I <sub>o</sub>  | N / A                            |           | 90 mA                  |           |
| Power P <sub>o</sub>  | N / A                            |           | 200 mW                 |           |
| effective internal capacitance C <sub>i</sub>                               | negligible                       |           | negligible             |           |
| effective internal inductance L <sub>i</sub>                                | negligible                       |           | negligible             |           |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A                            | 185 pF/m  | N / A                  | 185 pF/m  |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A                            | 0.8 µH/m  | N / A                  | 0.8 µH/m  |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C |           |                        |           |

Flow Meter  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
u, v, w, x = S0 or S4 or S\*\*\*

Remarks:  
- ) optional other suitable connectors as specified in manufacturer's documents  
- \*\*) or terminals 1 (+), 2 (GND)  
- \*\*) or terminals as specified in the User's Manual  
- \*) any value or equal to the applied IS power supply  
- N / A = not applicable



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- 1.2 Analogue voltage output

| Parameter   | Supply circuit                   |           | Signal circuit         |           |
|---|----------------------------------|-----------|------------------------|-----------|
|   | r = B, H, J, S, K, **)           | r = L***m | r = B, H, J, S, K, **) | r = L***m |
| level of protection   | Ex ia IIA / I                    |           | Ex ia IIA / I          |           |
| Voltage U <sub>i</sub>  | DC 14 V                          |           | DC 14 V                |           |
| Current I <sub>i</sub>  | 3 A                              |           | N / A                  |           |
| Power P <sub>i</sub>  | -)                               |           | N / A                  |           |
| Voltage U <sub>o</sub>  | N / A                            |           | -4.5 V ≤ U ≤ 12.6 V    |           |
| Current I <sub>o</sub>  | N / A                            |           | 12 mA                  |           |
| Power P <sub>o</sub>  | N / A                            |           | 35 mW                  |           |
| effective internal capacitance C <sub>i</sub>                               | negligible                       |           | negligible             |           |
| effective internal inductance L <sub>i</sub>                                | negligible                       |           | negligible             |           |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A                            | 185 pF/m  | N / A                  | 185 pF/m  |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A                            | 0.8 µH/m  | N / A                  | 0.8 µH/m  |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C |           |                        |           |

Flow Meter  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
u, v, w, x = U\*\*\*

Remarks:  
- ) optional other suitable connectors as specified in manufacturer's documents  
- \*\*) or terminals 1 (+), 2 (GND)  
- \*\*) or terminals as specified in the User's Manual  
- \*) any value or equal to the applied IS power supply  
- N / A = not applicable



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1.3 5 - 15 Hz frequency signal (active) / xx Hz - yy Hz frequency signal (active)

| Parameter   | Supply circuit                   |           | Signal circuit         |           |
|---|----------------------------------|-----------|------------------------|-----------|
|   | r = B, H, J, S, K, **)           | r = L***m | r = B, H, J, S, K, **) | r = L***m |
| level of protection   | Ex ia IIA / I                    |           | Ex ia IIA / I          |           |
| Voltage U <sub>i</sub>  | DC 14 V                          |           | DC 14 V                |           |
| Current I <sub>i</sub>  | 3 A                              |           | — )                    |           |
| Power P <sub>i</sub>  | — )                              |           | — )                    |           |
| Voltage U <sub>o</sub>  | N / A                            |           | N / A                  |           |
| Current I <sub>o</sub>  | N / A                            |           | N / A                  |           |
| Power P <sub>o</sub>  | N / A                            |           | N / A                  |           |
| effective internal capacitance C <sub>i</sub>                               | negligible                       |           | negligible             |           |
| effective internal inductance L <sub>i</sub>                                | negligible                       |           | negligible             |           |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A                            | 185 pF/m  | N / A                  | 185 pF/m  |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A                            | 0.8 µH/m  | N / A                  | 0.8 µH/m  |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C |           |                        |           |

Flow Meter  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
u, v, w, x = FA or F\*\*\*

Remarks:  
- ) optional other suitable connectors as specified in manufacturer's documents  
- ) or terminals 1 (+), 2 (GND)  
- ) or terminals as specified in the User's Manual  
- ) any value or equal to the applied IS power supply  
- N / A = not applicable

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2. Devices providing signal interfaces with galvanic separation

