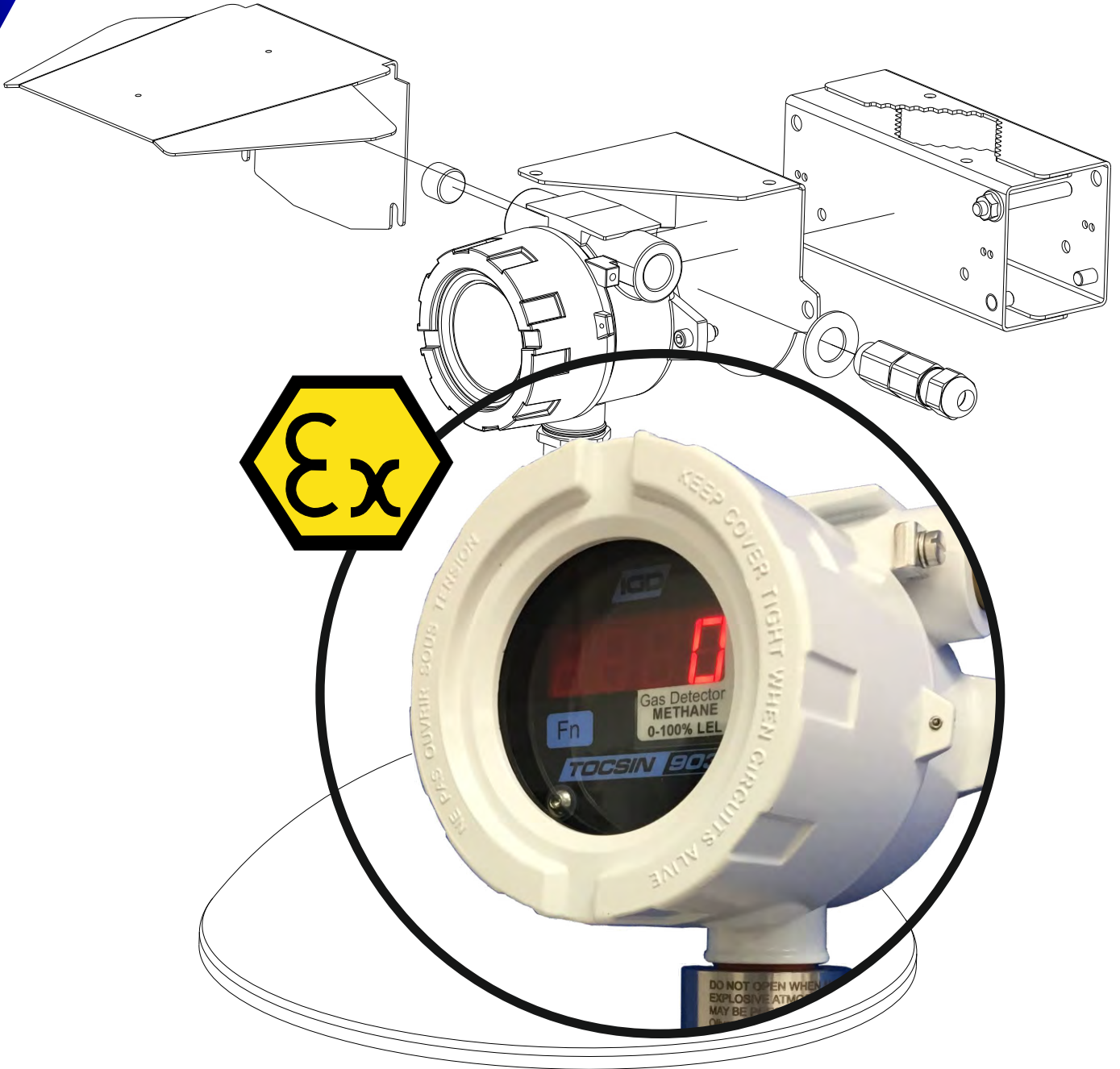


TOCSIN 903 SINGLE CHANNEL GAS DETECTOR USER INSTRUCTIONS



TOCSIN 903 SINGLE CHANNEL HAZARDOUS GAS MONITOR

The Tocsin 903 can be used either as a stand alone 4-20mA transmitter module or integrated into a larger system.

The software platform for the Tocsin 903 can be upgraded as new enhancements are added making the 903 system the only hazardous area gas detector you will ever need

Digital processing technology enhances an already proven range of hazardous area gas detectors making the Tocsin 903 series perform to new levels of excellence.

Inputs	Pellistor, mA, Serial	 
Outputs	4-20mA, Max 700 Ohms Serial Option Relay Option	
Display	4 Digit Red LED 14mm	
Controller T90 Response	Selectable 10s, 1s Filter	
Power supply	18 to 32V DC With Relay Option Typically 4 W 12 to 32V DC Without Relay Option	
Electrical Outputs	3 Wire 4-20mA (4 Wire Addressable Capability)	
Temperature	-10°C to +55°C	
Ingress Protection	IP66	
JB Housing Material	Junction Box, Copper Free Aluminium Alloy Epoxy Coated Option for 316 Stainless Steel and Marine Paint Finishes	
Sensor Housing Material	Sensor ,Stainless Steel 316 S16	
Explosion Protection	Junction Box, EExd IIC T6 II 2 D G	
Explosion Protection Sensor	EEx d IIC T6 II 2 D G	
	II 2G Ex db IIC T6/T5 Gb II 2D Ex tb IIIC T85°C/ T100°C Db Ta = -20°C to +40°C/+55°C IECEx EXV 16.0002X ExVeritas 16 ATEX 0140X ExVeritas 21UKEX0913X IP66 M20 x 1.5 Entries 12-32V DC Compliant to IEC 60079-29-1	 2804  2585
Housing Dimensions (mm)	110 Diameter x 127 High Plus detector option	
Cable Entry	2 x M20, NPT Options 1 x M20 Detector Entry	
Weight (Std Al Housing)	1.5Kg	

Refer to 102 Series Detector Data For Individual Sensor Performance.

MARKINGS AND APPLICABLE STANDARDS

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.

Serial D.O.M	TOCSIN 903
<p>II 2G Ex db IIC T6/T5 Gb II 2D Ex tb IIIC T85°C/ T100°C Db Ta = -20°C to +40°C/+55°C IECEX EXV 16.0002X ExVeritas 16 ATEX 0140X ExVeritas 21UKEX0913X IP66 M20 x 1.5 Entries 12-32V DC Compliant to IEC 60079-29-1 Web: www.internationalgasdetectors.com Tel: +44(0) 161 483 1415</p>	<p>Oliver IGD Ltd Crosby St Stockport SK2 6SH UK UK CA 2585 CE 2804</p>
<p>WARNING! DO NOT OPEN WHEN ENERGISED OR IF IN THE PRESENCE OF A FLAMMABLE ATMOSPHERE</p>	

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.

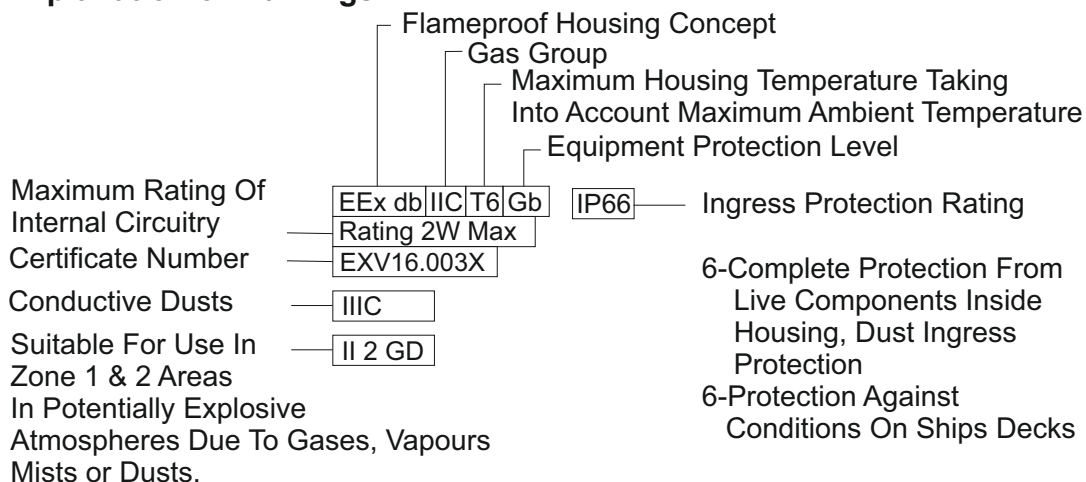
It is imperative to use cabling which suits the environment in which the JB3 and its sensor is to be used. The following is intended as a guide.

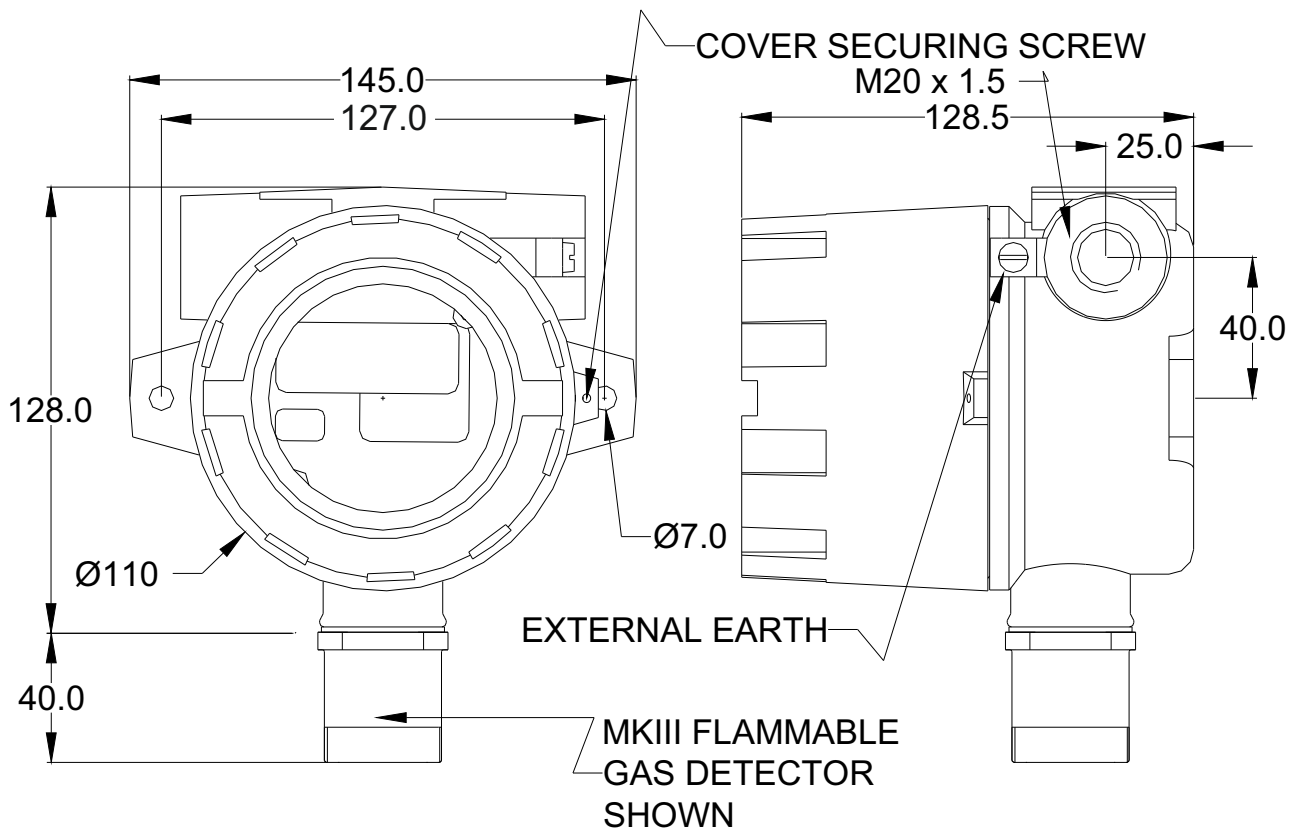
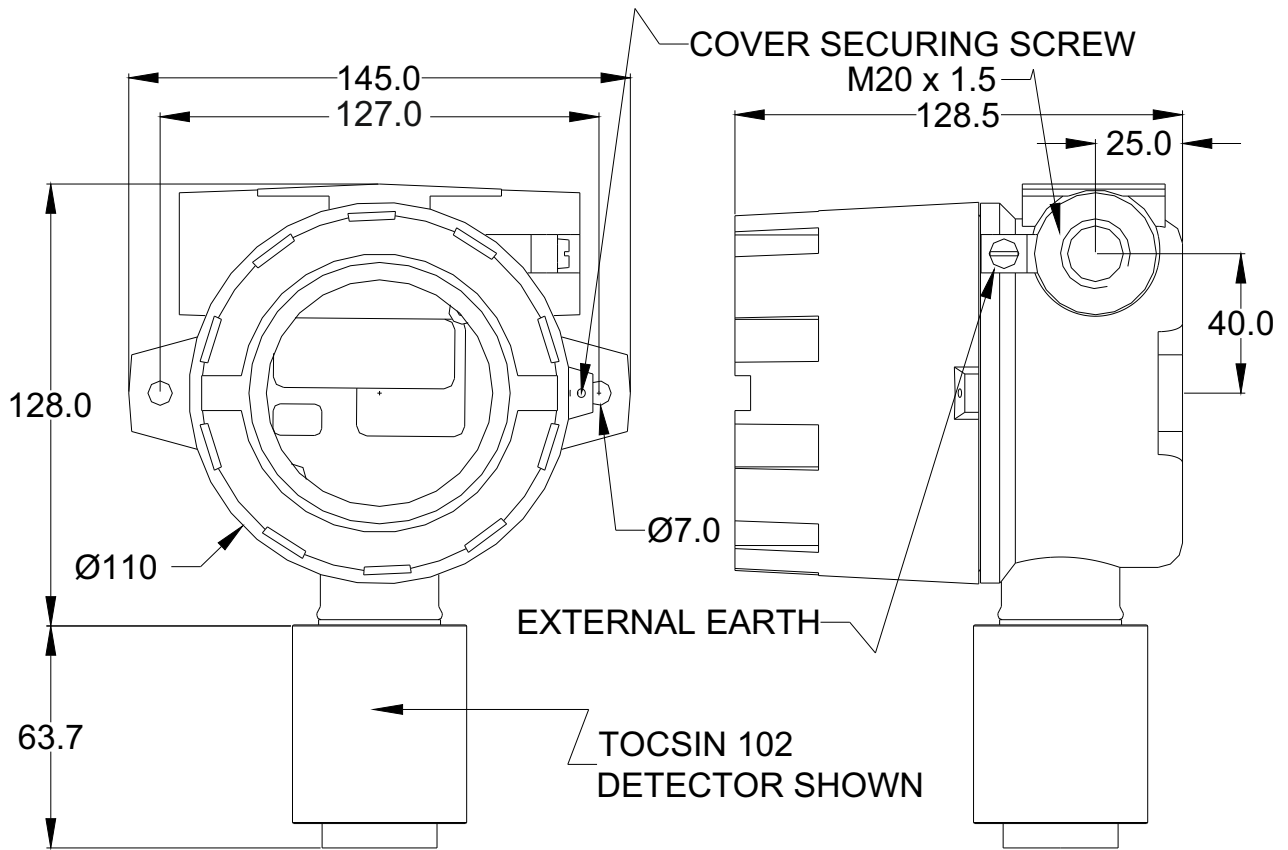
Use

