



# MiniPurge<sup>®</sup> Type X Size 1 Manual ML 442



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# 1. Specification Sheet – MiniPurge® Type X Systems

**Model No. (Example): 07 1 XLC / ss / PO / WM**

(Note: Not all codes are applicable)

**Purge System Type**

07 = MiniPurge

**Size**

1 = Sub MiniPurge  
Purge flow rate 225 NI /min, 8 scfm

**Approval / Certification**

**X =**  
Europe  
EN60079-0, EN60079-2  
**Sira 01ATEX1295X**  
0518 II 2 (2) G D   
Ex [pxb] IIC T6 Gb  
Ex [pxb] IIIC T85°C Db  
Tamb -20°C +55°C  
IEC  
IEC60079-0, IEC60079-2  
**IECEX SIR 07.0027X**  
Ex [pxb] IIC T6 Gb  
Ex [pxb] IIIC T85°C Db  
Tamb -20°C +55°C

**BRAZIL**  
INMETRO- TÜV 12.1462X  
Ex [pxb] IIC T6 Gb  
Ex [pxb] IIIC T85°C Db  
Tamb -20°C +55°C

USA / Canada NFPA 496  
**FM 1X8A4AE**  
Class I Div 1 Groups A, B, C & D

**UL E190061**  
Class I Div 1 Groups A, B, C & D

**Options as Required**

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

**Power & Alarm (Signals)**

**PO** = Pneumatic Output  
“Power” : On Purge Complete = 30 psi / 0.2 MPa / 2 bar Signal  
“Alarm” : Loss of Pressure = No signal  
“Pressurized” = 30 psi / 0.2 MPa / 2 bar Signal  
**PA** = Power and Alarm Terminal Box Ex e IIC T5  
Power and Alarm Terminal Box Ex e IIC T4  
“Power” ; 250 Vac 4 Amp AC15 2PNO – Ex d IIC T6  
“Alarm” : 250 Vac 4 Amp AC15 SPCO – Ex d IIC T6  
(European and IEC Systems Only)  
**IS** = Intrinsically Safe, Ex i & Ex i circuit  
“Power” : used with others’ Ex i equipment  
“Alarm” : Relay / Barrier

**MiniPurge® Housing**

**ss** = 316L Stainless Steel  
Neoprene “Top” Mount Gasket  
**pm** = Panel Mount (Side/Front Mount) 316L  
Stainless Steel

**Presurization Method**

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

For limitations and conditions of use refer to the applicable certificate at the back of this manual.

<b>Supply Pressure:</b>	Must be regulated at inlet Minimum 60 psi / 0.4 MPa / 4 bar Maximum 115 psi / 0.8 MPa / 8 bar	
<b>Air Quality:</b>	Compressed air / Nitrogen to instrument quality	
<b>Ambient Temperature:</b>	-20°C to + 55°C	
<b>Leakage Compensation:</b>	Variable up to 2 scfm / 60 NI/min to compensate for leakage of enclosure	
<b>Purge Timer:</b>	Stepped adjustable between 1 minute and 30 minutes	
<b>Flow &amp; Pressure Sensors:</b>	<b>CF:</b>	One sensor for both
	“Low Pressure and Flow”:	1” WC / 250 Pa (2.5 mbar)
	<b>LC:</b>	“Low Pressure Sensor”
	“Flow Sensor”	0.2” WC / 50 Pa (0.5 mbar) 1.13” WC/ 280 Pa / (2.8 mbar)
<b>Relief Valve:</b>	<b>System:</b>	<b>CF</b> <b>LC</b>
	Model No:	RLV25/ss RLV25/FS/ss
	Opening Pressure:	4” WC / 1 kPa (10 mbar) 4” WC / 1 kPa (10 mbar)
	Purge Flow Rate:	N/A (see Spark Arrestor) 8 scfm / 225 NI/min
	Material:	316L Stainless Steel, Spark Arrestor: Stainless Steel mesh, Gasket: Neoprene
<b>Spark Arrestor Unit</b> (CF systems only)	Model No:	SAU25
	Purge / Dilution Flow Rate:	Between 0.4 & 8 scfm / 10 & 225 NI/min (Default: 8 scfm) 7 user selectable orifice plates
	Material:	Stainless Steel
<b>Bulkhead Pipe Fittings:</b>	Air Supply:	1/2” NPT
	Output:	1/2” NPT
	Signal:	1/8” NPT

**Visual Indicators:**

**CF:** Alarm / Pressurized (Red / Green)  
Purge Complete (Red / Green)  
**LC:** Alarm / Pressurized (Red / Green)  
Purge Complete (Black / Amber)

**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.

## 2. Application Suitability

MiniPurge<sup>®</sup> 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<sup>®</sup> systems may be used for hazards of any gas group. However, apparatus associated with the MiniPurge<sup>®</sup> 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<sup>®</sup> 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
• Mild (carbon) Steel	• Nylon	• Silicone Rubber
• Brass	• Polyurethane	• Neoprene

### 3. Description and Principle of Operation

All Expo Technologies MiniPurge<sup>®</sup> 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<sup>®</sup> system status, and
- d) an output to provide remote indication or control.

The MiniPurge<sup>®</sup> system comprises a number of component units. The units required depend on the type of system selected. These are summarised in Table 1. The general description and function of each is as follows:

#### 3.1 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, 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.

#### 3.2 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. RLV25 (= 25mm 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

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

Continuous Flow systems incorporate the SAU25. This unit has a range of interchangeable calibrated orifice plates, which are used to measure the flow through the PE.



Figure 2 Spark Arrestor Type SAU25

#### 3.4 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.

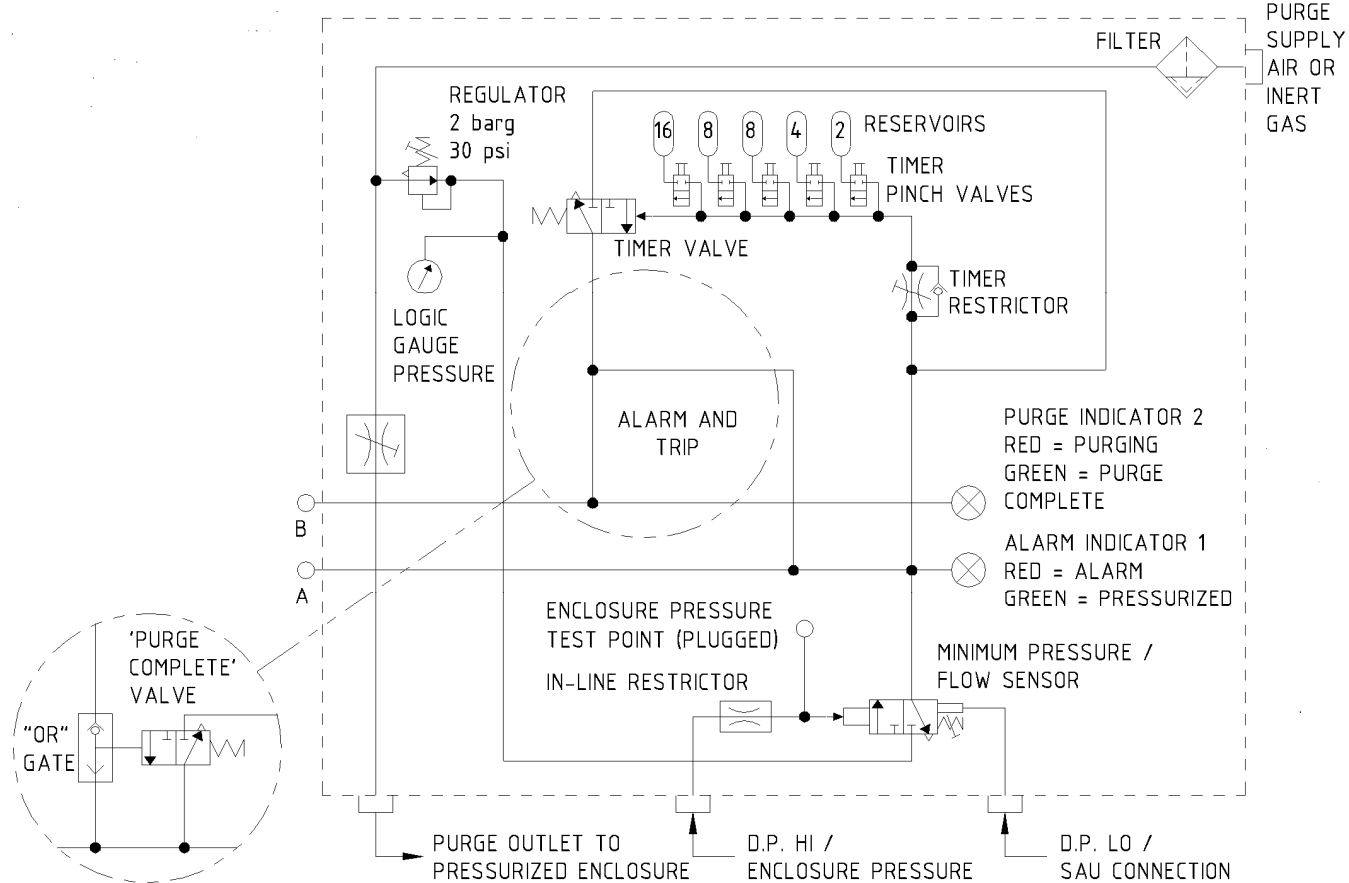


Figure 3 Continuous Flow Circuit Diagram

## 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. 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.

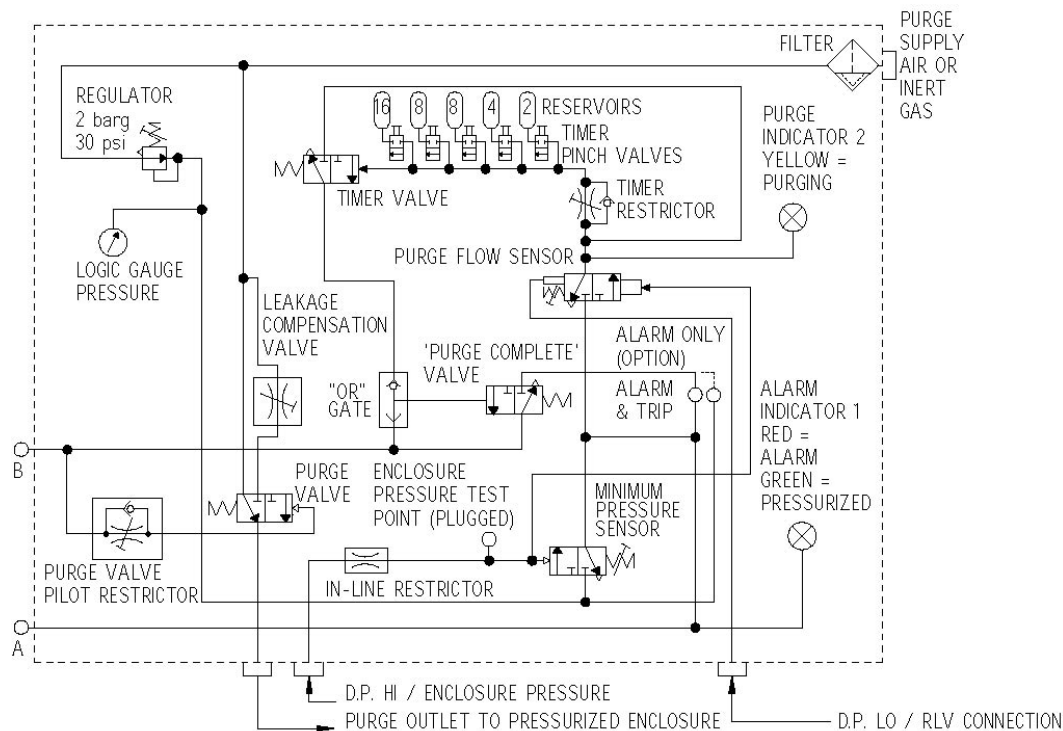


Figure 4 Leakage Compensation Circuit Diagram

## 3.5 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).

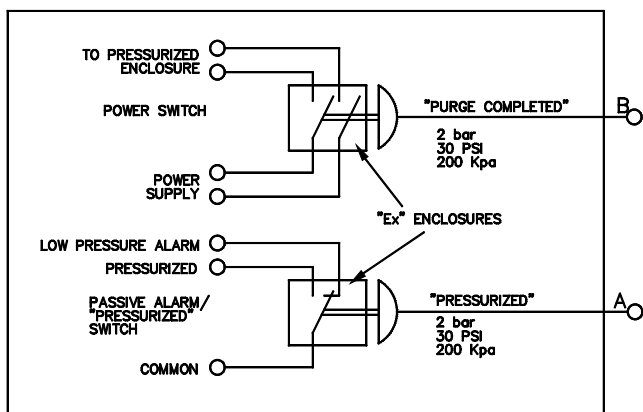


Figure 6 Pneumatic Output Option

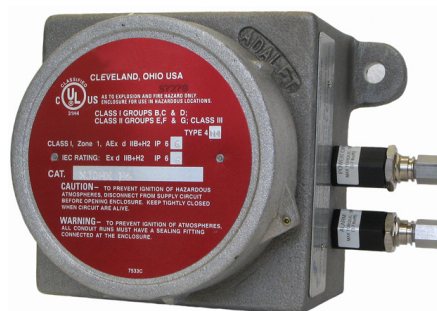


Figure 5 Typical MiniPurge Interface Unit type (MIU/dA)



