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## 1 Valid for Load Cells

**Ex ia:** BK2, CN3, PC1, PC2, PC3, PC4, PC6, PC7, PC12, PC22, PC30, PC42, PC46, PC60, PCB, RC1, RC3, Q50, SB4, SB5, SB6, SB8, SB9, SB14, SLB, UB1, UB6, ULB, UXT, VT1.

**Ex ec / tb:** PC1, PC6, PCB, RC3, SB4, SB8, SB14, SLB.

**Ex ec / tb / tc:** PC1x

**Ex mc:** PC22

## 2 Preamble

This manual covers only the “Ex” relevant aspects.

## 3 Equipment Function

Flintec load cells are designed to be used in various kinds of industrial scales and meet the most stringent accuracy requirements. 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.

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 0 Coding of Load Cells).

### 3.1 Equipment Ratings

#### 3.1.1 Load cells for Ex i

For CN3, SB5, PC1, PC22, PC30, PC42, PC46, PC60, SB9, SLB, ULB, PC3, PC6, PC7, PCB, Q50, RC1, RC3, SB14, SB4, SB6, SB8, UB1, UB6, UXT, PC4, PC2, PC12

| <i>Ui</i> | <i>Ii</i> | <i>Pi</i> | <i>EPL</i>        | <i>Temperature classes at ambient temperature Ta</i> | <i>Integral Cable</i>          |                               |
|-----------|-----------|-----------|-------------------|------------------------------------------------------|--------------------------------|-------------------------------|
|           |           |           |                   |                                                      | <i>Max. mutual capacitance</i> | <i>Max. mutual inductance</i> |
| 30V       | 350mA     | 1.6W      | <i>Ga (Gas)</i>   | <i>T4 (-40°C to +60°C)</i>                           | 150 pF/m                       | 1 µH/m                        |
|           |           |           | <i>Da (Dust)*</i> | <i>T<sub>200</sub>100°C (-40°C to +60°C)</i>         |                                |                               |

For BK2

| <i>Ui</i> | <i>Ii</i> | <i>Pi</i> | <i>EPL</i>        | <i>Temperature classes at ambient temperature Ta</i> | <i>Integral Cable</i>          |                               |
|-----------|-----------|-----------|-------------------|------------------------------------------------------|--------------------------------|-------------------------------|
|           |           |           |                   |                                                      | <i>Max. mutual capacitance</i> | <i>Max. mutual inductance</i> |
| 30V       | 350mA     | 1.3W      | <i>Ga (Gas)</i>   | <i>T4 (-40°C to +60°C)</i>                           | 150 pF/m                       | 1 µH/m                        |
|           |           |           | <i>Da (Dust)*</i> | <i>T<sub>200</sub>100°C (-40°C to +60°C)</i>         |                                |                               |

For VT1

| <i>Ui</i> | <i>Ii</i> | <i>Pi</i> | <i>EPL</i>        | <i>Temperature classes at ambient temperature Ta</i> | <i>Integral Cable</i>          |                               |
|-----------|-----------|-----------|-------------------|------------------------------------------------------|--------------------------------|-------------------------------|
|           |           |           |                   |                                                      | <i>Max. mutual capacitance</i> | <i>Max. mutual inductance</i> |
| 30V       | 350mA     | 1.5W      | <i>Ga (Gas)</i>   | <i>T4 (-40°C to +60°C)</i>                           | 150 pF/m                       | 1 µH/m                        |
|           |           |           | <i>Da (Dust)*</i> | <i>T<sub>200</sub>100°C (-40°C to +60°C)</i>         |                                |                               |

\*Assessment has been done under 200 mm depth of dust, therefore the equipment may be considered suitable for environments with an uncontrolled dust layer

#### 3.1.2 Load cells for Ex ec / tb or Ex ia

For PC1, PC6, PCB, RC3, SB4, SB8, SB14, SLB the excitation voltage must not exceed U=15 V. These load cells may be considered suitable for an uncontrolled layer of dust with an ignition temperature of 100°C or more.

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### 3.1.3 Load cells for Ex ec / tb / tc

For PC1x the excitation voltage must not exceed  $U=15\text{ V}$ . These load cells may be considered suitable for an uncontrolled layer of dust with an ignition temperature of  $100^{\circ}\text{C}$  or more.

