

**IBExU Institut für Sicherheitstechnik GmbH**  
An-Institut der TU Bergakademie Freiberg

[1] **EC-TYPE EXAMINATION CERTIFICATE**  
according to Directive 94/9/EC, Annex III  
(Translation)



- [2] Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres, Directive 94/9/EC
- [3] EC-Type Examination Certificate Number: **IBExU04ATEX1211**
- [4] Equipment: Sensor-Box Type SB-PA-...  
Sensor-Box Type SB-AL-...
- [5] Manufacturer: Grüttner Formtechnik
- [6] Address: Siemensstr. 5, 41515 Grevenbroich, Germany
- [7] This equipment and any acceptable variation thereto are specified in the schedule to this EC-Type Examination Certificate.
- [8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.  
The examination and test results are recorded in confidential test report IB-04-3-304 of 28 October 2004.
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50014:1997+A1 +A2, EN 50020:1994 and EN 50281-1-1:1998+A1.
- [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 under [17] in the schedule to this EC-Type Examination Certificate.
- [11] This EC-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this directive apply to the manufacture and supply of this equipment.
- [12] The marking of the equipment mentioned in [4] shall include the following:

II 2G EEx ia/ib IIC/IIB T6  
 II 2D IP 65 T 80 °C

The validity of the marking for the type of protection depends on type of protection of the associated apparatus used.

IBExU Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7 - D-09599 Freiberg  
Tel.: 00493731 3805-0 - Fax: 00493731 23650

Authorised for certifications Explosion protection

By order

(Dr. Lösch)



- Seal -  
(ID no. 0637)

Freiberg, 29 October 2004

Certificates without signature and seal are not valid.  
Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Schedule

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[13]

**Schedule**

[14]

**to the EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211**

[15]

**Description of equipment**

The Sensor-Boxes SB-PA-... and SB-AL-... consist of separate certificated intrinsically safe Ex-components which are common installed with Ex-terminal strip in a Polyamide- or Aluminiumcase.

|                           |  |
|---------------------------|--|
| Ambient temperature range | from -20 °C to +70 °C (for all variants, except with Sensor PL3-F25-N4-K)<br>from -20 °C to +50 °C (for the variants with Sensor PL3-F25-N4-K) |
| Degree of protection:     | IP 65  |
| Input electric circuit:   | EEx ia/ib IIC/IIB  |
| Nominal voltage:          | $U_i = 16 \text{ V}$ (for variants with PL3... $U_i = 15 \text{ V}$ )  |
| Nominal current           | $I_i = 25 \text{ mA}$  |
| Power                     | $P_i = 34 \text{ mW}$  |

The internal inductivities and capacities are differently depending on the respective Sensor-type. They are specified on the identification plate.

Safety reference

The electrical dates of the Ex- components, inclusively the existing "Special conditions" or references, can be taken from the actual EC-Type Examination Certificate in-built Ex- components. All metal casing parts (except screws) have to be connected to equipotential bonding conductor. The connecting cable have to be permanently installed.

[16]

**Test report**

The test results are recorded in detail in the confidential test report IB-04-3-304 of 28 October 2004.

Summary of the Test Result:

The Sensor-Boxes SB-PA-... and SB-AL-... fulfil the requirements of the type of protection Intrinsic Safety for an electrical apparatus for the Group II, Explosion Group IIC/IIB and Category 2G as well as requirements of Dust Explosion Protection.

[17]

**Special conditions**

none

[18]

**Essential Health and Safety Requirements**

Confirmed by norms (see [9]).

By order



(Dr. Lösch)

Freiberg, 29 October 2004

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[1] **1<sup>st</sup> Addition to  
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211  
- Translation -**

[2] **Equipment:** Sensor-Box Type SB-PA-...  
Sensor-Box Type SB-AL-...

[3] **Manufacturer:** Grüttner Formtechnik

[4] **Address:** Siemensstr. 5,  
41515 Grevenbroich, GERMANY

[5] **Addition / Alteration**  
The equipment mentioned under [2] can also be manufactured according to the altered construction documents, that is they can be used with additional empty cases.

[6] **Test documents**  
The documentation is part of the Test Report IB-05-3-294 from 12<sup>th</sup> October 2005.