- Pirelli LSX 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.

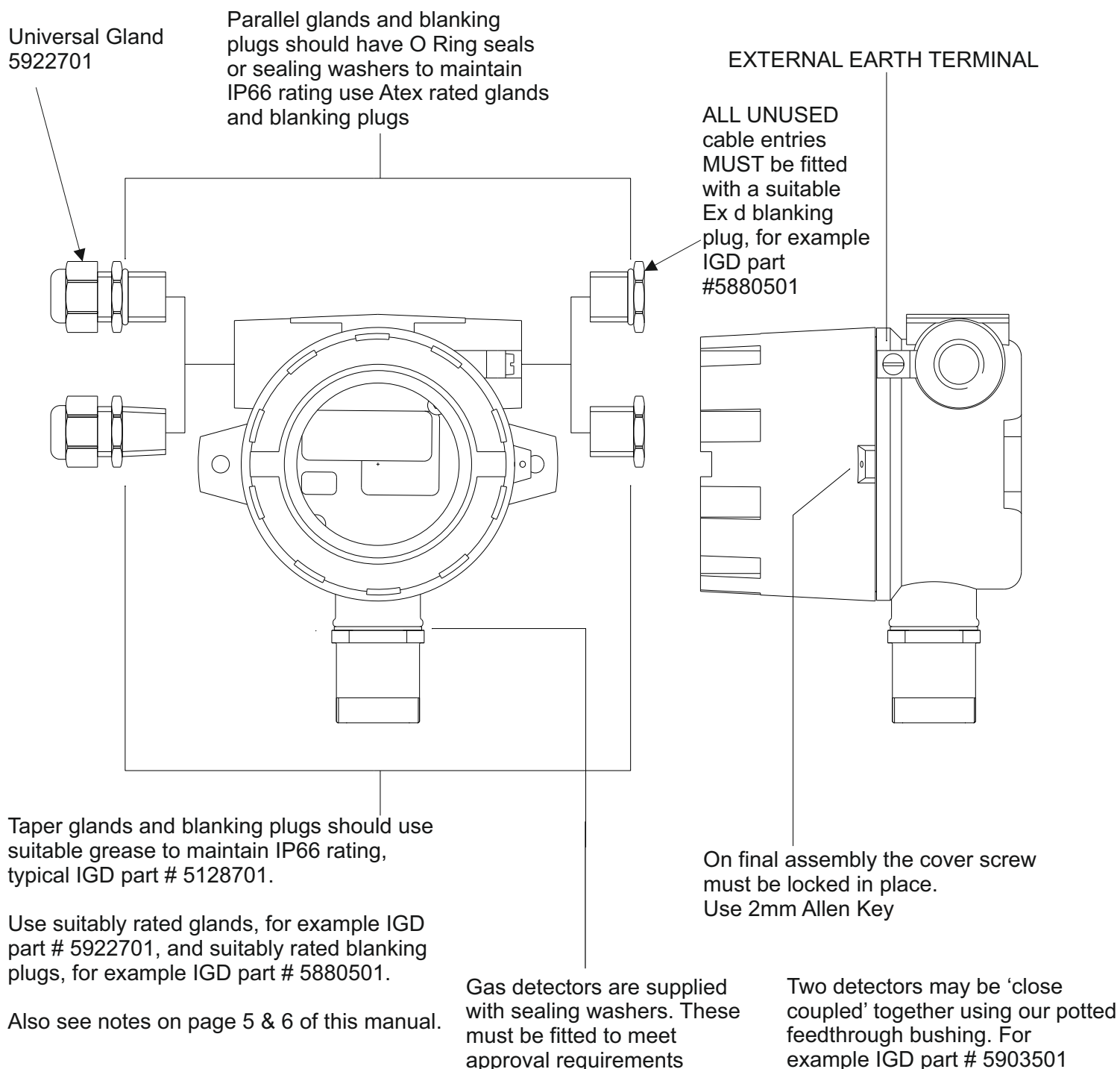
Explanation of Markings





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.



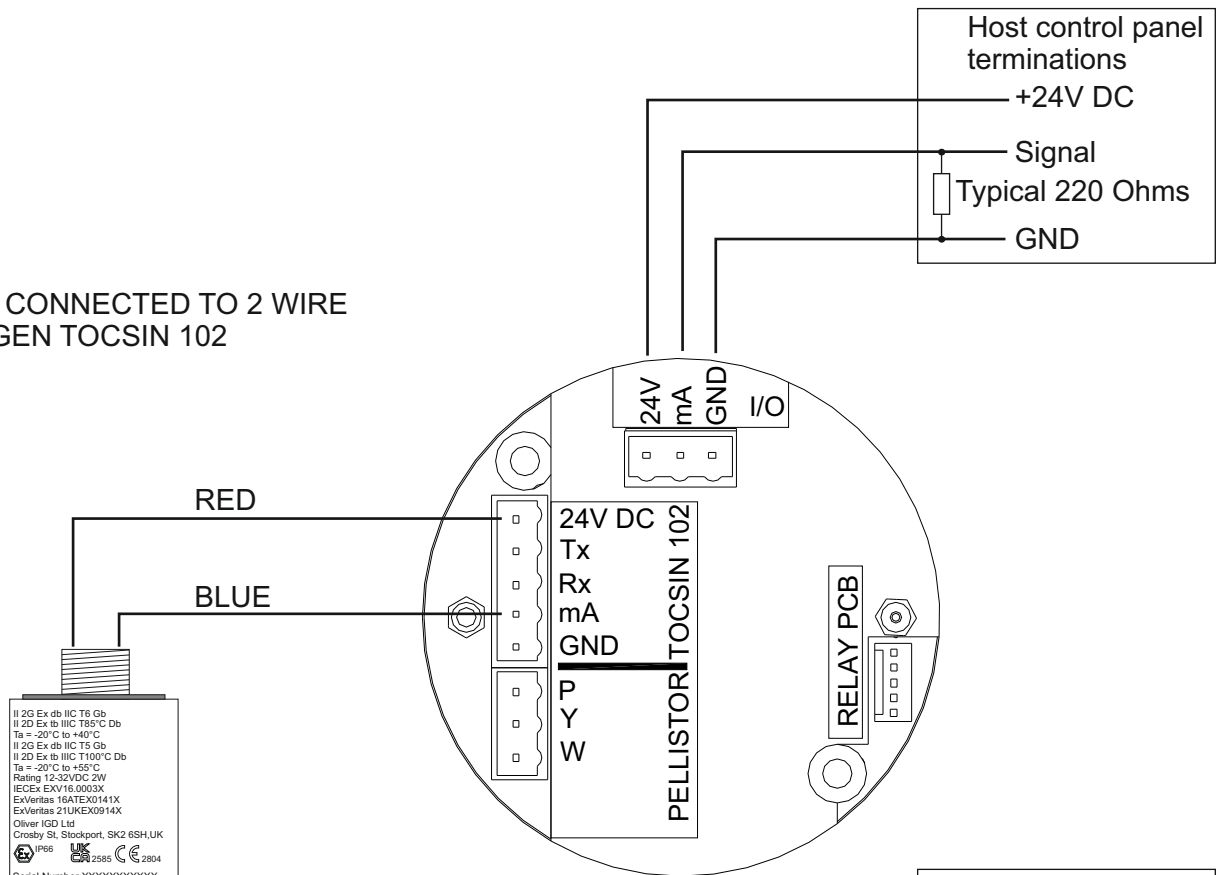
EXTERNAL EARTH	STRANDED CABLE USE	4.0mmSQ CSA	SOLID CORE CABLE USE	6.0mmSQ CSA
INTERNAL EARTH	STRANDED CABLE USE	1.5mmSQ CSA	SOLID CORE CABLE USE	2.5mmSQ CSA

