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	issued	checked	released
Date	30.06.2004	22.09.2010	29.09.2010
Signatures	<i>Greulich</i>	<i>Kümper</i>	<i>Dr. Achenbach</i>

0. Valid for Load Cells

BK2, PC1, PC2, PC2H, PC6, PC12, PC22, PC42, PC46, PC60, PCB, SB2, SB4, SB5, SB6, SB8, SB14, SLB, ZLB, RC1, RC2, RC3, UB1, UB5, UB6, ULB

1 . Preamble

This manual covers only the “Ex” relevant aspects.

2 . Equipment Function

Flintec load cells are designed to be used in various kinds of industrial scales and meet the most stringent accuracy requirements. Certifications have been obtained from Weights & Measures Authorities worldwide. These load cells are available with different maximum capacities and include accuracy classifications according to OIML R 60 and / or NTEP.

They offer stainless steel or aluminium construction sealed by welding or improved potting.

This makes them suitable for use in tough industrial environments – they are designed to withstand shock and fatigue loading.

The load cells can be used in all hazardous areas. The basic structure is always the same.

All standard equipment is provided with a 4-wire shielded conductor cable; equipment with the coding extension –6w is provided with a 6-wire shielded conductor cable.

(See Chapter 2.5 Coding of Load Cells)

2.1 Details

The following table shows the relationship between maximum total power P_i and maximum ambient temperature.

Temperature class / coding	$U_i = 30 \text{ V}, P_i = 4 \text{ W}$
T6 (gas)	$-40^\circ\text{C} \leq T_a \leq 45^\circ\text{C}$
T5 (gas)	$-40^\circ\text{C} \leq T_a \leq 60^\circ\text{C}$
T100°C (dust)	$-40^\circ\text{C} \leq T_a \leq 60^\circ\text{C}$

2.2 Connection of the Standard Version

Supply circuit: green (+) and black (-)
Signal circuit: white (+) and red (-)
Shield: yellow and / or metallic

The intrinsically safe circuit including the load cells must be built up with approved safety barriers or isolation amplifiers, matching the connected weighing indicator.