[7] **Test result**  
The Sensor-Boxes type SB-AL/A/S... and SB-VA... as well as with closed lid type SB-PA/G... with the proved modification fulfils likewise requirements of the type of protection Intrinsic Safety for an electrical apparatus for the Group II, Explosion Group IIC/IIB and Category 2G as well as requirements of Dust Explosion Protection.

The marking is unchanged:

II 2G EEx ia/ib IIC/IIB T6  
 II 2D IP 65 T 80 °C

All further information of the EC-Type Examination Certificate remain unchanged for this addition.

IBExU Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7 - 09599 Freiberg, Germany  
☎ +49 (0) 3731 3805-0 - ☎ +49 (0) 3731 23650

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(Identification No. 0637)

Freiberg, 13<sup>th</sup> October 2005

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- [1] **2<sup>nd</sup> Addition to  
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211  
- Translation -**
- [2] **Equipment:**  
a) Title corresponding to IBExU04ATEX1211:  
Sensor-Box  
Type SB-PA-... and SB-AL-...
- b) Supplementary titles: Sensor-Box  
Type SB-PA-...-U and SB-AL-SJ 3,5-SN-T
- [3] **Manufacturer:**  
a) Title corresponding to IBExU04ATEX1211:  
Grüttner Formtechnik
- b) Altered title: Rauter sensor-boxes
- [4] **Address:**  
a) Corresponding to IBExU04ATEX1211:  
Siemensstr. 5  
41515 Grevenbroich  
Germany
- b) Altered address: Düsseldorf Straße 186  
41460 Neuss  
Germany
- [5] **Addition / Alteration**  
The additions / alterations of equipment mentioned under [2] b) compared with the certify equipment [2] a) concern in singles:  
a) An expansion of the series of sensor boxes around the type SB-PA-...-U for applications in the mining as intrinsically safe electrical apparatus of the group I category M2.  
b) An expansion of the series of sensor boxes around the type SB-AL-SJ 3,5-SN-T for applications in the depression temperature range till -45 °C, existing only from components which are at least suitable for this temperature.
- [6] **Test Report**  
The proof of the explosion protection the under [2] b) mentioned equipment explained in the Test Report IB-06-3-057 from 13<sup>th</sup> March 2006. The test documents are component of the Test Report.
- [7] **Test result**  
IBExU certifies, that the under [2] b) mentioned equipment fulfils the in Annex II of the RL 94/9/EC fixed Essential Health and Safety Requirements by accordance with EN 50014:1997+A1+A2, EN 50020:2002 and EN 50281-1-1:1998.
- The sensor-box type SB-AL-SJ 3,5-SN-T for applications in the depression temperature range till -45 °C fulfils the requirements of the equipment group II, category 2G, type of protection intrinsic safety ia/ib, Explosion group IIC/IIB into dependence of the supply electrical circuit.  
The marking of the sensor-box type SB-AL-SJ 3,5-SN-T shall include the following:
- Ⓔ II 2G EEx ia/ib IIC/IIB T6  
Ⓔ II 2D IP 65 T 80  
-45 °C ≤ T<sub>a</sub> ≤ +70 °C

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The sensor-box type SB-PA-...-U for applications in the mining fulfils the requirements of the equipment group I, category M2, type of protection intrinsic safety ia/ib into dependence of the supply electrical circuit.

The marking of the sensor-box type SB-PA-...-U shall include the following:

**Ⓔ I M2 EEx ia/ib I**  
-20 °C ≤ T<sub>a</sub> ≤ +70 °C

This addition only is in connection with the EC-Type Examination Certificate  
IBExU04ATEX1211 of 29<sup>th</sup> October 2004 valid.

**IBExU** Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7 - 09599 Freiberg, Germany  
☎ +49 (0) 3731 3805-0 - 📠 +49 (0) 3731 23650

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Freiberg, 14<sup>th</sup> March 2006

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[1] **3<sup>rd</sup> Addition to  
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211  
- Translation -**

[2] Equipment: Sensor-Box  
Type SB-PA-... and SB-AL-...

[3] Manufacturer:  
a) Title corresponding to IBExU04ATEX1211:  
Grüttner Formtechnik  
b) Current title: Rauter sensor-boxes

[4] Address:  
a) Corresponding to IBExU04ATEX1211:  
Siemensstr. 5  
41515 Grevenbroich  
Germany  
b) Current address: Düsseldorf Straße  
41460 Neuss  
Germany

[5] **Addition / Alteration**  
The additions / alterations of equipment mentioned under [2] compared with the certify equipment concern in singles:  
The sensor boxes can be added with a membrane vent type POV/Metal Vent M12x1,5 in the box-ground.

