



## Explanations of Applications in Hazardous Areas

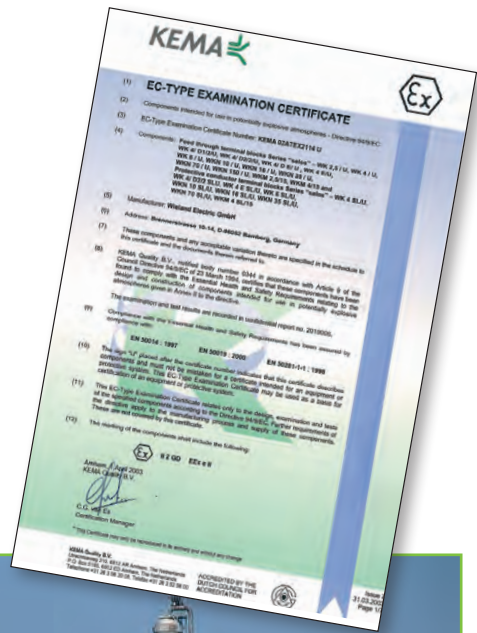
### Technical information

- The information regarding cross sectional area and connection types pertains to unprepared wires without ferrules! Ferrules are not necessary for secure connection! Whenever ferrules are used, make sure that the tools specified by the manufacturer are used exclusively.
- The voltage ratings apply to the terminals in their intended application. When different products are mounted adjacent to each other, the proper isolation distances must be adhered to.
- If the ground blocks are not used in block assemblies, but are mounted to the rail as single terminal blocks, end clamps have to be used.
- A detailed description of technical data, the standards requirements, and the application conditions are available on the **facts** & DATA sheet.

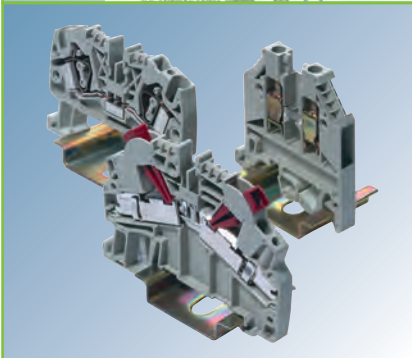
### ATEX regulation

- For the use of DIN rail terminal blocks in Ex areas, the regulations of EN 60079-0 apply; whereas for increased safety Ex e the regulations of EN 60079-7 must be followed. For an approximation of the laws of the EU member states directive 94/9/EG was created, which is generally known as ATEX 100a and which is the basis for harmonization in this field. ATEX stands for "atmosphere explosive" while 100a refers to the corresponding article of the EC contract.
- Directive ATEX 100a applies for protection against dust and gas explosions in all industrial Ex areas and in mining. The testing and certifying institutes named in directive ATEX 100a must follow accreditation procedures which are the same throughout Europe.
- In accordance with EN 60079-xxx and ATEX 100a, these certifying institutes write out EC certificates for prototype tests. These prototype test certificates for components together with the corresponding quality system certification of the supplier are required to obtain the so-called ATEX approval.
- In combination with the -mark, the markings of the Wieland terminal blocks have the following meanings:

	Identification
II	Device group
2	Category
G D	Areas
KEMA	Name of testing institute
ATEX...	Certificate, year of testing, number



## Explanations of applications in hazardous areas



Before 2003-06-30 the Ex protection directive 76/117/EEG applied for the EC and was translated into the relevant national law. For an approximation of the laws of the EU member states, directive 94/9/EG was created, which is generally known as ATEX 100a and which is the basis for harmonization in this field.

ATEX stands for "atmosphere explosive". When the transition period expires on 2003-06-30, all Ex certificates based on the Ex protection directive 76/117/EEG will become invalid. In Ex areas only the ATEX directive will apply then.

For the use of DIN rail terminal blocks in Ex areas with increased safety Ex "e" the regulations EN 60079-0 and EN 60079-7 apply also.

❑ The testing and certifying institutes named in ATEX directive must follow accreditation procedures which are the same throughout Europe.

In accordance with EN 60079-0/-7 and the ATEX directive, these certifying institutes issue EC certificates for prototype tests. These prototype test certificates for components together with the corresponding quality system certification of the supplier are required to obtain the so-called ATEX approval.

❑ DIN rail terminal blocks by Wieland with rising cage clamp, spring and IDC connection provide the required protection against self-loosening.

→ In addition to solid and stranded wires, also fine-stranded wires without ferrules can be connected.

