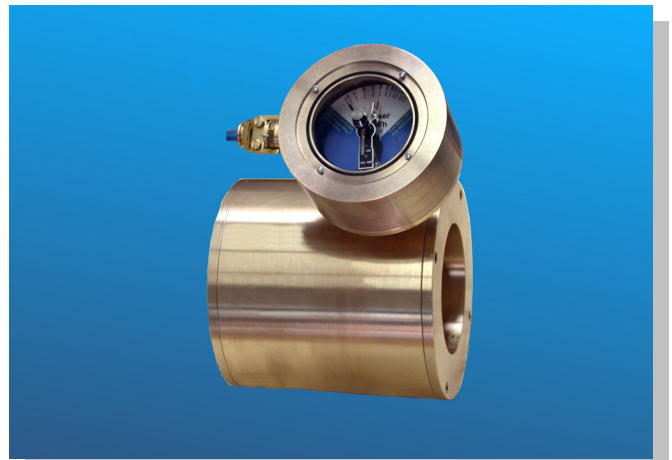
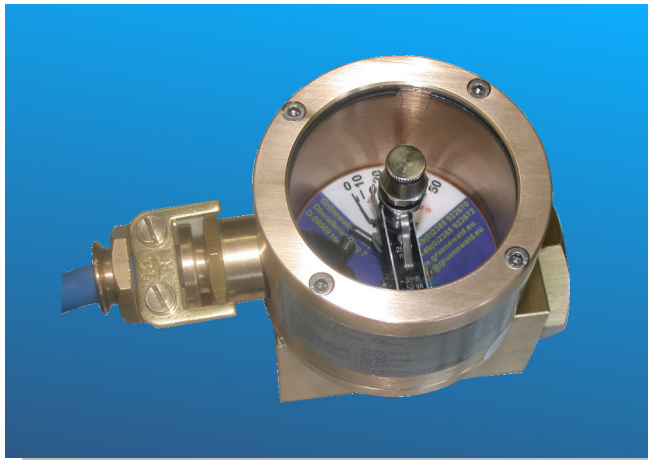


## OPERATING MANUAL



***Flow control device  
Type DAK  
Manufacturing Ranges  
from DN25 to DN200***



***I M2 Ex ia I Mb***

## General Information

*Dear Customer,*

The flow control device purchased, is a product of **Grünewald GmbH, 59069 Hamm** designed and manufactured for the operation of liquid medium 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)

E-Mail: [info@gruenewald.eu](mailto:info@gruenewald.eu)

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## 1. Introduction

This operating manual will assist to operate the flow control device 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 DAK flow control device.

Grünewald control and measuring devices operate mainly on electric-mechanical principles. 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 DAK flow control 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.**



## 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 cannot be solved within the operating manual provided information. Changes to specification and design as well as improvements to the device are subject to change with out 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 DAK flow control devices 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 DAK flow control 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 flow 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 DAK flow control device and the ambient temperatures. The intended purpose of use of the DAK flow control device 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 DAK flow control devices. 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 DAK flow control device 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 DAK flow control device not in compliance with the intended purpose of use of this item.
- Incorrect installation, commissioning, operation and maintenance of the DAK flow control device.
- Operation of the DAK flow control device 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 DAK flow control device.
- Unauthorized modification or adjustments of the DAK flow control device.
- 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 DAK flow control device 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 DAK flow control device. 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 DAK flow control device 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 DAK flow control device monitors volume in [l/min] or [m<sup>3</sup>/h]. Integrated changeover contacts, in conjunction with different kinds of line monitoring modules enable the use of the flow control device in either SPS or conventional controlled systems. As described with in this manual, minimum and/or maximum flow settings can be adjusted and monitored. The most common applications of use for the DAK flow control device are, pumps where a possible “ dry run ” must be monitored and prevented and the flow control in cooling circuits of motors.

## 9. Installation / Commissioning / Assembly Instructions

### • **DANGER**

- Take notice of operating pressure and pressure level
- Use device with fluids specified only
- Take notice of maximum flow
- Bleed system prior start up
- The Instruments of the series “TROPICAL” are not allowed to be dismantled in explosive areas.



### • **WARNING**

- Take notice of flow direction.
- Do not install directly after a pump.