[6] **Test Report**  
The proof of the explosion protection the under [2] mentioned equipment explained in the Test Report IB 06-3-163 from 29<sup>th</sup> May 2006. The test documents are component of the Test Report.

[7] **Test result**  
IBExU certifies, that the under [2] mentioned equipment fulfils the in Annex II of the RL 94/9/EC fixed Essential Health and Safety Requirements by accordance with EN 50014:1997 +A1+A2, EN 50020:2002 and EN 50281-1-1:1998.

The cryogenic temperature-sensor-box type SB-AL-SJ 3,5-SN-T for applications in extreme cold is with the membrane vent only till - 40 °C approved.

The marking of the sensor-box type SB-AL-SJ 3,5-SN-T with the membrane vent shall include the following:

II 2G EEx ia/ib IIC/IIB T6  
 II 2D IP 65 T 80 °C  
-40 °C ≤ T<sub>a</sub> ≤ +70 °C

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**Safety notes**

- At use in Group II outside of the normal temperature range at a minimal ambient temperature up to max. -40 °C the Membrane Vent must be installed and operated mechanically protected according to the low risk of mechanical danger according to EN 60079-0: 2004, paragraph 26.4.2.
- At the use of the Membrane Vent in Group I the mounting location must be selected in such a way, that it is protected against the risk of mechanical danger during the normal operation based on the requirements of EN 60079-0:2004, paragraph 9.2.
- Damaged Membrane Vents have to be replaced immediately.

This addition only is in connection with the EC-Type Examination Certificate IBExU04ATEX1211 of 29<sup>th</sup> October 2004 valid.

**IBExU** Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7 - 09599 Freiberg, Germany  
☎ +49 (0) 3731 3805-0 - 📠 +49 (0) 3731 23650

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Explosion protection

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(Dr. Lösch)



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(Identification No. 0637)

Freiberg, 30<sup>th</sup> May 2006

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[1] **4<sup>th</sup> Addition to  
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211  
- Translation -**

[2] Equipment: Sensor-Box  
Type SB-PA-... SB-AL-...and SB-VA-...

[3] Manufacturer: Rauter Sensor-Boxes

[4] Address: Düsseldorf Straße  
41460 Neuss  
Germany

[5] **Addition / Alteration**

The additions / alterations of the equipment mentioned under [2] compared with the certified equipment concern in particular:

- a) The sensor boxes fulfil also the requirements of the standard series EN 60079-0 and EN 61241-0.
- b) The sensor boxes can also be equipped with the cable entries type U28 of the comp. Pflitsch, type GHG 960 9235 P0023 (Neoprene sealing ring), of the comp. CEAG/Cooper-Crouse Hinds or type Skintop MS-M20 of the comp. Lapp.
- c) At the use of the cable entries mentioned under b) the ambient temperature range can be extended on -25 °C to +70 °C.
- d) The sensor boxes also can also be equipped with a Becker-Hirschmann-Adapter type BHA 01.
- e) Another high-grade steel enclosure type KL of the comp. Rittal can alternatively be used.

[6] **Test Report**

The proof of the explosion protection of the under [2] mentioned equipment is explained in the Test Report IB-07-3-276/1 of 26<sup>th</sup> October 2007. The test documents are part of the Test Report.

[7] **Test result**

IBExU certifies that the under [2] mentioned equipment fulfils the in Annex II of the Directive 94/9/EC fixed Essential Health and Safety Requirements by compliance with EN 60079-0:2004, EN 60079-11:2007, EN 62241-0:2006 and EN 61241-1:2004.

The marking of the sensor-boxes shall include the following:

⊕ II 2G Ex ia/ib IIC/IIB T6  
⊕ I M2 Ex ia/ib I  
⊕ II 2D Ex tD A21 IP 65 T 80 °C

Changed temperature range at use of the under [5] b) mentioned cable entries:  
-25 °C ≤ T<sub>a</sub> ≤ +70 °C

**Safety instructions**

- The correct safety notes and special conditions of the used Ex-components have to be taken into account.
- The extended temperature range is ensured only at use of the sealing compounds allowed for this.

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This addition is only valid in combination with the EC-Type Examination Certificate  
IBExU04ATEX1211 of 29<sup>th</sup> October 2004 and the additions 1 to 3 valid.

