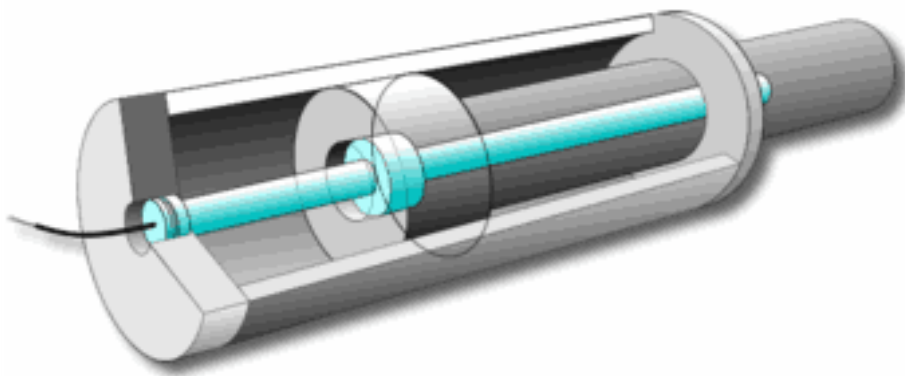


Operating Instructions



Reed Position Transducer

Type:

WMG 05-06 + 51-54

WMG 11-12+71-73

WMG 81+ 82

Version R.1E ATEX 01.07.2005

Page 1

General Information

Dear customer,
the Reed Position Transducer is a product of **Taciak AG** for installation in hydraulic cylinders as a position sensor.

Please read the operating instructions meticulously to prevent operating errors and to ensure a safe functioning and long service life of the unit.

Should you require further information, do not hesitate to contact us.

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1. Preface

These operating instructions shall help our customer to use the position sensor in a safe, appropriate and economic way

To follow the instruction will

- increase reliability and service life
- prevent hazards
- prevent repair and downtime

This operating instruction must be

- permanently available during assembly, maintenance and repair work,
- read and followed by each person carrying out work on position transducers.

The position sensors are manufactured by Taciak AG to the state of art and according to the approved safety rules and regulations. Inappropriate treatment and wrong usage however may cause hazardous situations for the operator or others or damages to machines or material respectively.



The position transducers have been manufactured meticulously, have been electrically tested for several times and checked for mechanical damages, residual chips etc. Should, however, any reason for an objection be found, we ask you to return the relevant product. We then will contact you immediately.

2. General Safety Notice

Please read these operating instructions before you start to work.



The operator is in general responsible for a perfect working of the transducers and has to pay attention to the safety regulations. The transducers are manufactured to the state of art and according to approved safety rules and regulations. During operation there may however occur hazardous situations for the operator or others or damages to machines and material.

Please only use the transducers

- **for their destined application**
- **in a state perfect with regard to safety regulations**

Please note the technical data of the position sensors and the surrounding temperature. For information on the destined application of the position sensors refer to chapter 8 of this booklet. The knowledge of the safety rules and regulations is the basis for a safe handling and trouble-free work with the position sensors. Furthermore the rules and regulations for accident prevention and for the installation of electrical and mechanical equipment and for radio interference suppression must be followed.

For all maintenance and repair work the workplace must be clean. Do not eat or smoke while you are carrying out work on the transducers. Manufacturer's guaranty and liability will become obsolete if arbitrary manipulations have been carried out which go beyond the destined use.

Please do note the operating instruction; especially the safety symbols and safety instructions on the equipment and in the documentation. Keep the operating instructions carefully.

2.1 Working on Position Transducers

DANGER !

Before working on position transducers, make sure that the cylinders are at standstill and all compressed air and hydraulic connections are shut and a movement will be excluded in any case.



2.2 Installation of Position Transducers

CAUTION !

Our position transducers must be thoroughly cleaned before installation, no metal chippings must be left at the magnet or the position meter. The relief bore must be cleaned from all impurities.



2.3 Handling Oil and Fats

CAUTION !

The safety instructions for the relevant products and all other chemical substances have to be followed.



2.4 Transport, Assembly and Dismantling

CAUTION !