### 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).

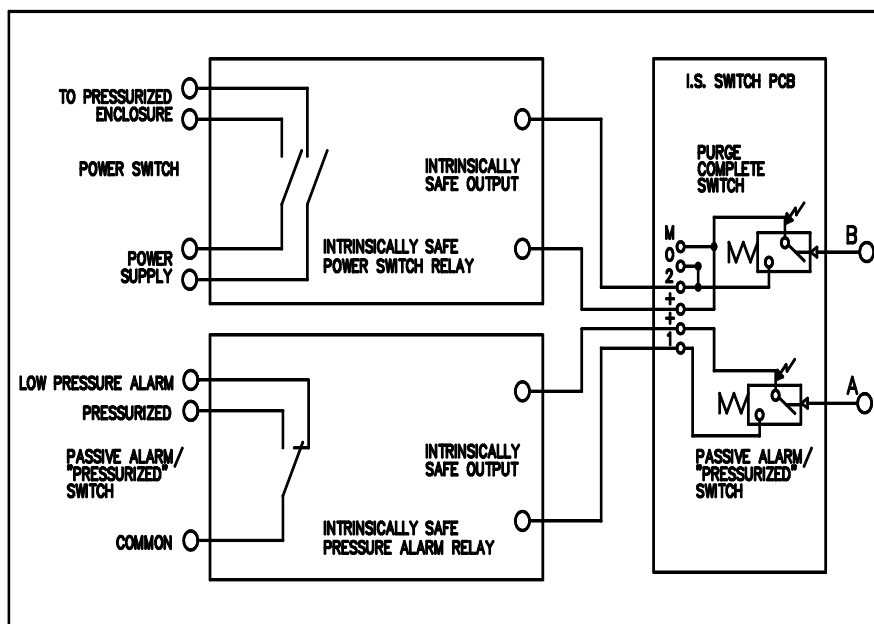


Figure 7. Intrinsically Safe (IS) Option

### c) PA - Power and Alarm

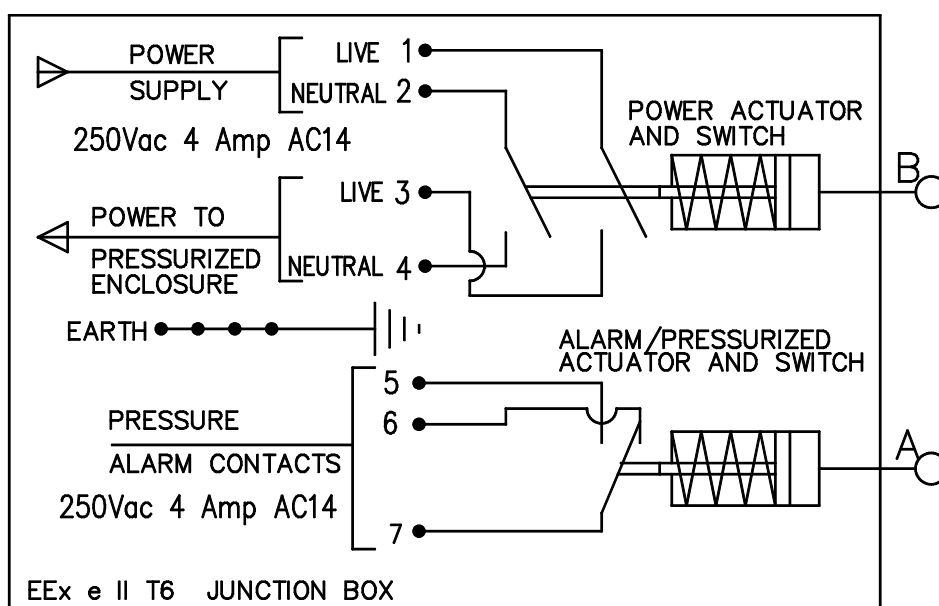


Figure 8. Ex de Power and Alarm (PA) Option

The terminal box is Increased Safety (Ex e) certified and incorporates the terminal connection points for the alarm and interlock circuits. 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.

## 4. Installation of the System

This MiniPurge<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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 (SAU25)

Table 1 System Components

### 4.1 Control Unit (CU)

The MiniPurge<sup>®</sup> 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<sup>®</sup> 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.

### 4.2 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. In particular the exterior of the Spark Arrestor should not be painted or blocked off in any way.

### 4.3 Connections to Protective Gas Supply

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

The supply pipe connection to the MiniPurge<sup>®</sup> 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<sup>®</sup> may also suffer because of poor air quality.

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<sup>®</sup> 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<sup>®</sup> 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.

## **4.4 Purge Air from CU to PE**

When the CU is directly top mounted onto the PE, no connection will normally be necessary, as the purge air will discharge into the PE directly. When the CU is not top mounted, or where internal air distribution is necessary a connection should be made from the purge air outlet on the CU (normally ½" 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.

## **4.5 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 metal tube. Make sure that all connections are free of leaks.

## **4.6 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 SAU25.

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 the back of the RLV "DP LO (Low) RLV Connection". This connection requires a pipe to connect the CU to the RLV25.

#### 4.7 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.

#### 4.8 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 permits 5 free volume changes and an example of the calculations is as follows:

If the PE external dimensions indicate an internal free volume of 500 Litres then,  

$$\frac{500 \text{ litres enclosure volume} \times 5 \text{ volume changes}}{225 \text{ litres/minute purge flow rate}} = 12 \text{ minutes purge time}$$

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.  

$$\frac{500 \text{ litres enclosure volume} \times 10 \text{ volume changes}}{225 \text{ litres/minute purge flow rate}} = 23 \text{ minutes purge time}$$

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 8 cubic foot, then,  

$$\frac{8 \text{ cubic foot enclosure volume} \times 4 \text{ volume changes}}{8 \text{ cubic foot/minute purge flow rate, (see above)}} = 4 \text{ minutes purge time}$$

If the same PE contains a motor, then,  

$$\frac{8 \text{ cubic foot enclosure volume} \times 10 \text{ volume changes}}{8 \text{ cubic foot/minute purge flow rate, (see above)}} = 10 \text{ minutes purge time}$$

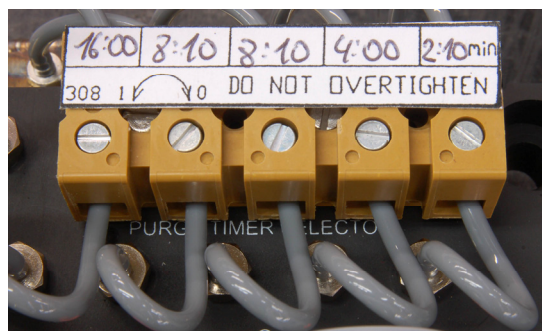


Figure 9 MiniPurge® timer block

The standard MiniPurge® units have the patented digital pneumatic timer system as shown in *Figure 9 MiniPurge® timer block*. The purge time is set by opening / closing the pinch valve so that the sum of the open valve times equals or exceeds the required purge time. **At least one valve must always be open, and the screws must be at the appropriate limit of travel. Do not over tighten.**

## **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
A	10	0.4
B	25	0.9
C	40	1.4
D	65	2.3
E	90	3.2
F	135	4.8
G	180	6.4
NO ORIFICE	225	8.0

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).

### **a) Leakage Compensation**

The action on loss of pressurization is set by moving the jumper tube (see Figure 10 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.

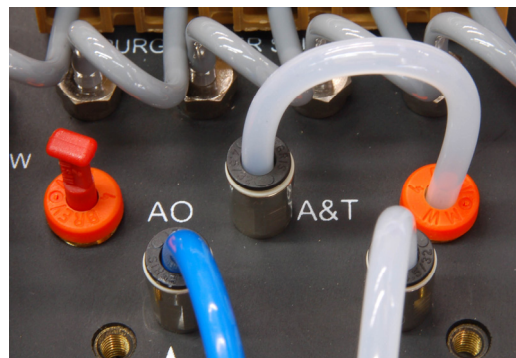


Figure 10 Action on loss of pressurization jumper tube

### **b) Continuous Flow**

The standard CF system is built set to Alarm and Trip. Alarm Only can be installed when order specified or supplied as a retrofit kit later. See options.

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:

Alarm Only on pressure or flow failure with power being removed manually by turning off the air supply to the MiniPurge<sup>®</sup> 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.

#### 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<sup>®</sup> system if the failure persists for an unacceptable time.

### 4.9 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.

### 4.10 Multiple Enclosures

More than one PE can be protected by a single system. Where PEs are connected and purged in "series" e.g. "Daisy Chained", the RLV and when using a CF system, the SAU25 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 RLV25 or SAU25, the pipe bore size should not be less than 25mm (1").

A common fault of installing small bore pipe leads to over pressurizing of all but the last enclosure.

PEs should not be connected in parallel.

## 5. Commissioning

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

Disconnect the supply pipe from the inlet to the MiniPurge<sup>®</sup> 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<sup>®</sup> system pressure test point (Remove the red plug on the low pressure sensor and connect 4mm OD nylon tube).



Figure 11. PE or MiniPurge<sup>®</sup> system pressure test point

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

### 5.1 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.

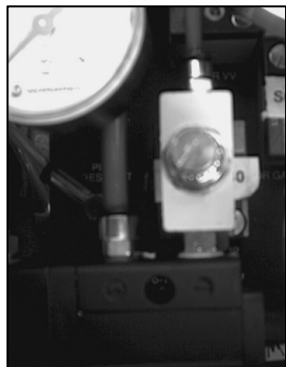


Figure 12. Flow Control Valve (FCV)

Check that the internal logic gauge reads 2bar /30 psig/200kPa. The purge 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 turning green 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 turn from red to green.

After the power has been turned on by the CU, the air flow will continue at the same rate to provide dilution as required.

## 5.2 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.  
Note tolerance of  $\pm 2$  mbarg / 0.8" WC / 200Pa
- Repeat the test several times.

Figure 13 Leakage Compensation Valve

- 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

At this time the "alarm/pressurized" indicator should be green and the "purging" indicator should be yellow. If the yellow 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 purge timer will start as soon as the "purging" indicator turns yellow. Check that the time delay between the "purging" indicator turning yellow and the application of power to the PE is not less than the minimum time required purging the PE. Times in excess of the minimum are permitted and a tolerance of +20% is normally acceptable. 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.

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.

### 5.3 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

## 6. 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 months.

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

### 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. Do not use solvents on any part of the filter assembly.

## 7. 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.

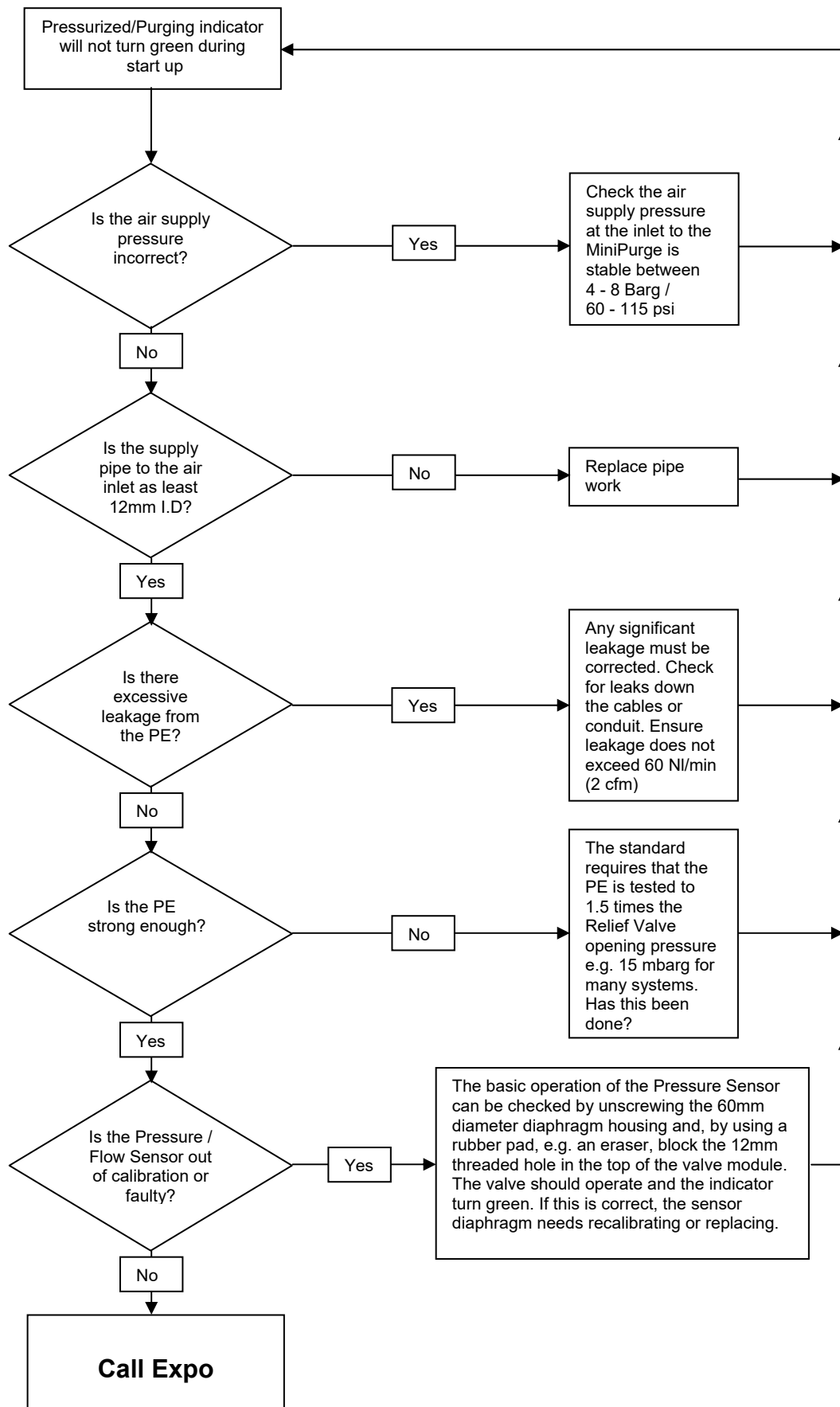
The system has been designed for ease of fault finding and the many of the components fitted are plug-in or manifold mounted. Check components by substitution only after establishing that such action is necessary. If the system is less than 12 months old, parts under warranty should be returned to Expo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