WARNING

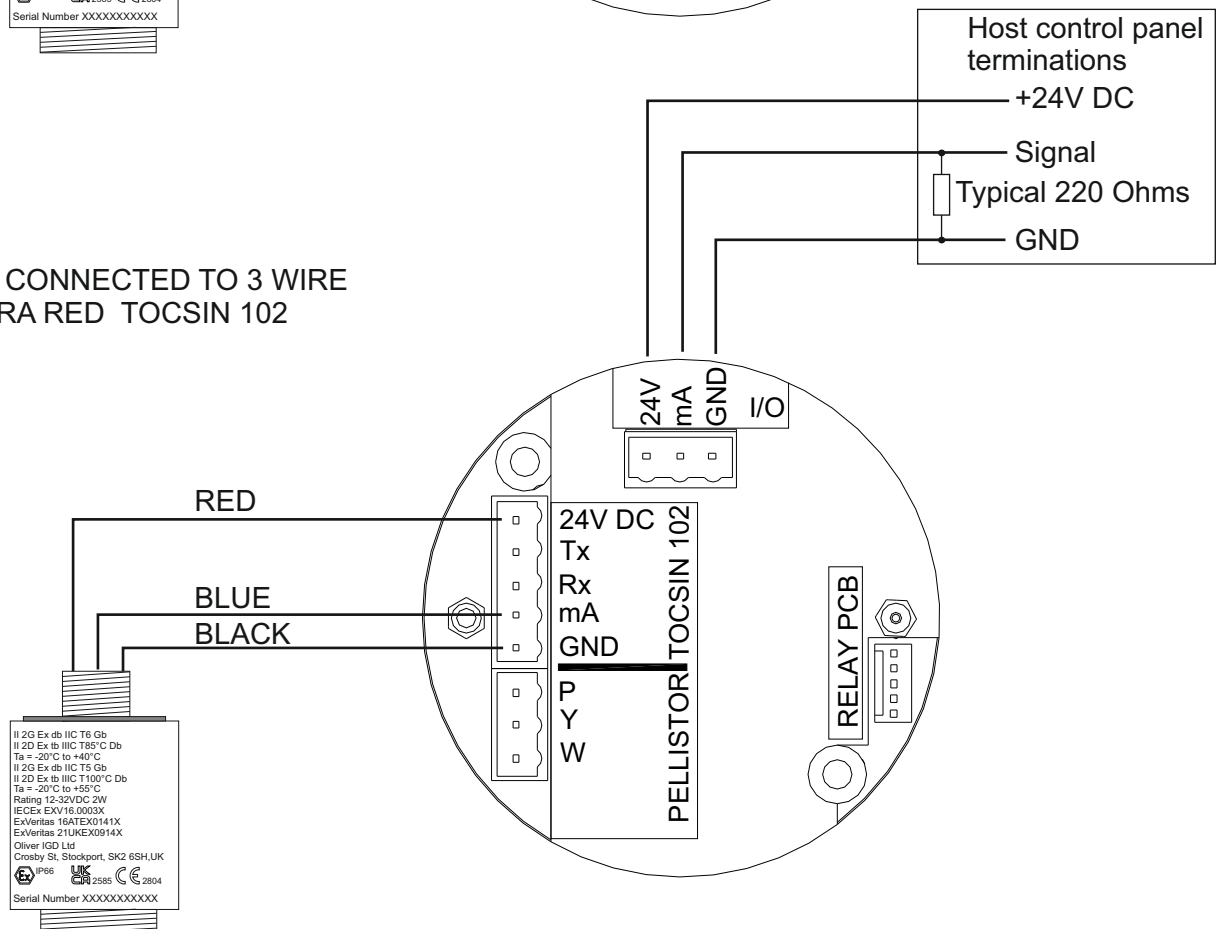
Glands and cable must be of a suitable type to match the zone of application of the equipment, see later notes in this manual

TOCSIN 903 TERMINATION DETAILS

TOCSIN 903 CONNECTED TO 2 WIRE TOXIC/OXYGEN TOCSIN 102



TOCSIN 903 CONNECTED TO 3 WIRE CO2/HC INFRA RED TOCSIN 102

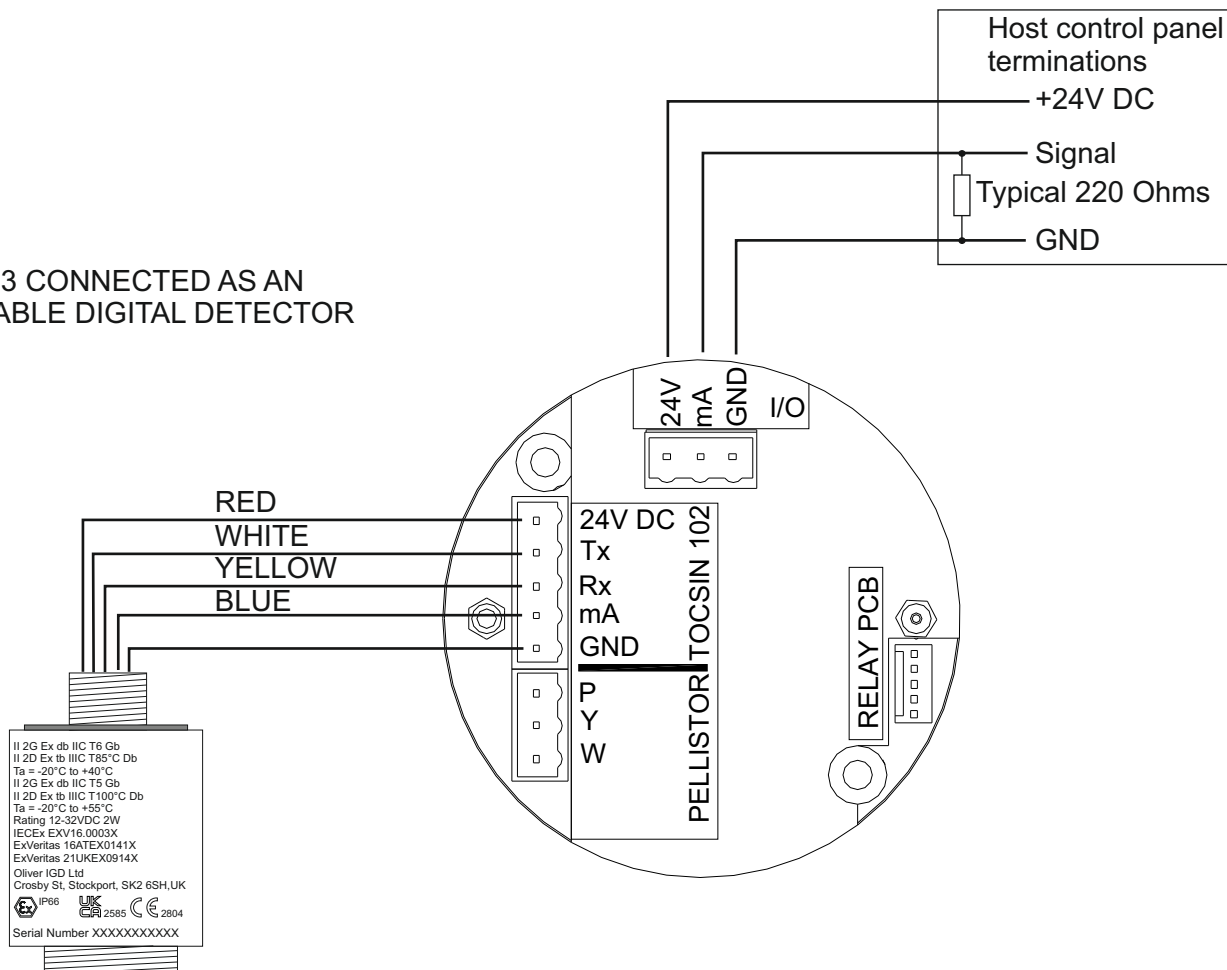


II 2G Ex db IIC T6 Gb
 II 2D Ex tb IIIC T85°C Db
 Ta = -20°C to +40°C
 II 2G Ex db IIC T5 Gb
 II 2D Ex tb IIIC T100°C Db
 Ta = -20°C to +55°C
 Rating: 12-52VDC 2W
 IECEx EXV16.0003X
 ExVeritas 16ATEX0141X
 ExVeritas 21UKEX0914X
 Oliver IGD Ltd
 Crosby St, Stockport, SK2 6SH, UK
 IP66
 2555
 2804
 Serial Number XXXXXXXXXXXX

II 2G Ex db IIC T6 Gb
 II 2D Ex tb IIIC T85°C Db
 Ta = -20°C to +40°C
 II 2G Ex db IIC T5 Gb
 II 2D Ex tb IIIC T100°C Db
 Ta = -20°C to +55°C
 Rating: 12-52VDC 2W
 IECEx EXV16.0003X
 ExVeritas 16ATEX0141X
 ExVeritas 21UKEX0914X
 Oliver IGD Ltd
 Crosby St, Stockport, SK2 6SH, UK
 IP66
 2555
 2804
 Serial Number XXXXXXXXXXXX