Position meters must **never** be transported, stored or operated near a strong magnetic field. Position meters must **never** be lifted or transported by magnetic cranes. Hydraulic cylinders with installed position meters must **never** be lifted or transported by magnetic cranes.



3. Responsibility of the Employer

The employer must only allow people to work on the position transducers, who:

- are familiar with the basic rules and regulations on safety at work and accident prevention and have been trained to work with the equipment.
- have read and fully understood the safety and caution advices of these operating instructions and all other documentation connected with this equipment.
- have regularly gone through a test in respect of their consciousness of safety at work.

Maintenance and repair is to be carried out only by a trained specialist. Malfunctions which may affect the safety must be eliminated immediately.

4. Responsibility of the Employees

Employees working on the position transducers must be familiar with these operating instructions.

All employees who work on the equipment always must:

- observe the basic regulations on safety at work and accident prevention,
- read and observe the safety and caution advice of this manual..

5. Guaranty and Liability

Our „General Terms of Sale and Delivery“ shall apply as far as no other agreement has been specified. Guaranty and liability claims for damages or injuries are excluded if they are based on one or several of the following reasons:

- Wrong usage of the position transducer.
- Inappropriate assembly, commissioning, operating and maintaining of the equipment.
- Operating the equipment when safety and protection devices are faulty or missing.
- Disregard of the advice in the operating instruction in respect of transport, storage, assembly, commissioning, operating, maintaining and preparation of the equipment.
- Arbitrary modifications of the design and the controls of the equipment beyond the destined purpose.
- Insufficient control of parts subject to wear.
- Handling malpractices at repair, inspection or maintenance.
- Accidents caused by inappropriate material or force major.

A liability for damages because of an operating error will not be accepted.

6. Meaning of the Symbols

Danger:

Notice of immediate danger to persons. May lead to serious injuries if neglected.



Warning:

Hydraulic, electric or pneumatic equipment should be maintained or repaired only by trained persons and all electric equipment be disconnected from the power supply.



Notice:

The operating instructions must be read before work is started and they must be followed when the equipment is in operation.



7. Instructions for Environmental Control

All legal regulations concerning waste avoiding and orderly salvage/disposal have to be obeyed. Particularly with installation, repair and maintenance work water-polluting substances like

- Lubricating grease and oil
- Hydraulic oil • Coolants
- Cleansing liquor containing solvents

must not be disposed on the ground or into the sewage system! These substances must be filled in suitable containers for transport and individual disposal!



8. Appropriate Application

The position transducers are exclusively made as position sensors for hydraulic cylinders. A use for other purposes, modifications and changes of design require agreement of the manufacturer. Otherwise they are considered as not appropriate.

The observance of the operating instructions and of the inspection and maintenance intervals belong to an appropriate application.

The manufacturer cannot be made liable for damages which result from an inappropriate application. The operator bears the risk.

9. Installation / Commissioning

- The type plate defines where the equipment is to be installed, in zone 0, 1 or 2. The installation of the intrinsically safe power circuits must be carried out by competent electricians according to the regulations (Certificate of expertise is required).
- The equipment is certified to IP65 and should be protected against adverse environmental circumstances.
- The EC test certificates must be noticed as well as the “special regulations” which may be enclosed.
- The equipment must not be used inappropriately.
- The interconnection with the pertaining and/or intrinsically safe electrical equipment must be checked separately.
- The sensors must be earthed to prevent electrostatic charging.
- At a surrounding temperature between -5° and 70° C the units with a solidly connected junction line may be allowed to be moving. Beyond that, up to a surrounding temperature of -40° to 80° C the junction line must be installed firmly.
- The terminals of a plug or a cable serve as a connection to the electric supply. Particular attention must be paid to maintain the IP protection (see drawing below).
- The reed units are resistant against most agents. The non-compatible or conditionally compatible agents are listed below – if in doubt, refer to the manufacturer.
 - Non compatible agents (heavily caustic)
 - Solutions containing fluoride < pH 4
 - Alkaline solutions > pH 13
- **The circuit must be intrinsically safe.**
- **The reed sticks must not be exposed to strong magnetic fields.**