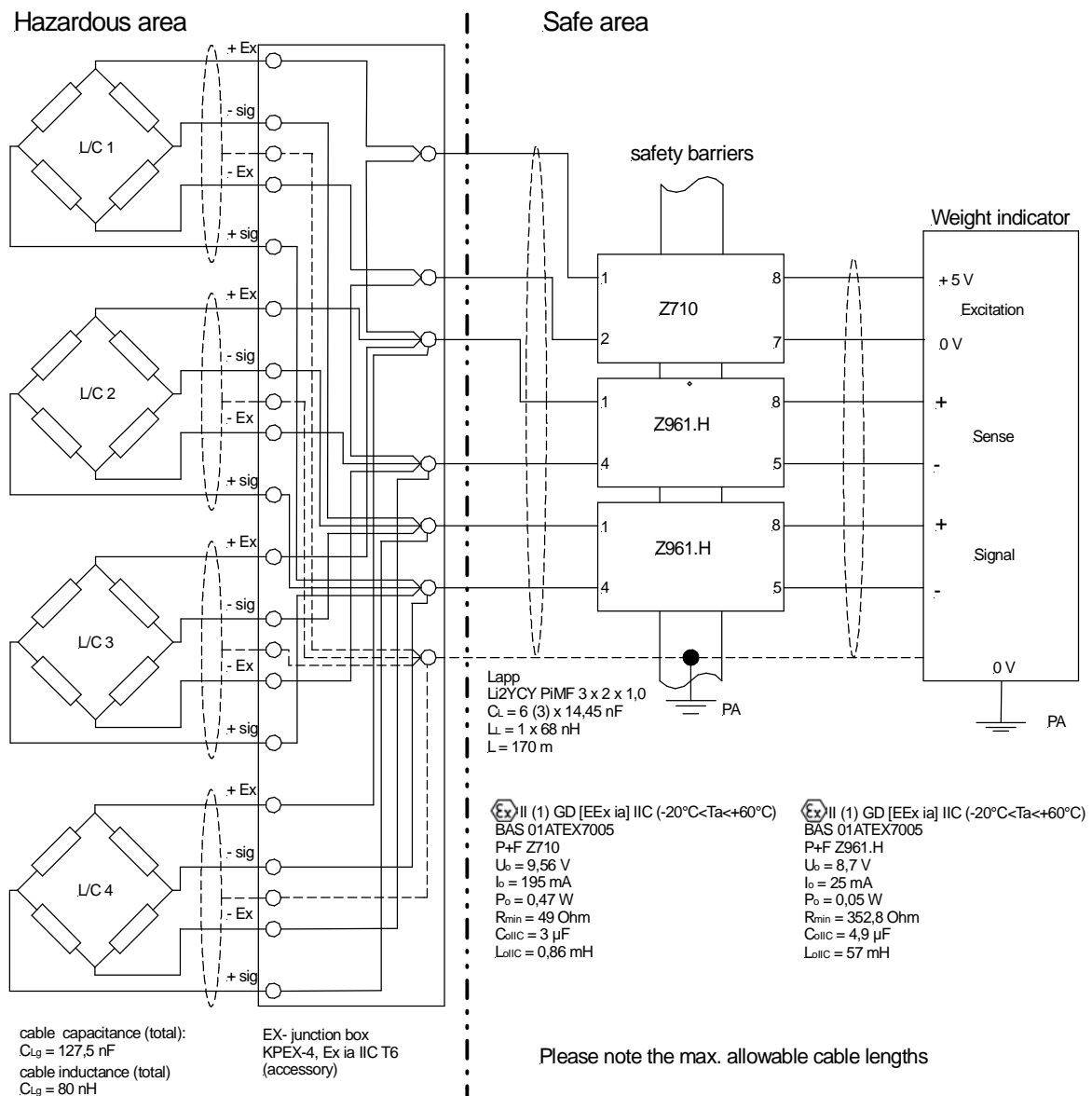
2.2.1 Examples of suitable circuits with approved safety barriers :

Warning: The specialist who installs the equipment must take responsibility for proper operation in combination with various measuring equipment .

Example: With safety barriers for single-ended supply

Typ SB4-10kN-C3 4ws
 BVS 09 ATEX E 086 x
 Ⓢ II 1 G Ex ia IIC T6/T5 Ga
 Ⓢ II 1 D Ex ia IIIC IP67 T100°C Da

Ci, Li are negligible



Wiring diagrams of different circuit examples are available on request.

2.3 Connections of the 6-wire Version

Supply circuit:	green (+) and black (-)
Signal circuit:	white (+) and red (-)
Sense circuit:	blue (+) and brown (-)
Shield:	yellow and / or metallic

The intrinsically safe circuit including the load cells must be built up with approved safety barriers or isolation amplifiers, matching the connected weighing indicator.

2.4 Advice for Interconnections

- Follow and respect the formation-regulations of the application-country, e.g. in Germany follow the regulations EN 60079-14 and EN 61241-14.
- It is ONLY permitted to use approved safety barriers or isolation amplifiers for explosive-areas. In Europe, it is a requirement to have an EC-Type Examination Certificate from a nominated certifying body for the Zones 0 / 1 / 20 / 21.
- The rated power, P_o , of all excitation devices must be equal to or less than the power, P_i , of one load cell.
- The excitation voltage U_o must be equal to or less than the voltage U_i of one load cell.
- The current, I_o , of all excitation devices must be equal to or less than the current, I_i , of one load cell.
- To ensure a potential equalisation with -6w versions, a ground connection between the load cell housing and the safety barrier's ground connector is required. In these installations, the shield of the connection cable is connected to ground potential at both ends.
- On usual deliveries up to 10 meters, the inductance and capacitance per unit length of the connection cables is negligible.