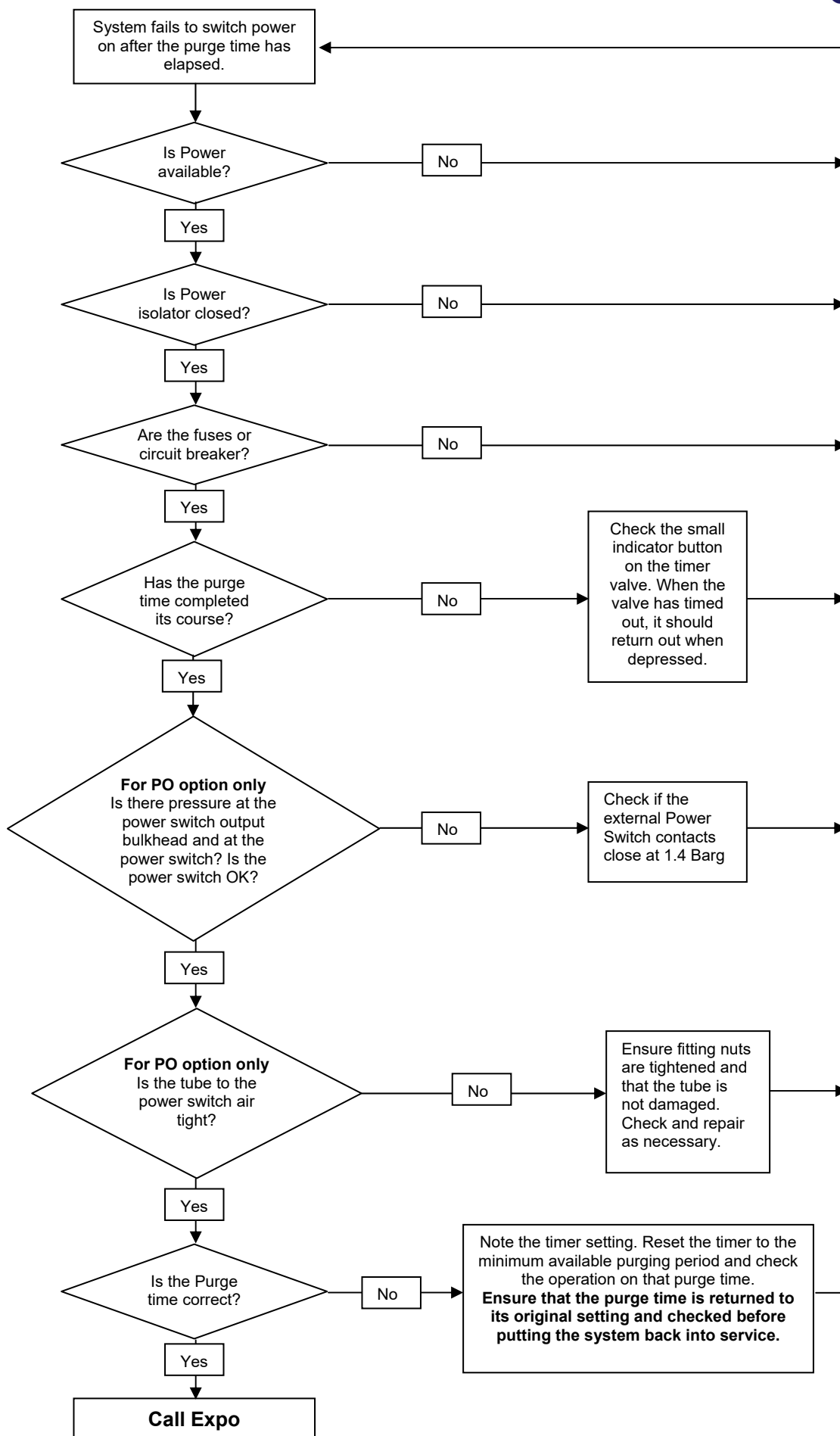
As with any pneumatic system the greatest enemies are water, oil and dirt in the air supply. For this reason the air system must always incorporate a dust and water filter. This can be part of the Expo system or can be provided by others. However dirt can enter from other sources and it is vital therefore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

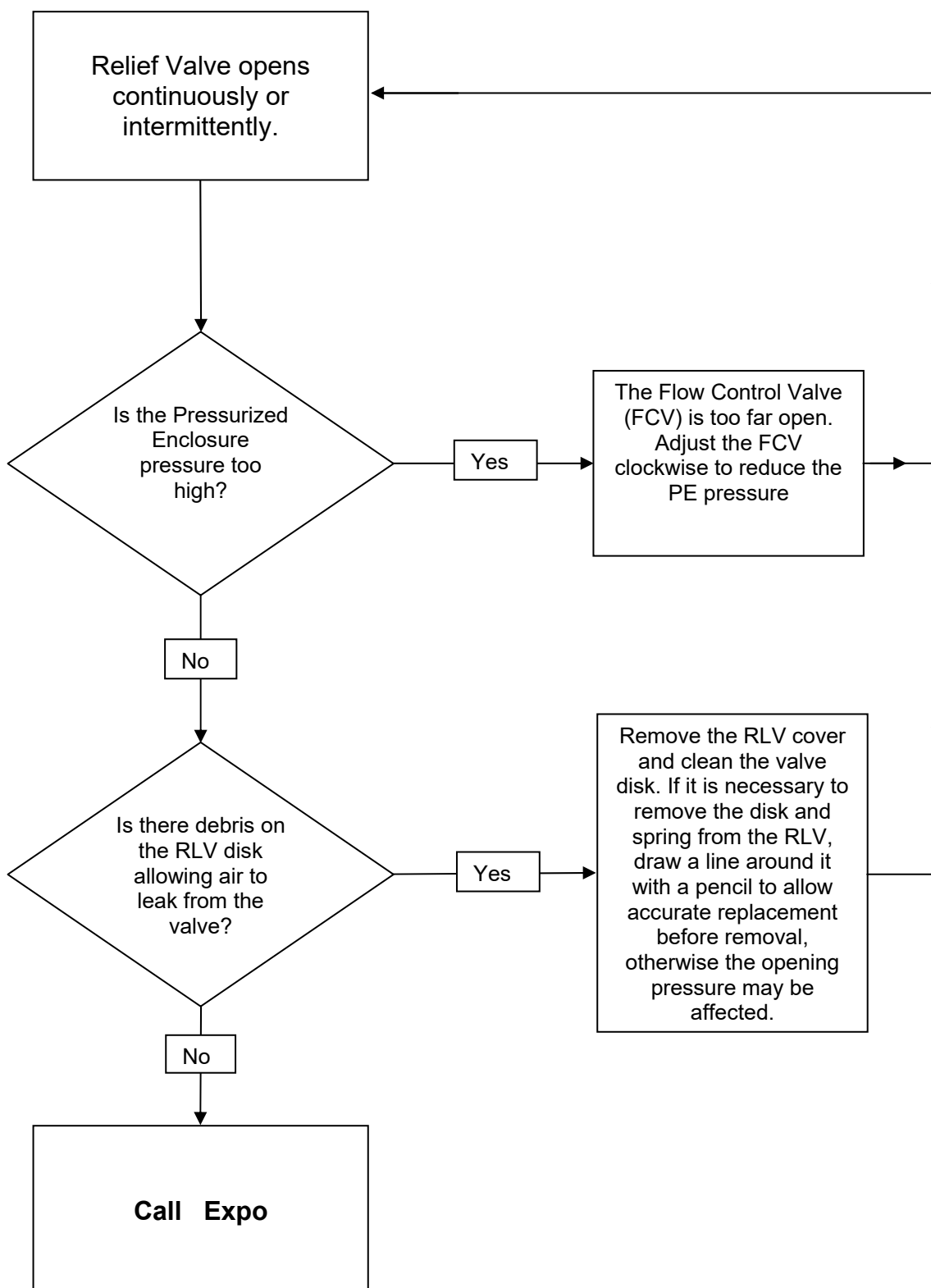
Before making the following checks verify that both the main air supply pressure to the purge system & the regulated pressure to the logic are as specified on the system specification sheet.

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

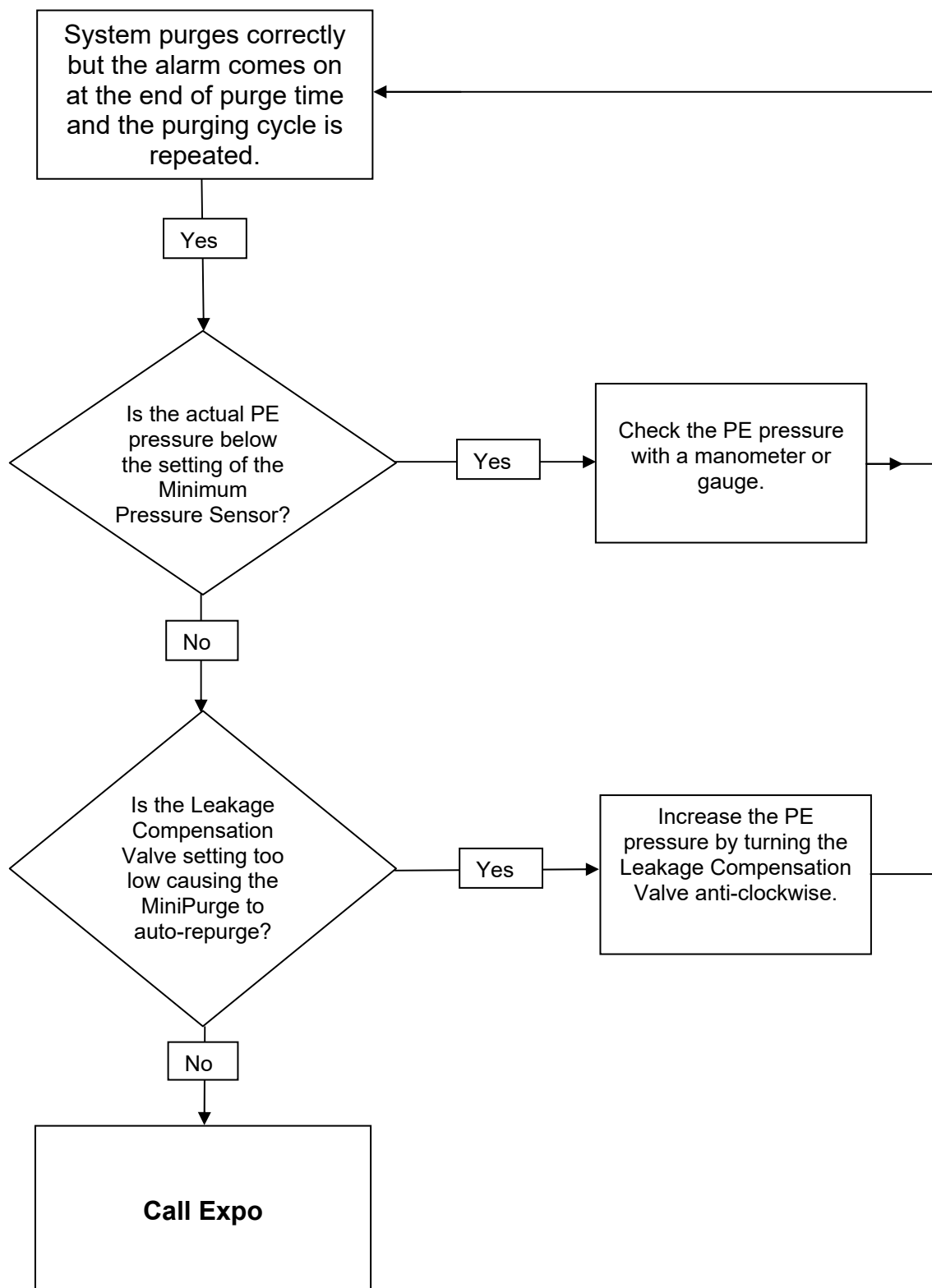
## Fault Finding (CF)