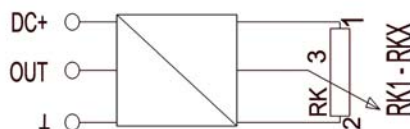
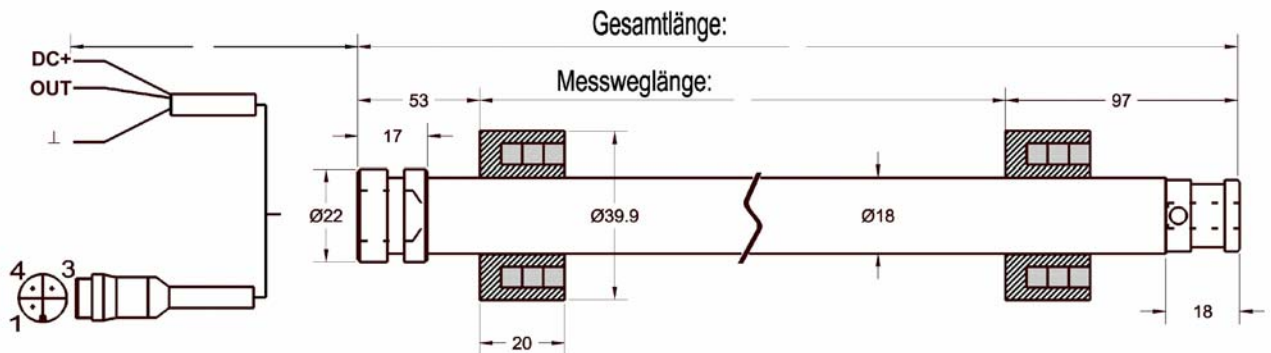
Before commissioning all means for safeguarding assembly must be removed!

Reed Metering Stick

Type: WMG 11-12 + 71-73

(Voltage referred to output)

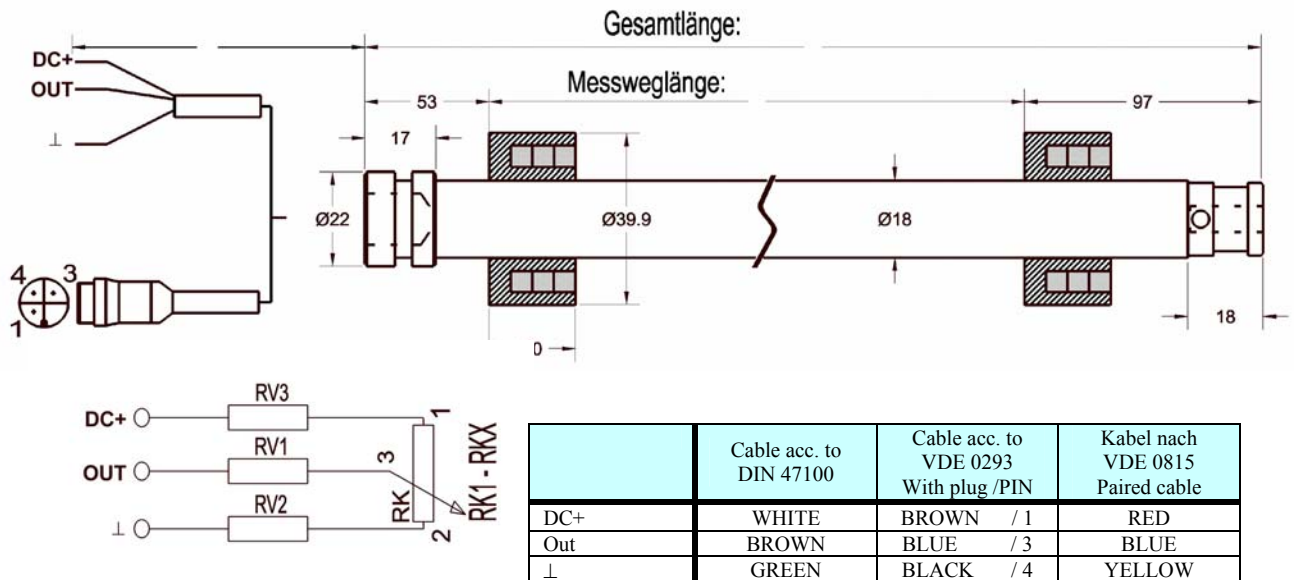
Range	Type	DC (V) in	DC (V) out
<input type="checkbox"/>	11	12 V	0,5-4,5 V
<input type="checkbox"/>	12	12 V	0,5-4,5 V
<input type="checkbox"/>	71	12 – 24 V	0,5-4,5 V
<input type="checkbox"/>	72	12 – 24 V	1-5 V
<input type="checkbox"/>	73	24V	1-10 V