❑ The connector cross sections, rated currents and rated voltages indicated for the terminal blocks in addition to the ATEX identification are part of the certificates.

→ The indicated values for the current carrying capability refer to a maximum ambient temperature of 40 °C. When the terminal blocks are loaded with a rated current of +10%, the maximum heating is 45 K acc. to EN 60079-7:2007.

❑ The ATEX directive applies to protection against dust and gas explosions in all industrial Ex areas as well as in mining.

The **material** group identifies the device's use in specific atmospheres

**G:** Explosion protection for explosive atmospheres due to gases, vapors or fogs (G:gas)

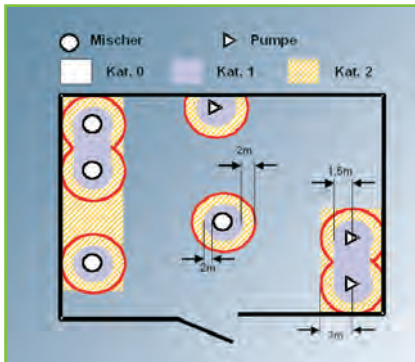
**D:** Explosion protection for explosive atmospheres due to dusts (D:dust)

❑ Electrical equipment for hazardous areas are distinguished in **groups** and **categories** depending on the probability of an explosion hazard.

**Group I:** Equipment for mine openings with firedamp hazard including their bank-head installations

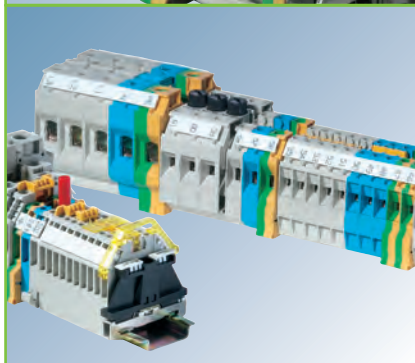
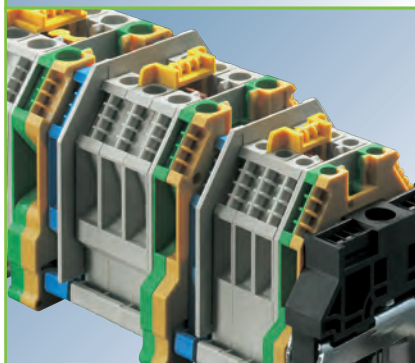
**Group II:** Equipment installed in all other hazardous areas, especially in the chemical and petrochemical industries.

## Explanations of applications in hazardous areas



**W** WKF 10/35  
0344 Ex II 2 GD Ex e II  
750 V 10° KEMA 01 ATEX 2087 U

**SP** 600 V 65 A  
14–6 AWG  
12722 Ex e II T6 CI I Zn 1  
AEx e II T6



The **device category** describes the achieved safety level of the device.

- Category 1** Continuous, long-term or frequent occurrence of explosive hazard atmospheres; very high safety degree; explosive gases may occur when the container is empty.
- Category 2** Occasional occurrence of explosive hazard atmospheres; high safety degree; especially when machines are operating.
- Category 3** Rare or short-term occurrence of explosive hazard atmospheres; normal safety degree; normally only in case of fault.

Hot surfaces of devices or device components are possible sources of ignition and therefore potential hazards. Depending on the maximum surface temperature based on the ignition temperatures of certain gases, temperature classes are assigned to electrical equipment of group II for all types of protection.  
DIN rail terminal blocks with protection type “e” for increased safety are normally assigned to **temperature class** T6.

Temperature class	max. surface temperature [°C]
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

### Marking of the equipment:

In combination with the Ex mark, the markings of the Wieland terminal blocks have the following meaning:

Ex	Ex equipment
II	Device group
2	Category/zone
G D	Material group/areas
Kema	Name of testing institute
...ATEX...	Year of testing, certificate, consec. no.
U	Certificate valid for components

In addition to the ATEX approval, Wieland DIN rail terminal blocks were approved for the indicated Ex areas by the following certifying institutes in North America:

- **UL-AEx, USA** → UL increased safety AEx e II T6 for Class I, Zone 1, Group II C hazardous locations
- **CSA-Ex, Canada** → Class I, Zone 1, Ex e II T6 for hazardous locations

### Ex i design

In Ex i applications (intrinsic circuits) electrical equipment without voltage sources (such as DIN rail terminal blocks) does not require prototype test certificates and marking.

The use of feed-through blocks in blue in intrinsic circuits for clear distinction has become generally accepted. The terminal blocks meet the design of the blocks certified according to Ex e.