2.1 5 - 15 Hz / xx Hz - yy Hz frequency signal circuits (passive)

| Parameter   | Supply circuit                   |           | Signal circuit         |           |
|---|----------------------------------|-----------|------------------------|-----------|
|   | r = B, H, J, S, K, **)           | r = L***m | r = B, H, J, S, K, **) | r = L***m |
| level of protection   | Ex ia IIA / I                    |           | Ex ia IIA / I          |           |
| Voltage U <sub>i</sub>  | DC 14 V                          |           | DC 14 V                |           |
| Current I <sub>i</sub>  | 3 A                              |           | — )                    |           |
| Power P <sub>i</sub>  | — )                              |           | — )                    |           |
| Voltage U <sub>o</sub>  | N / A                            |           | N / A                  |           |
| Current I <sub>o</sub>  | N / A                            |           | N / A                  |           |
| Power P <sub>o</sub>  | N / A                            |           | N / A                  |           |
| effective internal capacitance C <sub>i</sub>                               | negligible                       |           | negligible             |           |
| effective internal inductance L <sub>i</sub>                                | negligible                       |           | negligible             |           |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A                            | 185 pF/m  | N / A                  | 185 pF/m  |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A                            | 0.8 µH/m  | N / A                  | 0.8 µH/m  |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C |           |                        |           |

Flow Meter  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
type MAGIN-Ex<sup>®</sup>.....  
u, v, w, x = F or F\*\*\*

Remarks:  
- ) optional other suitable connectors as specified in manufacturer's documents  
- ) or terminals 1 (+), 2 (GND)  
- ) or terminals as specified in the User's Manual  
- ) any value or equal to the applied IS power supply  
- N / A = not applicable  
- the frequency signal circuits provide galvanic separation from the IS power supply circuit and from each other

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**2.2 Maximum / minimum value circuits (opto-isolator outputs passive)**

| Parameter   | Supply circuit  |           | Signal circuit         |           |
|---|---|-----------|------------------------|-----------|
|   | r = B, H, J, S, K, **)  | r = L***m | r = B, H, J, S, K, **) | r = L***m |
| level of protection   | Ex ia IIA / I   |           | Ex ia IIA / I          |           |
| Voltage U <sub>i</sub>  | DC 14 V   |           | DC 14 V                |           |
| Current I <sub>i</sub>  | 3 A   |           | — *)                   |           |
| Power P <sub>i</sub>  | — *)  |           | — *)                   |           |
| Voltage U <sub>o</sub>  | N / A   |           | N / A                  |           |
| Current I <sub>o</sub>  | N / A   |           | N / A                  |           |
| Power P <sub>o</sub>  | N / A   |           | N / A                  |           |
| effective internal capacitance C <sub>i</sub>                               | negligible  |           | negligible             |           |
| effective internal inductance L <sub>i</sub>                                | negligible  |           | negligible             |           |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A   | 185 pF/m  | N / A                  | 185 pF/m  |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A   | 0.8 µH/m  | N / A                  | 0.8 µH/m  |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C  |           |                        |           |
| Remarks:  | <ul style="list-style-type: none"> <li>- *) optional other suitable connectors as specified in manufacturer's documents</li> <li>- **) or terminals 1 (+), 2 (GND)</li> <li>- **) or terminals as specified in the User's Manual</li> <li>- *) any value or equal to the applied IS power supply</li> <li>- N / A = not applicable</li> <li>- the maximum / minimum switch circuits provide galvanic separation from the IS power supply circuit and from each other</li> </ul> |           |                        |           |

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**2.3 CAN-bus signal circuits**

| Parameter   | Supply circuit  |           | Signal circuit         |                   |
|---|---|-----------|------------------------|-------------------|
|   | r = B, H, J, S, K, **)  | r = L***m | r = B, H, J, S, K, **) | r = L***m         |
| level of protection   | Ex ia IIA / I   |           | Ex ia IIA / I          |                   |
| Voltage U <sub>i</sub>  | DC 14 V   |           | 8.5 V                  |                   |
| Current I <sub>i</sub>  | 3 A   |           | 145 mA                 |                   |
| Power P <sub>i</sub>  | — *)  |           | 940 mW                 |                   |
| Voltage U <sub>o</sub>  | N / A   |           | 5.5 V                  |                   |
| Current I <sub>o</sub>  | N / A   |           | 170 mA *)              |                   |
| Power P <sub>o</sub>  | N / A   |           | 840 mW *)              |                   |
| effective internal capacitance C <sub>i</sub>                               | negligible  |           | 0.6 µF                 |                   |
| effective internal inductance L <sub>i</sub>                                | negligible  |           | negligible             |                   |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A   | 185 pF/m  | N / A                  | 0.6 µF + 185 pF/m |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A   | 0.8 µH/m  | N / A                  | 0.8 µH/m          |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C  |           |                        |                   |
| Remarks:  | <ul style="list-style-type: none"> <li>- *) optional other suitable connectors as specified in manufacturer's documents</li> <li>- **) or terminals 1 (+), 2 (GND)</li> <li>- **) or terminals as specified in the User's Manual</li> <li>- *) any value or equal to the applied IS power supply</li> <li>- *) single data line value and sum value of both data lines in parallel</li> <li>- N / A = not applicable</li> <li>- the CAN-bus signal circuits provide galvanic separation from the IS power supply circuit and from each other</li> </ul> |           |                        |                   |