	Cable acc. to DIN 47100	Cable acc. to VDE 0293 With Plug PIN	Cable acc. to VDE 0815 Paired cable
DC+	WHITE	BROWN / 1	RED
Out	BROWN	BLUE / 3	BLUE
⊥	GREEN	BLACK / 4	YELLOW

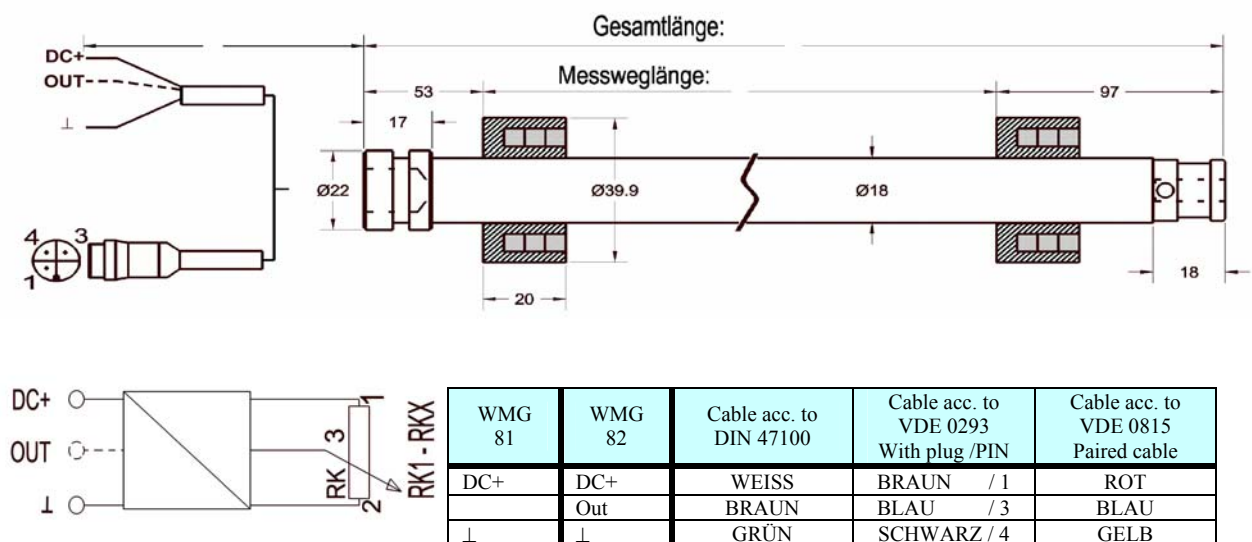
Reed Metering Stick
Type: WMG 05-06 + 51-54
(Resistance referred to output)

Range	Type	RV1	RV2	RV3	DC max (V)	kΩ/m
<input type="checkbox"/>	05	0 Ω	0 Ω	0 Ω	5,0 V	0-25
<input type="checkbox"/>	06	0 Ω	0 Ω	0 Ω	5,0 V	0-50
<input type="checkbox"/>	51	51 Ω	51 Ω	51 Ω	6,0 V	
<input type="checkbox"/>	52	100 Ω	100 Ω	100 Ω	6,0 V	
<input type="checkbox"/>	53	200 Ω	200 Ω	200 Ω	13,5 V	
<input type="checkbox"/>	54	510 Ω	510 Ω	510 Ω	26,0 V	



Reed Metering Stick
Type: WMG 81+ 82
(Power referred to output)

Range	Type	DC (V) in	Out	Design
<input type="checkbox"/>	81	24 V	4-20mA	2-wires
<input type="checkbox"/>	82	24 V	4-20mA	3-wires



Hinweis: Bei WMG 81 entfällt OUT (2-Draht)

Modifications as a result of technical progress may be carried out.

