SP2 SmartPurge

Manual

ML662

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.

Section 1: System Specification

1.1: SmartPurge Control Unit

Model Number

SP2 - ab - c

a =	**P**	for Purge and Pressurize Control Unit
	F	for Fan Control Unit
b=	**M**	for Mains Universal Voltage
	L	for Low Voltage
c =	**ss**	for Stainless Steel

1.2: SmartPurge Control Unit Data

		SP2-Px Model	**SP2-Fx Model**
Purge Flow Range	Leakage Compensation	110 to 540 Nl/min	Determined by customer's air supply fan & calibrated outlet orifice.
	Continuous Flow	10 to 600 Nl/min	
Purge Time		1 to 99 minutes	
Low Pressure Trip Options		Immediate Trip, Alarm Only, Delay Trip (Up to 99 mins)	
Enclosure Pressure		0.8 to 7 mbarg after purge	1.3 to 65 mbarg
Orifice Differential Pressure		N/A	0.8 to 70 mbarg
Enclosure High Pressure		0.8 to 25 mbarg	20 to 70 mbarg
Rated Power	Universal Voltage	90 to 254 VAC 50 to 60 Hz : 20mA , 5VA	
	Low Voltage	11 to 28 VDC : 115mA, 3W	
Mounting Position		May be mounted in any position external to pressurized enclosure	
Material		316L Stainless Steel	
Unit Dimensions		187 x 134 x 108 mm (7.36" x 5.27" x 4.25") without cable glands and purge outlet/connections	
Unit Weight		4.2 kg (9.3 lb)	
Environmental Protection		IP64	
Temperature		-20°C to +60°C	
Approvals	IECEx	IECEx FME11.0006X Ex eb ib mb [ib Gb] [pxb Gb] IIC T4 Gb Ex tb [pxb Db] IIIC T135°C Db -20°C to +60°C	
	ATEX	CE 2804 Ex II 2 (2) GD FM11ATEX0060X Ex eb ib mb [ib Gb] [pxb Gb] IIC T4 Gb Ex tb [pxb Db] IIIC T135°C Db -20°C to +60°C	

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	USA	Class I, Zone 1 AEx e ib m [p] IIC T4 Class I, Zone 21 AEx tb [pD] IIIC T135°C -20°C to +60°C
	Canada	Ex e ib m [p] IIC T4 -20°C to +60°C
	China - CCC NEPSI	Ex e ib mb [ib Gb] [p] IIC T4 Gb Ex tb [p] IIIC T135°C Db -20°C to +60°C Ex e ib mb [ib Gb] [p] IIC T4 Gb Ex tD [pD] A21 IP64 T135°C
	PESO	Ex e ib m [p] IIC T4 -20°C to +60°C
	KOSHA	Ex e ib m [p] IIC T4 -20°C to +60°C Ex tD [pD] A21 T135°C -20°C to +60°C
Safety Integrity Level		SIL 2

1.3: Electrical Ratings

SmartPurge Control Unit

		Mains Universal Voltage	Low Voltage
Power Supply	(Terminals 1, 2)	90 - 254 VAC 50 - 60 Hz, Um = 254 Vac	11 - 28 VDC
Alarm Contact Ratings	(Terminals 5, 6 and 7, 8)	240 V, 1 A Fuse type (see *Installation of the System* section for details)	
Fuse	(Terminals 9, 10)	100 mA	500 mA
Power Switching	(Terminals 3, 4)	6 A 250 V AC1*	5 A 28 V DC1*

* Note: The rated current of power contact is for resistive load ONLY. The max transient current of power contact is 15A, exceeding the value would significantly shorten the life of power contact or cause instant damage.

Energy limitation parameters:

	Terminal TB1	U_o (Vdc)	I_o (mA)	C_o (µF)	L_o (mH)	P_o (W)
SOV	1, 2	23.58	165.5	0.091	2.9	0.975
IP	3,4	23.58	165.5	0.091	2.9	0.975
Remote Output	9, 10, 11, 12	8.465	405.1	5.145	0.48	0.857
External Alarm	5, 6	5.88	5.9	negligible	0	0.009
Override	7, 8	5.88	5.9	negligible	0	0.009

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Section 2: Application Suitability

SmartPurge systems are certified for use in hazardous locations, where the hazardous location is non-mining (above ground) and the hazard is caused by flammable gasses, vapours or dust. The system may be used in IECEx and ATEX Zone 1(21) and Zone 2(22) - Categories 2 and 3 respectively.

Installations shall comply with the relevant requirements of the national electrical code where the unit is being installed such as IEC/EN 60079-14, ANSI/NFPA-70 NEC or CSA C22.1.

SmartPurge systems may be used for hazards of any gas or dust group. Apparatus associated with the SmartPurge 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 primarily designed for use 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 SmartPurge systems. If substances that will adversely affect any of these materials are present in the surrounding environment, please consult Expo Technologies ltd for further guidance.

Materials of Construction		
Stainless Steel	Nylon	Acetal
Mild (Carbon) Steel	Acrylic	Silicone Foam
Brass	Polyurethane	PVC Foam
Aluminium	Polycarbonate	

Section 3: Description and Principle of Operation

Purge and pressurization is a method of protection used in Zone 1 (21) and Zone 2 (22) hazardous locations to ensure that the interior of an enclosure is free of flammable gas for the safe use of non-hazardous area approved electrical equipment within the enclosure.

Prior to switching on the power to the electrical equipment, clean compressed air (or inert gas) drawn from a non hazardous location, is released into the enclosure to flush out any flammable gases. The duration of this purge process is normally ascertained by performing a purge test.

After the purging cycle, the system connects the power to the equipment to be protected. The SmartPurge system continuously monitors the enclosure pressure to ensure an internal overpressure is maintained to prevent any flammable gasses in the external atmosphere from entering the enclosure.

The system is fully automatic in operation, and can be configured by the user to meet the application requirements. If the pressure inside the protected enclosure drops below the minimum threshold the system will either shut down the electrical apparatus and / or give an alarm signal depending on the configuration. The default setting is immediate disconnect of the power.

SP2-Px Model

This system is designed with the purge outlet integrated into the controller and monitors and controls the flow of the clean compressed air (or inert gas) to maintain the required enclosure pressure.

The controller can be fitted with different orifice plates to achieve different flow rates and enclosure pressure. The Purge outlet is fitted with a spark arrestor to prevent emission of arcs, sparks and incandescent particles.

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SP2-Fx Model

This system is designed primarily for use when the purge gas is supplied by a fan (not supplied for Expo). Via a customised calibrated orifice plate, the SP2-Fx measures the differential pressure from the high and low pressure points across the orifice plate to detect the suitable purge flow of the enclosure.

It is for the installer to ensure the fan is suitably rated to supply the required air flow and that the calibrated orifice assembly is correctly installed. The SP2-Fx must be configured with the appropriate differential pressure between Min Flow and Max Flow rate.

The most common application is for a motor which requires a continual supply of air.

The orifice assembly must be placed on the air exhaust of the enclosure and not the supply side. This is to ensure that the purge flow readings are of the air passing through the enclosure. Measuring the supply side cannot guarantee purge Flow if inlet ducting is damaged.

A Spark Arrestor should also be added to the exhaust point of the enclosure prior to the orifice assembly to prevent the emission of arcs, sparks and incandescent particles produced within the pressurized enclosure.

Section 4: Main Components

4.1: SmartPurge Controller

The SmartPurge Control Unit is an electronic unit designed to be used in the hazardous location, it provides the following functions:

- Microprocessor controlled purge and delay timing
- Isolation to equipment (2 pole rated 6A @ 230V AC1 duty)
- 2 Status / Alarm contacts (user configurable)
- System status indication via LCD
- Delay isolation option
- Monitoring and control of purge flow
- Monitoring and control of enclosure pressurization

4.2: Air Supply Unit

SP2-Px Models

The SmartPurge controls the flow of protective gas into the pressurized enclosure through the Air Supply Unit. There are two varieties of unit:

Solenoid Digital Valve for Manual Leakage Compensation – SP2-DV

This is designed for leakage compensation purging applications. The flow of gas through the pressurized enclosure is controlled by the SmartPurge Controller. This allows switching between the purging and leakage compensation phases of the purge and pressurization cycle.

Continuous Flow Control Valve – SP2-CF-2

This is designed for continuous flow purging applications. The air flow through the pressurized enclosure is controlled manually by the user via the needle valve. Suitable for low flow rate applications, applications where a continuous flow of air is required for cooling or when the dilution of hazardous gases generated inside the enclosure is required.

SP2-Fx Models

The flow of protective gas into the pressurized enclosure is from a customer supplied fan.

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4.3: Purge Outlet Unit

SP2-Px Models

The Purge Outlet Unit is housed within the SmartPurge enclosure and measures flow across an orifice. It is pre-set to open at an enclosure pressure of 8 - 10 mbarg.

A Spark Arrestor is added to the exhaust point of the Purge Outlet Unit to prevent the emission of arcs, sparks and incandescent particles produced within the pressurized enclosure.

SP2-Fx Models

The purge outlet unit (sourced separately) should be fitted to the enclosure encompassing the orifice assembly with the reference points connected to the SmartPurge Controller. It is the installer's responsibility to ensure that the calibrated orifice assembly is correctly installed, refer to Smart Purge 2 Fan Hook Up Diagram, and to ensure the controller is configured to the appropriate differential pressure 'Min Flow DP'.

A Spark Arrestor should also be added to the exhaust point of the enclosure prior to the orifice assembly to prevent the emission of arcs, sparks and incandescent particles produced within the pressurized enclosure.

4.4: Accessories

Cable Gland Kit - SP2-GK

An Expo recommended set of cable glands for field wiring. M16 Gland for cable of outer diameter 4 - 8.4 mm and M20 Gland for cable of outer diameter 7.2 - 11.7 mm

Override Switch - SP2-OS

A panel mounting, key operating switch that bypasses the SmartPurge Controller output signal.

Splash Cover - SP2-SC (SP2-Px Models only)

A cover to protect the outlet valve from direct water jets.

SmartPurge Interface Unit - SIU

The SIU is a flamepoof interface which provides isolation of the power to equipment housed inside the enclosure, as well as other signal and data connections.

Section 5: Installation of the System

WARNING! Only trained and authorized personnel should install the SmartPurge System, observing all safety and installation instructions within this manual as well as any other relatable local regulations.

5.1: General Safety Warnings

- The Expo SmartPurge purge and pressurization system must only be used in accordance with the instructions in this manual and for the purpose described earlier.
- Installation must be carried out in accordance with these instructions by a competent person in accordance with relevant standards, such as EN 60079-14, and any local Codes of Practice that are in force.
- Failure to comply with the instructions in the manual during operation, installation, commissioning and maintenance may lead to personal injury, damage to property or voiding of the warranty and/or certification of the SmartPurge system.
- The use of a certified purge and pressurization system does not guarantee or imply the compliance of the complete enclosure with ATEX or IECEx standards. Such compliance can only be endorsed by an EU Notified Body.
- The SmartPurge 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.

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5.2: Hazardous area safety

- The system is designed for use in hazardous areas; correct installation and maintenance are critical for safe operation. Installation and maintenance must only be carried out by qualified and authorized personnel in accordance with local and site regulations.
- No unauthorised modifications to the equipment should be made. Purging should be done in accordance with the relevant standard.

5.3: Electrical Safety

- The system control unit contains components which may be live when powered. Always isolate power from supply to the SmartPurge and the enclosure before opening.

5.4: Compressed Gas

- The SmartPurge system should be connected to a protective gas supply, which is suitable for purging and pressurization.
- This system is designed for use with compressed air or other inert gasses such as Nitrogen.
- When an inert gas is being used to supply the purge system, risk of asphyxiation exists. Refer to Application Suitability section.

Compressed Gas Handling Safety

- Take precautions when connecting or disconnecting compressed gas supplies.
- Ensure all flexible pipes used are well secured.
- Never block pipes with any part of the body.
- Ensure that equipment is maintained in good condition.
- The system exhausts air from the compressed air supply into the atmosphere so a clean supply must be used. Do not allow the exhaust air to be breathed.

5.5: Air Supply Quality

The air supply must be: clean, non-flammable and from a non-hazardous location. The air should be of Instrument Air Quality with reference to BS ISO 8573-1: 2010, 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.

Note: Although the SmartPurge system will operate with lower air quality, it's operational life will be adversely affected. The equipment that is being protected by the SmartPurge may also suffer because of poor air quality.

5.6: SP2-Px Orifice plate installation - Flow Rate Configuration

- Before mounting the SP2-P, it should be configured for the flow range required.

1. Select the appropriate Orifice Plate and Flow Restrictor (where necessary) using Table 1 for reference.
2. Position in the orifice plate in over the purge air entry in the back of the SmartPurge Controller. Secure in place using the 2 screws supplied. Refer to Figure 1 for guidance.

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3. Screw the brass flow restrictor into the outlet of the SP2-DV. Use a flat screwdriver to fully tighten the restrictor in to the valve.
4. The SmartPurge settings need to be configured to the new orifice size.

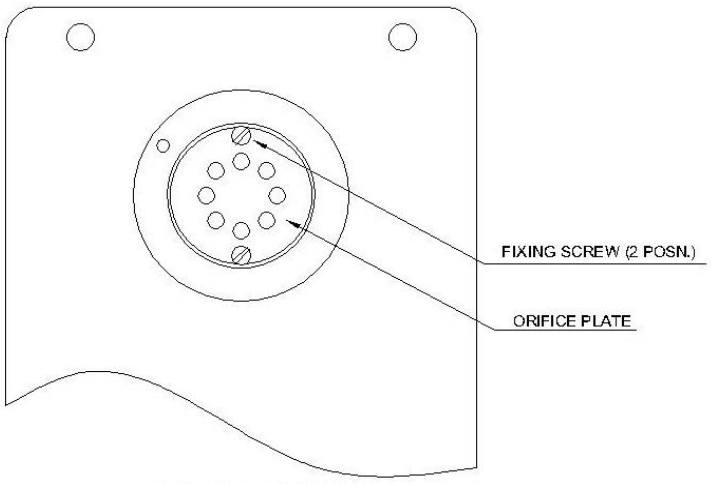

Figure 1: Orifice Plate Fixing

Table 1: Air Supply Configuration - Leakage Compensation

Flow Range	Inlet Flow Restrictor (SP2-DV)	SmartPurge Controller Outlet Orifice	Certified Minimum Flow Rate	Minimum Air Supply Requirement Pressure at Flow	
			Nl/min (scfm)	Bar (psi)	Nl/min (scfm)
A	 Ø2.7mm hole	8 Hole Orifice  = 13 mm	150 (5)	3.1 (45)	212 (7.5)
B	 Ø4.2mm hole	16 Hole Orifice  = 18mm	300 (10)	3.5 (50)	414 (15)
C	None	None = 25 mm	540 (19)	4.5 (65)	848 (30)

Note: The minimum air supply requirements shown in the table above are greater than those shown for the certified minimum flow rate. This is to allow for the additional air required to make up for enclosure leakage and the tolerance of the air flow measurement.

Table 2: Air Supply Configuration - Continuous Flow

Controller Outlet Orifice	Certified Minimum Flow Rate	Recommended Air Supply
	Nl/min (scfm)	Bar (psi)
None = 25 mm	10-600 (0.35-21.2)*	1-4 (14.5-58)

*Based on flow test with 6mm ID pipe and 4Bar supply.

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Note: Store the orifice plate(s) and flow restrictor(s) which are not used so that the unit may be reconfigured if required at a future date.

Record the selections made and mark the flow range selected on the label with an indelible marker.

Only standard Expo outlet orifices should be used. Consult EXPO if a custom orifice/flow rate is required.

5.7: SmartPurge Controller Mounting

- The SmartPurge controller should be installed directly on the pressurized enclosure. It should be installed such that the system display and certification labels are in view. SP2-F can be mounted off the enclosure but is should be mounted close the pressurized enclosure.
- The system should not be subject to vibration. If to be mounted on a surface that may transmit vibrations it is recommend that the SmartPurge control unit is first mounted onto a chassis plate which is mounted via Anti-Vibration (AV) mounts.
- SmartPurge is designed to be mounted only to a flat surface.

1. Cut the apertures within the enclosure as per the cut out drawing for the specific model.
2. Position the SmartPurge Controller into position.
3. Using appropriate M5 fittings, secure the SmartPurge to the enclosure via the four mounting points on the top and bottom of the SmartPurge.
4. Install cable glands to the cable entry points in the bottom of the SmartPurge controller.

Note: Cable glands must be suitability rated for the environment. M20 and M16 glands to be used.

5.8: SmartPurge Controller Electrical Connection

- Connections to the SmartPurge must be through cable glandes. If cable entries are not going to be used, an Ex e blanking plug must be fitted in place of the cable gland.
- Torque for electrical terminals:
  - Intrinsically safe terminals: 0.22 - 0.25 Nm
  - Non-intrinsically safe terminals: 0.4 - 0.5 Nm

1. Remove the 4 lid retain screws and remove the lid.

WARNING! Never remove the lid while powered.

2. Pass the cables through the cable glandes.
3. Connect the corresponding wires to the relevant terminals inside the SmartPurge, refer to the wiring layout drawing.
4. Ensure all wires are secure.
5. Tighten the cable gland to secure the cable in position. It is recommended to leave a bit of extra wire loop in the housing to prevent strain.
6. Replace the lid and secure back in position.

Power Supply & Earth (Terminals 1 - 2)

- The unit must be supplied from a separately switched, labelled circuit with over current protection of not greater than 6 Amps.
- The protective earth conductor must be securely attached to the protective earth terminal on the SmartPurge terminal cover plate.

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- The SmartPurge is housed in and increased safety (Ex e) enclosure. This must be earthed using an earth conductor of minimum 4 mm^2, connected to the earth connection on the outside of the unit.

Power to Protected Equipment (Terminals 3 - 4)

- The SmartPurge system provides a switched mains voltage output that can be used to power the protected equipment. It can also be used to drive relays and contactors that provide the necessary switching function.
- The load connected to the output from the SmartPurge must not exceed:
  - Universal Mains: 6 A (AC1).
  - Low Voltage version: 5A, 28 Vdc.

Note: The rated current of power contact is for resistive load ONLY. The max transient current of power contact is 15A, exceeding the value would significantly shorten the life of power contact or cause instant damage.

Alarm Circuits (Terminals 5 - 6 and 7 - 8)

- The SmartPurge system provides two volt-free contacts rated 250 V, 1 A AC1. These provide remote indication of the state of the purge system and for the generate alarm signals.
- A fuse or other current limiting device must be placed in the alarm circuit to limit the current to below that specified.
- This must have a breaking capacity of 1500 Amps or greater.
  - The fuse or circuit breaker used must have an "F" characteristic to IEC 127 for a fuse, or type B characteristic for a miniature circuit breaker.
  - Where other types of fuse or circuit breaker are used, the user must verify that the switching contacts have not been welded together by the current flowing in the time taken for the fuse to blow or circuit breaker to trip.
- The status / alarm outputs must not be used to control the switching of power to the protected equipment.

All connections to intrinsically safe terminals must be made from intrinsically safe circuits in accordance to the wiring layout drawing.

Solenoid Valve (Intrinsically Safe Terminals 1 - 2)

I/P Converter (Intrinsically Safe Terminals 3 - 4)

External Alarm (intrinsically Safe Terminals 5 - 6)

- Factory configured to be disable with a resistor fitted in place. To use remove the resistor and wire accordingly.

Override keyswitch (Intrinsically Safe Terminals 7 - 8)

- Factory configured to be disable with a resistor fitted in place. To use remove the resistor and wire accordingly.

Serial Interface (Intrinsically Safe Terminals 9 - 10 - 11 - 12)

5.9: Purge Air Inlet and Outlet

- The air supply must be regulated at a pressure less than the maximum stated inlet pressure.
- Remember that the minimum air supply pressure requirements quoted are those needed during purge.
- If adequate air pressure regulation and filtration cannot be assured, it is recommended that a filter regulator set is installed at the air inlet.
- Pipe work to and from the air supply unit must be sized to provide adequate airflow with the minimum pressure drop.

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- Long pipe runs or restrictive pipes and fittings may cause substantial pressure drops.
- 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.
- 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 SmartPurge Air Supply should be piped within the pressurized enclosure to ensure purging of potential dead air spots.
- The purge air inlet and outlet should be located or piped to the opposite side of the enclosure from each other to ensure effective purging, unless effective purging can be proved by other means.

SP2-Px Models

SP2-DV

- The SP2-DV can be mounted internal or external to the enclosure.

1. Cut the apertures within the enclosure as per the cut out drawing on the GA drawing
2. Position the SP2-DV into position.
3. Using appropriate fixings, secure the valve to the enclosure wall.
4. Connect the pilot valve on the SP2-DV to the IS solenoid valve terminals (1-2) in the SmartPurge Controller.
5. Connect the air supply line to the air supply port (1/4" BSSP fitting) on the front of the valve.

SP2-CF-2

1. Mount the bracket to the surface using appropriate fixings.
2. Remove the set nut from the regulator.
3. Insert the regulator into the bracket and secure in place by tightening the regulator set nut.
4. Connect the air supply line to the regulator port.
5. Connect the flow control valve outlet to the purge inlet pipe into the enclosure.

Note: 8mm push-in fittings are supplied. It is recommended to use pipe with an 8mm outer diameter and 6mm inner diameter. Different pipe sizes can be used by replacing the push-in fitting (3/8" fitting) if required.

SP2-Fx Models

1. Install the air supply from the fan system into the enclosure.
2. Install the purge outlet assembly to the enclosure
3. Connect the orifice low and high pressure reference points from the outlet assembly to the corresponding connections on the side of the SmartPurge controller
4. Connect a pipe into the enclosure from the Enclosure Pressure connector on the side of the controller.

Note: 1/8" fittings are used on the side of the controller. Use appropriately sized pipe.

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Section 6: Commissioning

6.1: Pre-Commissioning Checks

Note: The system is pre-set and no adjustments (other than those detailed in this document) should be made without consultation with Expo.

- Ensure the SmartPurge has been correctly installed.
- Ensure that all electrical power to the enclosure being protected is isolated.
- Check all pipe work and wiring is in accordance with appropriate instructions and wiring diagrams.
- Check all doors, inspection covers and other openings in the enclosure are sealed and secure.
- Check the correct orifice plate and flow restrictor (where required) are fitted.
- The SmartPurge Controller parameters must been set accordingly to system requirements, refer to Section: Configuration / Parameters.

6.2: System Commissioning

SP2-Px Model

- Ensure the air supply valve is fully closed.

1. Turn the air supply to the Air Supply Unit ON and set the supply pressure.
2. Turn the power to the SmartPurge Controller ON, the display will show **Low Pressure Fault**.

Note: When turning ON, the system will first show the serial number. Check this corresponds with the system documentation and label. Contact Expo Technologies if there are any differences.

3. Slowly open the Air Supply Unit adjustment valve to allow the enclosure pressure to build up above the set minimum pressure, the display will change to **Purge Flow Low**.

4.a **SP2-DV**: The solenoid valve in the SP2-DV will turn ON the purge air flow, it may take several seconds before the enclosure pressure reaches the required level.

4.b **SP2-CF-2**: Continue to adjust the valve to increase the flow to the required flow rates for purging

Note: Press the [↓] button once, to show the enclosure pressure on the controller display. Use the display while adjusting the flow to check enclosure pressure.

Typical enclosure pressures:

Normal Operation:	2.5 mbarg
During Purge:	9 mbarg
Minimum Pressure:	1 mbarg
Maximum Pressure:	14 mbarg

5. While purging, the display will show **Purge in Progress** and the **purge time/volume counter**.

Note: **Purge Flow Low** or **Purge Flow High** will be displayed if the flow is incorrect. If this happens, increase or decrease the flow by adjusting the Air Supply Unit until the display shows **Purge in Progress**.

Note: If the purge flow is too high, this could result in a potential dangerous overpressure situation:

a. **SP2-DV:** *The solenoid valve in the SP2-DV will turn OFF the purge air flow to allow enclosure pressure to reduce. Once the enclosure pressure falls within the required level the solenoid valve will turn ON the air supply again.*

b. **SP2-CF-2:** Close the valve to turn OFF the air flow to allow the enclosure pressure to fall within the required limits. Once fallen, adjust the valve to turn ON the air supply again

c. Reduce the purge flow rate by reducing the supply pressure, and re-start the purge cycle.

6. Check the system purges for the correct time/volume.
7. Once the purge time/volume has been satisfied, the display will show **Purge Complete.** The SmartPurge Controller will then connected power the protected equipment**.**

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SP2-Fx Model

1. Turn the air supply to the enclosure (fan).
2. Turn the power to the SmartPurge Controller ON.

Note: When turning ON, the system will first show the serial number. Check this corresponds with the system documentation and label. Contact Expo Technologies if there are any differences.

3. Once the enclosure has been pressurised and flow rate reached, the SmartPurge will enter purge mode. While purging, the display will show **Purge in Progress** and the **purge time/volume counter**.

Note: Press the [↓] button once, to show the enclosure pressure on the controller display.

