



## Installation & Maintenance Manual

### ES/DS\*\*\*\* & EM/DM\*\*\*\* Terminal Enclosures

### ES/DS\*\*\*\* & EM/DM\*\*\*\* Control Stations

#### Specifications

<b>Types</b>	ES/DS1110, 1511, 2315, 3030, 4050, 5060, 6090 & 8013 (EM/DM****) JB Terminal Enclosures ES/DS1110, 1511, 2315, 3030, 4050, 5060, 6090 & 8013 (EM/DM****) LCS/LCU Control Stations	
<b>Hazardous Area</b>		
ATEX certificate number	SIRA09ATEX3135X	
IECEX certificate number	IECEX SIM 09.0001X	
CE number	CE 0102	
Certification coding for ATEX/IECEX		
ES/DS**** JB		Ex e IIC T* Gb Ex tb IIIC T** Db Ex e II T* Ex tD A21 T**
ES/DS**** LCS/LCU		Ex e IIC T* Gb (terminals/ meters fitted) Ex de IIC T* Gb (above plus terminals/ switches/indicator lamps) Ex demi IIC T* Gb (above plus indicator lamps/fuses/) Ex tb IIIC T** Db  Ex e II T* (terminals/ meters fitted) Ex de II T* (above plus terminals/ switches/indicator lamps) Ex demi II T* (above plus indicator lamps/fuses/) Ex me (ia) IIC T4 (field bus barrier) Ex eia II T4 (connection mega blocks for field bus systems) Ex me II T4 (segment protector ) Ex tD A21 T**
Gas/dust temperature class		
ES/DS**** JB	T6/T80°C @ Ta+40°C/+55°C (+65°C- IEC c/w PHOENIX or equivalent terminals) T5/T95°C @ Ta+40°C/+55°C (+65°C- IEC c/w PHOENIX or equivalent terminals) T4/T80°C @ Ta+40°C/+55°C (fitted with Field bus barrier )	
ES/DS**** LCS/LCU	T6/T80°C @ Ta+40°C/+55°C T5/T95°C @ Ta+40°C/+55°C	
Minimum ambient temperature		
ES/DS****JB/LCS/LCU	-20°C	
IP Rating		
ES/DS****JB/LCS/LCU	IP66/65	
Maximum internal power dissipation (MDP)	Dependent on enclosure size – see certification label	
<b>Mechanical</b>		
Material	S/Steel 316L (optional – Painted Mild Steel)	
Finish	Natural	
Cover screw torque	3Nm	
Entry threadform	Refer to Customer Specific Drawing produced at time of ordering	
<b>Electrical</b>		
Maximum voltage	Dependent on terminals & equipment fitted – see certification label	
Maximum current	Dependent on terminals, cable & equipment fitted – see certification label	
<b>Conformity</b>	IEC/EN 60079-0 IEC/EN 60079-7 IEC/EN 61241-0 IEC/EN 61241-1 IEC/EN 60529	



## Installation

To minimise the risk of ignition by electrical apparatus in hazardous areas efficient installation, inspection and maintenance of apparatus and systems is essential and the work should be carried out by suitably trained personnel in accordance with the prevailing code of practice.

- 1) The enclosure should be mounted via the through-holes that are exposed when the lid is removed. The enclosure should be used as a template when marking fixing points, alternatively, the dimensions of the fixing centres are moulded into the rear face of the enclosure. Expanding bolts should be used when mounting on concrete, or suitably sized bolts, nuts and anti-vibration washers when mounting to a steel framework.
- 2) An assessment should be made to ensure that the amount of power being dissipated within the enclosure is lower than the figure stated on the certification label so that temperature classes can be guaranteed.
- 3) Cables should not be bunched together so as to create hot spots. This is especially important when using relatively high currents with cables of smaller cross section.
- 4) Only suitably approved Ex e terminals may be fitted.
- 5) Only one conductor should be inserted into each terminal.
- 6) All strands of each conductor must enter the terminal.
- 7) No cables should be left floating and un-terminated.
- 8) Cable insulation should extend to within 1mm of the metalwork of the terminal. Creepage and clearance distances given by EN 60079-7: 2007 are as follows:
 