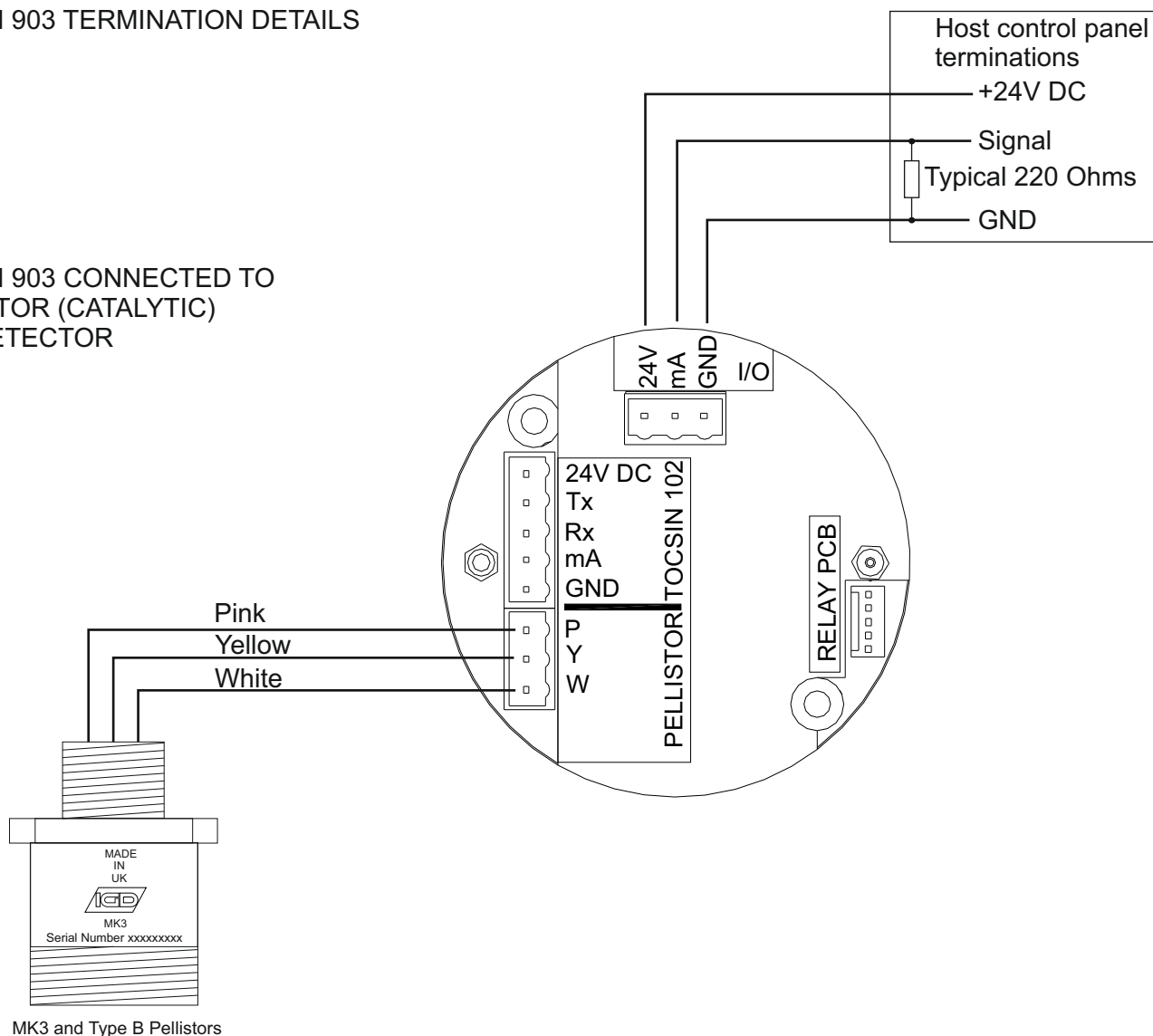
TOCSIN 903 TERMINATION DETAILS

TOCSIN 903 CONNECTED AS AN ADDRESSABLE DIGITAL DETECTOR



TOCSIN 903 TERMINATION DETAILS

TOCSIN 903 CONNECTED TO PELLISTOR (CATALYTIC) GAS DETECTOR

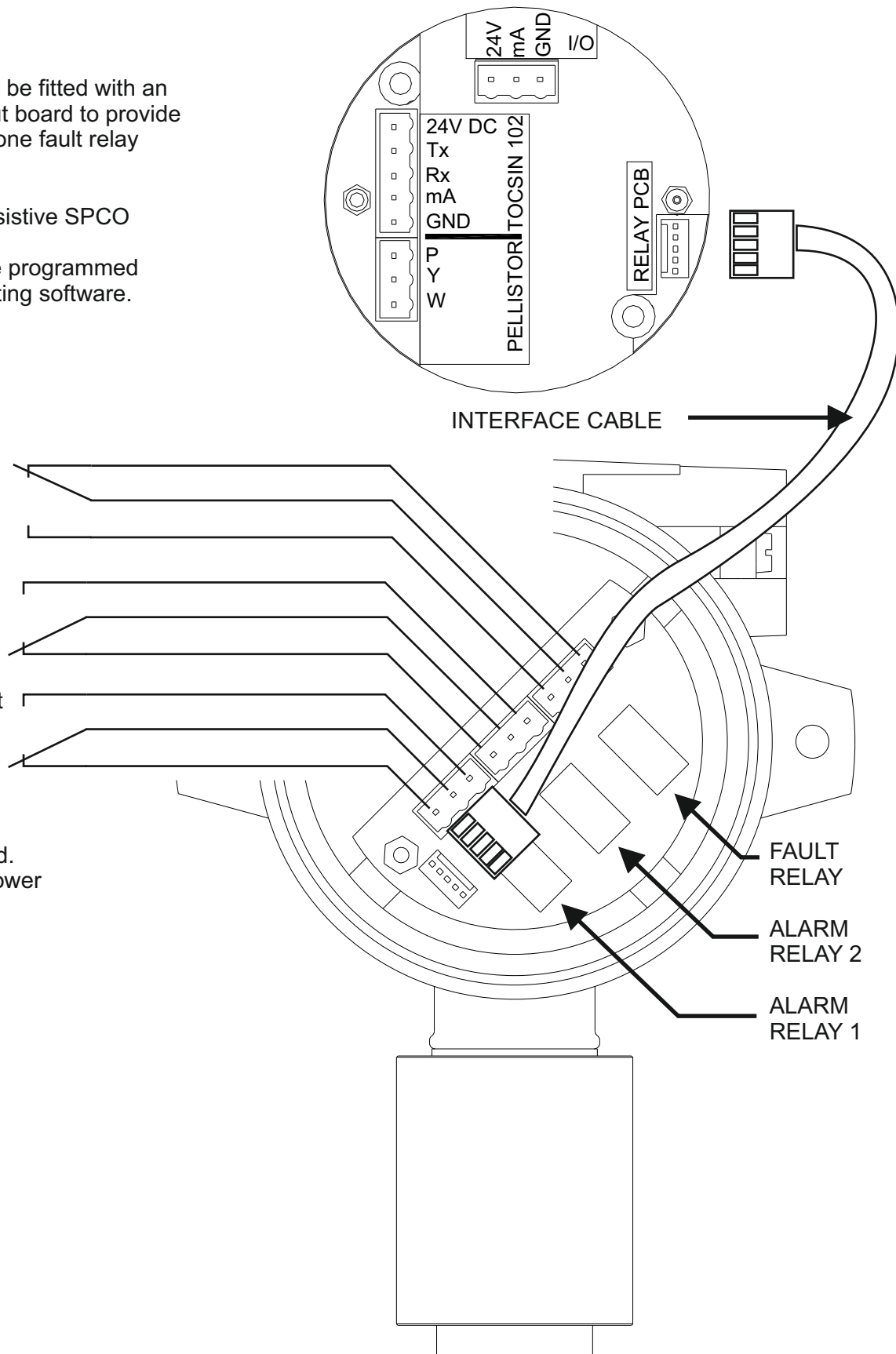


RELAY OUTPUT MODULE (OPTIONAL)

The Tocsin 903 can be fitted with an optional relay output board to provide 2 alarm levels and one fault relay output.

All relays are 7A resistive SPCO

Alarm levels can be programmed from the 903 operating software.

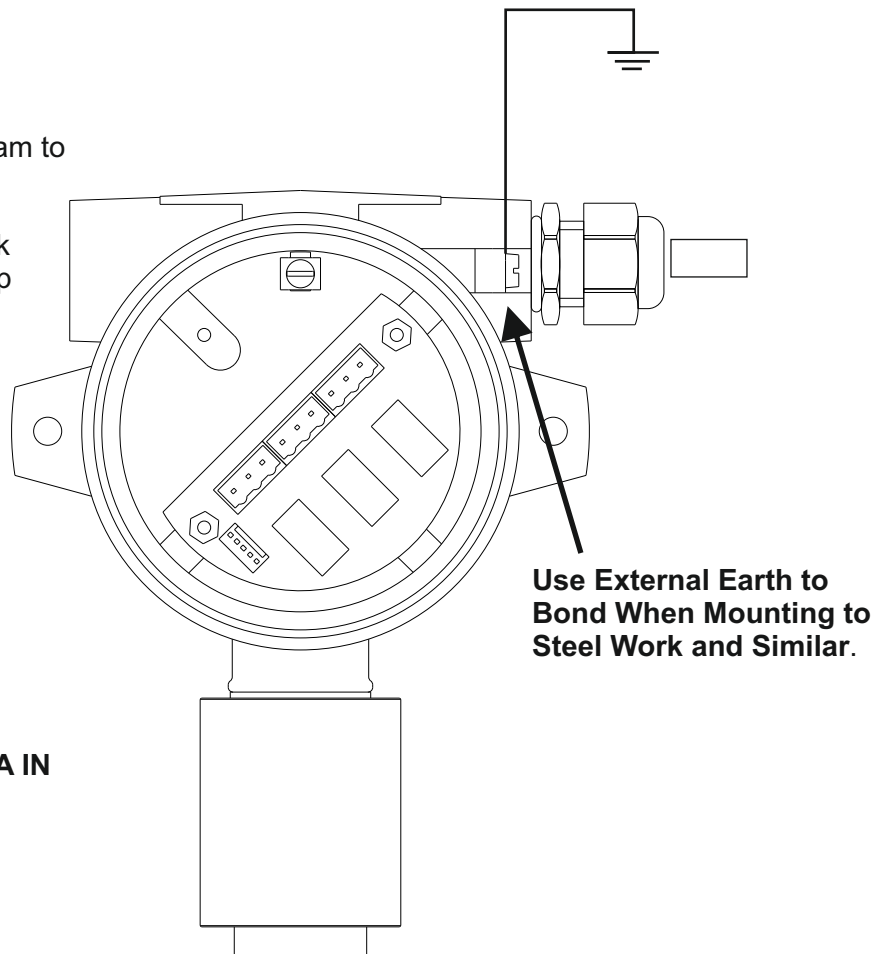


Earth Bonding and Cable Screening

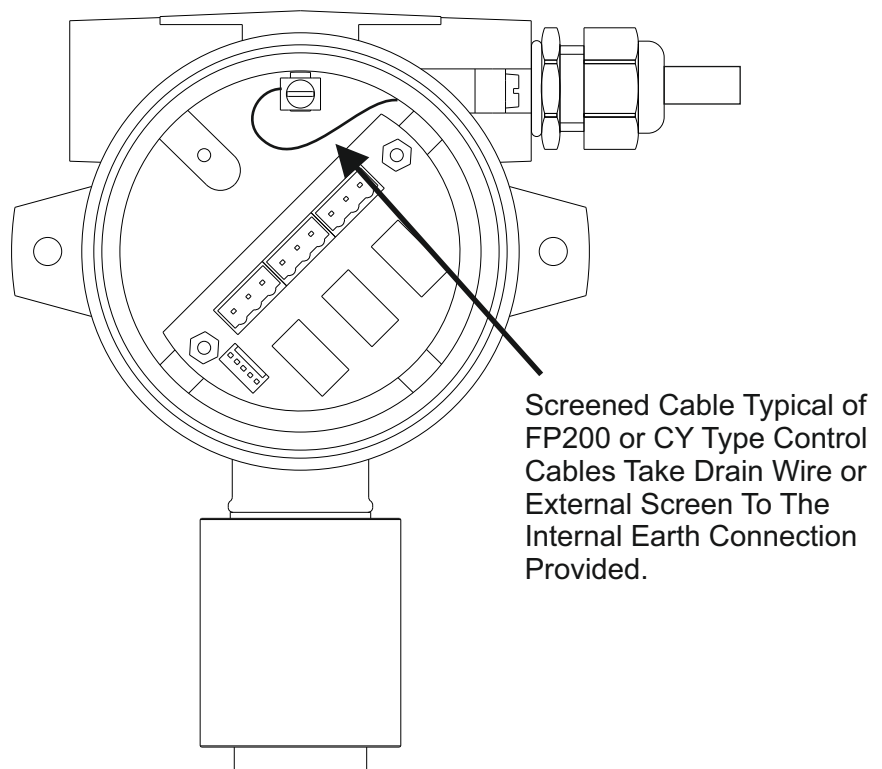
The 903 must be correctly earth bonded for reliable and safe operation.

Please follow the enclosed diagram to ensure correct installation.

This is intended to reduce the risk from electric shock, static build up and signal noise.



IN ALL CASES CABLES AND GLANDS MUST BE APPROPRIATE FOR THE AREA IN WHICH THE 903 IS MOUNTED.



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 aluminium 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 entries MUST be fitted with a suitably 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 <small>Innovative Gas Detection since 1917</small>			
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



International Gas Detectors
Innovative Gas Detection since 1917

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

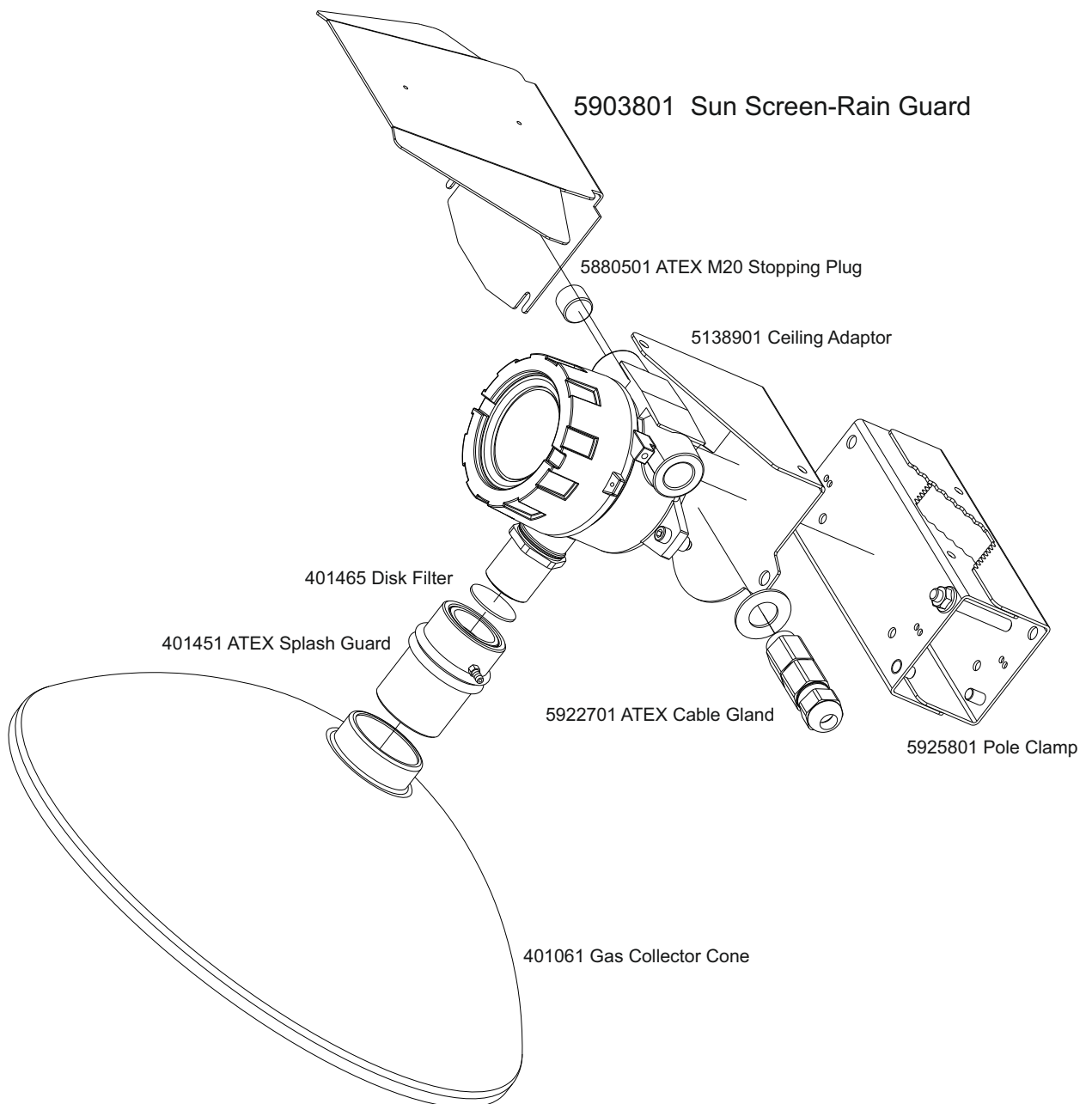
System name			
Inspection date		Doc template #	
Equipment type Ex d gas detector		Detector serial #	
Site name			
Check that:			Y,N or NA
A	General		
1	Equipment is appropriate to the ELP/Zone requirements of the location		
2	Equipment group is correct		
3	Equipment temperature class is correct		
4	Equipment 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