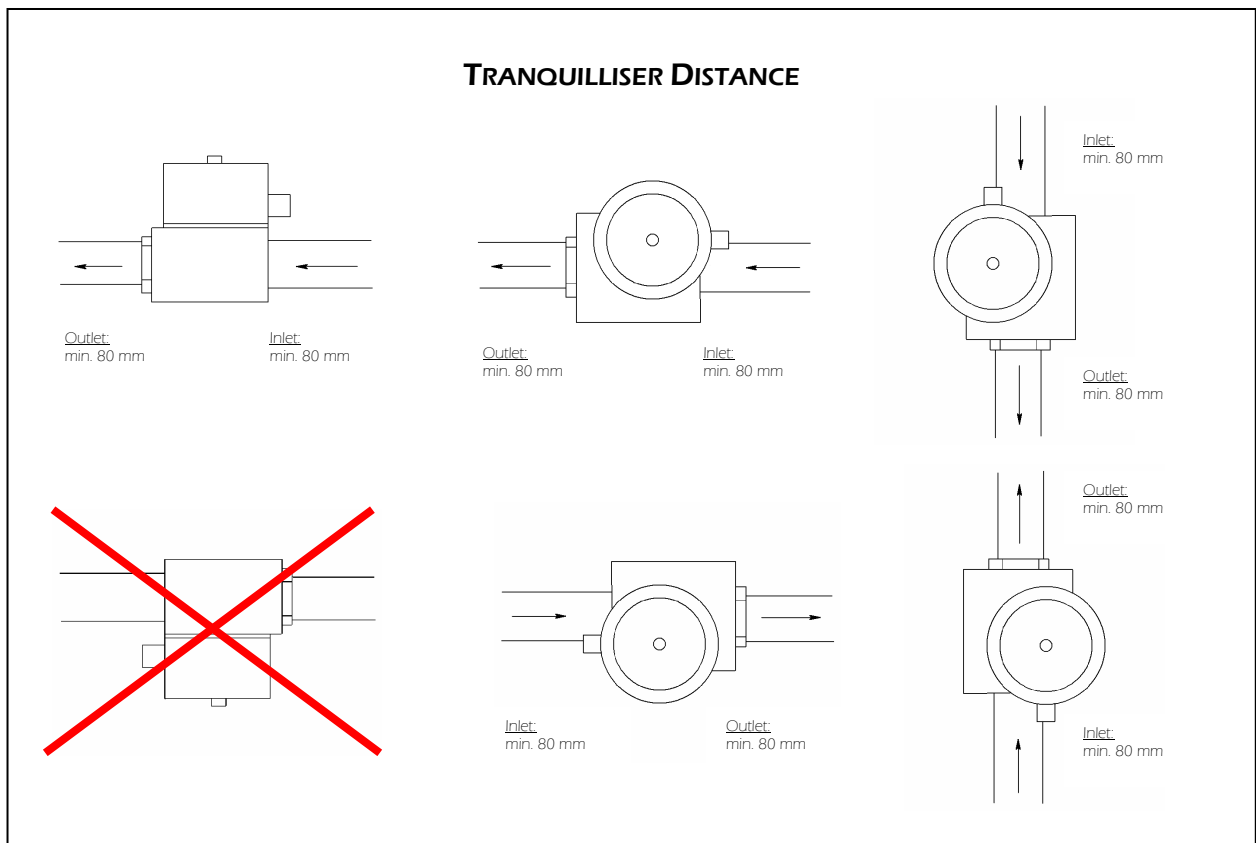
### • **ATTENTION**

- Seal during installation.



- **NOTE**

- If required take notice of mounting position
- Notice the specifications of the switch and gauge tolerances
- A tranquilliser length of 5 x pipe diameter is recommended
- The System pressure must exceed the pressure drop caused by the device



## 10. Adjustment of flow control device

For adjustment, the square pin of the lock is to be pressed with the adjusting spanner until the adjustment arm attached at the square pin, engages with the adjustment pin on either of the two pointers for the nominal setting point. By turning the adjustment spanner, whilst being pressed, each of the pointers can be positioned to the desired nominal setting over the entire range of the scale. The adjusting arm must not touch the contact of the device whilst in pressed condition.



## 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 DAK flow control device may influence safety and must not be performed unless approved by the manufacturer.

The devices are, apart from periodical cleaning (which is dependent on the degree of pollution of the medium) maintenance free units.

- 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 to any repair or maintenance tasks, local rules and regulations must be acknowledged.

## 12. Transportation / Storage

- Transport temperatures shall not exceed the range of -20°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.
- 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. Functioning of the DAK flow control device

The angle of the flap, mounted inside of the flow control device, changes with the medium's velocity of the flow.