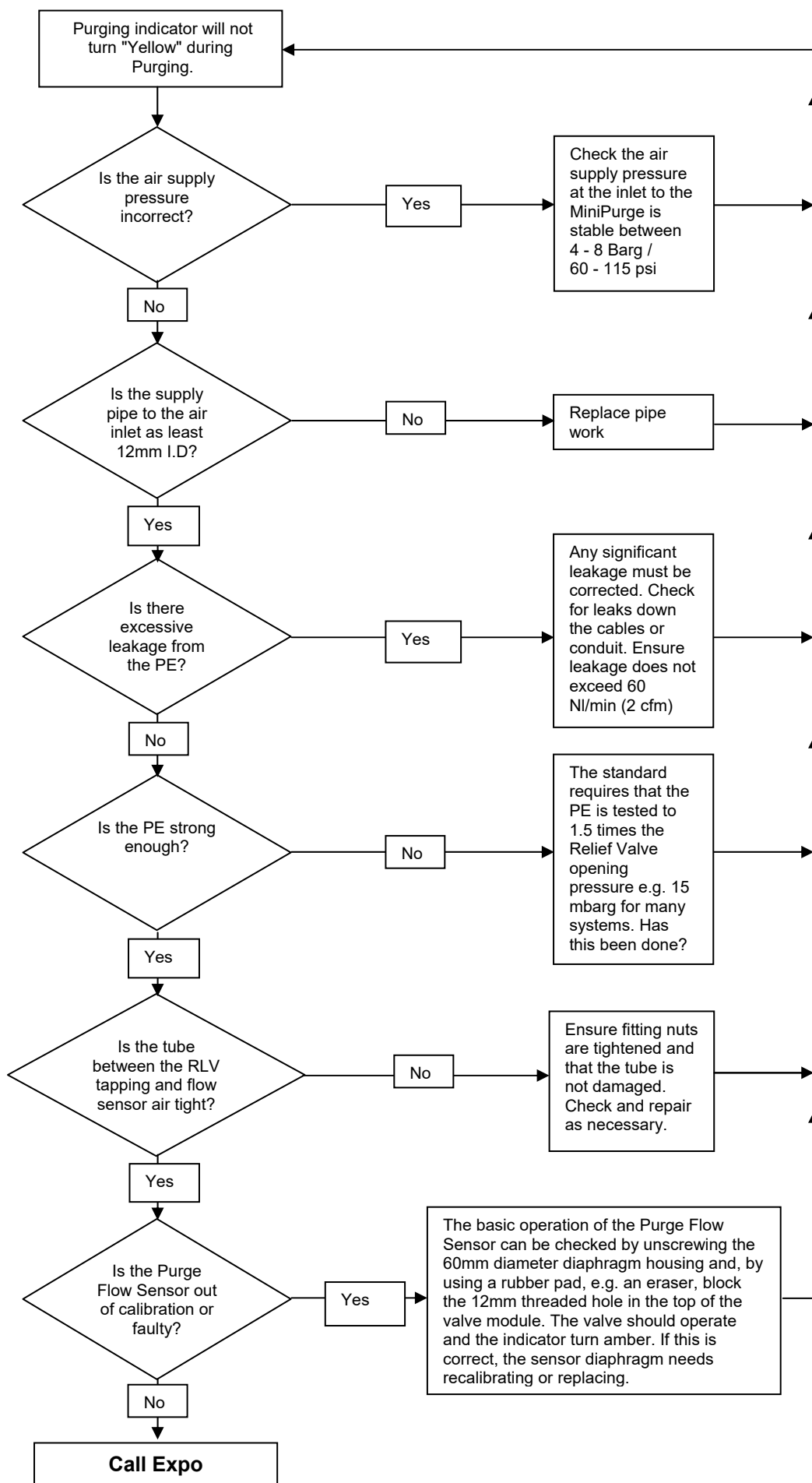




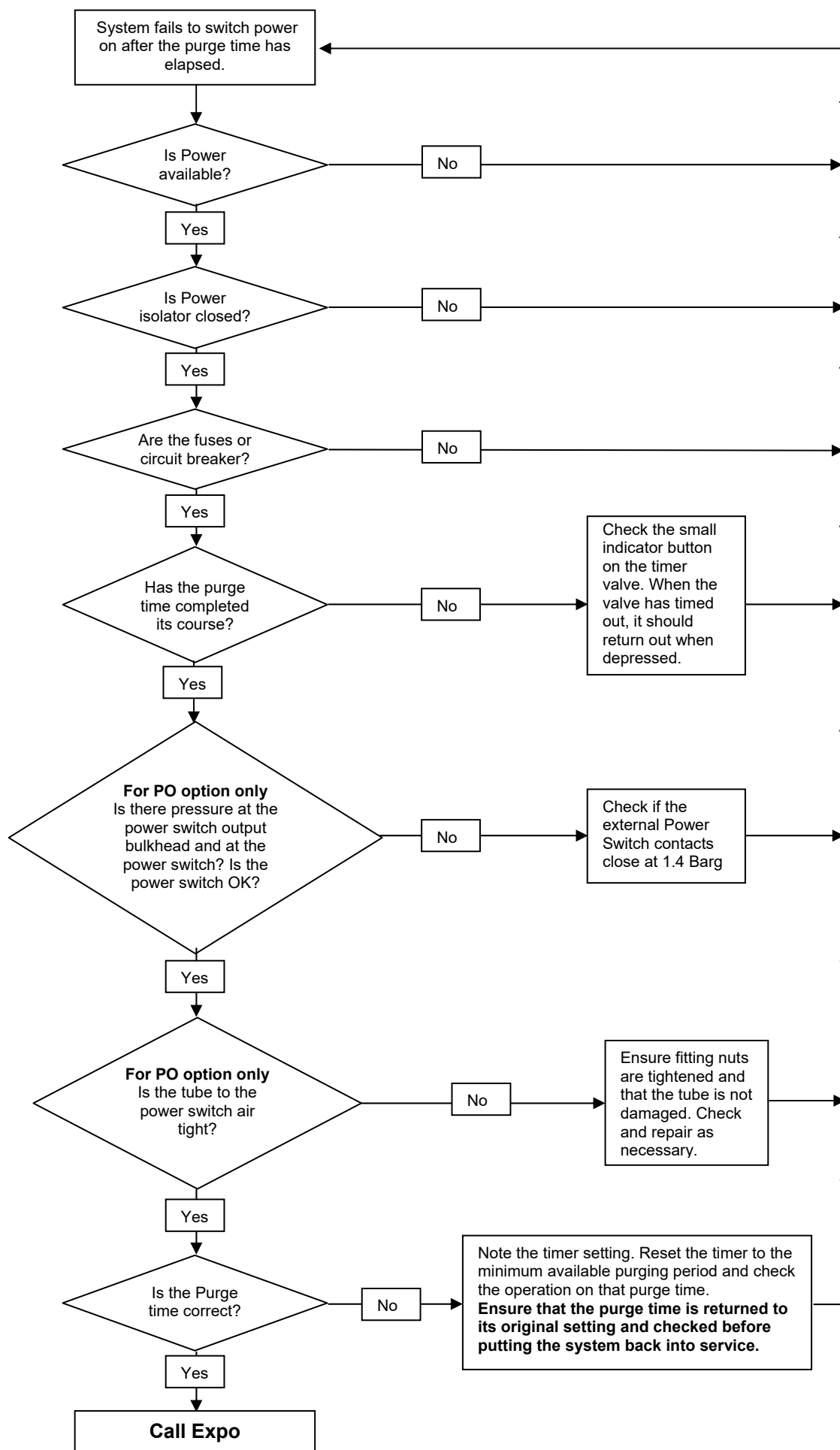


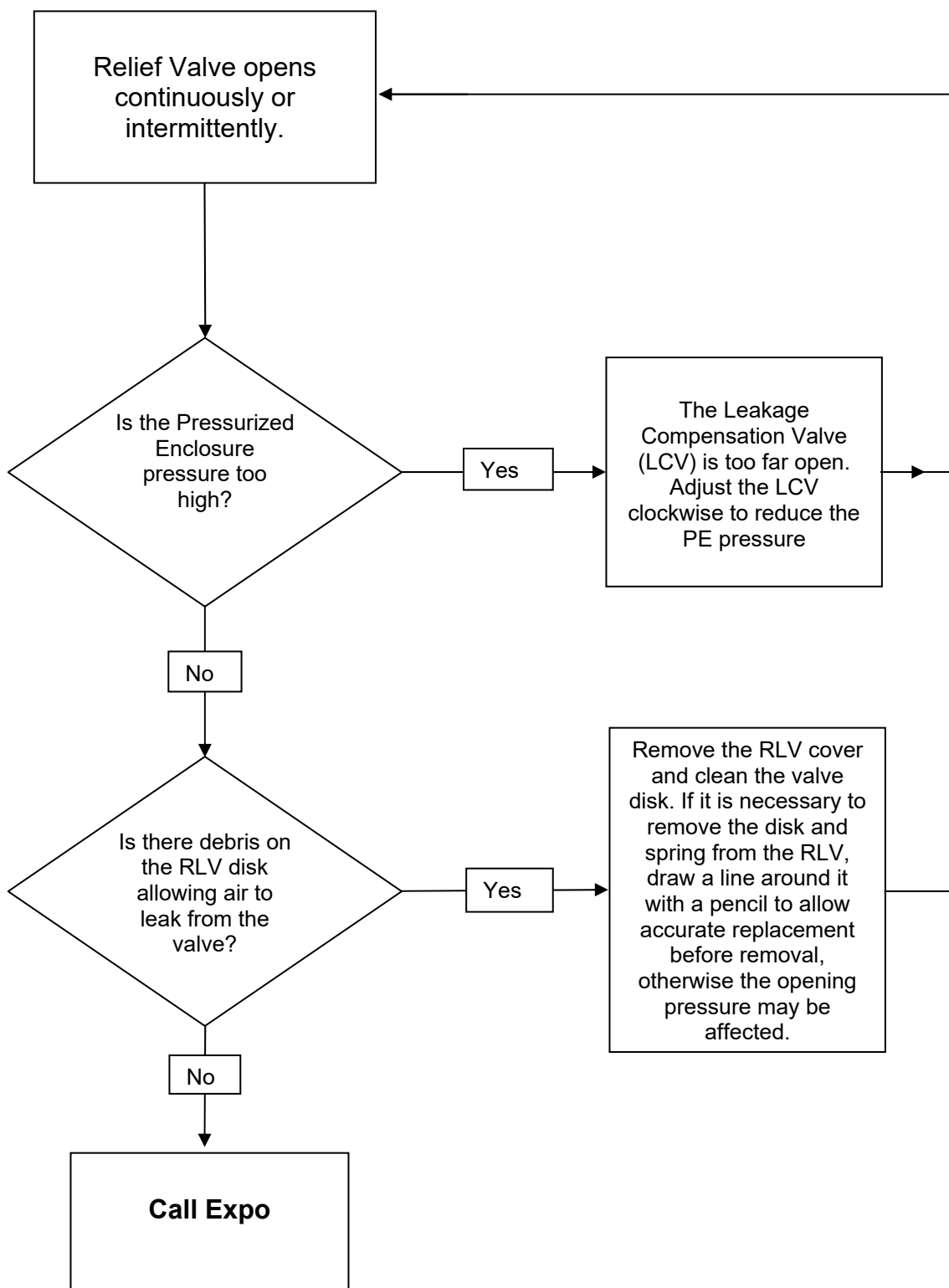
## Fault Finding (LC)











## 8. Approval Documents

System	Certificate	Certificate Number
MiniPurge®	IECEX Certificate	IECEX SIR 07.0027X
	ATEX Certificate	01ATEX1295X
	INMETRO/TÜV	TÜV 12.1462X
	FM Certificate	1X8A4.AE
	UL Certificate	E190061

For PA Option Only	Certificate	Certificate Number
Ex e junction box	IECEX Certificate	IECEX ITS 10.0003X
	ATEX Certificate	10ATEX37092X
	INMETRO/TÜV	TÜV 12.1463
Ex d switches	IECEX Certificate	IECEX EPS 14.0092X
	ATEX Certificate	EPS 14 ATEX 1 766 X