### 3.1.4 Load cells for Ex mc

For PC22 the rated DC voltage must be  $5\text{ VDC} \dots 15\text{ VDC}$ , and rated DC current  $15\text{ mA} \dots 50\text{ mA}$ . This load cell may be considered suitable for an uncontrolled layer of dust with an ignition temperature of  $78^{\circ}\text{C}$  or more.

## 3.2 Connection of the 4-wire 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 constructed with approved equipment (e.g., safety barriers or switch amplifiers) matching the connected weighing indicator.

## 3.3 Connection 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 constructed with approved equipment (e.g. safety barriers or switch amplifiers) matching the connected weighing indicator.

## 3.4 Installation guidelines

- The installation must be carried out by competent personnel with suitable training and qualification e.g. CompEx, IECEx CoPC.
- Follow and respect the guidelines and regulations of the application country.  
e.g.: IEC 60079-14, or local equivalents.
- It is **ONLY** permitted to use approved equipment (e.g., safety barriers or switch amplifiers) for explosive areas. In Europe, it is a requirement for such equipment to be covered by an appropriate Type Examination Certificate.
- Intrinsically safe and non-intrinsically safe circuits must be installed separately.
- For load cell where the shield is connected to the load cell body, "s" is in the marking code.
- For load cell where the shield is not connected to the load cell body - The load cell body must be bonded to the construction that is earthed or embedded in the ground.

## 3.5 Coding of the Load Cells

*The load cells are marked according to the following scheme:*

AAA-BBB-CCC-DDE-ZZ, e.g. **CN3-100kg-C3-6ws-12**

|     |   |                                                                                                                       |
|-----|---|-----------------------------------------------------------------------------------------------------------------------|
| AAA | = | Load cell type                                                                                                        |
| BBB | = | Load cell maximum capacity                                                                                            |
| CCC | = | Accuracy class                                                                                                        |
| DD  | = | without marking = 4-wire; 6w = 6-wire                                                                                 |
| E   | = | without marking = shield of cable not connected to load cell body,<br>s = shield of cable connected to load cell body |
| ZZ  | = | Cable length in plain text (in meter)                                                                                 |

|          |                |            |    |          |     |              |          |      |        |
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## 4 Designation

All Flintec load cells follow the same electrical design and can be used in gas and dust atmospheres requiring equipment groups IIA, IIB, IIC, IIIA, IIIB or IIIC:

They can be used within an intrinsically safe system for ATEX equipment category 1 equipment and IECEx Equipment Protection Level (EPL) Ga Da for installation in Zones 0, 1, 2, 20, 21 or 22. The connected equipment is normally a Zener barrier located in the non-hazardous area, but could also be other associated apparatus located in the non-hazardous area or intrinsically safe equipment in the hazardous area.

Those load cells with marking Ex tb can be installed as ATEX equipment category 2 equipment in dust environment and IECEx EPL Db. This would normally be installed in Zone 21 or 22.

Those load cells with marking Ex ec / tc or Ex mc can be installed as ATEX equipment category 3 and IECEx EPL Gc Dc. This would normally be installed in Zones 2 and 22.

The Ex marking label is attached to the connection cable close to the load cell body.

### 4.1 Standard Label



### Equipment Label – Warning Side

Flintec Transducers (Pvt) Ltd,  
PO Box 24, Spur Rd 2, Phase 1, KEPZ,  
Katunayake, Sri Lanka

#### WARNING

Hazardous area.  
Please refer to the instruction  
manual for safe installation  
and use.

#### ACHTUNG

Explosionsgefährdeter Bereich.  
Bitte beachten Sie die  
Bedienungsanleitung für eine sichere  
Installation und Verwendung.