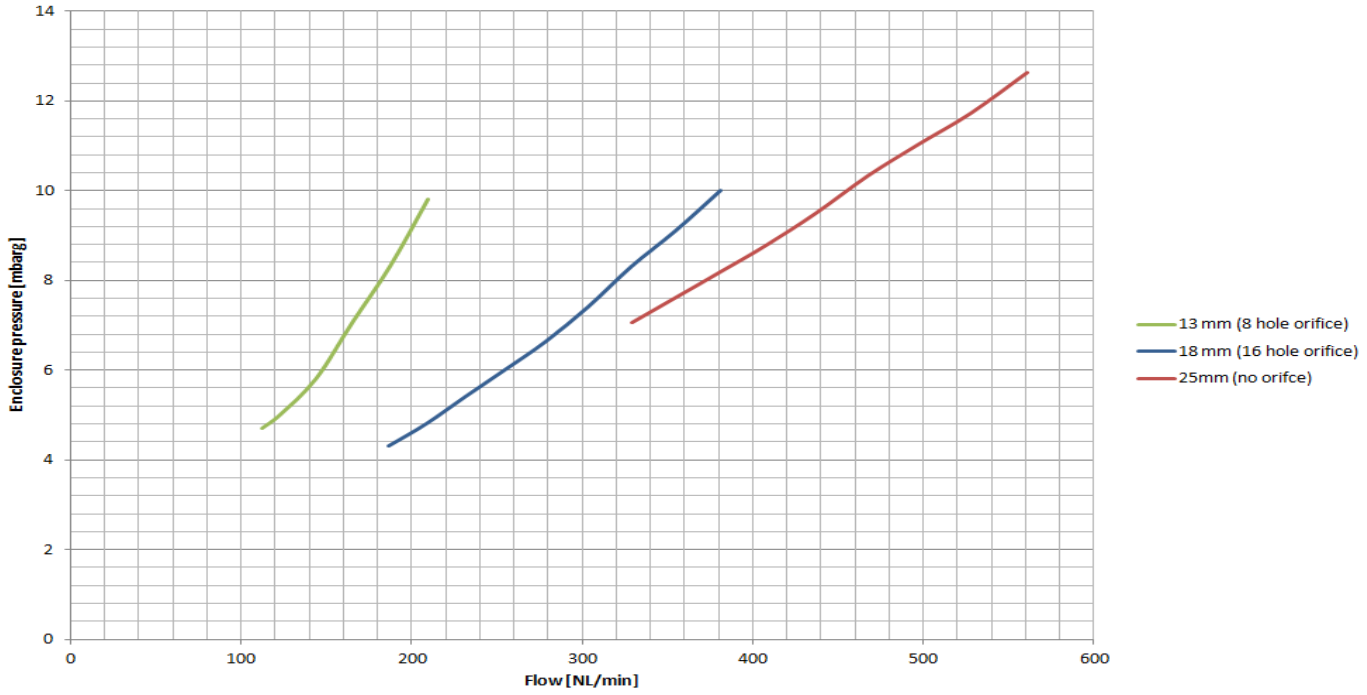
4. Check the system purges for the correct time/volume.
5. Once the purge time/volume has been satisfied, the display will show **Purge Complete.** The SmartPurge Controller will then connected power the protected equipment**.**

- To allow for variations in temperature and air supply pressure, increase the air supply pressure by approximately 5%. Observe the pressure displayed to ascertain when the appropriate pressure is reached. This gives sufficient flow to trigger the flow sensor during purge.
- Record and save the air supply pressure for future reference.
- Once the system is commissioned and set up accordingly, change the password from the factory default to ensure only authorised personnel are permitted to make any changes.
- Check the function of the alarm contacts when pressure drops below the set minimum pressure. If correct operation is not observed refer to the fault finding section of this handbook.

If the System has not performed as expected, check the installation is correct, check the controller has been set to the required settings. If all is correct, refer to section: Fault Finding.

Section 7: System Flow Rates

7.1: SP2-DV Enclosure Pressure vs Flow Rates



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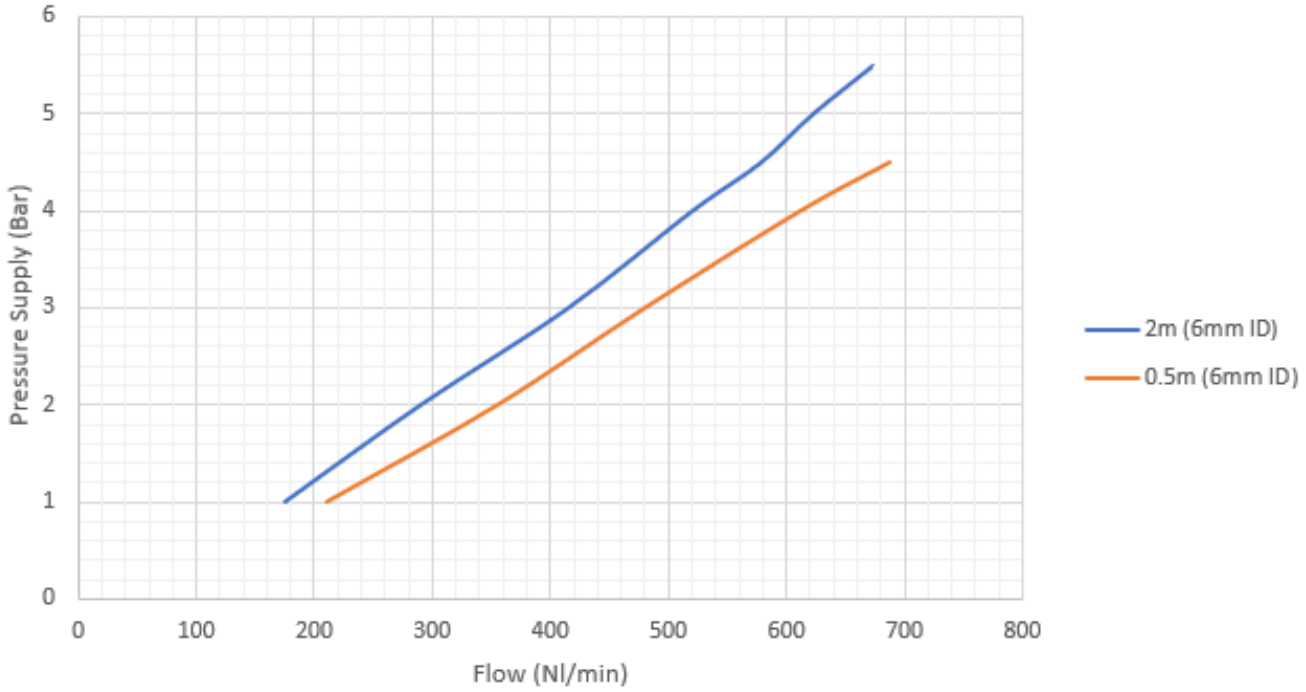
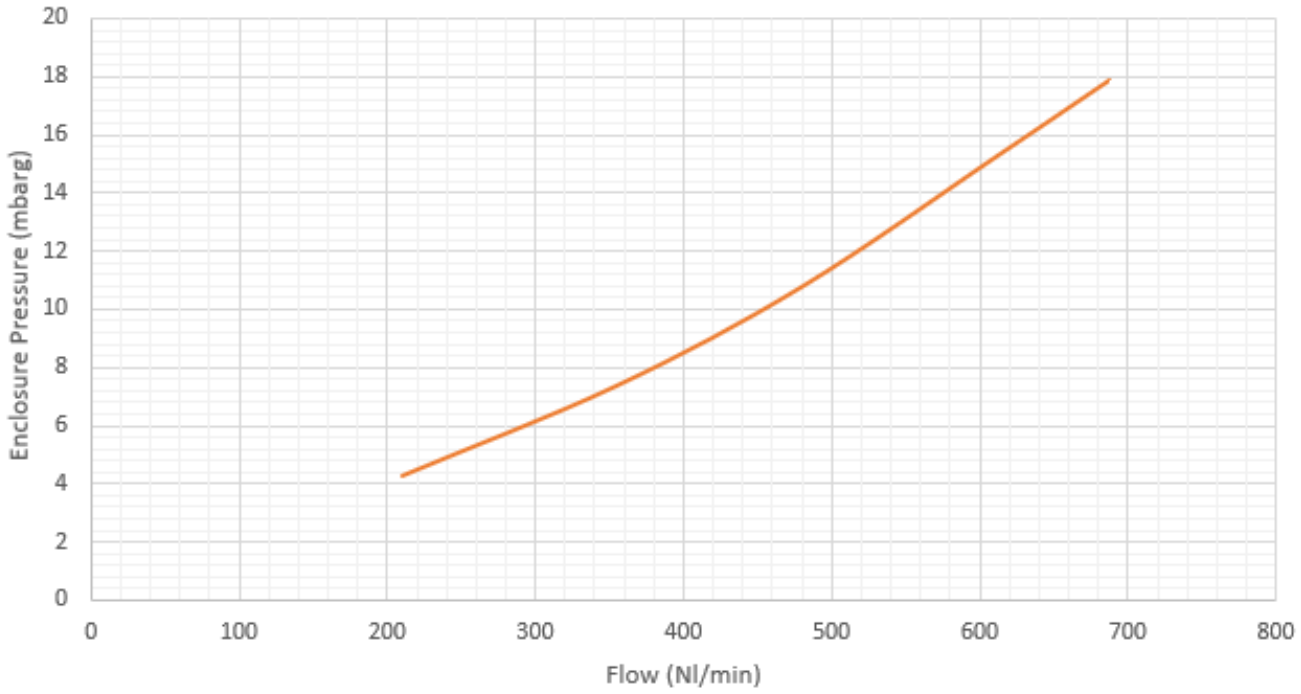
7.2: SP2-CF-2 Supply Pressure vs Flow Rates



*2m and 0.5m - connection length between CF kit and Enclosure

7.3: SP2-CF-2 Enclosure Pressure vs Flow Rates



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Section 8: Configuration / Parameters

8.1: System Configuration

Once the SmartPurge Controller has been installed it must be configured and settings such as the low pressure, purge flow method and orifice diameter must be set up.

Note: The Test and Inspection Sheet supplied with the unit will show the factory set parameters. If settings are changed, ensure to record the change for future reference.

The SmartPurge controller has a two-lined display for system status/alarm notification and parameter configuration. The four push buttons allows users to navigate menu items/messages and set parameter values.

	Menu Button	Scroll to the next menu item.
	Up Button	Scroll to the previous sub-menu/parameter item/messages, increase digit value.
	Down Button	Scroll to the next sub-menu/parameter item/messages, decrease digit value.
	Enter Button	Enter the menu item/parameter, confirm selection.

The default screen for the SmartPurge displays **Purge System Status**, which provides information related to the current state of the purge system.

The software is intuitive so only prompts, sub-menus and parameters are shown/selectable based on the purge method selected.

Press the button to scroll to through the menu items. When the required menu item is displayed, press the button to enter into the sub-menu.

To scroll through the sub-menus press the or buttons. Then press the button to enter item/accept change.

To revert back to the previous menu press the button.

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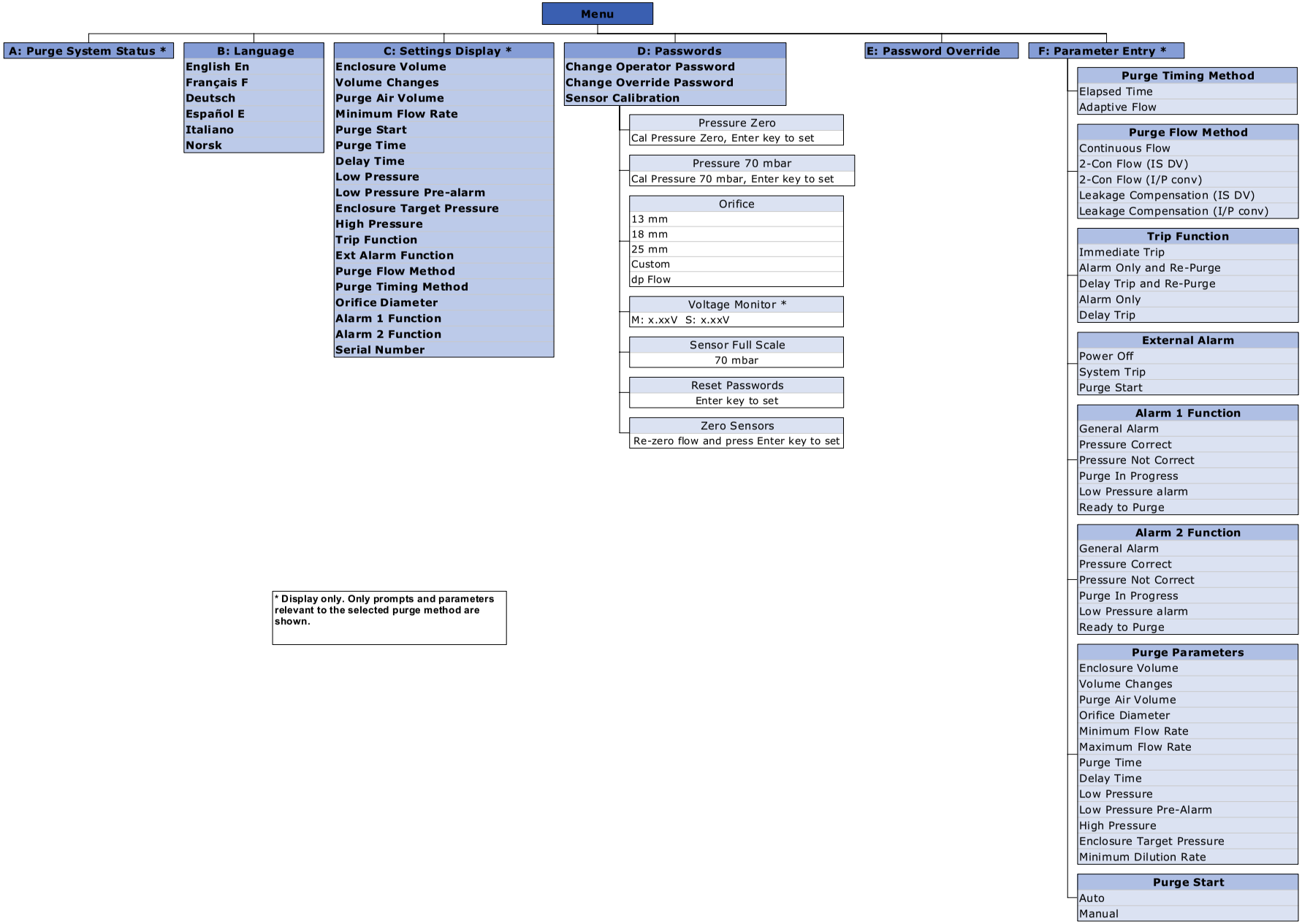

* Display only. Only prompts and parameters relevant to the selected purge method are shown.

A: Purge System Status

This screen is the default display for the system and shows general system status information, alarms and prompts.

The top line of the display will show the system status. The bottom line of the display will show system information and alarm messages (if present).

Press ↑ or ↓ to scroll through information/messages: enclosure pressure, purge flow rate and trip mode.

By default, the display will show trip mode. The display will revert to the default status after 30 seconds of no actions. To freeze the display on another status, press the ↵ button when the status is shown on the display. Press the ↑ or ↓ button to unfreeze the display.

Typical message/errors seen on the display are shown below:

Message	Condition
Purge System Status Low Pressure Fault	The enclosure is not pressurised.
Purge System Status High Pressure Fault	The enclosure is over-pressurised.
Purge System Status Purge Flow Low	The enclosure pressure is within limits and the purge cycle has started. however, the flow rate is below the minimum.
Purge System Status Purge Flow High	Purge is in progress, but the flow rate is too high.
Purging in Progress NN mins remain	Purge is in progress, and the flow rate is within limits. Time based purging.
Purge in Progress NNNNNN litres remain	Purge is in progress, and the flow rate is within limits. Adaptive flow purging.
Purge System Status Purge Complete	Purge has complete.
Power Tripped Low Pressure Fault	Pressurisation has failed after purge complete, immediate trip.
Power On Low Pressure Fault	Pressurisation has failed after purge complete, alarm only.
Trip in NN minutes Low Pressure Fault	Pressurisation has failed after purge complete, delay trip running.
Power Tripped Low Pressure Fault	Pressurisation has failed after purge complete, delay trip timed out or power has been manually tripped during delay trip or alarm only.

B: Language

This menu is used to change the display language. When **Language** is displayed press the ↵ button to view the list of languages. Languages available are English (default), French, German, Spanish, Italian and Norwegian.

The display will show the current language selected. Press ↑ or ↓ to scroll through the options, press the ↵ button to select the desired language.

The operator password will be required to change the language.

Press the ↑ or ↓ button to increase or decrease the flashing number 0-9. Then press the ↵ button to move to the next number. Once all numbers have been entered, press ↵ to enter the password. Successful entry of the password will change the system language.

C: Settings Display

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The Settings Display menu is used to give the operator a view of all the parameters that have been set up for the purge system in its present configuration. This is for display only, it is not possible to change settings in this menu.

When **Settings Display** is displayed press the ↵ button to select this menu, then use the ↑ or ↓ buttons to view the settings.

D: Passwords

The passwords menu allows the user to change the passwords used by the system to control access to various parts of the system. The system uses 3 passwords:

- The Operator Password: required to access the language menu and to modify any of the purging parameters.
- The Override Password: required to turn on the system override or by-pass function allowing power to be connected to the protected equipment regardless of the state of the purge system.
- The Maintenance Password is fixed by Expo, and is not available to general users, as this password controls access to the pressure sensor and flow rate calibration system.

Passwords consist of a 4-digit number, 0000 to 9999. The default value of the Operator and Override passwords is 0000.

When **Passwords** is displayed, press the ↵ button to select this menu.

When changing a password, you will first be prompted to enter the current Password.

You will then be prompted to enter the new password.

To enter the password, 4 0's will be on the bottom line of the display, the first 0 will be flashing. Press the ↑ or ↓ buttons to change the value to the appropriate value, then press the ↵ button to move on to the next digit.

Note: To return the previous number, press the ↑ and ↓ buttons simultaneously.

After changing the last number, press the ↵ button to enter the password. You will then be asked to confirm the new password. If the confirmation succeeds, a confirmation message will be displayed, if it fails, an error message will be displayed, and it will be necessary to repeat the process.

E: Password Override

This is a software version of a manual override keyswitch. It allows users to switch on the power to the protected equipment, regardless of the status of the purge system.

This must only be used when the area is known to be hazard free, and typically will require the use of a Hot Work Permit or similar. You should follow your local work instructions and regulations for such matters.

If a manual override keyswitch is fitted to the system, this will take precedence over the password override.

- If the password override has been used and the manual override is activated, the override can only be removed manually. It is not possible to use the password in this case.
- All override is cancelled when the Keyswitch override is turned OFF.
- If the Keyswitch override is in use, the password override menu is not available, and a warning message is shown.

When **Password Override** is displayed, press the ↵ button to select this menu. A message will be displayed asking whether the override should be turned On or Off, depending on the present state of the override. Press the ↑ button to confirm **Yes** and the ↓ button to confirm **No**.

Press the ↑ or ↓ button to increase or decrease the flashing number 0-9. Then press the ↵ button to move to the next number. Once all numbers have been entered, press ↵ to enter the password. Successful entry of the password will turn the override On.

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The password is not required to turn the Override Off.

It is possible to remove the Password Override option from the main menu, by setting the Override Password to "9999" in the Passwords menu.

F: Parameter Entry

The Parameter Entry menu allows the user to configure the system to the specific application.

When **Parameter Entry** is displayed, press the ↵ button to select this menu. The Operator Password is required to be entered before the sub-menu can be accessed.

Press the ↑ or ↓ button to increase or decrease the flashing number 0-9. Then press the ↵ button to move to the next number. Once all numbers have been entered, press ↵ to enter the password.

Press the ↑ or ↓ button to scroll through the sub-menu. Press the ↵ button to enter the parameter options.

Press the ↑ or ↓ button to scroll through the parameter options. Press the ↵ button to select the required setting.

Purge Timing Method

The choice of purge timing methods.

Elapsed Time	This option is the traditional timing method. The purge flow is maintained above a minimum for a set period of time measured in minutes. If the flow drops below the minimum, the purge time is reset and the purge time will restart.
Adaptive Flow	This method is a cumulative values of true flow rate measured over time. The system will take into account the time that the flow rate is above the minimum but below the maximum specified flow rate. If the flow rate falls below minimum the accumulation of purge volume will stop but the total is not reset. Flow rate above the maximum is accumulated at the maximum rate. the accumulation is only reset when the pressure exceeds the limits for the low or high pressure alarms.

Purge Flow Method

The choice between how the flow of purge gas is to be controlled.

Continuous Flow:	There is no control by the system over the flow of purge air. After the purge has completed, the system checks for flow above the minimum dilution rate.
Leakage Compensation with IS Digital Valve	The purge flow is controlled by an intrinsically safe solenoid valve, and leakage compensation controlled manually by means of a leakage compensation needle valve.

Trip Function

The choice of action to be taken by the system if the pressure goes out of the specified range.

Immediate Trip	This option will disconnect the power to the protected equipment as soon as the enclosure pressure goes out of bounds.
Alarm Only & Repurge	Alarm Only does not disconnect the power to the protected equipment, but will activate the appropriate alarm signals. It is possible to turn the power to the protected equipment off by pressing the Down button on the keypad. A message will be displayed to ask for confirmation that the power is to be turned off.

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Delay Trip & Repurge	Delay Trip will disconnect the power to the protected equipment after a pre-set period of time has elapsed after the enclosure pressure goes out of limits. As with the Alarms Only option, the appropriate alarm signals are activated, and it is possible to manually turn the power to the protected equipment off by pressing the Down button on the keypad.
Alarm Only	This will prevent the enclosure being re-purged once pressure is restored after pressurization failure.
Delay Trip	This will prevent the enclosure being re-purged once pressure is restored after pressurization failure.

External Alarm

The action taken by the system in response to the External Alarm. This is an IS (Intrinsically Safe Circuit),

Power Off	Choosing power off will cause the system to remove power from the protected enclosure when the external alarm input is activated. For example, this option could be used with a thermostat, to prevent over-heating.
System Trip	Choosing system trip will cause the system to act as if a pressure fault had been detected. The system will trip in accordance with the currently selected trip mode. For example, this option would be chosen when the input is used to connect additional pressure switches monitoring the pressurization.
Purge Start	Choosing purge start will inhibit the start of a purge cycle if an external alarm input is present.

The default condition is "Purge Start"

Alarm 1 & Alarm 2

There are two normally open volt free contacts (Alarm 1 and Alarm 2) that may be configured to give a number of indications

General Alarm	This is the default function of Alarm 1, and is active whenever the enclosure is not in a pressurized condition. The contacts close when the enclosure is purged and pressurized.
Pressure Correct	The status relay is closed when the enclosure pressure is within limits
Pressure NOT Correct	The status relay is closed when the enclosure pressure is NOT within limits.
Purge In Progress	The status contact closes when the purge flow is above the minimum level. This is the default function of Alarm 2.
Low Press Pre-Alarm	The status relay closes when the enclosure pressure falls below the low pressure pre-alarm setting, giving an early warning of impending loss of pressurization.
Ready to Purge	When the External Alarm option Purge Start has been chosen this Alarm contact will close to inform the user that purge has not started. This will either be because the Purge Start signal has not been received or there is insufficient Purge Flow being measured in the purge air exit valve.

