# MiniPurge® Type X / ET
# Size 2 Manual
# ML 443


**Important Note:**

**It is essential for safety that the installer and user of the Expo system follow these instructions.**

Please refer to the standard for principles and definition.
These instructions apply only to the pressurizing system. it is the responsibility of the manufacturer of the pressurized enclosure to provide instructions for the enclosure.

Expo Technologies reserves the right to replace any component, with one of the equivalent functionality.

# Contents

# Section 1: System Specification - MiniPurge® Type X Systems

**Model No. (Example): 07 2 X LC / ss / ET / PO / WM** (Note: Not all codes are applicable)

**Purge System Type**

**07** = MiniPurge

**Size**

**2** = MiniPurge
Purge flow rate:
450 Nl /min, 16 scfm

**Approval / Certification**

**ATEX (Europe)**
EN60079-0, EN60079-2, EN60079-11
**Sira 01ATEX1295X**
CE 2804 Ex II 2 (2) G D
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
Tamb -20°C +55°C

IECEx (International)
EN60079-0, EN60079-2, EN60079-11
**IECEx SIR 07.0027X**
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
Tamb -20°C +55°C

INMETRO (Brazil)
**TÜV 12.1462X**
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
-20°C ≤ Ta ≤ +55°C

NFPA (USA)
NFPA 496, FM 3600, 3610, 3615, 3620
**FM 1X8A4.AE**
X-Purge Class I Div 1 Grp ABCD Tamb = 60°C
X-Purge Class II Div 1 Grp EFG Tamb = 60°C

CSA (Canada)
NFPA 496, CSA C22.2 No. 25, No. 30, No. 157
**FM 1X8A4.AE**
X-Purge Class I Div 1 Grp ABCD Tamb = 60°C
X-Purge Class II Div 1 Grp EFG Tamb = 60°C

CCC (China)
**CNEX 2020312304000830**
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
Tamb -20°C +55°C

EAC (Eurasian Economic Union)
TR CU 012/2011
**RU C-GB.AЖ58.B.00906/20**
1Ex [px] ia IIC T5 Gb
Ex [px] ia IIIC T100°C Db
-20°C ≤ Tamb ≤ +55°C

**Options as Required**

**MO** = Manual Override
**MK** = MIU Mounting Kit (PO systems only)
**WM** = Wall Mounting Bars

**Power & Alarm (Signals)**

**PO** = Pneumatic Output Signal

**PA** = Power and Alarm Terminal Switches. Integral /PA Terminal Box

**IS** = Intrinsically Safe Power and Alarm Terminal Box

**Timing Method**

**ET** = Electronic Timer

**MiniPurge® Housing**

**ss** = 316L Stainless Steel (NROB finish)
Neoprene "Top" Mount Gasket

**pm** = Panel Mount (Side/Front Mount) 316L Stainless Steel (NROB finish)

**Pressurization Method**

**CF** = Continuous Flow
**LC** = Leakage Compensation



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For detailed limitations and special conditions of use, please refer to the full certificate as attached to this Manual or available from www.expoworldwide.com

## MiniPurge® Control Unit Data

| | | |
|---|---|---|
| **Supply Pressure:** | | Must be regulated at inlet<br>Minimum 60 psi / 0.4 MPa / 4 bar<br>Maximum 115 psi / 0.8 MPa / 8 bar |
| Air Quality: | | Compressed air / Nitrogen to instrument quality |
| Ambient Temperature: | | -20°C to + 55°C |
| Leakage Compensation: | | Variable up to 9 scfm / 250 Nl/min to compensate for leakage of enclosure |
| Bulkhead Pipe Fittings: | Air Supply: | 1/2" NPT |
| | Output: | 1/2" NPT |
| | Signal: | 1/8" NPT |
| Visual Indicators: | CF / LC | Alarm (Red 🔴) / Pressurized (Green 🟢)<br>Purge Complete (Black ⚫ / Yellow 🟡) |

**/PA Terminal Box:**

| | |
|---|---|
| | Stainless Steel, Ex e IIC T5 Gb / Ex tb IIIC T100°C Db IP66 Tamb: -20°C to +55°C with terminals, front access cover & lower removable gland plate.<br>Stainless Steel, Ex e IIC T4 Gb Tamb: -20°C to +60°C with terminals, front access cover & lower removable gland plate. |
| Power Interlock Switch: | DPNO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db. |
| Alarm Switch | SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db. |
| Intermediate Switch: | SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db. |
| System Purging Switch (Optional): | SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db. |

**/IS Terminal Box:**

| | |
|---|---|
| | Stainless steel, for intrinsically safe circuits only, c/w blue terminals, front access cover and lower removable gland plate. |
| Power Interlock Switch: | Volt Free contacts for the connection of Intrinsically Safe Circuits. |
| Alarm Switch | Volt Free contacts for the connection of Intrinsically Safe Circuits. |
| Intermediate Switch: | Volt Free contacts for the connection of Intrinsically Safe Circuits. |
| System Purging Switch (Optional): | Volt Free contacts for the connection of Intrinsically Safe Circuits. |

**/PO Terminal Box**

| | | | |
|---|---|---|---|
| Power Interlock Switch: | 2.3 barg outlet via 1/2" NPT Female connection. | | |
| Alarm / Pressurized Signal: | 2.3 barg outlet via 1/2" NPT Female connection. | | |
| Purge Time: | User selectable, in 1 minute intervals up to 99 minutes (tolerance -0+3 seconds) | | |
| Flow & Pressure Sensors: | CF: | One sensor for both "Low Pressure and Flow": | 1" WC / 250 Pa (2.5 mbar) |
| | LC: | "Low Pressure Sensor" | 0.2" WC / 50 Pa (0.5 mbar) |
| | | "Flow Sensor" | 1.13" WC/ 280 Pa / (2.8 mbar) |
| Action on "Loss of Pressure": | CF: | Action on "Loss of Pressure" = "Alarm & Trip". Option /AO specifies an "Alarm Only" kit. | |
| | LC: | Action on "Loss of Pressure" = "Alarm & Trip" or "Alarm Only". LC Model is user selectable. | |

**Relief Valve Unit and Purge Outlet Valve with Integral spark arrestor**

| System: | | **CF** | **LC** |
|---|---|---|---|
| Type: | | RLV36/ss | RLV36/FS/ss |
| Opening Pressure: | | 4" WC / 1 kPa (10 mbar) | 4" WC / 1 kPa (10 mbar) |
| Purge Flow rate: | | N/A (see Spark Arrestor) | 16 scfm / 450 Nl/min |
| Material | Housing: | 316L Stainless Steel | |
| | Gasket: | Neoprene | |

**Spark Arrestor Unit (CF Systems Only)**

| | | |
|---|---|---|
| Type: | | SAU40 |
| Purge / Dilution Flow Rate: | | 8 - 16 scfm / 225 – 450 Nl/min<br>4 user selectable orifice plates |
| Material: | Housing: | Stainless Steel |

# Section 2: Specific Conditions of Use (ATEX and IECEx Certificates)

When using the AO, AS and DT options, the recommendations for the additional requirements of Ex p apparatus contained within IEC EN 60079-14 shall be applied.

The installer/user shall ensure that the MiniPurge Control Unit is installed in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.

The values of the safety parameters shall be set in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.

This MiniPurge Control Unit shall be incorporated into equipment and the appropriate Conformity Assessment Procedures applied to the combination (as defined by Directive 2014/34/EU – ATEX). This certificate does not cover the combination.

The purge controller, low temperature version, shall be protected by a safety related system that ensures that it cannot be energised if the temperature of the air inlet or purge controller falls below -20°C. This system shall utilise the RTDs that are fitted to the purge controller to provide the appropriate level of system integrity (i.e., a level of operational safety of CAT 3 according to EN 954-1 for ATEX Category 2 & Zone 1 applications): note that these RTDs have not been assessed as a safety related device (in accordance with EHSR 1.5 of the ATEX Directive).



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# Section 3: Application Suitability

MiniPurge® Systems are certified for use in Hazardous Areas, where the Hazardous Area is non-mining (i.e., above ground) and the hazard is caused by flammable gasses, vapours, or dust. Depending on the model, the systems may be used in IECEx, ATEX Zone 1(21) - Category 2 and NEC 500 Class I, Div 1.

MiniPurge® systems may be used for hazards of any gas group. However, apparatus associated with the MiniPurge® system, such as Intrinsically Safe signalling circuits and flameproof enclosures containing switching devices may be limited in their gas group. The certification documentation supplied with any such devices must be checked to ensure their suitability.

This system is designed for use primarily with compressed air. Where other inert compressed gasses are used (Nitrogen, for example) the user must take suitable precautions so that the build up of the inert gas does not present a hazard to health. Consult the Control of Substances Hazardous to Health (COSHH) data sheet for the gas used. Where a risk of asphyxiation exists, a warning label must be fitted to the Pressurized Enclosure.

The following materials are used in the construction of MiniPurge® systems. If substances that will adversely affect any of these materials are present in the surrounding environment, please consult Expo for further guidance.

Materials of construction:

| | | | |
|---|---|---|---|
| • Stainless Steel | • Aluminium | • Acrylic | • Polycarbonate |
| • Mild (carbon) Steel | • Nylon | • Silicone Rubber | • ABS |
| • Brass | • Polyurethane | • Neoprene | • Glass Filled Polyester |



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# Section 4: Description and Principle of Operation

The MiniPurge® system is pneumatic in operation, with electrical interfaces.
Purge and pressurization is a method of protection used in Zone 1 (21) and/or Zone 2 (22) hazardous locations to ensure that the interior of an enclosure is free of flammable gas. Addition of a MiniPurge® system allows the electrical equipment within the enclosure to be used safely in a hazardous location.
The principle of purge and pressurization is as follows:
• Clean compressed air or inert gas is drawn from a non-hazardous location.
• The interior of the pressurized enclosure is flushed to remove any hazardous gas or dust.
• This is introduced into the pressurized enclosure to keep the internal pressure at least 0.5 mbarg above the external pressure.
• Whilst pressurized, flammable gas cannot enter the enclosure from the environment.
Prior to switching on the power to the electrical equipment, the enclosure must be purged to remove any flammable gas that might have entered the enclosure before pressurization. Purging is the process of removal contaminated air and replacement with air (or inert gas) known to be free from flammable gas. The duration of this purge process is normally ascertained by performing a purge test.
At the end of the purge cycle the system automatically switches to leakage compensation mode. The Purge Outlet Valve is closed, and the airflow is reduced but remains high enough to compensate for the leakage of air from the enclosure whilst maintaining the minimum over pressure state.
In the event of pressure failure within the pressurized enclosure the system will raise an alarm in the form of visual indicators and a volt free contact depending on the specification of the system. The default action on loss of pressurization is alarm and automatic disconnect of power (A&T - Alarm and Trip). This can be changed by the customer to Alarm Only (/AO), please refer to section titled Main Components.

# Section 5: Main Components

The MiniPurge® system comprises several component units. The units required depend on the type of system selected. These are summarised in Table 1.

All Expo Technologies MiniPurge® pressurization systems provide:
a) a method of pressurizing a Pressurized Enclosure (PE) while at the same time compensating for any leakage, together with
b) a method of purging the enclosure, before power is applied, to remove any flammable gas that may have entered the enclosure while it was not pressurized,
c) visual indication of the MiniPurge® system status, and
d) an output to provide remote indication or control.

### 5.1 Control Unit (CU)

The Control Unit (CU) is the heart of the system. It contains a pneumatic logic circuit specially designed and built to control the functions required for purge and pressurization. For all systems this includes air filtration, pressure and purge flow measurement, electronic purge timing, and local visual indication of Pressurized/Alarm and flow sensed. It also provides the outputs for power and remote alarm control corresponding to the output type selected.


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## 5.2 Relief Valve (RLV)

The Relief Valve unit is fitted to the PE to provide a means of limiting the maximum pressure experienced by the PE during operation. The RLV model number has a suffix giving the diameter of the valve aperture in millimetres e.g., RLV36 (= 36mm bore). The RLV also incorporates a Spark Arrestor to prevent sparks being ejected from the PE into the classified area.
In Leakage Compensation systems, the RLV is combined with the flow measurement mechanism.

Figure 1 LC Relief Valve

## 5.3 Calibrated Outlet Orifice/Spark Arrestor (SAU)

Continuous Flow systems incorporate the SAU40. This unit has a range of interchangeable calibrated orifice plates, which are used to measure the flow through the PE.

## 5.4 The Methods of Pressurizing

### a) CF - Continuous Flow

A Continuous Flow (CF) of protective gas is passed through the PE. Initially this flow is verified and performs the purging phase of the operation. When the purging phase is completed – i.e., the purge time has elapsed- the same flow of protective gas maintains the pressurization of the enclosure. This flow may be required to dilute an internal source of hazardous gas release.

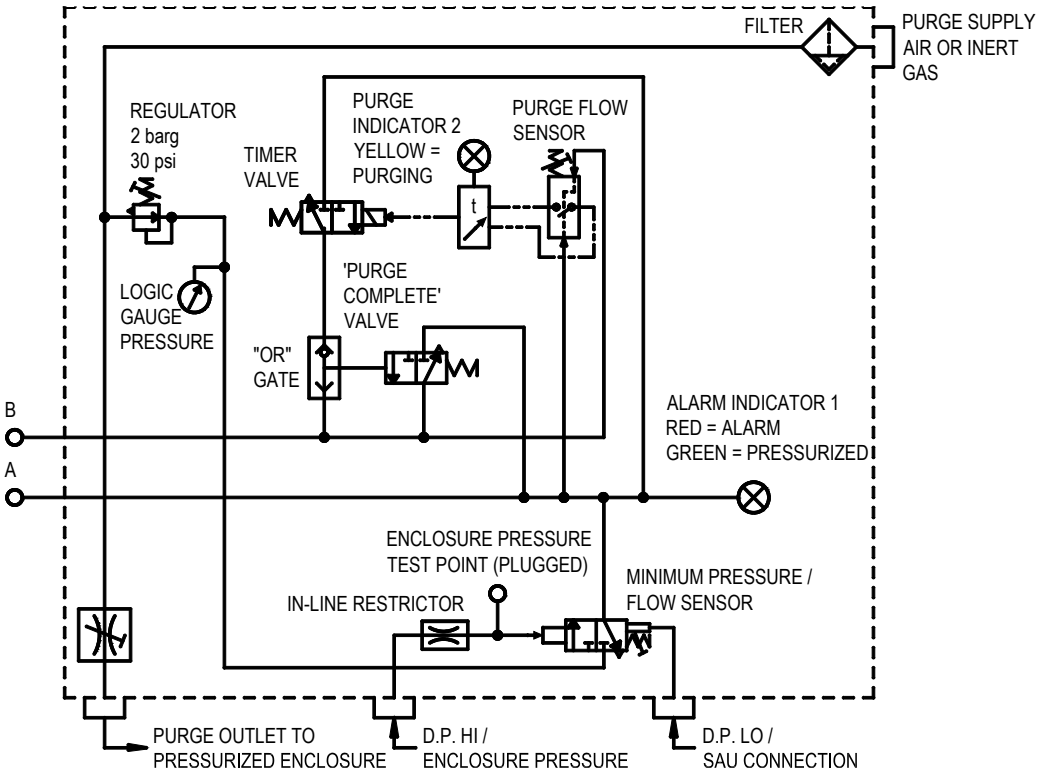


Figure 2 Continuous Flow Circuit Diagram

### b) LC - Leakage Compensation

Initially a high flow of protective gas is passed through the enclosure. This flow is verified and performs the purging phase of the operation. When the purging phase is completed – i.e., the purge time has elapsed - the flow of protective gas is provided via an adjustable valve so that it just compensates for any leakage from the PE in addition to maintaining its pressurization.


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If leakage is less than 5 l/min then the LCV will be awkward to set. You will find that the RLV spring will cycle open and closed. If this happens contact our service department for advice.

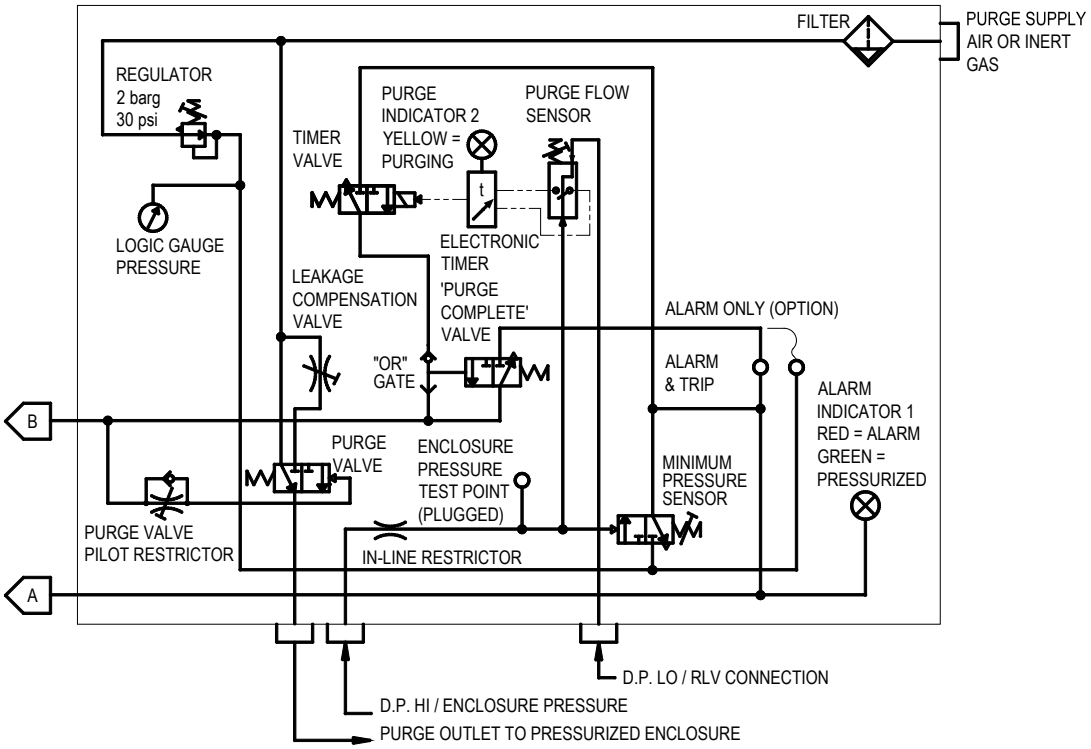


Figure 3 Leakage Compensation Circuit Diagram


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## 5.5 Type of Output

The functions of the outputs are power control and alarm/pressurized indication. Power control provides a signal to switch the power to the PE. Alarm output provides a passive signal to indicate remotely when the enclosure is not pressurized and an active signal when pressurized.

### a) PO- Pneumatic Output

The power control and pressurized outputs are pneumatic signals, which may be used to operate other devices to provide power switching or alarm indication. The lack of any output signal indicates incomplete purge and alarm. In many instances these outputs may be connected to the Expo range of MiniPurge® Interface Unit s (MIU).

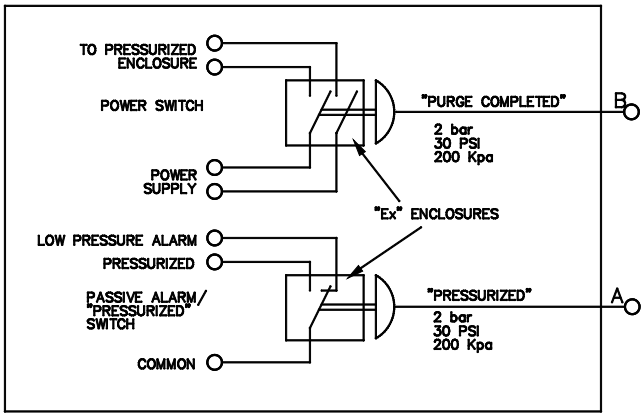


Figure 5 Pneumatic Output Option


Figure 4 Typical MiniPurge Interface Unit type (MIU/dA)

### b) IS - Intrinsically Safe Output

The power control and alarm outputs are volt free contacts which form part of an Intrinsically Safe (IS) circuit which then provides power control or alarm outputs in a safe (unclassified) area. These contacts must only be connected to IS circuits as the switch contacts are in the hazardous area. In many instances these outputs may be connected to the Expo range of MiniPurge® Interface Units (MIU).