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☎ +49 (0) 3731 3805-0 - 📠 +49 (0) 3731 23650

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Freiberg, 29<sup>th</sup> October 2007

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- [1] **5<sup>th</sup> Addition to  
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1211**  
according to Directive 94/9/EC, Annex III  
**- Translation -**

- [2] Equipment:  
a) Designation corresponding to IBExU04ATEX1211:  
**Sensor-Box**  
Type SB-PA-... and SB-AL-...
- b) Supplementary types: Type SB-PA-... SB-AL-...and SB-VA-...

- [3] Manufacturer:  
a) Name corresponding to IBExU04ATEX1211:  
Grüttner Formtechnik
- b) Altered Name: Rauter Sensor-Boxes

- [4] Address:  
a) Address corresponding to IBExU04ATEX1211:  
Siemensstr. 5, D-41515 Grevenbroich
- b) Altered address: Düsseldorf Straße 186  
41460 Neuss  
Germany

- [5] **Addition / Alteration**  
This is a summarized addition, which included all previous alterations and one new addition:  
a) An expansion of the series of sensor boxes around the type SB-PA-...-U for applications in the mining as intrinsically safe electrical apparatus of the group I category M2.  
b) An expansion of the series of sensor boxes around the type SB-AL-SJ 3,5-SN-T for applications in the depression temperature range to -45 °C.  
c) The sensor boxes can also be equipped with a membrane vent and different cable entries.  
d) A further high-grade steel enclosure type KL of the company Rittal can alternatively be used.  
e) The sensor boxes also can be equipped with a Becker-Hirschmann-Adapter type BHA 01 or different Harting plug-in connectors.

Only intrinsically safe inductive sensors are used, which are separately certified in accordance with Directive 94/9/EC. The values of the sensors for inductance and capacitance are inherited at the outside type label.

**Technical data**

Ambient temperature: from -20 °C to +70 °C (for all variants, apart from PL3-F25-N4-K)  
from -20 °C to +40 °C (with sensor PL3-F25-N4-K)  
from -25 °C to +70 °C (when cable entries are applicable)  
from -45 °C to +70 °C (type SB-AL-SJ 3,5-SN-T)

Degree of protection: IP 65

Input electric circuit in type of protection intrinsic safety Ex ia/ib IIC/IIB:

Nominal voltage:  $U_i = 16 \text{ V}$  (for variants with PL3...  $U_i = 15 \text{ V}$ )  
Nominal current:  $I_i = 25 \text{ mA}$   
Power:  $P_i = 34 \text{ mW}$

- [6] **Test Report**  
The proof of the explosion protection of the under [2] mentioned equipment is explained in the Test Report IB-10-3-415 of 16 March 2011. The test documents are part of the Test Report.

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[7] **Test result**

The sensor boxes Type SB-PA-... SB-AL-...and SB-VA-... fulfil the requirements of explosion protection for equipment of Group I and II, type of protection Intrinsic safety „ia“ respectively „ib“ Category 2G, 2D and M2.

IBExU certifies that the under [2] mentioned equipment fulfils the in Annex II of the Directive 94/9/EC fixed Essential Health and Safety Requirements by compliance with EN 60079-0:2009, EN 60079-11:2007 and EN 61241-11:2006.

The marking of the alterations sensor-boxes type SB-PA-..., SB-AL-...and SB-VA-...shall include at least one of the following details:

⊕ II 2G Ex ia/ib IIC/IIB T6  
⊕ II 2D Ex ia IIIC T 80 °C  
⊕ I M2 Ex ia I (type SB-PA-...-U)  
-45 °C/-25 °C/-20 °C ≤ T<sub>a</sub> ≤ +40 °C/+70 °C

[8] **Safety instructions**

- The correct safety notes and special conditions of the used Ex-components, particularly membrane vent and cable entries, have to be taken into account.
- The extended temperature range is ensured only at use of the sealing compounds allowed for this.

**This addition is only valid in combination with the EC-Type Examination Certificate IBExU04ATEX1211 of 29<sup>th</sup> October 2004.**

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☎ +49 (0) 3731 3805-0 - ☎ +49 (0) 3731 23650

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- Explosion protection -

By order



(Dr. Wagner)



- Seal -  
(Identification No. 0637)

Freiberg, 16 March 2011

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