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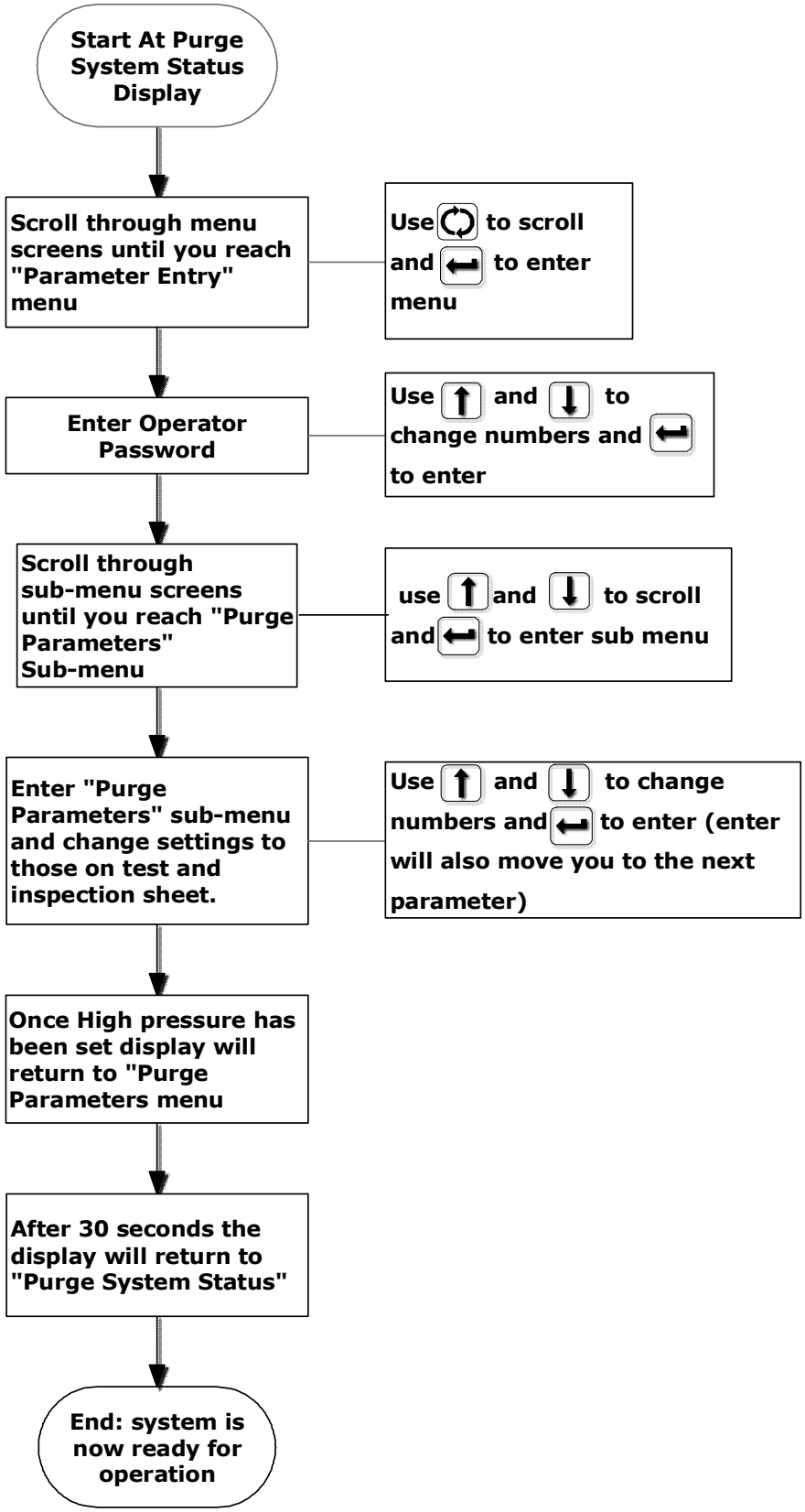
Purge Parameters

The configuration of all the specific details needed to fully configure the SmartPurge System to the application. To change parameters follow the below sequence:



The user can escape early from the parameter entry menu after the desired item has been changed by pressing . Early escape is only possible provided all the parameters remain consistent with correct operation.

Note: Not all of the parameters listed below will be relevant to the purging method selected.

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In this section the system will suggest some values based on the parameters entered earlier. Where values are suggested, these values may be adjusted by the user, but only in an upward direction. You cannot use a value smaller than that suggested by the system.

Enclosure Volume	Enter the volume of the purged enclosure. The volume may be between 1 and 99999 litres.
Number of Vol. Changes	Enter the number of times you wish the enclosure volume to be changed. The number of times may be between 1 and 10. Where the purge air volume has been evaluated by testing, set the number of changes to 1. The default value is 10.
Purge Air Volume	The system will suggest a purge air volume based on the Enclosure Volume x Number of Volume. Changes. Where the purge air volume has been measured by testing, enter the desired volume here.
Orifice Diameter	It is possible to select 3 different orifice sizes in order to change the range of flow rates measured by the system. The default value for orifice diameter is 25mm, and corresponds to a maximum flow rate during purge of 540 litres per minute. Two smaller orifice plates are supplied, and are fitted over the air entry into the SmartPurge. The orifice is secured by two screws. Refer to Table 1 For systems that have been specially factory-configured, an extra orifice diameter may be selected in this menu. Details of the flow rate for this orifice size will be recorded in the project specific information section of the manual. Standard systems will only offer the 3 sizes as detailed in Table 1
Purge Time	Enter the desired purge time, in minutes. A value will be suggested, based on the purge air volume / minimum purge flow rate.
Minimum Flow Rate	Enter the minimum purge flow rate. The default value suggested will depend upon the orifice diameter selected.
Maximum Flow Rate	Enter here the maximum purge flow rate. A default value will be suggested, based on the orifice diameter. (Adaptive Flow Purge Timing only)
Minimum Dilution Rate	Enter here the minimum dilution rate for the purge flow after the main purge has completed. (Continuous Flow High Purge methods only)
Low Pressure	Enter the lowest acceptable pressure within the enclosure. The function of this is to shut power off to the pressurized enclosure due to a loss of pressure that may allow the entry of hazardous gas or particles.
High Pressure	Enter the highest acceptable pressure within the enclosure. Enclosures should have a maximum test pressure and it is advised that the High Pressure is set a below this point. This will warn the user that higher than expected pressure is present inside the enclosure.
Low Pressure Pre-Alarm	Enter the pressure which is above the Low Pressure and below the expected normal operation pressure of the enclosure. The function of this alarm is to warn the user that the enclosure pressure is falling to allow for preventative maintenance to occur.
Enclosure Target Pressure	Where an I/P supply valve is used the Enclosure Target Pressure is maintained by the valve after purge complete.

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Notes on air volume and purge time parameters:

- The enclosure volume must be larger than 10 litres and smaller than 99999 litres.
- The number of purge volume changes must be between 1 and 10.
- The Purge Air Volume is automatically calculated by the system as the enclosure volume x number of volume changes.
- The user may amend the Purge Air Volume, but only to a larger volume. The maximum volume is 99999 litres.
- The user may select an orifice size from the 3 standard sizes or from the Custom Size, if one has been configured.
- The minimum flow rate is automatically calculated as 40% of the maximum flow rate available for the selected orifice.
- The maximum flow rate is automatically calculated as 80% of the maximum flow rate available for the selected orifice.
- The user may amend the maximum and minimum flow rates. The system will check that the value for minimum flow rate is always lower than the value for maximum flow rate. The maximum flow rate cannot be larger than the maximum flow rate available for the selected orifice.
- The purge time is automatically calculated by the system by dividing the purge air volume by the minimum flow rate.
- The purge time has a minimum value of 1 minute.

The user can amend the purge time to a larger value than the one calculated by the system.

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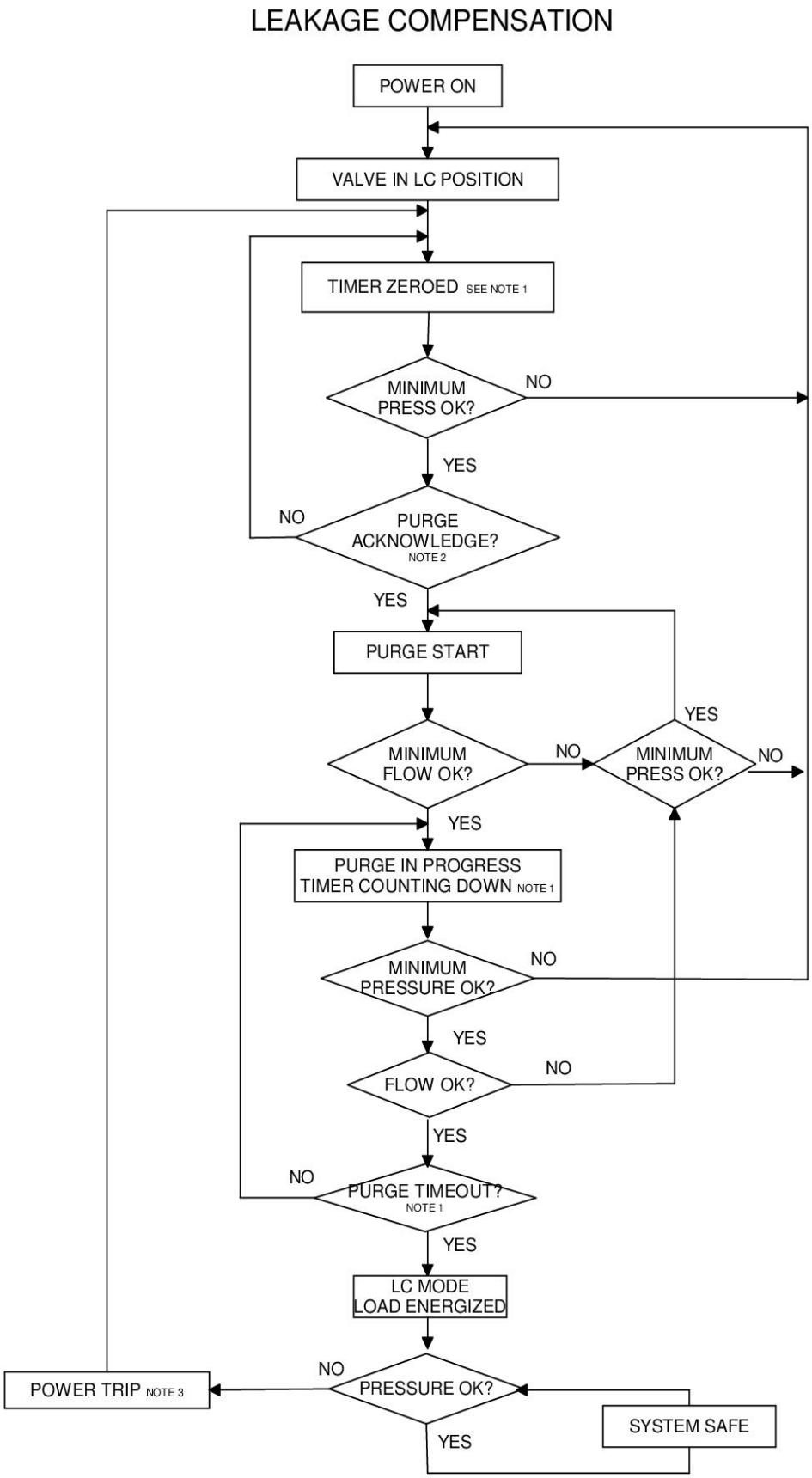
8.2: Operational Strategies



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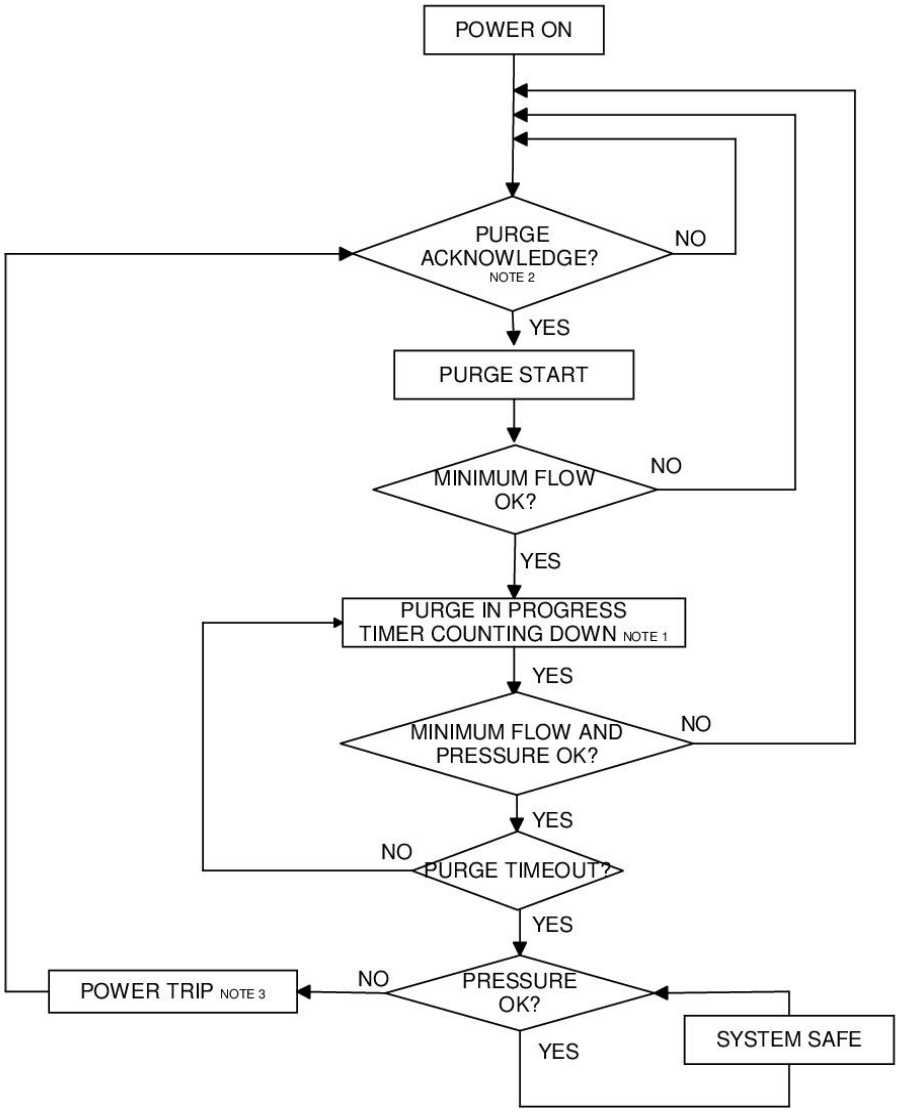
CONTINUOUS FLOW



Note 1: In elapsed time mode, purge is controlled by the timer ; In adaptive flow mode, purge is controlled by the number of litres of air used

Note 2: Purge acknowledge only applies when the parameter **Purge Start** is set to manual. This message prompts the user to initiate the purge cycle by pressing the enter button.

Section 9: Maintenance of the System

The maintenance of the system outlined in this manual should be supplemented with any additional requirements set out in appropriate local codes of practice.

9.1: Routine Maintenance

It is recommended that these tasks are carried out annually.

The system should be checked to ensure that the system generates an alarm when the enclosure pressure drops below the set minimum pressure.

The condition of the connections and cable glands should be checked by suitably qualified personnel. This may be required more frequently depending on environment.

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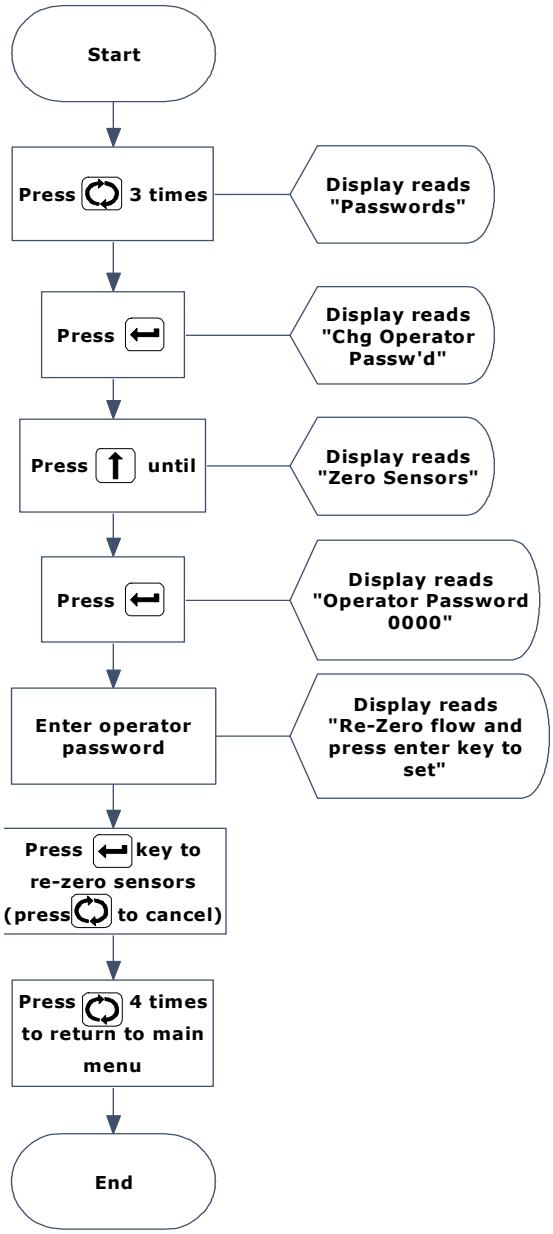
9.2: Re-zeroing of the Flow and Pressure Sensors

If the SmartPurge display shows the error message **Pressure Mismatch** the zero point of the flow and pressure sensors must be reset. It is essential to the correct operation of this function that the enclosure is not pressurized. It is suggested that the best way to ensure this is to perform this operation with the enclosure door open and the air supply turned off. Carry out re-zeroing as follows:



9.3: Repairs

If the SmartPurge needs repairs, these should be carried out by an Expo Service Person.

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Section 10: Fault Finding

Symptom	Fault	Solution
No display on the Control Unit		Check power to Control Unit. Check fuse in Control Unit. If the ambient temperature is below -20°C the display may not be visible.
Low pressure fault. No Pressure OK indication	No air supply	Check air supply is on. Defective wiring between SmartPurge and Air Supply Unit.
	Excessive leakage	Check that all enclosure doors, covers and conduit or cable entries are sealed and that the enclosure is of an airtight construction. Improve sealing using closed cell foam strip or suitable sealant.
	Low air supply pressure	Open air supply valve (where fitted) to provide more air flow Increase the air supply pressure Ensure atmospheric pressure is referenced.
No Purge in Progress indication	Insufficient air supply	Check that when the purge is flowing that the pressure at the air inlet is greater than the value shown in Table 1. Check air supply and piping for correct sizing and excessive restrictions.
	Excessive enclosure leakage during purging	Seal leaks as above
Purge timer does not time out	Elapsed Time Purging: Purge flow drops during purge sequence. Adaptive Flow Purging: The purge accumulation process will stop if the purge flow drops below the minimum setting.	Check air supply capacity. Increase air supply pressure or select a lower minimum flow threshold.
High pressure fault indication	SmartPurge air outlet is restricted or blocked.	Unblock
	Purge flow is too high	Reduce supply pressure.
Error message "Pressure Mismatch"	Flow and pressure sensor Zero point deviated from factory settings	Re-zero the Flow and Pressure Sensors
Error message: Master/Slave PIC failure"	System failure due to multiple errors or over temperature.	Make sure the system is operating within the temperature limit. Restart the system.

If all checks have been carried out and the system still does not perform as expected, contact your local distributor or Expo Technologies.

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Section 11: Recommended Spare

Part Number	Description
SP2-DV	Intrinsically safe solenoid valve, switches between the purge flow and leakage compensation flow rate.
SP2-CF-2	SmartPurge 2 continuous flow regulator and valve
EFU-F001-000	Universal Voltage Fuse Assembly 100mA (T)
EFU-F005-000	Low Voltage Fuse Assembly 500mA (T)

Section 12: Drawings and Diagrams

12.1: SP2-Px Model Drawings

Title	Drawing Number	Sheet Number
Control Unit Drawing	XMA-STD0-001	1 of 10
External Controller Dimensions	XMA-STD0-001	2 of 10
SmartPurge 2 Internal Components	XMA-STD0-001	4 of 10
SmartPurge 2 Controller Cutout	XMA-STD0-001	9 of 10
SmartPurge2 SDV Assembly	XMA-STD0-001	6 of 10
SmartPurge2 SDV Mounting and Cutouts	XMA-STD0-001	7 of 10
SmartPurge 2 Hook up	XMA-STD0-001	10 of 10
SmartPurge 2 Continuous Flow Kit	SP2-CF-2	1 of 1

12.2: SP2-Fx Model Drawings

Title	Drawing Number	Sheet Number
Control Unit Drawing	XMA-STD0-002	1 of 11
External Controller Dimensions	XMA-STD0-002	2 of 11
SmartPurge 2 Internal Components	XMA-STD0-002	4 of 11
SmartPurge 2 Controller Cutout	XMA-STD0-002	9 of 11
SmartPurge 2 Fan Hook up	XMA-STD0-002	11of 11
Typical Orifice Arrangement	XMA-STD0-002	10 of 11
Air Outlet Assembly	AOA-010-050	1 to 3

12.3: SP2 Common Drawings

Title	Drawing Number	Sheet Number
Line Fault Detection Connector Assembly	XMA-STD0-001	5 of 10
SmartPurge 2 Wiring Layout	XMA-STD0-001	8 of 10
SmartPurge 2 Intrinsically Safe Control Drawing USS	SD8112	1 of 1
SmartPurge 2 Intrinsically Safety Control Drawing Canada	SD8113	1 of 1

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Section 13: Certification

Component	Certificate	Number
SmartPurge Control Unit	IECEx	IECEx FME 11.0006X
	ATEX	FM11ATEX0060X
	FM (USA)	FM23US0049X
	FM (Canada)	FM23CA0036X
	CCC	2022322304004431
	PESO	P374648/1
	KOSHA	19-AV4BO-0035 (Gas)
		19-AV4BO-0034 (Dust)
SIL 2 Rating	ESC	A127_CT001_(2.0)
IS SOV (SP2-DV)	IECEx	IECEx_DEK_11.0038X
	ATEX	DEKRA 11ATEX0091X

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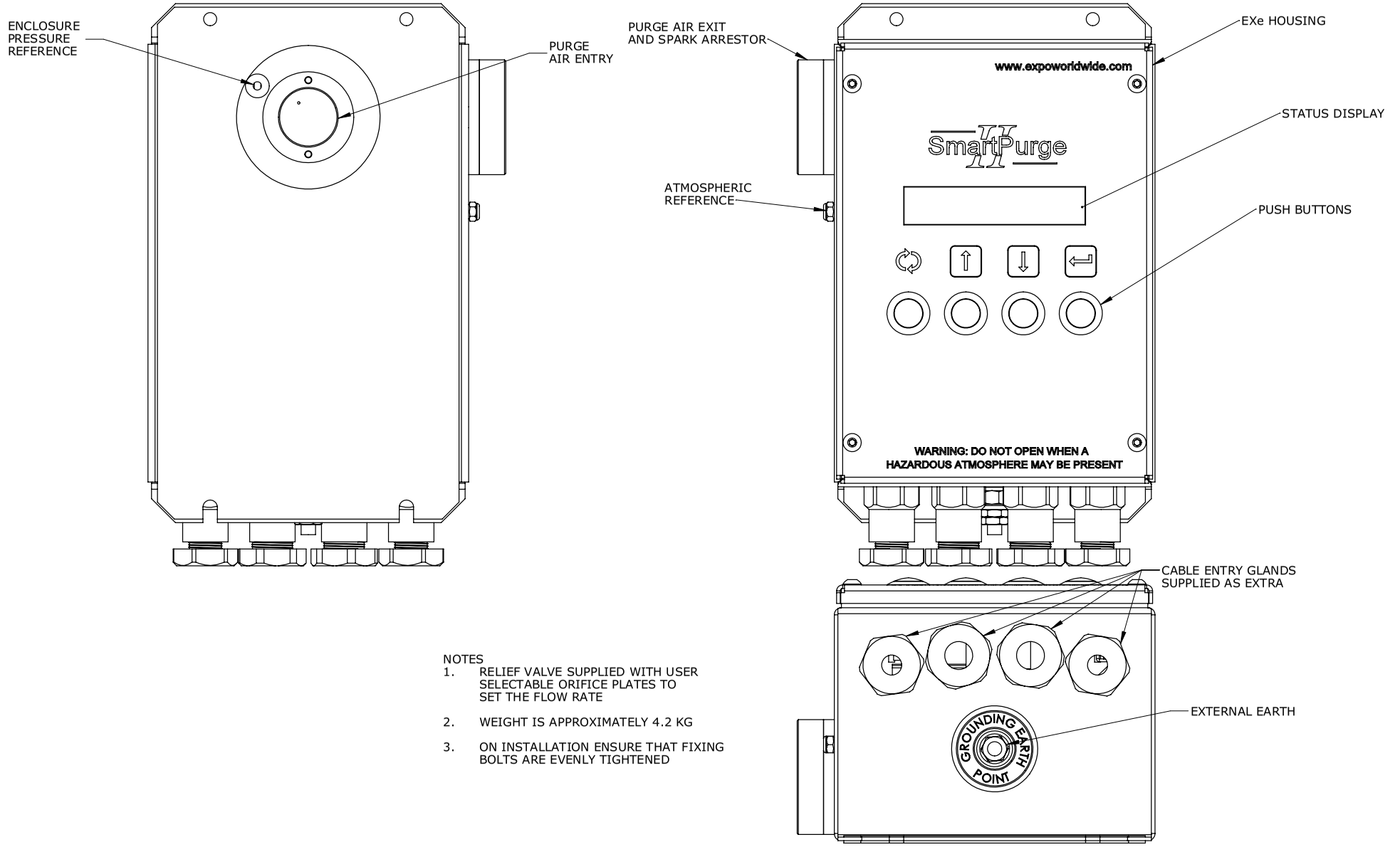
8	7	6	5	4	3	2	1

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	



NOTES
1. RELIEF VALVE SUPPLIED WITH USER SELECTABLE ORIFICE PLATES TO SET THE FLOW RATE
2. WEIGHT IS APPROXIMATELY 4.2 KG
3. ON INSTALLATION ENSURE THAT FIXING BOLTS ARE EVENLY TIGHTENED