Accessory Order Codes

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
401451	102 Series Detector Splash Guard
401465	Optional Disk Filter

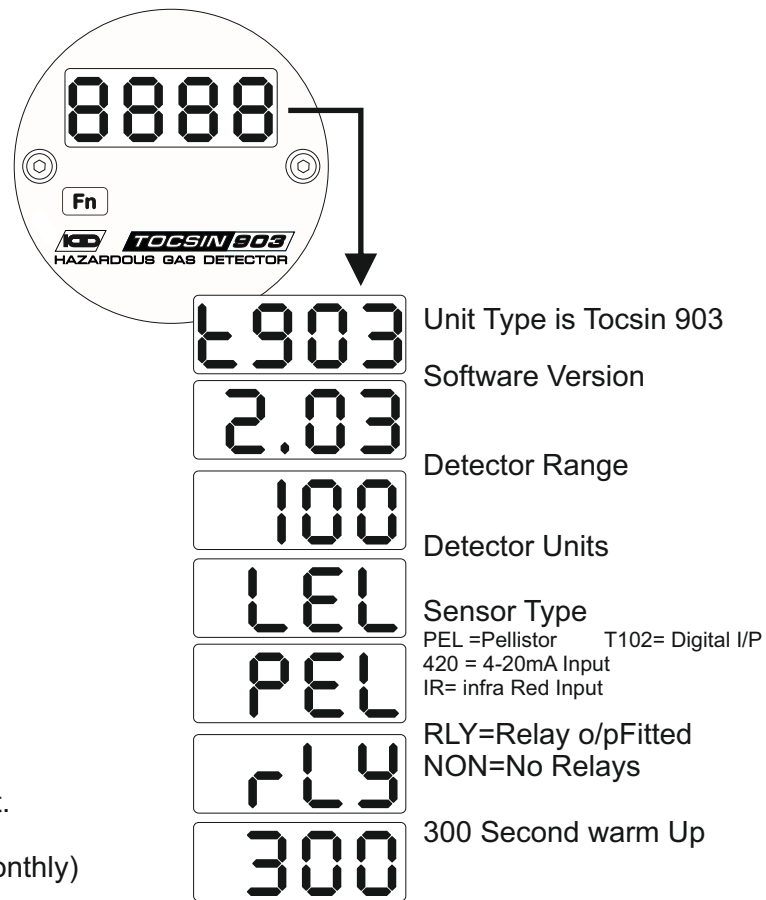


Section 1 Basic Operation.

Before attempting to operate the Tocsin 903 single channel gas detector ensure that the installation and calibration instructions have been followed to install the system.

Powering on the system.

After ensuring correct installation of the Tocsin 903 the unit can be switched on. When first switched on the Tocsin 903 will perform a display test, indicate T903 then its software version, range, units, sensor type, relay output action, address and then commence a 300 second count down timer. This allows the sensor to stabilise before operation. During this time the analyser alarm outputs are off and the 4-20mA output is fixed at 4mA. At the end of the count down the unit will indicate a continuously updating gas concentration.

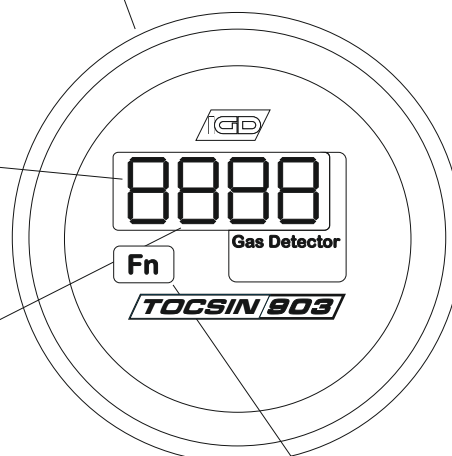


A calibration label will be fitted to the side of the unit. This label will indicate when the system is next due for calibration. Regular calibration (usually 6 monthly) is vital for correct system operation.

The Tocsin 903 in normal monitoring mode.

The Tocsin 903 is fitted with a 4 digit 7 segment high brightness LED display for easy recognition in poor lighting conditions.

The gas being monitored by the Tocsin 903 will be indicated here along with its units of measure. For instance the unit shown here is measuring for a flammable gas measured in percent of the gases Lower Explosive Limit. Other possibilities could be toxic gases measured in Parts Per Million or Oxygen Measured in Percent volume concentration.



The Function button is used to cancel alarms or to access the internal software functions and system set up.

Section 1 Basic Operation.

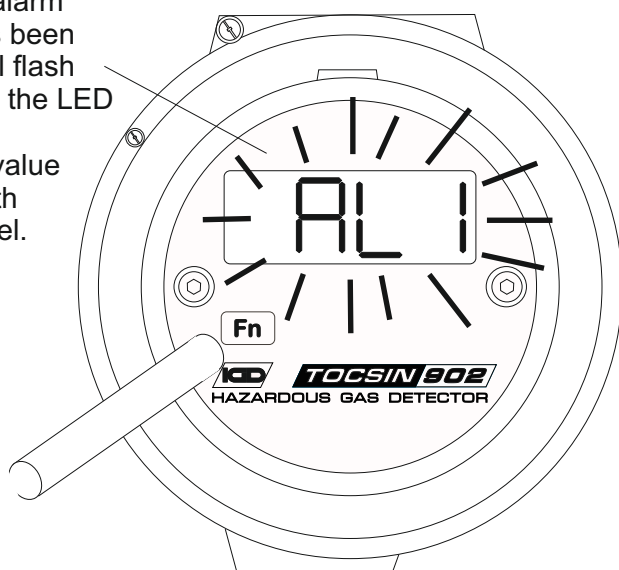
What to do if the alarm activates.

The Tocsin 903 is fitted with a number of interfaces which may be connected to other systems in the location that the gas detector is being used. For instance the Tocsin 903 could be set up to cut off the mains gas supply to a boiler in the event of a gas leak or it could be set up to activate alarms external to the unit in the event of a toxic gas leak.

Whatever interfaces are connected the following will happen as a minimum.

1.1 If an alarm set point is exceeded.

The highest alarm level that has been exceeded will flash on and off on the LED display. The Current gas value alternates with the alarm level.



The Tocsin 903 is fitted with a function button which is activated using a magnetic pointer provided with the system. By following the instructions in this manual the menu system can be accessed to set alarm levels change ranges or sensor type.

Use the magnetic 'pointer' once to mute the alarm. (The 'SIL', silence function)
 In this instance note that the outputs stay in the alarm state as does the display.
 Select 'RES' or RESET function to reset the alarm.
 Note if the hazard is still present the alarms will be re-activated.

Note that the system may be configured to act as a simple 4-20mA device in which case indicated alarm levels will be disabled.

Section 2 Editing and Display Options.

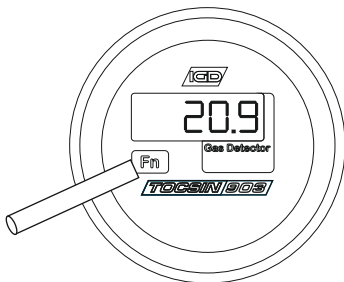
As supplied and installed the Tocsin 903 will be programmed for the following:

- Detector Range
- Detector Units
- Sensor Type
- Relay Action

It will not normally be necessary for a user to need to change any of these parameters. To attempt to change any of the parameters without the necessary specialist knowledge and training could compromise the performance of the gas detector. The operator does have access to zero the unit and check or change the alarm levels. This feature is password protected. Passwords are entered as follows:

2.1 Entering the USER password

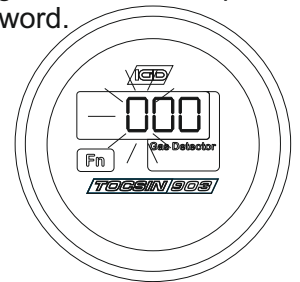
With the display indicating 903 hold the magnetic pointer over the Fn area..



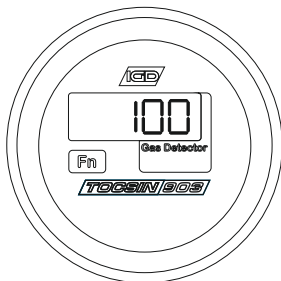
The display will indicate PASS remove the pointer when this is displayed.



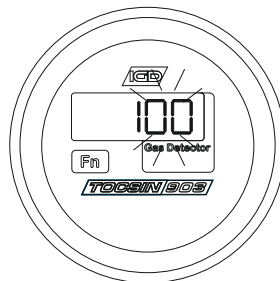
The display will now indicate all zero's. The first zero will be flashing. The T903 is expecting a password.



Bring the magnetic pointer over the Fn area and the digit will increment. Increment the display to read '1'



Hold the magnetic pointer over the Fn area. Each digit in turn will flash.



When all digits are flashing remove the pointer. The display will now alter to indicate the USER menu (see next section)

USER MENU

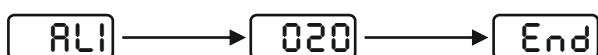
After entering the pass code for the user menu the display will sequence through the menu as:

- AL1** Select to set Alarm Level 1
- AL2** Select to set Alarm Level 2
- AL1t** Select to set AL1 Alarm Action, either Rising, Rising Latching, Falling or Falling Latching
- AL2t** Select to set AL2 Alarm Action, either Rising, Rising Latching, Falling or Falling Latching
- Zero** Select to set Zero the detector
- CAL** Select to set Calibrate the Detector
- End** Select to Return to Normal Operation

Use the magnet to select the desired action.

AL1 Set Alarm Level 1 Command

Use this option to set or change alarm Level 1.
Select AL1 from the menu using the magnet

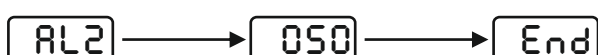


Select AL1 and the current alarm level is displayed. Use the data entry sequence to alter if required (see previous).

Once data is entered select END to return to the main menu.

AL2 Set Alarm Level 1 Command

Use this option to set or change alarm Level 1.
Select AL1 from the menu using the magnet

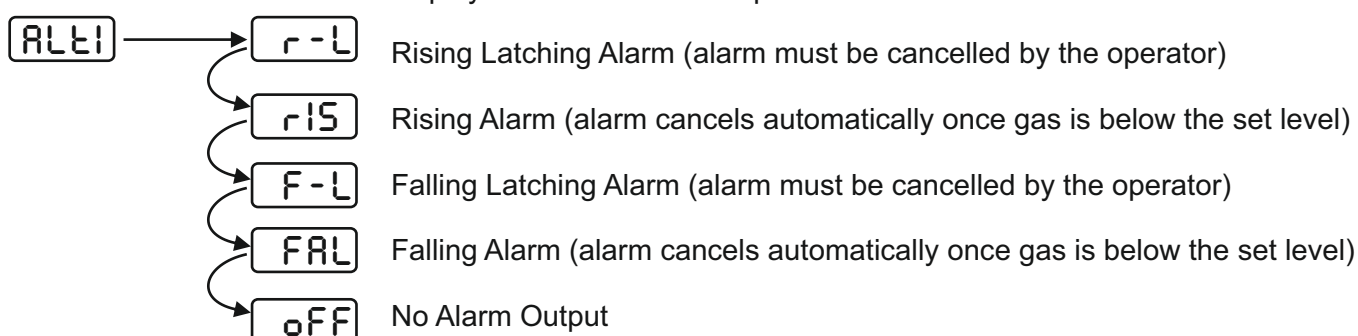


Select AL2 and the current alarm level is displayed. Use the data entry sequence to alter if required (see previous).