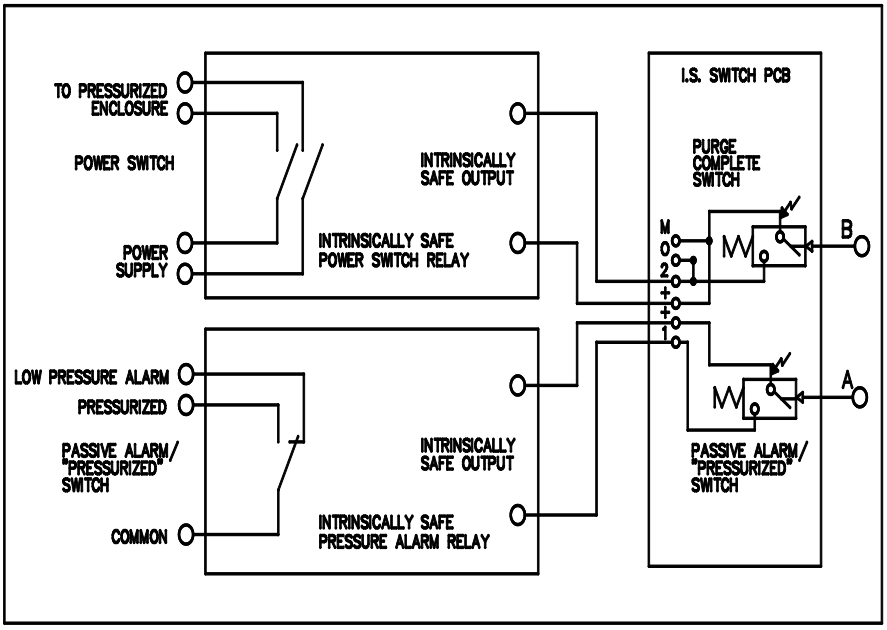


Figure 6 Intrinsically Safe (IS) Option



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### c) PA - Power and Alarm

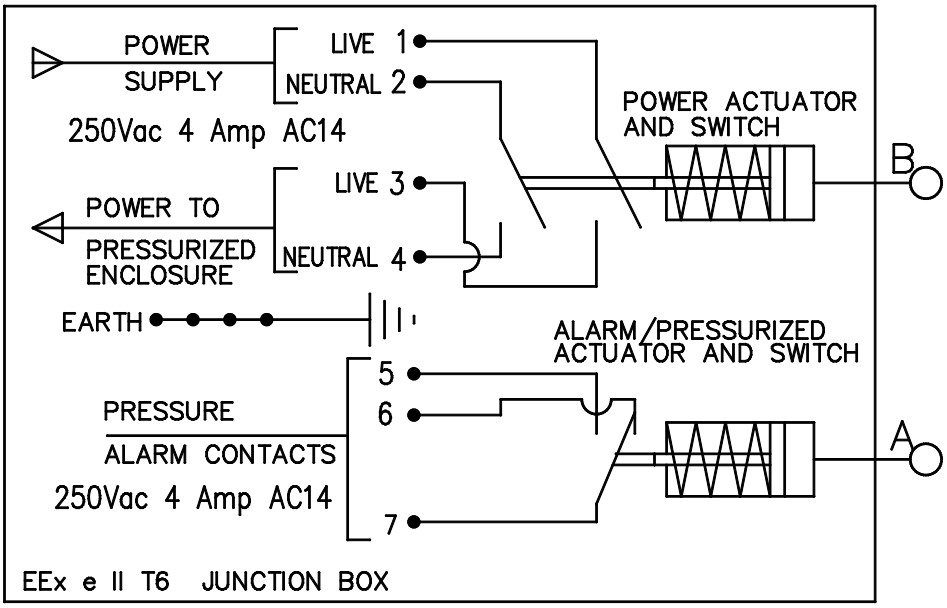


Figure 7 Ex de Power and Alarm (PA) Option

The Terminal Box is increased safety (Ex e) certified and incorporates the terminal connection points for the alarm and interlock switches. All contacts provided are volt free (dry).

Cable entry methods (for example conduit or cable glands) must be certified to IECEx, ATEX or INMETRO standards. The main requirement is that IP66 (or better) ingress protection must be provided by use of seals or washers.



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# Section 6: Installation of the System

This MiniPurge® is designed for use under normal industrial conditions of ambient temperature, humidity, and vibration. Please consult Expo before installing this equipment in conditions that may cause stresses beyond normal industrial conditions.

The MiniPurge® system shall be installed in accordance with relevant standards, such as IEC / EN 60079-14, NEC 500, NFPA 496 and any local codes of practice that are in force.

There are up to three components for the MiniPurge® system, dependent upon the system type:

| System type | Control Unit (CU) | Relief Valve (RLV) | Spark Arrestor Unit |
|---|---|---|---|
| Leakage Compensation | YES | YES | Integral to RLV |
| Continuous Flow | YES | YES | YES (SAU40) |

Table 1 System Components

### 6.1 Control Unit (CU)

The MiniPurge® system should be installed either directly on or close to the PE. See mounting details. Generally, the most convenient arrangement is to install the CU on the top of the PE. Must be mounted vertically as shown in MiniPurge® Configuration XBR-7TD0-003. The CU can be mounted on the side of the PE using the rear mounting fixings. The piped connections to the PE should be made using metallic tube through suitable bulkhead connections. The CU can be remote mounted using the wall mounting bars (/WM option) and should be installed as close as possible to the PE. It should be installed so that the system indicators and certification labels may be readily observed.

### 6.2 Relief Valve (RLV) and Spark Arrestor Unit (SAU)

To achieve efficient purging the points where air enters and exits the PE should normally be at opposite ends of the PE. These items must be mounted vertically. The RLV or SAU are recommended to be situated at the bottom, or on the side of the enclosure at the bottom, when the CU is top mounted on the enclosure, thus achieving top to bottom purging. The purge air may be piped within the PE to ensure purging of potential dead air spots.
It is important that the interior and exterior of the Spark Arrestor is kept clean and debris is not allowed to accumulate which might affect the calibration of the device. The exterior of the Spark Arrestor should not be painted or blocked off in any way.

### 6.3 Connections to Protective Gas Supply

The MiniPurge® system should be connected to a protective gas supply, which is suitable for purging and pressurization.

The supply pipe connection to the MiniPurge® must be appropriate for the maximum input flow rate for the application.

The air supply must be regulated at a pressure less than the maximum stated inlet pressure.

The air supply must be clean, non-flammable and from a non-hazardous location. The air should be of Instrument Air Quality. Although the purge control system will operate with lower air quality, its operational life will be adversely affected. The equipment that is being protected by the MiniPurge® may also suffer because of poor air quality.


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With reference to BS ISO 8573-1: 2010, Instrument Air is typically specified as:
*Particle Class 1*
In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 to 0.5 micron size range, 400 particles in the 0.5 to 1 micron size range and 10 particles in the 1 to 5 micron size range.

*Humidity or pressure dew point*
The dew point, at line pressure, shall be at least 10 °C below the minimum local recorded ambient temperature at the plant site. In no case, should the dew point at line pressure exceed +3 °C.

*Oil Class 2*
In each cubic metre of compressed air, not more than 0.1mg of oil is allowed. This is a total level for liquid oil, oil aerosol and oil vapour.

When an inert gas is being used to supply the purge system, risk of asphyxiation exists. Refer to *Application Suitability* section.

Before connection of the air supply to the purge system, the supply pipe work should be flushed through with instrument quality air to remove any debris that may remain in the pipes. This must be carried out for at least 10 seconds for every meter of supply pipe.

Unless a supply shut-off valve has been fitted to the MiniPurge® system, an external shut-off valve with the same, or larger, thread size as the Control Unit inlet fitting should be fitted by the installer to prevent any restriction of purge flow.

The purge air from the MiniPurge® Control Unit should be piped within the pressurized enclosure to ensure purging of potential dead air spots.

The purge system is fitted with an internal regulator factory set to 3 bar feeding the logic.

### 6.4 Purge Air from CU to PE
When the CU is mounted directly on the top of the PE, no connection will normally be necessary, as the purge air will discharge into the PE directly. When the CU is not mounted on the top of the PE, or where internal air distribution is necessary a connection should be made from the purge air outlet on the CU (normally 1/2" NPT Female), via pipe pressure rated at least to the supply pressure, to the PE. This should be kept as short as possible and should be adequately sized to ensure that the full purge flow can be delivered.

### 6.5 CU to Enclosure Pressure Monitor
When the CU is mounted directly on the top of the PE, no connection will normally be necessary, as the enclosure pressure monitor point will sense directly inside the PE.

If the CU is not mounted directly on the top of the PE or if there are fans, which may create localised low-pressure areas within the PE, it is necessary to pipe this connection. The connection is made to the enclosure pressure sensor fitting (normally 1/8" NPT Female) on the CU. There is virtually no flow in this circuit, so small bore tube may be used. Expo recommends 6mm O/D stainless steel tube. Make sure that all connections are free of leaks.

### 6.6 CU to Flow Sensor
In Continuous Flow **(CF)** systems, a Differential Pressure Sensor is combined with the Minimum Pressure Sensor and measures the "DP HI (High) / Enclosure Pressure" within the PE and the pressure in the monitoring device at the back of the SAU "DP LO (Low) SAU Connection". This connection requires a pipe connection between the CU and the SAU40.
In Leakage Compensation **(LC)** systems a dedicated Purge Flow Sensor measures the differential pressure between the "DP HI (High) / Enclosure Pressure" and the pressure in the monitoring device at


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the back of the RLV "DP LO (Low) RLV Connection". This connection requires a pipe to connect the CU to the RLV36.

### 6.7 Power Supplies and their Isolation

All power entering the PE shall be provided with a means of isolation. This requirement also applies to any external power sources, which are connected to equipment such as "volt-free" or "dry" contacts within the PE. Printer signal, network cards, etc need isolation.

**Exception:** Power to other apparatus that is already suitable for the hazardous area need not to be isolated by the MiniPurge® system.
In all cases the application and the isolation of the power must be controlled by the MiniPurge® system. Refer to Specification Sheet for output options available.

### 6.8 Adjustments and Settings

**Purge Time**

If no specific purge test has been performed on the PE, the volume of the PE must be determined by the manufacturer or user and the necessary purging time calculated based on the purge flow rate specified by the "standard" being used. It is the user's responsibility to verify or enter this data on the PE and/or MiniPurge® system nameplate. Ask Expo if in doubt. The IEC / EN 60079-2 permit 5 volume changes and an example of the calculations is as follows:

If the PE external dimensions indicate an internal volume of 1000 Litres then,

$$\frac{\text{1000 litres enclosure volume x 5 volume changes}}{\text{450 litres/minute purge flow rate}} = \text{12 minutes purge time}$$

If the PE is a motor, experience of purge testing shows that it is prudent to multiply the motor internal "free" volume by ten to get the purging volume.

$$\frac{\text{1000 litres enclosure volume x 10 volume changes}}{\text{450 litres/minute purge flow rate}} = \text{23 minutes purge time}$$

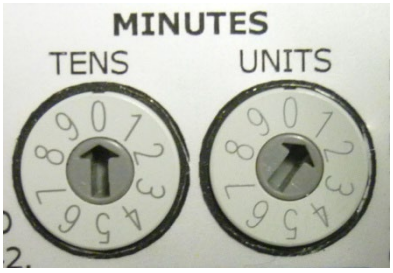
The following applies for NFPA 496 standards where 4 complete volume changes are permitted for enclosures except when the PE contains a motor when 10 volume changes are required.

If the PE external dimensions indicate a total volume of 40 cubic foot, then,

$$\frac{\text{40 cubic foot enclosure volume x 4 volume changes}}{\text{16 cubic foot/minute purge flow rate, (see above)}} = \text{10 minutes purge time}$$

If the same PE contains a motor, then,

$$\frac{\text{40 cubic foot enclosure volume x 10 volume changes}}{\text{16 cubic foot/minute purge flow rate, (see above)}} = \text{25 minutes purge time}$$




The standard MiniPurge® units have an electronic timer system as shown in Figure 8 MiniPurge® Timer Selector Switches. The purge time is set by adjusting the Timer Selector Switches so that the time equals or exceeds the required purge time. **If the time is set to '00', the purge time will be indefinite.**

Figure 8 MiniPurge® Timer Selector Switches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## Purge Flow Rate (Orifice Size Selection) - Only for CF Systems

The purge flow rate is selected by placing the appropriate orifice plate in the SAU. The purge flow rates given in Table 2 are based on standard setting of the flow sensor of 2.5mbar, 1" WC, 250Pa. For LC systems the purge flow rate is set by the selection of the RLV and is not user adjustable.

| Orifice Plate Number | Continuous Flow Rate with 2.5 mbarg, 1" WC, 250 Pa flow sensor set point | |
|---|---|---|
| | N litre/minute | SCFM |
| 1 | 225 | 8 |
| 2 | 275 | 10 |
| 3 | 365 | 13 |
| 4 | 450 | 16 |

Table 2 Purge Flow Rates

## Action on Loss of Pressurization

The action on loss of pressurization is the responsibility of the user.
The action on loss of pressurization can be set to ALARMS ONLY (AO), or ALARM AND AUTOMATIC DISCONNECT OF POWER (A&T).

**For both Leakage Compensation and Continuous Flow systems,** the action on loss of pressurization is set by moving the jumper tube (see Figure 9 Action on Loss of Pressurization Jumper Tube). The standard setting is Alarm and Trip where the link is from C to A&T, with a plug in AO. Changing to Alarm Only (AO) is user adjustable by moving the link from C to AO, and plugging A&T.

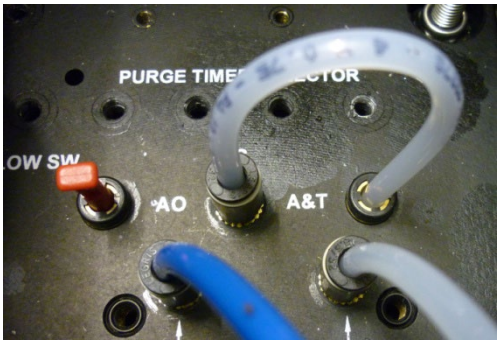


Figure 9 Action on loss of pressurization jumper tube

The selection for action on loss of pressurization depends on the area of operation and the following guidelines should be followed.
The user must make use of this alarm facility in accordance with the local code of practice for "action on pressure or flow failure". Most codes include the following recommendations:
Zone 1 Installations:
Alarm and automatic disconnect of power.
Exception: If the equipment inside the PE is suitable for use in Zone 2, the power trip may be performed manually, (no automatic power trip), if the pressure or flow failure persists for an unacceptable time.

Zone 2 Installations:
Where automatic timing is preferred, Alarm Only on pressure or flow failure with power being removed manually by turning off the air supply to the MiniPurge® system if the failure persists for an unacceptable time.

Class I Division 1 Installations:
Alarm and Automatic Trip of Power. Note: NFPA 496 states power to the circuits shall be permitted to be continued for a short period if immediate loss of power would result in a more hazardous condition and if both audible and visual alarms are provided at a constantly attended location.


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Class I Division 2 Installations:
Where automatic timing is preferred, Alarm Only on pressure or flow failure with power being removed manually by turning off the air supply to the MiniPurge® system if the failure persists for an unacceptable time.

### 6.9 Internal Gas Release

If the PE contains an internal source of release of flammable gas or vapour, the procedures for assessment of the release as given in NFPA 496 or IEC / EN 60079-2 should be used. Expo is pleased to provide assistance or consultancy and advice on such matters.
The user must verify that the specifications of the Expo system e.g., pressure, continuous flow (dilution) rate and type of protective gas are correct for the specific application.

### 6.10 Multiple Enclosures

More than one PE can be protected by a single system. Where PE's are connected and purged in "series" e.g., "Daisy Chained", the RLV and when using a CF system, the SAU40 should be fitted on the last enclosure with the Purge Inlet connected to the first enclosure. The bore and length of the pipe or conduit used to interconnect the enclosures is critical and will determine the maximum pressure experienced by the first enclosure in the series. Advice on sizing can be obtained from the Expo sales office but in general terms when using RLV36 or SAU40, the pipe bore size should not be less than 36mm (1½").
A common fault of installing small bore pipe leads to over pressurizing of all but the last enclosure.
PE's should not be connected in parallel.


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# Section 7: Commissioning

Start by checking that the system has been installed in accordance with this manual.

Disconnect the supply pipe from the inlet to the MiniPurge® system and blow it through for at least 10 seconds per meter (3ft) of length to remove any debris or condensation.

Connect a temporary pressure gauge or water manometer to the PE or MiniPurge® system pressure test point (Remove the red plug on the low-pressure sensor and connect 4mm OD nylon tube).


Figure 10 PE or MiniPurge® system pressure test point

Unless a supply shut-off valve has been specially fitted inside the MiniPurge® system, it may be advisable to install an external shutoff valve with the same, or larger, thread size as the MiniPurge® CU inlet fitting upstream of the connection.

### 7.1 Continuous Flow (CF) Systems

Open the Flow Control Valve (FCV) until the alarm/pressurized indicator just turns from red to green. Clockwise will reduce the flow and anti-clockwise will increase the airflow.
If the FCV is opened fully and the indicator has still not turned green, check the air supply pressure **at the inlet to the Control Unit while flow is taking place**. It must be above the minimum 4 bar/ 60 psig/ 400kPa specified.

Check that the internal logic gauge reads 2bar /30 psig/200kPa.
The electronic timer will start as soon as the "alarm/pressurized" indicator turns from red (alarm) to green (pressurized). Check that the time delay between the indicator flashing yellow and the application of power to the PE is not less than the minimum time required to purge the PE. When the purge time has been completed, the "purge complete" indicator will stop flashing.
After the power has been turned on by the CU, the air flow will continue at the same rate to provide dilution as required.

Figure 11 Flow Control Valve (FCV)


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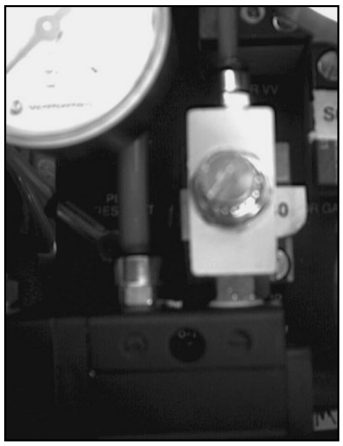
## 7.2 Leakage Compensation Systems (LC)



- Open the Leakage Compensation Valve (LCV) fully, turn anti-clockwise.
- Clockwise will reduce the flow and anti-clockwise will increase the airflow.
- Open the supply regulator SLOWLY and allow the PE pressure to rise until the RLV opens. Check that the RLV opens at or below the figure specified in the documentation.
- RLV tolerance +0, -20% of default setting.
- Repeat the test several times.
- Open the supply regulator to between 4 and 8 barg / 60 and 115 psi / 400 and 800 kPa and the purging flow will start.
- Check that the internal logic gauge reads 2 bar /30 psi / 200 kPa

Figure 12 Leakage Compensation Valve (LCV)

At this time, the "alarm/pressurized" indicator should be green, and the "purging" indicator should be flashing yellow. If the "purging" indicator remains black the flow through the RLV is below the minimum for which the flow sensor has been calibrated. Check the air supply pressure at **the inlet to the Control Unit while purging is taking place**. It must be above the minimum specified.

The electronic purge timer will start as soon as the "purging" indicator starts flashing yellow. Check that the time delay between the "purging" indicator flashing yellow and the application of power to the PE is not less than the minimum time required purging the PE. Times more than the minimum are permitted. If the time is too short, it must be increased accordingly.
After the power has been applied via the CU, the purging valve will close and the air flow into the enclosure will be controlled by the LCV. The initial setting of fully open will normally be too high. It should now be adjusted to set the PE pressure and leakage. There are three possible situations:

Air continues to come out through the RLV Spark Arrestor after power has been applied in considerable quantity. The LCV is much too far open, and the air flow is holding the RLV open continuously.
Close the LCV slowly. The PE pressure will start to fall as the flow decreases but eventually the RLV will close and the enclosure pressure rise again. At this point the RLV may start to open intermittently as the PE pressure rises to the point where it exceeds the RLV opening pressure. When the RLV opens the pressure will fall quickly to the point where the RLV re-closes and the enclosure pressure starts to rise again. This is entirely normal for this type of RLV.

If the RLV is opening intermittently the LCV is slightly too far open. When the RLV opens, the enclosure pressure falls quickly to the point where the RLV re-closes and the enclosure pressure starts to rise again. This is entirely normal for this type of RLV and shows that it is working correctly.
Continue then to close the LCV until the cycling stops and the enclosure pressure starts to fall. Carefully adjust the LCV until the PE pressure is approximately 50% of the RLV opening pressure and stable. This pressure may be around 5 mbarg / 2" WC / 500 Pa and will be the "normal working pressure".