## 9. Glossary

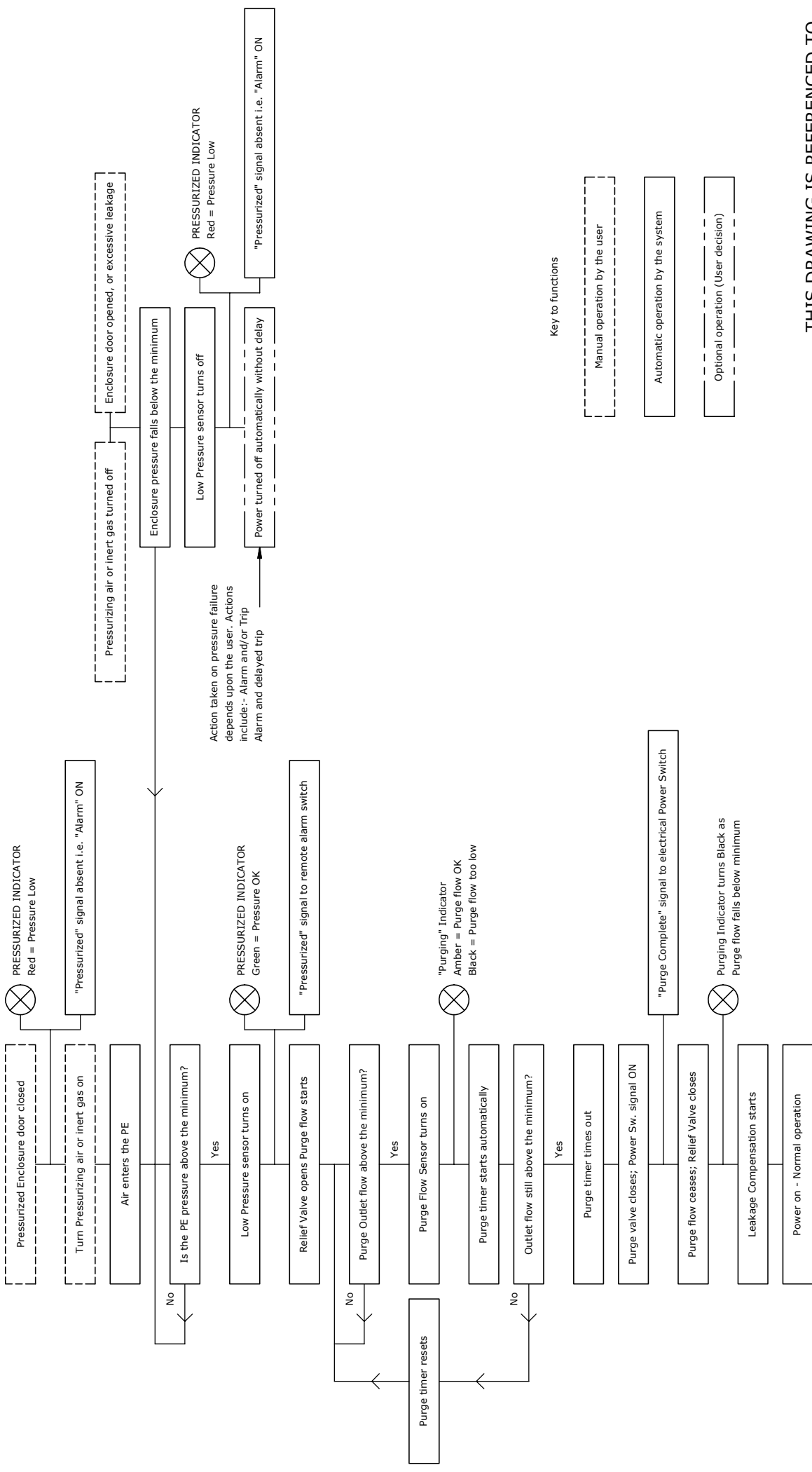
Acronym	Description
A&T	Alarm and Trip
AO	Alarm Only
CF	Continuous Flow
CU	Control Unit
FCV	Flow Control Valve
FM	Factory Mutual
IS	Intrinsically Safe
LC	Leakage Compensation
LCV	Leakage Compensation Valve
MIU	MiniPurge® Interface Unit
PA	Ex d Power and Alarm Switch Wired to Ex e terminal box
PE	Pressurized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

3rd ANGLE  
PROJECTION

DIMENSIONS IN mm  
DO NOT SCALE

UNSPECIFIED NO DEC PLACE ±0.5  
TOLERANCES 1 DEC PLACE ±0.2  
2 DEC PLACE ±0.1  
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

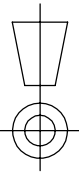
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REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE:	23/06/2010	MATERIAL	SURREY KT7 0RH UNITED KINGDOM		SCALE	1:1	REV:	01
				DRAWING STATUS:	Controlled	FINISH	TITLE		DRAWING No.	XBR-7TD0-040		
01	DRAWN	23/06/2010	JPdB	APP'D	CHK'D	DR'WN	JOB No:		SHEET No. 1 OF 1			
				JPdB	PSC	BRD	CUSTOMER:		EXPO			

THIS DRAWING IS REFERENCED TO  
EXPO CERTIFICATION DRAWING EP99-2-3

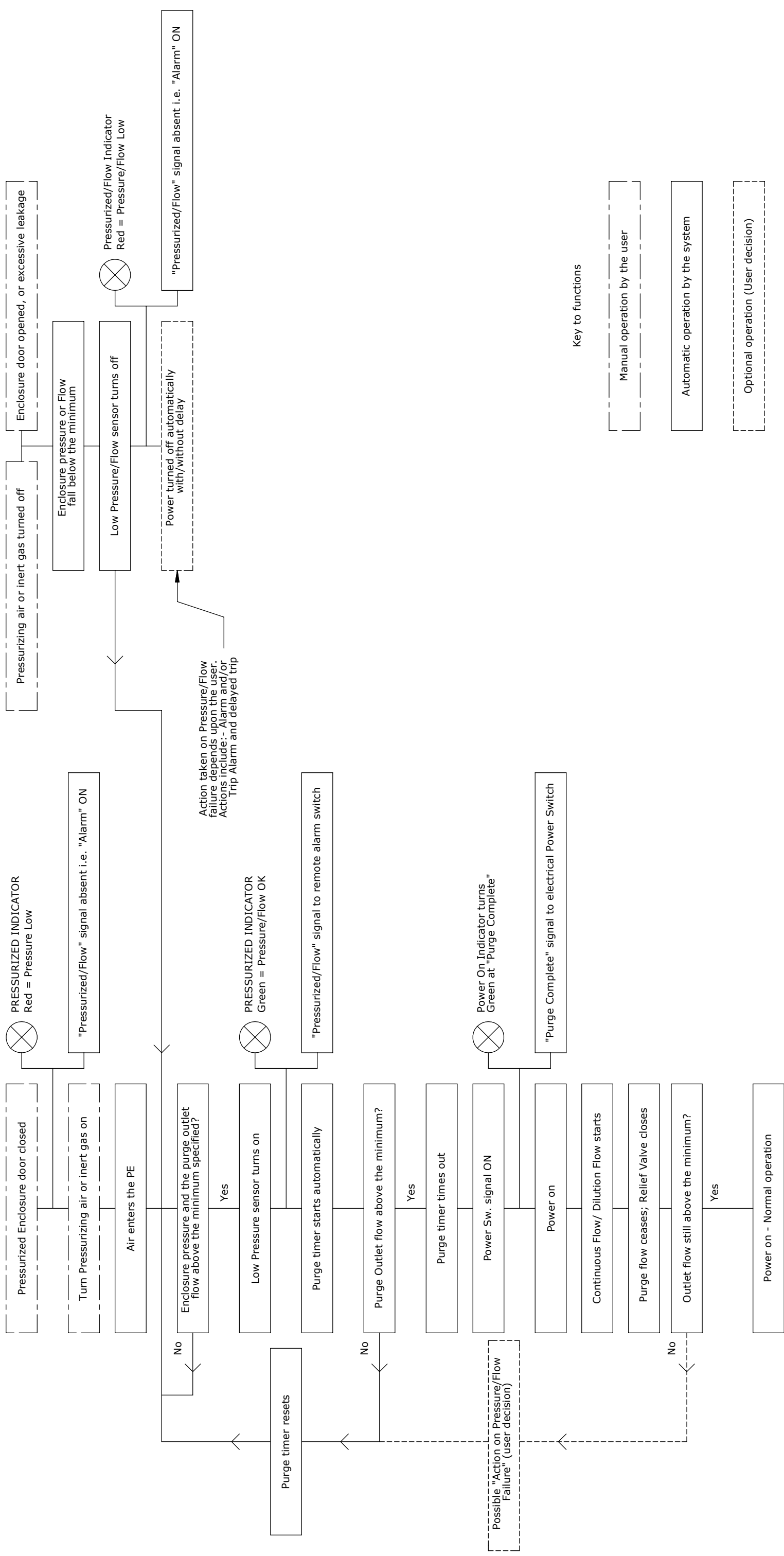
3rd ANGLE  
PROJECTION



DIMENSIONS IN mm  
DO NOT SCALE

UNSPECIFIED NO DEC PLACE ±0.5  
TOLERANCES 1 DEC PLACE ±0.2  
2 DEC PLACE ±0.1  
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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Key to functions

Manual operation by the user

Automatic operation by the system

Optional operation (User decision)

THIS DRAWING IS REFERENCED TO  
EXPO CERTIFICATION DRAWING EP99-2-4

**Expo Technologies Limited** SURREY KT7 0RH  
UNITED KINGDOM



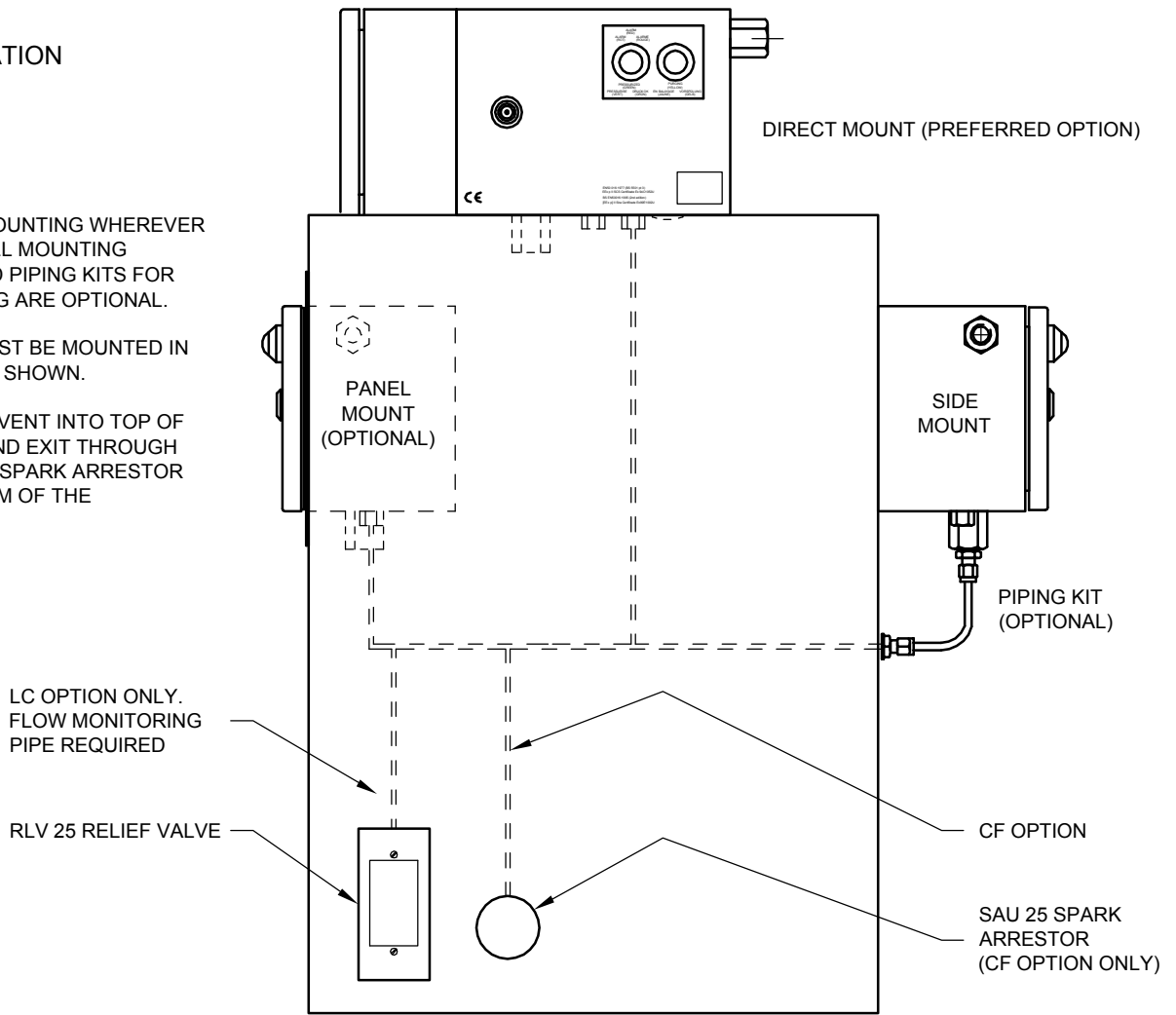
SCALE 1:1 REV: 01  
DRAWING No. XBR-7TD0-041  
SHEET No. 1 OF 1

REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE: 23/06/2010	MATERIAL
01	DRAWN	23/06/2010	JPdB	JPdB	FINISH
		DRAWING STATUS: Controlled		APP'D	CHK'D
				JPdB	DR'WN
				PSC	BRD
				TITLE MINIPURGE X CF SEQUENCE DIAGRAM	
				JOB No: CUSTOMER:	

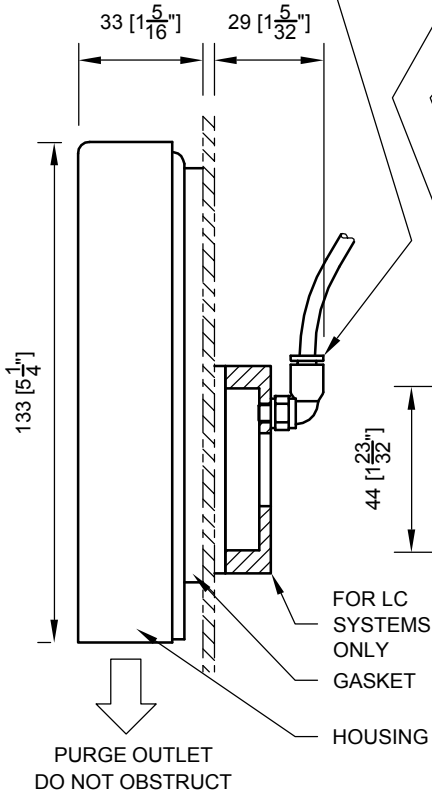
# MiniPurge CONFIGURATION

## NOTES:

- 1) USE DIRECT MOUNTING WHEREVER POSSIBLE, WALL MOUNTING BRACKETS AND PIPING KITS FOR SIDE MOUNTING ARE OPTIONAL.
- 2) MINIPURGE MUST BE MOUNTED IN THE POSITIONS SHOWN.
- 3) PURGE AIR TO VENT INTO TOP OF ENCLOSURE AND EXIT THROUGH RELIEF VALVE /SPARK ARRESTOR AT THE BOTTOM OF THE ENCLOSURE.