2.5 Coding of the Load Cells

The load cells have to be marked according to the following scheme:

AAA-BBB-CCC-DDEF-ZZ, e.g. **SB8-100kg-C3-6wsc-12**

AAA	=	Load cell type
BBB	=	Load cell maximum capacity
CCC	=	Accuracy class
DD	=	without marking = 4-wire; 6w = 6-wire
E	=	without marking = screen of cable not connected to load cell body, s = screen of cable connected to load cell body
F	=	without marking = not coated, c = coated
ZZ	=	Cable length in meter (plain text) if the load cell cable at delivery is longer than 10 m

2.6 Reference notes concerning electrostatics

The load cells can be covered with a non-conductive protective coating as corrosion prevention. In the type designation code the load cells are marked as "c" in the last position (F).

The free projected surface must not be larger than indicated in the following table after mounting the load cells (types ***-*** **-*c) and propagating brush discharges must be avoided.

Used in:	Max. free projected surface		
	IIA	IIB	IIC
Zone 0	50 cm ²	25 cm ²	4 cm ²
Zone 1 / 2	100 cm ²	100 cm ²	20 cm ²
Zone 20	No limitation of size, but exclusion of propagating brush discharges		
Zone 21 / 22			

If the limiting values of the at maximum tolerable free projected surface cannot be maintained, then mounting can be done by the user (if propagating brush discharges can be eliminated) and he can point to this risk on an ESD- warning label (Clean wet only !) on site and in his explosion protection document. In Zone 2 the installation contractor may permit larger free surfaces on his own responsibility, in accordance with the EX regulations.

2.7 Special notes to the relative inductance and capacities of cables within intrinsically safe circuits

Up to a cable length of 10 meters, the inductance and capacitance of the load cell cables are negligible. The cable length is shown as ZZ within the type code. In case the load cell cable length exceeds 10 meter, the inductance and capacitance have to be considered.

Following default values can be used (according article 12.2.2.2 of EN 60079-14) :

- $C_L = 200 \text{ pF/m}$
- $L_L = 1 \text{ }\mu\text{H/m}$

3. Designation

All Flintec load cells follow the same electrical design and meet the requirements for category1 equipment. The operating company must ensure that already used load cells must not used in other zones except in the same category. Therefore the label has a corresponding checkbox
The ATEX-label is attached to the connection cable close to the load cell body. All allowed designations for this load cell are prepared. The operating company or the specialist who installs the equipment **must** fill in a checkbox with the valid zone by use of a permanent waterproof marker pen or hole punch at site. Without any entry on the label, the load cell is limited for use in zone 2 or 22!

3.1 Standard Label








ca. 45 x 28 mm

If applicable mark at this point for use in zone 0 or 20 →

If applicable mark at this point for use in zone 1 or 21 →

If applicable mark at this point for use in zone 2 or 22 →

3.2 Categorie - Designation

	<p>WARNING Hazardous area. Installation must be in accordance with Flintec instructions. Check the applicable zone. Once selected it may not change.</p>
<p>IECEX BVS 09.0036X -40°C≤Ta≤45°C/60°C For use in zones 0, 1, 20, 21 only</p>	
<p>BVS 09 ATEX E 086 X CE 0158 For use in zones 0, 1, 20, 21 only</p>	
<input type="checkbox"/>	<p> II 1G Ex ia IIC T6/T5 Ga II 1D Ex ia IIIC IP67 T100°C Da</p>
<input type="checkbox"/>	<p> II 2G Ex ia IIC T6/T5 Gb II 2D Ex ia IIIC IP67 T100°C Db</p>
<p>TFR:03 ATEX 025X -40°C≤Ta≤45°C/60°C For use in zones 2, 22 only</p>	
<input type="checkbox"/>	<p> II 3G Ex ic IIC T6/T5 Gc II 3G Ex nA IIC T6/T5 Gc</p>
<input type="checkbox"/>	<p> II 3D Ex tD IIIC IP67 T100°C Dc</p>