A shaft firmly attached to the flap leads into the display part of the device. A pointer and a spring are attached to the shaft. The pointer in the display housing moves in accordance to the flap position.

An integrated change over contact, which can be adjusted as described in paragraph 10 of this manual, is positioned above the pointer.

On customer demand the scale is equipped with a dual scale for water and an additional oil scale. Accuracy of the oil flow depends on oil type (viscosity) and oil temperature and is noticeably inferior.

## 14. Hazards

This paragraph contains a summary description of hazards that may arise during, Transport, Storage, Installation, Operation, Maintenance and Repair.

### ATTENTION!

Observe the weight of devices larger than size DN 50. Mounting devices must be used.



Do not touch inside of the housing with hands or fingers. Risk of cutting, jamming or pinching.

Observe this operating manual to prevent any of the within this document described hazards.

Hazards emerging from assembly / installation into a facility must be observed and included into a risk assessment.



## 15. Technical assistance

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

**Grünewald GmbH, 59069 Hamm**

**Tel. +49 02385 922670, Fax +49 02385 922672**

or **E-Mail: [info@gruenewald.eu](mailto:info@gruenewald.eu)**

## 16. Model Key

DA- \*\*\* / \*\*\* / \*\*  
 DAK- \*\*\* / \*\*\* / \*\* / \*\*\* / \*

Nominal Width DN	Measuring range	Mechanical connection	Electrical connection	Control form
***	L [L/min]  cbm [cbm/h]	F [Flange]  G** [Thread]  S [Sandwich]  O [connect-O]	E** [Insertion through fixed wire max. 30m]  P [PROMOS-plug connector BN 41**]  S [Souriau-plug-connector]  H [Harting-plug-connector]	N [without circuit]  E [Resistor circuit]  D [Light emitting diode/LED]  DD [Anti parallel diode]  P [PROMOS circuit]  S [Siemens end element]

Order Examples:    DAK-025/120L/G1"/E10/N                  DAK-025/50L/G1"/P/P                  DA-080/100cbm/O  
                             DAK-150/180cbm/S/E03/DD                  DAK-032/200L/G1¼"/SF/E                  DA-050/40cbm/R2"

## 17. Technical details

### Electrical parameters

Models DAK-\*\*\*/\*\*\*/\*\*/\*

-	D	≤I max	30	mA
-	DD	≤I max	1	A
-	S	≤I max	50	mA
		≤V	13	V
-	P	≤I max	25	mA / 24V
		≤I max	50	mA / 12V
-	E	≤I max	25	mA / 24V
		≤I max	50	mA / 12V
-	N	≤I max	1	A / 24V
		≤I max	2	A / 12V

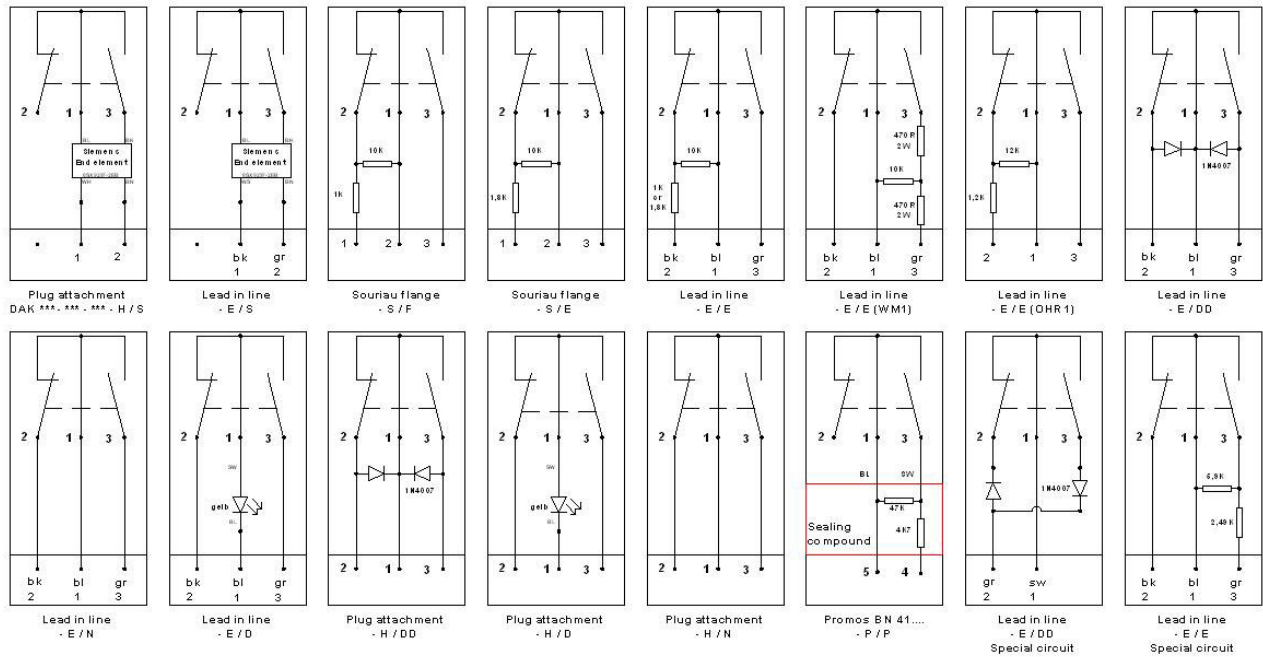
Changes to specification and design as well as technical improvements to the device are subject to change with out notice and are fully to the discretion of the manufacturer.