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**2.4 RS485 signal circuits**

| Parameter   | Supply circuit   |           | Signal circuit                            |                   |
|---|--|-----------|---|-------------------|
|   | r = B, H, J, S,<br>K, ** <sup>1)</sup> 2)  | r = L***m | r = B, H, J, S,<br>K, ** <sup>1)</sup> 2) | r = L***m         |
| level of protection   | Ex ia IIA / I  |           | Ex ib IIA / I                             |                   |
| Voltage U <sub>i</sub>  | DC 14 V  |           | 4.5 V                                     |                   |
| Current I <sub>i</sub>  | 3 A  |           | 240 mA                                    |                   |
| Power P <sub>i</sub>  | - 3)   |           | 1000 mW                                   |                   |
| Voltage U <sub>s</sub>  | N / A  |           | 4.5 V                                     |                   |
| Current I <sub>s</sub>  | N / A  |           | 145 mA 2)                                 |                   |
| Power P <sub>s</sub>  | N / A  |           | 900 mW 2)                                 |                   |
| effective internal capacitance C <sub>i</sub>                               | negligible   |           | 0.6 µF                                    |                   |
| effective internal inductance L <sub>i</sub>                                | negligible   |           | negligible                                |                   |
| effective internal capacitance C <sub>i</sub> (permanently connected cable) | N / A  | 185 pF/m  | N / A                                     | 0.6 µF + 185 pF/m |
| effective internal inductance L <sub>i</sub> (permanently connected cable)  | N / A  | 0.8 µH/m  | N / A                                     | 0.8 µH/m          |
| Ambient temperature range   | -50 °C ≤ T <sub>a</sub> ≤ +80 °C   |           |   |                   |
| Remarks:  | <ul style="list-style-type: none"> <li>- <sup>1)</sup> optional other suitable connectors as specified in manufacturer's documents</li> <li>- <sup>2)</sup> or terminals 1 (+), 2 (GND)</li> <li>- <sup>3)</sup> or terminals as specified in the User's Manual;</li> <li>- <sup>4)</sup> any value or equal to the applied IS power supply</li> <li>- <sup>5)</sup> single data line value and sum value of both data lines in parallel versus GND</li> <li>- N / A = not applicable</li> <li>- the RS485 signal circuits provide galvanic separation from the IS power supply circuit and from each other</li> </ul> |           |   |                   |



## 22. EU-Declaration of Conformity

# EU-Konformitätserklärung *EU Declaration of Conformity*

**Im Sinne der: *In the legal scene of:***

- EU- Richtlinie Explosionsschutz 2014/34/EU  
*EU direction 2014/34/EU for equipment and protective systems intended for use in potentially explosive atmospheres explosion prevention*
- EU- Richtlinie über die elektromagnetische Verträglichkeit EMV- Richtlinie 2014/30/EU  
*EU- guidelines over the electromagnetic sociability EMV- guidelines 2014/30/EU*

**Für das: *For:***

|   |  |  |   |
|---|--|--|---|
| Bezeichnung / <i>description</i>  | <b>MAGINEx®- */**/*** ***/**/*/**...</b> |  |   |
| Kennzeichnung / <i>marking</i>  | ⊕  | I M1 Ex ia I Ma<br>I M2 Ex [ib] I Mb                       |   |
|   | ⊕  | II 2 G Ex ia IIA T4 Gb<br>II 2G Ex ia [ib] IIA T4 Gb       |   |
| Zulassung / <i>certification</i>  |  | BVS 13 ATEX E 061<br>IECEX BVS 13.0072                     |   |
| Seriennummer / <i>serial number</i>                                       |  | Lt. Lieferpapieren / <i>according to delivery documets</i> |   |
| Notifizierte Stelle / <i>notified body</i>                                | <b>CE</b>                                | 0158   | <b>DEKRA EXAM GmbH,</b><br><b>Dinnendahlstraße 9, D- 44809 Bochum</b> |
| EU- Baumusterprüfbescheinigung / <i>EU- Type Examination Certificate:</i> |  |  | BVS 13 ATEX E 061   |
| Der Hersteller / <i>the manufacturer</i>                                  | <b>Grünwald GmbH</b>                     | <b>Tel.:</b>   | <b>+49 (0) 2385 / 922670</b>  |
|   | <b>Oberallener Weg 7</b>                 | <b>Fax:</b>  | <b>+49 (0) 2385 / 922672</b>  |
|   | <b>D- 59069 Hamm</b>                     | <b>Mail:</b>   | <b>info@gruenewald.eu</b>   |

Hiermit bestätigen wir, dass die vorgenannten **MAGINEx® der Grünwald GmbH, Mess- u. Regeltechnik** den wesentlichen Anforderungen entsprechen, die in den Richtlinien des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen (2014/34/EU, 2014/30/EU) in der aktuellen Fassung festgelegt ist. Die Erklärung gilt für alle Exemplare, die nach den beim Hersteller hinterlegten Fertigungsunterlagen - die Bestandteil dieser Erklärung sind - hergestellt wurden.