We recommend that the setting of the minimum pressure sensor be checked at this time. Note the position of the LCV knob. (A pencil mark placed on the knob at "12 O'clock" can be used). Slowly lower the PE pressure by closing the LCV further, counting the number of turns from the "normal working pressure" position. Note the pressure at which the "alarm/pressurized" indicator turns from green to red and check that it is not lower than the figure given in the documentation. Check also the "alarm" electrical contacts. As soon as the "alarm/pressurized" indicator turns red, the system will start to re-purge. If Alarm and Trip function is selected the enclosure power will be switched off.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While it is re-purging return the LCV to its "normal working pressure" position so that, at the end of purging, the enclosure pressure should immediately settle down at the correct "normal" pressure.

If, at the end of purging, the PE pressure falls below the minimum pressure sensor setting and the LCV is fully open, the system will start to purge again. This is indicative of excessive leakage from the enclosure. In this case, check the enclosure for leakage, and reduce or eliminate the leaks. This time, at the end of purging, the enclosure should stay pressurized and the RLV action is as in a) or b) above. Proceed as described above.

### 7.3 Normal operation

Turn the air supply on or off to start or stop the system. After this the pressurizing and purging sequence is entirely automatic



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# Section 8: Maintenance of the System

The maintenance recommended for the system consists of the following items, supplemented by any additional local requirements imposed by the local Code of Practice. Expo recommends that the commissioning tests be repeated at least every six to 24 months dependant on site conditions.
In addition, the following checks are also recommended at that time:

- Check the RLV and all Spark Arrestors. Remove all debris & corrosion or replace with a spare.
- Check the condition of the air supply filter element. Clean or replace it, as necessary.

At least every two years check the following additional items:

- Apparatus is suitable for the Hazardous Location
- There are no unauthorised modifications
- The air supply must be to the correct quality, refer to section Air Quality
- The interlocks and alarms function correctly
- Approval labels are legible and undamaged
- Adequate spares are carried
- The action on pressure failure is correct

The Intrinsically Safe Battery Pack should be changed at least every three years, and the commissioning tests repeated. After the timing phase has elapsed, the battery may be 'hot-swapped' in a hazardous environment without effecting the operation of the MiniPurge Ex px system.

**Recommended spares**
ETM-IS31-001 Intrinsically Safe Battery Pack

**Pressure Sensor calibration**
If it is decided that the minimum pressure /purge flow sensor needs recalibrating it must be returned to Expo for this service.

**Filter cleaning**
If the filter element needs cleaning the filter bowl can be unscrewed and removed. The filter element also unscrews and can then be cleaned in soapy water or replaced. Do not use solvents on any part of the filter assembly.


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# Section 9: Fault Finding

If the system does not behave in the manner described above, there is a fault. Some of the more likely faults are dealt with below. If a cure cannot be affected by following the procedure shown below, please call Expo (24 hour answering) or your supplier for further assistance.

The system has been designed for ease of fault finding and the many of the components fitted are plug-in or manifold mounted. Check components by substitution only after establishing that such action is necessary. If the system is less than 12 months old, parts under warranty should be returned to Expo for investigation, with a full report of the fault and the system serial number.

As with any pneumatic system the greatest enemies are water, oil, and dirt in the air supply. For this reason, the air system must always incorporate a dust and water filter. This can be part of the Expo system or can be provided by others. However, dirt can enter from other sources and it is vital therefore that the procedures described in Section 2 is carried out before using the system for the first time or following any disconnection of the pipework. Failure to perform this work may cause damage that will not be covered under warranty.

Before making the following checks verify that both the main air supply pressure to the purge system & the regulated pressure to the logic are as specified on the system specification sheet.

Different flow charts for faulting have been provided for both the CF and LC options.



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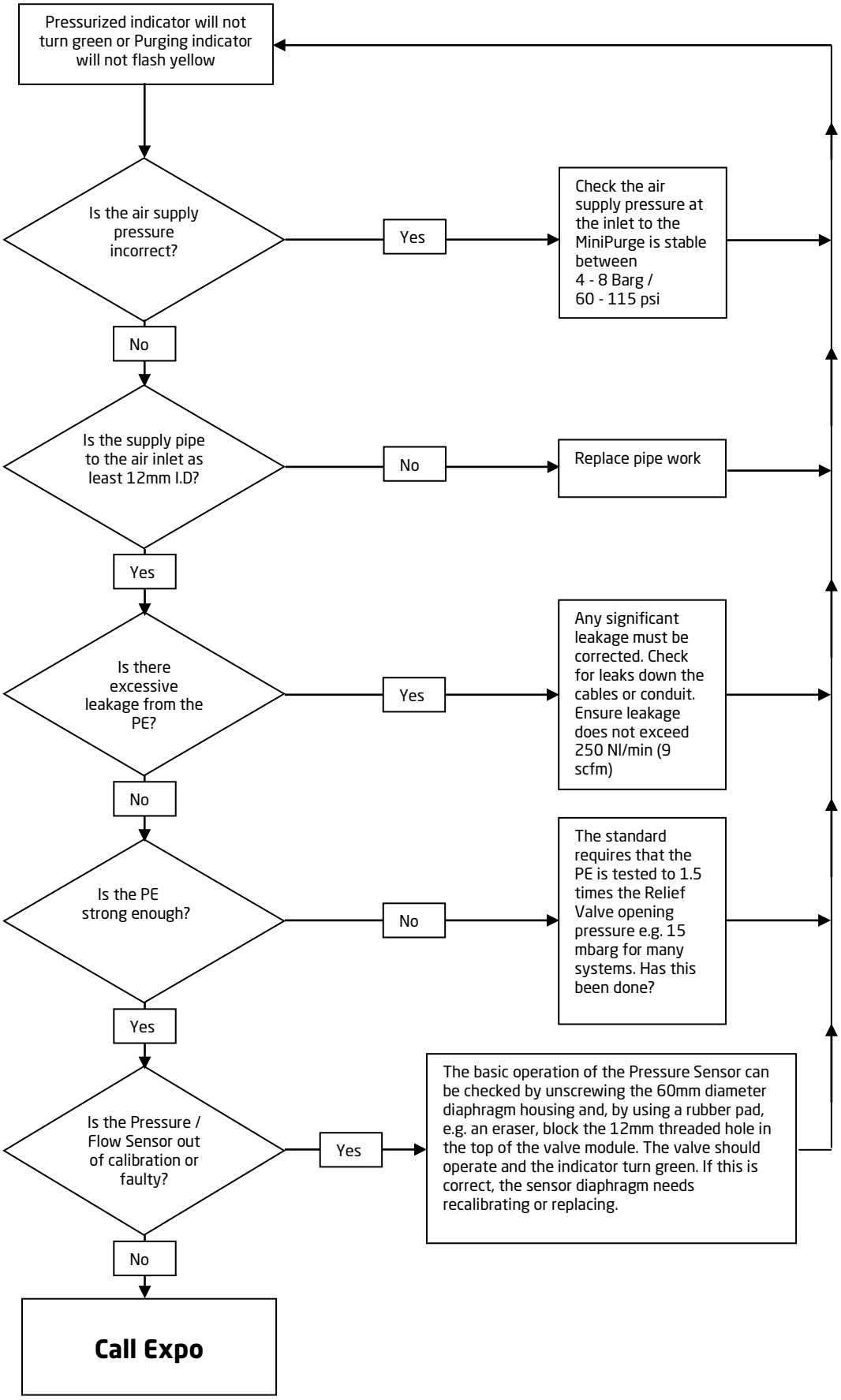
## Fault Finding (CF)



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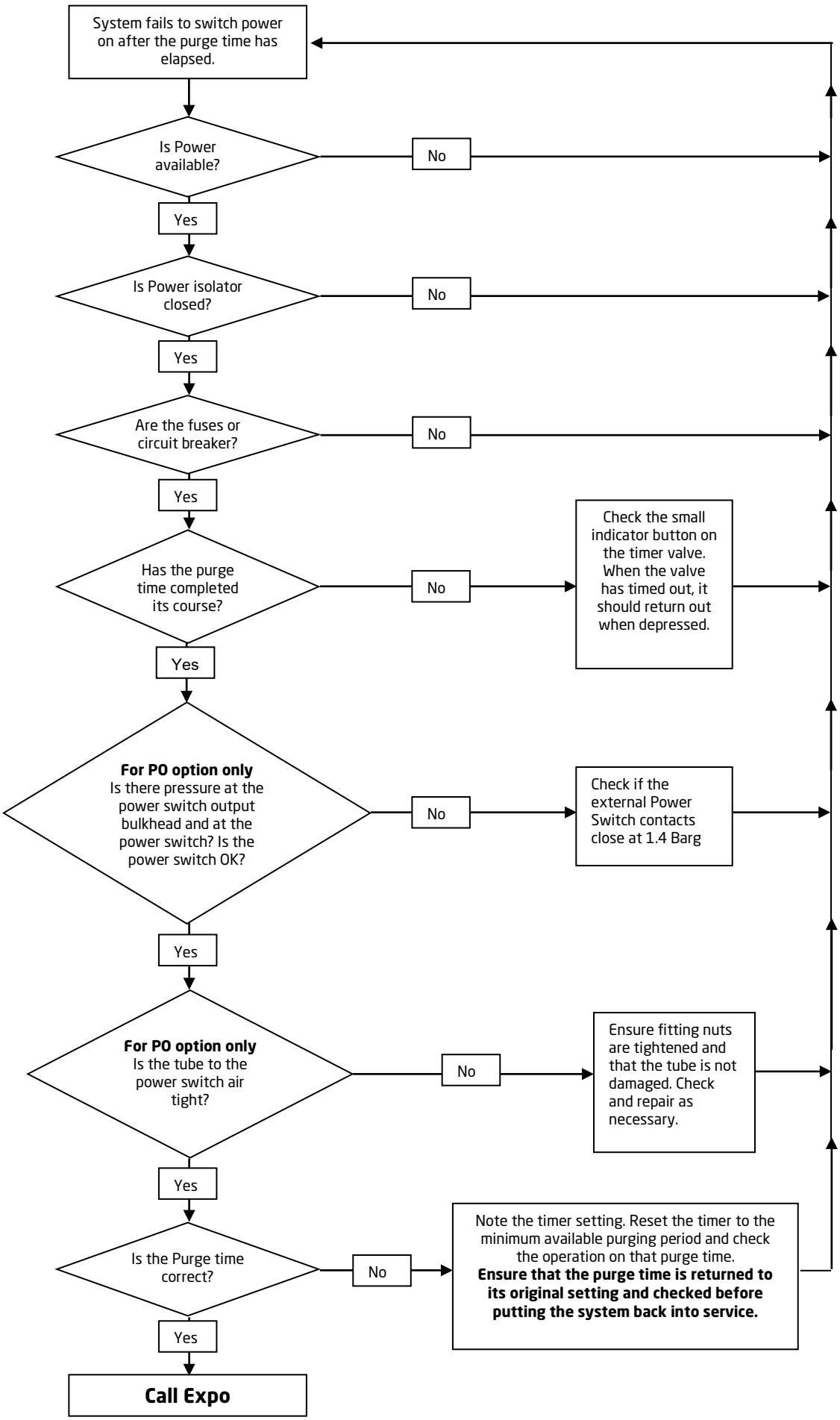



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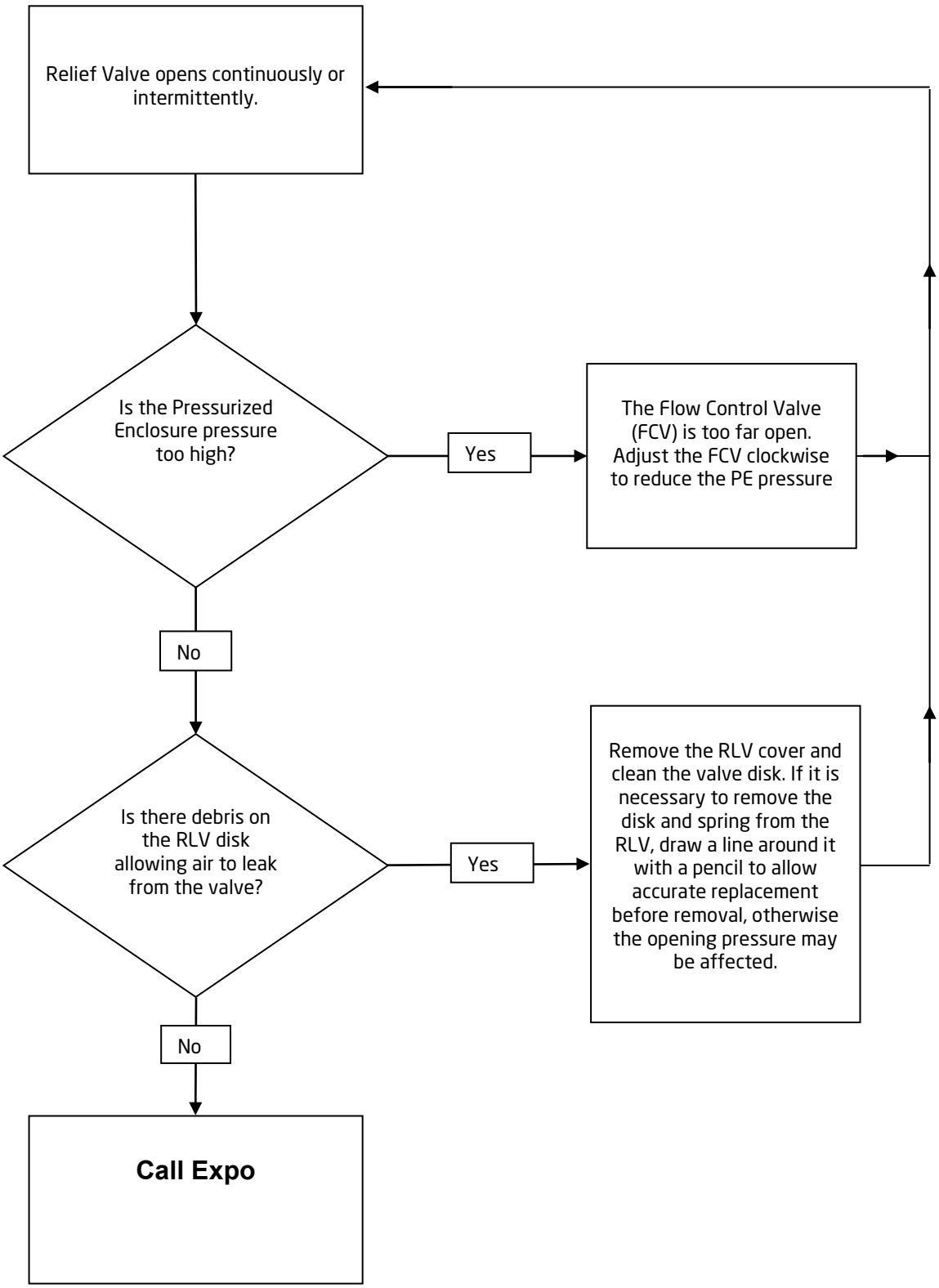




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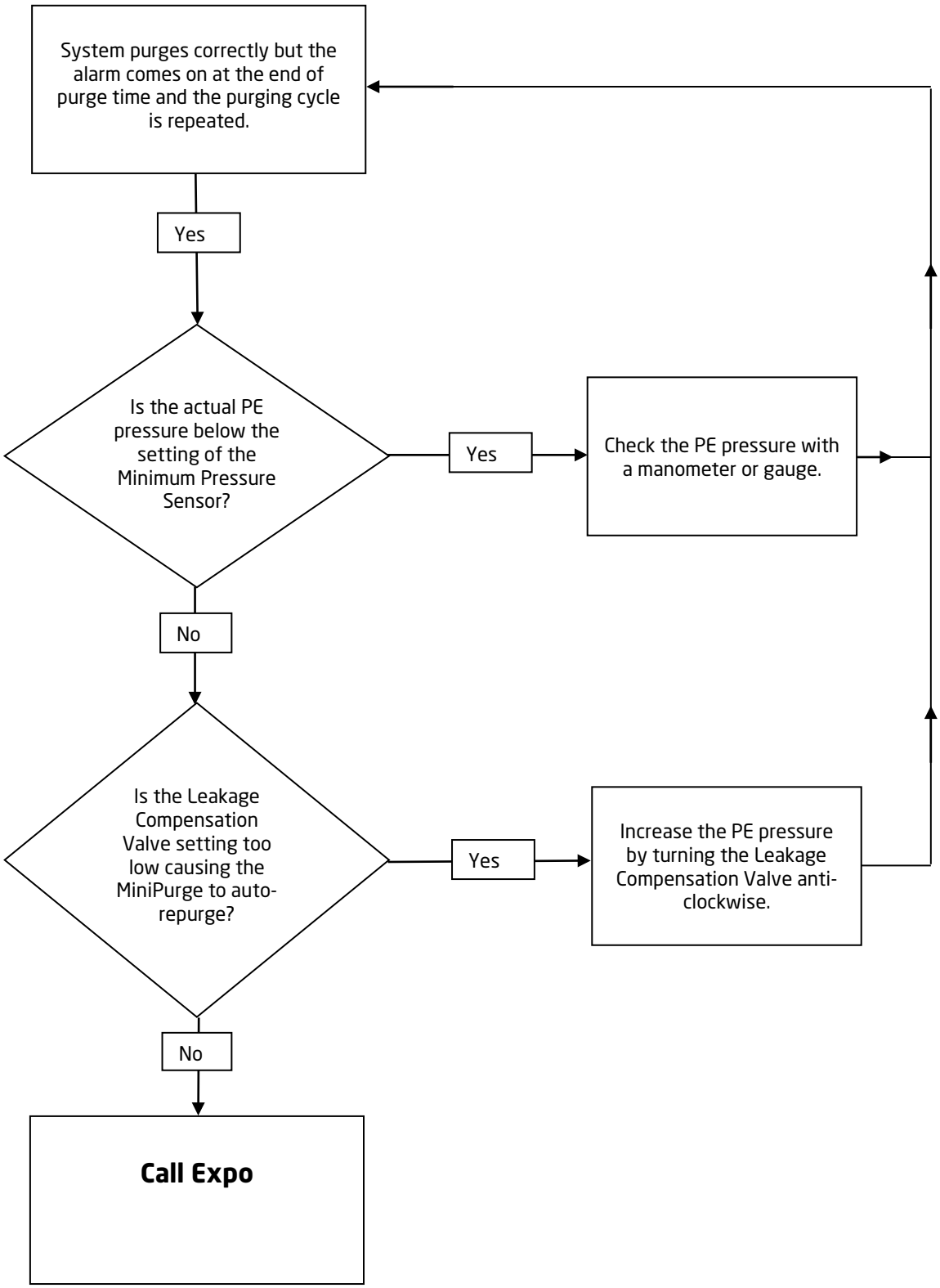
## Fault Finding (LC)