Mechanical Connection:	1", 1 ¼", 2" straight pipe thread or Sandwich connection
Nominal Width:	DN 25 to DN200 (see table)
Measuring range:	see table
Tranquilliser Distance:	In: 5 x DN (e.g. 5x DN25 = 125 mm) Out: 5 x DN (e.g. 5x DN25 = 125 mm) Any adaptation to the length requires written approval of the manufacturer.
Medium:	Water or medium with water like viscosity
Nominal Pressure:	40bar (580Psi, 4Mpa) up to 200bar (2900Psi, 20Mpa)
Material:	Brass MS58 / Red Brass RG7
Environment Temperature:	-20°C to +60°C (253,15°K to 333,15°K)
Nominal Current:	0V to 24V
Circuit Durability:	0V to 12V: 2,0A 12V to 24V: 1,0A
Protection class:	IP54 for >DN50 IP67 for DN25 and DN32

Type	Nominal Pressure	Connection Type	Mounted length	Measuring Range
DAK 025	PN 200 bar	internal screw-thread G 1"	100 mm	0-30 l / min
DAK 025	PN 200 bar	internal screw-thread G 1"	100 mm	0-50 l / min
DAK 025	PN 200 bar	internal screw-thread G 1"	100 mm	15-80 l / min
DAK 025	PN 200 bar	internal screw-thread G 1"	100 mm	15-120 l / min
DAK 032	PN 100 bar	internal screw-thread G 1 1/4"	110 mm	20-200 l / min
DAK 032	PN 100 bar	internal screw-thread G 1 1/4"	110 mm	20-300 l / min
DAK 050	PN 40 bar	internal screw-thread G 2"	130 mm	0-40 m <sup>3</sup> / h
DAK 050	PN 40 bar	Sandwich connection	115 mm	0-40 m <sup>3</sup> / h
DAK 050	PN 40 bar	Sandwich connection	115 mm	0-60 m <sup>3</sup> / h
DAK 050	PN 40 bar	Connect-O	145 mm length of housing	0-40 m <sup>3</sup> / h
DAK 050	PN 40 bar	Connect-O	145 mm length of housing	0-60 m <sup>3</sup> / h
DAK 080	PN 40 bar	Sandwich connection	150 mm	0-60 m <sup>3</sup> / h
DAK 080	PN 40 bar	Sandwich connection	150 mm	0-80 m <sup>3</sup> / h
DAK 080	PN 40 bar	Sandwich connection	150 mm	0-100 m <sup>3</sup> / h
DAK 080	PN 40 bar	Connect-O	225 mm length of housing	0-100 m <sup>3</sup> / h
DAK 100	PN 40 bar	Sandwich connection	165 mm	0-80 m <sup>3</sup> / h
DAK 100	PN 40 bar	Sandwich connection	165 mm	0-100 m <sup>3</sup> / h
DAK 100	PN 40 bar	Sandwich connection	165 mm	0-120 m <sup>3</sup> / h
DAK 100	PN 40 bar	Sandwich connection	165 mm	0-150 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-180 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-200 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-250 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-300 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-350 m <sup>3</sup> / h
DAK 150	PN 40 bar	Sandwich connection	220 mm	0-400 m <sup>3</sup> / h
DAK 200	PN 40 bar	Sandwich connection	220 mm	0-400 m <sup>3</sup> / h
DAK 200	PN 40 bar	Sandwich connection	220 mm	0-450 m <sup>3</sup> / h
DAK 200	PN 40 bar	Sandwich connection	220 mm	0-500 m <sup>3</sup> / h
DAK 200	PN 40 bar	Sandwich connection	220 mm	0-550 m <sup>3</sup> / h
DAK 200	PN 40 bar	Sandwich connection	220 mm	0-600 m <sup>3</sup> / h

Other measuring ranges, inside diameters, materials, types of connection and nominal pressures on request.