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED	MATERIAL	WEIGHT (Kg)
08/12/2011		STAINLESS STEEL 316L 1.5mm THK	
DRAWING STATUS	REVISION	FINISH	
RELEASED	05	VERTICAL BRUSHED 240 GRIT ALL EXTERNAL WELDS REMOVED	
SCALE 2:1	A3		

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE
SMARTPURGE2 PURGE CONTROLLED MAINS SUPPLY STAINLESS STEEL

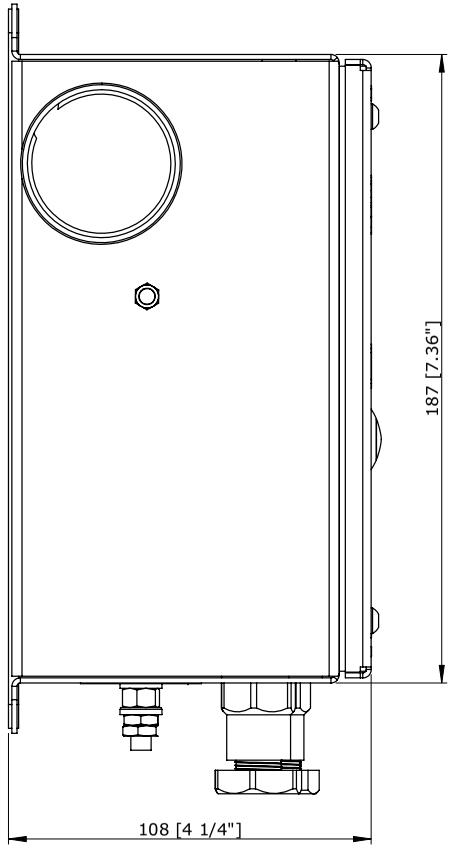
DRAWING No.
XMA-STD0-001

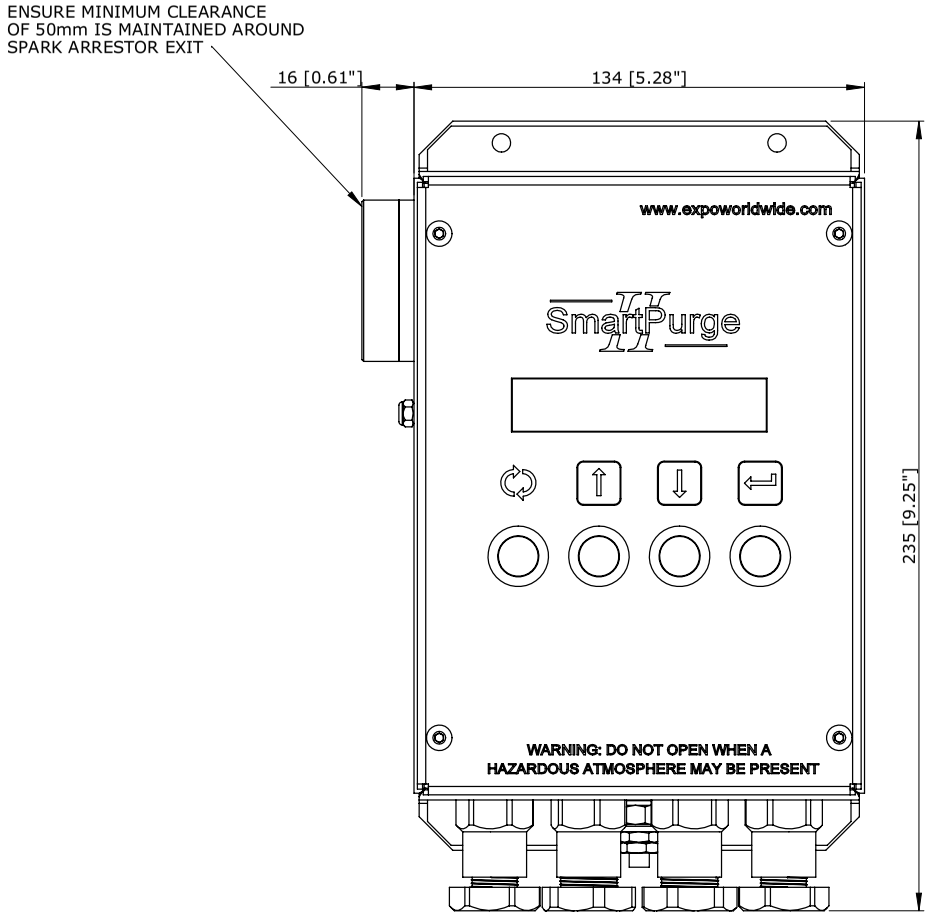
SHEET No. 1 OF 10

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 No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED	MATERIAL	WEIGHT (Kg)
08/12/2011		STAINLESS STEEL 316L 1.5mm THK	
DRAWING STATUS	REVISION	FINISH	
RELEASED	05	VERTICAL BRUSHED 240 GRIT ALL EXTERNAL WELDS REMOVED	
SCALE 1:5	A3		

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE
EXTERNAL CONTROLLER DIMENSIONS

DRAWING No.
XMA-STD0-001

SHEET No. 2 OF 10

expo Technologies

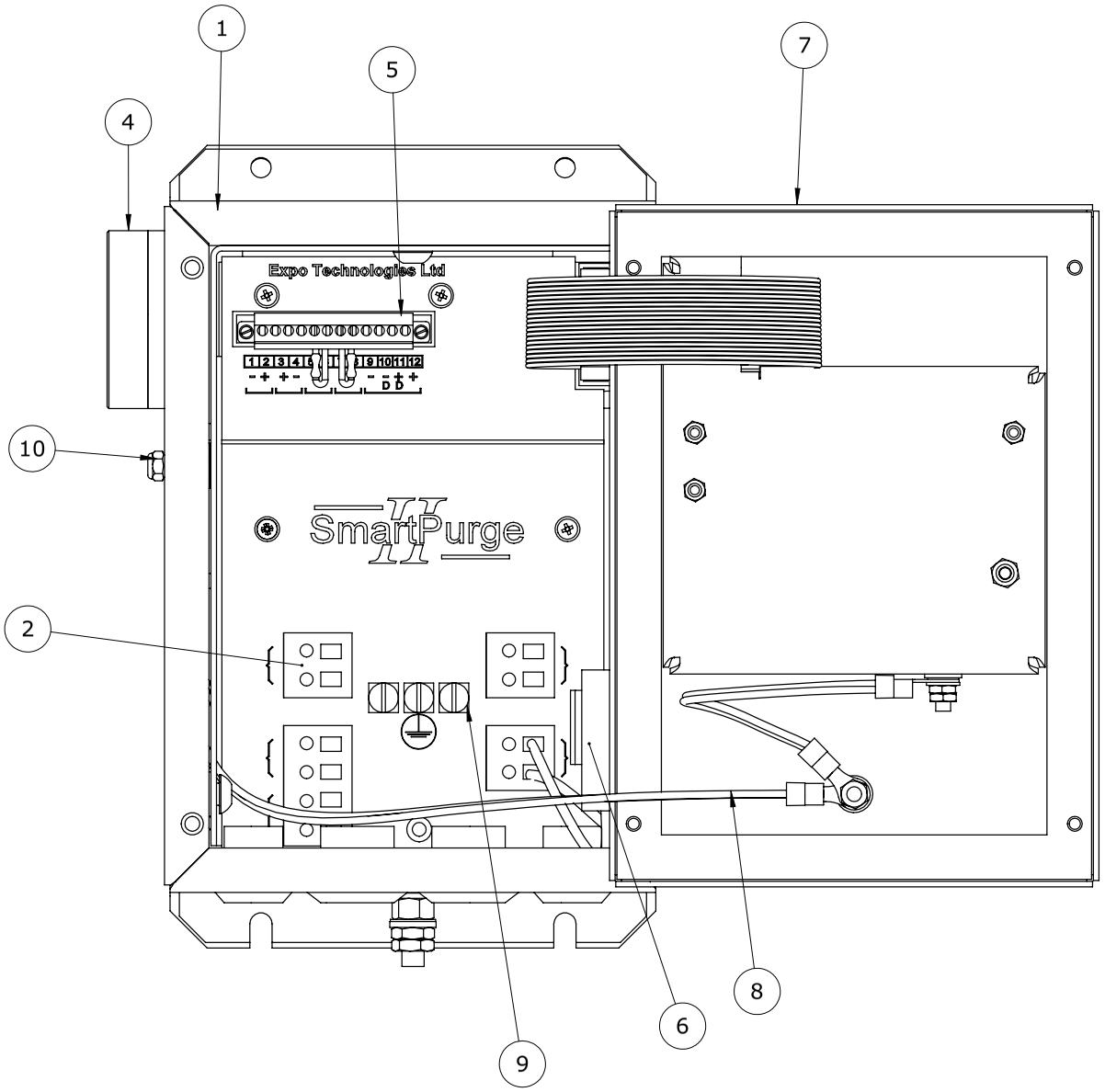
8	7	6	5	4	3	2	1

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



ITEM NO.	DESCRIPTION	QTY
1	SMARTPURGE 2 PURGE ENCLOSURE	1
2	POWER TERMINALS	1
3	CABLE GLANDS (SUPPLIED SEPERATELY)	4
4	PURGE AIR EXIT SPARK ARRESTOR	1
5	TERMINALS FOR INTRINSICALLY SAFE CIRCUITS	1
6	POTTED EXE FUSE FOR SP2	1
7	SMARTPURGE 2 SS HOUSING LID	1
8	LID TO ENCLOSURE EARTH CABLE	1
9	EARTH TERMINAL MANTLE	3
10	BRASS SILENCER FOR ATMOSPHERIC REFERENCE	1

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE: 08/12/2011
CONTROLLED:
DRAWING STATUS: RELEASED
REVISION: 05
SCALE: 1:5
SIZE: A3

MATERIAL: STAINLESS STEEL 316L 1.5mm THK
FINISH: VERTICAL BRUSHED 240 GRIT ALL EXTERNAL WELDS REMOVED

WEIGHT (Kg):

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: SMARTPURGE 2 INTERNAL COMPONENTS

DRAWING No.: XMA-STD0-001

SHEET No. 4 OF 10

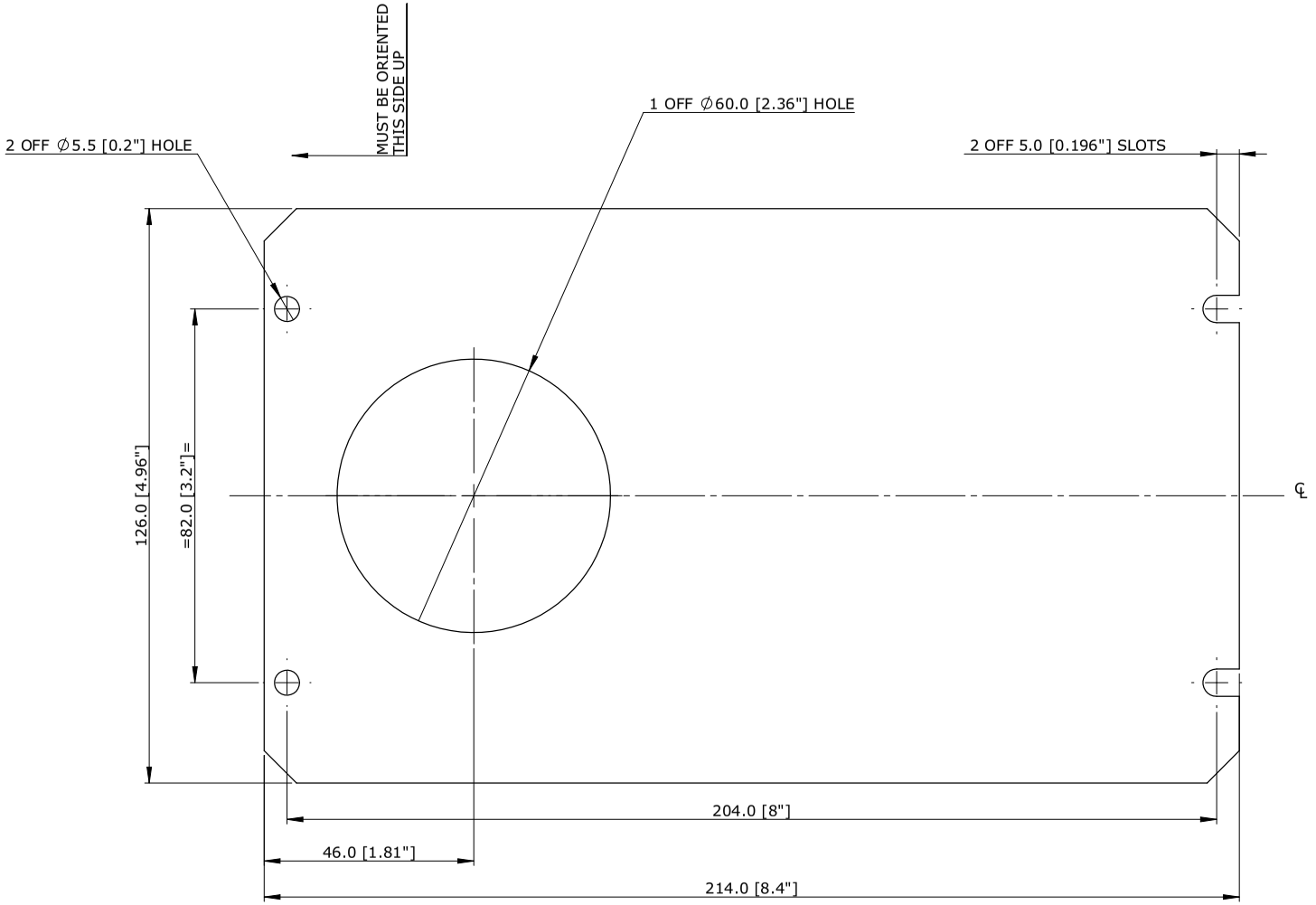
expo Technologies

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	

NOTE

FOR SDV CUT-OUT DIMENSIONS SEE PAGE 07



REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED	MATERIAL	WEIGHT (Kg)
08/12/2011		BLK PVC FOAM 3.0mm THK 3509	
DRAWING STATUS	REVISION	FINISH	TITLE
RELEASED	05	SAB	SP2 CONTROLLER CUTOUT
SCALE 1:1	A3		

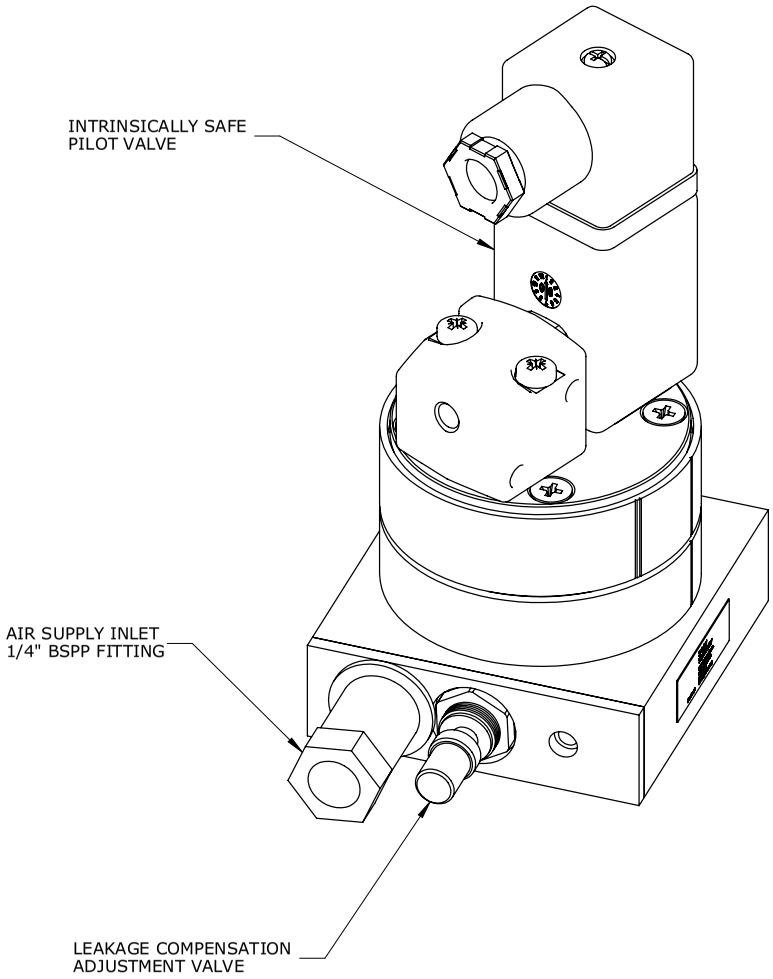
Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

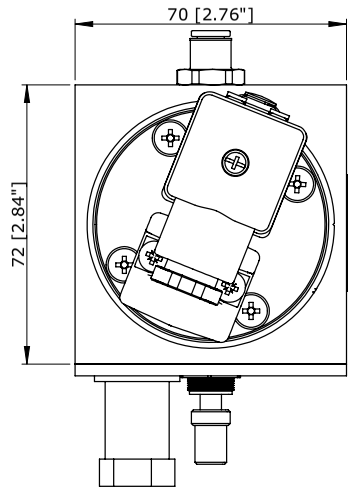
DRAWING No. XMA-STD0-001

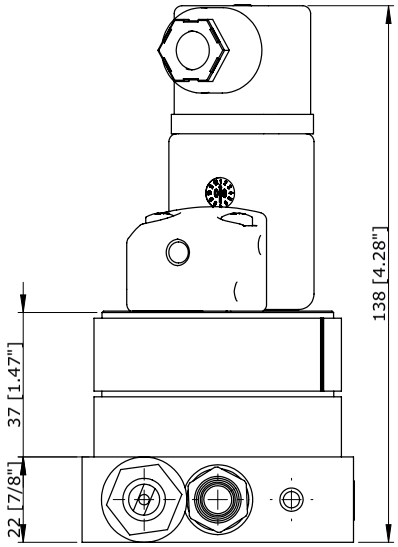
SHEET No. 9 OF 10

8	7	6	5	4	3	2	1

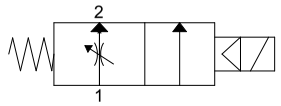
3RD ANGLE PROJECTION	DIMENSIONS IN mm [ ] DENOTES IMPERIAL	TOLERANCES UNLESS OTHERWISE STATED FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.05 ANGLE STD ±1°	DO NOT SCALE IF IN DOUBT ASK	







FFD PNEUMATIC FUNCTIONS



2 PORT / 2 POSITION, NORMALLY CLOSED

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED	MATERIAL	WEIGHT (Kg)
08/12/2011		SEE PART DETAILS	
DRAWING STATUS	REVISION	FINISH	
RELEASED	05	SEE PART DETAILS	
SCALE 1:2	A3		

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

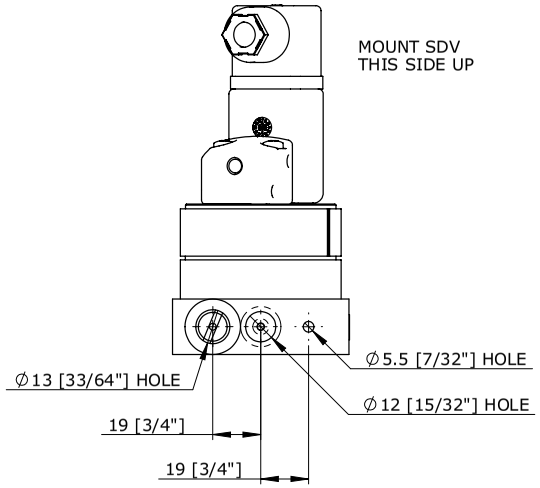
TITLE
SMART PURGE 2 SDV ASSEMBLY

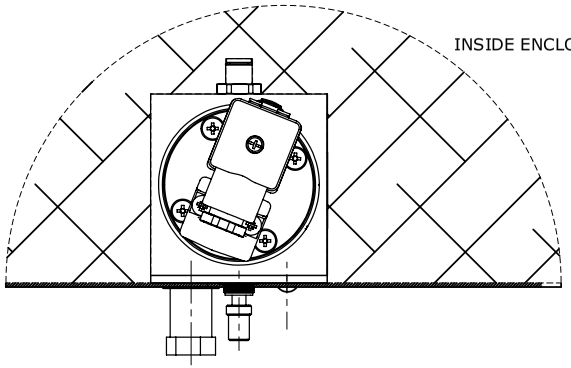
DRAWING No.
XMA-STD0-001

SHEET No. 6 OF 10

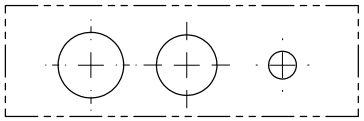
8	7	6	5	4	3	2	1
3RD ANGLE PROJECTION	DIMENSIONS IN mm [ ] DENOTES IMPERIAL	TOLERANCES UNLESS OTHERWISE STATED FLATNESS TO BE LESS THAN 0.4 OVER ANY 100mm LENGTH DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.05 ANGLE STD ±1°	DO NOT SCALE IF IN DOUBT ASK				

INTERNAL MOUNTING SDV DIMENSIONS

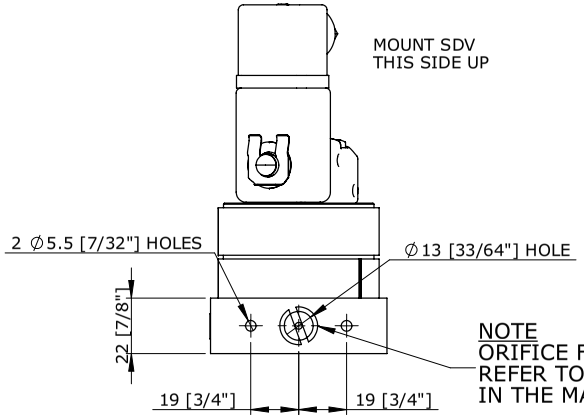




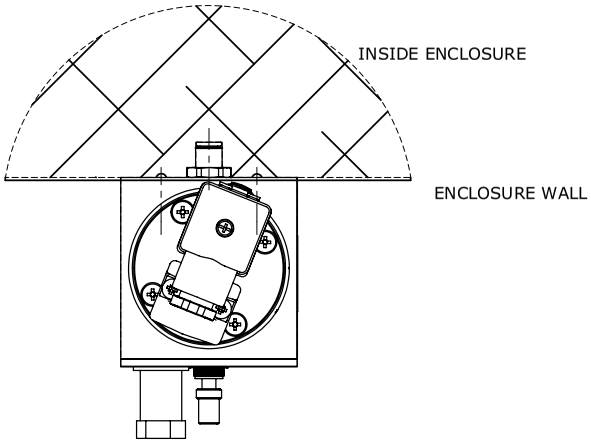
SDV INTERNAL MOUNTING CUT-OUT



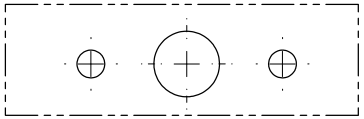
EXTERNAL MOUNTING SDV DIMENSIONS



NOTE
ORIFICE FITTED.
REFER TO TABLE 1
IN THE MANUAL



SDV EXTERNAL MOUNTING CUT-OUT



REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED
08/12/2011	
DRAWING STATUS	REVISION
RELEASED	05
SCALE 1:1	A3

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

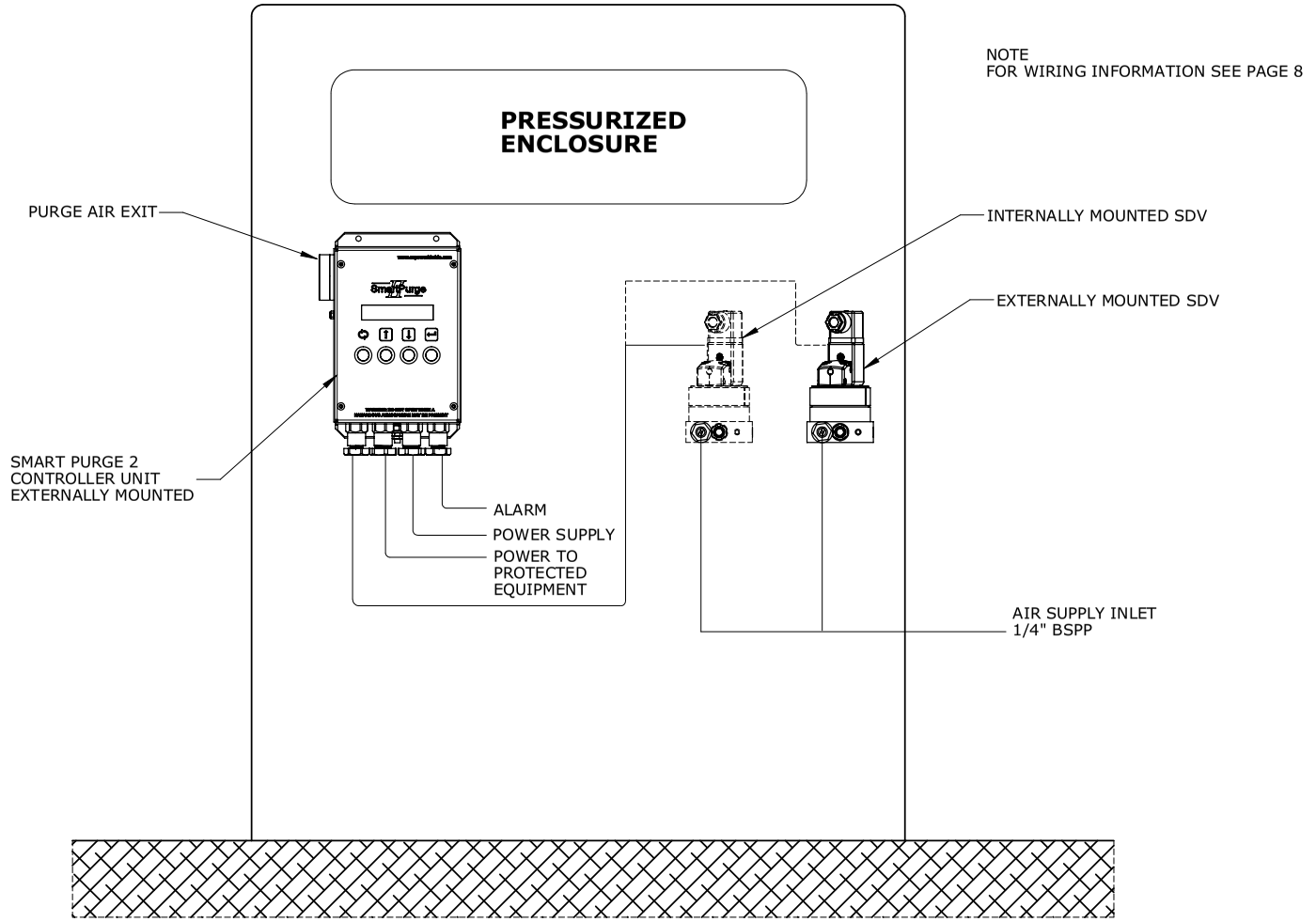
Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: SMARTPURGE 2 SDV MOUNTING AND CUT OUTS