AL1t Alarm Level 1 Type Command

Use this option to set or change alarm Level 1 Type. Select ALT1 from the menu using the magnet. With the desired Alarm Type displayed hold the magnet in place until the display flashes to set.

Select ALT1 to alter the alarm action. The currently selected type is displayed when this menu option is selected.

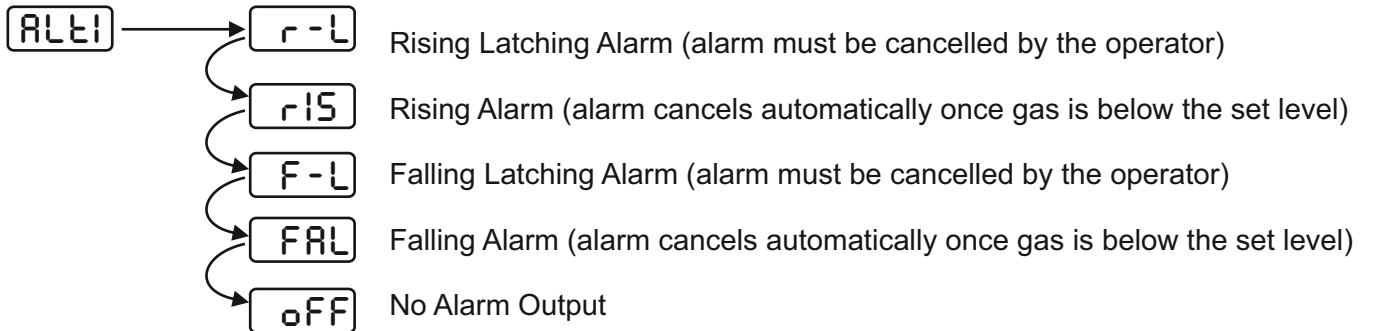


USER MENU CONTINUED

ALT2 Alarm Level 2 Type Command

Use this option to set or change alarm Level 2 Type. Select ALT2 from the menu using the magnet. With the desired Alarm Type displayed hold the magnet in place until the display flashes to set.

Select ALT2 to alter the alarm action. The currently selected type is displayed when this menu option is selected.



Zero and Calibration.

In common with most measuring devices gas detection equipment requires regular calibration if it is to operate correctly. Gas detectors are usually calibrated using either a synthetic air mixture or Nitrogen depending on the detector to obtain a zero point and a known gas concentration to obtain a calibration point. Usually bottled calibration gas is used to calibrate the detectors. In some cases this is either not practical or simply not desirable due to the nature of the gas. In such cases electrochemical gas generators can be used or ampules of solution mixed on the spot in a known volume. In some cases, Chlorine detectors being a good example an amount of atmospheric moisture (Rh) is required for the detector to function correctly. In such cases bottled gas is of no use and a gas generator must be employed.

The frequency of calibration is governed mainly by two factors, the type of detector and the environment it is located in. Calibration records should be kept for gas detection equipment and should indicate in particular the state of calibration of the detector both before and after calibration. Examination of such records over time can then be used to determine if a detector in a given environment is capable of maintaining calibration for the chosen period. If not then consideration should be given to either reducing the interval between calibrations or choosing an alternative detection technology.

Equipment fo Calibration and Methodology

A gas detector calibration kit will normally include:-

Zero Gas Bottle or Air Pump/Scrubber

Calibration Gas or Gas Generator

Calibration Gas Adaptor (possible this is a permanent fitment in hard to reach locations)

Gas flow Regulators

Introduction Tubing (again possibly permanent fitment in hard to reach locations)

Calibration Stickers (to indicate date of calibration, next due date and certificate number)

Method

In principle the sequence of events to ZERO and CALIBRATE are as follows:-

1. Inhibit the control panel during calibration so the act of introducing gas does not set off the alarm. This will vary from system to system.
2. Fit the calibration gas adaptor to the sensor if this is not a permanent fitment.
3. Flow zero gas for the recommended period for the detector and note the reading. Note that many gas detectors will zero clamp the reading. This pre-calibration record will indicate if there has been any zero drift since the last calibration and can be used to assess if the calibration period is correct for the detector.
4. Flow Calibration gas for the recommended period for the detector and note the reading. This pre-calibration record will indicate if there has been any calibration drift since the last calibration and can be used to assess if the calibration period is correct for the detector.
5. Re-introduce zero gas for the recommended period for the detector and follow the instructions on the following pages to zero the detector
6. Re-introduce calibration gas for the recommended period for the detector and follow the instructions on the following pages to calibrate the detector.
7. Observe and record the detector reading whilst flowing calibration gas.
8. Update the calibration status stickers on the detector

Example of Required Calibration equipment



Detector to be Calibrated

Fixed Flow Regulator

Gas Adaptor
P/N 401101
Shown.

Adaptor options as:

MKIII & Tocsin 102 use 401101A
Tocsin 103 Series use 401101B
MKV and VI use 401101C

Calibration Gas Bottle:

When using note the following:

Do not use past the expiry date indicated

Do not use below the recommended minimum fill pressure

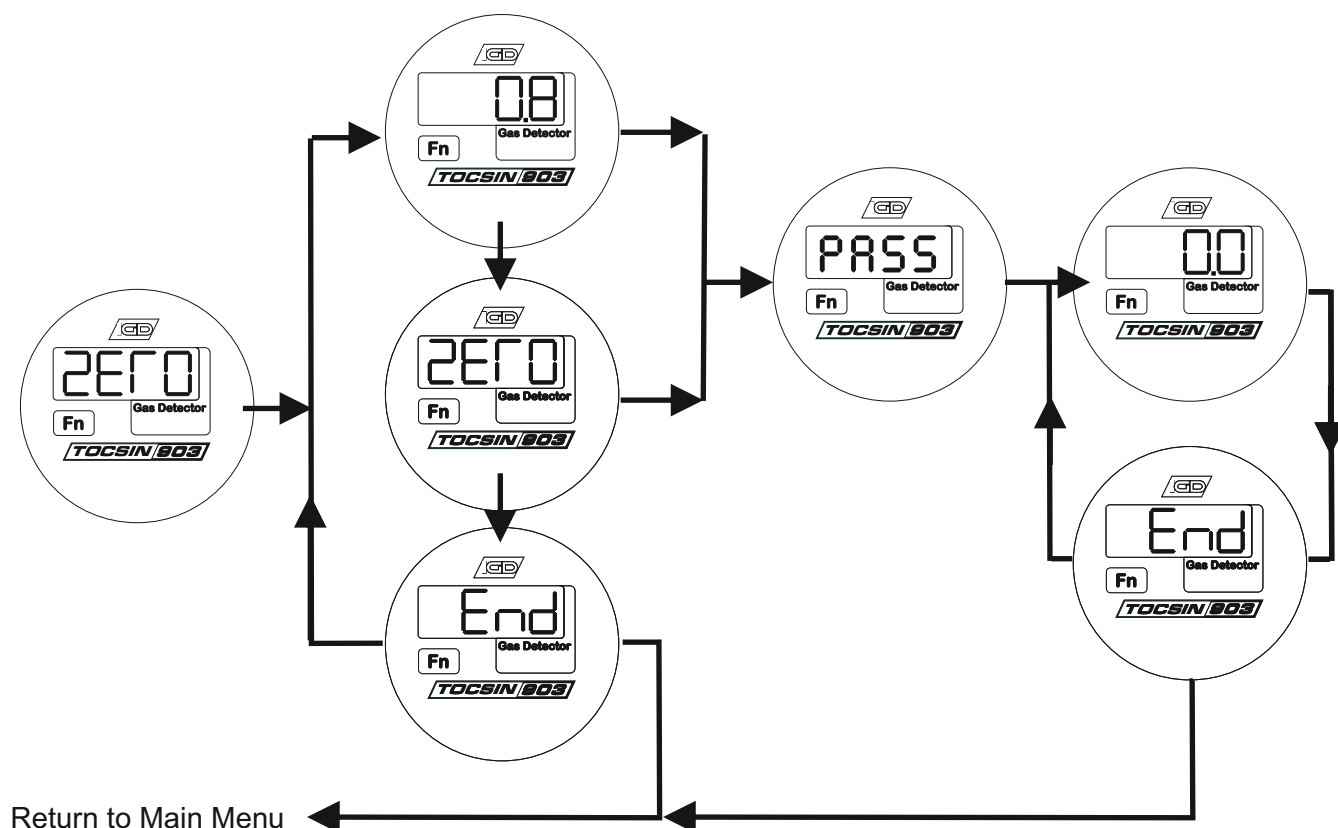
Always check the concentration is that required

Check the bottle accuracy (ideally no worse than +/-3% absolute

Check and observe any COSH instructions for safe handling

USER MENU CONTINUED

DETECTOR ZERO FUNCTION



Select ZERO from the menu and the first sequence of options is displayed as

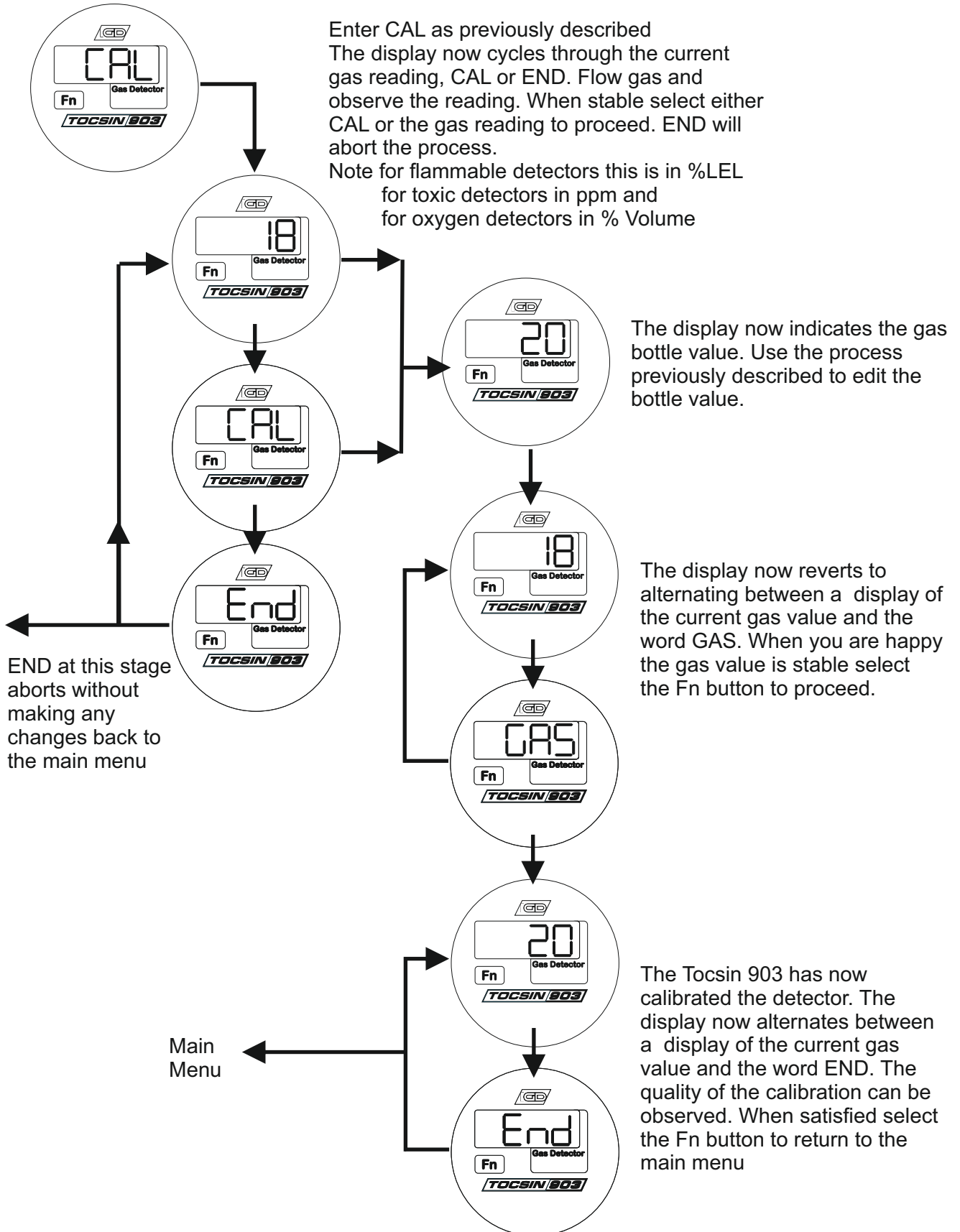
Current Reading,
Option to Zero,
Option to END without performing a zero.