10. Operation, Maintenance and Repair

The rules for safety and accident prevention apply for the operation of the equipment.

The equipment performs steadily over a long period of time. Therefore a regular adjustment is not necessary. Also maintenance work will not be required

As soon as malfunctions do occur remove the equipment. The inside parts cannot be repaired by the operator. The equipment is to be returned to the manufacturer for examination.

The rules for the operation of electric installations have to be followed.

All equipment operated in hazardous areas must not be tampered with.

11. Description of Equipment

The position transducer with reed contact consists of an electronic unit, flameproof enclosed in a stainless steel slide tube.

12. Working Mode of the Position Transducers

A ring magnet operates contact less a reed switch which is enclosed in a protective tube calliper- ing a linear measuring voltage from a high resistant bridge. The processed signal provides for a short circuit proof output at correct polarity. .

The Reed Position Transducers WMG-*** operate as sensors in the categories M1 and /or M2, as well as in 1 and/or 2 and 3.

There are three basic types available:

- a. WMG 05-06 + 51-54 with a variable DC resistance referred to output
- b. WMG 11-12 + 71-73 with voltage referred to output
- c. WMG 81 + 82 with power referred to output
- d. Additional contacts or PT100 elements for temperature metering can be installed optionally.

The power supply is **intrinsically safe**. The data transmitters are built to the system of protection ia or ib. The units with plug have one intrinsically safe power circuit; the units with a connecting line or supply terminal are laid out for several intrinsically safe power circuits.

13. Further Dangers

Listed below is a summary of further dangers which may occur at transport, storage, assembly, operation, maintenance and repair.

13.1. Mechanically

- Contusion or shearing strain between moving parts of the equipment.
- Overstretching or tearing off of cables and hoses.
- Slipping of the test piece.
- Insufficient stability.

13.2 Electrically:

- Damaged cables or components.
- Breakdown of the control circuits.
- Malfunction of the control circuit; a malfunction or damage of the control circuit may cause dangerous situations within the installation

13.3 Thermal:

- Scalding by touching hot components of the equipment.
- Ignition by sparking.

13.4 Temporary failure of protective gear:

- Temporary lack of protective gear or bypass of controls at maintenance or repair work

Please note the relevant safety instructions to avoid the above listed incidents!

Hazards caused by the equipment and the breakdown of electric or pneumatic supply must be taken into consideration by the management. Appropriate measures for a prevention should be taken and the recognition of these possible hazards be recorded.



14. Assistance in Case of Failures

In case of a failure of the position transducer **Taciak AG** will be at your service.

15. Supply

Reedstick, ready for use together with an operating instruction.

16. Technical Data

16.1 Type Specification

The units are marked as follows:

WMG ** ** * ** * ** * * ** * ** *

WMG bb cc ddd ee ff g h ii jjjj

WMG = Position transducer

bb	Type	11 = U 0,5 .. 4,5 Volt, U _i = 12V
	Type	12 = U 0,5 .. 4,5 Volt, U _i = 12V
	Type	51 = 100 .. x Ω, U _i = 5V
	Type	52 = 200 .. x Ω, U _i = 5V
	Type	53 = 400 .. x Ω, U _i = 12V
	Type	54 = 1000 .. x Ω, U _i = 24V
	Type	71 = U 0,5 .. 4,5 Volt U _i = 24V
	Type	72 = U 1 .. 5 Volt, U _i = 24V
	Type	73 = U 1 .. 10 Volt, U _i = 24V
	Type	81 = I 4 .. 20 mA, U _i = 24V 2wires
	Type	82 = I 4 .. 20 mA, U _i = 24V 3wires (without ATEX – certificate)