approx. 54 x 44 mm

4. Commissioning and Installation

- a) This equipment (load cells) can be used either in zone 0, 1 or 2, or zone 20, 21 or 22 in explosion groups IIA, IIB, IIC, IIIA, IIIB, or IIIC.
- b) The allowed ambient temperature range is from -40°C to $45^{\circ}\text{C}/60^{\circ}\text{C}$.
- c) This equipment complies to protection class $> \text{IP67} / \text{EN 60529}$.
- d) This equipment must be electro statically grounded.
- e) The load cell must not be used if it is defective or shows any visible damage.
- f) Load cells must not be re-used in an intrinsically-safe circuit if they have already been operated in a circuit in zone 2 or 22.

5. Usage

WARNING: Misuse will cause the loss of warranty and manufacturer's responsibility.

The load cells are only allowed for professional applications in accordance with the load cell data sheet and Flintec application parts.

- a) If the load cells are not powered from an intrinsically-safe circuit the connection cables must either be lead out of the hazardous area to terminate them or terminated in suitable junction boxes.
- b) If used in hazardous dust environment, the dust layer on the load cell body must not exceed 5 mm in thickness.
- c) The load cell types PC22, PC42, PC46, PC60 and ZLB have an aluminium housing. If used in zone 0, the general precautions for the application of light metals must be followed, e.g. protection against impact energy.
- d) The load cells type BK2, PC1, PC22, PC42, PC46, PC60, SB5, SLB, UB5, ULB and ZLB have a plastic surface $> 4 \text{ cm}^2$. If used in zone 0 precautions against electrostatic charging must be implemented.
- e) In zone 0 and in the apparatus group IIC the connecting cables of the load cells must be laid protectedly against static charges

6. Maintenance

Maintenance interventions on the load cells have to be carried out by Flintec personnel only.

7. Repair

This equipment is certified for use in hazardous locations, therefore no modifications are allowed. Repairs **must** only be performed by personnel specifically trained for repairs of this equipment.

8. Waste Disposal

The waste disposal of package and shipped parts **must** be done in accordance with the regulations of the country in which the equipment is installed.

9. EC-Declaration of Conformity

EC-DECLARATION OF CONFORMITY

EC-Declaration of conformity of a sub-assembly
with the ATEX-Directive 94/9/EC (ATEX95), Amendment X.B

The manufacturer

Flintec GmbH, Bemannsbruch 9, DE74909 Meckesheim


hereby declares that the sub-assembly described below

Description: Load cells of types

PC1, PC2, PC2H PC6, PC12, PC22, PC42, PC46, PC60, PCB, SB2, SB4, SB5, SB6, SB8, SB14, SLB, BK2, ZLB, RC1, RC2, RC3, UB1, UB5, UB6, ULB, BK2

Serial number see shipping documents

Marking:

CE  II1G Ex ia IIC T6/T5 Ga or II1D Ex ia IIIC IP67 T100°C Da or 2G Ex ia IIC T6/T5 Gb or II2D Ex ia IIIC IP67 T100°C Db or II 3G Ex nA IIC T6/T5 Gc or II3G Ex ic IIC T6/T5 Gc or II 3D Ex tD IIIC IP67 T100°C Dc

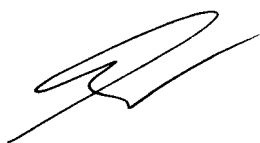
complies with the provisions of the following harmonized standards in the version, valid at signature date:

EN 60079-0	Explosive atmospheres - Part 0: Equipment - General requirements
EN 60079-11	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
EN 60079-15	Electrical apparatus for explosive gas atmospheres -Part 15: Construction, test and marking of type of protection "n" electrical apparatus
EN 60079-26	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
EN 61241-0	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
EN 61241-11	Electrical apparatus for use in the presence of combustible dust. Part 11: Protection by intrinsic safety "iD"

Also complies with the following European and National Standards and technical provisions in the version, valid at signature date: Technical rules for the operational safety (TBRs) 2153 Avoidance of ignition hazards as consequence of electrostatic charging.