### 4.2 Equipment Label Ex ia

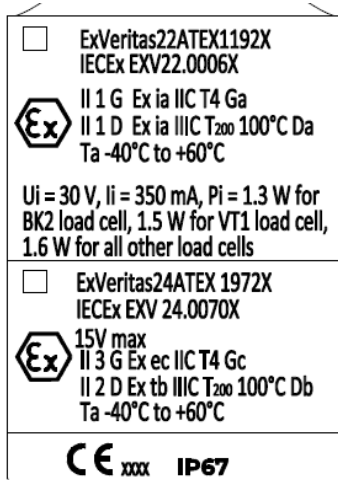
ExVeritas22ATEX1192X  
IECEx EXV22.0006X



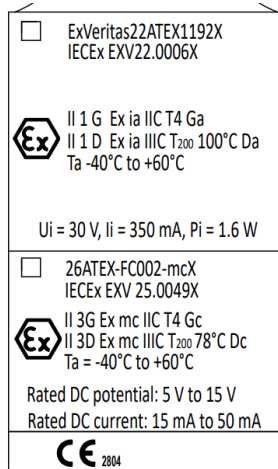
II 1 G Ex ia IIC T4 Ga  
II 1 D Ex ia IIIC T200 100°C Da  
Ta -40°C to +60°C

Ui = 30 V, li = 350 mA, Pi = 1.3 W for  
BK2 load cell, 1.5 W for VT1 load cell,  
1.6 W for all other load cells

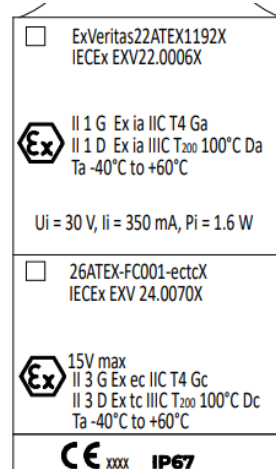
### 4.3 Equipment Label Ex ia / ec / tb



### 4.4 Equipment Label Ex ia / mc



### 4.5 Equipment Label Ex ec / tc



|          |         |            |    |          |     |              |          |      |        |
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## 5 Commissioning and Installation

- Load cells PC1, PC1x, PC6, PCB, RC3, SB4, SB8, SB14, SLB and PC22 have a label with two certification marking sections. Only the section which has been selected by means of a punched hole in the box in the top-left corner will apply, and the load cell must not be used under the non-selected certification.
- The equipment is only certified for use in ambient temperatures in the range -40°C to +60°C and should not be used outside this range.
- This equipment either has no internal voids or complies with degree of protection IP67 according to IEC 60529.
- This equipment must be grounded.
- The load cell must not be used if it is defective or shows any visible damage.
- Load cells which have been installed as part of an Ex ec/tb or Ex mc or other non-intrinsically safe circuit must not be re-used in an intrinsically safe circuit.

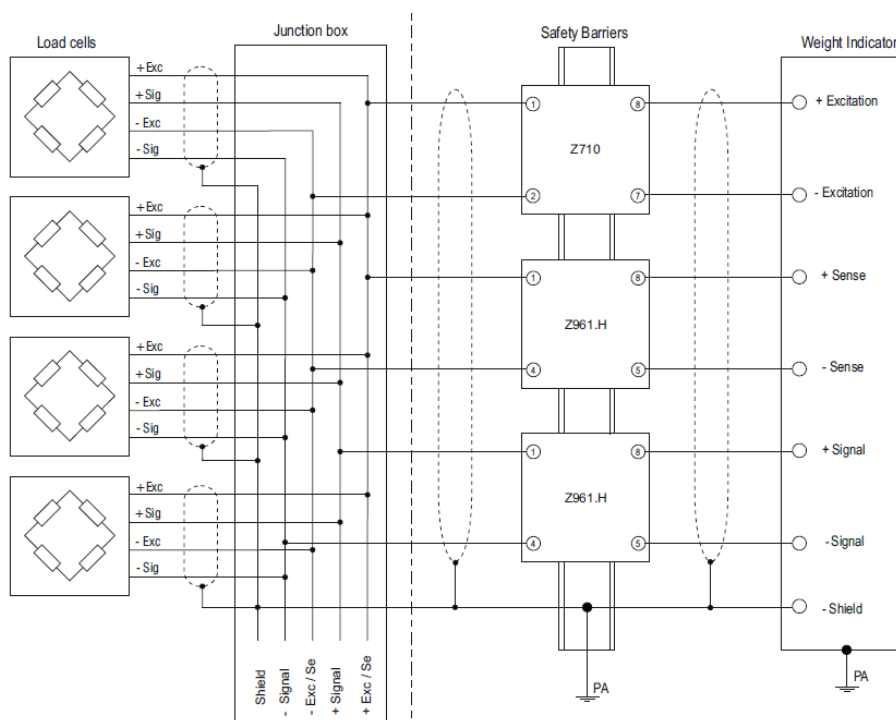
### 5.1 Examples of suitable circuits

The personnel installing the equipment must be suitably qualified and take responsibility for proper installation in a potentially explosive atmosphere.