cc	Electric connection	01 = plug M8x1
	Electric connection	02 = plug M12x1
	Electric connection	05 = socket M12x1
	Electric connection	11 = connectorbox
	Electric connection	21 = plug DIN 43650
	Electric connection	51 = single leads
	Electric connection	55 = wire 3 x 0,14
	Electric connection	56 = wire 2 x 2 x 0,14
	Electric connection	57 = wire 3 x 2 x 0,14
	Electric connection	58 = wire 4 x 2 x 0,14
	Electric connection	59 = wire 5 x 2 x 0,14
	Electric connection	65 = wire 3 x 0,25
	Electric connection	66 = wire 2 x 2 0,25
	Electric connection	67 = wire 3 x 2 x 0,25
	Electric connection	68 = wire 4 x 2 x 0,25
	Electric connection	69 = wire 5 x 2 x 0,25
	Electric connection	75 = shielded cable 3 x 0,14
	Electric connection	76 = shielded cable 2 x 2 x 0,14
	Electric connection	77 = shielded cable 3 x 2 x 0,14
	Electric connection	78 = shielded cable 4 x 2 x 0,14
	Electric connection	79 = shielded cable 5 x 2 x 0,14
	Electric connection	85 = shielded cable 3 x 0,25
	Electric connection	86 = shielded cable 2 x 2 x 0,25
	Electric connection	87 = shielded cable 3 x 2 x 0,25
	Electric connection	88 = shielded cable 4 x 2 x 0,25
	Electric connection	89 = shielded cable 5 x 2 x 0,25

- ddd Length of connecting cable (cm) i.e. 005 = 5 cm
- ee Type of material/tube dia. 01 = 1.4571, Ø 12 x 1
 Type of material/tube dia. 02 = 1.4571, Ø 14 x 1
 Type of material/tube dia. 03 = 1.4571, Ø 16 x 1
 Type of material/tube dia. 04 = 1.4571, Ø 16 x 1,5
 Type of material/tube dia. 05 = 1.4571, Ø 18 x 2
 Type of material/tube dia. 06 = 1.4571, Ø 24 x 4
- ff Mechanics, inlet piece type X ##
 Mechanics, inlet piece type Typ Y ##
 Mechanics, inlet piece type Typ Z ##
- g Pressure range, 1 = 6 bar ##
 Pressure range, 2 = 16 bar ##
 Pressure range, 3 = 25 bar ##
 Pressure range, 4 = 100 bar ##
 Pressure range, 5 = 200 bar ##
 Pressure range, 6 = 300 bar ##
 Pressure range, 7 = 400 bar ##
 Pressure range, 8 = 500 bar ##
 Pressure range, 9 = 600 bar ##
 Pressure range, 0 = 1000 bar ##
- h Special features 1 = 1 X PT 100
 Special features 2 = 2 X PT 100
 Special features 3 = 3 X PT 100
 Special features 8 = 1 X Kontakt
 Special features 0 9 = 2 X Kontakt
- i Definition (mm), i.e. 05 = 5 mm ##
- jjjj Metering length, decoded, i.e. 0050 = 50 mm ##

= Notice: Type Specification (not shown on the type plate), is of no importance for the Ex-certification.

16.2 Definition of the electric characteristics etc.

The technical data given in the type description are mandatory standard

There may be some markings attached to the type specification i. e. number of variant and/or individual customer markings. They are however of no importance for the Ex-certification.

Surrounding temperature -30 .. 80/C
 IP-Protection acc. to EN 60529: IP 65
 EMV-Resistance to jamming EN 61000-6-2
 EMV-Interference emission: EN 61000-6-4

It is supposed that the equipment is in accordance with the recommendation 89/336/EEG (electromagnetic compatibility), has an adequate resistance to jamming and that a normal operation is

not impaired. Special conditions which may result from the surrounding EMV-field are to be noticed and if necessary the manufacturer to be informed.

16.3 Marking


On customers request the „ATEX“ WMG Reed Sticks are marked with a plastic label, which is attached to the cable.



Legend:

- 6. Type Specification, input and output data (i.e.: WMG 11 – 12 V-DC / 0,5-4,5 V)
- 7. Id. number of Certifier and approval number
- 8. Marking acc. to 94/9/EG recommendation (i.e.: I M2 EEx ia I)
- 9. Free for customers markings

Different from the specification acc. to the recommendation 94/9EG a minimum marking will be engraved into the Reed Sticks acc. to standard EN50014 Abs. 27.6.