DRAWING No. XMA-STD0-001

SHEET No. 7 OF 10

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					



NOTE
FOR WIRING INFORMATION SEE PAGE 8

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED
08/12/2011	
DRAWING STATUS	REVISION
RELEASED	05
SCALE 1:1	A3

MATERIAL: STAINLESS STEEL 316L 1.5mm THK

FINISH: VERTICAL BRUSHED 240 GRIT ALL EXTERNAL WELDS REMOVED

WEIGHT (Kg):

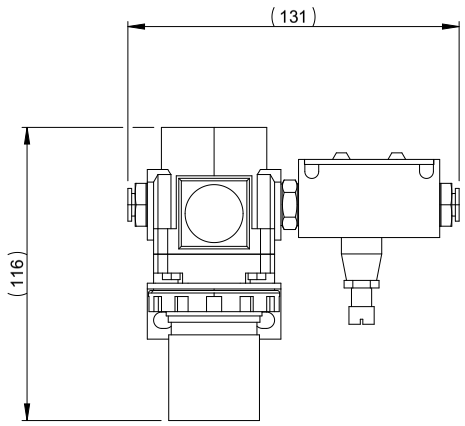
Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: SMARTPURGE 2 HOOK-UP

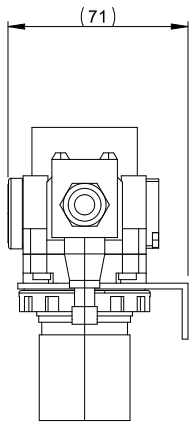
DRAWING No. XMA-STD0-001

SHEET No. 10 OF 10

3RD ANGLE PROJECTION	GENERAL TOLERANCES TO ISO 2768 - m K																								UNLESS OTHERWISE STATED:	DO NOT SCALE
BS8888	LINEAR	>0.5 to 6	>6 to 30	>30 to 120	>120 to 400	>400 to 1000	>1000 to 2000	>2000 to 4000	EXTERNAL RADIUS & CHAMFER HEIGHTS	>0.5 to 3	>3 to 6	>6	ANGULAR (SHORTER LEG)	≤10	>10 to 50	>50 to 120	>120 to 400	>400	STRAIGHTNESS & FLATNESS	≤10	>10 to 30	>30 to 100	>100 to 300	>300 to 1000	>1000 to 3000	DIMENSIONS IN mm; [ ] DENOTES IMPERIAL REMOVE ALL BURRS AND SHARP EDGES 0.2 x 45° TYP; INTERNAL CORNERS R0.2 TYP	IF IN DOUBT ASK
		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0		±0.2	±0.5	±1.0		±1°	±0°30'	±0°20'	±0°10'	±0°5'		0.05	0.1	0.2	0.4	0.6	0.8		

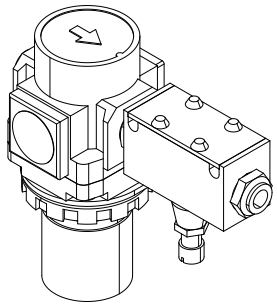


FRONT VIEW

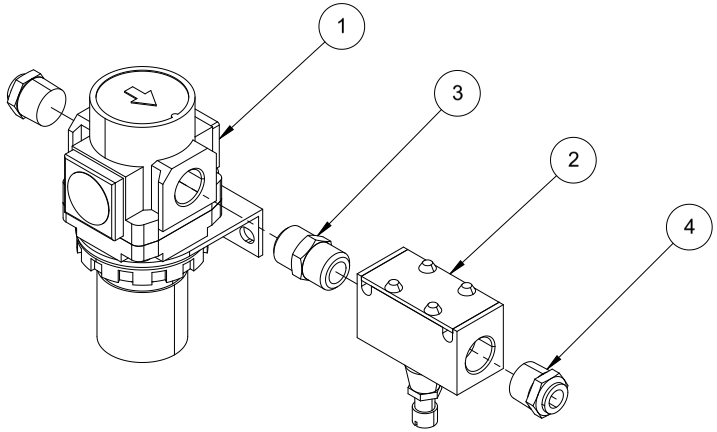


SIDE VIEW

ITEM	PART NUMBER	DESCRIPTION	QTY
1	HRA-0000-025	REGULATOR W/BACKFLOW, 03 (3/8), WITH BRACKET	1
2	HVE-ASB1-000	SPEED CONTROLLER, THREADED PORT, 03 (3/8)	1
3	TTR-0PP0-0N0	HEX. NIPPLE, 3/8" BSPT EQUAL	1
4	TPC-108P-0B0	PUSH-IN FITTING, TUBE-MALE THREAD, 8mm DIA, 3/8	2



ISO VIEW



EXPLODED VIEW

REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
01	24/042	BA	AO	PB	30/01/2024

DRAWING No.: SP2-CF-2

LIFECYCLE STATE: RELEASED | REVISION: 01

TITLE: SMARTPURGE 2 CONTINUOUS FLOW KIT

MATERIAL: SEE PART DETAILS (MASS [Kg]: 0.56)

FINISH: SEE PART DETAILS

COMPLIANCE REQUIRED: REACH; RoHS & 3TG | SCHEDULE DOC. REF ✓ ML644 - SmartPurge2

DRAWING TYPE: SUB-ASSEMBLY | SCALE: 1:2 | SIZE: A3 | SHEET: 1/1

expo Technologies

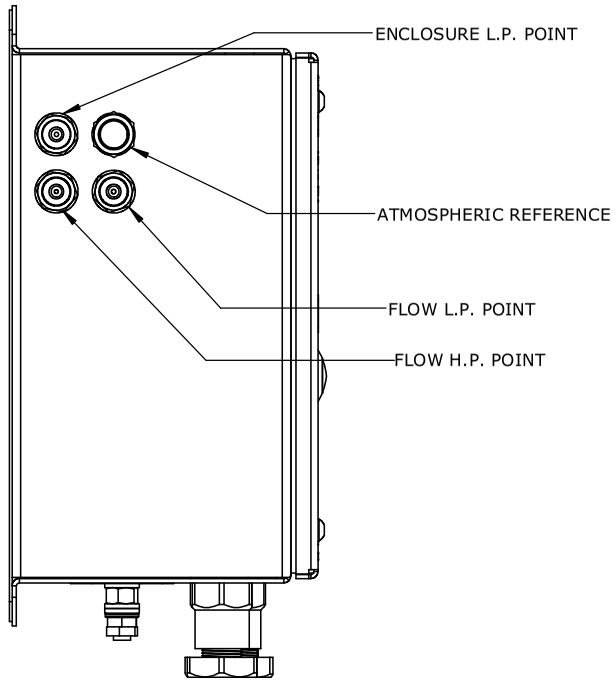
8	7	6	5	4	3	2	1

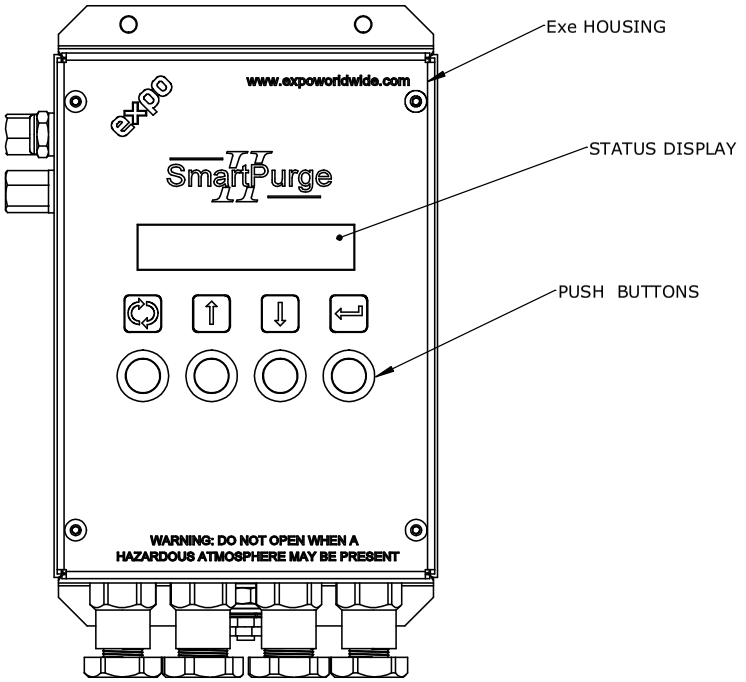
3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL
DO NOT SCALE

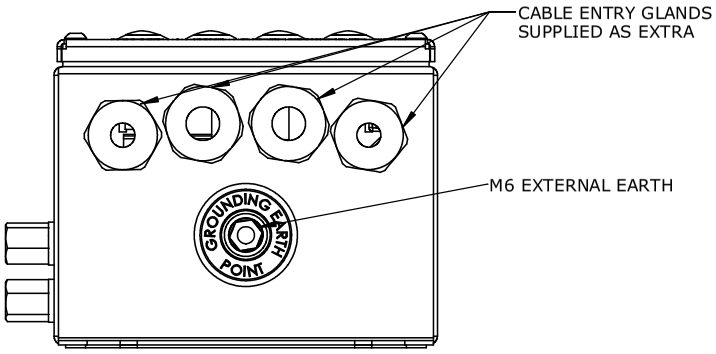
UNSPECIFIED TOLERANCES
NO DEC PLACE ±0.5
1 DEC PLACE ±0.2
2 DEC PLACE ±0.1
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

1/8" NPT PNEUMATIC CONNECTIONS





NOTES
1. WEIGHT IS APPROXIMATELY 4.2 KG
2. ON INSTALLATION ENSURE THAT FIXING BOLTS ARE EVENLY TIGHTED



IF IN DOUBT ASK

REVISION TABLE			
REV.	MOD NUMBER	APPROVED DATE	APPROVED
03	DQN-12357	18/01/2017	DM
04	DQN-12357	06/02/2017	DM
05	6725	07/03/2019	PB

DRAWN DATE:		
13/07/2012		
DRAWING STATUS:		
RELEASED		
APPROVED	CHECKED	DRAWN
JPdB	MSP	MN

MATERIAL: STAINLESS STEEL 316

FINISH: VERTICAL BRUSHED 240 GRIT ALL EXTERNAL WELDS REMOVED

Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM

TITLE: CONTROL UNIT DRAWING

WEIGHT	JOB No.	CUSTOMER
	-	-

A3 SCALE 2:1 REV. 05

DRAWING No. XMA-STD0-002

SHEET No. 1 OF 11

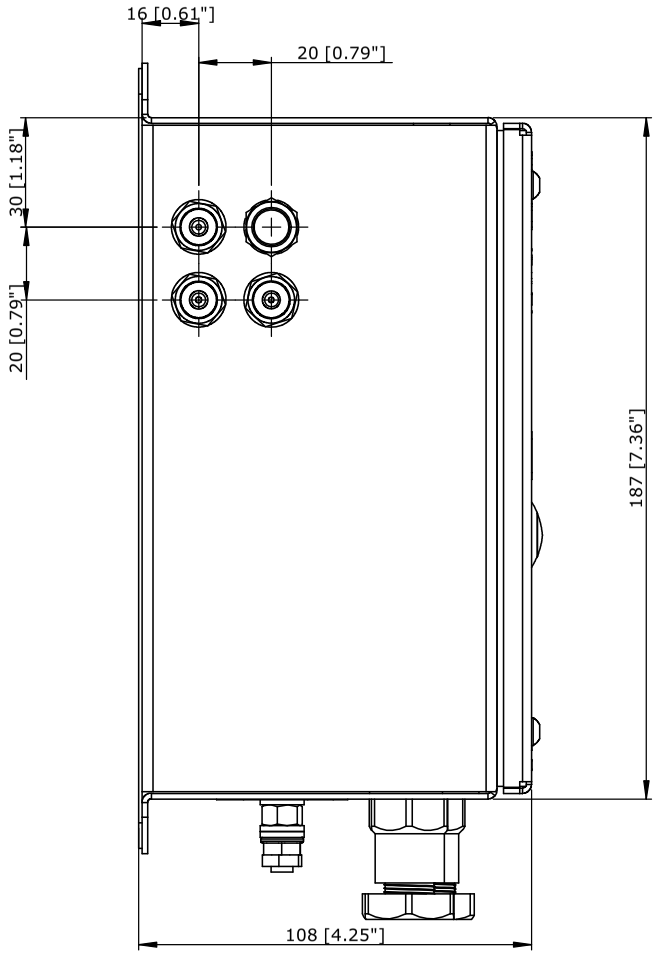
3rd ANGLE PROJECTION

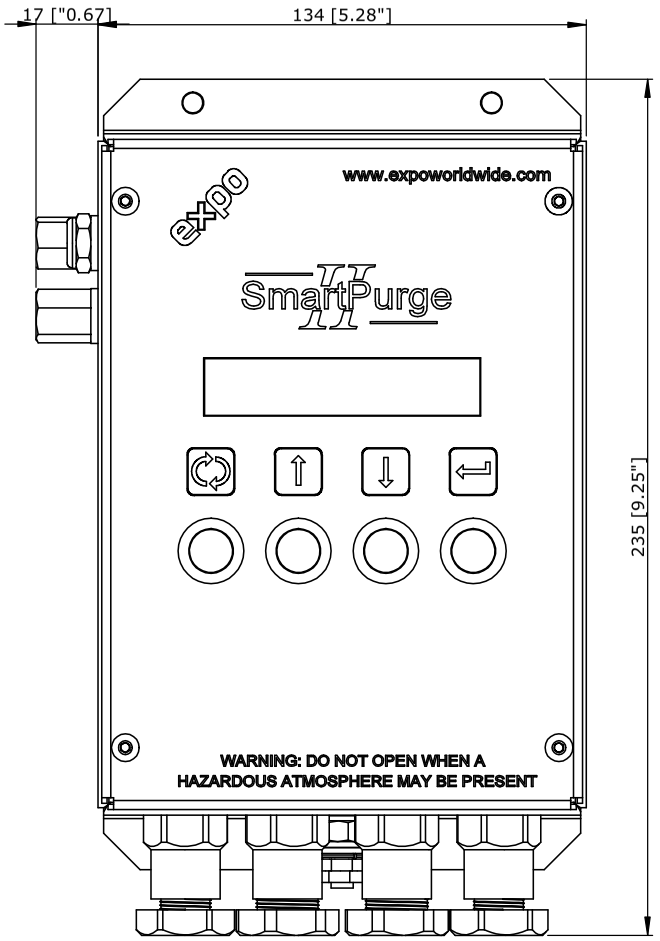
DIMENSIONS IN mm

DO NOT SCALE

UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1

FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH





DRAWN DATE: 13/07/2012			MATERIAL: STAINLESS STEEL 316, 1.5mm THK
DRAWING STATUS: RELEASED			
APP'D	CHK'D	DR'WN	FINISH: VERTICAL BRUSHED 240 GRIT, ALL EXTERNAL WELDS REMOVED
JPdB	MP	MN	

Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM

TITLE: EXTERNAL CONTROLLER DIMENSIONS

SCALE: N.T.S. | REV: 05

DRAWING No.: XMA-STD0-002

SHEET No. 2 OF 11

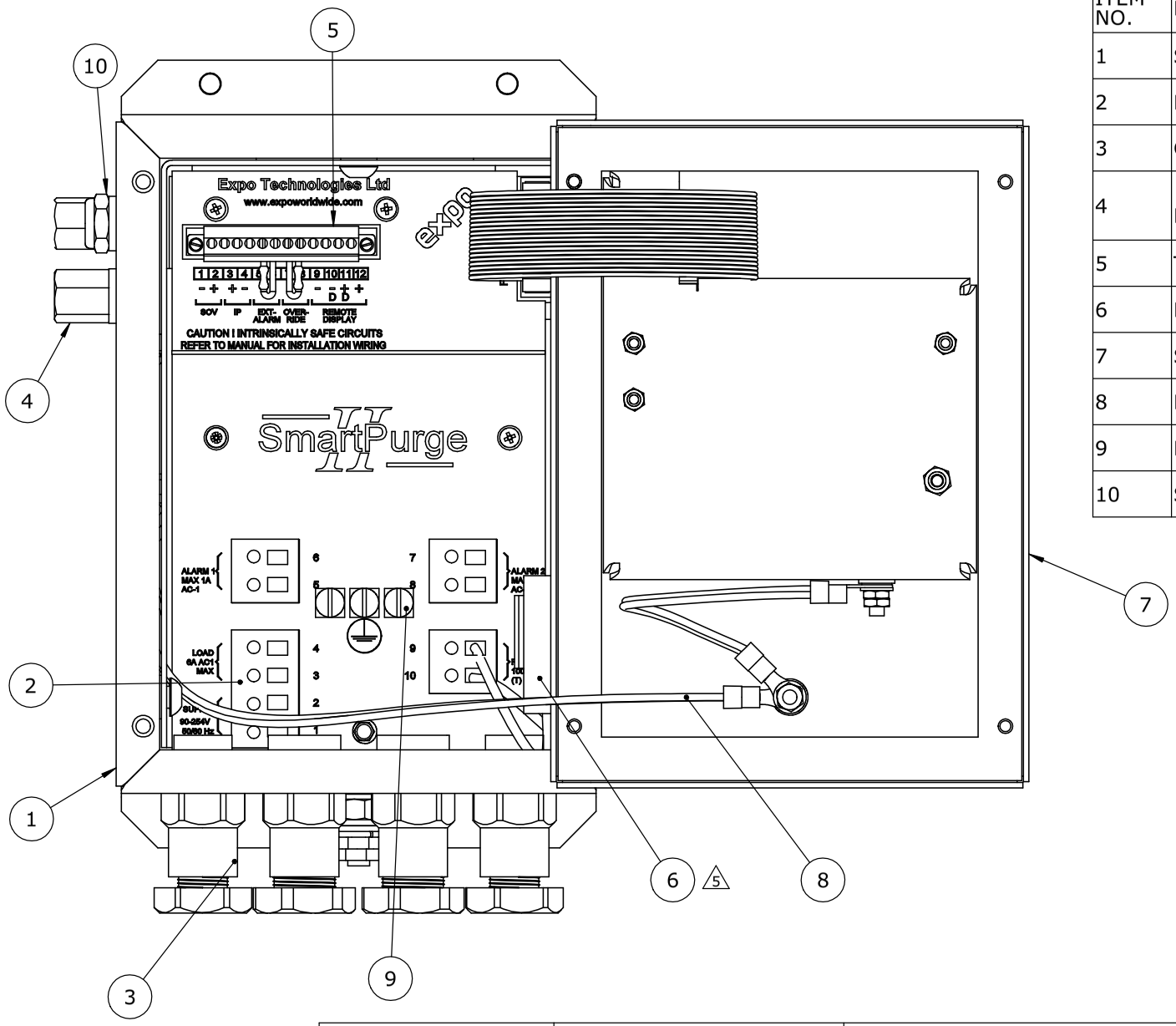
3rd ANGLE PROJECTION

DIMENSIONS IN mm

DO NOT SCALE

UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1

FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH



ITEM NO.	Description	QTY.
1	SMARTPURGE 2 FAN VERSION ENCLOSURE	1
2	POWER TERMINALS	1
3	CABLE GLANDS (SUPPLIED SEPARATELY)	1
4	1/8" SUB ADAPTOR FOR SENSING FLOW AND ENCLOSURE PRESSURE	3
5	TERMINALS FOR INTRINSICALLY SAFE CIRCUIT	1
6	ENCAPSULATED FUSE FOR SP2 △5	1
7	SMARTPURGE2 SS HOUSING LID	1
8	LID TO ENCLOSURE EARTH CABLE	1
9	EARTH TERMINAL MANTLE	3
10	SINTERED STAINLESS STEEL BREATHER	1

DRAWN DATE: 13/07/2012	MATERIAL: STAINLESS STEEL 316, 1.5mm THK	**Expo Technologies Limited** SURREY TW16 5DB UNITED KINGDOM
DRAWING STATUS: RELEASED		TITLE: SMART PURGE 2 INTERNAL COMPONENTS
APP'D: JPdB / CHK'D: MP / DR'WN: MN	FINISH: VERTICAL BRUSHED 240 GRIT, ALL EXTERNAL WELDS REMOVED	SCALE: N.T.S. / REV: 05 / DRAWING No.: XMA-STD0-002 / SHEET No. 3 OF 11

3rd ANGLE PROJECTION

DIMENSIONS IN mm

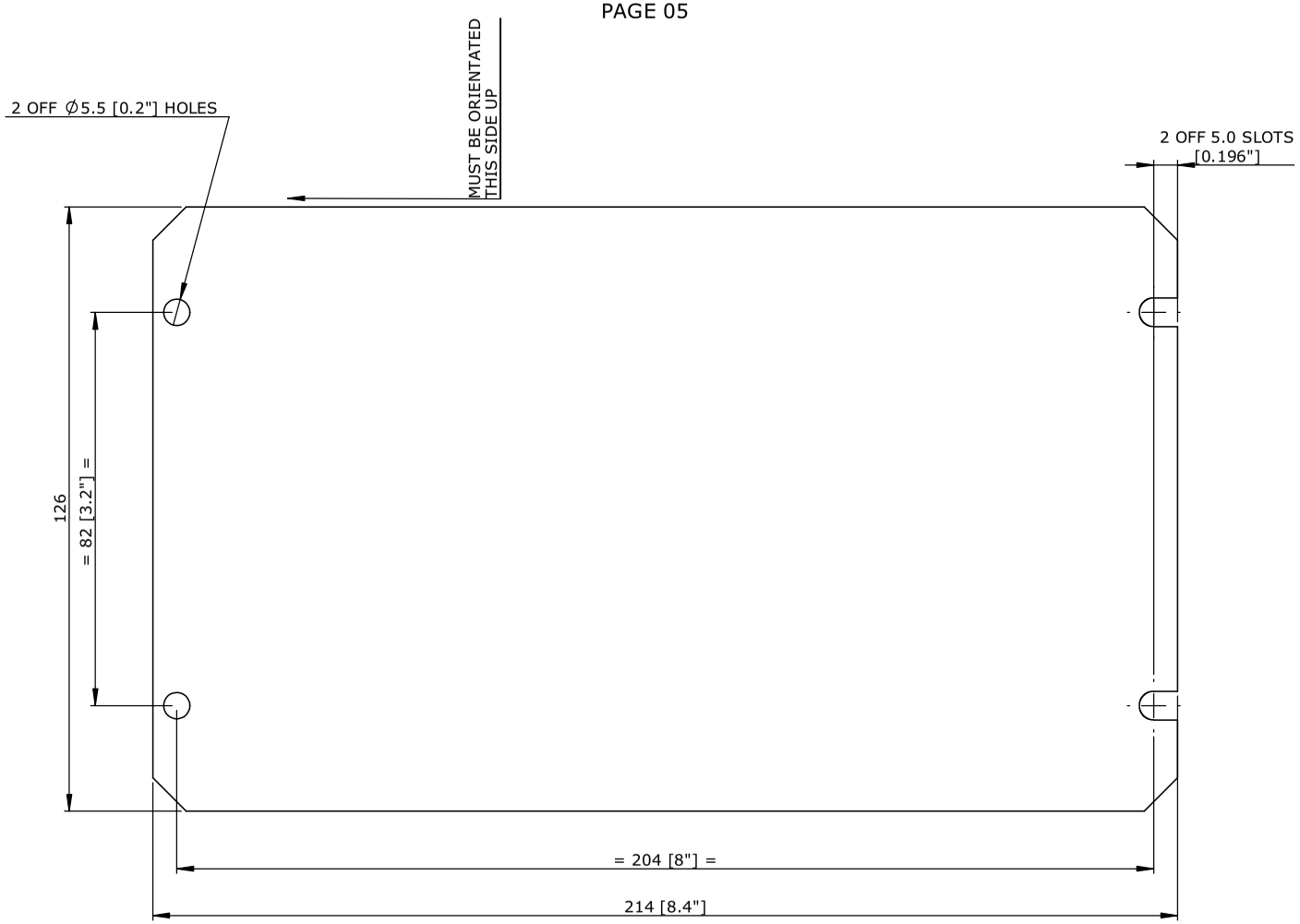
DO NOT SCALE

UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1

FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

NOTE

FOR SDV CUTOUT DIMENSIONS SEE PAGE 05



DRAWN DATE: 13/07/2012			MATERIAL: BLK PVC FOAM 3mm THK 3509	Expo Technologies Limited, SURREY TW16 5DB UNITED KINGDOM
DRAWING STATUS: RELEASED				TITLE: SMARTPURGE2 CONTROLLER AND DIGITAL VALVE CUTOUT
APP'D	CHK'D	DR'WN	FINISH: SAB	
JPdB	MP	MN		