## 18. Electrical connection



Drawing number:  
2-05-025-001\_001



## 19. Environmental protection

### ATTENTION!

For safe and environmentally friendly disposal of operating and process materials as well as replacement parts, national and international laws, rules and regulations must be acknowledged. Observe any relevant safety rules and data sheets when handling oils, greases and other chemical substances.



## 20. EG-Model test certificate

**Translation**

(1) **EC-Type Examination Certificate**

(2) **- Directive 94/9/EC -**  
Equipment and protective systems intended for use in potentially explosive atmospheres

(3) **DMT 03 ATEX E 080**

(4) **Equipment:** Flow Measuring Instrument type DAK \*\*\*-\*\*\*-\*\*\*-\*/\*\*

(5) **Manufacturer:** Grünewald GmbH

(6) **Address:** D- 59069 Hamm (previous: D - 42857 Remscheid)

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8) The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 03.1032 EG.


(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 50014:1997+A1-A2	General requirements
EN 50020:2002	Intrinsic safety 'i'

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate


(12) The marking of the equipment shall include the following:

 **I M2 EEx ia I**

**Deutsche Montan Technologie GmbH**  
Essen, dated March 06, 2003

Signed: Dr. Jockers	Signed: Dr. Eickhoff
_____ Certification body	_____ Special services

Page 1 of 4 to DMT 04 ATEX E 080  
This certificate may only be reproduced in its entirety and without change  
Dünenstraße 9 44809 Bochum Germany Phone +49 201 172-3947 Fax +49 201 172-3948  
(until 31.05.2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1 45307 Essen Germany)

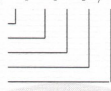


(13) Appendix to

(14) **EC-Type Examination Certificate**  
**DMT 03 ATEX E 080**

(15) 13.1 Subject and type

Flow Measuring Instrument type DAK \*\*\*-\*\*\*-\*\*\*-\*/\*\*

Nominal width	
Volume	
Mechanical connection	
Electrical connection	
Operation-mode version	

Nominal width: DN, indicated in l/min or cbm/h

Volume: indicated in l/min or cbm/h

Mechanical-connection code:

F	for flange
G	for threaded connection R"
S	for sandwich-construction
O	for plug-in O-system

Electrical-connection code:

H	for plug-in system type Harting
E	for cable entry and permanently connected cable up to 30 m
S	for connector type Souriau
P	for connector type Promos

Operation mode:

D	for light emitting diode (LED)
DD	for diodes anti-parallel
S	for Siemens-terminator
P	for Promos-version
E	for resistor array
N	for contact only (without components)

13.2 Description

The Flow Measuring Instrument, designed for fluid media and used in intrinsically safe systems as accessory, only provides components, which do not affect type of protection intrinsic safety.

A potential-free switch (combined contact active open / active closed), assembled with or not assembled with components like diode(s), resistors or Siemens terminator, is mounted in a metallic enclosure fitted with a plexi-glass cover. The switch is designated to be connected to one intrinsically safe circuit. The Siemens-terminator is mounted in a hole of the enclosure, designed for this purpose. The light emitting diode is mounted within the enclosure.

Page 2 of 4 to DMT 04 ATEX E 080  
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15.3 Parameters

15.3.1 Version providing LED type DAK \*\*\* - \*\*\* - \*\*\* - \* / D

Current  $I_i$  DC 30 mA  
Effective internal capacitance / inductance  $C_i / L_i$  negligible

15.3.2 Version providing diodes anti-parallel type DAK \*\*\* - \*\*\* - \*\*\* - \* / DD

Current  $I_i$  DC 1 A  
Effective internal capacitance / inductance  $C_i / L_i$  negligible

15.3.3 Version providing Siemens-terminator type DAK \*\*\* - \*\*\* - \*\*\* - \* / S

Voltage  $U_i$  DC 13 V  
Current  $I_i$  DC 50 mA  
Effective internal capacitance / inductance  $C_i / L_i$  negligible