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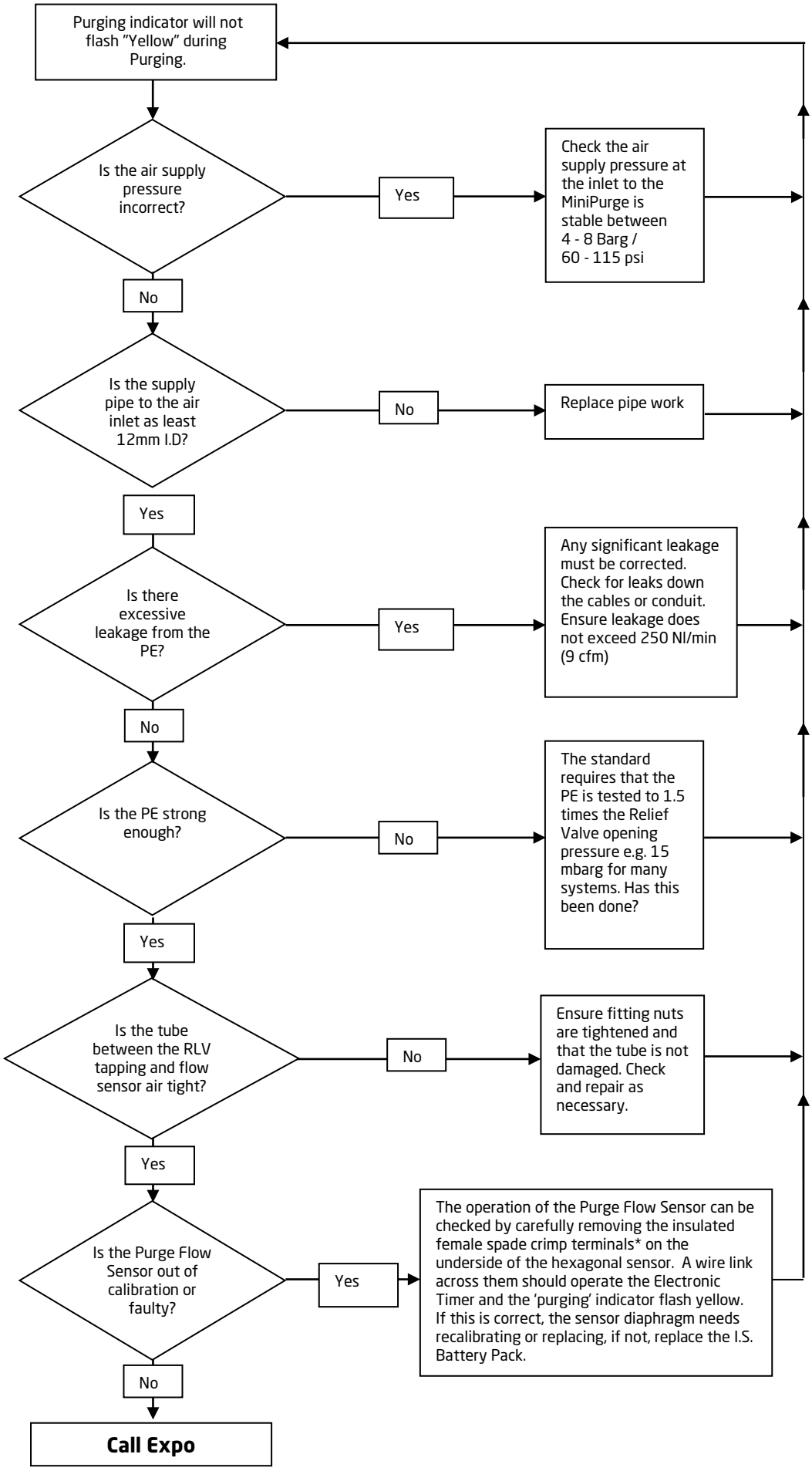




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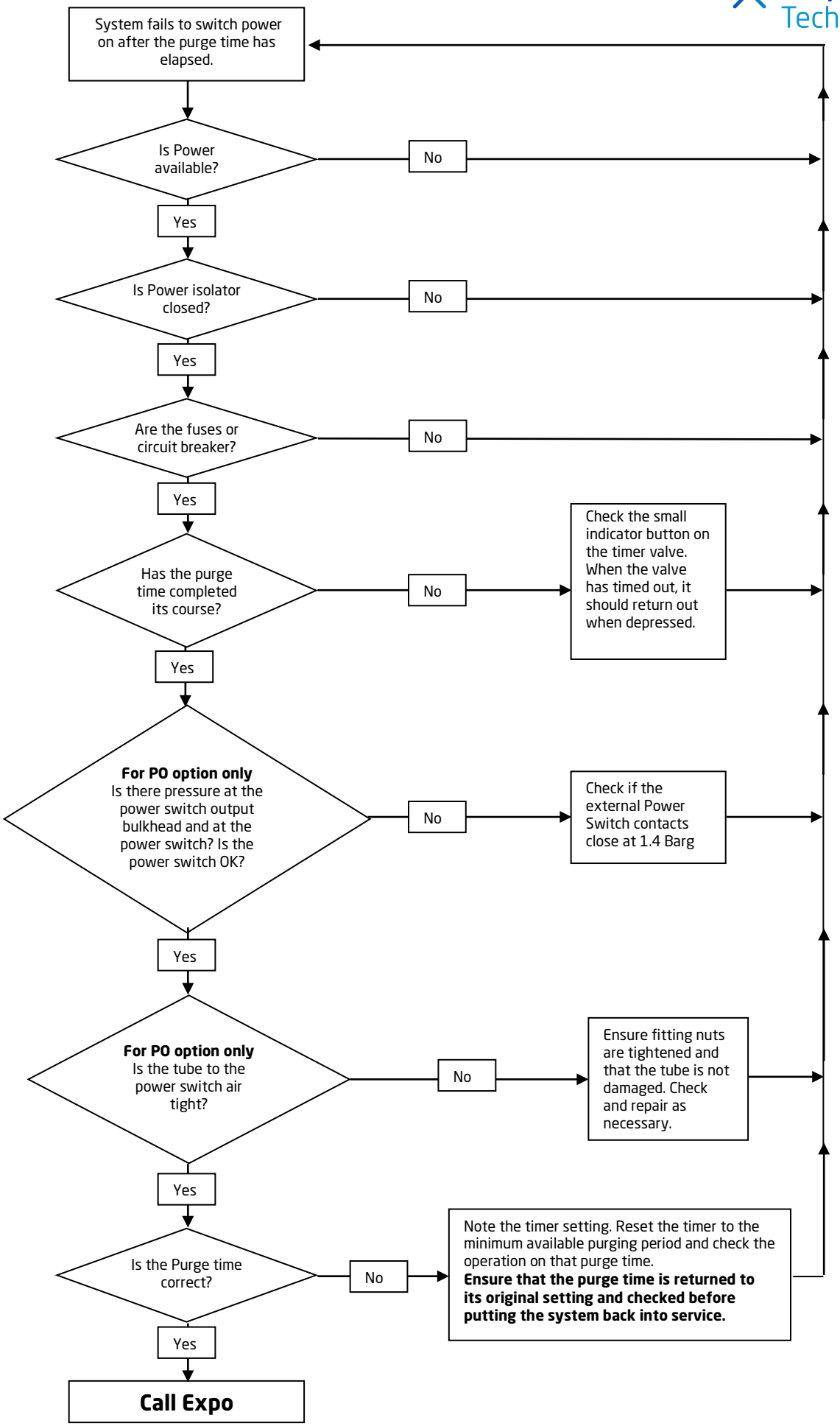




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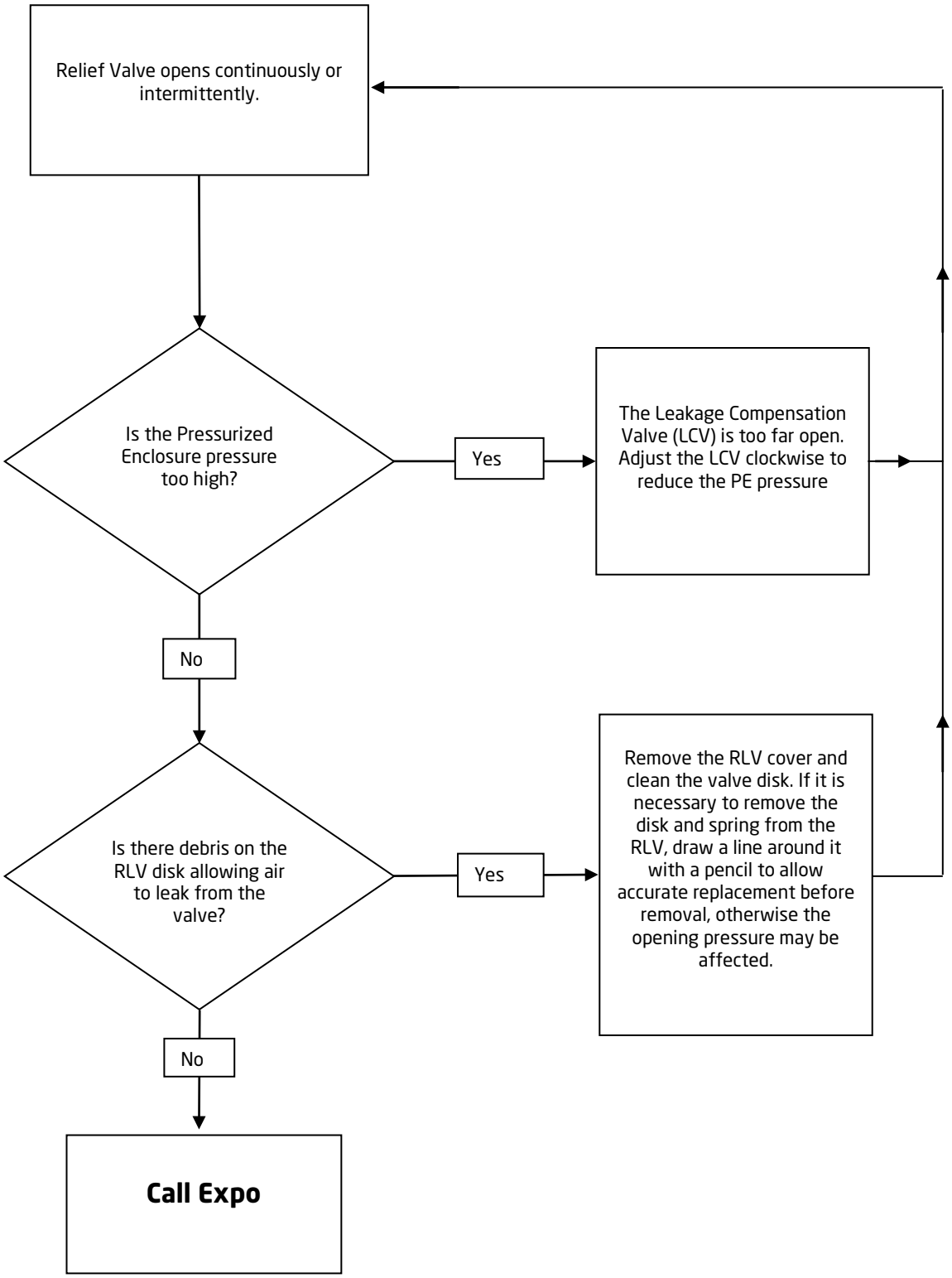




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# Section 10: Glossary

| Acronym | Description |
|---|---|
| A&T | Alarm and Trip |
| AO | Alarm Only |
| CF | Continuous Flow |
| CU | Control Unit |
| FCV | Flow Control Valve |
| FM | Factory Mutual |
| IS | Intrinsically Safe |
| LC | Leakage Compensation |
| LCV | Leakage Compensation Valve |
| MIU | MiniPurge® Interface Unit |
| PA | Ex d Power and Alarm Switch Wired to Ex e terminal box |
| PE | Pressurized Enclosure |
| PO | Pneumatic Output |
| RLV | Relief Valve |
| SAU | Spark Arrestor Unit |
| UL | Underwriter Laboratories |

# Section 11: Drawings and Diagrams

| Title | Drawing Number | Number of Sheets |
|---|---|---|
| MINIPURGE SIZE 2X | XBR-7000-003 | 4 |
| MINIPURGE CIRCUITS | XBR-7TD0-026 | 3 |
| MINIPURGE CUTOUTS | XSD-7TD0-002 | 3 |
| RELIEF VALVE DIMENSIONS | XSD-RTD0-003 | 2 |
| MANUAL OVERRIDE SWITCH HOOK UP | AGE-WC00-207 | 1 |
| MANUAL OVERRIDE SWITCH HOOK UP | AGE-WC00-117 | 1 |
| Ex e JUNCTION BOX M/O GA | XSD-7TD0-013 | 1 |



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# Section 12: Certification

Certificates can be found in the accompanying booklet (ML499) or download the certificates at www.expoworldwide.com

| System | Certificate | Certificate Number |
|---|---|---|
| MiniPurge® | EU-Declaration of Conformity | SC004-CE* |
| | IECEx Certificate | IECEx SIR 07.0027X |
| | ATEX Certificate | 01ATEX 1295X |
| | INMETRO/TÜV | TÜV 12.1462X |
| | CCC Certificate | 2020312304000830 |
| | EAC Certificate | EA3C RU C-GB.Aж58.B.00906/20 |
| | FM Certificate | 1X8A4.AE |
| Electronic Timer | EU Declaration of Conformity | SC039-CE* |
| | IECEx Certificate | FME 10.0001X |
| | ATEX Certificate | 10 ATEX0003X |

| For PA Option Only | Certificate | Certificate Number |
|---|---|---|
| Ex e junction box | EU-Declaration of Conformity | SC027-CE* |
| | IECEx Certificate | IECEx EXV 19.0057X |
| | ATEX Certificate | ExVeritas 19 ATEX0542X |
| | INMETRO/TÜV | TÜV 12.1463 |
| | CCC Certificate | 20203123000422 |
| Ex d switches | IECEx Certificate | IECEx EPS 14.0092X |
| | ATEX Certificate | 2020322304000843 |
| | CCC Certificate | 2020322304000843 |
| | EAC Certificate | EA3C RU C-DE.AH07.B.04162/22 |

MiniPurge Interface Unit MIU/e User Instruction Manual

* Documents are attached to the manual.


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| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

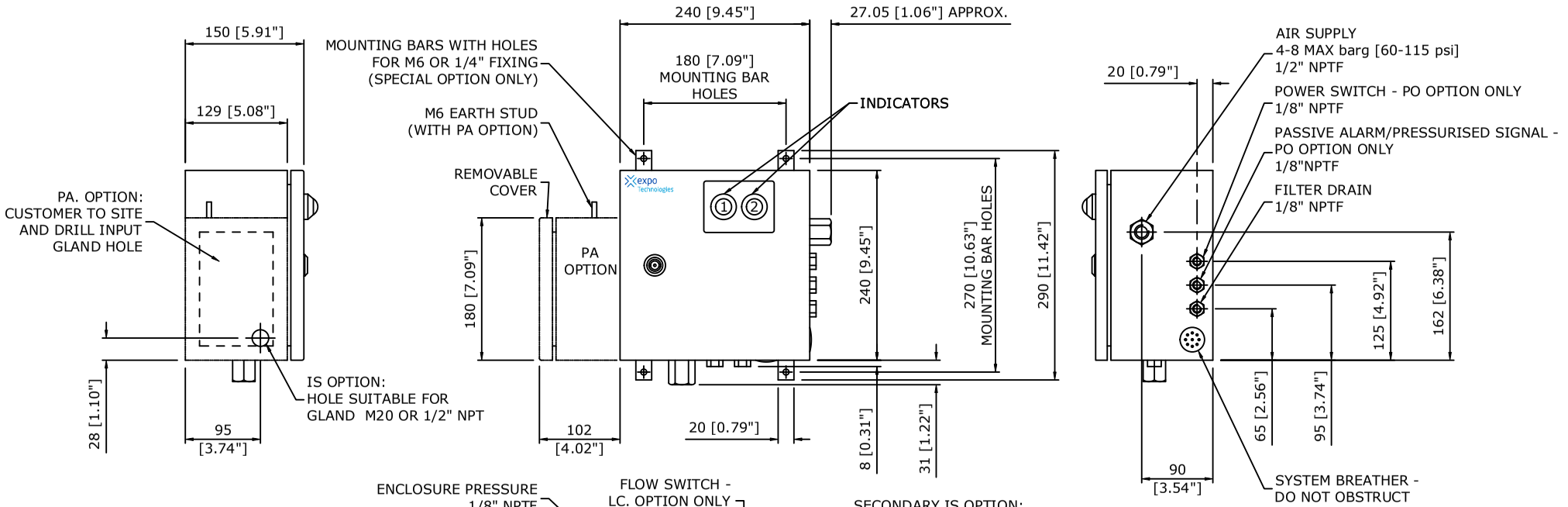
3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE
IF IN DOUBT ASK






| | ALARM INDICATOR 1 | | PURGE INDICATOR 2 | |
|---|---|---|---|---|
| | ALARM | PRESSURIZED | PURGING | PURGE COMPLETE |
| LEAKAGE COMPENSATION (LC) | RED | GREEN | YELLOW | BLACK |
| CONTINUOUS FLOW (CF) | RED | GREEN | YELLOW | BLACK |
| CONTINUOUS FLOW AFTER HIGH PURGE (CFHP) | RED | GREEN | YELLOW | BLACK |

NOTES

1. MINIPURGE MUST BE MOUNTED WITH PURGE OUTLET FITTING IN VERTICAL PLANE POINTING DOWN.
2. APPROXIMATE WEIGHT: 6.1 kg [13.3 lb].
3. EQUIVALENT IMPERIAL DIMENSIONS SHOWN IN BRACKETS.
4. REFER TO DRG XSD-7TD0-002 FOR MOUNTING DETAILS.

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12456 | 15/10/20 | CE | AR | MLC |
| 06 | 5970 | 03/07/12 | | | SM |
| 05 | 5556 | 14/12/10 | | | SB |

DRAWN DATE: 21/05/04
CONTROLLED:
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3

MATERIAL: SEE PART DETAILS
FINISH: SEE PART DETIALS
WEIGHT (Kg): 6.1

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

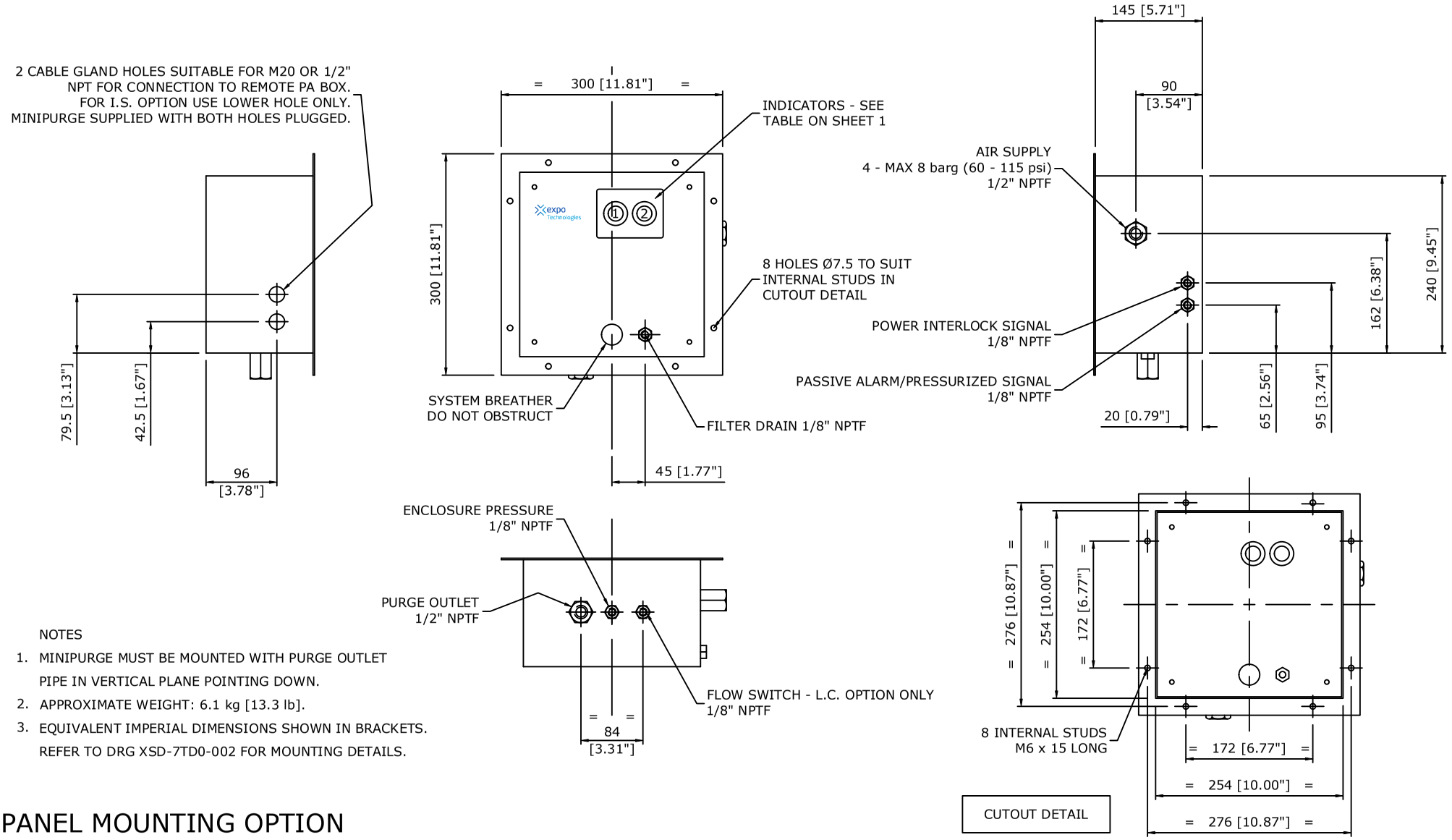
TITLE: MINIPURGE SIZE 2X

DRAWING No. XBR-7000-003

SHEET No. 1 OF 4

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 3RD ANGLE PROJECTION | DIMENSIONS IN mm [ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED: DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05; ANGLE STD ±1°; FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DO NOT SCALE IF IN DOUBT ASK |  | | | |




NOTES

1. MINIPURGE MUST BE MOUNTED WITH PURGE OUTLET PIPE IN VERTICAL PLANE POINTING DOWN.
2. APPROXIMATE WEIGHT: 6.1 kg [13.3 lb].
3. EQUIVALENT IMPERIAL DIMENSIONS SHOWN IN BRACKETS. REFER TO DRG XSD-7TD0-002 FOR MOUNTING DETAILS.

