Junction Box

Operation Manual

Document Ref: SL-035 v6

JB3 SERIES ATEX JUNCTION BOXES USER INFORMATION

Version 6

INVESTORS IN PEOPLE

bsi. ISO 9001 Quality Management FS646773 ISO 14001 Environmental Management EMS696504

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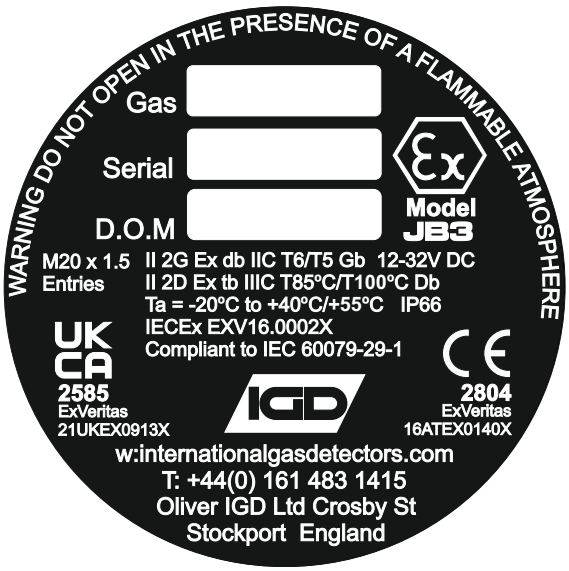
MARKINGS AND APPLICABLE STANDARDS



The housing must be grounded to a minimum 20A ground.
If the JB3 is to be used in a zoned hazardous area ensure the certification marks on the side of the main housing match the zones certification requirements.
In such cases do not operate the JB3 without the cover correctly screwed in place.

JB3

INSTALLATION INSTRUCTIONS

The following information is provided to enable safe installation and operation of the Model JB3 Junction Box.

The junction box can be fitted with either two or three wire flammable gas sensor.

It is vitally important for correct and safe operation that appropriate cable types and sizes are used and all earth bonding points observed. It is also important to observe all instructions for entry terminations. Failure to follow these instructions may result in a system which may be dangerous or fail to operate correctly.

It is imperative to use cabling which suits the environment in which the JB3 and its sensor is to be used. The following is intended as a guide.

Use

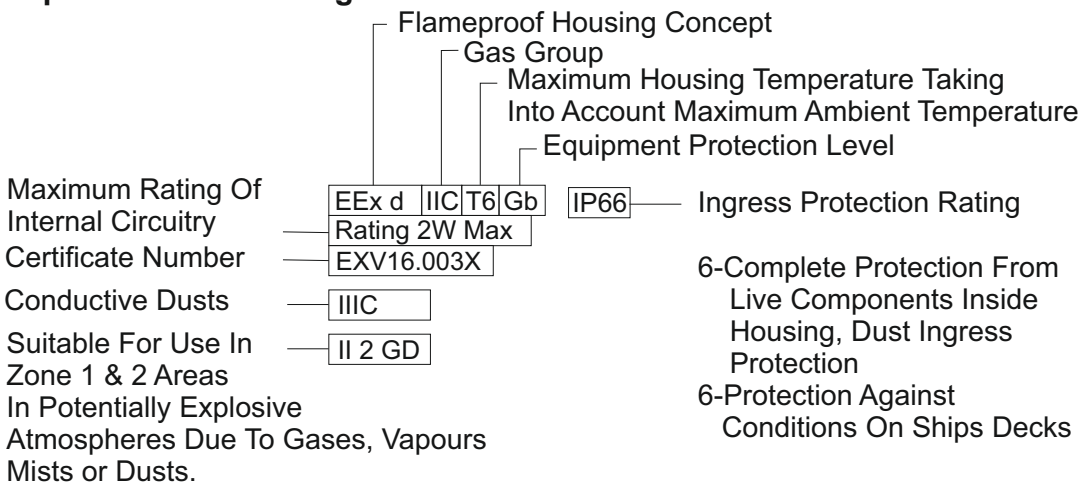
Pirelli LSX/FP type cable for office/light commercial un-zoned installations

Steel Wire Armoured or CY cable for medium/heavy industrial un-zoned installations