SCALE 1:1 | REV: 05

DRAWING No. XMA-STD0-002

SHEET No. 9 OF 11

3rd ANGLE PROJECTION

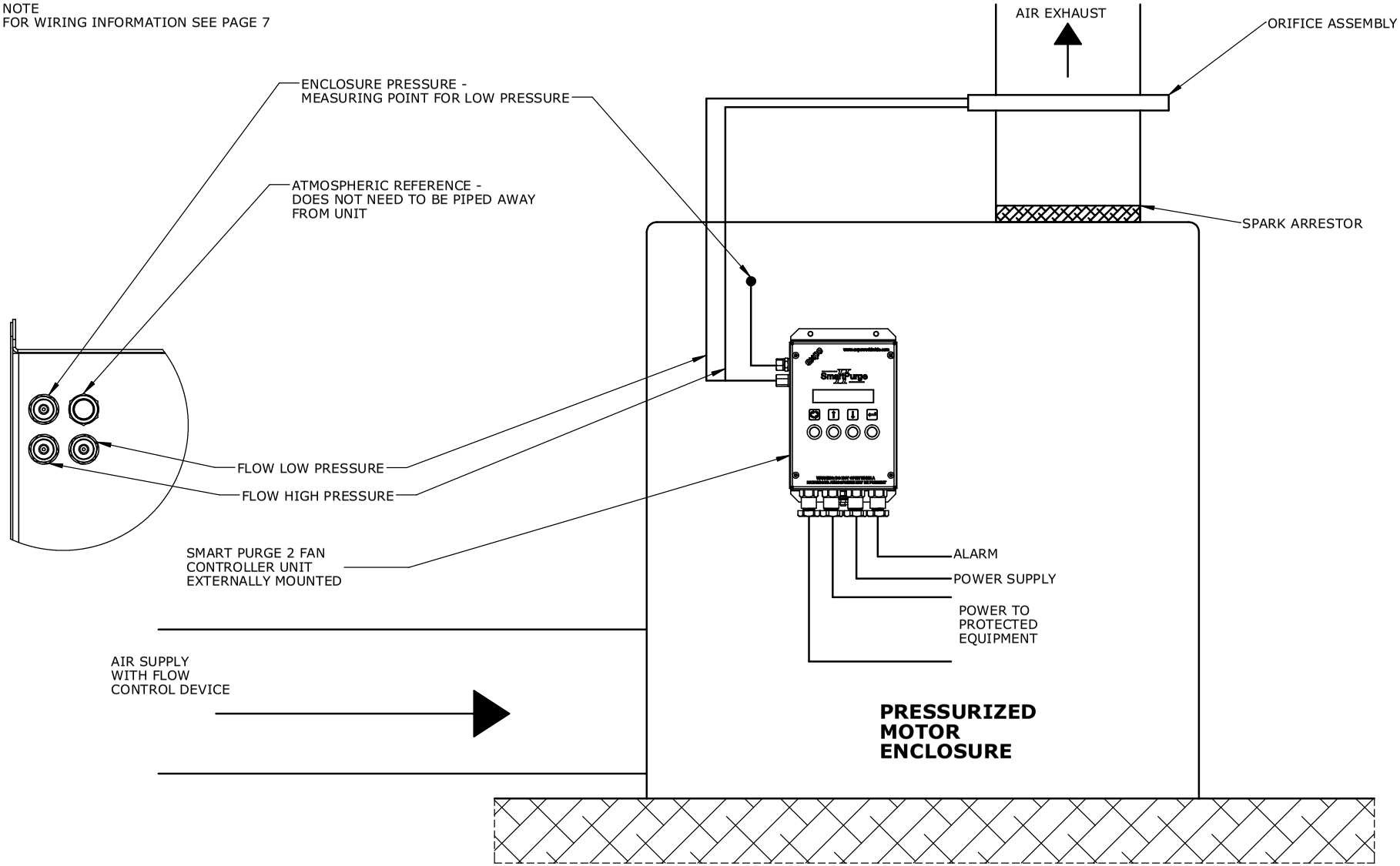
DIMENSIONS IN mm

DO NOT SCALE

UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1

FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

NOTE
FOR WIRING INFORMATION SEE PAGE 7



DRAWN DATE: 13/07/2012			MATERIAL: STAINLESS STEEL 316, 1.5mm THK
DRAWING STATUS: RELEASED			
APP'D	CHK'D	DR'WN	FINISH: VERTICAL BRUSHED 240 GRIT, ALL EXTERNAL WELDS REMOVED
JPdB	MP	MN	

Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM

TITLE

SMART PURGE 2 FAN HOOK UP DIAGRAM

SCALE N.T.S. | REV: 05

DRAWING No. XMA-STD0-002

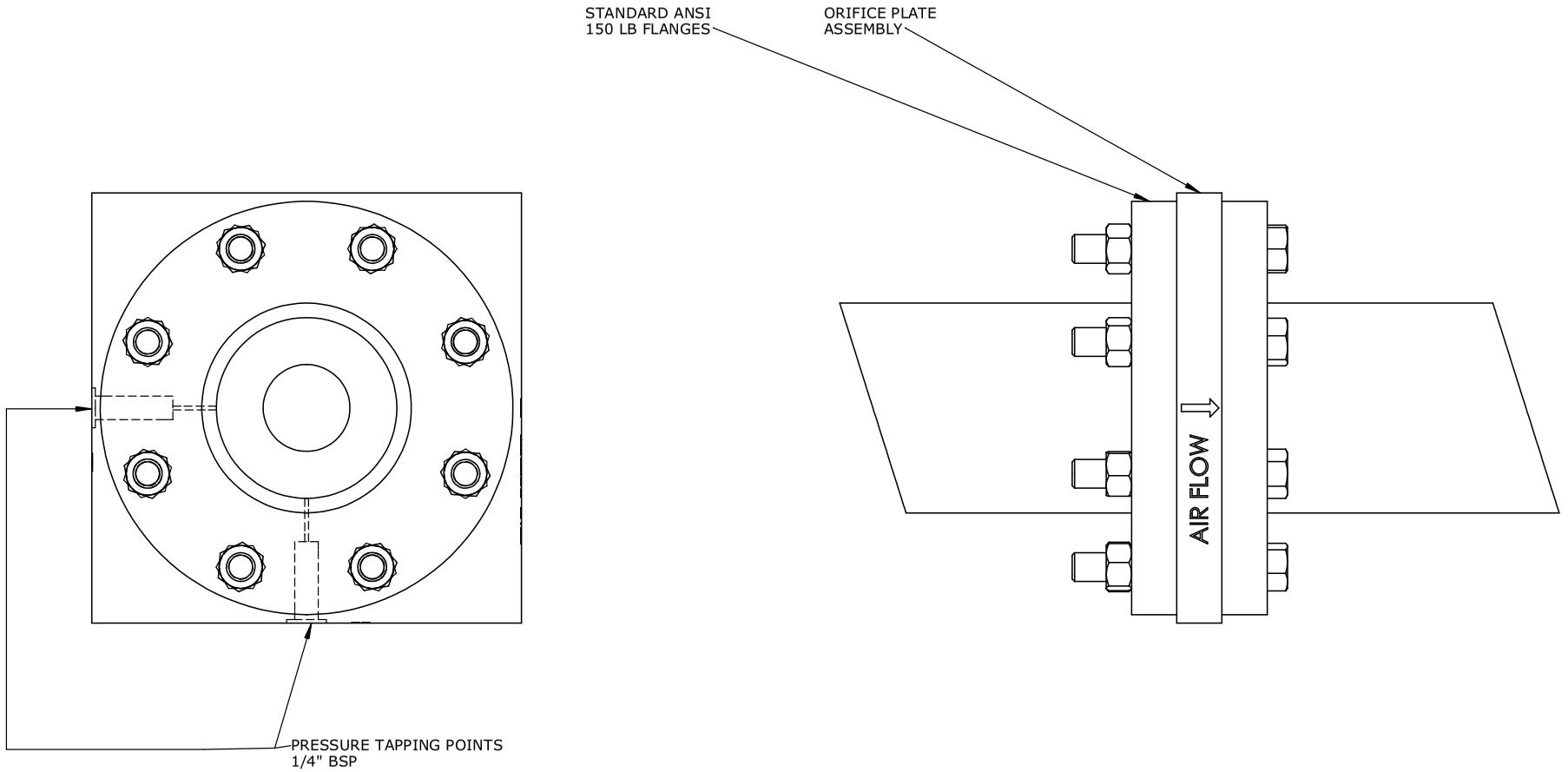
SHEET No. 11 OF 11

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



DRAWN DATE: 13/07/2012			MATERIAL NA	Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM	SCALE NTS / REV: 05
DRAWING STATUS: RELEASED				TITLE: TYPICAL ORIFICE ARRANGEMENT	DRAWING No. XMA-STD0-002
APP'D	CHK'D	DR'WN	FINISH NA	JOB No:	CUSTOMER:
JPdB	MP	MN			SHEET No. 10 OF 11

3rd ANGLE PROJECTION

DIMENSIONS IN mm
DO NOT SCALE

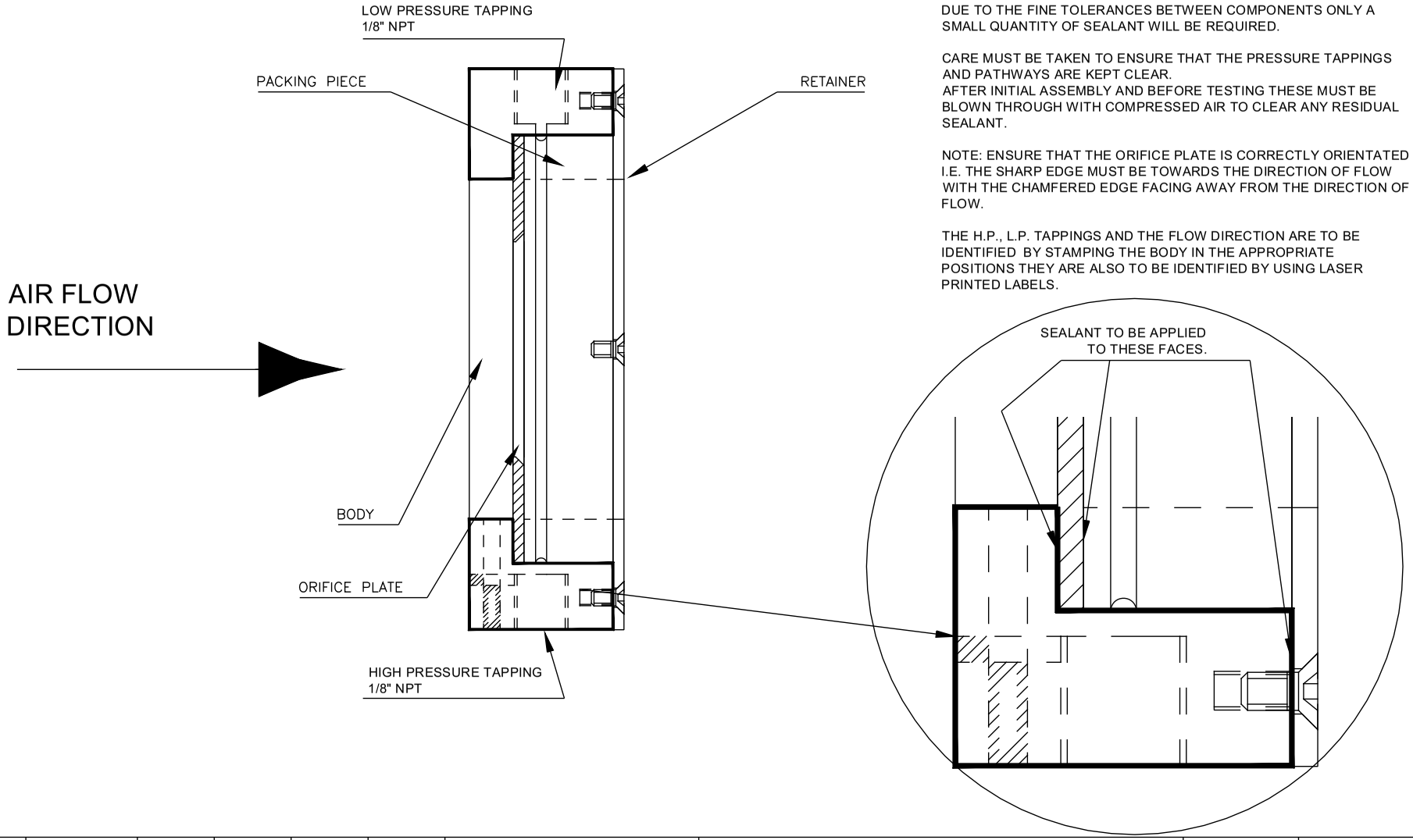
UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

PARTS ARE TO BE ASSEMBLED USING NON SETTING SEALANT AS PER BILL OF MATERIALS. THIS SHOULD BE USED IN SUFFICIENT QUANTITIES TO FORM AN AIR TIGHT SEAL ON ALL INTERNAL FACES. DUE TO THE FINE TOLERANCES BETWEEN COMPONENTS ONLY A SMALL QUANTITY OF SEALANT WILL BE REQUIRED.

CARE MUST BE TAKEN TO ENSURE THAT THE PRESSURE TAPPINGS AND PATHWAYS ARE KEPT CLEAR.
AFTER INITIAL ASSEMBLY AND BEFORE TESTING THESE MUST BE BLOWN THROUGH WITH COMPRESSED AIR TO CLEAR ANY RESIDUAL SEALANT.

NOTE: ENSURE THAT THE ORIFICE PLATE IS CORRECTLY ORIENTATED I.E. THE SHARP EDGE MUST BE TOWARDS THE DIRECTION OF FLOW WITH THE CHAMFERED EDGE FACING AWAY FROM THE DIRECTION OF FLOW.

THE H.P., L.P. TAPPINGS AND THE FLOW DIRECTION ARE TO BE IDENTIFIED BY STAMPING THE BODY IN THE APPROPRIATE POSITIONS THEY ARE ALSO TO BE IDENTIFIED BY USING LASER PRINTED LABELS.



APP'D	MJF	ISSUE:	1	2	3		MATERIAL
CHK'D	MJF	MOD. No:	DRAWN	3141	5387		
DR'WN	MJP	DATE:	30/08/01	25/09/01	9/11/11		FINISH
		APPROVED:	MJF	MJF	JPdB		
		DRAWING STATUS: CERT RELATED					

Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM

TITLE: AIR OUTLET ASSEMBLY

JOB No: 28384 CUSTOMER: CTA

SCALE: N.T.S

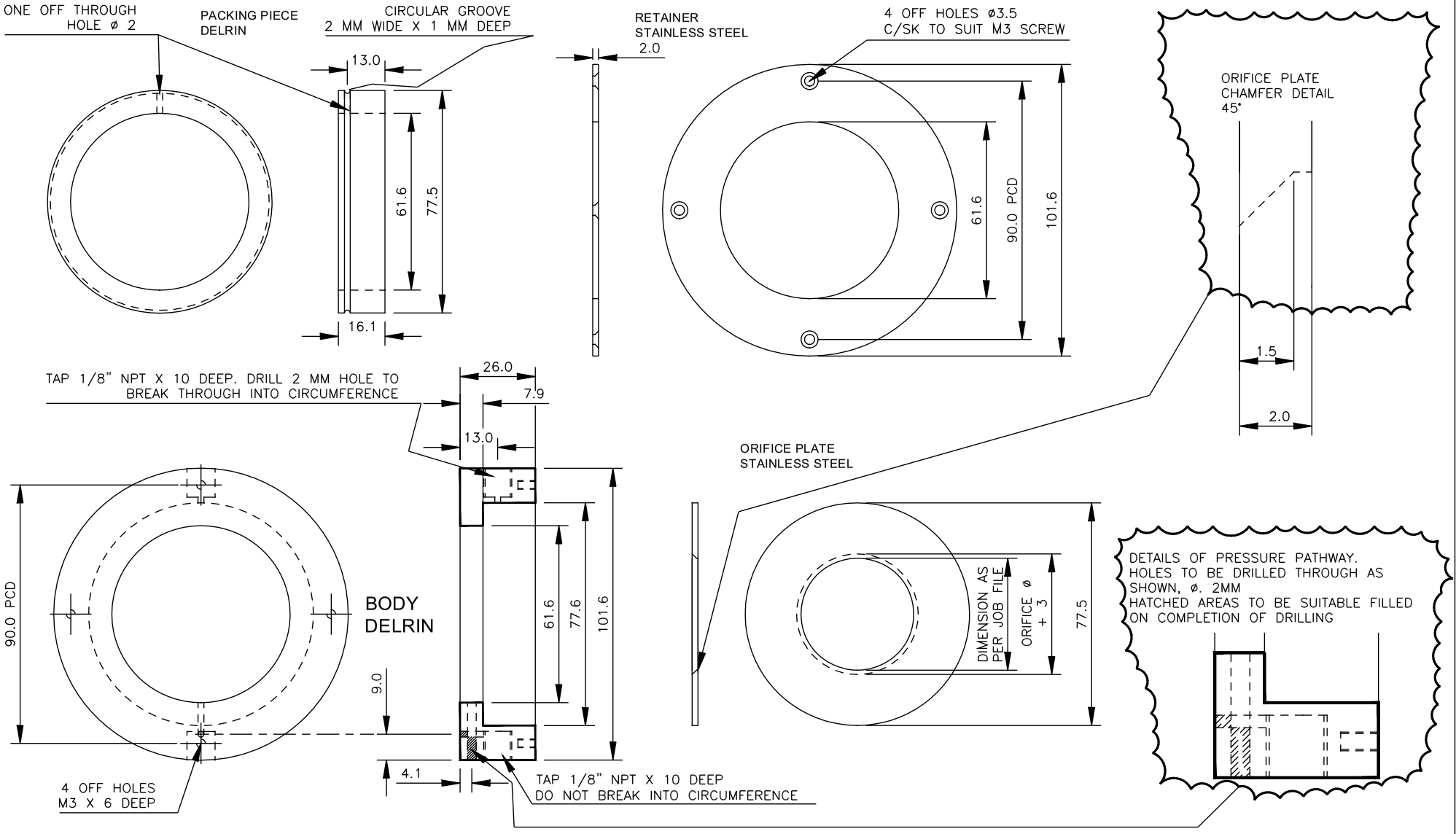
DRAWING No.: AOA-010-050

SHEET No. 1 OF 3

3rd ANGLE PROJECTION

DIMENSIONS IN mm
DO NOT SCALE

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



APP'D	MJF	ISSUE:	1	2	3		MATERIAL
CHK'D	MJF	MOD. No:	DRAWN	3141	5387		
DR'WN	MJP	DATE:	31/08/01	25/09/01	9/11/11		FINISH
		APPROVED:	MJF	MJF	JPdB		
		DRAWING STATUS: CERT RELATED					

Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM

TITLE: AIR OUTLET ASSEMBLY

JOB No:

CUSTOMER: CTA

SCALE: N.T.S

DRAWING No.: A0A-010-050

SHEET No. 2 OF 3

3rd ANGLE PROJECTION

DIMENSIONS IN mm
DO NOT SCALE

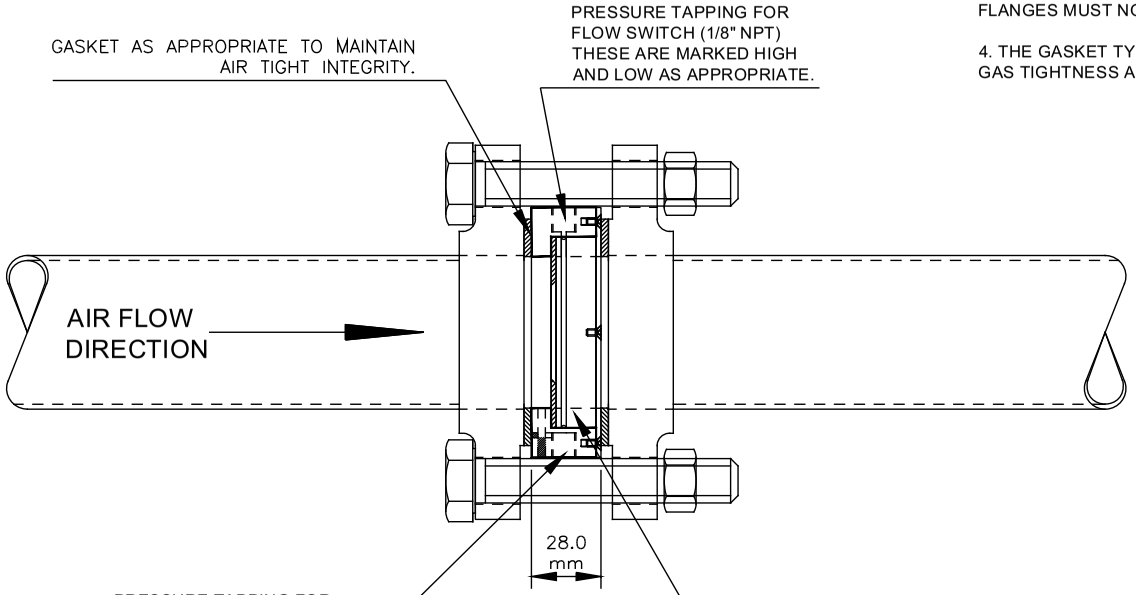
UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

ASSEMBLY NOTES:
1. THE ORIFICE PLATE AND CARRIER SIT WITHIN THE BOLT CIRCLE OF SPECIFIED FLANGES. I.E. ANSI STANDARD

2.THE AIR DUCTING MUST BE STRAIGHT AND PARALLEL FOR A MINIMUM OF 5 X DUCT DIAMETERS UPSTREAM OF THE ORIFICE PLATE AND 3 X DUCT DIAMETERS DOWNSTREAM.