# PANEL MOUNTING OPTION

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12456 | 15/10/20 | CE | AR | MLC |
| 06 | 5970 | 03/07/12 | | | SM |
| 05 | 5556 | 14/12/10 | | | SB |

| DRAWN DATE | CONTROLLED |
|---|---|
| 21/05/04 | |
| DRAWING STATUS | REVISION |
| CERT REL | 07 |
| SCALE N.T.S | A3 |

MATERIAL: SEE PART DETAILS

FINISH: SEE PART DETIALS

WEIGHT (Kg): 6.1

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE: MINIPURGE SIZE 2X

DRAWING No. XBR-7000-003

SHEET No. 2 OF 4

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

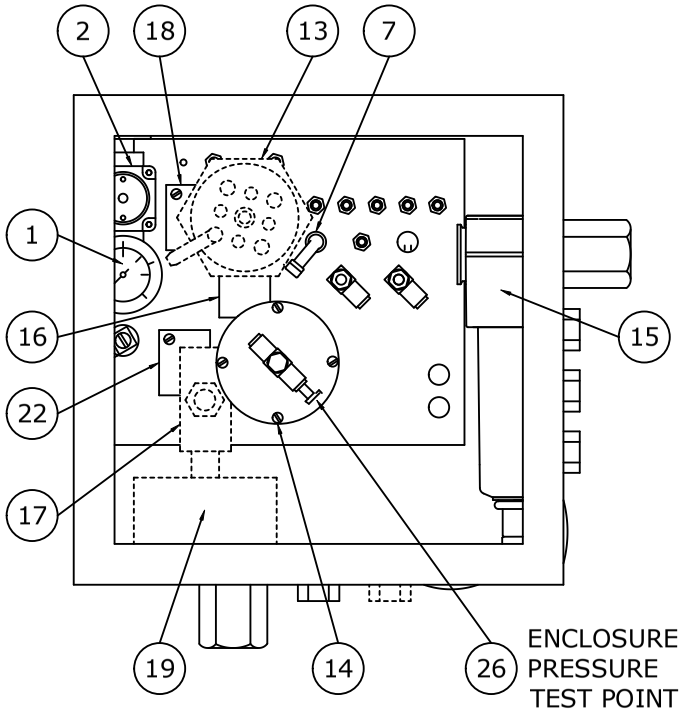
TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

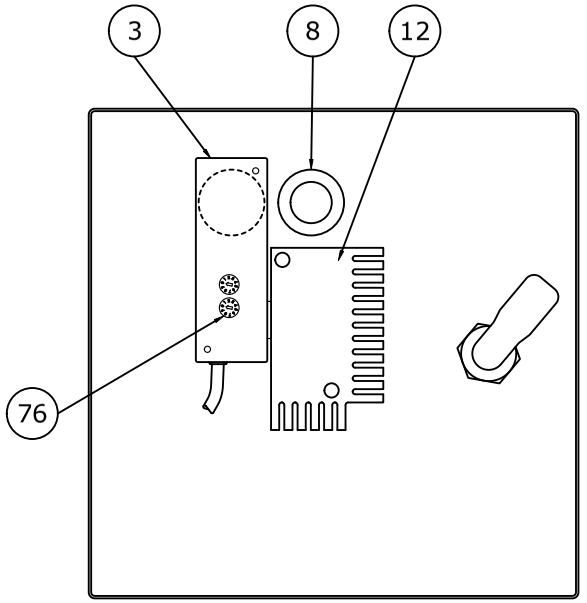
DO NOT SCALE
IF IN DOUBT ASK



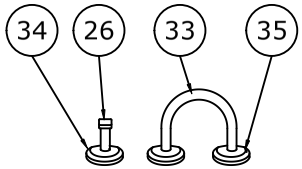
| | |
|---|---|
| 1 | GAUGE, LOGIC AIR SUPPLY |
| 2 | LOGIC AIR SUPPLY REGULATOR |
| 3 | ELECTRONIC TIMER |
| 7 | BLACK COLLAR (PLUGGED) |
| 8 | INDICATOR, "ALARM/PRESSURIZED" |
| 9 | INDICATOR, "PURGING" |
| 12 | I.S. BATTERY PACK |
| 13 | PURGE FLOW SENSOR |
| 14 | MINIMUM PRESSURE SENSOR |
| 15 | MAIN AIR SUPPLY FILTER, AUTOMATIC DRAIN |
| 16 | "OR" GATE |
| 17 | LEAKAGE COMPENSATION VALVE |
| 18 | TIMER VALVE |
| 19 | PURGE BOOST VALVE |
| 22 | PURGE COMPLETE VALVE |
| 26 | PLUG 4mm (ENCLOSURE PRESSURE TEST POINT) |
| 33 | "ACTION ON ALARM" OPTION PIPE |
| 34 | ALARM ONLY PUSH-IN FITTING |
| 35 | ALARM AND TRIP PUSH-IN FITTING |
| 76 | PURGE TIME SELECTOR SWITCHES |

LC LEAKAGE COMPENSATION PO OPTION SHOWN (ITEMS IN DOTTED REMOVED FOR CF AND ITEM 13 REPLACED BY TIMER SWITCH)

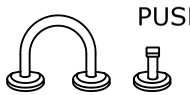



VIEW OF DOOR FROM INSIDE




ALARM AND TRIP




ALARM ONLY

# INTERNAL COMPONENTS

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12456 | 15/10/20 | CE | AR | MLC |
| 06 | 5970 | 03/07/12 | | | SM |
| 05 | 5556 | 14/12/10 | | | SB |

DRAWN DATE: 21/05/04
CONTROLLED:
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3

MATERIAL: SEE PART DETAILS
FINISH: SEE PART DETIALS
WEIGHT (Kg): 6.1

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE: MINIPURGE SIZE 2X

DRAWING No. XBR-7000-003
SHEET No. 3 OF 4

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

3RD ANGLE PROJECTION

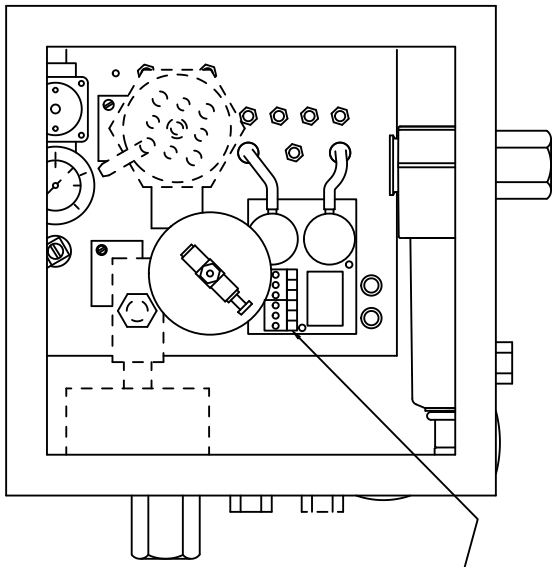
DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE
IF IN DOUBT ASK

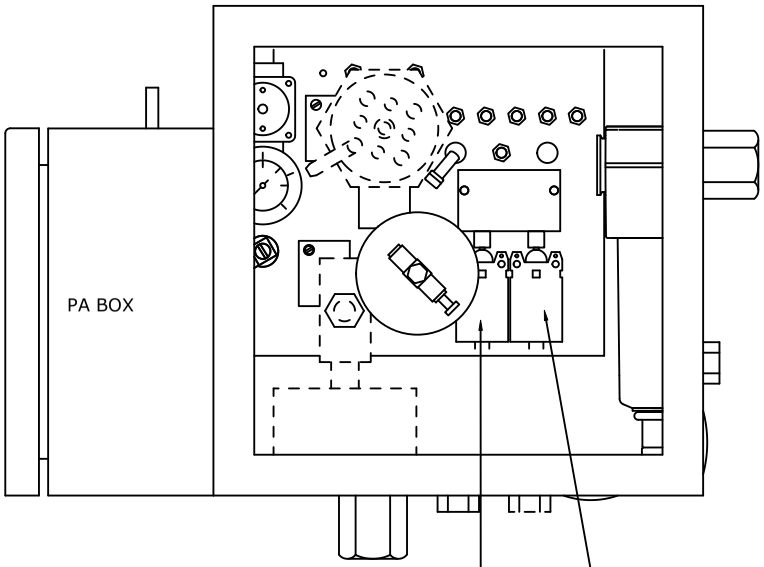


## IS OPTION



TERMINALS FOR CONNECTING
I.S. CIRCUITS VIA M20 CABLE
ENTRY ON LHS OR BOTTOM

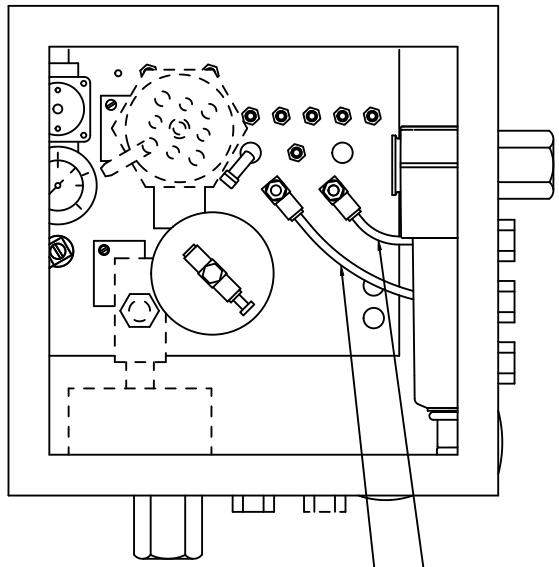
## PA OPTION




Ex d SWITCH WIRED TO ALARM
TERMINALS IN PA BOX

Ex d SWITCH WIRED TO POWER
TERMINALS IN PA BOX

## PO OPTION



CLEAR 4mm PIPE TO PASSIVE
ALARM/PRESSURIZED SIGNAL
1/8"NPTF CONNECTOR

BLUE 4mm PIPE TO POWER
INTERLOCK 1/8"NPTF CONNECTOR

NOTE:
LC LEAKAGE COMPENSATION PO OPTION SHOWN (ITEMS IN DOTTED REMOVED FOR CF AND REPLACED BY TIMER SWITCH)

# OPTIONS

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12456 | 15/10/20 | CE | AR | MLC |
| 06 | 5970 | 03/07/12 | | | SM |
| 05 | 5556 | 14/12/10 | | | SB |

DRAWN DATE: 21/05/04
CONTROLLED:
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3

MATERIAL: SEE PART DETAILS
FINISH: SEE PART DETIALS

WEIGHT (Kg): 6.1

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE: MINIPURGE SIZE 2X

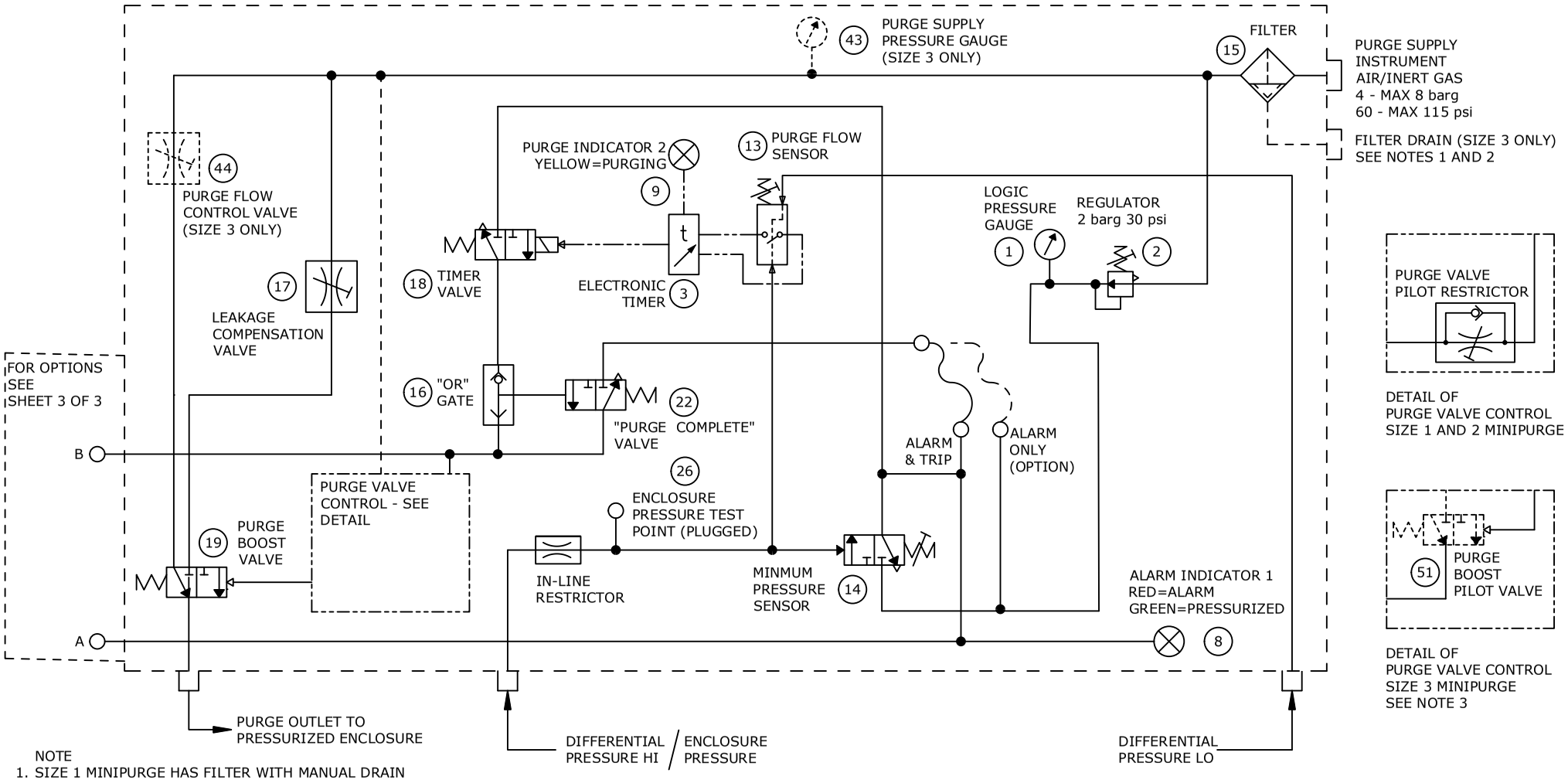
DRAWING No.: XBR-7000-003

SHEET No. 4 OF 4

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 3RD ANGLE PROJECTION | DIMENSIONS IN mm [ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED: DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05; ANGLE STD ±1°; FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DO NOT SCALE IF IN DOUBT ASK |  | | | |

# LC - LEAKAGE COMPENSATION




NOTE
1. SIZE 1 MINIPURGE HAS FILTER WITH MANUAL DRAIN
2. SIZE 2 AND ABOVE HAVE FILTER WITH AUTOMATIC DRAIN AND EXTERNAL DRAIN CONNECTION POINT.
3. ITEMS SHOWN IN DOTTED ARE ONLY FITTED TO SIZE 3 MINIPURGE

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 03 | DQN-12456 | 21/10/20 | CE | AR | MLC |
| 02 | 5108 | 14/12/10 | | | JPdB |
| 01 | DRAWN | 04/10/07 | NRB | MLC | JPdB |

| DRAWN DATE | CONTROLLED |
|---|---|
| 04/10/07 | |
| DRAWING STATUS | REVISION |
| CERT REL | 03 |
| SCALE N.T.S | A3 |

MATERIAL

FINISH

WEIGHT (Kg)

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE
MINIPURGE CIRCUITS

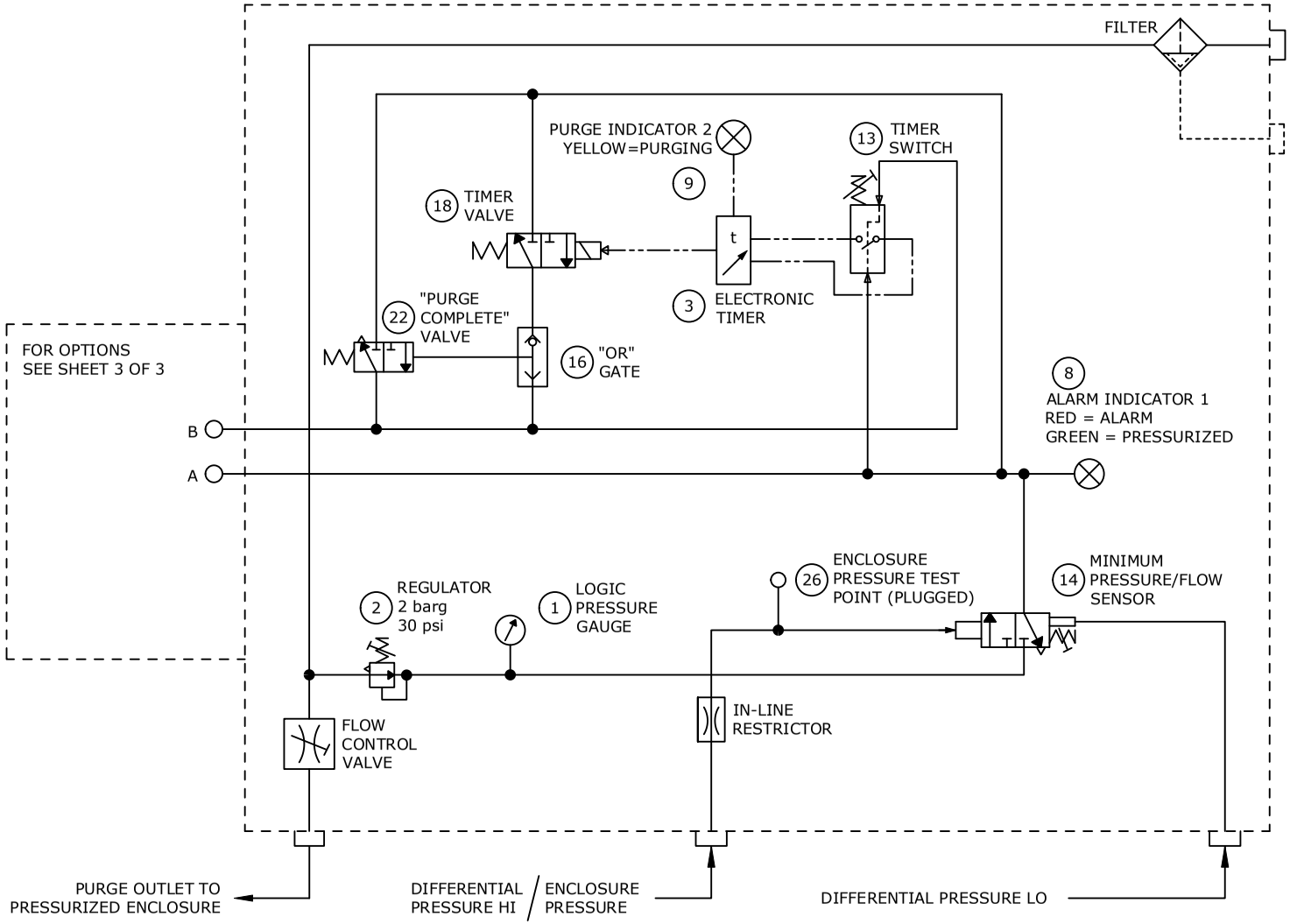
DRAWING No.
XBR-7TD0-026

SHEET No. 1 OF 3

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 3RD ANGLE PROJECTION | DIMENSIONS IN mm [ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED: DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05; ANGLE STD ±1°; FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DO NOT SCALE IF IN DOUBT ASK |  | | | |

# CF - CONTINUOUS FLOW




NOTES
1. SIZE 1 MINIPURGE HAS FILTER WITH MANUAL DRAIN SIZE 2 AND ABOVE HAVE FILTER WITH AUTOMATIC DRAIN AND EXTERNAL DRAIN CONNECTION POINT.