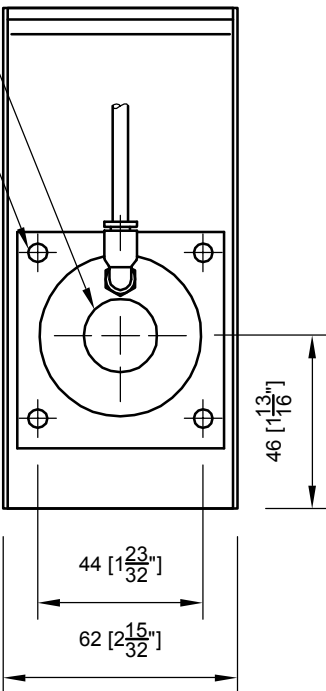


D.P. LO  
6mm OR M5 (10-32 UNF)  
FITTING SUPPLIED



RLV25 RELIEF VALVE  
WEIGHT = 0.5 kg (1.1 lb)

M5 FIXINGS SUPPLIED  
Ø6 (Ø1/4") HOLES REQUIRED  
IN ENCLOSURE.  
HOLE Ø25(1") REQUIRED  
IN ENCLOSURE

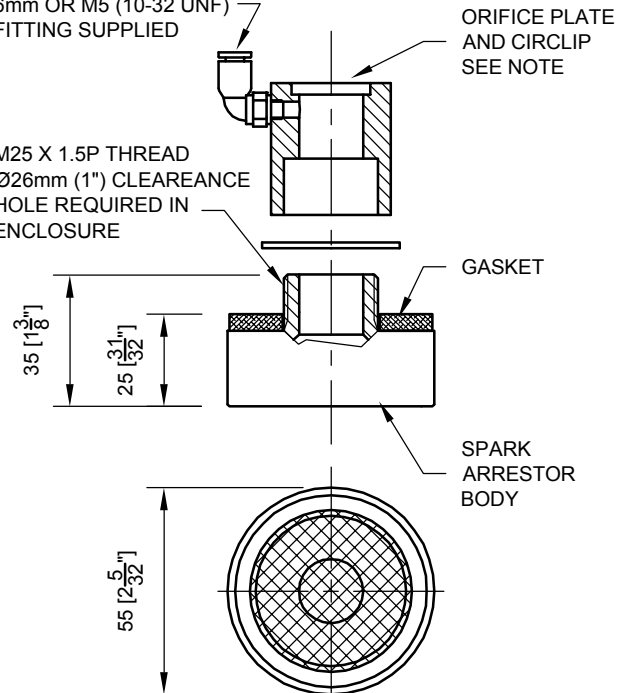


CUTOUT DETAILS VIEWED  
FROM INSIDE ENCLOSURE

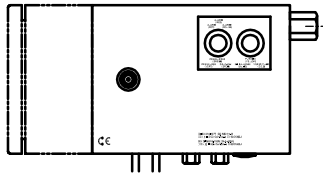
SAU25 SPARK ARRESTOR  
WEIGHT = 0.2 kg (0.44 lb)

D.P. LO  
6mm OR M5 (10-32 UNF)  
FITTING SUPPLIED

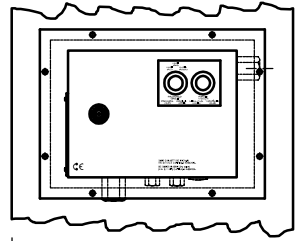
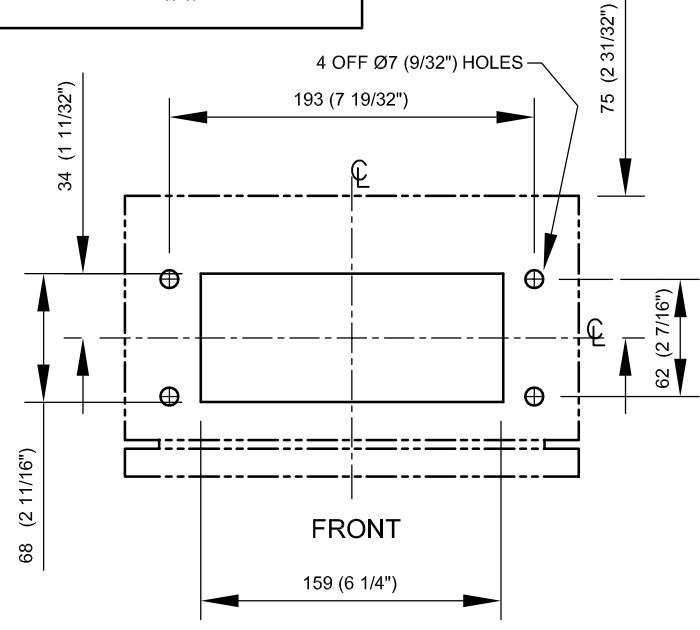
M25 X 1.5P THREAD  
Ø26mm (1") CLEARANCE  
HOLE REQUIRED IN  
ENCLOSURE



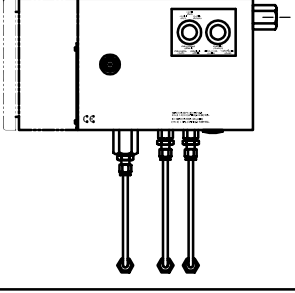
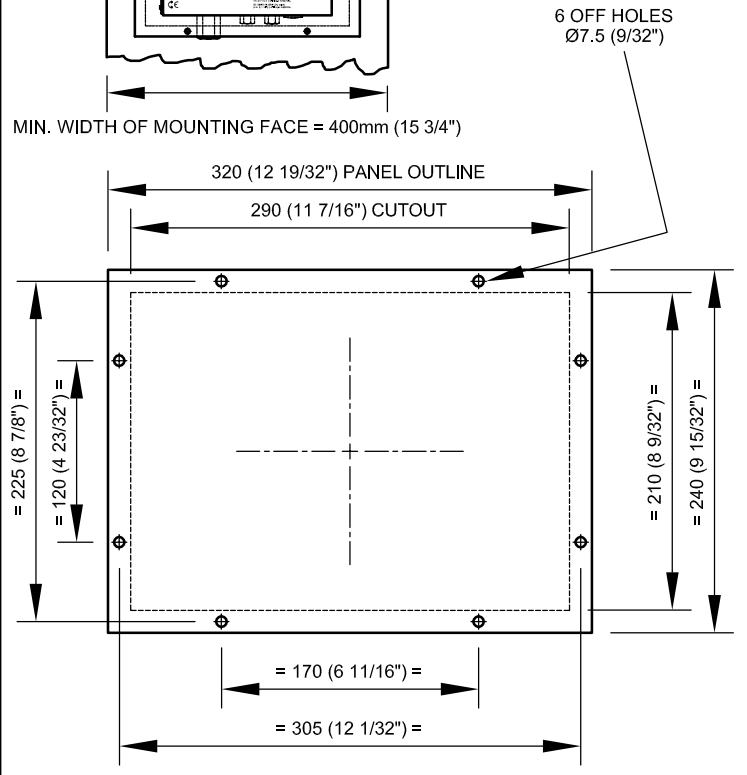
NOTE:-  
SYSTEMS SUPPLIED WITHOUT ENCLOSURES ARE  
SUPPLIED WITH A RANGE OF 8 ORIFICE PLATES TO SUIT  
FLOW RATES BETWEEN 10-225 NL/MIN (0.4-8 SCFM)



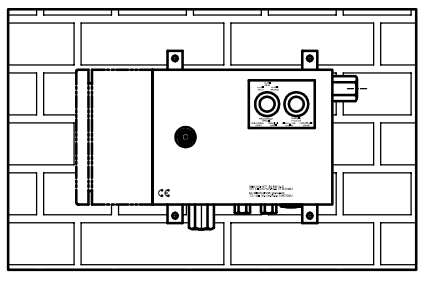
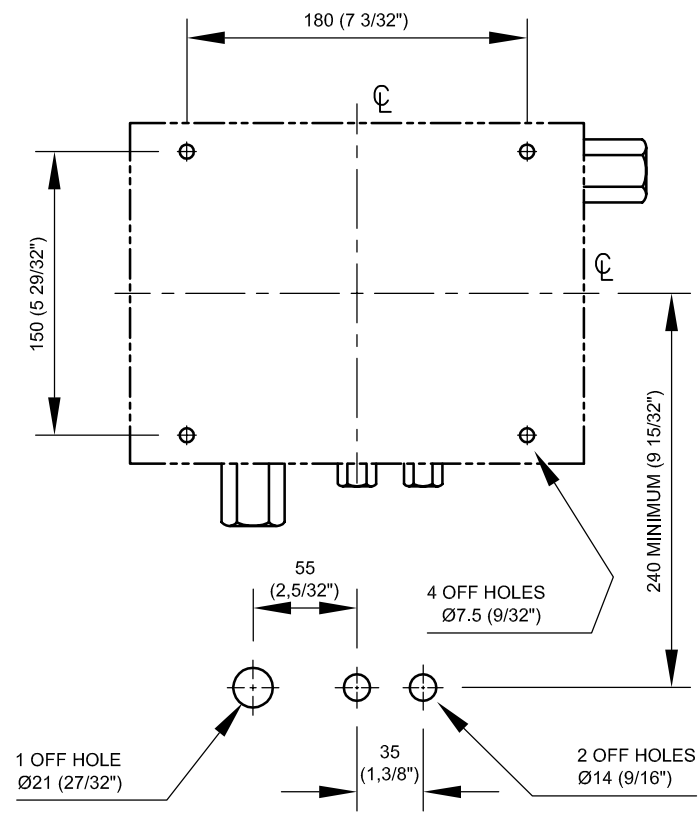
**PREFERRED OPTION  
DIRECT MOUNT  
(ON TOP OF ENCLOSURE)**



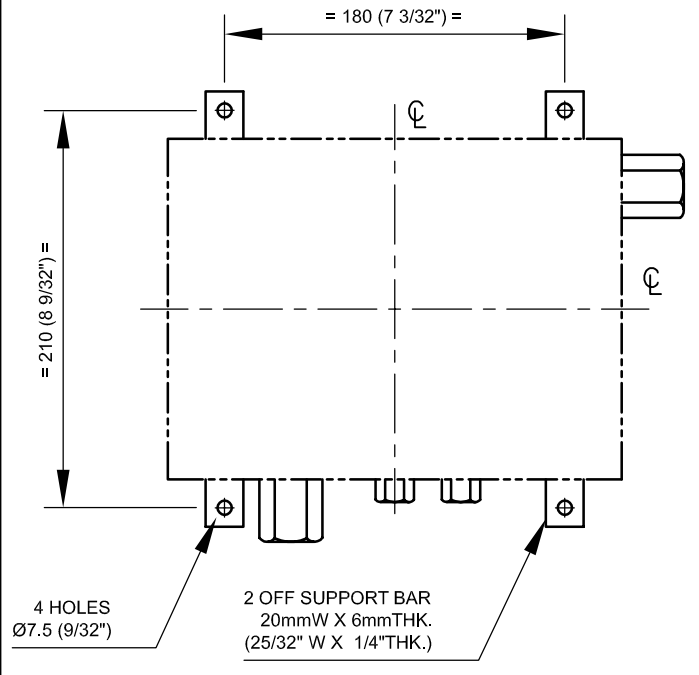
**PANEL MOUNT  
(ON FRONT OR SIDE OF ENCLOSURE)**



**REAR MOUNT  
(ON SIDE OF ENCLOSURE)**



**REMOTE MOUNT  
(ON WALL OR PANEL)**



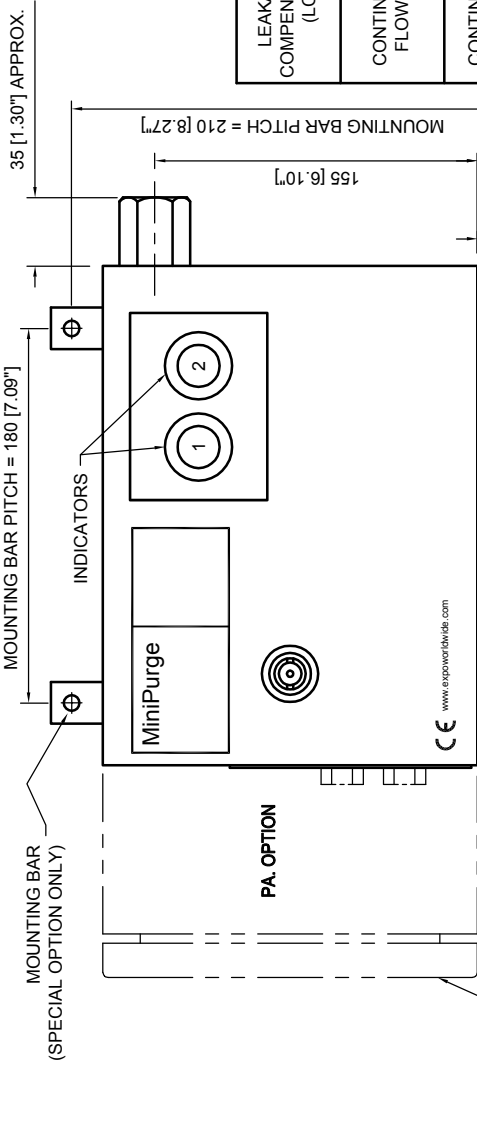
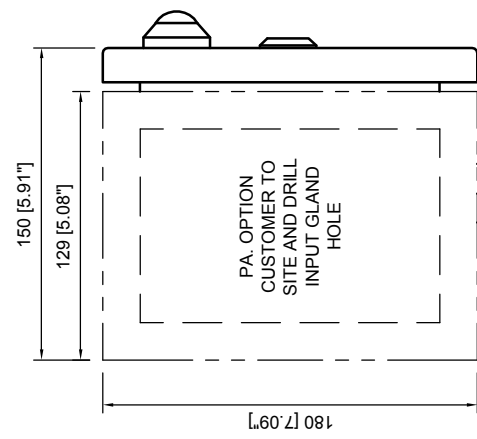
3rd ANGLE PROJECTION