#### 5.1.1 Intrinsic Safety (Ex ia)

**Warning:** This example is for guidance only and it is the responsibility of the installer to ensure that intrinsic safety is not invalidated.

**Example:** With safety barriers for single-ended supply. The load cell body must be separately bonded to the construction that is earthed or embedded in the ground using an equipotential or a supplementary bond in accordance with IEC 60079-14 (this is required even if the shield is connected to the load cell body).

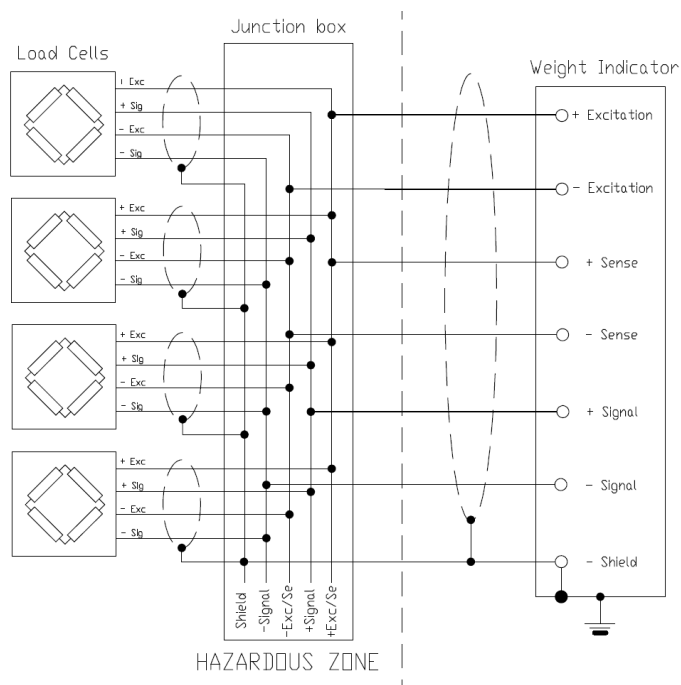


Example of Safety barriers:  
P+F Z710 / Z961.H  
BAS 01ATEX7005

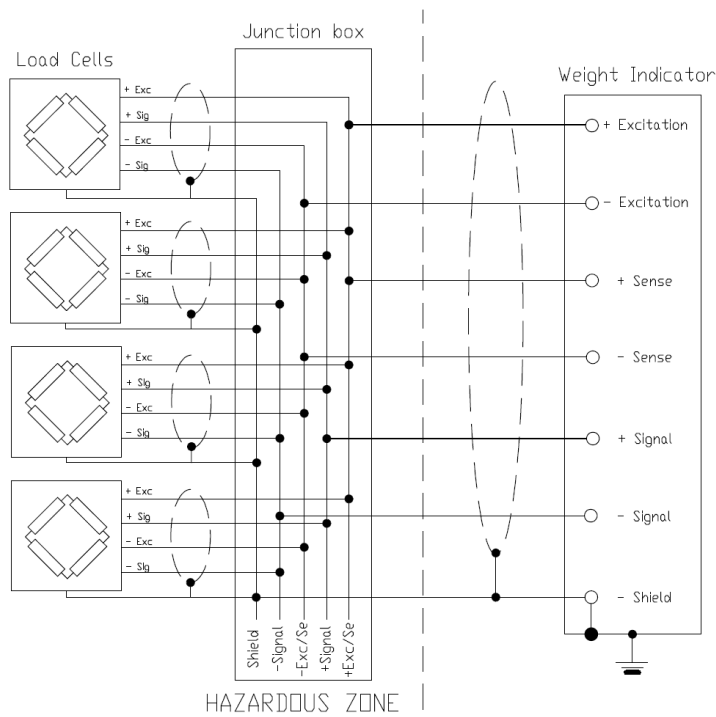
|          |         |            |    |          |     |              |          |      |        |
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## 5.1.2 Increased Safety (Ex ec); Protection by enclosure (Ex tb); Encapsulation (Ex mc)

**Example 1:** The shield of the cable is connected to the load cell body. The load cell body must also be separately bonded to the construction that is earthed or embedded in the ground using an equipotential or a supplementary bond in accordance with IEC 60079-14.