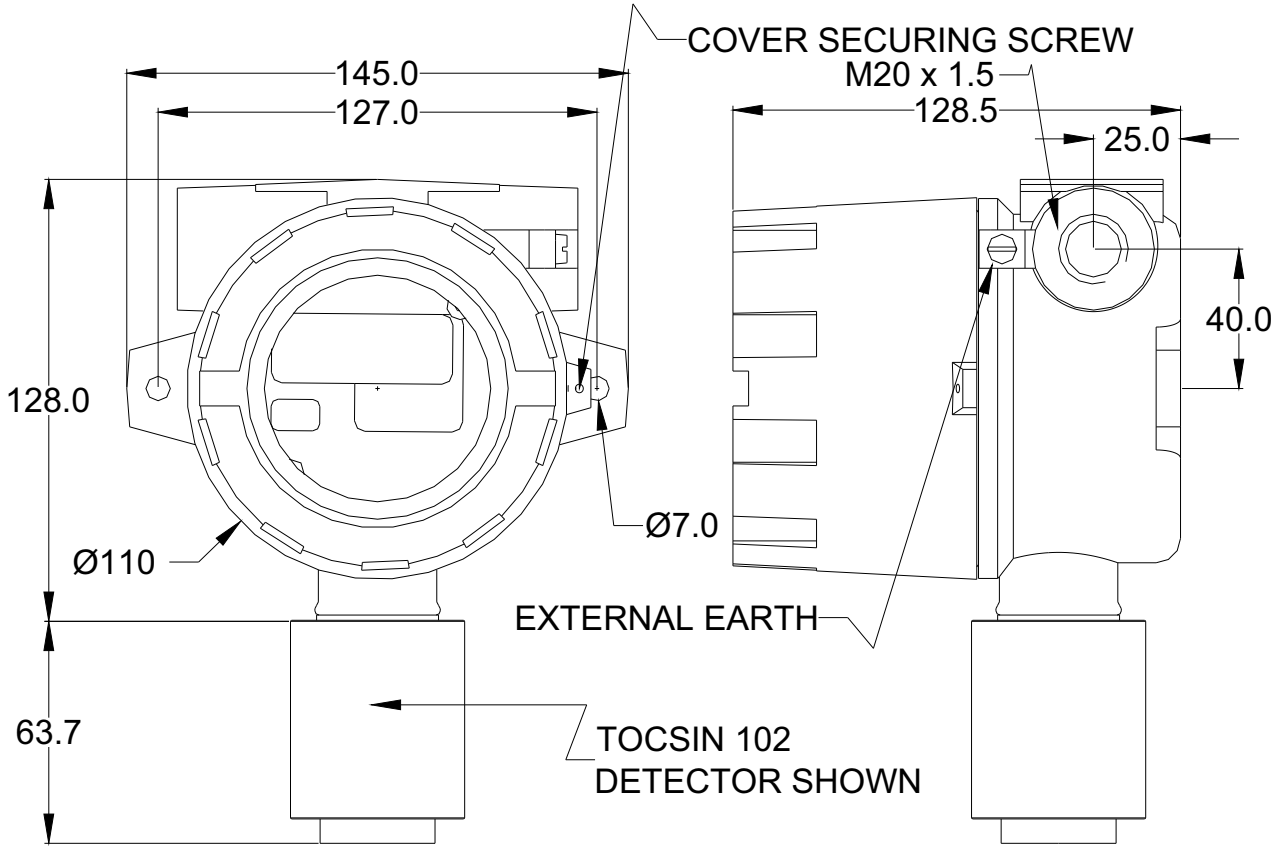
SWA or Mineral Insulated Pyro cable for all hazardous area zoned installations.

Note in all cases the JB3 Housing must be earthed and used in conjunction with correctly zoned cable glands and sealing for safe operation in a hazardous area.