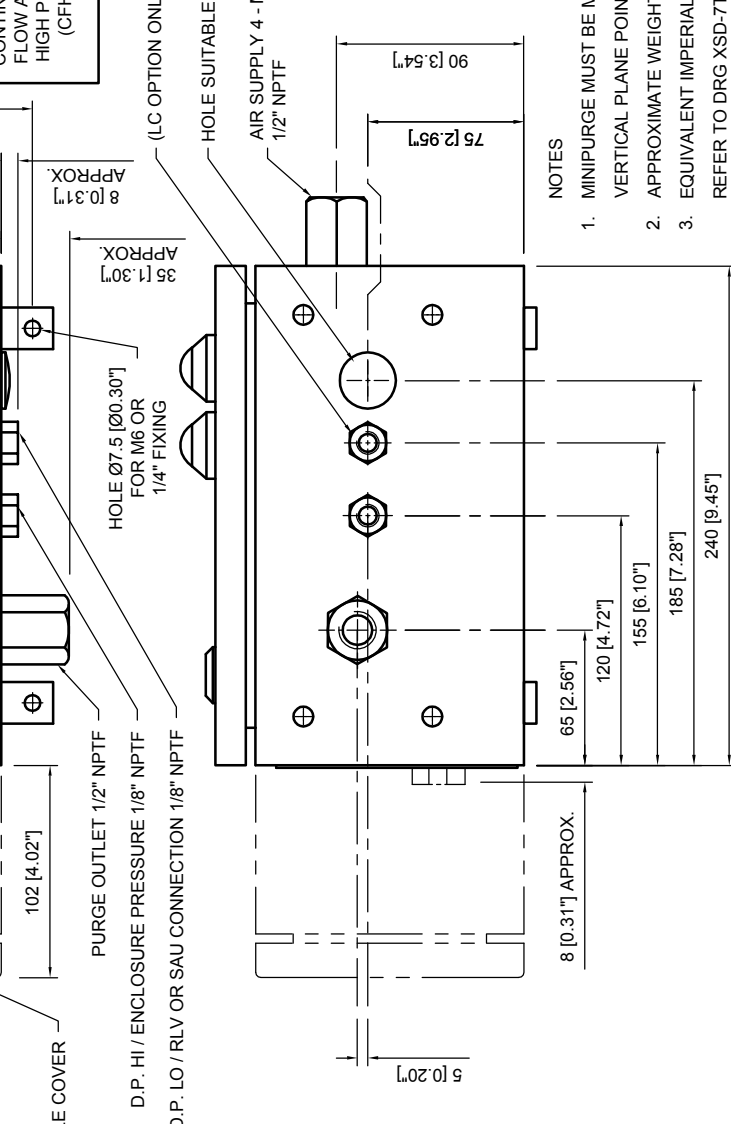
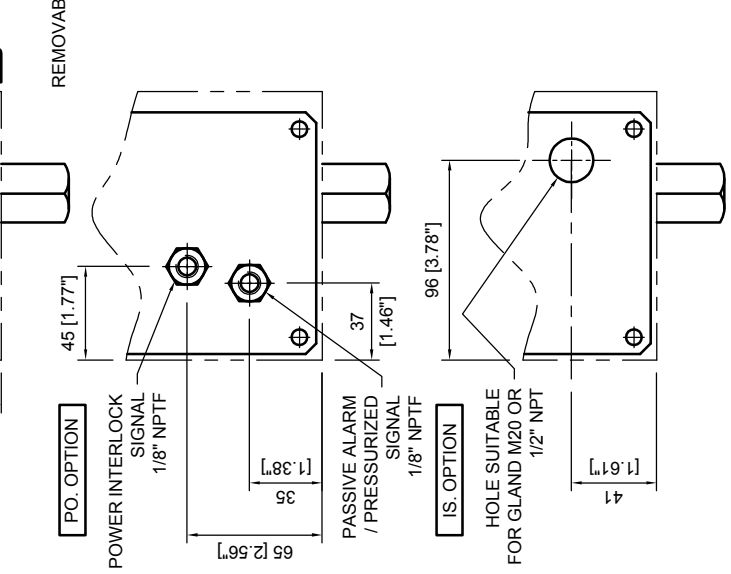
DIMENSIONS IN mm  
**DO NOT SCALE**

UNSPECIFIED NO DEC PLACE ±0.5 TOLERANCES  
1 DEC PLACE ±0.2  
2 DEC PLACE ±0.1  
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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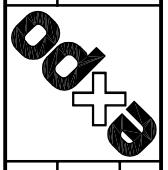
ALARM	PRESSURIZED	ALARM INDICATOR 1	PURGE INDICATOR 2
RED	GREEN	GREEN	PURGING
RED	GREEN	GREEN	BLACK
RED	GREEN	GREEN	YELLOW
RED	GREEN	GREEN	BLACK



NOTES

- MINIPURGE MUST BE MOUNTED WITH PURGE OUTLET FITTING IN VERTICAL PLANE POINTING DOWN.
- APPROXIMATE WEIGHT: 5.5 kg [12.1 POUNDS].
- EQUIVALENT IMPERIAL DIMENSIONS SHOWN IN BRACKETS. REFER TO DRG XSD-7TD0-001 FOR MOUNTING DETAILS.

APPD	MJF	ISSUE:	1	2	3	4	5	
CHKD	MJF	MOD. No:	DRAWN	4353	4385	4657		
DRWN	MGB	DATE:	28/01/00	13/09/07	21/12/07	2/4/09		
		APPROVED:	MJF	JPdB	JPdB	JPdB		
DRAWING STATUS: NON CERTIFIED								
Expo Technologies Limited			SURREY KT7 0RH UNITED KINGDOM		SCALE			N.T.S
MINIPURGE 07 TYPE 1X			TITLE		DRAWING No.			XBR-7000-002
MATERIAL: STAINLESS STEEL			FINISH: NROB		JOB No:			1 OF 3





3rd ANGLE PROJECTION

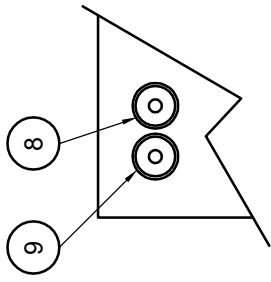
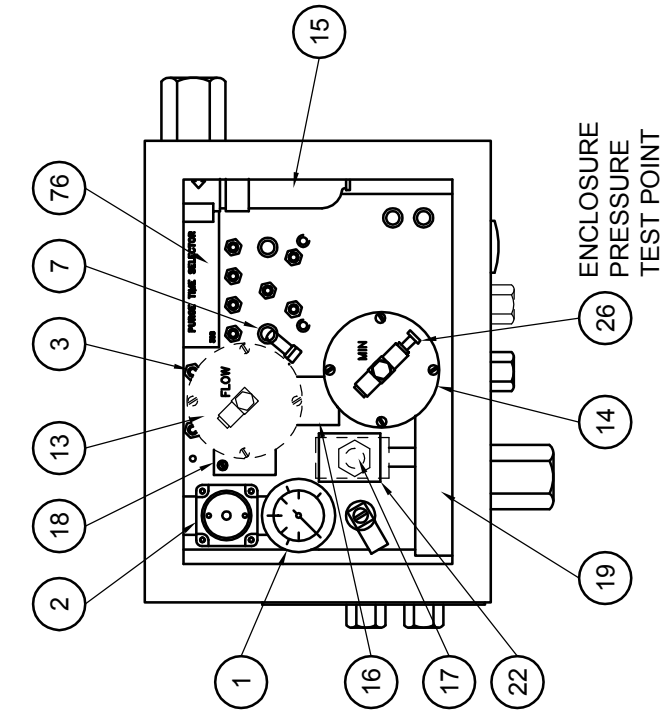


DIMENSIONS IN mm  
DO NOT SCALE

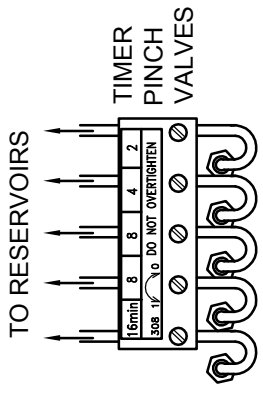
UNSPECIFIED NO DEC PLACE ±0.5  
TOLERANCES 1 DEC PLACE ±0.2  
2 DEC PLACE ±0.1  
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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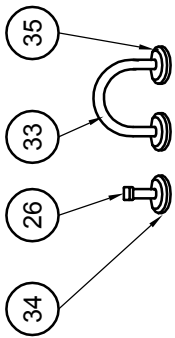
LC LEAKAGE COMPENSATION SHOWN (ITEMS IN DOTTED REMOVED FOR CF)



DOOR INTERNAL



PURGE TIME SELECTOR



ALARM AND TRIP



PUSH-IN PLUG

1	GAUGE, LOGIC AIR SUPPLY	26	PLUG 4mm
2	LOGIC AIR SUPPLY REGULATOR	33	"ACTION ON ALARM" OPTION PIPE
3	IN LINE RESTRICTOR	34	ALARM ONLY PUSH-IN FITTING
7	BLACK COLLAR (PLUGGED)	35	ALARM AND TRIP PUSH-IN FITTING
8	INDICATOR, "ALARM/PRESSURIZED"	76	PURGE TIME SELECTOR
9	INDICATOR, "PURGING"		
13	PURGE FLOW SENSOR		
14	MINIMUM PRESSURE SENSOR		
15	MAIN AIR SUPPLY FILTER, MANUAL DRAIN		
16	PURGE COMPLETE "OR" GATE		
17	LEAKAGE COMPENSATION VALVE		
18	TIMER VALVE		
19	PURGE BOOST VALVE		
22	PURGE COMPLETE VALVE (BELOW ITEM 17)		

APPD	MJF	ISSUE:	1	3	4	5
CHKD	MJF	MOD. No:	DRAWN	4353	4385	4657
DRWN	MGB	DATE:	27/01/00	13/09/07	21/12/07	2/4/09
		APPROVED:	MJF	JPdB	JPdB	JPdB
		DRAWING STATUS:	NON CERTIFIED			

MATERIAL	
FINISH	

<b>Expo Technologies Limited</b> SURREY KT7 0RH UNITED KINGDOM	
TITLE	MINIPURGE 07 TYPE 1X
JOB No:	CUSTOMER:

SCALE	NTS
DRAWING No.	XBR-7000-002
SHEET No.	2 OF 3

3rd ANGLE  
PROJECTION

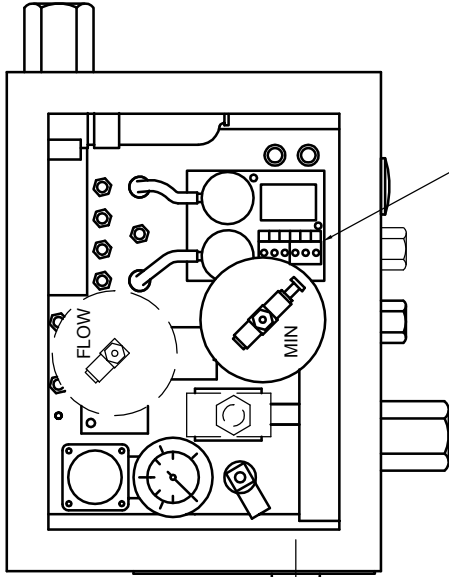


DIMENSIONS IN mm  
DO NOT SCALE

UNSPECIFIED NO DEC PLACE ±0.5  
TOLERANCES 1 DEC PLACE ±0.2  
2 DEC PLACE ±0.1  
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

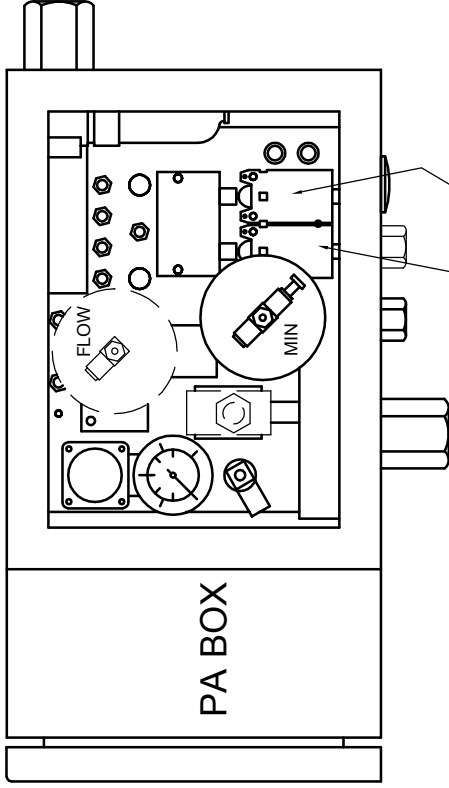
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### IS OPTION