### Accessories:

The accessories offered by us for the use with DIN rail terminal blocks can be operated according to the ATEX directive and are therefore listed in our catalog.

## Explanations of applications in hazardous areas

### DIN rail terminal blocks for installations with explosion hazard (Ex terminals) Protection category Increased safety "e"

Ex terminals are DIN rail terminal blocks that have been tested and certified by a European Ex test institute according to

**EN 60 079-0 – VDE 0170/0171 part 1 "General requirements" and**

**EN 60 079-7 – VDE 0170/0171 part 6 Protection category: Increased safety "e"**

DIN EN 60079-0, VDE 0170-1: Explosionsfähige Atmosphäre - Teil 0: Geräte - Allgemeine Anforderungen (IEC 60079-0:2007); Deutsche Fassung EN 60079-0:2009

DIN EN 60079-7, VDE 0170-6: Explosionsfähige Atmosphäre - Teil 7: Geräteschutz durch erhöhte Sicherheit „e“ (IEC 60079-7:2006); Deutsche Fassung EN 60079-7:2007

The protection category Increased safety "e" applies to electrical equipment that resists sparks, electric arcing or hazardous surface temperatures during operation. DIN rail terminal blocks thus fall into temperature category T6 in which electrical equipment at an ambient temperature of 40 °C and proper use does not exceed the maximum temperature (surface temperature) of 85 °C.

Certifying test institutes are, for example, the Physikalisch Technische Bundesanstalt PTB in Germany, the Laboratoire Central des Industries Electrique LCIE in France, the Health and Safety Executive BASEEFA in Great Britain, the EX laboratory of ASEV in Switzerland, among others.

However, for DIN rail terminal blocks as incomplete electrical equipment, only a partial certification is issued. This certificate is the basis for the final acceptance and certification of the complete installation before it is commissioned by an expert.

The certificate (prototype test certificate) includes a description of the DIN rail terminal blocks, in which special requirements regarding the preparation of terminal strips are put into place, for example, installing partitions and end plates when terminal blocks are connected in series. This information is also provided in our catalog that in this case serves as an instruction manual.

#### Test Certificate

Certificates of KEMA, PTB and DEKRA are available for feed-through terminal blocks of series WK., WKF., WKFN.. and ground blocks of series WK..SL., WKF..SL., WKFN..SL.. and revos Ex industrial multipole connectors, if indicated. The certificates indicate the relevant rated values and include the accessories listed in the description. The areas of application are divided into:

**Group I: Electrical equipment for mine openings with firedamp hazard**

**Group II: Electrical equipment for hazardous areas except for mine openings with firedamp hazard (for example installations with explosion hazard for the chemical and petrochemical industry).**

According to a resolution of the DEK (Deutsche Elektrotechnische Kommission) terminal blocks are also accepted as electrical equipment for Group I (firedamp protection Ex e I) for which only the increased safety protection type 'e' for Group II (explosion protection Ex e II) has been certified and vice versa.

Ex protected DIN rail terminal blocks are identified with the marking Ex e I and Ex e II and an additional marking according to ATEX directive 94/9/EG. The complete test certificate with a description is available on request.

#### Protection category "Intrinsic safety Ex i"

The DIN rail terminal blocks can be used in Group II (Category 2) and Group 1 (Category M2) equipment, as the standard requirements are identical in this case.

It has been generally accepted that feed-through terminals in intrinsic circuits are clearly marked with the blue coloring of the insulated housing. For intrinsic circuits, feed-through terminals can be used in the standard version and if required are available with blue insulating housing.



## Explanations of applications in hazardous areas

### Mounting instructions for Ex e applications:

- If feed-through blocks are mounted directly adjacent to other feed-through blocks of a different size, or directly adjacent to ground blocks, the open side of the block group of the same type must be covered by an end plate or partition.
- If adjacent DIN rail terminal blocks are jumpered or if jumpered DIN rail terminal blocks are positioned next to unjumpered DIN rail terminal blocks, a partition plate must be inserted between the individual terminal block groups or at the beginning and end of a laterally or longitudinally connected terminal block (group) in order to meet the specified isolation distances. Notched out and jumpering cross connectors can not be used in Ex areas.