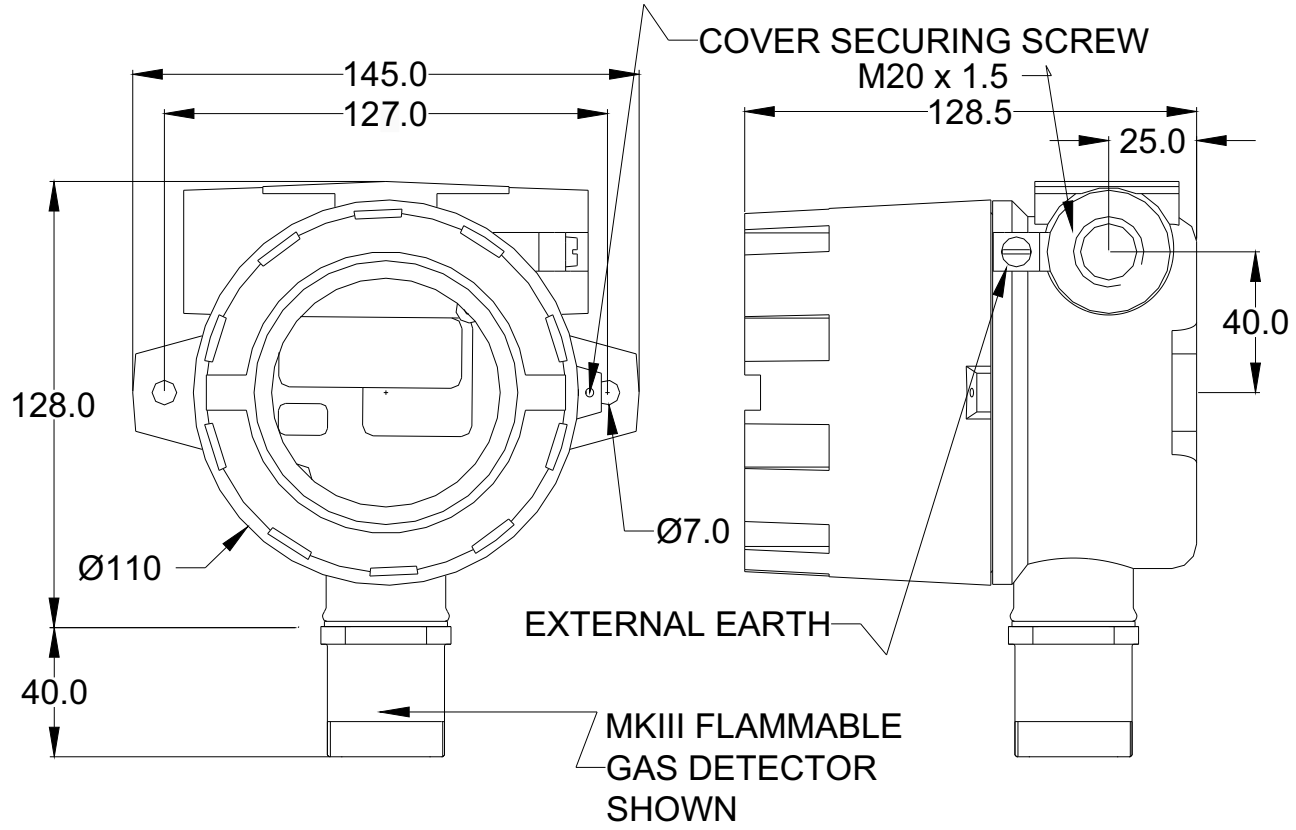
Explanation of Markings



MOUNTING DETAILS AND DIMENSIONS FOR COMBINED JB3 AND TOCSIN 102 DETECTORs

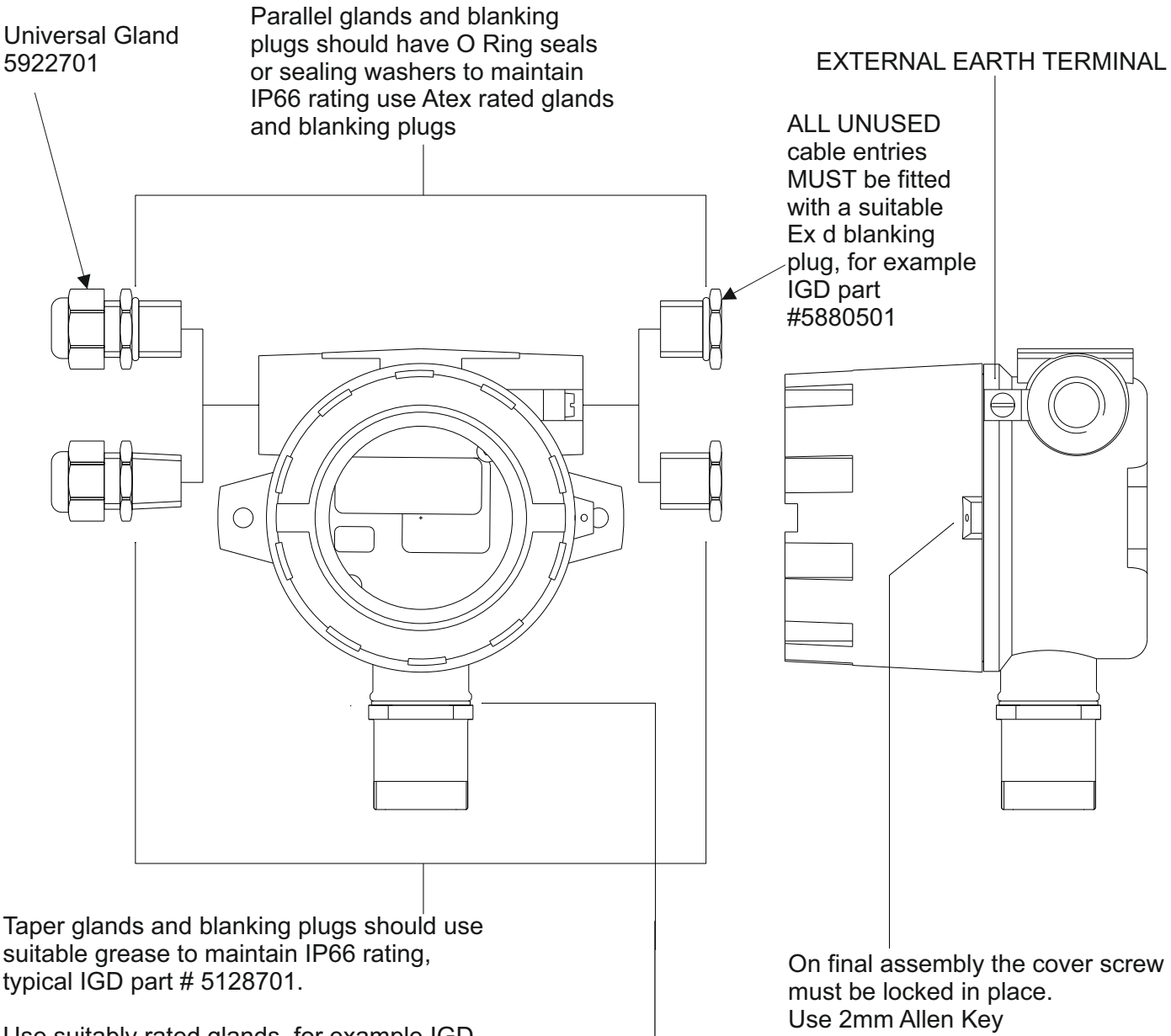


MOUNTING DETAILS AND DIMENSIONS FOR COMBINED JB3 AND MKIII DETECTOR



CUSTOMER SEALING AND EARTHING RESPONSABILITIES

The JB3 is designed for use in Zone 1 and Zone 2 hazardous areas and is ATEX & IECEx certified. To maintain compliance it is imperative the installer of the equipment observes the following installation guidelines. Failure to do so could compromise the protection concept of the equipment.



Taper glands and blanking plugs should use suitable grease to maintain IP66 rating, typical IGD part # 5128701.