## ABOVE CIRCUIT SHOWS ALARM & TRIP

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 03 | DQN-12456 | 21/10/20 | CE | AR | MLC |
| 02 | 5108 | 14/12/10 | | | JPdB |
| 01 | DRAWN | 04/10/07 | NRB | MLC | JPdB |

| DRAWN DATE | CONTROLLED |
|---|---|
| 04/10/07 | |
| DRAWING STATUS | REVISION |
| CERT REL | 03 |
| SCALE N.T.S | A3 |

MATERIAL

FINISH

WEIGHT (Kg)

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE
MINIPURGE CIRCUITS

DRAWING No.
XBR-7TD0-026

SHEET No. 2 OF 3

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

3RD ANGLE PROJECTION

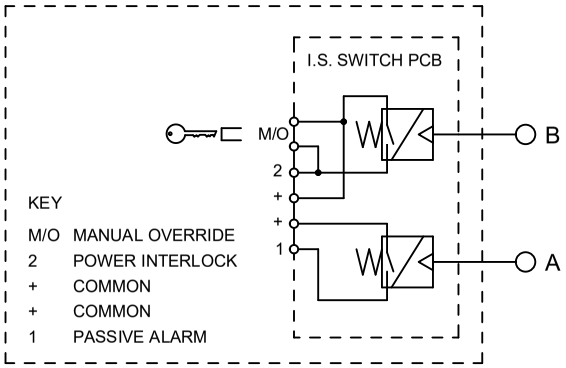
DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE
IF IN DOUBT ASK

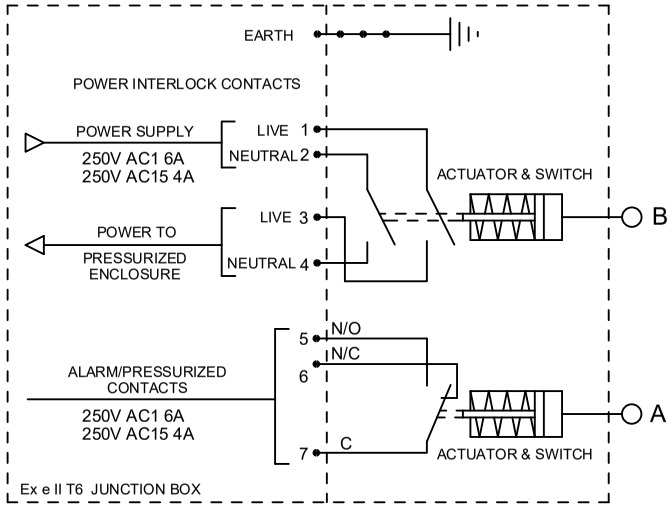


## OPTION IS
## INTRINSICALLY SAFE



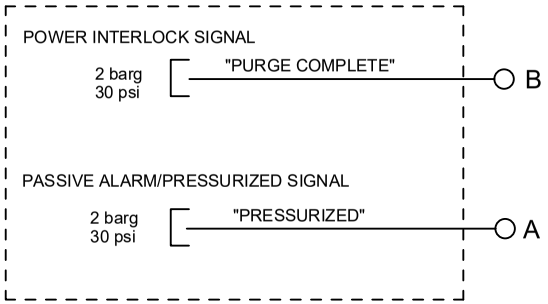

POWER INTERLOCK AND PASSIVE ALARM OUTPUTS ARE VOLT FREE CONTACTS AND MUST ONLY BE CONNECTED TO INTRINSICALLY SAFE CIRCUITS. FOR FM AND UL SEE DRAWING EP80-2-11.

## OPTION PA
## POWER AND ALARM




Ex d FLAMEPROOF SWITCHES TERMINATED IN Ex e JUNCTION BOX. SUITABLE CABLE GLANDS MUST BE USED.

## OPTION PO
## PNEUMATIC OUTPUT




CONNECT 1/8" NPT OUTPUTS TO SUITABLE DEVICES SUCH AS A MINIPURGE INTERFACE UNIT.

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 03 | DQN-12456 | 21/10/20 | CE | AR | MLC |
| 02 | 5108 | 14/12/10 | | | JPdB |
| 01 | DRAWN | 04/10/07 | NRB | MLC | JPdB |

| DRAWN DATE | CONTROLLED |
|---|---|
| 04/10/07 | |
| DRAWING STATUS | REVISION |
| CERT REL | 03 |
| SCALE N.T.S | A3 |

MATERIAL

FINISH

WEIGHT (Kg)

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE
MINIPURGE CIRCUITS

DRAWING No.
XBR-7TD0-026

SHEET No. 3 OF 3

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

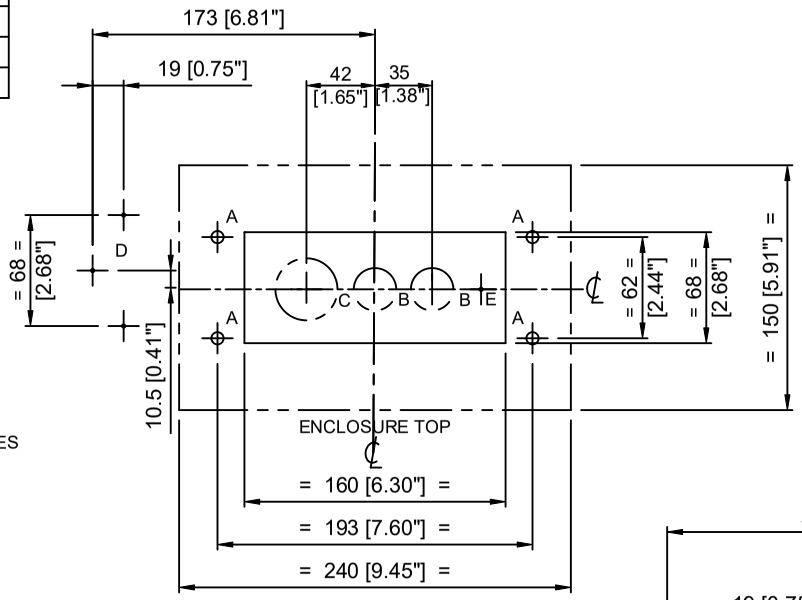
TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE IF IN DOUBT ASK

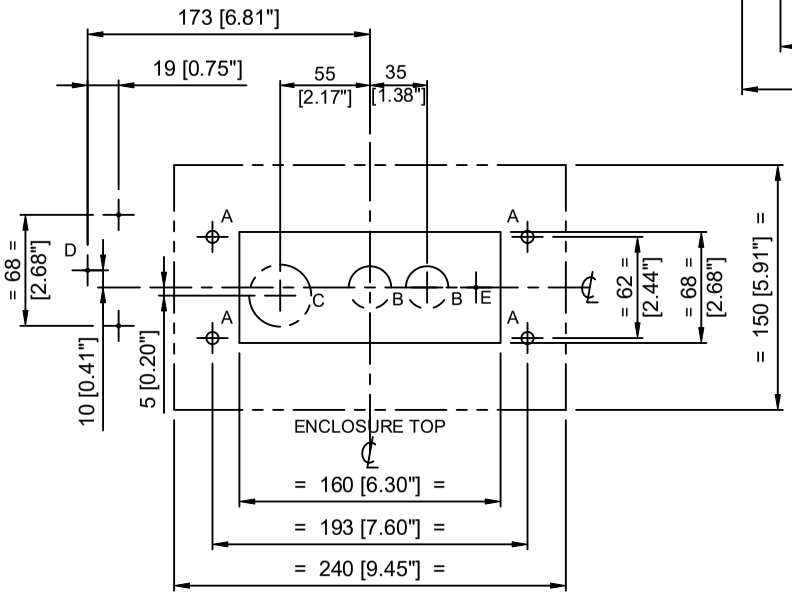


| REF | DESCRIPTION |
|---|---|
| A | HOLE Ø7.5 [9/32"] |
| B | HOLE Ø26 [1"] (ALTERNATIVE TO CUTOUT) |
| C | HOLE Ø38 [1 1/2"] (ALTERNATIVE TO CUTOUT) |
| D | 3 CENTRE DOTS FOR PA OPTION ONLY |
| E | I.S OPTION (SQUARE CUT OUT REQUIRED) |

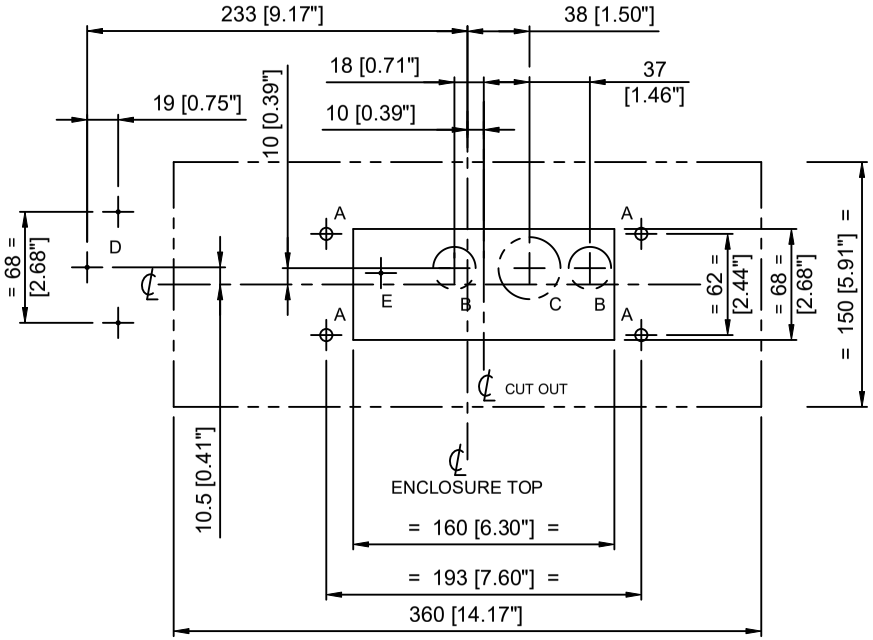
## DETAIL 'B'
CUTOUT / HOLES FOR SIZE 2 ENCLOSURES




## DETAIL 'A'
CUTOUT / HOLES FOR SIZE 1 ENCLOSURES




## DETAIL 'C'
CUTOUT / HOLES FOR SIZE 3 ENCLOSURES




| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12472 | 15/03/21 | AR | CE | PB |
| 06 | 6227 | 17/6/16 | | | DM |
| 01 | DRAWN | 10/10/07 | | | JPdB |

DRAWN DATE: 10/10/07
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3

MATERIAL:
FINISH:
WEIGHT (Kg):

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE: MINIPURGE CUTOUTS

DRAWING No.: XSD-7TD0-002

SHEET No. 1 OF 3

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

3RD ANGLE PROJECTION

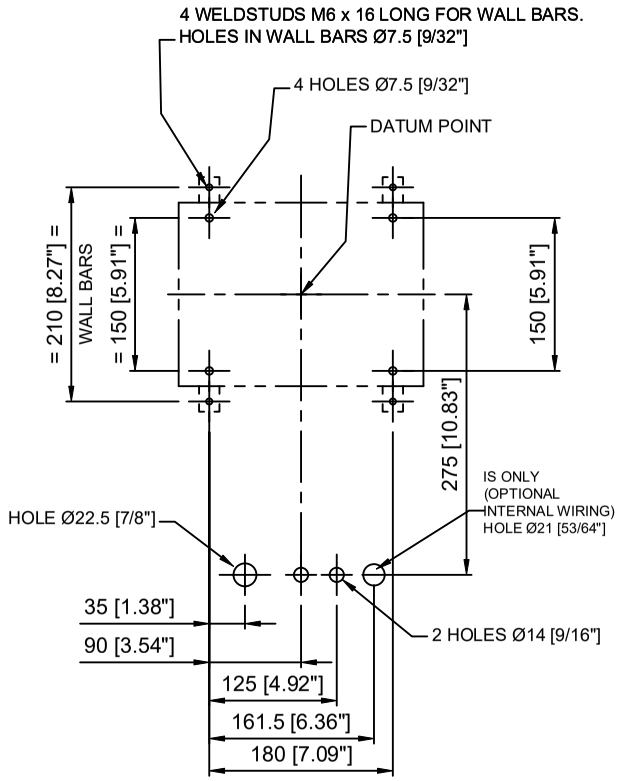
DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE
IF IN DOUBT ASK

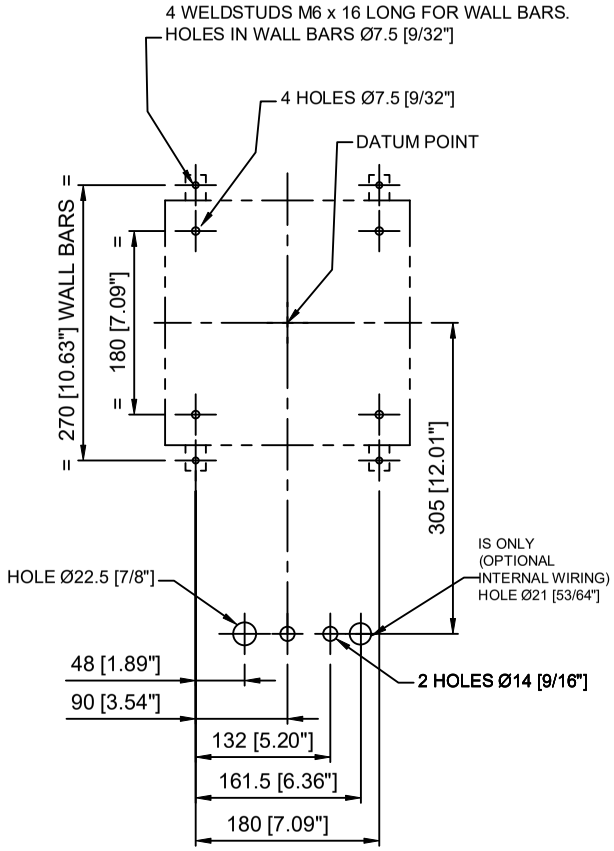


## DETAIL 'D'
WALL MOUNTED SIZE 1 ENCLOSURE
FRONT VIEW OF ENCLOSURE



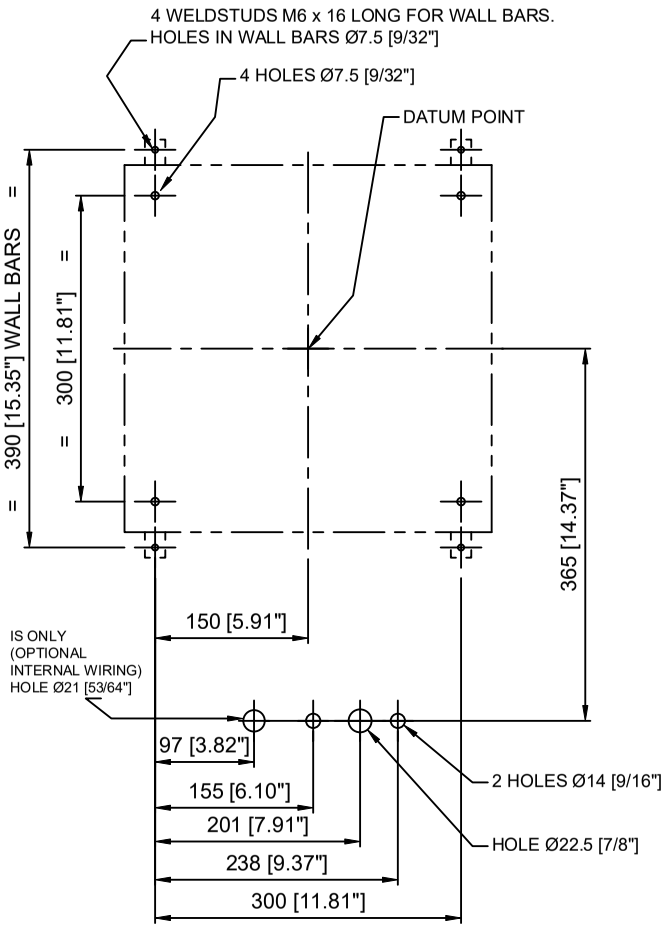

NOTE
ENCLOSURE MOUNTING EITHER THROUGH
4 x Ø7.5 [9/32"] HOLES OR ON
4 x M6 STUDS USING WALL BARS

## DETAIL 'E'
WALL MOUNTED SIZE 2 ENCLOSURE
FRONT VIEW OF ENCLOSURE




NOTE
ENCLOSURE MOUNTING EITHER THROUGH
4 x Ø7.5 [9/32"] HOLES OR ON
4 x M6 STUDS USING WALL BARS

## DETAIL 'F'
WALL MOUNTED SIZE 3 ENCLOSURE
FRONT VIEW OF ENCLOSURE




NOTE
ENCLOSURE MOUNTING EITHER THROUGH
4 x Ø7.5 [9/32"] HOLES OR ON
4 x M6 STUDS USING WALL BARS

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12472 | 15/03/21 | AR | CE | PB |
| 06 | 6227 | 17/6/16 | | | DM |
| 01 | DRAWN | 10/10/07 | | | JPdB |

DRAWN DATE: 10/10/07
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3

MATERIAL:
FINISH:
WEIGHT (Kg):

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

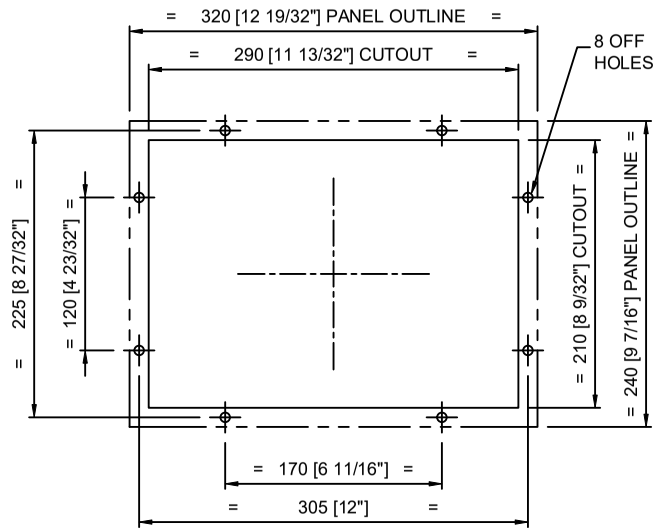
TITLE: MINIPURGE CUTOUTS

DRAWING No.: XSD-7TD0-002

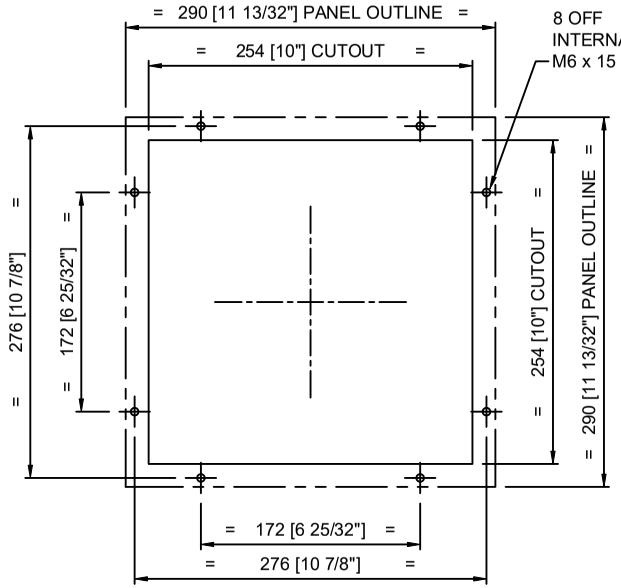
SHEET No. 2 OF 3

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 3RD ANGLE PROJECTION | DIMENSIONS IN mm [ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED: DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05; ANGLE STD ±1°; FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DO NOT SCALE IF IN DOUBT ASK |  | | | |