3. THE GASKETING USED TO SEAL THE CARRIER BETWEEN THE FLANGES MUST NOT INVADE INTO THE PIPE BORE.

4. THE GASKET TYPE IS NOT CRITICAL BUT MUST ENSURE THE GAS TIGHTNESS AROUND THE ORIFICE PLATE CARRIER.



APP'D	MJF	ISSUE:	1	2	3	
CHK'D	MJF	MOD. No:	DRAWN	3141	5387	
DR'WN	MJP	DATE:	27/09/01	25/09/01	9/11/11	
		APPROVED:	MJF	MJF	JPdB	
		DRAWING STATUS: CERT RELATED				

MATERIAL

FINISH

Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM

TITLE: AIR OUTLET ASSEMBLY

JOB No: 28384

CUSTOMER: CTA

SCALE: N.T.S

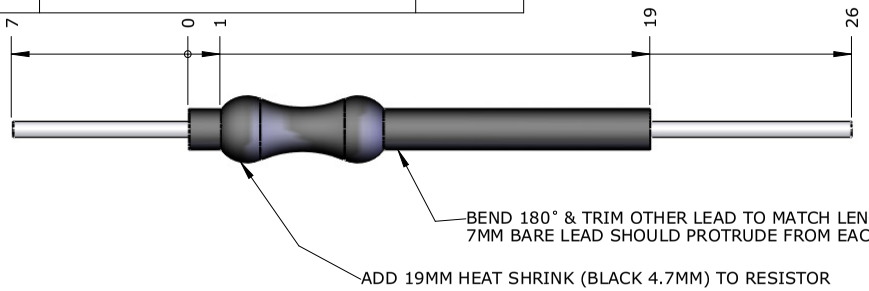
DRAWING No.: A0A-010-050

SHEET No. 3 OF 3

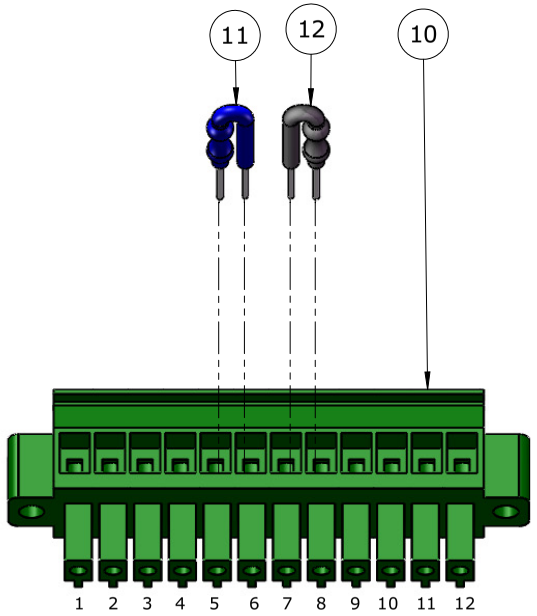
8	7	6	5	4	3	2	1

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	

ITEM NO.	DESCRIPTION	QTY.
10	PLUG 12WAY CABLE MOUNT 3.5mm PHOENIX CONTACT	1
11	RESISTOR 1K 0.4W MFR4	1
12	RESISTOR 10K 0.4W MFR4	1

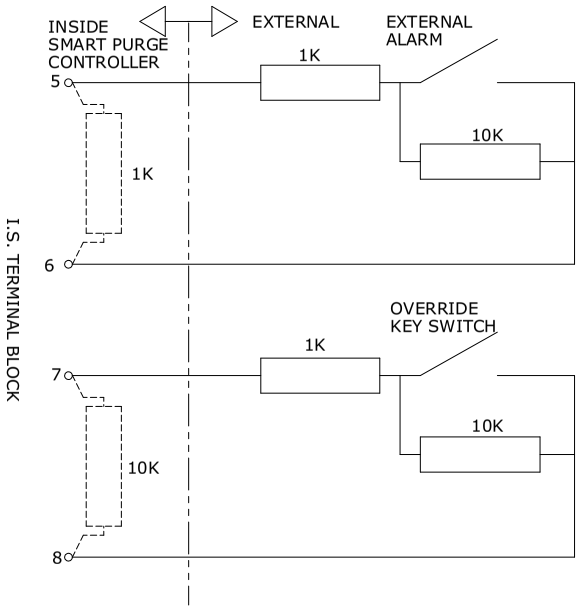


REPEAT PROCEDURE FOR EACH RESISTOR



5-6=1K
7-8=10K

NOTE
OVERRIDE AND EXTERNAL ALARM WIRING



1KΩ AND 10KΩ 0.4 WATT 5%TOLERANCE RESISTORS REQUIRED AT THE EXTERNAL ALARM SWITCH AND OVERRIDE KEY SWITCH FOR LINE FAULT DETECTION

WHEN THE EXTERNAL ALARM OR OVERRIDE KEY SWITCH ARE NOT REQUIRED, FIT RESISTORS AS SHOWN (DOTTED) INSIDE IN THE SMART PURGE UNIT.

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	08/12/2011	CONTROLLED	
DRAWING STATUS	RELEASED	REVISION	05
SCALE	1:1		A3

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

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: LINE FAULT DETECTION CONNECTOR ASSMEBLY

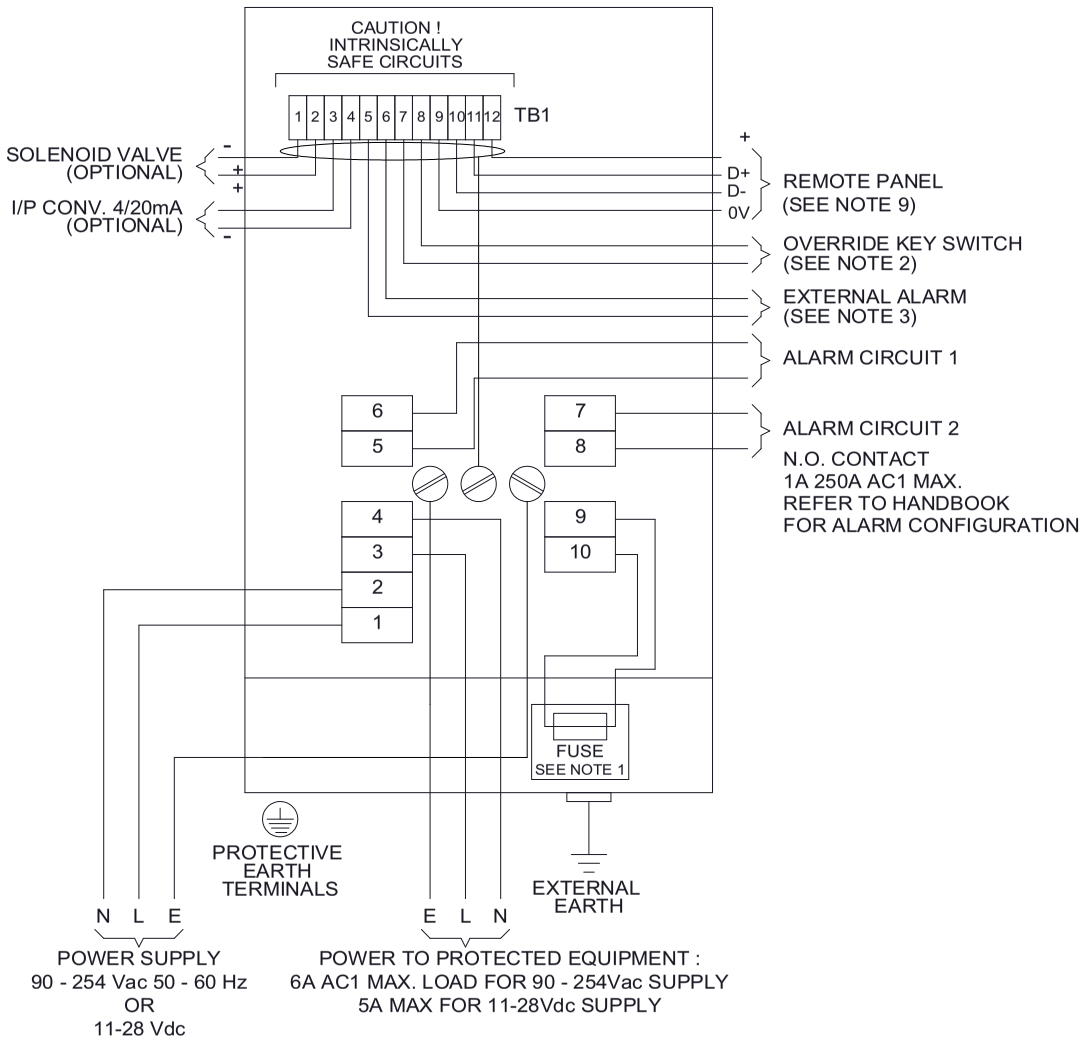
DRAWING No. XMA-STD0-001

SHEET No. 5 OF 10

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					

F E D C B A

SMART PURGE CONTROL UNIT



NOTES:-

1. FUSE RATING:
   AC SUPPLY: 100 mA
   DC SUPPLY 500mA
2. FIT 10K 0.25W RESISTOR IN PLACE OF OVERRIDE SWITCH WHEN NOT REQUIRED.
3. FIT 1K 0.25W RESISTOR IN PLACE OF EXTERNAL ALARM WHEN NOT REQUIRED.
4. CONDUCTORS OF INTRINSICALLY SAFE CIRCUITS SHALL NOT BE CARRIED IN THE SAME CABLE AS CONDUCTORS OF CIRCUITS WHICH ARE NOT INTRINSICALLY SAFE.
5. THE RADIAL THICKNESS OF THE CONDUCTOR INSULATION SHALL BE APPROPRIATE TO THE CONDUCTOR DIAMETER AND THE NATURE OF THE INSULATION. THE MINIMUM RADIAL THICKNESS SHALL BE 0,2 mm.
6. THE CONDUCTOR INSULATION SHALL BE SUCH THAT IT WILL BE CAPABLE OF WITHSTANDING AN R.M.S. A.C. TEST VOLTAGE OF TWICE THE NOMINAL VOLTAGE OF THE INTRINSICALLY SAFE CIRCUIT WITH A MINIMUM OF 500 V.
7. THE DISTANCE BETWEEN THE CONDUCTORS OF ANY CORE OF AN INTRINSICALLY SAFE CIRCUIT AND THAT OF ANY CORE OF A NON-INTRINSICALLY SAFE CIRCUIT SHALL BE IN ACCORDANCE WITH IEC 60079-11 TABLE 5 COLUMN 4 (FOR 375V THIS WILL BE 1.0 mm) EXCEPT WHEN ONE OF THE FOLLOWING APPLY:
   - THE CORES OF EITHER THE INTRINSICALLY SAFE OR THE NON-INTRINSICALLY SAFE CIRCUIT ARE ENCLOSED IN AN EARTH SCREEN, OR
   - THE INSULATION OF THE INTRINSICALLY SAFE CORES IS CAPABLE OF WITHSTANDING AN R.M.S. A.C. TEST VOLTAGE OF 2000 V
8. TERMINAL BLOCKS TERMINAL TIGHTENING TORQUES:
   NON INTRINSICALLY SAFE: 0.4 - 0.5 Nm
   INTRINSICALLY SAFE TB1: 0.22 - 0.25 Nm
9. REMOTE PANEL CAN BE REPLACED BY SMART PURGE 2 REMOTE LED ASSEMBLY. REF DRAWING SD7997 THE ELECTRICAL CONNECTIONS ARE DETAILED ON THIS DRAWING

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
05	DQN-12483	15/06/2021	CE	AR	AW
04	DQN-12472	05/01/2021	CE	RJ	AR
03	5873	04/07/2013			MP

DRAWN DATE	CONTROLLED
08/12/2011	
DRAWING STATUS	REVISION
RELEASED	05
SCALE 1:1	A3

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

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: SMARTPURGE 2 WIRING LAYOUT

DRAWING No. XMA-STD0-001

SHEET No. 8 OF 10

expo Technologies

3rd ANGLE PROJECTION

DIMENSIONS IN mm

DO NOT SCALE

UNSPECIFIED TOLERANCES: NO DEC PLACE ±0.5; 1 DEC PLACE ±0.2; 2 DEC PLACE ±0.1

FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

HAZARDOUS (CLASSIFIED) LOCATION
CLASS I ZONE 1 AS PER NEC 505

SMART PURGE 2 CONTROL UNIT
ENERGY LIMITATION PARAMETERS
SP2-XX-XX

	SOV	IP	EXTERNAL ALARM	OVER-RIDE	REMOUT OUTPUT
TERMINAL TB1	1,2	3,4	5,6	7,8	9,10,11,12
Uo (Vdc)	23.58	23.58	5.88	5.88	8.465
Io (mA)	165.5	165.5	5.9	5.9	405.1
Co (µF)	0.091	0.091	NEGLIGIBLE	NEGLIGIBLE	5.145
Lo (mH)	2.9	2.9	0	0	0.48
Po (W)	0.975	0.975	0.009	0.009	0.857

2 TWISTED PAIRS OVER SHIELDED
0.75mm² MIN CONDUCTOR SIZE
MAX LOOP IMPENDENCE 15Ω
SHIELD CONNECTED TO GROUND
AT BOTH ENDS OF CABLE
CABLE MAXIMUM LENGTH IS 50 METRES

SMART PURGE 2 REMOTE PANEL
ENERGY LIMITATION PARAMETERS
SP2-RP FOR REMOTE PANEL
TERMINALS 1, 2, 3 AND 4

Ui (Vdc)	Ii (mA)	Ci (µF)	Li (mH)	Pi (W)
8.465	405.1	5.145	0.48	0.857

SOLENOID VALVE (SOV) (USER SUPPLIED SEE NOTE 12)

PROPORTIONAL VALVE (IP) (USER SUPPLIED SEE NOTE 12)

EXTERNAL ALARM (INPUT) VOLT FREE CONTACT (USER SUPPLIED SEE NOTE 12)

OVER-RIDE (INPUT) VOLT FREE CONTACT (USER SUPPLIED SEE NOTE 12)

EXTERNAL EARTH

EXTERNAL EARTH

EQUIPOTENTIAL EARTH BONDING

1. Vmax or Ui>Vt;Imax or Ii > It; (Ci of all loops or Ccable) <Ca or Co; (Li of all loops + Lcable) <La or Lo; Pmax or Pi>Po
2. The configuration of associated Apparatus must be FM Approved under Entity Concept.
3. I.S. Equipment must be FM Approved.
4. I.S. Equipment may be installed within the Hazardous (Classified) location for which it is approved.
5. I.S. Barrier or Equipment and hazardous location loop apparatus manufacturer's control drawings must be followed when installing a system.
6. Control equipment connected to the Associated Apparatus must not generate more than 250 Vrms or Vdc.
7. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinisically safe systems for Hazardous (Classified) Locations" and the National Electrical Code®(ANSI/NFPA 70)
8. No revision to this drawing is permitted without FM Approval.
9. AEx '[ib]' is suitable only for connecting to Class I Zone 1 Hazardous (Classified) Locations and not Class I, Zone 0, or Class I, Division 1 Hazardous (Classified) Locations.
10. All Equipment installed in Class I Zone 1 hazardous area.
11. The cores of the intrinsically safe circuits are either in an earth screen or the insulation of the intrinsically safe cores is capable of withstanding an R.M.S A.C. test voltage of 2000 V
12. User supplied equipment shall be FM approved.

REV.	MOD NUMBER	APPROVED DATE	APPROVED
01	DRAWN	14/10/2013	MH

DRAWN DATE: 13/08/2013
DRAWING STATUS: CERTIFIED

APP'D	CHK'D	DRAWN
MH	MH	MN

MATERIAL

FINISH

Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM

TITLE: SMART PURGE 2
INTRINSIC SAFETY CONTROL DRAWING

JOB No:

CUSTOMER:

SCALE 2:1

REV:

DRAWING No. SD8112 01

SHEET No. 1 OF 1

3rd ANGLE PROJECTION

DIMENSIONS IN mm
DO NOT SCALE

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

HAZARDOUS LOCATION
CLASS I ZONE 1 AS PER CEC

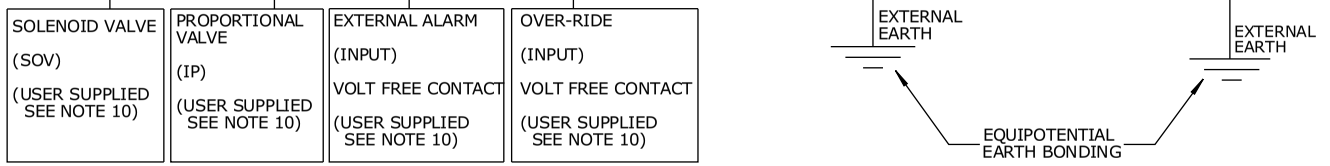
SMART PURGE 2 CONTROL UNIT ENERGY LIMITATION PARAMETERS SP2-XX-XX

	SOV	IP	EXTERNAL ALARM	OVER-RIDE	REMOUT OUTPUT
TERMINAL TB1	1,2	3,4	5,6	7,8	9,10,11,12
Uo (Vdc)	23.58	23.58	5.88	5.88	8.465
Io (mA)	165.5	165.5	5.9	5.9	405.1
Co (µF)	0.091	0.091	NEGLIGIBLE	NEGLIGIBLE	5.145
Lo (mH)	2.9	2.9	0	0	0.48
Po (W)	0.975	0.975	0.009	0.009	0.857

2 TWISTED PAIRS OVER SHIELDED
0.75mm² MIN CONDUCTOR SIZE
MAX LOOP IMPENDENCE 15Ω
SHIELD CONNECTED TO GROUND AT BOTH ENDS OF CABLE
CABLE MAXIMUM LENGTH IS 50METRES

SMART PURGE 2 REMOTE PANEL ENERGY LIMITATION PARAMETERS SP2-RP FOR REMOTE PANEL TERMINALS 1, 2, 3 AND 4

Ui (Vdc)	Ii (mA)	Ci (µF)	Li (mH)	Pi (W)
8.465	405.1	5.145	0.48	0.857



1. Vmax or Ui>Vt;Imax or Ii > It; (Ci of all loops or Ccable) <Ca or Co; (Li of all loops + Lcable) <La or Lo; Pmax or Pi>Po
2. The configuration of associated Apparatus must be FM Approved or CSA Certified when installed in Canada under Entity Concept.
3. Smart Purge 2 May be installed within the Hazardous location for which it is approved.
4. Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
5. No revision to this drawing is permitted without FM Approval.
6. I.S. Equipment may be installed within the Hazardous location for which it is approved.
7. I.S. Barrier or Equipment and hazardous location loop apparatus manufacturer's control drawings must be followed when installing a system.
8. All Equipment is installed in Class I Zone 1 hazardous area
9. The cores of the intrinsically safe circuits are either in an earth screen or the insulation of the intrinsically safe cores is capable of withstanding an R.M.S A.C. test voltage of 2000 V
10. User supplied equipment shall be FM approved or CSA certified

REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE: 24/09/2013			MATERIAL
				DRAWING STATUS: CERTIFIED			
				APP'D	CHK'D	DRAWN	FINISH
				MH	MP	MN	

Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM

TITLE: SMART PURGE 2 INTRINSIC SAFETY CONTROL DRAWING

JOB No:

CUSTOMER:

SCALE 2:1 REV:

DRAWING No. SD8113 E

SHEET No. 1 OF 1

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx FME 11.0006X** Page 1 of 5

Status: **Current** Issue No: 7

Date of Issue: 2023-07-19

Applicant: **EXPO Technologies Ltd**
Unit 2, The Summit
Hanworth Road
Sudbury on Thames
Surrey TW16 5DB
United Kingdom

Certificate history:
Issue 6 (2019-04-08)
Issue 5 (2019-02-15)
Issue 4 (2017-06-29)
Issue 3 (2016-06-14)
Issue 2 (2015-06-03)
Issue 1 (2013-04-03)
Issue 0 (2012-03-23)

Equipment: **SmartPurge SP2 and SP2 - Remote Control Panel**

Optional accessory:

Type of Protection: **Intrinsic safety 'i'; Encapsulation 'm'; Increased safety 'e'; Pressurized 'p' & Protection by enclosure 't'.**

Marking: **Control unit**

Ex eb ib mb [ib Gb] [pxb Gb] IIC T4 Gb -20°C ≤ Ta ≤ 60°C

Ex tb [pxb Db] IIIC T135ºC Db -20°C ≤ Ta ≤ 60°C

The Remote Control Terminal

Ex ib IIC T4 Gb -20°C ≤ Ta ≤ 60°C

Approved for issue on behalf of the IECEx Certification Body: **Andrew Was**

Position: **Certification Manager**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

FM Approvals Ltd
Voyager Place
Maidenhead
Berkshire
SL6 2PJ
United Kingdom

FM Approvals
Member of the FM Global Group

IECEx Certificate of Conformity

Certificate No.: **IECEx FME 11.0006X** Page 2 of 5

Date of issue: 2023-07-19 Issue No: 7

Manufacturer: **EXPO Technologies Ltd**
Unit 2, The Summit
Hanworth Road
Sudbury on Thames
Surrey TW16 5DB
United Kingdom

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Edition:7.0 — Explosive atmospheres - Part 0: Equipment - General requirements

IEC 60079-11:2011 Edition:6.0 — Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

IEC 60079-18:2017 Edition:4.1 — Explosive atmospheres - Part 18: Protection by encapsulation "m"

IEC 60079-2:2014 Edition:6 — Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure "p"

IEC 60079-31:2013 Edition:2 — Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

IEC 60079-7:2017 Edition:5.1 — Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/FME/ExTR11.0007/00
GB/FME/ExTR11.0007/01
GB/FME/ExTR11.0007/02
GB/FME/ExTR11.0007/03
GB/FME/ExTR11.0007/04
GB/FME/ExTR11.0007/05
GB/FME/ExTR11.0007/06
GB/FME/ExTR11.0007/07

Quality Assessment Report:

GB/SIR/QAR07.0012/19

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The SmartPurge 2 (SP2) is an electronic purge and pressurization control system consisting of a Control Unit containing the following: a power supply and switching module, a flow and pressure measuring unit and an electronic control unit. A display is provided for monitoring the status and for use during set-up.

Two versions of the SmartPurge2 are available, as a purge and pressurize control unit (P) and as a fan control unit (F). Both these versions are available with a universal voltage (M) or a low voltage (L) power supply. The SmartPurge 2 is housed within a stainless steel enclosure with an ingress protection rating of IP64.

The system can be connected to an optional Remote Panel which is housed in an aluminium enclosure.

The maximum service temperature is 60 °C.

SP2-ab-SS SmartPurge2 Purge Control Unit

a = P, or F

b = M, or L

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The window of the SmartPurge 2 may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the surface should only be done with a damp cloth.
2. The powder coated surface and the non-metallic window of the SmartPurge 2 Remote Control Terminal may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the powder coated surface and window should only be done with a damp cloth.

IECEx Certificate of Conformity

Equipment (continued):

Power Supply (Terminals 1, 2): 90-254 Vac or 11-28 Vdc Um = 254 Vac

Alarm Contact ratings

(Terminals 3,4): 6A at 250 Vac; 5A at 30 Vdc

(Terminals 5, 6 and 7, 8): 250V, 1A Fuse type

(Terminals 9, 10): 100mA (when b = M) or 500mA (when b = L)

Energy Limitation Parameters

	Terminal TB1	U_o (Vdc)	I_o (mA)	C_o (µF)	L_o (mH)	P_o (W)
SOV	1, 2	23.58	165.5	0.091	2.9	0.975
IP	3, 4	23.58	165.5	0.091	2.9	0.975
Remote Output	9, 10, 11, 12	8.465	405.1	5.145	0.48	0.857
External alarm	5, 6	5.88	5.9	Negligible	0	0.009
Over-ride	7, 8	5.88	5.9	Negligible	0	0.009

SmartPurge2 Purge Remote Panel

SRP-2 Energy Limitation parameters

U_i (Vdc)	I_i (mA)	C_i (µF)	L_i (mH)	P_i (W)
8.465	405.1	5.145	0.48	0.857

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Update to power supply due to component obselescence. Update to marking string.

1. EU-TYPE EXAMINATION CERTIFICATE

2. **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3. **EU-Type Examination Certificate No:** **FM11ATEX0060X**

4. **Equipment or protective system: (Type Reference and Name)** **SmartPurge2 Purge Control Unit and SmartPurge2 Remote Control Terminal**

5. **Name of Applicant:** **Expo Technologies Ltd**

6. **Address of Applicant** **Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey, TW16 5DB, United Kingdom**

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8. FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

   The examination and test results are recorded in confidential report number:

   3041589EC dated 23rd March 2012

9. Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

   EN IEC 60079-0:2018, EN 60079-2:2014, EN 60079-7:2015+A1:2018, EN 60079-11:2012, EN 60079-18:2015+A1:2017, EN 60079-31:2014, EN 60529:1991+A1:2000+A2:2013

10. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

Certificate issued by:

Richard A Zammitt
Ireland
12.1.2

July 25, 2023

Certification Manager, FM Approvals Europe Ltd.

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

SCHEDULE

EU-Type Examination Certificate No. FM11ATEX0060X

11. This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include:

    Epsilon X accompanied by additional marking defined in the Annex.

13. **Description of Equipment or Protective System:**

    The SmartPurge 2 (SP2) is an electronic purge and pressurization control system consisting of a Control Unit containing the following: a power supply and switching module, a flow and pressure measuring unit and an electronic control unit. A display is provided for monitoring the status and for use during set-up.

    Two versions of the SmartPurge2 are available, as a purge and pressurize control unit (P) and as a fan control unit (F). Both these versions are available with a universal voltage (M) or a low voltage (L) power supply. The SmartPurge 2 is housed within a stainless steel enclosure with an ingress protection rating of IP64.

    The system can be connected to an optional Remote Panel which is housed in an aluminium enclosure. The maximum service temperature is 60 °C.

    For further details including Energy Limitation Parameters – refer to ANNEX

14. **Specific Conditions of Use:**

    See Annex.