15.3.4 Version providing Promos connector type DAK \*\*\* - \*\*\* - \*\*\* - \* / P

Voltage  $U_i$  DC 12 V  
Current  $I_i$  DC 50 mA  
or  
Voltage  $U_i$  DC 24 V  
Current  $I_i$  DC 25 mA  
Effective internal capacitance / inductance  $C_i / L_i$  negligible

15.3.5 Version providing one contact only type DAK \*\*\* - \*\*\* - \*\*\* - \* / N

Voltage  $U_i$  UC 24 V 12 V  
Current  $I_i$  UC 1 A 2 A  
Effective internal capacitance / inductance  $C_i // L_i$  negligible

15.3.6 Versions providing cable entry and permanently connected cable type DAK \*\*\* - \*\*\* - \*\*\* - E / \*

Voltage / Current according to 15.3.1 to 15.3.5  
Capacitance per unit length  $C_l \leq 100$  pF/m  
Inductance per unit length  $L_l \leq 0,85$   $\mu$ H/m

15.3.7 Ambient temperature range - 20°C  $\leq T_a \leq$  +60°C

(16) Test and assessment report  
BVS PP 03.1032 EG as of 06.03.2003

(17) Special conditions for safe use  
None

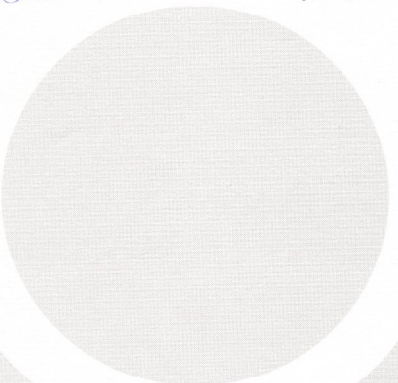
We confirm the correctness of the translation from the German original.  
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 04. November 2004  
BVS-Schä/Kw A 20000699

**EXAM BBG Prüf- und Zertifizier GmbH**

*J. Peters*  
Certification body

*A. Müller*  
Special services







**DEKRA**  
Translation

### 1<sup>st</sup> Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

#### to the EC-Type Examination Certificate DMT 03 ATEX E 080

**Equipment:** Flow Measuring Instrument type DAK \*\*\*-\*\*\*-\*\*\*-\*/ \*  
**Manufacturer:** Grünewald GmbH  
**Address:** 59069 Hamm, Germany

Description

The Flow Measuring Instrument can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2006 General requirements  
 EN 60079-11:2007 Intrinsic safety 'i'

The marking of the equipment shall include the following:

 **I M2 Ex ia I**

Special conditions for safe use

None

Test and assessment report

BVS PP 03.1032 EG as of 10.04.2008

**DEKRA EXAM GmbH**  
Bochum, dated 10. April 2008

Signed: Dr. Jockers  
Certification body

Signed: Dr. Eickhoff  
Special services unit

Page 1 of 2 to DMT 03 ATEX E 080 / N1  
 This certificate may only be reproduced in its entirety and without change.  
 DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234 9006-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com  
 (until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1

**DEKRA**

**Translation**

**EU-Type Examination Certificate Supplement 2**  
Change to Directive 2014/34/EU

1 **Equipment intended for use in potentially explosive atmospheres**  
Directive 2014/34/EU

2 **EU-Type Examination Certificate Number:** DMT 03 ATEX E 080

3 **Product:** Flow Measuring Instrument type DAK

4 **Manufacturer:** Grünewald GmbH

5 **Address:** Oberallener Weg 7, 59069 Hamm, Germany

7 This supplementary certificate extends EC-Type Examination Certificate No. DMT 03 ATEX E 080 to apply to products designed and constructed in accordance with the specification set out in the appendix of this certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA EXAM GmbH, Notified Body number 0158, in accordance with Article 11 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex I to the Directive.  
The examination and test results are recorded in the confidential Report No. 6V0 PP 93 7032 EU.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60076-3:2013 + A11:2013 General requirements**  
**EN 60076-11:2012 Intrinsic Safety "i"**

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:  
 **IM2 Ex ia I Mb**  
DEKRA EXAM GmbH  
Bochum, 2017-04-04

Signed: Dr Franz Eckhoff Signed: Dr Michael Wittler  
Certifier Approver

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Telephone: +49 (0) 2385 922672, Fax: +49 (0) 2385 922672, www.dekra.com