### Installation information

- The feed through terminal blocks and protective conductor terminal blocks are suitable for enclosures for use in explosive gas atmospheres or for use in the presence of combustible dust. For explosive gas atmospheres these enclosures must satisfy the requirements of EN 60079-0 and EN 60079-7. For combustible dust these enclosures must satisfy the requirements of EN 61241-0 and EN 61241-1.
- If the terminal blocks are combined with other certified series and sizes and when their accessories are used, the required creepage distances and clearances must be adhered to.
- If cables are used whose cross-section is smaller than the nominal cable cross-section, the corresponding lower current must be specified in the EC prototype test certificate for the complete device.
- Due to the heat generated during operation at the specified current and at ambient temperatures of  $\leq 40\text{ °C}$ , the DIN rail terminal blocks can be installed in equipment (mainly distribution and connection boxes) suitable for temperature class T6. If DIN rail terminal blocks are installed in equipment with a temperature class ranging from T1 to T5, it must be ensured that the maximum temperature of the insulating parts does not exceed the maximum value in the operating temperature range.
- If the DIN rail terminal blocks are installed in a housing with protection type "e" (increased safety) according to EN 60079-7, the clearances and creepage distances stated in Table 1 must be adhered to.
- The indicated values for the current carrying capability refer to a maximum ambient temperature of  $40\text{ °C}$ . When the terminal blocks are loaded with the maximum rated current the temperature rise will be max.  $45\text{ K}$ .
- Operating temperature range:  $-40\text{ °C} \dots +80\text{ °C}$ , series WK(N)/M..., WKF  
 $-20\text{ °C} \dots +80\text{ °C}$ , series WKFN


### DQS certification for all company sectors

- Quality standard as per DIN ISO 9001 in Development, Production and Assembly
- Continued control of the quality standard by means of regular internal and external quality audits
- Compatible with certificates of other countries:
  - BSI Certificate, Great Britain
  - SQS Certificate, Switzerland
  - Aib-Vincotte Certificate, Belgium
  - ÖQS Certificate, Austria

All Wieland components which require **CE** general certification are **CE** certified, and identified with the **CE** logo.



## Explanations of applications in hazardous areas

**revos** -multipole connectors are designed for special applications in hazardous areas. Their use in zone 0 for intrinsic circuits has been approved by the DEKRA EXAM test institute. The housings for the multipole connectors are manufactured from die cast zinc alloy.

### Operating instructions for the connector series „revos Ex...“

A pluggable connection consists of a hood, a base as well as a female and male insert.

Installation of a pluggable connection must be prepared as follows:

- Closed bottom housings must be fixed with screws to a flat surface using the available bore holes.
- Open-bottom housings must be fixed with screws to a flat surface using the available bore holes. Before fixing the housing to the surface, ensure that the seal fixed to the base at the time of delivery is mounted correctly.
- The female insert and male insert must be screwed into the hood (or alternatively screwed into the base) using the screws already attached to the frame of the male or female connector.
- The cables are connected to the male connectors and female connectors using the screw connection with a torque of 0.5 Nm.

The components are made ready for operation by plugging the hood and base together and latching them.

The relevant connectors must be mounted to device in a way that at least protection degree IP 54 according to EN 60529 is ensured.

The „revos Ex“ connectors are designed for use in an ambient temperature range at installation site of  $-20^{\circ}\text{C}$  bis  $+60^{\circ}\text{C}$ .

#### Usage note:

The „revos Ex“ plug connector series can be used with a rated voltage of 90 V and a permissible cable cross-section of  $0.5\text{ mm}^2$  to  $2.5\text{ mm}^2$  for the following application areas according to ATEX directive 94/9/EC and the EN 60079-0:2006, EN 60079-11:2007 and EN 50303:2000 standards:

 **I M1 Ex ia I**

Proof is provided by the marking of the Ex area on the individual components of the connector.


Permissible conductor cross section:	1.5 mm <sup>2</sup> to	2.5 mm <sup>2</sup>	at	16 A
		1.0 mm <sup>2</sup>	at	10 A
		0.75 mm <sup>2</sup>	at	6 A
		0.5 mm <sup>2</sup>	at	3 A

Translation of the German Operating instructions


Wieland Electric GmbH  
Brennerstraße 10-14  
D-96052 Bamberg  
Germany



# Explanations of applications in hazardous areas



BBG Prüf- und Zertifizier GmbH




**Prüfprotokoll - Test and Assessment Report**  
**BVS PP 03.1081 EG**


**EG - Baumusterprüfung für Geräte und Komponenten zur Verwendung in explosionsgefährdeten Bereichen (Richtlinie 94/9/EG)**

**EC - Type Examination for Equipment and Components Intended for Use in Potentially Explosive Atmospheres (Directive 94/9/EC)**