Select either the reading or Zero and the Tocsin 903 will perform a zero. At the end of the process the display will show either PASS or FAIL. The display then shows the 'zeroed' reading and the 'End' option. Select either of these options to return to the main menu.

Note when performing a zero a suitable zero gas must already have been applied to the detector using the correct gas adaptor for the detector.

USER MENU CONTINUED

Selecting to Calibrate The Tocsin 903



Section 3 General Information

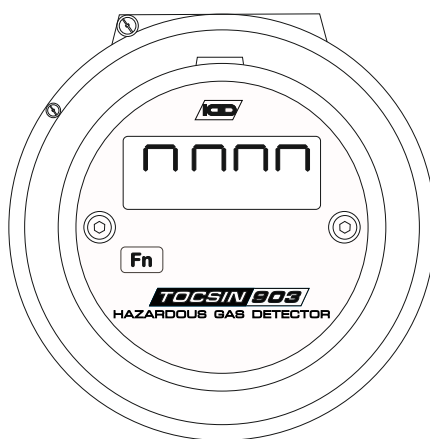
Fault Conditions.

The Tocsin 903 controller can detect and report faults which may develop with the sensor. .

Section 3.1 Over or Under Range Indication.

If the gas being sensed exceeds the range of the sensor fitted to the Tocsin 903 by more than 10% of the sensors range then this is indicated by the display indicated below.

When the gas concentration is back in range the Tocsin 903 reverts to normal operation

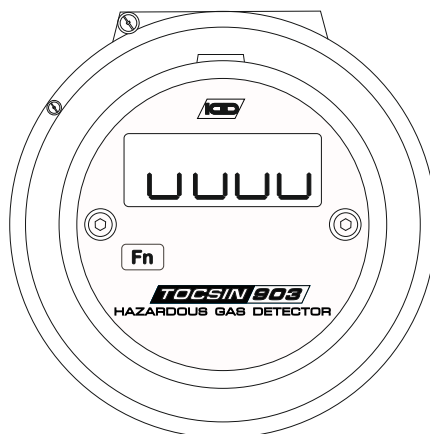


This indicates gas over range.

If the Tocsin 903 is being used as a 4-20mA transmitter then the output will drop below 2.5mA to indicate a fault condition.

In some circumstances for example if the temperature conditions exceed the rating of the sensor or if the calibration period has been exceeded the sensor may drop below the range of the Tocsin 903. Should the sensor signal drop below the zero point by more than 10% of the sensors range this is indicated by the display shown below.

When the gas concentration is back in range the Tocsin 903 reverts to normal operation.



This indicates gas under range.

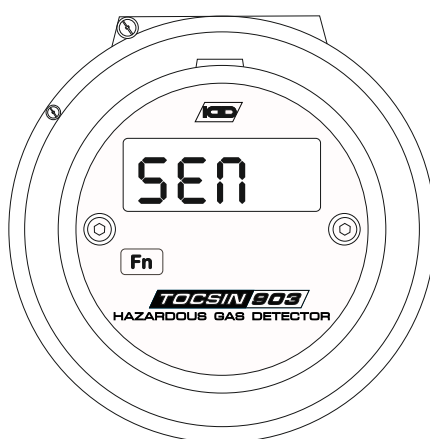
If the Tocsin 903 is being used as a 4-20mA transmitter then the output will drop below 2.5mA to indicate a fault condition.

In both cases the fault must be continuously present for more than 5 seconds.

Fault Conditions Continued.....

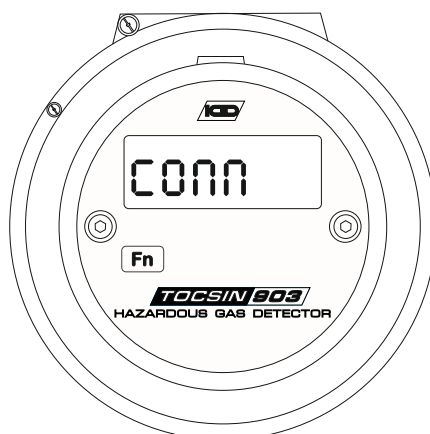
Section 3.2 Sensor Fault.

If the controller detects that the analogue control loop between the detector and controller is either open circuit or short circuit then the following display is indicated. when corrected the display will revert to normal operation



This indicates an analogue sensor fault, either open or short.

For digital detectors should communication between the Tocsin 903 and the detector be lost then the following error message is displayed. Normal operation is resumed once the error is corrected.



This indicates a communication error between the T903 and detector.

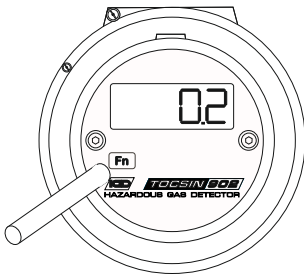
In both cases the fault must be continuously present for more than 5 seconds.

Password Protected Menus

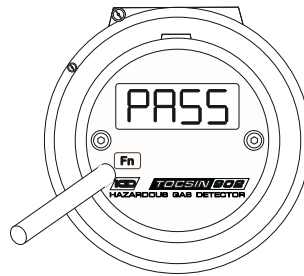
The Tocsin 903 stores its calibration and set up information in battery backed memory. To access these functions it is necessary to enter a password as previously described. These password protected functions should only be carried out by trained staff otherwise problems can arise due to poor calibration or zeroing. Similarly if detector set up functions are incorrectly set then poor performance could result.

Follow the procedure described below to gain access to the system calibration and set up functions.

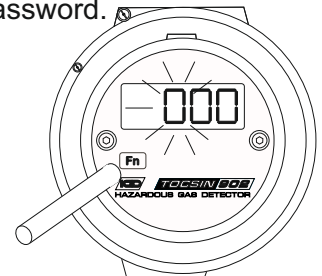
With the display indicating 0.2 hold the magnetic pointer over the Fn area..



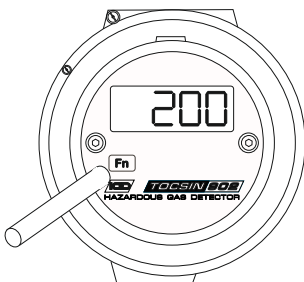
The display will indicate PASS remove the pointer when this is displayed.



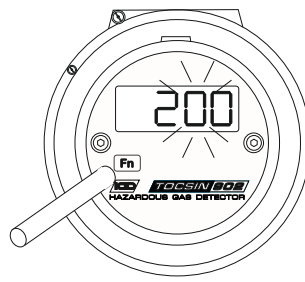
The display will now indicate all zero's. The first zero will be flashing. The T903 is expecting a password.



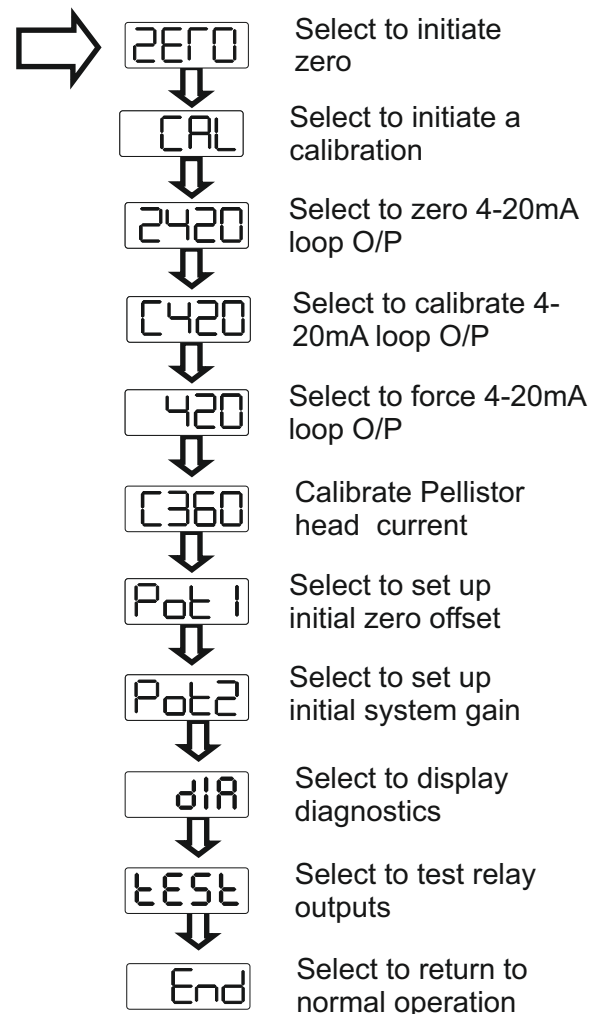
Bring the magnetic pointer over the Fn area and the digit will increment. Alter the display to read as required



Hold the magnetic pointer over the Fn area. Each digit in turn will flash.



When all digits are flashing remove the pointer. The display will now cycle through the available options



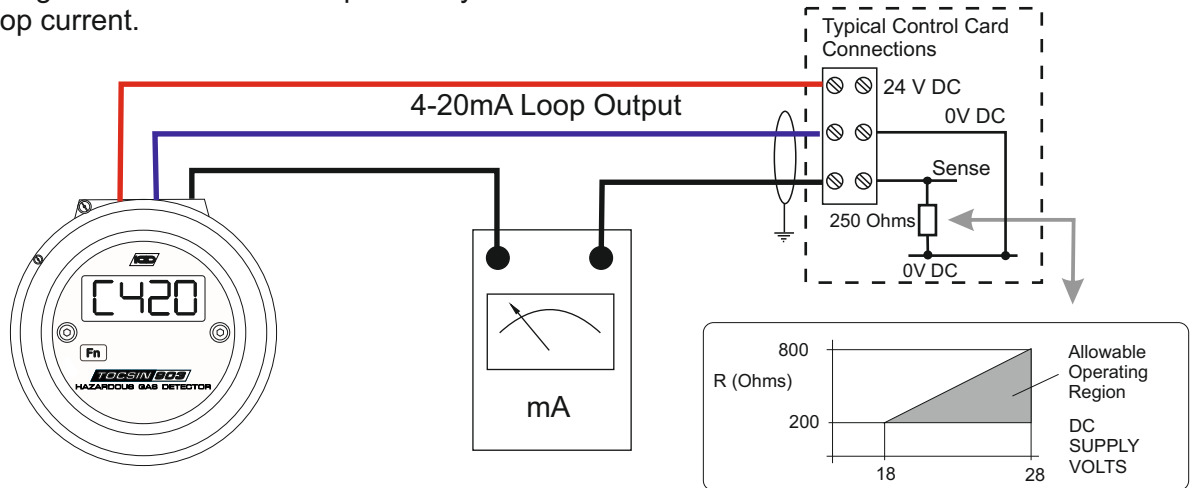
NOTE:

These menus are shown for information only and should only be accessed by a trained Oliver IGD appointed engineer. Altering any of the following settings can result in inadvertent damage or unexpected operation of the unit.

C420 Select to calibrate 4-20mA loop O/P

The 'C420' function is used to calibrate the 4-20mA loop output by the following method.
NOTE ZERO FIRST THEN CALIBRATE.

- 1 Using a calibrated ammeter preferably traceable to a national standard measure the loop current.



- 2 Select the '420' option and set the current loop output to 18mA. Observe and record the meter reading. If it matches the set output current no further action needs to be taken the current output is already set up and calibrated.
- 3 If the ammeter reading differs from that set using the '420' function then calibrate the loop by using the 'C420' function. Whilst the '420' function is still outputting a fixed value select the 'C420' function. Adjust the on screen value up/down until the reading matches the ammeter reading. Use the '420' function again to check that the ammeter and Tocsin 902 are concurrent. Note that it may be necessary to repeat this process a few times if there was a large initial difference.