The sub-assemblies of category 1 and 2 complies with the model, which has obtained an "EC" type certificate, number BVS 09ATEX E 086X issued by the notified body 0158 DEKRA EXAM, Dinnendahlstrasse 9, DE 44809 Bochum.

Meckesheim, July 15th 2010



i.V. Gisbert Greulich

Project Manager

10. EC- Type Examination Certificate



Translation

(1) EC-Type Examination Certificate

- (2) - Directive 94/9/EC -
Equipment and protective systems intended for use
in potentially explosive atmospheres
- (3) **BVS 09 ATEX E 086 X**
- (4) **Equipment:** Load cell type ***-***-***-***
- (5) **Manufacturer:** Flintec GmbH
- (6) **Address:** 74909 Meckesheim, Germany
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.
- (8) The certification body of DEKRA EXAM 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 09.2098 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
- | | |
|------------------|-------------------------------------|
| IEC 60079-0:2007 | General requirements |
| EN 60079-11:2007 | Intrinsic safety 'i' |
| EN 60079-26:2007 | Equipment Protection Level (EPL) Ga |
| EN 61241-0:2006 | General requirements |
| EN 61241-11:2006 | Intrinsic safety 'iD' |
- (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 appendix 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:



II 1G Ex ia IIC T6/T5 Ga resp. **II 2G Ex ia IIC T6/T5 Gb**
II 1D Ex ia IIIC IP67 T100°C Da **II 2D Ex ia IIIC IP67 T100°C Db**

DEKRA EXAM GmbH

Bochum, dated 06. July 2009

Signed: Simanski

Certification body

Signed: Ruhnau

Special services unit



(13) Appendix to

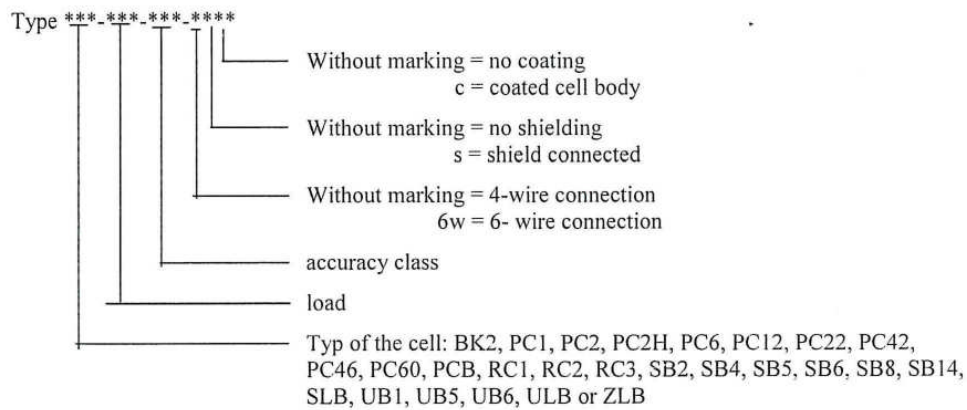
(14) **EC-Type Examination Certificate**

BVS 09 ATEX E 086 X

(15) 15.1 Subject and type

Load cell type ***-***-***-****

Instead of the *** in the complete denomination letters and numerals will be inserted which characterize modifications:



15.2 Description

The load cells are used for converting a load into an electrical signal.
The cells have a metal enclosure with inside fixed resistance strain gauges.
The electrical connection is carried out by a permanently connected cable.
The cells are "simple apparatus".