Use suitably rated glands, for example IGD part # 5922701, and suitably rated blanking plugs, for example IGD part # 5880501.

Also see notes on page 5 & 6 of this manual.

On final assembly the cover screw must be locked in place.
Use 2mm Allen Key

Gas detectors are supplied with sealing washers. These must be fitted to meet approval requirements

Two detectors may be 'close coupled' together using our potted feedthrough bushing. For example IGD part # 5903501

EXTERNAL EARTH	STRANDED CABLE USE	4.0mmSQ CSA	SOLID CORE CABLE USE	6.0mmSQ CSA
INTERNAL EARTH	STRANDED CABLE USE	1.5mmSQ CSA	SOLID CORE CABLE USE	2.5mmSQ CSA

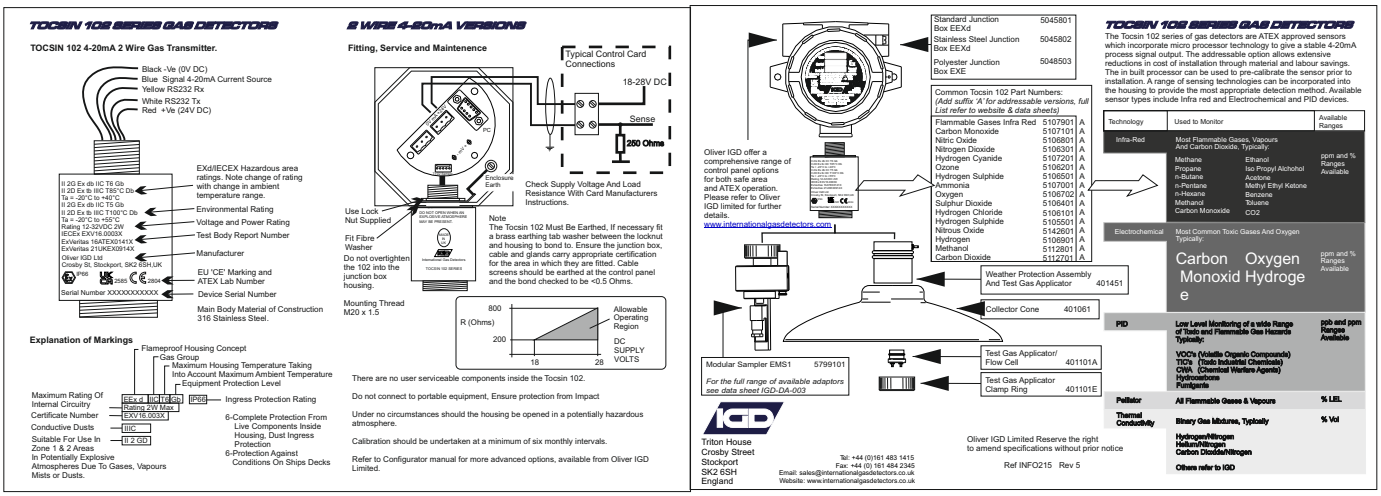
WARNING

Glands and cable must be of a suitable type to match the zone of application of the equipment, see note on page 5 of this manual

