Installation & Maintenance Manual for Flanged Control Panels

Specifications

Types	FP.* Refer to type code builder in annex	
Hazardous Area		
	Certificate number	
FS Ex e enclosure	CML 16 ATEX 3009X / IECEx CML 16.0008X	
Ex d enclosure options:		
EJB variants	INERIS 14 ATEX 0022X / IECEx INE 14.0029X	
GUB variants	INERIS 14 ATEX 0035X / IECEx INE 14.0042X	
CE number	CE 0102	
Certification coding (other variants possible – see certification labels):		
FS Ex e enclosure	Ex II 2 GD	Ex de ib IIC T* Gb Ex tb IIIC T** Db
EJB variants	Ex II 2 GD	Ex db IIB T* Gb Ex tb IIIC T** Db
GUB variants	Ex II 2 GD	Ex db IIC T* Gb Ex tb IIIC T** Db
*,** Gas temperature class/dust surface temperature is application specific - refer to Customer Specific Drawing produced at time of ordering		
Minimum ambient temperature	-50°C, -40°C	
Maximum ambient temperature	+55°C	
IP Rating	IP 66	
I.S. safety parameters	Refer to Customer Specific Drawing produced at time of ordering	
Maximum internal power dissipation (MDP)	Dependent on enclosure size and application internal rise – see certification labels	
Mechanical		
FS Ex e enclosure:		
Material	316L	
Finish	Electropolished	
Cover screw torque	2Nm	
Entries	Refer to Customer Specific Drawing produced at time of ordering	
Ex d enclosures:		
Material	EJB, GUB - Light metal alloy EJBX, GUBX - Stainless steel	
Cover screw torque	EJB8B, 10B - 20Nm EJB15A – 30Nm EJB17Q, EJB18B – 40Nm EHB20A – 65Nm For stainless steel EJBX* add +5 Nm to the above values	
Electrical		
Maximum voltage	Dependent on terminals & equipment fitted – see certification label	
Maximum current	Dependent on terminals, cable & equipment fitted – see certification label	
Conformity	EN 60079-0: 2012/A11: 2013 EN 60079-1: 2014 EN 60079-7: 2015 EN 60079-11: 2012 EN 60079-31: 2014	

Overview

The flange panel consist of two separately certified enclosures.

The Ex d enclosure contains electrical equipment that may produce arcs, sparks or high temperatures during operation and/or barriers for intrinsically safe circuits.

The Ex e enclosure is flanged directly to the Ex d enclosure and contains terminals and/or control functions. Cables pass from the Ex e enclosure to the Ex d enclosure through the use of Ex d certified cable entry devices.

The enclosures are supplied assembled from the factory. In this way the installer avoids needing to make cable terminations within the Ex d enclosure.

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) When selecting an installation location for the enclosure, **Control Panels fitted with Schmersal controls must be protected from impacts greater than 4J and permanent exposure to UV radiation.**
2) The assembly should be mounted via the external fixing feet that are provided. The Customer Specific Drawing supplied at the time of ordering will give details of the framework fixing centres. Expanding bolts should be used when mounting on concrete, or suitably sized bolts, nuts and anti-vibration washers when mounting to a steel framework.
3) 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. Most of the dissipation in a terminal box application arises from the current flowing in the cables, therefore the length of cable within the enclosure should be minimised. Refer to Table 1 for dissipations of standard copper cables at standard fusing currents.
4) 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.
5) Only suitably approved Ex e terminals may be fitted. **Only feedthrough terminals are permitted within Ex e enclosures. Note that fuse terminals, relays, MCB's, contactors etc. MUST NOT BE FITTED IN AN EXE ENCLOSURE.**
6) Only one conductor should be inserted into each terminal.
7) All strands of each conductor must enter the terminal.
8) No cables should be left floating and un-terminated.
9) 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