2420 Select to zero 4-20mA loop O/P

Follow the same basic procedure described for calibration but this time use it to zero the 4-20mA loop output.

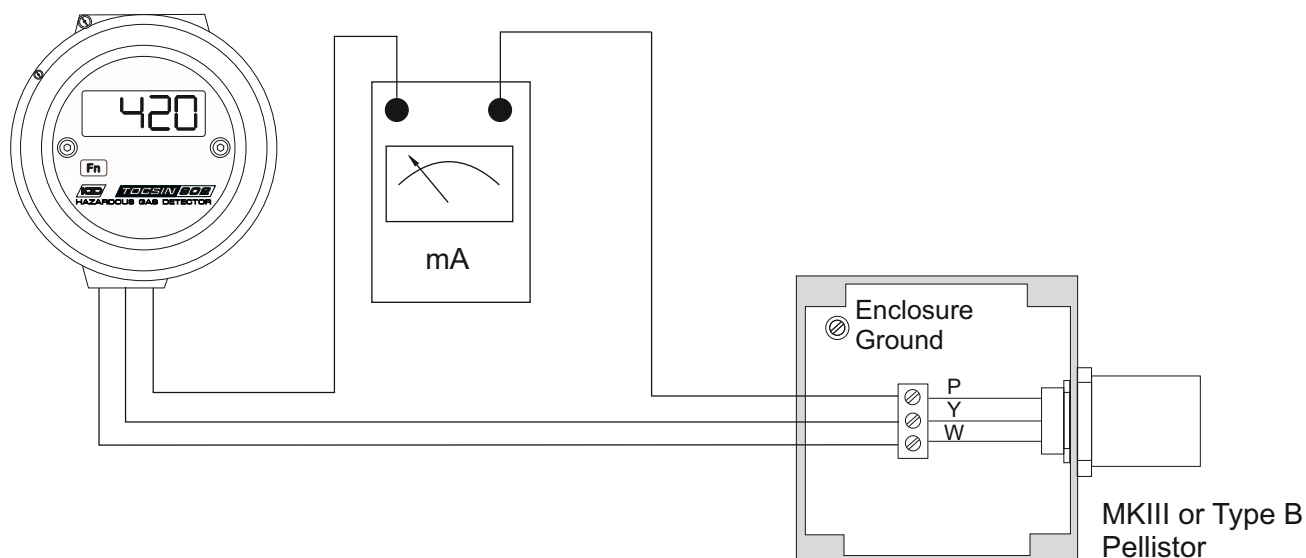
420 Select to force 4-20mA loop O/P

The '420' function allows the user to output a set current for diagnostic purposes on the 4-20mA loop output. The output once set will remain for a short period until the system times out and returns to normal operation or a new value is input. Maximum output value is 25mA.

C360 Select to calibrate the pellistor drive current

This function can be used to eliminate any read errors between the set drive current for a pellistor head and the current measured using an external ammeter. For example if the Tocsin 903 indicates it is outputting 360mA to the measuring head but an external ammeter indicates 350mA then select C360 and increment the displayed value until 360mA (+/-5mA) is indicated on the ammeter.

Checking the head current is calibrated



Pot 1 Select to set up
initial system zero

The 'POT 1' function sets up an initial zero setting using an electronic 'potentiometer'. Once set at the factory this should not need to be re-set during the operational life of the Tocsin 903. Note this option is only present when a pellistor type is selected.

Pot2 Select to set up
initial system Gain

The 'POT 2' function sets up an initial gain setting using an electronic 'potentiometer'. Once set at the factory this should not need to be re-set during the operational life of the Tocsin 903. Note this option is only present when a pellistor type is selected.

tSt Select to test relay output function

This option will energise all the output relays for a short period. Note this feature is only operational on models fitted with relay outputs.

dIR Select to display system diagnostics sequentially as:
Concentration, Volts, Zero Volts, Cal Volts, Bottle Value
Each button press shows the next parameter.
Select END when displayed to return to the main menu.

End Select to return the Tocsin 902 to normal
operational mode.

PRODUCTION SET UP MENU

Enter Code 345 to gain access to the engineer set up menus for the Tocsin 903. This menu system should only be used by trained engineers as it is possible to alter the basic operation of the unit with this menu. Menu options are as follows:

SEn Select to alter the sensor input type

Options are: PEL for pellistor input, T102 for toxic 102 series detectors, IR for infra red detectors, 4-20 for standard 4-20mA input devices.

Unit Select to alter the units for the 903

Options are: LEL, PPM, VOL note the units option is important when the Tocsin 903 is used in addressable mode. If not set correctly then the displayed units will be incorrect on the host control panel.

SPAn Select to alter the Range for the 903

This option allows the user to alter the range on the 903 display and is used when scaling the 4-20mA input. Again if set incorrectly the units display and transmitted data will be incorrect. Note that if the range is altered from the factory set range then the alarm levels will be reset to defaults. These defaults will be 20 and 50% of the set range and can be altered to any desired value within the set range after the range has been set.

Add Select to alter the address for the 903

Use this option to set the unit address when used in addressable mode.

SEr Select to alter the serial number of the 903

Use this option to set a serial number if required for the 903

PORT Select to alter the output port function of the 903

Use this option to set the output port either to run a relay card or addressable RS485

End Select to return to normal operation

All these menu items operate in the same manner. Enter code 300 in password mode and each menu item is displayed in turn. Select a menu item and by using the magnet each menu item can be displayed in turn. When the required item is displayed hold the magnet over the function button until the display flashes. The option is now selected into memory.

APPENDIX 1 PUTTING INTO SERVICE

For point gas detection to be effective, detectors must be correctly installed, located and calibrated. This section is intended to provide an overview to effectively put point gas detectors into service and the factors to be taken into consideration.

- 1 Gas detection is fitted to mitigate risks from hazardous gas hazards that have been identified during hazard risk assessments. Consideration must be given to ensure that the gas detectors fitted are appropriate to (a) mitigate the hazard (b) Are suitable for the environmental conditions (c) Are approved to a standard suitable for the zoning of the area involved.
- 2 Tocsin 903 series controllers and their associated detectors are EXD certified ATEX rated detectors suitable for zone 1 and 2 deployment. Ensure the ATEX zoning requirements are concurrent with the units certification.
- 3 Cable glands and seals must also carry suitable certification and be installed as described earlier in this manual and to manufacturers certification requirements. If in doubt seek clarification.
- 4 Cabling for EXD equipment must have suitable mechanical protection and have sufficient electrical characteristics for the installation. IGD can offer guidance if required for specific installations.
- 5 903 Series controllers and associated detectors must be sited ensuring the units environmental ratings for temperature, humidity etc are not exceeded. Consideration to local heat sources, direct sunlight, wind-chill, water jets or spray must be considered as factors for long term reliable operation. Accessories are available to mitigate some of these factors.
- 6 Detectors must be located taking into consideration the characteristic of the gas hazard and potential gas release sources. IGD publish guides to help and can undertake site surveys for specific installations
- 7 Once sited cabling to controllers and detectors must be proved prior to making electrical connection following normal wiring practices.
- 8 For analogue installations it is recommended to prove circuits using signal generators prior to connection. This ensures each cable run is correctly identified at the control panel, that the scaling and response is correct before the 903 and its detector is connected.
- 9 For addressable detectors IGD publish a recommended cable commissioning procedure which is available on request.
- 10 Once powered allow the 903 controller to complete its normal start up cycle. Do not bypass. At the end of this cycle ensure the reading indicates as expected (most flammable or toxic gas detectors should read zero at this stage but may read any background gas level present. Note that Oxygen detectors should read 20.9% and low range CO2 detectors may be reading circa 400ppm background).
- 11 To ensure correct operation at this point in commissioning a suitable zero gas should be applied and if necessary the detector can be zeroed using the controller menu system. Once zeroed and with the zero gas still flowing ensure the host control system is also reading zero. Note that the correct calibration gas adaptors must be used and gas applied at a flow rate between 0.5 to 1L/min.

- 12 Once the zero point has been correctly established and with system alarms suitably inhibited, calibration gas can be applied. This should be gas of a known value traceable to nationally recognised standards and be a suitable mixture for the detector to which it is being applied. If in doubt IGD can advise in specific circumstances. Note that the correct calibration gas adaptors must be used and gas applied at a flow rate between 0.5 to 1L/min. If necessary use the 903 controller software to adjust the calibration point to read the applied gas correctly. At this point with gas still flowing ensure the host monitoring system reads concurrently.
- 13 Re-apply zero gas to flush calibration gas from the detector and ensure that post calibration the detector returns to reading zero.
- 14 Remove the zero gas and observe correct operation noting that the detector may now start registering any background level of the target gas that may be in the environment.
- 15 Details of calibrations and checks undertaken in this manner should be recorded for future reference.
- 16 Detectors will require regular calibration checks. The frequency of such checks will be a function of the environment in which the detector is installed. Temperature changes, wind chill, humidity variations, water spray and vibration if present to any great degree will all work to increase required calibration frequency. After initial installation detector performance should be monitored through calibration to establish suitable calibration frequency which may not be the same for similar detectors on the same site due to their environmental circumstance.
- 17 If controllers and detectors are switched off and on then they must be re-verified by checking operation with zero and calibration gas to ensure correct operation.
- 18 Refer to earlier Forms for ATEX installation and maintenance checks.



International Gas Detectors

Doc Ref: SL-039 v17pg 35

EC Declaration of Conformity

Declares that the product listed as:

TOCSIN 903

Single channel gas detector controller with display certified for use in potentially explosive atmospheres Can be combined with 102 or MK3 series detectors. Interfaces for alarm relay outputs, 4-20mA signal.

Are in conformity with the provisions of the following European Directive(s) when installed, operated, serviced and maintained in accordance with the installation and operating instructions contained in the product documentation.

Issuers name and address:

Oliver IGD Limited of
Triton House
Crosby St,
Stockport,
SK2 6SH
United Kingdom

2004/108/EC **EMC Directive**
2014/35/EU **Low Voltage Equipment Directive** (note not applicable to 24V DC Powered Versions)

And that the standards and/or technical specifications referenced below have been applied or considered.

IEC 60079-0:2017 7th Ed	Explosive Atmospheres Equipment General Requirements
IEC 60079-29-1:2016 2nd Ed	Explosive Atmospheres. Gas Detectors. Performance Requirements of Defectors for Flammable Gases.
IEC 60079-1	Equipment protection by flameproof enclosures 'd'
EN 50270	Electromagnetic compatibility - Electrical Equipment for the Detection and Measurement of Combustible Gases, toxic Gases or Oxygen
IEC 60529	Degree of Protection to IP66
EN 60068-2-6	Vibration
EN 50271	Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen. Requirements and tests for apparatus using software and/or digital technologies
EN 60335:2012+A11:2014	Electrical Safety
IEC 61010-1:2010 +A1:2016	Safety requirements for electrical equipment for measurement, control, and laboratory use
EN 61010-1: 2010 +A1:2019	
Technical File Reference	T750-TF9

Oliver IGD Limited Operate an Independently assessed ATEX/IECEx QAN.

Quality Assurance Certificate Number
16PQAN0014
Quality Assurance Notification Number:
2585



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United Kingdom



FS646773 EMS696504

Oliver IGD Limited operate an independently assessed ISO9001:2015 Quality Management and ISO14001:2015 Environmental Management System

Certificate Numbers
FS0646773 & EMS696504

BSI Assurance UK LTD,
London, W4 4AL
United Kingdom

Testing Agency:

TUV - SUD
Octagon House
Concorde Way
PO 15 5RL
Fareham



IECEx Certificate can be checked on-line at

<http://iecex.iec.ch/iecex/iecexweb.nsf/421ce8815c53a3afc1257a1e00576486/edf48860d8d8c16fc1257f480050cb78?OpenDocument>

TUV Certificates and reports can be checked on-line at https://www.tuev-sued.de/industry_and_consumer_products/certificates

Issued by: Oliver IGD Limited, Stockport, SK2 6SH , United Kingdom

Signature:

Declaration of Conformity in accordance with EN ISO/IEC 17050-1:2010

Name: Andrew J Collier M.I.O.D
Position: Managing Director

Date: 17 Feb 2020

Declaration Ref: T903-DEC-10



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