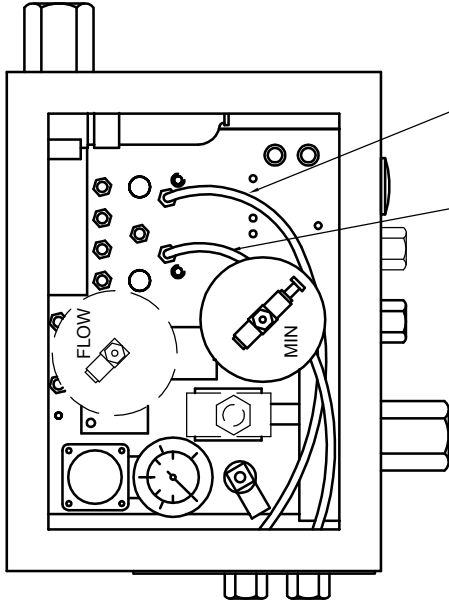
TERMINALS FOR CONNECTING I.S.  
CIRCUITS VIA M20 OR 1/2" NPT CABLE  
ENTRY ON LHS OR BOTTOM

### 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 VERSION SHOWN. (ITEMS IN DOTTED REMOVED FOR CF)

APP'D	MJF	ISSUE:	1	3	4	5	MATERIAL	
CHK'D	MJF	MOD. No:	DRAWN	4353	4385	4657		
DRWN	MGB	DATE:	04/02/00	13/09/07	21/12/07	2/4/09	FINISH	
		APPROVED:	MJF	JPdB	JPdB	JPdB		
		DRAWING STATUS:	NON CERTIFIED					

<b>Expo Technologies Limited</b>	
SURREY KT7 0RH UNITED KINGDOM	
TITLE	MINIPURGE 07 TYPE 1X
JOB No:	CUSTOMER:

SCALE	NTS
DRAWING No.	XBR-7000-002
SHEET No.	3 OF 3

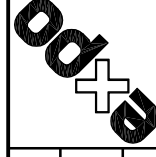


Fig 1a Single channel interface circuit  
e.g. "Y" or "Z" Pressurization Alarm circuit

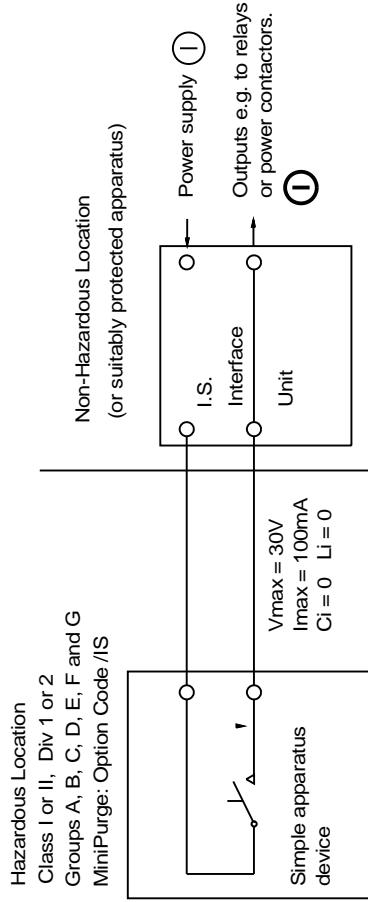
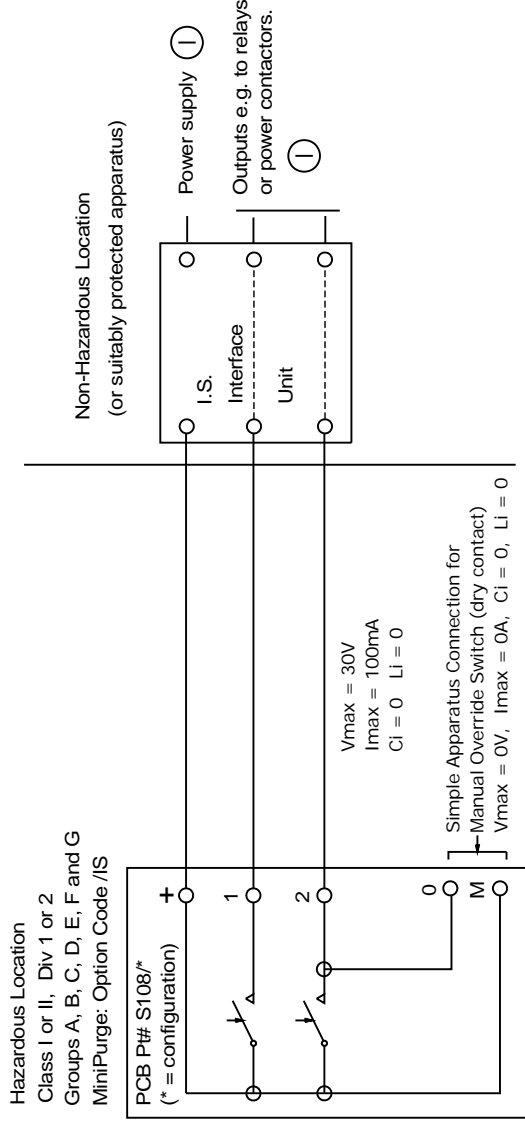


Fig 1b Multi-channel interface circuit  
e.g. "X" pressurization Alarm & Power Control



Notes for both Fig 1a and Fig 1b

- 1 Electrical equipment connected to associated apparatus should not use or generate more than 250 volts
- 2 Installation shall be in accordance with the manufacturer's instructions and the National Electrical Code (ANSI/NFPA 70)
- 3 For guidance on Installation see ANSI/ISA RP12.6. (Installation of IS Instrument Systems in Class I Hazardous Locations)
- 4 Voc or Vt of associated apparatus is less than Vmax  
Isc or It of associated apparatus is less than Imax  
Ci plus capacitance of interconnecting cabling is less than Ca of the associated apparatus  
Li plus inductance of interconnecting cabling is less than La of the associated apparatus
- 5 'Simple Apparatus' is a device that will not generate or store more than 1.2V, 0.1A, 25mW or 20uJ
- 6 For Gas Groups A, B permitted Imax for I.S., for V peak = 30V is 101 mA  
Alternatively: For Gas Group A, B with Vpeak = 19.2V Imax for I.S. is 350mA.

REV	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE:	13/07/2007
4	4330	13/7/2007	MLC	DRAWING STATUS:	Certified
05	5076	01/11/2010	AMO	APP'D	CHK'D DRWN
06	5297	20/07/2011	AMO	AMO	AMO

**THIS IS A CERTIFICATION DOCUMENT.**  
**ANY UNAUTHORISED CHANGE INVALIDATES APPROVAL.**

TITLE		MINIPURGE OPTION 'IS'	
JOB No:		CUSTOMER:	

SURREY KT7 0RH  
UNITED KINGDOM



SCALE	NTS	REV:	06
DRAWING No.		EP80-2-11	
SHEET No.		1 OF 1	

## MiniPurge Interface Unit MIU/e User Instruction Manual



Manufacturer: **Expo Technologies Ltd**, Unit 2 The Summit, Sunbury on Thames. UK.

Model Type & Rating:

MIU/e1	MIU/e2	MIU/e1/MO
400V / 7A	400V / 7A	400 V / 2A

Certificates:

IECEX ITS10.0003X	ITS 10ATEX37092X	TUV 12.1463
Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 Tamb -20°C to +55°C	⊕ II 2 G D Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 Tamb -20°C to +55°C	Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 Tamb -20°C to +55°C
Ex e IIC T4 Gb Tamb -20°C to +60°C	⊕ II 2 G D Ex e IIC T4 Gb Tamb -20°C to +60°C	Ex e IIC T4 Gb Tamb -20°C to +60°C

Hazardous Area Marking Code:

### APPLICATION SUITABILITY

The MiniPurge Interface Units – MIU/e 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 or vapours.

The systems may be used in ATEX/IECEX Gas Zones 1 & 2, Gas Groups IIA, IIB & IIC and in Dust Zones 21 & 22, Dust Groups IIIA, IIIB & IIIC.

The following materials are used in the construction of MIU/e: Stainless Steel, Steel, Brass, Copper, Polyamide, Silicone. If substances that will adversely affect any of these materials are present in the surrounding environment, please consult Expo Technologies for further guidance. This equipment is designed for use under normal industrial conditions of ambient temperature, humidity and vibration. Please consult Expo Technologies before installing this equipment in conditions that may cause stresses beyond normal industrial conditions.

**WARNING - Only install, commission, inspect, maintain or fault find when safe to do so.**

### INSTALLATION

The MIU/e shall be installed in accordance with relevant standards, such as EN 60079-14 and any local codes of practice that are in force. Cable glands or other cable entry devices shall be appropriately certified and suitable for the cable and the conditions of use and be installed in accordance with the manufacturer's instructions.

The MIU/e shall be connected to the Purge and Pressurization system in accordance with the instructions given in the handbook supplied with the pressurization system.

The external earth connection of the MIU/e shall be connected to earth using minimum 4mm<sup>2</sup> conductor.

### TERMINALS

MIU/e may be fitted with a combination of:

WDU2.5 terminals certified to KEMA 98ATEX1683U & IECEX ULD05.0008U

SAK2.5 terminals certified to KEMA 98ATEX1798U & IECEX KEM06.0014U

WPE2.5 Earth terminals certified to KEMA 98ATEX1683U & IECEX ULD05.0008U

#### For all type of terminals:

Tightening torque range: 0.4 to 0.8 Nm (WDU & WPE) & 0.4 to 0.6 Nm (SAK)

Conductor cross section maximum 2.5 mm<sup>2</sup>, minimum 1.5 mm<sup>2</sup>

Type of connection is screwed - Solid copper conductors to be used.

Stripping length shall be 10 mm.

Only one conductor is allowed at each side of a terminal. Multiple conductors shall be crimped together before screwed into the terminal.

#### Maximum number of terminals:

For Model MIU/e1 – Up to 18 current carrying terminals

For Model MIU/e2 – Up to 33 current carrying terminals

For Model MIU/e1/MO – Up to 13 current carrying terminals

### COMMISSIONING

The installation of the cable glands, electrical and earth connections shall be inspected for correct installation before the unit is put into service. The lid shall be correctly fitted.

### MAINTENANCE

The condition of enclosure and associated cable glands shall be inspected for damage every six months. The terminals shall be inspected for tightness and gaskets inspected for damage.

### FAULT FINDING

When wiring or signal fault occurs, check each terminated wire, terminals for tightness and gaskets for damage.

External faults such as broken switches within the Control Unit may also require investigation.



**CE**  
**EU-Declaration of  
Conformity**

With  
European  
Directives

Issued under the sole responsibility of  
**Expo Technologies Ltd**  
Unit 2, The Summit, Hanworth Road  
Sunbury on Thames TW16 5DB, UK

**This is to declare that “Purge Controllers: Sub-MiniPurge, MiniPurge,  
Super-MiniPurge, Super-MiniPurge 1800/3500/7000/7000X”  
are manufactured in conformity with the following  
European Directives and standards:**

Electromagnetic Compatibility Directive 2014/30/EU

MiniPurge Systems with a /PO suffix in the type number are non-electrical and are outside the scope of the EMC Directive.

MiniPurge Systems with suffices /PA or /IS incorporate one or more volt-free (“dry”) contacts which work in circuits specified by others. In normal operation these circuits are “benign” and no CE mark is appropriate.

MiniPurge Systems with Electronic Timer (Option /ET) are designed to conform to the EMC Directive, in compliance with EN 61000-6-4:2007 and EN 61000-6-2:2005 (Intertek Report EM10048000).

Low Voltage Directive 2014/35/EU

MiniPurge Systems are intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Low Voltage Directive.

Pressure Equipment Directive 97/23/EC

MiniPurge Systems are classified as not higher than category I under Article 9 of this Directive and intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Pressure Equipment Directive.

ATEX Directive 2014/34/EU Equipment for explosive atmospheres



MiniPurge Systems are designed to conform to the ATEX Directive in fulfilment of the essential health and safety requirements set out in Annex II, and in compliance with:

EN 60079-0: 2012 + A11:2013                      EN 60079-2: 2014

MiniPurge Systems are certified by SIRA Certification Service, Hawarden Industrial Park, Hawarden CH5 3US, England, under EC Type-Examination Certificate SIRA 01ATEX1295X, in compliance with:

EN 60079-0: 2012                      EN 60079-2: 2014

According to the model, MiniPurge Systems are rated and shall be marked as follows:

MiniPurge, Type X & Type Y models	Group II Category 2G & 2D	 II 2(2) GD
MiniPurge, Type Z models	Group II Category 3G & 3D	 II 2(3) GD

MiniPurge systems are manufactured under Production Quality Assurance Notification SIRA 99 ATEX M043, issued by SIRA Certification Service, Notified Body No 0518.

Signed for and on behalf of Expo Technologies Ltd.,

John Paul de Beer  
Managing Director

Date 16/08/2016  
Confidential Assessment file reference SC004





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