15. **Essential Health and Safety Requirements:**

    The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16. **Test and Assessment Procedure and Conditions:**

    This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

    Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

    This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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17. **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
5 April 2012	Original Issue.
2 April 2013	Supplement 1: Report Reference: – 3041590rev120910 dated 25th March, 2013. Description of the Change: 1. Address of Applicant change from: Summer Road, Thames Ditton, Surrey, KT7 0RH, UK. Update to Approved drawings due to address change.
3 June 2015	Supplement 2: Report Reference: RR201328 dated 2nd June 2015 Description of the Change: Minor documentation update.
14 June 2016	Supplement 3: Report Reference: – RR205060 dated 26th May 2016 Description of the Change: Update standards to the latest edition (EN 60079-0: 2009 to 2012 + A11:2013, EN 60079-11: 2007 to 2012), and minor documentation update. Updated to EU certificate.
29 June 2017	Supplement 4: Report Reference: – RR209790 dated 13th June 2017 Description of the Change: Documentation updates.
12 April 2019	Supplement 5: Report Reference: – PR452625 dated 22nd March 2019 Description of the Change: Update to standards used; EN 60079-2, EN 60079-7, EN 60079-18, EN 60079-31 and EN 60529. Certificate transferred from FM Approvals Ltd., notified body No. 1725, to FM Approvals Europe Ltd., notified body No. 2809.
26 July 2023	Supplement 6: Report Reference: PR465043 dated 24 July 2023. Description of the Change(s): Modification to the power supply board due to component obsolescence. Clarifications made to Marking and Specific Conditions of Use

SCHEDULE
EU-Type Examination Certificate No. FM11ATEX0060X

ANNEX

SP2-ab-SS SmartPurge2 Purge Control Unit

Markings:

II 2 (2) G Ex eb ib mb [ib Gb] [pxb Gb] IIC T4 Gb -20°C ≤ Ta ≤ 60°C
II 2 (2) D Ex tb [pxb Db] IIIC 135°C Db -20°C ≤ Ta ≤ 60°C

Description of Equipment:

SP2-ab-SS SmartPurge2 Purge Control Unit
a = P or F, System type
b = M or L, Supply voltage

Power Supply (Terminals 1, 2): 90-254 Vac or 11-28 Vdc

Um = 254 V_{ac}

Power Switching (Terminals 3, 4) 6 A at 250 Vac
5 A at 30 Vdc
Alarm Contact ratings (Terminals 5, 6 and 7, 8): 250V, 1A

Fuse type (Terminals 9, 10): 100 mA (when b = M)
500 mA (when b = L)

Energy Limitation Parameters:

	Terminal TB1	*Uo (Vdc)*	*Io (mA)*	*Co (µF)*	*Lo (mH)*	*Po (W)*
SOV	1, 2	23.58	165.5	0.091	2.9	0.975
IP	3, 4	23.58	165.5	0.091	2.9	0.975
Remote Output	9, 10, 11, 12	8.465	405.1	5.145	0.48	0.857
External alarm	5, 6	5.88	5.9	Negligible	0	0.009
Over-ride	7, 8	5.88	5.9	Negligible	0	0.009

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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SCHEDULE

EU-Type Examination Certificate No. FM11ATEX0060X

Specific Conditions of Use:

The non-metallic window may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in CLC/TR 60079-32-1. Cleaning of the window should only be done with a damp cloth.

SP2-RP SmartPurge 2 Remote Control Terminal

Markings:

II 2 G Ex ib IIC T4 Gb -20 °C ≤ Ta ≤ 60 °C

Description of Equipment:

SP2-RP SmartPurge 2 Remote Panel
Energy Limitation Parameters:

Ui (Vdc)	Ii (mA)	Ci (µF)	Li (mH)	Pi (W)
8.465	405.1	5.145	0.48	0.857

Specific Conditions of Use:

The powder coated surface and the non-metallic window of the SmartPurge 2 Remote Control Terminal may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in CLC/TR 60079-32-1. Cleaning of the powder coated surface and window should only be done with a damp cloth.

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Blueprint Report

Expo Technologies Ltd (1000002806)

Class No 3620

Original Project I.D. 3041589

Certificate I.D. FM11ATEX0060X

Drawing No.	Revision Level	Drawing Title	Last Report
EPC-BGB0-001	3	SmartPurge2 UV LV PSU PCB Data Files	PR465043
EPC-BGB0-002	1	Standard Transducer PCB Data Files	3041590
EPC-BGB0-003	2	Front Panel PCB Data Files	3041590
EPC-BGB0-004	1	Remote Panel PCB Data Files	3041590
EPC-BGB0-006	1	SmartPurge2 PSU LV Daughter PCB Data Files	3041590
EPC-BGB0-008	4	Prime Transducer PCB Data Files	3041590
EPC-BGB0-009	2	Logic PCB Data Files V1	3041590
EPC-BGB0-010	1	Corrected Logic Board EPC-BGB0-010	3041590
EPC-BGB0-011	1	Mod-board Retrofit	3041590
IECEx KEM07.0023U	-	Component Certificate, Terminal Blocks	3041590
IECEx KIWA 18_0009U	1	Optocoupler SpandexMeder 522-03-i	PR465043
KIWA 18ATEX0017U	2	Optocoupler VISHAY CNY65EXI	PR465043
PTB Ex 91.C.3123U	-	Component Certificate, Earth Terminal	3041590
SD7272	3	Remote Panel Block Diagram	3041590
SD7273	3	Logic Electronics Block Diagram	3041590
SD7274	3	System Block Diagram	PR452625
SD7306	2	Operational Sequences Document Part 3	3041590
SD7571	2	Transformer, PSU LV	3041590
SD7617	1	Design Document Part 1	3041590
SD7618	2	Design Document Part 2	PR452625
SD7619	6	Certification Labelling	PR465043
SD7816	2	General Assembly - steel	3041590
SD7817	5	Enclosure - steel	PR452625
SD7818	1	Terminal Block Clearances - steel	3041590
SD7819	2	Spark Arrestor	3041590
SD7820	2	Lid: Window & Sealing - steel	3041590
SD7821	2	Lid: Display - steel	RR209790
SD7822	1	LCD Module	3041590
SD7823	2	Flow Sensor Block - steel	PR452625
SD7824	1	Type FN Sensor Block - steel	3041590
SD7825	2	Earth Terminal - steel	3041590
SD7923	2	Transformer, PSU UV	3041589
SD7924	1	PSU Block Diagram	3041590
SD7925	1	External Connections	3041590
SD7926	1	PCB Interconnection	3041590
SD7933	3	SmartPurge2 LV PSU Circuit Diagram	PR465043
SD7934	2	SmartPurge2 LV PSU Daughter / Circuit Diagram	3041589
SD7936	3	SmartPurge2 UV PSU Circuit Diagram	PR465043
SD7942	2	UV Fuse Assembly	3041590
SD7943	2	LV Fuse Assembly	3041590
SD7944	4	CERT Label UV Fuse	RR205060
SD7945	3	CERT Label LV Fuse	RR205060
SD7977	2	SmartPurge2 Power Supply Encapsulation Procedure	PR452625
SD7981	4	UV Power Supply Parts List	PR465043
SD7983	3	LV Power Supply Parts List	PR465043
SD7984	1	SP2 Fuse Assembly Encapsulation Process	3041590
SD7985	2	Logic Assembly / Circuit Diagram	3041590
SD7986	2	Logic Board Parts List	3041590
SD7987	2	Prime Transducer Board PCB / Circuit Diagram	3041590
SD7988	2	Prime Transducer Board Parts List	452625

SD7989	1	Standard Transducer Board PCB / Circuit Diagram	3041590
SD7990	1	Standard Transducer Board Parts List	3041590
SD7991	2	Front Panel Parts List	3041590
SD7992	2	Front Panel PCB / Circuit Diagram	3041590
SD7993	2	Remote Panel Parts List	PR452625
SD7994	1	Remote Panel PCB / Circuit Diagram	3041590
SD7995	1	LV PSU Daughter Board Parts List	3041590
SD7997	2	SmartPurge2 External Connections (LED)	3041590
SD8009	3	SP2 Retrofit Mod Board for Logic Board	RR209790
SD8374	2	SmartPurge 2 Instructions (ATEX and IECEx)	PR465043

CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**

2. **Certificate No:** **FM23US0049X**

3. **Equipment:**
   (Type Reference and Name) **SmartPurge2 Purge Control Unit and SmartPurge2 Remote Control Terminal**

4. **Name of Listing Company:** **Expo Technologies Ltd**

5. **Address of Listing Company:** **Unit 2,**
   The Summit,
   Hanworth Road,
   Sunbury on Thames,
   Surrey, TW16 5DB, United Kingdom

6. The examination and test results are recorded in confidential report number:

   3047764 dated 10th January 2014

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM 3600:2022, FM 3620:2018, FM 3810:2005, ANSI/UL 60079-0:2009, ANSI/UL 60079-2:2015, ANSI/UL 60079-7:2013, ANSI/UL 60079-11:2011, ANSI/UL 60079-18:2012, ANSI/UL 60079-31:2013, ANSI/IEC 60529:2004, ANSI/UL 61010-1:2004

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. Equipment Ratings:

    See Annex

Certificate issued by:

J.E. Marquedant
VP, Manager - Electrical Systems

24 July 2023
Date

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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SCHEDULE

US Certificate Of Conformity No: FM23US0049X

11. The marking of the equipment shall include:

    See Annex

12. **Description of Equipment:**

    The SmartPurge 2 (SP2) is an electronic purge and pressurization control system consisting of a Control Unit containing the following: a power supply and switching module, a flow and pressure measuring unit and an electronic control unit. A display is provided for monitoring the status and for use during set-up.

    Two versions of the SmartPurge2 are available, as a purge and pressurize control unit (P) and as a fan control unit (F). Both these versions are available with a universal voltage (M) or a low voltage (L) power supply. The SmartPurge 2 is housed within a stainless steel enclosure with an ingress protection rating of IP64.

    The system can be connected to an optional Remote Panel which is housed in an aluminium enclosure. The maximum service temperature is 60 °C.

13. **Specific Conditions of Use:**

    See Annex

14. **Test and Assessment Procedure and Conditions:**

    This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

    A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

    Details of the supplements to this certificate are described below:

Date	Description
10 January 2014	Original Issue.
24 July 2023	Supplement 1: Report Reference: PR465043 dated 24 July 2023. Description of the Change(s): Converted to new certificate format.

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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ANNEX

SP2-ab-SS SmartPurge2 Purge Control Unit

Equipment Ratings:

Suitable for Zone 1 protected by increased safety, intrinsic safety and encapsulation and as associated pressurization equipment AEx e ib m [p] IIC T4 and suitable for Zone 21 protection by enclosure and as associated pressurization equipment AEx tb [pD] IIIC T135°C with an ambient temperature rating of -20°C to +60°C Hazardous (Classified) Locations (indoors/outdoors - IP64) when installed per control drawing SD8113.

Markings:

Class I Zone 1 AEx e ib m [p] IIC T4 -20°C ≤ Ta ≤ 60°C; - SD8112; Entity
Zone 21 AEx tb [pD] IIIC T135°C Ta = -20°C to 60°C — SD8112; Entity

Description of Equipment:

SP2-ab-SS SmartPurge2 Purge Control Unit
a = P or F, System type
b = M or L, Supply voltage

Power Supply (Terminals 1, 2): 90-254 Vac or 11-28 Vdc

Um = 254 V_{ac}

Power Switching (Terminals 3, 4) 6 A at 250 Vac
5 A at 30 Vdc
Alarm Contact ratings (Terminals 5, 6 and 7, 8): 250V, 1A

Fuse type (Terminals 9, 10): 100 mA (when b = M)
500 mA (when b = L)

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SCHEDULE
US Certificate Of Conformity No: FM23US0049X

Energy Limitation Parameters:

	Terminal TB1	U_0 (Vdc)	I_0(mA)	C_0(µF)	L_0(mH)	P_0(W)
SOV	1,2	23.58	165.5	0.091	2.9	0.975
IP	3,4	23.58	165.5	0.091	2.9	0.975
Remote Output	9,10,11,12	8.465	405.1	5.145	0.48	0.857
External alarm	5,6	5.88	5.9	Negligible	0	0.009
Over-ride	7,8	5.88	5.9	Negligible	0	0.009

Specific Conditions of Use:

The non-metallic window of the SmartPurge 2 may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the window should only be done with a damp cloth.

SP2-RP SmartPurge2 Remote Control Terminal

Equipment Ratings:

Intrinsically safe for Class I, Zone 1, AEx ib IIC T4 with an ambient temperature rating of -20°C to +60°C using the Entity concept when installed in accordance with Control Drawing SD8112.

Markings:

Class I Zone 1 AEx ib IIC T4 -20°C ≤ Ta ≤ 60°C; - SD8112; Entity

Description of Equipment:

SP2-RP SmartPurge2 Remote Control Terminal

Entity parameters

Ui (Vdc)	Ii(mA)	Ci (µF)	Li (mH)	Pi (W)
8.465	405.1	5.145	0.48	0.857

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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SCHEDULE

US Certificate Of Conformity No: FM23US0049X

Specific Conditions of Use:

The powder coated surface and the non-metallic window of the SmartPurge 2 Remote Control Terminal may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the powder coated surface and window should only be done with a damp cloth.

CERTIFICATE OF CONFORMITY

1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**

2. **Certificate No:** **FM23CA0036X**

3. **Equipment:**
   (Type Reference and Name) **SmartPurge2 Purge Control Unit and SmartPurge2 Remote Control Terminal**

4. **Name of Listing Company:** **Expo Technologies Ltd**

5. **Address of Listing Company:** **Unit 2,**
   The Summit,
   Hanworth Road,
   Sunbury on Thames,
   Surrey, TW16 5DB, United Kingdom

6. The examination and test results are recorded in confidential report number:

   3047764 dated 10th January 2014

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   CSA C22.2 No. 60079-0:2011, CSA C22.2 No. 60079-11:2011, CSA C22.2 No. 60079-18:2012, CSA C22.2 No. 60079-2:2012, CSA C22.2 No. 60079-7:2012, CSA C22.2 No. 60529:2005, CSA C22.2 No. 61010-1:2004

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. Equipment Ratings:

    See Annex

Certificate issued by:

J.E. Marquedant
VP, Manager - Electrical Systems

24 July 2023
Date

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SCHEDULE

Canadian Certificate Of Conformity No: FM23CA0036X

11. The marking of the equipment shall include:

    See Annex

12. **Description of Equipment:**

    The SmartPurge 2 (SP2) is an electronic purge and pressurization control system consisting of a Control Unit containing the following: a power supply and switching module, a flow and pressure measuring unit and an electronic control unit. A display is provided for monitoring the status and for use during set-up.

    Two versions of the SmartPurge2 are available, as a purge and pressurize control unit (P) and as a fan control unit (F). Both these versions are available with a universal voltage (M) or a low voltage (L) power supply. The SmartPurge 2 is housed within a stainless steel enclosure with an ingress protection rating of IP64.

    The system can be connected to an optional Remote Panel which is housed in an aluminium enclosure. The maximum service temperature is 60 °C.

13. **Specific Conditions of Use:**

14. **Test and Assessment Procedure and Conditions:**

    This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

15. **Schedule Drawings**

    A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

    Details of the supplements to this certificate are described below:

Date	Description
10 January 2014	Original Issue.
24 July 2023	Supplement 1: Report Reference: PR465043 dated 24 July 2023. Description of the Change(s): Converted to new certificate format.

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

ANNEX

SP2-ab-SS SmartPurge2 Purge Control Unit

Equipment Ratings

Suitable for Zone 1 protected by increased safety, intrinsic safety and encapsulation and as associated pressurization equipment Ex e ib m [p] IIC T4 with an ambient temperature rating of -20°C to +60°C hazardous Locations (indoors/outdoors - IP64) when installed per control drawing SD8113.

Markings

Ex e ib m [p] IIC T4 -20°C ≤ Ta ≤ 60°C; - SD8113; Entity

Description of Equipment

SP2-ab-SS SmartPurge2 Purge Control Unit
a = P or F, System type
b = M or L, Supply voltage

Entity parameters

	Terminal TB1	U_0 (Vdc)	I_0(mA)	C_0(µF)	L_0(mH)	P_0(W)
SOV	1,2	23.58	165.5	0.091	2.9	0.975
IP	3,4	23.58	165.5	0.091	2.9	0.975
Remote Output	9,10,11,12	8.465	405.1	5.145	0.48	0.857
External alarm	5,6	5.88	5.9	Negligible	0	0.009
Over-ride	7,8	5.88	5.9	Negligible	0	0.009

Specific Conditions of Use

The non-metallic window may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the window should only be done with a damp cloth.

SCHEDULE
Canadian Certificate Of Conformity No: FM23CA0036X

SP2-RP SmartPurge2 Remote Control Terminal

Equipment Ratings

Intrinsically safe for Class I, Zone 1, Ex ib IIC T4 with an ambient temperature rating of -20°C to +60°C using the Entity concept when installed in accordance with Control Drawing SD8113.

Markings

Ex ib IIC T4 Ta = -20°C to 60°C — SD8113; Entity

Description of Equipment

SP2-RP SmartPurge2 Remote Control Terminal

Entity parameters

Ui (Vdc)	Ii(mA)	Ci (µF)	Li (mH)	Pi (W)
8.465	405.1	5.145	0.48	0.857

Specific Conditions of Use

The powder coated surface and the non-metallic window of the SmartPurge 2 Remote Control Terminal may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TS 60079-32-1. Cleaning of the powder coated surface and window should only be done with a damp cloth.

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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F 348 (Apr 21)

ESC
ENGINEERING SAFETY CONSULTANTS

Certificate of Conformity to IEC 61508 Safety Integrity Level (SIL) 2

Functional Safety of Safety-Related Programmable Electronic Systems

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The SmartPurge ATEX Certified Intelligent Purge and Pressurise System SP2

Designed and manufactured by

Expo Technologies Ltd
Summer Road, Thames Ditton, Surrey, KT7 0RH, UK

The above system has been assessed and is considered capable for use in a SIL2 high demand safety function. The assessment was based on the assumptions and data provided in:

- ESC Ltd Report No. A127_SV001_(2.0)

The system assessed comprises of the following modules in full redundant configuration:

- Pressure Transmitter
- Logic Board
- Relay

With the output normally energised, de-energise to safe state, the estimated frequency of dangerous failure per hour is 2.2E-7 (providing a minimum proof test interval of 1 year);

The assessment was carried out to determine compliance with IEC 61508 with regards to:

- Random Hardware Failures;
- Minimum Architecture.

Managing Director: Kenneth G L Simpson
Member of IEC61508 and IEC 61511 committees
Assessment Date: August 2011

[Certificate: A127_CT001_(2.0)]

Engineering Safety Consultants
Collingham House, 10-12 Gladstone Road, Wimbledon, London
SW19 1QT Telephone: +44 2085422807
E-Mail: info@esc.uk.net, Website: www.esc.uk.net

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx DEK 11.0038X** Page 1 of 4

Status: **Current** Issue No: 7

Date of Issue: 2022-09-16

Applicant: **Emerson Automation Fluid Control & Pneumatics Italy Srl**
Strada per Cernusco 19
Bussero (Milano) 20041
Italy

Equipment: **Solenoid Valve Operator type LISC**

Optional accessory:

Type of Protection: **ia Ga, ib Gb, ib Db**

Marking: Ex ia IIC T6 Ga or
Ex ib IIC T6 Gb and
Ex ib IIIC T85 °C Db

Certificate history:

Issue 6 (2021-09-07)
Issue 5 (2020-08-06)
Issue 4 (2019-11-08)
Issue 3 (2016-04-04)
Issue 2 (2015-12-04)
Issue 1 (2011-11-18)
Issue 0 (2011-06-14)

Approved for issue on behalf of the IECEx Certification Body: **R. Schuller**

Position: **Certification Manager**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
Netherlands

IECEx Certificate of Conformity

Certificate No.: **IECEx DEK 11.0038X** Page 2 of 4

Date of issue: 2022-09-16 Issue No: 7

Manufacturer: **Emerson Automation Fluid Control & Pneumatics Italy Srl**
Strada per Cernusco 19
Bussero (Milano) 20041
Italy

Manufacturing locations: **Additional Manufacturing locations see Annex**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Edition:7.0 — Explosive atmospheres - Part 0: Equipment - General requirements

IEC 60079-11:2011 Edition:6.0 — Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

NL/DEK/ExTR11.0030/04

Quality Assessment Reports:

FR/LCI/QAR07.0006/14
NL/DEK/QAR11.0004/06
NL/DEK/QAR14.0006/07
GB/SIR/QAR06.0056/11
NL/DEK/QAR13.0014/07
NO/DNV/QAR09.0007/08
GB/SIR/QAR07.0041/10
NL/DEK/QAR13.0016/05

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Solenoid Valve Operator type LISC is used to control a valve.
Ambient temperature range -40 °C to +65 °C.

Exciter circuit (terminals + and -):
in type of protection intrinsic safety Ex ia IIC, Ex ib IIC and Ex ib III C only for connection to a certified intrinsically safe circuit, with maximum values:
U_i = 30 V; I_i = 300 mA; P_i = 1.6 W; C_i = 0 nF; L_i = 0 µH.

SPECIFIC CONDITIONS OF USE: YES as shown below:
The Solenoid Valve Operator must be installed so, that even in the event of rare incidents, an ignition source due to electrostatic discharge is excluded.

If the Solenoid Valve Operator is mounted to a valve made of aluminium or with parts made of aluminium and used in a potentially explosive atmosphere requiring the use of EPL Ga equipment, the apparatus must be installed so, that even in the event of rare incidents, an ignition source due to impact sparks or friction is excluded.

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Update QARs.
Additional manufacturing location in India.

Annex:

225632400-DEK11.0038X-7 Annex1.pdf

Annex 1 to Certificate of Conformity IECEx DEK 11.0038X issue 7

Manufacturing locations

1. Emerson Automation Fluid Control & Pneumatics Italy Srl
   Strada per Cernusco 19
   20041 Bussero (Milano)
   Italy

2. Asco Controls B.V.
   Neonstraat 3
   6718 WX Ede
   The Netherlands

3. ASCO SAS
   53, rue de Beauce
   28110 Luce
   France

4. Emerson Automation Fluid Control & Pneumatics UK Ltd
   2 Pit Hey Place
   West Pimbo
   Skelmersdale
   Lancashire WN8 9PG
   United Kingdom

5. Emerson Automation Fluid Control & Pneumatics Poland Sp. z.o. o
   Kurczaki 132
   93 331 Łódź
   Poland

6. ASCO Numatics (India) Pvt. Ltd.
   No. 57, Kundrathur Main Road
   Gerugambakkam, Porur
   Chennai-600128, Tamil Nadu
   India

7. ASCO Numatics (India) Pvt. Ltd
   Plot No P 45, 8th Avenue,
   Domestic Tariff Area, Mahindra World City,
   Chengalpet Taluk, Kanchipuram, Tamil Nadu, 603002
   India

8. ASCO Valve (Shanghai) Co. Limited
   No. 480, Xin Miao No. 3 Road, Xin Qiao Town
   Song Jiang District,
   Shanghai 201612
   P.R. China

9. ASCO L.P.
   1561 Columbia Highway
   Aiken, SC 29801
   USA

CERTIFICATE

EU-Type Examination

(1)

(2) **Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number: **DEKRA 11ATEX0091 X** Issue Number: **4**

(4) Product: **Solenoid Valve Operator type LISC**

(5) Manufacturer: **Emerson Automation Fluid Control & Pneumatics Italy Srl**

(6) Address: **Strada Per Cernusco 19, 20060 Bussero (Milano), Italy**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential test report number NL/DEK/ExTR11.0030/03.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012 + A11 **EN 60079-11 : 2012**

except in respect of those requirements listed at item 18 of the Schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

II 1 G Ex ia IIC T6 Ga or
II 2 G Ex ib IIC T6 Gb and
II 2 D Ex ib IIIC T85 °C Db

Date of certification: 8 November 2019

DEKRA Certification B.V.

L.G. van Schie
Certification Manager

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SCHEDULE

(13)

(14) **to EU-Type Examination Certificate DEKRA 11ATEX0091 X** Issue No. **4**

(15) **Description**

Solenoid Valve Operator type LISC is used to control a valve.

Ambient temperature range -40 °C to +65 °C.

Electrical data

Exciter circuit (terminals + and -):
in type of protection intrinsic safety Ex ia IIC, Ex ib IIC and Ex ib IIIC, only for connection to a certified intrinsically safe circuit, with maximum values:
U_i = 30 V; I_i = 300 mA; P_i = 1,6 W; C_i = 0 nF; L_i = 0 µH.

Installation instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

No. NL/DEK/ExTR11.0030/03.

(17) **Specific conditions of use**

The Solenoid Valve Operator must be installed so, that even in the event of rare incidents, an ignition source due to electrostatic discharge is excluded.

If the Solenoid Valve Operator is mounted to a valve made of aluminium or with parts made of aluminium and used in a potentially explosive atmosphere requiring the use of equipment of category 1 G, the apparatus must be installed so, that even in the event of rare incidents, an ignition source due to impact sparks or friction is excluded.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR11.0030/03.

(20) **Certificate history**

Issue 1	-	214283400	Initial certificate
Issue 2	-	214934200	Specific condition of use added
Issue 3	-	218067000	Update of the standards.
Issue 4	-	224039100	Name change of the manufacturer

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