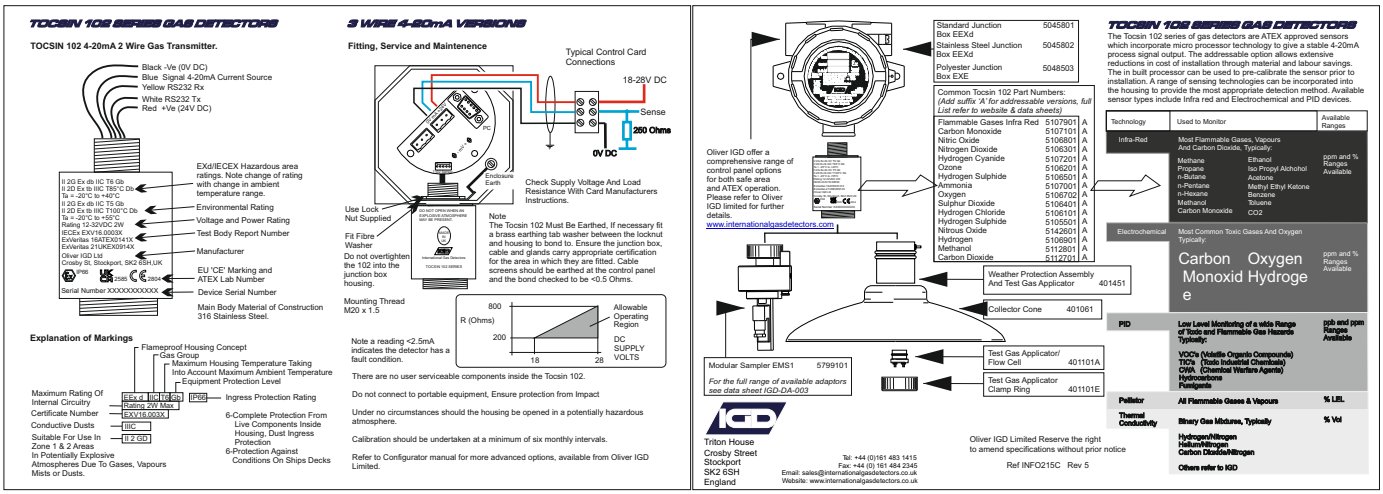
INTERFACE WIRING

Refer to manuals shipped with detectors as:

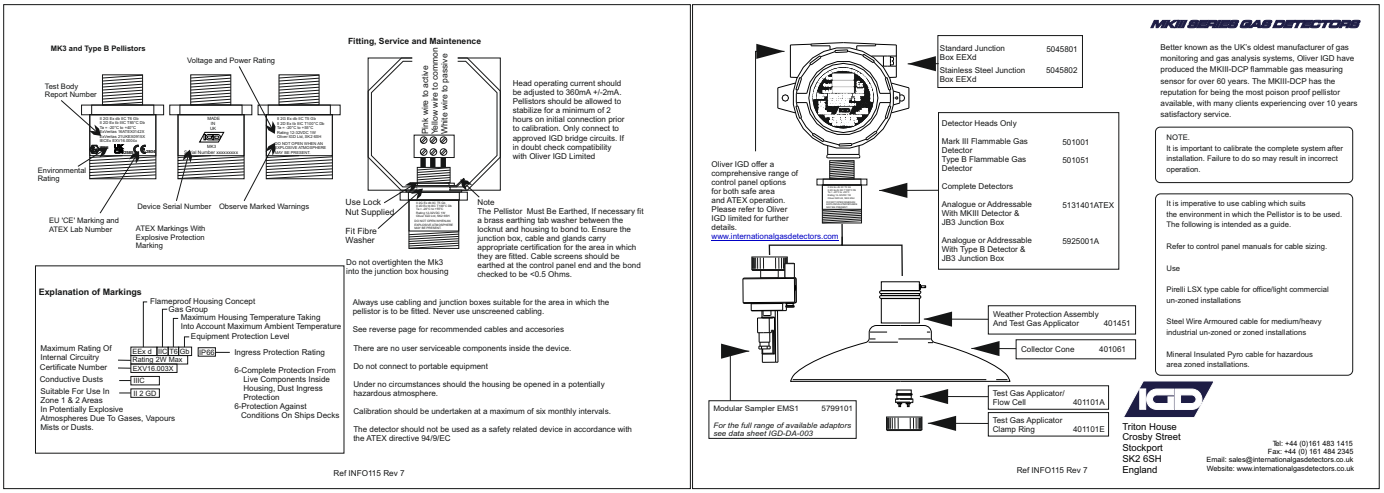
2 Wire Gas Transmitters Ref INFO215 Rev 4



3 Wire Gas Transmitters Ref INFO215B Rev 4



Mk3 & Type B Pellistors Ref INFO115 Rev 7



Notes

The following notes on equipment selection and installation are taken from applicable standards. They are not intended to replace adequate knowledge and skill on the part of those using them. Also any and all applicable local regulations should be considered when deciding on installation methods and materials.