**Example 2:** The shield of the cable is NOT connected to the load cell body. The load cell body must be bonded to the construction that is earthed or embedded in the ground using an equipotential or a supplementary bond in accordance with IEC 60079-14.



|          |         |            |    |          |     |              |          |      |        |
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## 6 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.
- The load cells are suitable for use in areas subject to an uncontrolled dust layer.

## 7 Repair or Modification

There are no other user-serviceable parts. Any faults must be rectified by returning the device to the manufacturer.

Load cell cable cannot be disconnected or replaced. The cable gland nut must not be loosened or removed. Tightening may be required if it becomes loose, with a torque of 3.4 Nm (30 in-lbs) for SB4, SB14, SB8, RC3, PC6, PCB, SB5, RC1, SB6, UB1, UB6, Q50, CN3, PC4, PC2, PC12 products and 2.8 Nm (25 in-lbs) for SLB, PC1(x), SB9, ULB, PC7, UXT and VT1 products

## 8 Specific Conditions of Use

- Mechanical impact to the non-metallic parts of PC1(x) may cause damage that invalidates types of protection Ex ec and Ex tb. The PC1 shall be installed in an enclosure or cover which will ensure that there is no risk of impact to the PC1(x). The level of impact protection is defined in IEC60079 Part 0 under 'Resistance to impact'.
- PC22, PC42, PC46 and PC60 have an enclosure made in aluminum. When the equipment is used on areas requiring EPL Ga, the equipment must be protected against impacts or friction that could cause mechanically generated sparks.
- Models SB5, BK2, PC1(x), PC22, PC30, PC42, PC46, PC60, SB9, SLB, ULB and PC3 have enclosures which present a potential electrostatic charging hazard in the hazardous area. A suitable method must be used to minimize this risk, such as:
  - Control of environmental humidity to minimize the generation of static electricity.
  - Protection from direct airflow causing a charge transfer.
  - Touch with an insulating object.
  - Means to continuously drain off electrostatic charges
- Ensure that exposed conductive parts of load cells are connected to the equipotential bonding system in accordance with IEC 60079-14.
- Load cells with exposed encapsulation, when installed, must not be exposed to ultraviolet light, for example direct sunlight or luminaires.
- The power source for Ex ec/tb must be a CE, UKCA or UL compliant SELV supply, with a working maximum load cell supply voltage of 15.0 V.
- The cable must be secured against pulling and bending for a distance of 25 mm from the cable entry point.
- For Group III: The PC22 shall not be installed in an area that contains fast moving particles which may make contact along the surface of the device (e.g. pneumatic transfer of powders, and charge spraying in an electrostatic coating process).

## 9 Waste Disposal

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

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## 10 Certificates

### 10.1 EU-Type Examination Certificate

EU-Type Examination Certificate, *ExVeritas 22ATEX1192X*, can be downloaded from [www.flintec.com](http://www.flintec.com)

EU-Type Examination Certificate, *ExVeritas 24ATEX1972X*, can be downloaded from [www.flintec.com](http://www.flintec.com)

### 10.2 IECEx Certificate of Conformity

IECEx Certificate of Conformity, *IECEx EXV22.0006X*, can be downloaded from [www.iecex-certs.com](http://www.iecex-certs.com)

IECEx Certificate of Conformity, *IECEx EXV24.0070X*, can be downloaded from [www.iecex-certs.com](http://www.iecex-certs.com)

IECEx Certificate of Conformity, *IECEx EXV25.0049X*, can be downloaded from [www.iecex-certs.com](http://www.iecex-certs.com)

### 10.3 CE EU-Declaration and Attestation of Conformity

EU-Declarations of Conformity *No: 02-EU/CE/EX* can be downloaded from [www.flintec.com](http://www.flintec.com)

EU-Attestation of Conformity *26ATEX-FC001-ectcX* can be downloaded from [www.flintec.com](http://www.flintec.com)

EU-Attestation of Conformity *26ATEX-FC002-mcX* can be downloaded from [www.flintec.com](http://www.flintec.com)

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