1. Id. number of Certifier:	 ia BVS 03 ATEX E 166 X		
2. Name of Manufacturer:		TACIAK-	
3. Type:		WMGXX-	
4. Year of manufacture:		XX-	
5. Serial number:			XXXX

With reservation of the right for modifications which follow the progress of technique.

17. Environmental Protection

ATTENTION!

Operating material and process materials as exchange parts must always be disposed in a safe way without environmental impact. The relevant regulations must be obeyed. For oil, grease and other chemical substances the safety rules relevant for the product have to be regarded.



**Baugruppen-Einbauerklärung (Herstellereklärung) nach Anhang II.B
Declaration of incorporation of a subassembly (Annex II.B)**

**Einbauerklärung (Artikel 4 Absatz 2 der Richtlinie 98/37/EG)
Declaration of incorporation (Article 4(2) of Directive 98/37/EC)**

Der Hersteller / the manufacturer **Taciak AG, Kattenbeck 20, D-59394 Nordkirchen**

erklärt, dass die nachfolgende Maschine oder Baugruppe / hereby declares that the machinery or the subassembly described below:

Bezeichnung / description **Wegmessgeber WMG ******
Kennzeichnung / marking **E II 1G EEx ia IIB/IIC T4 or E II 1/2G EEx ia IIB/IIC T4 or E M1 EEx ia I**
Seriennummer / serial number **lt. Lieferpapieren / papers**

erst in Betrieb genommen werden darf, nachdem die Konformität der Maschine, in die diese eingebaut wird, mit den Bestimmungen der Richtlinie 98/37/EG und den sie umsetzenden nationalen Rechtsvorschriften erklärt wurde; may not be put into service before the machinery in which it will be incorporated is declared to comply with the provisions of directive 98/37/EC and with the regulations transposing it into national law.

Mit den Bestimmungen folgender harmonisierter Normen, in der zum Unterschriftsdatum gültigen Fassung übereinstimmt / complies with the provisions of the following harmonized standards in the version, valid at signature date :

EN ISO 12100	Sicherheit von Maschinen, Teil 1 und 2, Grundbegriffe und Gestaltungsleitsätze
EN 50014	Elektrische Betriebsmittel für explosionsgefährdete Bereiche, Allgemeine Bestimmungen
EN 50020	Elektrische Betriebsmittel für explosionsgefährdete Bereiche, Eigensicherheit „i“
EN 50284	Spezielle Anforderungen an Konstruktion, Prüfung und Kennzeichnung elektrischer Betriebsmittel der Gerätegruppe II, Kategorie 1 G
EN 50303	Gruppe I, Kategorie-M1-Geräte für den Einsatz in Atmosphären, die durch Grubengas und/oder brennbare Stäube gefährdet sind
EN 61000-6-2	Elektromagnetische Verträglichkeit (EMV), Teil 6-2: Fachgrundnormen, Störfestigkeit für Industriebereich
EN 61000-6-4	Elektromagnetische Verträglichkeit (EMV), Teil 6-4: Fachgrundnormen, Fachgrundnorm Störaussendung für Industriebereich

Mit den Bestimmungen folgender europäischer Richtlinien übereinstimmt / complies with the provisions of the following european directives:

- | | | |
|---|------------------------------------|--|
| - | RL 94/9/EG / directive 94/9/EC | Explosionsschutz / Explosion protection |
| - | RL 89/336/EG / directive 89/336/EC | Elektromagnetische Verträglichkeit / EMC |

Benannte Stelle / notified body **0158 EXAM BBG Prüf- und Zertifizier GmbH, Dinnendahlstraße 9, D-44809 Bochum**
EG-Baumusterprüfbescheinigung / EC-Type Examination Certificate: **BVS 03 ATEX E 166 X**

Ebenfalls mit folgenden europäischen und nationalen Normen und technischen Vorschriften in der zum Unterschriftsdatum gültigen Fassung übereinstimmt / also complies with the following european and national standards and technical provisions in the version, valid at signature date:

BGR 132 Vermeidung von Zündgefahren infolge elektrostatischer Aufladungen

Ausgefertigt in / done at
Am / on
Name des Unterzeichners / name of signatory
Unterschrift / Signature

Nordkirchen, Germany
July, 25th 2003
Arnold Taciak, Geschäftsführer / General Manager