Selection of cables

In accordance with EN 60079-14, cables connected to Ex d enclosures should satisfy one of the following:

- Have ALL the following characteristics:
  - Sheathed with thermoplastic, thermosetting or elastomeric material
  - Any bedding or sheathing must be extruded
  - Any fillers must be non-hygroscopic (meaning resistant to the absorption of moisture)

or;

- Mineral insulated & metal sheathed

or;

- Special cables, for example flat cables with appropriate glands

It is worth noting that many PVC sheathed and insulated cables do not satisfy these requirements.
Also if an armoured cable is used, then the gland should be of a type that clamps the armour, and provides a compression seal on the inner sheath.
For these purposes armoured can refer to armoured OR braided (SWA or SY), and should be clamped accordingly.
If using a fine braided cable with strands of less than 0.15mm, where the braid covers at least 70% of the surface of the cable, then compression sealing only on the outer sheath, is permitted. In such instances the braid should be brought into the enclosure, and handled accordingly.
Fire Proof cable, such as FP200 can be used with the recommended IGD gland. The aluminuim tape which forms the outer metal jacket can be clamped in the armour clamping ring.

Selection of cable glands

In accordance with EN 60079-14, cable glands used with Ex d enclosures should satisfy one of the following:

- Certified barrier glands

or;

- Cables and glands meeting ALL of the following:
  - Certified Ex d glands
  - Connected cable length is at least 3m
  - Cable having ALL the following characteristics:
    - Sheathed with thermoplastic, thermosetting or elastomeric material
    - Any bedding or sheathing must be extruded
    - Any fillers must be non-hygroscopic (meaning resistant to the absorption of moisture)

or;

- Certified Ex d bushing and Ex e junction box

or;

- Mineral insulated cable and suitable, certified glands

or;

- Other certified barrier device

It should be noted that the use of tapes, heat shrink or other devices to enlarge the diameter of the cables sheath to make the gland compression seal grip the cable, is explicitly forbidden.
To satisfy the above requirements we recommend using IGD part # 5922701, with at least 3m of cable left before the next gland, and a cable which complies with the above requirements.

Unused cable entries

It is critical to the safety integrity of the system that all unused cable entires MUST be fitted with a suiatbly certified Ex d stopping plug. We recommend using IGD part # 5880501.

Un-used cores of a multi-core cable

Any un-used cores in a multi-core cable must be either terminated to earth, or effectively isolated from other cores and terminations. We recommend terminating to the internal earth stud.

Maintenance

Whilst the maintenance of installations is the responsibility of the site operator, EN 60079-17 gives guidance on what should be checked and when. Included at the back of this manual is a chart based on that found in section 6 of EN 60079-17, for a Periodic Close Inspection. This chart is intended to be used by qualified personnel in conjunction with the EN 60079-17.

Commissioning

When commissioning a system for use in a zoned area, EN 60079-17:2014 4.3 mandates that, it shall be given an initial inspection. Included at the back of this manual is a chart based on that found in section 6 of EN 60079-17, for an Initial Detailed Inspection. This chart is intended to be used by qualified personnel in conjunction with the EN 60079-17.

Qualification of personnel

Personnel involved in installation and commissioning of equipment in Zoned areas should be suitably qualified. The qualifications required are detailed in various parts of the EN 60079 standard. Qualification can be purely internal or can involve a third party. It is the responsibility of each individual organisation to decide upon the most appropriate way to implement these requirements.
As well as the mandatory qualifications in the standard personnel must of received adequate training in the gas detection equipment. To comply with EN 60079 such training must be documented.
Installation, commissioning, maintenance and operation by unqualified personnel could lead to serious equipment malfunction and/or unsafe operation.

Installation location

It is important that the detector is mounted in accordance with EN 60079-14, clause 14.2 which states that flameproof joints must be a minimum distance away from solid obstacles, (eg structural steelwork) which is not part of the equipment.
Note that if the detector is mounted to a flat surface then the joints where the cables and detectors go into the housing are closer than the minimum, but this has been taken account of during testing and hence does not need to be considered.
For a IIA installation the minimum distance is 10mm, for a IIB it is 30mm and for IIC it is 40mm.

Earthing

Both internal and external earth studs are provided, and can be used as the installation requires. The external earth point provides a means for connecting the enclosure, which is considered to be an ‘exposed conductive part’, to the bonding system. There is no specific requirement in 60079 to run a separate earth bond to this stud, but we recommend that one is connected. This is inline with best practice and many local requirements, for example equipment going offshore from Aberdeen. The minimum size conductor for such bonds is 4mm² as per EN60079-14 clause 6.4.1.

To summarise, as a minimum we recommend that:

- The internal earth stud be used to:
  - Connect any unused cores
  - Connect any earth core internal to the cable
- The external earth stud be used to bond the enclosure to the any steel-work, on which the gas detector is mounted.

Greases and assembly compounds

EN 60079-14 allows for the use of grease when assembling flameproof joints, such as threaded cable glands, but stipulates that it must be, non-setting, non-metallic and non-combustible, and, in the case of cable entries, also that earth continuity must be maintained. We recommend conductive carbon grease such as IGD part # 5128701.