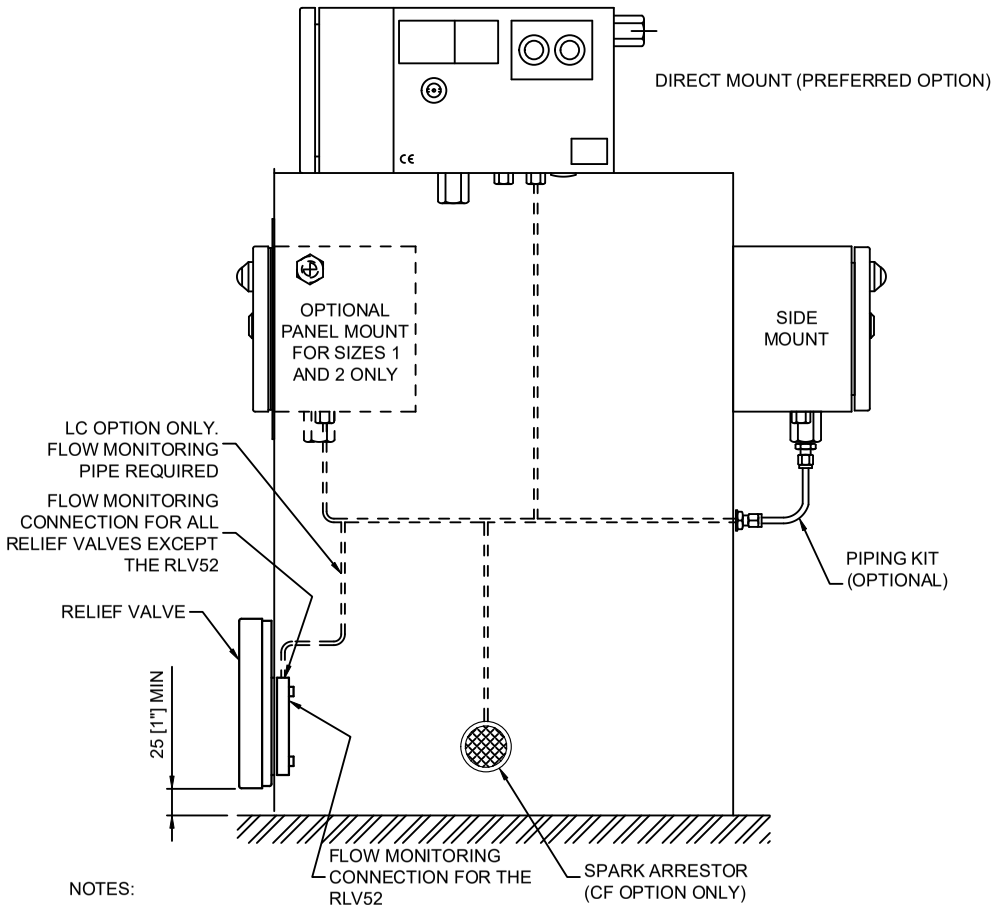



DETAIL 'D'
PANEL MOUNT SIZE 1




DETAIL 'E'
PANEL MOUNT SIZE 2

MINIPURGE CONFIGURATION




NOTES:

1. USE DIRECT MOUNTING WHEREVER POSSIBLE; WALL MOUNTING BRACKETS AND PIPING KITS FOR SIDE MOUNTING ARE OPTIONAL.
2. MINIPURGE MUST BE MOUNTED WITH THE PURGE OUTLET PIPE IN VERTICAL PLANE POINTING DOWN.
3. PURGE AIR TO VENT INTO TOP OF THE ENCLOSURE AND EXIT THROUGH THE RELIEF VALVE/SPARK ARRESTOR AT THE BOTTOM OF THE ENCLOSURE.
4. EXTERNAL TUBES SHOULD BE METALLIC (NON-CRUSHABLE), MINIMUM BORE 6mm

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 07 | DQN-12472 | 15/03/21 | AR | CE | PB |
| 06 | 6227 | 17/6/16 | | | DM |
| 01 | DRAWN | 10/10/07 | | | JPdB |

DRAWN DATE: 10/10/07
DRAWING STATUS: CERT REL
REVISION: 07
SCALE: N.T.S
A3
MATERIAL:
FINISH:
WEIGHT (Kg):

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

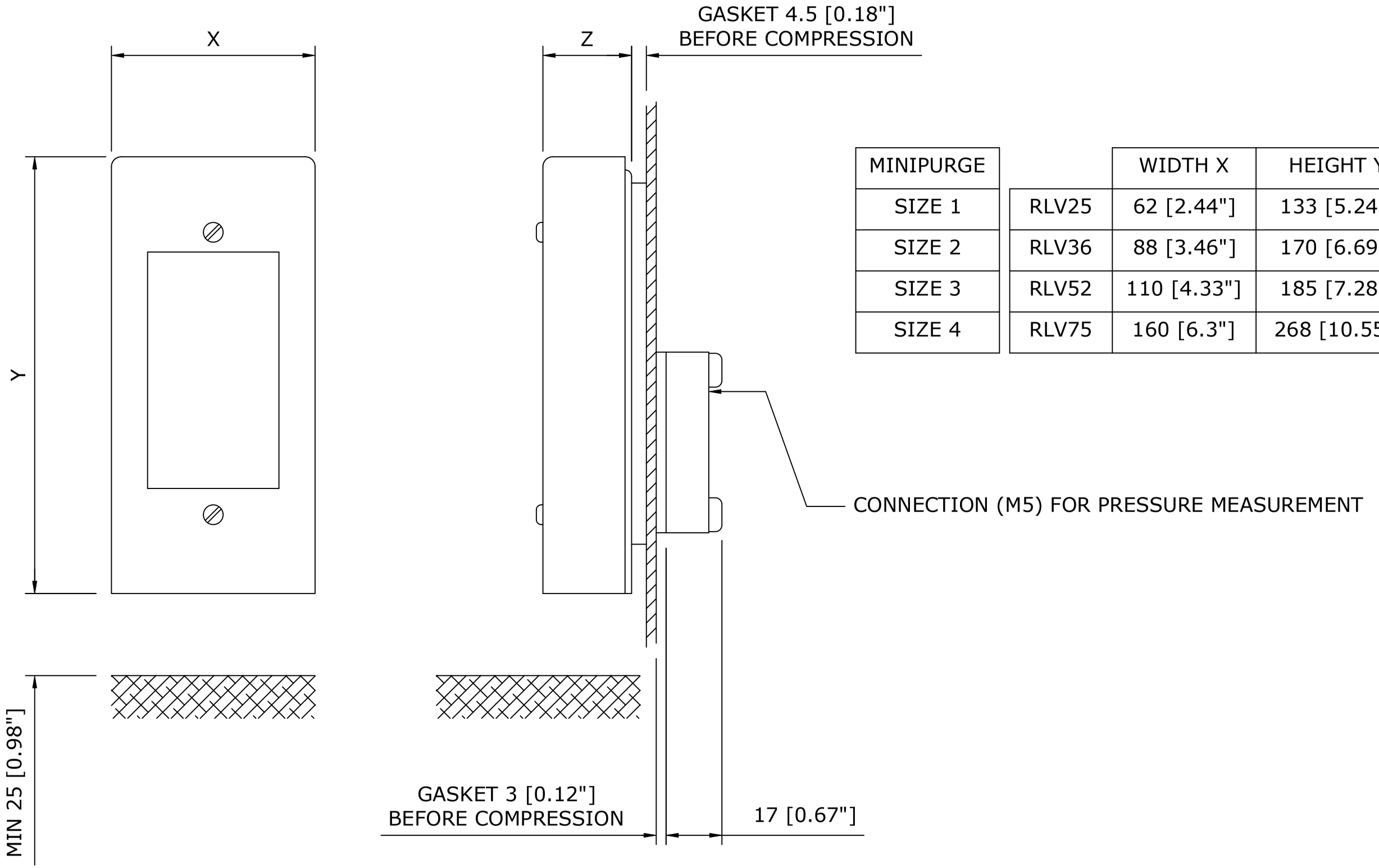
TITLE: MINIPURGE CUTOUTS

DRAWING No. XSD-7TD0-002

SHEET No. 3 OF 3

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

| 3RD ANGLE PROJECTION | DIMENSIONS IN mm<br>[ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED<br>FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH<br>DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05<br>ANGLE STD ±1° | DO NOT SCALE IF IN DOUBT ASK |  |
|---|---|---|---|---|




| MINIPURGE | | WIDTH X | HEIGHT Y | DEPTH Z |
|---|---|---|---|---|
| SIZE 1 | RLV25 | 62 [2.44"] | 133 [5.24"] | 28 [1.10"] |
| SIZE 2 | RLV36 | 88 [3.46"] | 170 [6.69"] | 33 [1.30"] |
| SIZE 3 | RLV52 | 110 [4.33"] | 185 [7.28"] | 37 [1.46"] |
| SIZE 4 | RLV75 | 160 [6.3"] | 268 [10.55"] | 115 [4.53"] |

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 04 | DQN-12456 | 21/10/20 | CE | AR | MLC |
| 03 | 6075 | 14/04/14 | | | SM |
| 02 | 6011 | 19/11/13 | | | JPdB |

| DRAWN DATE | CONTROLLED | MATERIAL |
|---|---|---|
| 09/10/07 | | |
| DRAWING STATUS | REVISION | FINISH |
| CERT REL | 04 | |
| SCALE N.T.S | A3 | |

WEIGHT (Kg)

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE
RELIEF VALVE DIMENSIONS

DRAWING No.
XSD-RTD0-003

SHEET No. 1 OF 2

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

| 3RD ANGLE PROJECTION | DIMENSIONS IN mm [ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED<br>FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DECIMALS<br>X ±0.5<br>X.X ±0.2<br>X.XX ±0.1<br>X.XXx ±0.05 | ANGLE<br>STD ±1° | DO NOT SCALE IF IN DOUBT ASK | The contents of this drawing / document are Copyright © Expo Technologies Limited. They are to be treated as confidential and are returnable upon request. They are not to be copied or communicated in part or in whole without written consent from Expo Technologies Limited, neither are they to be used in any way against our interests. |
|---|---|---|---|---|---|---|

F

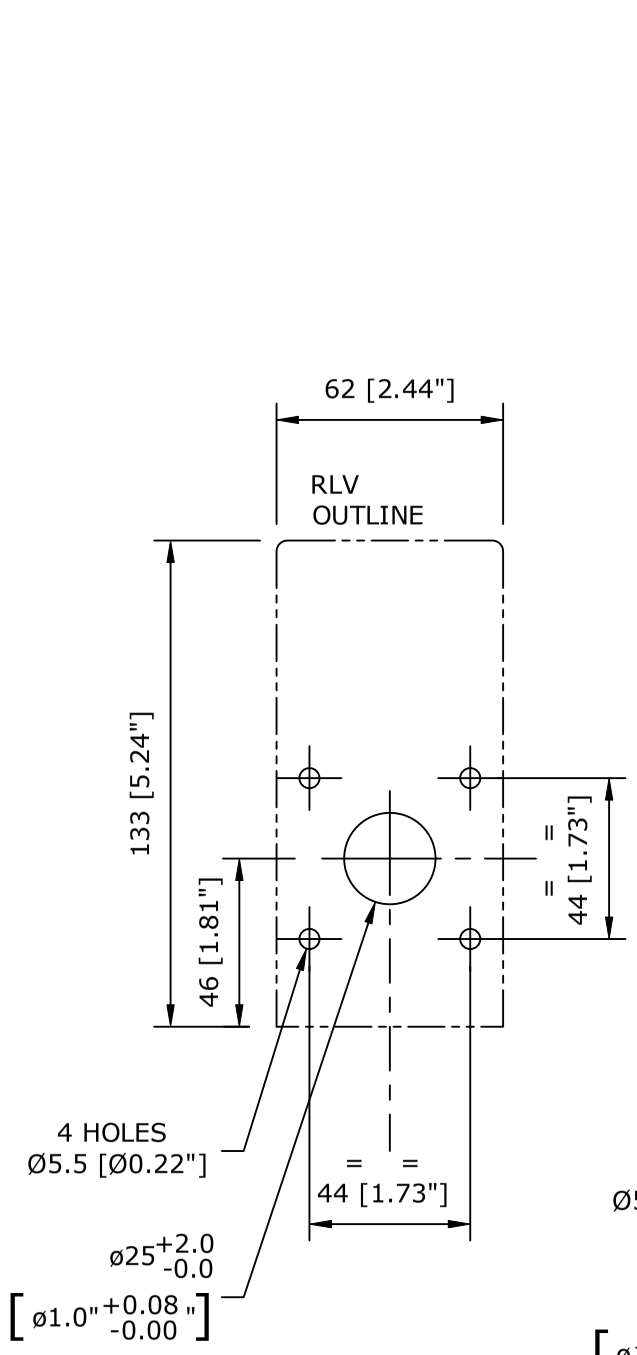
E

D

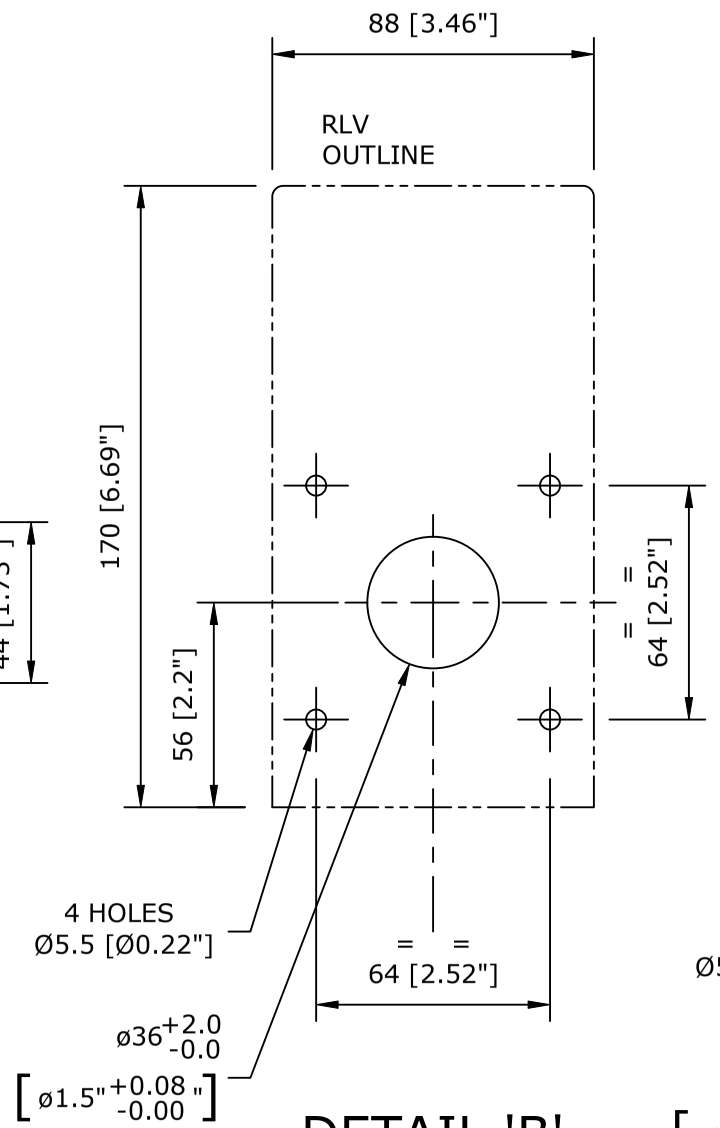
C

B

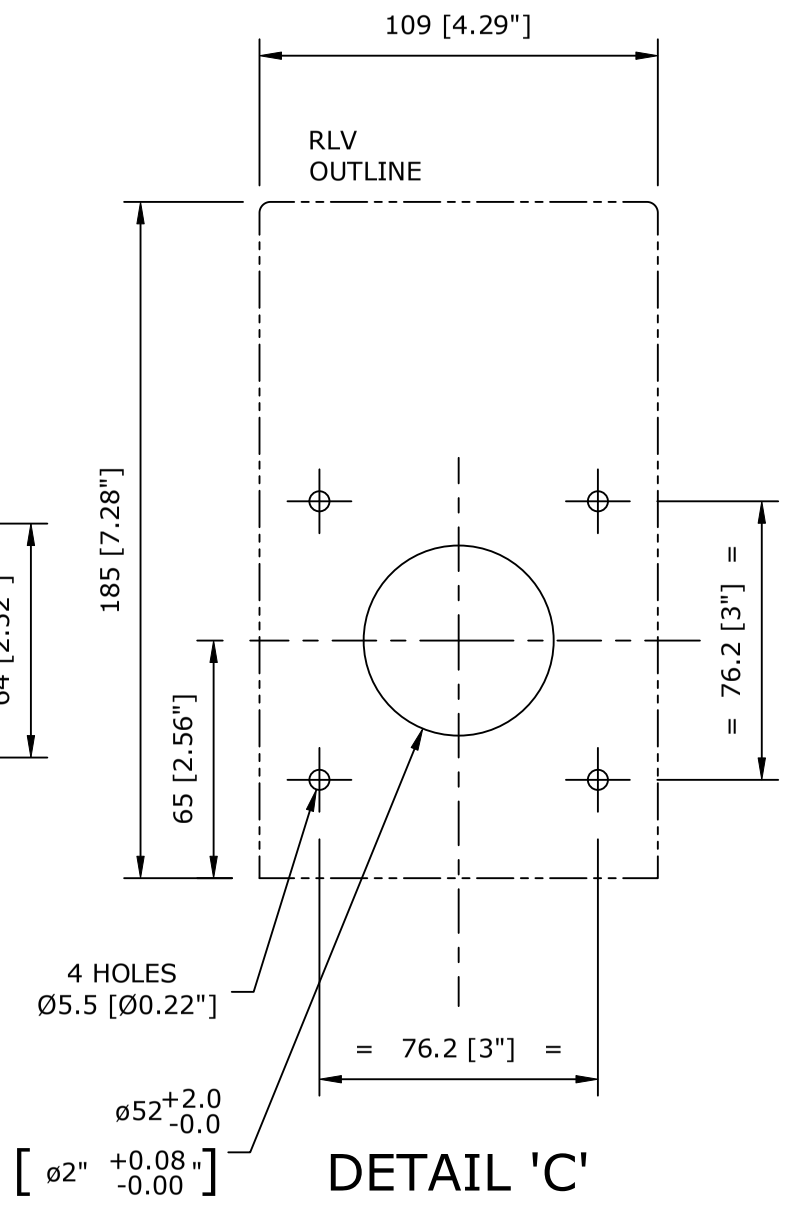
A



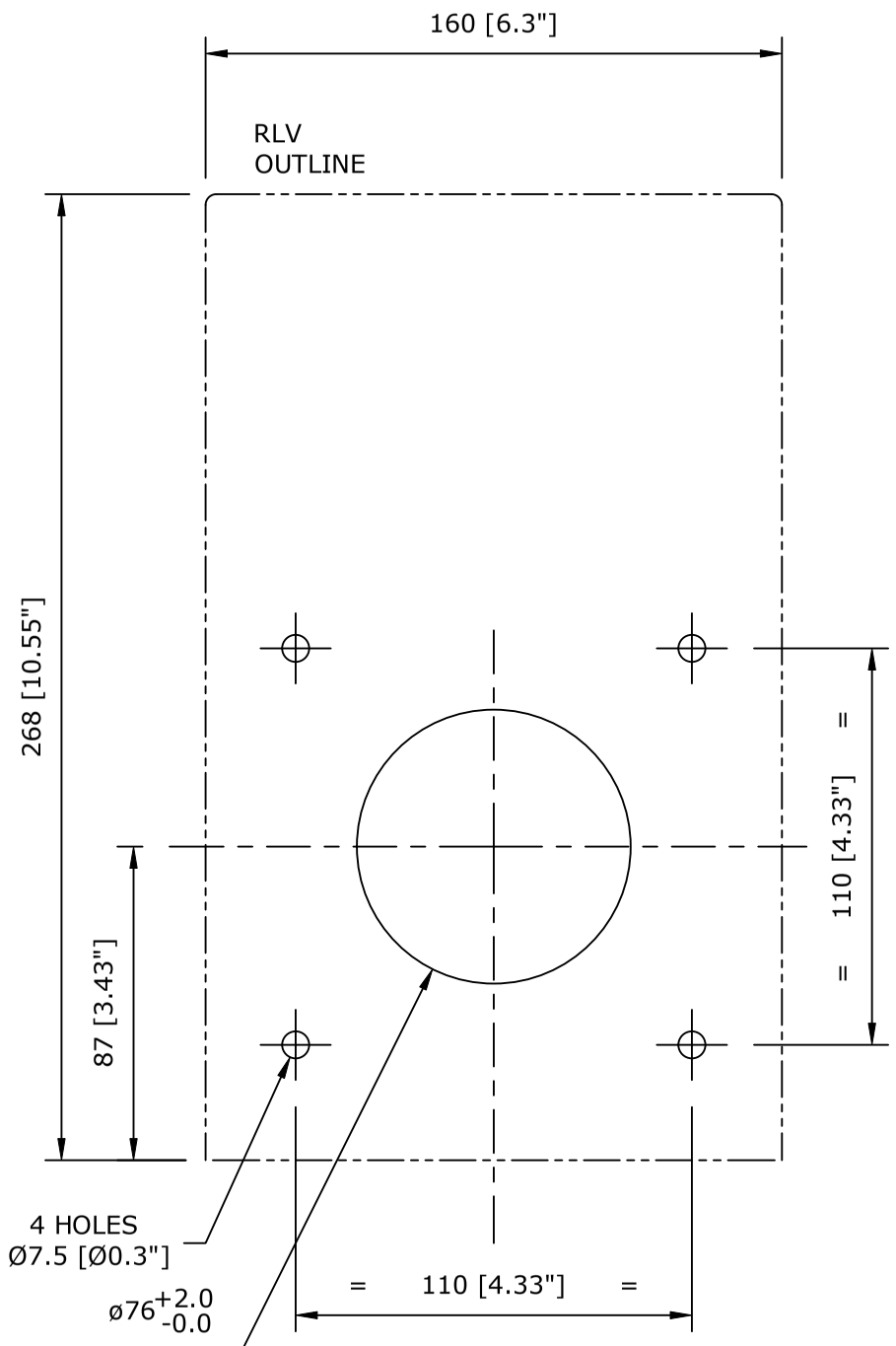

DETAIL 'A'
RLV25
CUTOUT




DETAIL 'B'
RLV36
CUTOUT




DETAIL 'C'
RLV52
CUTOUT




DETAIL 'D'
RLV75
CUTOUT

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 04 | DQN-12456 | 21/10/20 | CE | AR | MLC |
| 03 | 6075 | 14/04/14 | | | SM |
| 02 | 6011 | 19/11/13 | | | JPdB |

| DRAWN DATE | CONTROLLED | MATERIAL |
|---|---|---|
| 09/10/07 | | |
| DRAWING STATUS | REVISION | |
| CERT REL | 04 | FINISH |
| SCALE N.T.S | A3 | |