15.3 Parameters

Voltage	U _i	DC	30	V
Power	P _i		4	W
Ambient temperature range	T _a			
for Temperature Class T6				-40 °C up to +45 °C
for Temperature Class T5				-40 °C up to +60 °C
for Dust application				-40 °C up to +60 °C

(16) Test and assessment report

BVS PP 09.2098 EG as of 06.07.2009



(17) Special conditions for safe use

- 17.1 The load cells type PC22, PC42, PC46, PC60 and ZLB have an aluminium enclosure; if those cells are used in areas requiring Category 1G apparatus, avoid an ignition hazard due to impact or friction.
- 17.2 The load cells type BK2, PC1, PC22, PC42, PC46, PC60, SB5, SLB, UB5, ULB and ZLB have a plastic surface larger than 4 cm²; if those cells are used in areas requiring Category 1G apparatus, avoid risk from electrostatic discharge.
- 17.3 If the load cell is used in areas requiring Category 1G apparatus for gas group IIC, they should be installed in a way that intensive electrostatic charges are avoided.
- 17.4 The load cells type ***-***-***-***c have a coated cell body; if they are used in areas requiring Category 1D or 2D apparatus, avoid an ignition hazard due to propagating brush discharges.

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, 06. July 2009
BVS-Schu/Her A 20090180

DEKRA EXAM GmbH



Certification body



Special services unit

Translation

(1) 1. Supplement to the EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC Supplement accordant with Annex III number 6
- (3) No. of EC-Type Examination Certificate: **BVS 09 ATEX E 086 X**
- (4) Equipment: **Load cell type ***_***_***_******
- (5) Manufacturer: **Flintec GmbH**
- (6) Address: **Bemannsbruch 9, 74909 Meckesheim, Germany**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.
- (8) The certification body of DEKRA EXAM 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 09.2098 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
- IEC 60079-0:2011 General requirements**
EN 60079-11:2012 Intrinsic safety 'i'
EN 60079-26:2007 Equipment Protection Level (EPL) Ga
- (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 appendix to this certificate.
- (11) This supplement to the 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:



II 1G Ex ia IIC T6/T5 Ga

resp.

II 2G Ex ia IIC T6/T5 Gb

II 1D Ex ia IIIC IP67 T100°C Da

II 2D Ex ia IIIC IP67 T100°C Db

DEKRA EXAM GmbH
Bochum, dated 25.09.2012

Signed: Simanski

Signed: Dr. Eickhoff

Certification body

Special services unit

- (13) Appendix to
- (14) **1. Supplement to the EC-Type Examination Certificate
BVS 09 ATEX E 086 X**
- (15) 15.1 Subject and type

Load cell type ***_***_***_****

15.2 Description

The load cells have been assessed in acc. with IEC 60079-0:2011 and EN 60079-11:2012.

15.3 Parameters

Voltage	Ui	DC	30	V
Power	Pi		4	W
Ambient temperature range for Temperature Class T6 for Temperature Class T5 for Dust application	Ta			
			-40 °C up to +45 °C	
			-40 °C up to +60 °C	
			-40 °C up to +60 °C	


- (16) Test and Assessment Report
BVS PP 09.2098 EG as of 25.09.2012

(17) Special conditions for safe use

- 17.1 The load cells type PC22, PC42, PC46, PC60 and ZLB have an aluminium enclosure; if those cells are used in areas requiring Category 1G apparatus, avoid an ignition hazard due to impact or friction.
- 17.2 The load cells type BK2, PC1, PC22, PC42, PC46, PC60, SB5, SLB, UB5, ULB and ZLB have a plastic surface larger than 4 cm²; if those cells are used in areas requiring Category 1G apparatus, avoid risk from electrostatic discharge.
- 17.3 If the load cell is used in areas requiring Category 1G apparatus for gas group IIC, they should be installed in a way that intensive electrostatic charges are avoided.
- 17.4 The load cells type ***_***_***_***c have a coated cell body; if they are used in areas requiring Category 1D or 2D apparatus, avoid an ignition hazard due to propagating brush discharges.

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.

DEKRA EXAM GmbH
44809 Bochum, 25.09.2012
BVS-Schu/Dj A 20121005



Certification body



Special services unit