International Gas Detectors
Innovative Gas Detection since 1917

Initial detailed inspection check-list to EN 60079-17:2014 Part 6. Table 1 Ex d & Ex tD

System name			
Inspection date		**Doc template #**	
Equipment type	**Ex d gas detector**	**Detector serial #**	
Site name			

	Check that:	**Y,N or NA**	**Comments**
A	**General**		
1	Equipment is appropriate to the ELP/Zone requirements of the location		
2	Equipment group is correct		
3	Equipment temperature class is correct		
4	Equipment maximum surface temperature is correct		
5	Degree of protection (IP grade) of equipment is appropriate for the level of protection/group/conductivity		
6	Equipment circuit identification is correct		
7	Equipment circuit identification is available		
8	Enclosure glass parts and glass -to-metal sealing gaskets and/or compounds are satisfactory		
9	There is no damage or unauthorised modifications		
11	Bolts, cable entry devices (direct or indirect) and blanking elements are of the correct type and are complete and tight. Physical check		
12	Threaded covers on enclosures are of the correct type, are tight and secured. Physical check		
13	Joint surfaces are clean and undamaged and gaskets, if any, are satisfactory and correctly positioned		
14	Conditions of gaskets is satisfactory		
15	There is no evidence of ingress of water or dust in the enclosure in accordance with the IP rating		
17	Electrical connections are tight		
25	Breathing and draining devices are satisfactory		
26	Items 26 – 31 refer to motors and lighting so hence are not relevant and have been omitted		
B	**Installation – General**		
1	Type of cable is appropriate		
2	There is no obvious damage to cables		
3	Sealing of ducts, pipes and/or conduits is satisfactory		
4	Stopping boxes and cable boxes are correctly fitted		
5	Integrity of conduit system and interface with mixed system maintained		
6	Earthing connections, including any supplementary earthing bonding connections are satisfactory (for example connections are tight and conductors are satisfactory (for example connections are tight and conductors are of sufficient cross-section). Physical check.		
7	Fault loop impedance (TN systems) or earthing resistance (IT systems) is satisfactory		
8	Automatic electrical protective devices are set correctly (auto reset not possible)		
9	Automatic electrical protective devices operate within permitted limits		
10	Specific conditions of use (if applicable) are complied with		
11	Cables not in use are correctly terminated		
12	Obstructions next to flameproof joints are in accordance with IEC 60079-14:2014 14.2. See explanatory note on Page 6 of the 903 manual		
14	Items 14-23 refer to heating systems and motors, hence they have been omitted		
C	**Environment**		
1	Equipment is adequately protected against corrosion, weather, vibration and other adverse factors		
2	No undue accumulation of dust and dirt		
3	Electrical insulation is clean and dry		

Signature	Print name

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Periodic close inspection check-list to EN 60079-17:2014 Part 6. Table 1 Ex d & Ex tD

System name			
Inspection date		**Doc template #**	
Equipment type	**Ex d gas detector**	**Detector serial #**	
Site name			