Fachstelle für Sicherheit elektrischer Betriebsmittel - 095  
 Carl-Byling-Haus  
 Dirmendahlstraße 8  
 44809 Bochum




DAR-Reg.-Nr.: ZLS-P-353-2/01

<p>Gegenstand: Gerät Typ Subject: Equipment type</p> <p>Hergestellt und zur Prüfung vorgelegt Manufactured and submitted for examination</p> <p>Anschrift Address</p> <p>Prüfgrundlage Basis for examination</p> <p>Verwendete Normen Standard basis</p> <p>Prüfgrundlage für Sicherheits- und Gesundheitsanforderungen, die nicht von den verwendeten Normen abgedeckt werden Basis for those health and safety requirements not covered by the standard basis</p> <p>Kennzeichnung Marking</p> <p>Antragsnummer Project number</p>	<p>Steckverbinderserie revos Typ Ex**</p> <p>Wieland Electric GmbH D - 96052 Bamberg</p> <p>Anhang II der Richtlinie 94/9/EG Annex II of Directive 94/9/EC EN 50014:1997 *A1-A2 Allgemeine Besondere Eigenschaften</p> <p>Entfällt Not relevant</p> <p> I M2 EEx ia I A 20030062</p>
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Seite 1 von 7 zum Prüfprotokoll - Page 1 of 7 of Test Report  
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 (bis 31.05.2007: Deutsche Montan Technologie GmbH DT)





**2nd Supplement**  
 (Supplement in accordance with Directive 94/9/EC Annex III number 6)  
**to the EC-Type Examination Certificate**  
**BVS 03 ATEX E 184 X**

Equipment:	Industrial multipole connectors revos type Ex**
Manufacturer:	Wieland Electric GmbH
Address:	96052 Bamberg, Germany

**Description**

The reason for the issuance of this supplement is to certify the conformity of this equipment with the standard level of EN 60079-0:2006, EN 60079-11:2007 and EN 50303:2000 as well as changing the apparatus category to M1.


The industrial multipole connectors revos type Ex\*\* are rectangular connectors available in a 6-, 10-, 16-, 24- and 48-pole variant with a screw-type terminal and suitable for a wire range of 0,5 - 2,5mm<sup>2</sup> which allow to connect single-conductors or fine-wired conductors. The upper and lower section of the enclosures are available in an one hand or two hand interlocking variant and as needed for mounting to an equipment or as a free cable joint.

The connector contains only parts which do not affect the type of protection intrinsic safety. Due to the equipments type of construction the different intrinsically safe circuits are separated up to a sum of voltages (peak values) of 90 V.

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'
EN 50303:2000	M1 Equipment

The marking of the equipment shall include the following:

 I M1 Ex ia I

Page 1 of 3 to: BVS 03 ATEX E 184 X / M2  
 This certificate may only be reproduced in its entirety and without change.  
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 (until 31.05.2007: EXAM BBG Prüf- und Zertifizier GmbH)





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## Industrial technology

Solutions for the control cabinet

- DIN rail terminal blocks
  - Screw, spring clamp or IDC connection technology
  - Wire cross sections up to 240 mm<sup>2</sup>
  - Numerous special functions
  - Software solutions interfacing to CAE systems
- Safety
  - Safety sensors
  - Safety relays
  - Modular safety systems with fieldbus link
- PLC and fieldbus components
  - Standard applications in IP20
  - Increased environmental conditions with railroad and ship approvals
- Interface
  - Coupling relays, semiconductor switches
  - Measuring and monitoring relays
  - Timer and switching relays
  - Analog modules
  - Passive interfaces
  - Power supply units
  - Overvoltage protection

Solutions for field applications

- Remote automation technology
  - Power distribution
  - Fieldbus interfaces and motor starters
- Connectors for industrial applications
  - Square and round connectors
  - Aluminum or plastic housings
  - Degree of protection up to IP68
  - Current-carrying capacity up to 100 A
  - Connectors for hazardous areas
  - Modular, application specific technology

PC board terminals and connectors

- Screw or spring clamp connection technology
- Spacings: 3.5 mm to 10.16 mm
- Reflow or wave soldering process

## Building and installation technology

- Building installation systems
  - Main power supply connectors IP20/IP65 ... IP68
  - Bus connectors
  - Combined connectors
  - Low-voltage connectors
  - Power distribution system with flat cables
  - Distribution systems
  - Bus systems in KNX, LON and radio technology
  - DIN rail terminal blocks for electrical installations
  - Overvoltage protection