WEIGHT (Kg)

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

TITLE
RELIEF VALVE DIMENSIONS

DRAWING No.
XSD-RTD0-003

SHEET No. 2 OF 2

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

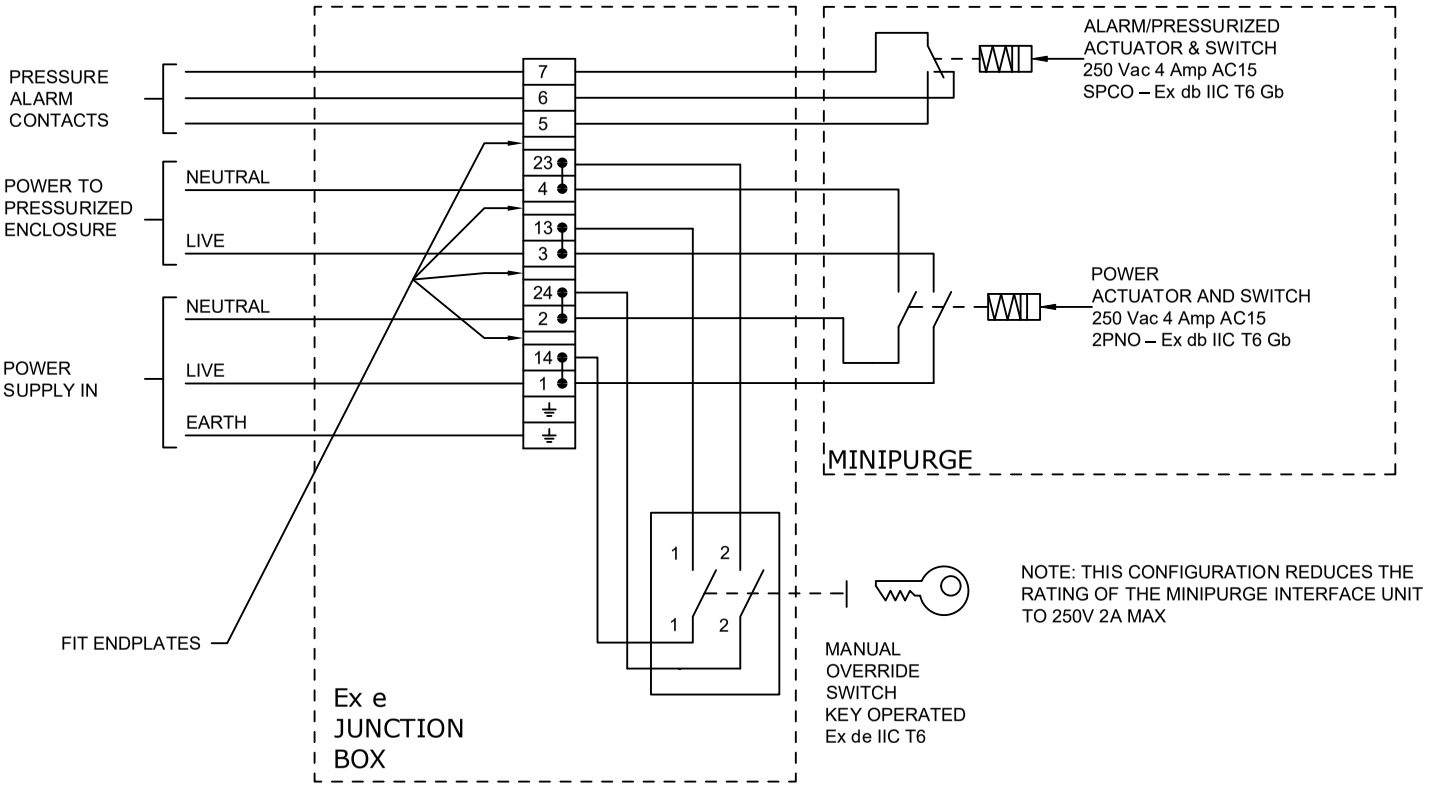
3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

TOLERANCES UNLESS OTHERWISE STATED
FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05
ANGLE STD ±1°

DO NOT SCALE
IF IN DOUBT ASK






| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 03 | DQN-12429 | 05/05/20 | AR | CE | MH |
| 02 | 5481 | 08/02/12 | | | JPdB |
| 01 | Drawn | 09/06/11 | BRD | PC | JPdB |

DRAWN DATE: 09/06/2011
DRAWING STATUS: CERT REL
REVISION: 03
SCALE: N.T.S
A3

MATERIAL:
FINISH:
WEIGHT (Kg):

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

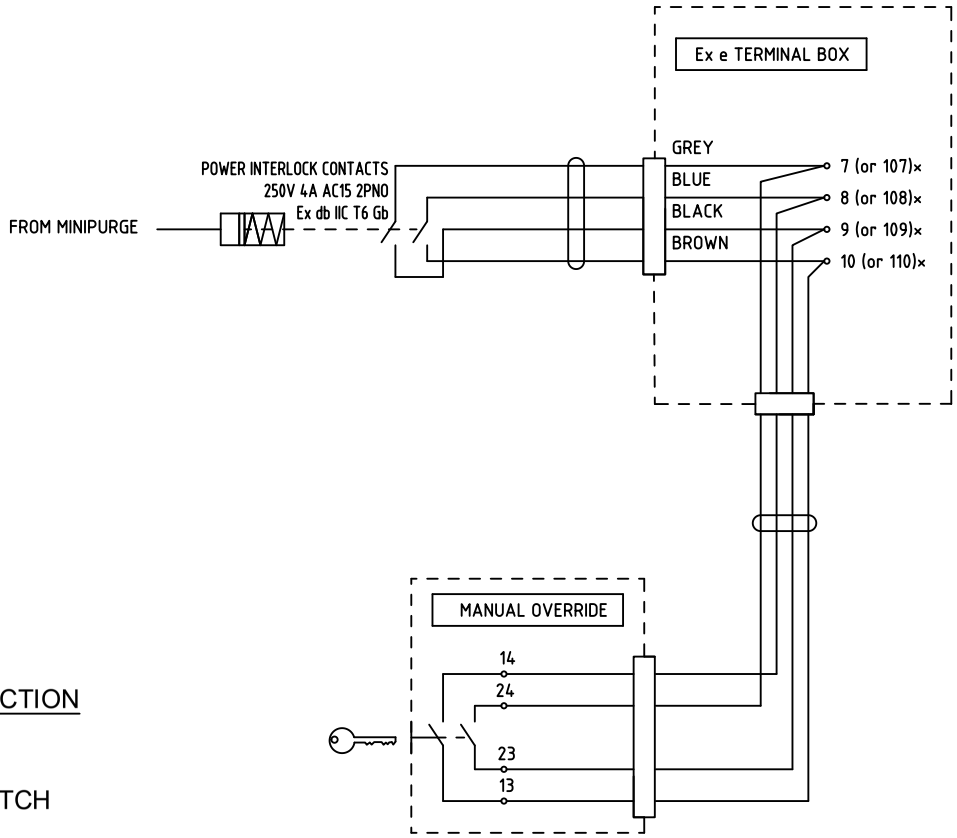
TITLE: MANUAL OVERRIDE SWITCH HOOK UP

DRAWING No.: AGE-WC00-207

SHEET No. 1 OF 1

expo Technologies

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 3RD ANGLE PROJECTION | DIMENSIONS IN mm<br>[ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED<br>DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05<br>ANGLE STD ±1°<br>FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH | DO NOT SCALE<br>IF IN DOUBT ASK | The contents of this drawing / document are Copyright © Expo Technologies Limited. They are to be treated as confidential and are returnable upon request. They are not to be copied or communicated in part or in whole without written consent from Expo Technologies Limited, neither are they to be used in any way against our interests. | | | |




GLAND PLATE IN PURGE SYSTEM IS UNDRILLED.

CABLE GLANDS ARE NOT SUPPLIED.

* TERMINAL NUMBER ACCORDING TO PURGE SYSTEM TERMINAL LAYOUT DRAWING

## MANUAL OVERRIDE FUNCTION

PART CODE /MO(BOX)

VIA KEY-OPERATED SWITCH
(2 POSITIONS 0-1)

GRP ENCLOSURE, IP66 1 X M20 ENTRY

SWITCH RATING
550VAC/10A (AC-15)
110VDC / 2.5A (DC-13)

TEMP RATING -60 TO +55°C

ATEX / IECEX / EAC / BRAZIL / CSA /
PESO / cULus
Ex db eb IIC T5 Gb
Ex tb IIIC T95°C Db

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 13 | DQN-12472 | 01/04/21 | AR | CE | AW |
| 12 | DQN-12446 | 20/07/20 | AR | CE | AW |
| 11 | DQN-12429 | 05/05/20 | AR | CE | MH |

DRAWN DATE: 01/07/2013
DRAWING STATUS: CERT REL
REVISION: 13
SCALE: N.T.S
A3

MATERIAL:
FINISH:
WEIGHT (Kg):

**Expo Technologies Limited**
SURREY TW16 5DB UNITED KINGDOM

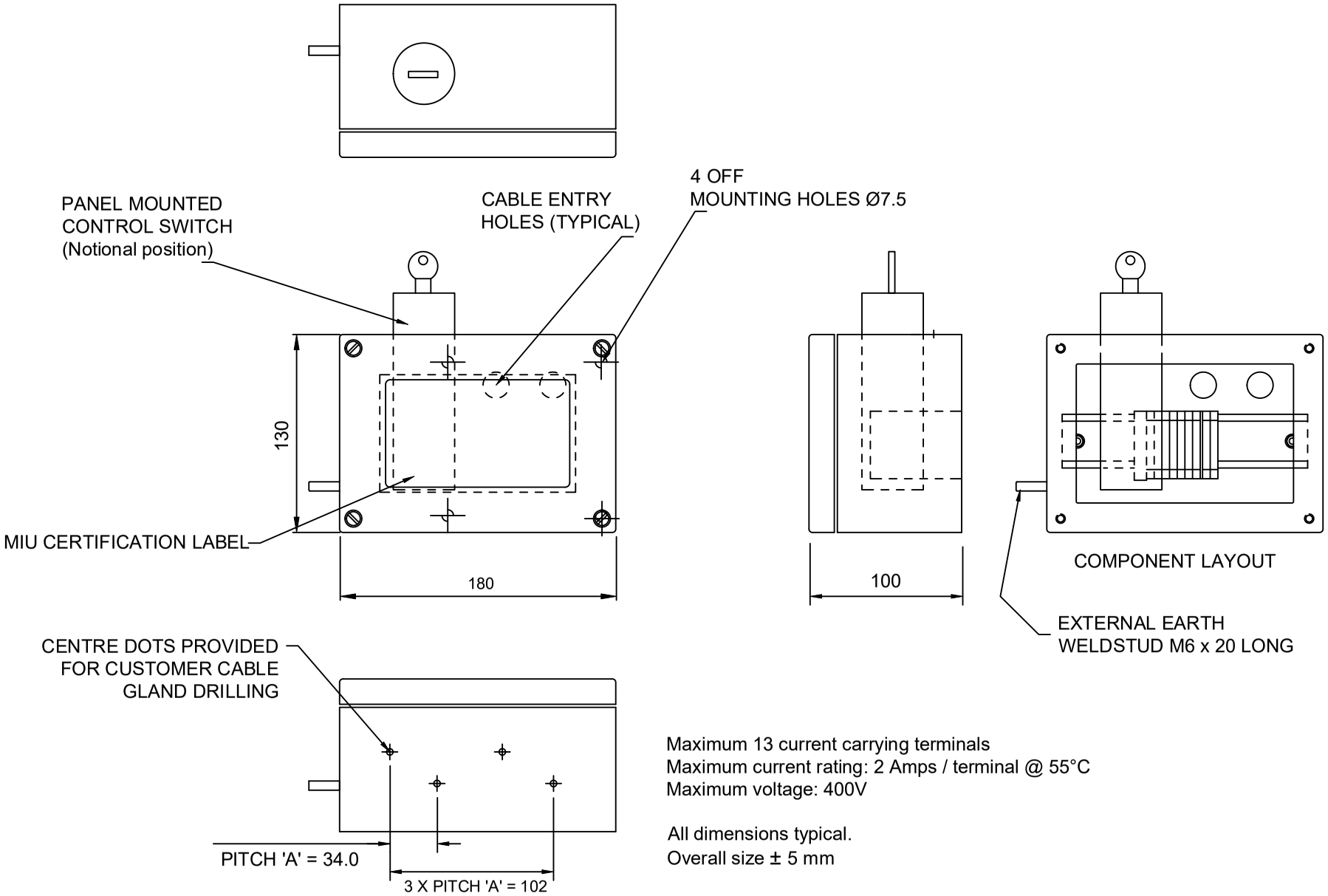
TITLE: MANUAL OVERRIDE SWITCH HOOK-UP

DRAWING No.: AGE-WC00-117

SHEET No. 1 OF 1

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

| 3RD ANGLE PROJECTION | DIMENSIONS IN mm<br>[ ] DENOTES IMPERIAL | TOLERANCES UNLESS OTHERWISE STATED<br>FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH<br>DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXx ±0.05<br>ANGLE STD ±1° | DO NOT SCALE IF IN DOUBT ASK |  |
|---|---|---|---|---|




Maximum 13 current carrying terminals
Maximum current rating: 2 Amps / terminal @ 55°C
Maximum voltage: 400V

All dimensions typical.
Overall size ± 5 mm

| REVISION | MOD # | DATE | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|
| 01 | DRAWN | 05/05/20 | AR | CE | MH |
| | | | | | |
| | | | | | |

| DRAWN DATE | MATERIAL | WEIGHT (Kg) | Expo Technologies Limited<br>SURREY TW16 5DB UNITED KINGDOM | DRAWING No. |
|---|---|---|---|---|
| 05/05/20 | | | | XSD-7TD0-013 |
| DRAWING STATUS: CERT REL / REVISION: 01 | FINISH | TITLE: Ex e JUNCTION BOX M/O GA | | SHEET No. 1 OF 1 |
| SCALE: N.T.S / A3 | | | | |

**EU Authorised Representative:**
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46 Eastcote Drive, Little Island,
Co. Cork, T45 WR68, Ireland.
Email: EUAR@expopharma.ie

**Manufacturer:**
Expo Technologies Ltd
Unit 2, The Summit, Hanworth Road,
Sunbury-on-Thames, TW16 5DB, U.K.
Email: sales@expoworldwide.com

# EU Declaration of Conformity CE

**This declaration of conformity is issued under the sole responsibility of the manufacturer and EU authorised representative named above:**

**Object of the declaration:**

| | |
|---|---|
| **Product Name:** | MiniPurge Controller System |
| **Product Options:** | This declaration covers all variants associated with the above product |

**The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

| **Type of Legislation:** |
|---|
| Electromagnetic Compatibility Directive (EMC) 2014/35/EU |
| ATEX Directive 2014/34/EU |

**The Following harmonised standards and technical specifications have been applied:**

| **Type of Legislation:** | **General Standard:** | **Reference Standard:** |
|---|---|---|
| **EMC Directive:** | Generic standards - Immunity for industrial environments | EN 61000-6-2:2005 |
| | Generic standards - Emission standard for industrial environments | BS EN IEC 61000-6-4:2007 |
| **ATEX Directive:** | Equipment general requirements0:2018/AC:2020 | EN IEC 60079-0:2018/AC:2020 |
| | Equipment protection by intrinsic safety "i" | EN 60079-11:2012 |
| | Equipment protection by pressurized enclosure "p" | EN 60079-2:2014 |

**Notified Body:**

| | |
|---|---|
| **NB Name:** | ExVeritas |
| **NB Number:** | 2804 |

Technical documentation and assessments are in the Expo Technologies confidential technical file SC004.

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

**Date:** 17th October 2024

**EU Authorised Representative**:
ExpoPharma Engineering Services Ltd
46 Eastcote Drive, Little Island,
Co. Cork, T45 WR68, Ireland.
Email: EUAR@expopharma.ie

**Manufacturer:**
Expo Technologies Ltd
Unit 2, The Summit, Hanworth Road,
Sunbury-on-Thames, TW16 5DB, U.K.
Email: sales@expoworldwide.com

# EU Declaration of Conformity CE

**This declaration of conformity is issued under the sole responsibility of the manufacturer and EU authorised representative named above:**

**Object of the declaration:**

| | |
|---|---|
| **Product Name:** | Electronic Timer Module (ETM-IS**_***) |
| **Product Options:** | This declaration covers all variants associated with the above product |

**The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

| **Type of Legislation:** |
|---|
| ATEX Directive 2014/34/EU |

**The Following harmonised standards and technical specifications have been applied:**

| **Type of Legislation:** | **General Standard:** | **Reference Standard:** |
|---|---|---|
| **ATEX Directive:** | Equipment general requirements | EN IEC 60079-0: 2018 |
| | Equipment protection by intrinsic safety "i" | EN 60079-11: 2012 |

**Notified Body:**

| | |
|---|---|
| **NB Name:** | ExVeritas |
| **NB Number:** | 2804 |

Technical documentation and assessments are in the Expo Technologies confidential technical file SC039.

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

**Date:** 7th May 2024

**EU Authorised Representative**:
ExpoPharma Engineering Services Ltd
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Co. Cork, T45 WR68, Ireland.
Email: EUAR@expopharma.ie

**Manufacturer:**
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Unit 2, The Summit, Hanworth Road,
Sunbury-on-Thames, TW16 5DB, U.K.
Email: sales@expoworldwide.com

# EU Declaration of Conformity CE

**This declaration of conformity is issued under the sole responsibility of the manufacturer and EU authorised representative named above:**

**Object of the declaration:**

| | |
|---|---|
| **Product Name:** | MiniPurge Interface Units (MIU/e) |
| **Product Options:** | This declaration covers all variants associated with the above product |

**The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

| **Type of Legislation:** |
|---|
| ATEX Directive 2014/34/EU |

**The Following harmonised standards and technical specifications have been applied:**

| **Type of Legislation:** | **General Standard:** | **Reference Standard:** |
|---|---|---|
| **ATEX Directive:** | Equipment general requirements | EN IEC 60079-0:2018 |
| | Equipment protection by increased safety "e" | EN 60079-7:2015+A1:2018 |
| | Equipment dust ignition protection by enclosure "t" | EN 60079-31:2014 |

**Notified Body:**

| | |
|---|---|
| **NB Name:** | ExVeritas |
| **NB Number:** | 2804 |

Technical documentation and assessments are in the Expo Technologies confidential technical file SC027.

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

**Date:** 7th May 2024

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**www.expoworldwide.com**