Voltage (AC or DC)	Minimum creepage distance (mm)	Minimum clearance (mm)
≤250	8	8
≤500	16	8
- 9) If cross connects are fitted, partitions/barriers may be required to preserve clearance distances.
- 10) All terminals should be tightened to the torque specified by their manufacturer.
- 11) Cable entries should be made only with suitably approved Ex e / Ex tb glands noting that this equipment is suitable for use with gas group IIC & dust group IIIC. IP ratings should be suitable for the intended area of installation. Metal cable glands shall be earthed.
- 12) All unused entries should be fitted with suitably approved Ex e / Ex tb stopping plugs.
- 13) Once the cover is fitted, ensure that all fasteners are fully tightened.

### Special conditions for safe use

- 1) Intrinsically safe and non-intrinsically safe circuits fitted within the same enclosure shall be separated as required by IEC/EN 60079-14.
- 2) Warning "ELECTROSTATIC HAZARD, CLEAN ONLY WITH A DAMP CLOTH" only applies when fitted with 108sq polycarbonate & round window.
- 3) Cable warning label only required for T5 application.
- 4) Refer IEC/ATEX CoC for limiting parameters and temperature classifications as listed in IEC CoC Tables- 1,2,3,5,7,8,9,10. ATEX CoC Tables- 3,4,5.
- 5) When fitted with non-light transmitting operator components certified under CML 16ATEX3339U and IECEx CML 16.0114U, the enclosures are to be installed in low risk impact areas.

### Maintenance

Electrical apparatus installed in hazardous locations has design features that make it operationally safe under normal conditions. In order to ensure that the apparatus remains serviceable the following points should be attended to on a periodical basis. The period between inspections is not fixed, but should be adjusted to suit the environmental conditions where the equipment is situated. An initial inspection after 12 months of use is suggested.

- 1) Ensure that all fasteners are present.
- 2) Ensure that the enclosure or control functions are not damaged or distorted so as to prevent proper functioning of the gaskets.
- 3) Ensure that the enclosure is not corroded such as to affect its IP rating.
- 4) Ensure external earth bonding connections are in place and in good condition.
- 5) Ensure that all entry devices are in good condition and securely tightened.
- 6) Ensure that the certification label is present and legible.

**Ensure that the location where the equipment is fitted is free from flammable gas or dust.** With the enclosure open:

- 7) Ensure that the cover gasket remains in place and is in good condition. Replacement gaskets are available from Pepperl+Fuchs.
- 8) Ensure that all terminals are in good condition i.e. no cracks or breakage.
- 9) Ensure that all terminals are tightened to the manufacturer's specified torque.
- 10) Ensure that no conductors have moved such as to reduce creepage and clearance distances.
- 11) Ensure that any modifications that have been performed are in accordance with the previous section, making reference to the certification if necessary.
- 12) With the cover refitted, ensure that all fasteners are fully tightened.

#### **MAINTENANCE OF INTERNAL ELECTRICAL EQUIPMENT:**

- 1) The replacement of faulty components is to be done using components having exactly the same physical and electrical parameters with preservation of the existing layout configuration and watts dissipation of components should be taken into consideration.
- 2) Installation of equipment to be in accordance with appropriate Installation & Maintenance Standards.
- 3) If Applicable- In the occurrences of window assembly Glass breakage, the cover assembly is to be replaced by parts available P+F.

#### **Maintenance :**

- a. Isolate elsewhere before opening.
- b. Dis-assemble as stated in Installation Procedure.
- c. Main Visual checks:- Gasket condition, Corrosion of securing screws, Integrity of housings.
- d. Wire terminations are secure.
- e. Assemble as per installation procedure.

Refer to Appropriate Selection Installation & Maintenance Standards for,

- a) General Requirements. b) Increased Safety 'e' c) Combustible dust 'tD'