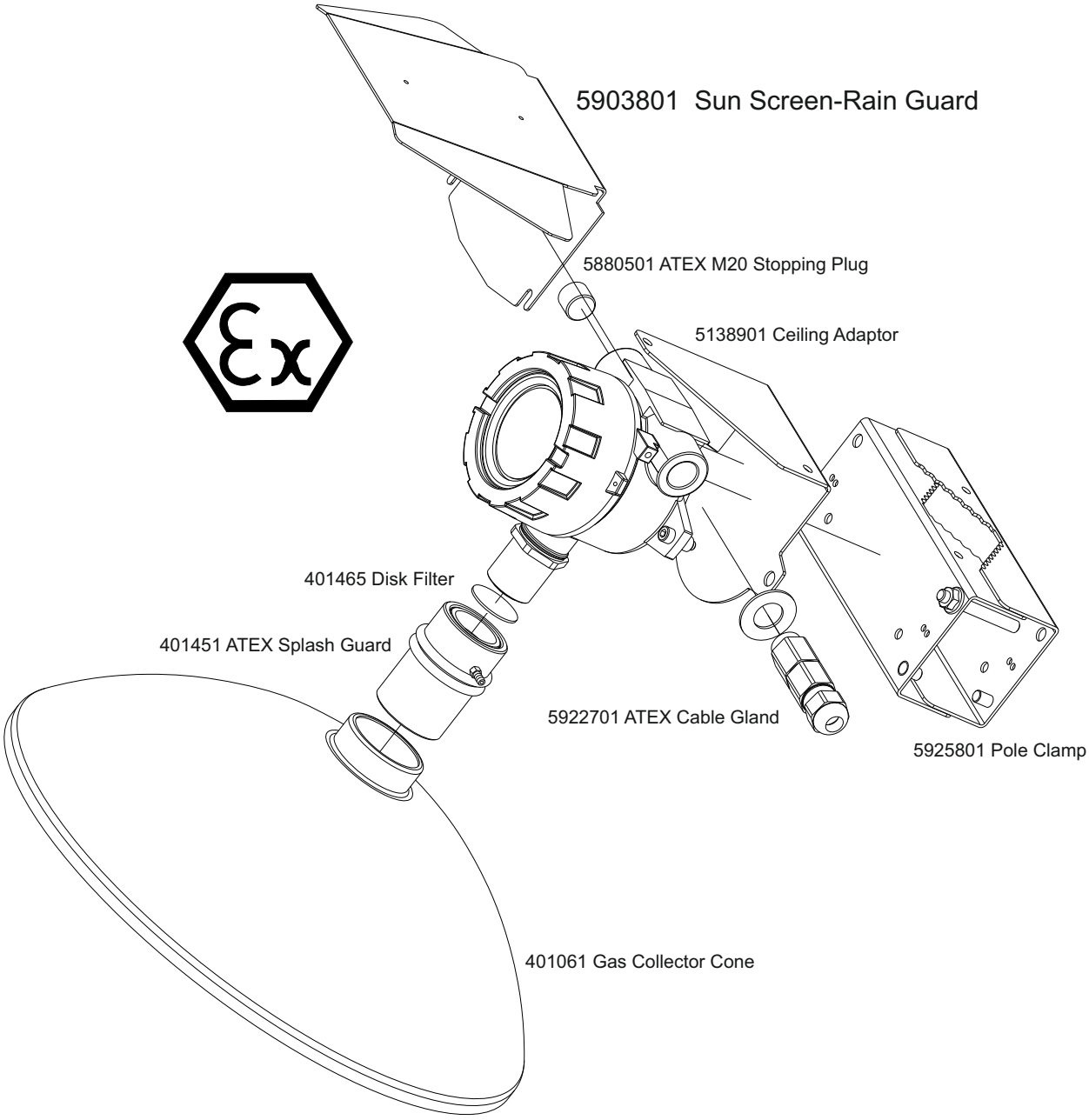
	Check that:	**Y,N or N/A**	**Comments**
A	**General**		
1	Equipment is appropriate to the ELP/Zone requirements of the location		
2	Equipment group is correct		
3	Equipment temperature class is correct		
4	Equipment maximum surface temperature is correct		
5	Degree of protection (IP grade) of equipment is appropriate for the level of protection/group/conductivity		
7	Equipment circuit identification is available		
8	Enclosure glass parts and glass -to-metal sealing gaskets and/or compounds are satisfactory		
10	There is no evidence of unauthorised modifications		
11	Bolts, cable entry devices (direct or indirect) and blanking elements are of the correct type and are complete and tight. Physical check		
12	Threaded covers on enclosures are of the correct type, are tight and secured. Physical check		
25	Breathing and draining devices are satisfactory		
26	Items 26 – 31 refer to motors and lighting so hence are not relevant and have been omitted		
B	**Installation – General**		
2	There is no obvious damage to cables		
3	Sealing of ducts, pipes and/or conduits is satisfactory		
6	Earthing connections, including any supplementary earthing bonding connections are satisfactory (for example connections are tight and conductors are satisfactory (for example connections are tight and conductors are of sufficient cross-section). Visual check.		
12	Obstructions next to flameproof joints are in accordance with IEC 60079-14:2014 14.2. See explanatory note on Page 6 of the 903 manual		
14	Items 14-23 refer to heating systems and motors, hence they have been omitted		
C	**Environment**		
1	Equipment is adequately protected against corrosion, weather, vibration and other adverse factors		
2	No undue accumulation of dust and dirt		
3	Electrical insulation is clean and dry		

Signature	Print name

Order Codes

5045802	JB3 Series Junction Box with Terminal PCB for use with MK3 and 102 Series Detectors. **Aluminium Alloy**, Copper Free, Powder Coated. ATEX/IECEX EX d
5045803	JB3 Series Junction Box with Terminal PCB for use with MK3 and 102 Series Detectors. **316 Stainless Steel**, Powder Coated. ATEX/IECEX EX d
5045810	JB3 Series Junction Box with Terminals General Use for use. **Aluminium Alloy**, Copper Free, Powder Coated. ATEX/IECEX EX d
5922701	M20 Universal EX d Cable Gland
5880501	M20 Stopping Plug
5128701	Conductive Assembly Paste
5138901	Ceiling Adaptor
5903801	Sun Screen/Rain Guard
5925801	Pole Clamp

Notes


5903801 Sun Screen-Rain Guard
5880501 ATEX M20 Stopping Plug
5138901 Ceiling Adaptor
401465 Disk Filter
401451 ATEX Splash Guard
5922701 ATEX Cable Gland
5925801 Pole Clamp
401061 Gas Collector Cone