**DEKRA**

13 **Appendix**

14 **EU-Type Examination Certificate**  
DMT 03 ATEX E 080  
Supplement 2

15 **Product description**

15.1 **Subject and type**  
Flow Measuring Instrument type DAK

Nominal width:   
Volume:  
Mechanical connection:  
Electrical connection:  
Operation mode version:

Nominal width: DN, indicated in l/min or cm<sup>3</sup>/min  
Volume:  
Mechanical-connection code: F for flange, G for threaded connection R, S for sandwich construction, D for plug-in D-system, \* for special mounting features  
Electrical-connection code: H for plug-in system type Harting, E for cable entry and permanently connected cable up to 30 m, S for connector type Souriau, P for connector type Promos, \* for further connector options  
Operation mode: D, for light emitting diode (LED), DD for diodes and parallel, S for Siemens-terminator, P for Promos-version, E for resistor array, N for contact only (without components), \* for further variants not affecting electrical parameters

15.2 **Description**  
With this supplement the certificate is changed to Directive 2014/34/EU. (Annotation: in accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.)

**Reason for the supplement:**  
- change to Directive 2014/34/EU  
- update of applied standards to EN 60076-0 / -11 Ed. 6.

**Description of Product**  
The Flow Measuring Instrument for fluid and gaseous media is used in intrinsically safe systems as accessory and only provides components, which do not affect type of protection intrinsic safety.  
A potential free switch (potential contact active open / active closed), assembled with or not assembled with components like diodes), resistors or Siemens terminator, is mounted in a metallic enclosure fixed with a plexiglass cover. The switch is designated to be connected to a single intrinsically safe circuit.

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The Siemens-terminator is mounted in a hole of the enclosure, designed for this purpose. The light emitting diode is mounted within the enclosure. Listing of all components used referring to older standards: not applicable.

**16.3 Parameters**

16.3.1 Version providing LED type DAK \*\*\* - \*\*\* - \* / B  
 Current I<sub>L</sub> DC 35 mA  
 Effective internal capacitance / inductance C<sub>i</sub> / L negligible

16.3.2 Version providing diodes and parallel type DAK \*\*\* - \*\*\* - \* / DD  
 Current I<sub>L</sub> DC 5 A  
 Effective internal capacitance / inductance C<sub>i</sub> / L negligible

16.3.3 Version providing Siemens-terminator type DAK \*\*\* - \*\*\* - \* / S  
 Voltage U<sub>i</sub> DC 13 V  
 Current I<sub>L</sub> DC 50 mA  
 Effective internal capacitance / inductance C<sub>i</sub> / L negligible

16.3.4 Version providing Promos connector type DAK \*\*\* - \*\*\* - \* / P  
 Voltage U<sub>i</sub> DC 12 V  
 Current I<sub>L</sub> DC 50 mA  
 or  
 Voltage U<sub>i</sub> DC 24 V  
 Effective internal capacitance / inductance C<sub>i</sub> / L negligible

16.3.5 Version providing one contact only type DAK \*\*\* - \*\*\* - \* / N  
 Voltage U<sub>i</sub> AC-DC 24 V 12 V  
 Current I<sub>L</sub> AC-DC 1 A 2 A  
 Effective internal capacitance / inductance C<sub>i</sub> / L negligible

16.3.6 Versions providing cable entry and permanently connected cable type DAK \*\*\* - \*\*\* - \* / E / J  
 Voltage / Current according to 15.3.1 to 15.3.6  
 Capacitance per unit length C<sub>i</sub> ≤ 100 pF/m  
 Inductance per unit length L<sub>i</sub> ≤ 0.05 µH/m

16.3.7 Ambient temperature range -50 °C ≤ T<sub>a</sub> ≤ +60 °C

**16 Report Number**  
 BUS PFP 03.1032 EU, as of 2017-04-04

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 info@exam.de | +49 234 2069-100 | Fax: +49 234 2069-110 | ex.exam@exam.de

**17 Special Conditions for Use**  
 None

**18 Essential Health and Safety Requirements**  
 The Essential Health and Safety Requirements are covered by the standards listed under item 0.

**19 Drawings and Documents**  
 Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original. In the case of annotation only the German wording shall be valid and binding.