*We herewith declare conformity of the above mentioned **MAGINEx® of Grünwald GmbH, Mess- u. Regeltechnik**, with the general directives outlined in the actual edition of the guidelines (2014/34/EU, 2014/30/EU) for equipment and protective systems with the intended purpose of use within explosive environment / atmospheres, of the council for approximation of laws of the member states.*

*This declaration is valid for all issues produced in accordance to the manufacturing documents of the manufacturer, which also form part of this declaration.*

Zur Beurteilung der Erzeugnisse wurden folgende Normen herangezogen:  
*Following standards were used for the assessment of the products:*

|                     |   |
|---------------------|---|
| EN 60079-0:2015     | Explosionsgefährdete Bereiche – Teil 0: Allgemeine Anforderungen<br><i>Explosive atmospheres - Part 0: Equipment - General requirements</i>   |
| EN 60079-11:2012    | Explosionsgefährdete Bereiche – Teil 11: Geräteschutz durch Eigensicherheit „i“<br><i>Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"</i>               |
| EN 60079-26:2015    | Explosionsgefährdete Bereiche - Teil 26: Betriebsmittel mit Geräteschutzniveau (EPL) Ga<br><i>Explosive atmospheres - Part 26: Equipment with Equipment protection level (EPL) Ga</i> |
| IEC 60079-0 : 2011  | Explosive atmospheres - Part 0: Equipment - General requirements  |
| IEC 60079-11 : 2011 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"   |
| IEC 60079-26 : 2014 | Explosive atmospheres - Part 26: Equipment with Equipment protection level (EPL) Ga   |

|                 |   |
|-----------------|---|
| EN 50303 : 2001 | Gruppe I, Kategorie-M1-Geräte für den Einsatz in Atmosphären die durch Grubengas und / oder brennbare Stäube gefährdet sind<br><i>Group I, category M1 equipment intended to remain functional in atmospheres endangered by firedamp and/or coal dust</i>   |
| EN 61000-3-2    | Elektromagnetische Verträglichkeit (EMV) - Teil 3-2: Grenzwerte – Grenzwerte für Oberschwingungsströme (Geräte-Eingangsstrom ≤16A)<br><i>Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current &lt;LE&gt; 16A per phase)</i>  |
| EN 61000-3-3    | Elektromagnetische Verträglichkeit (EMV) - Teil 3-3: Grenzwerte – Begrenzung von Spannungsänderungen, Spannungsschwankungen und Flicker in öffentlichen Niederspannungs- Versorgungsnetzen für Geräte mit einem Bemessungsstrom ≤16A je Leiter, die keiner Sonderanschlussbedingung unterliegen.<br><i>Electromagnetic compatibility (EMC) – Part 3-3: Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current &lt;LE&gt; 16A per phase and not subject to conditional connection.</i> |
| EN 61326-1      | Elektrische Mess-, Steuer-, Regel- und Laborgeräte- EMV- Anforderungen- Teil 1: Allgemeine Anforderungen<br><i>Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements</i>   |

Im Sinne der EG- Richtlinie Maschinen 2006/42/EG handelt es sich hier um eine auswechselbare Ausrüstung für eine übergeordnete Maschine. Die Gefährdungsanalyse der übergeordneten Maschine muss alle wesentlichen Risiken, die durch den Zusammenbau entstehen oder dem Hersteller nicht bekanntes EMV- Umfeld, überprüfen und in eine Risikokategorie einteilen. Entsprechende Maßnahmen sind durch die Gesamtmaschine zu gewährleisten.

*For the purposes of the EC Machinery Directive 2006/42/EG, these are interchangeable equipment for a superordinated machine. The hazard analysis of the superordinated machine has substantially all the risks incurred by the assembly or producer check-known EMC environment, and classified into a risk category. Appropriate measures have to be guaranteed by the entire machine.*

Ausgefertigt in / done at

Hamm

Am / on

March, 08<sup>th</sup> 2016

Name des Unterzeichners / name of signatory

Michael Wolf, Geschäftsführer oder Vertretung /  
General manager or representative

Unterschrift / Signature



(Maschinelle Unterschrift / machine- signature)



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