10) If cross connects are fitted, partitions/barriers may be required to preserve clearance distances.
11) All terminals should be tightened to the torque specified by their manufacturer.
12) 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.
13) All unused entries should be fitted with suitably approved Ex e / Ex tb stopping plugs.
14) When the internal/external earth stud is supplied loose, the components should be fitted as per the below Figure 1.
15) Once the cover is fitted, ensure that all fasteners are fully tightened.
16) **No metal should be removed from the Ex d enclosure i.e. extra cable entries or mounting points should not be made.**
17) **No modifications should be made to the fitted equipment without consultation with Pepperl+Fuchs. The fitted equipment has been assessed to produce a heat rise that will maintain the stated gas/dust temperature classes.**
18) **The Ex d enclosure may have been supplied with spare cable entries plugged with Ex d stopping plugs. These should not be changed for linebushes or cable glands without consultation with Pepperl+Fuchs.**
19) A corrosion inhibiting grease may be applied to the surface of the flameproof joints before assembly. If applied, the grease should be of a type that does not harden because of ageing, does not contain any evaporating solvent and does not cause corrosion of the joint surfaces.

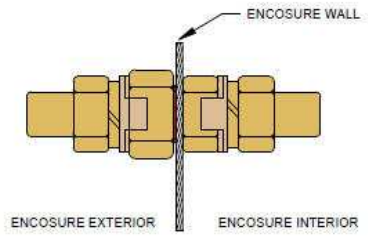

Figure 1

	Current (A)					
Cable CSA	1	2	4	6	10	16
1mm²	0.0168	0.0672	0.269	0.605	1.68	4.3
2.5mm²	0.00672	0.0269	0.108	0.242	0.672	1.72
4mm²	0.0042	0.0168	0.067	0.151	0.42	1.08
6mm²	0.0028	0.0112	0.045	0.101	0.28	0.717

Table 1 – Dissipation of copper cables in W/m

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 and of the correct property class. Refer to the certification label for details.
2) Ensure that the enclosure or control functions are not damaged or distorted so as to prevent proper functioning of the gaskets and/or flameproof joints.
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) Look for pitting or damage to the flamepaths of the enclosure body and cover. Surface corrosion may be removed, but abrasive cleaners should not be used.
12) Look for wear or damage to the flamepaths of any operating shafts (pushbuttons or rotary switches) that pass through the enclosure.
13) The flamepaths of the enclosure should be cleaned, and may optionally be coated in grease to guard against corrosion. If applied, the grease should be of a type that does not harden because of ageing, does not contain any evaporating solvent and does not cause corrosion of the joint surfaces.
14) Ensure that any modifications that have been performed are in accordance with the previous section, making reference to the certification if necessary.
15) With the cover refitted, ensure that all fasteners are fully tightened.

Annex

FP type codes:

Type									
FP flanged panel									
|	**Ex d enclosure type**								
|	**EJB*** EJB type in aluminum, Ex d IIB+H_2 (* = enclosure size, see selection table)								
|	**EJBX*** EJB type in stainless steel, Ex d IIB+H_2 (* = enclosure size, see selection table)								
|	**GUB** GUB type in aluminum, Ex d IIC								
|	**GUBX** GUB type in stainless steel, Ex d IIC								
|	|	**Ex d enclosure variant**							
|	|	standard variant							
|	|	**W** variant with viewing window (see individual data sheets)							
|	|	**E** variant with extension (GUB only, see individual data sheets)							
|	|	**WE** variant with window and extension (GUB only, see individual data sheets)							
|	|	|	**GUB enclosure size (EJB sizes see enclosure type)**						
|	|	|	* see selection table						
|	|	|	|	**Ex e enclosure type**					
|	|	|	|	**FS** stainless steel enclosure with return flange					
|	|	|	|	|	**Ex e enclosure size**				
|	|	|	|	|	* see selection table				
|	|	|	|	|	|	**Ex e enclosure positioning**			
|	|	|	|	|	|	below Ex d enclosure			
|	|	|	|	|	|	**T** on top of Ex d enclosure			
|	|	|	|	|	|	**L** left of Ex d enclosure			
|	|	|	|	|	|	|	**Version index**		
|	|	|	|	|	|	|	* see selection table		
|	|	|	|	|	|	|	|	**Production location**	
|	|	|	|	|	|	|	|	* see selection table	
|	|	|	|	|	|	|	|	|	**Variant number**
|	|	|	|	|	|	|	|	|	-Yxxxxxx

FP.	EJB20A	W3		.FS	08B	T	.V1	.ITA	-Y123456

Example: Ex d enclosure type EJB in aluminum, size 20A, with rectangular window size 3, combined with Ex e enclosure in stainles steel, size 08B, positioned on top of Ex d enclosure, version 1, produced in Italy