DEKRA EXAM GmbH  
 Bochum, dated 2017-04-04  
 EVD-SchaltNr.: A-20170190

*[Signature]* *[Signature]*  
 Center Approver

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 info@exam.de | +49 234 2069-100 | Fax: +49 234 2069-110 | ex.exam@exam.de



## 21. 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-directive 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-directive over the electromagnetic sociability EMV- guidelines 2014/30/EU*

**Für das: *For:***

Bezeichnung / <i>description</i>	 Kennzeichnung / <i>marking</i>	Zulassung / <i>certification</i>	 Notifizierte Stelle / <i>notified body</i>
<b>DA...</b>	---	---	---
<b>DAK...</b>	I M2 Ex ia I Mb	DMT 03 ATEX E 080	0158 DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum
<b>DFM...</b>	I M2 Ex ib I	IBExU 07 ATEX 1068	0637 IBExU Institut für Sicherheitstechnik Fuchsmühlenweg 7 D-09599 Freiberg
<b>MAGIN-Ex® ...</b>	I M1 Ex ia I Ma I M2 Ex [ib] I Mb II 2 G Ex ia IIA T4 Gb II 2G Ex ia [ib] IIA T4 Gb	BVS 13 ATEX E 061 IECEX BVS 13.0072	0158 DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum
<b>RV...</b>	I M2 EEx ib I	IBExU 06 ATEX 1107	0637 IBExU Institut für Sicherheitstechnik Fuchsmühlenweg 7 D-09599 Freiberg
<b>SIMPL-Ex® ...</b>	I M1 Ex ia I Ma	IBExU 13 ATEX 1110 IECEX IBE 13.0039	0637 IBExU Institut für Sicherheitstechnik Fuchsmühlenweg 7 D-09599 Freiberg
<b>SMALL-Ex® ...</b>	I M1 Ex ia I Ma I M2 (M1) Ex [ia Ma] ib I Mb II 1/2 G Ex ia IIC T4/T6 Ga/Gb II 2G Ex ia IIC T4/T6 Gb	BVS 06 ATEX E 005 X IECEX BVS 09.0056 X	0158 DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum
<b>TS...</b>	I M2 EEx ia I	DMT 02 ATEX E 256	0158 DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum
<b>UNI...</b>	I M2 EEx ib I	BVS 03 ATEX E 230	0158 DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum

Bezeichnung / *description*

Lt. Lieferpapieren / *according to delivery documents*

Seriennummer / *serial number*

Lt. Lieferpapieren / *according to delivery documents*

Der Hersteller / *the manufacturer*

**Grünwald GmbH**  
**Oberallener Weg 7**  
**D- 59069 Hamm**

**Tel.: +49 (0) 2385 / 922670**  
**Fax: +49 (0) 2385 / 922672**  
**Mail: info@gruenewald.eu**

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

Diese Konformitätserklärung wurde unter der alleinigen Verantwortung des Herstellers ausgestellt.

*We herewith declare conformity of the above mentioned devices 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:*

Bezeichnung / description	Norm / standard																														
	EN 60079-0:2012	EN 60079-11:2012	EN 60069-26:2015	IEC 60079-0:2011	IEC 60079-11:2011	IEC 60079-26:2014	EN 10204	EN 12266-2	EN 50303:2001	EN 61000-3-2	EN 61000-3-3	EN 61000-4-2	EN 61000-4-4	EN 61000-6-2	EN 61326-1	EN 61326-3-1	EN 61326-3-2	EN 13849-1	EN 61508	EN 61508-1	EN 61508-2	EN 62061	DIN EN 50628	DIN 22100-7	SN 29500	EN ISO 12100	EN 1127-1	EN 13463-1	EN 13463-5	BGR 132	
<b>DA...</b>																											X	X	X	X	X
<b>DAK...</b>	X	X												X									X								
<b>DFM...</b>	X	X												X									X	X							
<b>MAGIN-Ex®...</b>	X	X	X	X	X	X			X	X	X				X																
<b>RV...</b>	X	X					X	X						X									X	X							
<b>SIMPL-Ex®...</b>	X	X		X	X				X			X	X		X																
<b>SMALL-Ex®...</b>	X	X	X	X	X	X			X			X	X		X	X	X	X	X	X	X	X									
<b>TS...</b>	X	X													X						X	X		X		X					
<b>UNI...</b>	X	X													X						X										

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/EC, 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

Am / on

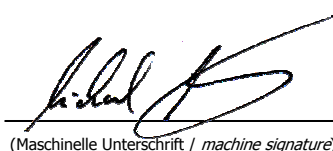
Name des Unterzeichners / name of signatory

Unterschrift / Signature

D-59069 Hamm

13.04.2017

M. Wolf, Geschäftsführer / general manager



(Maschinelle Unterschrift / machine signature)



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