

D818-ET MiniPurge[®]

Manual

ML 511

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
MiniPurge® Control Unit Data	2
Relief Valve Unit and Purge Outlet Valve with integral spark arrestor	3
Section 2: Quick User Guide	4
Installation	4
Operation of the System	4
Section 3: Application Suitability	5
Section 4: Description and Principle of Operation	6
Section 5: Main Components	7
Air Supply Filter / Regulator	7
Logic Air Supply Regulator	7
Minimum Pressure Sensor	7
Purge Flow Sensor	7
Intermediate Sensor	8
Electronic Purge Timer	8
Purge Complete Valve	8
OR Gate	8
Alarm Only Circuit (/AO)	8
Visual Indicators	9
Power Interlock Switch	9
Alarm / Pressurized Switch	9
System Purging Switch (Optional)	9
Purge Valve	9
Purge Flow Restrictor	9
CLAPS Sensor	9
CLAPS Regulator	9
Relief Valve Unit	10
/PA Terminal Box	10
Section 6: Installation of the System	10
Relief Valve Unit	10
Air Supply Quality	10
Pipe Work	11
Multiple Enclosures	11
Provision and Installation of Alarm Devices	11
Power Supplies and their Isolation	12
Power Interlock Switch	12
Section 7: Commissioning	13
Commissioning the System	13
Normal Operation	14
Section 8: Maintenance of the System	15
General maintenance	15
Additional maintenance checks	15
Maintenance of Electronic Timer	15
Re-calibration of the Relief Valve Unit	15
Re-calibration of the Pressure Sensors	16
Section 9: Fault Finding	17
General Information	17
System purges correctly but trips and auto re-purges at the end of the purge time	17
Relief Valve opens (continuously or intermittently)	18
System enters purging but purge indication does not occur	18
System begins purging but cycles fail to complete	18
Section 10: Recommended Spares List	19
Section 11: Glossary	19
Section 12: Drawings and Diagrams	19
Section 13: Certifications	20

Section 1: System Specification

3 X LC / ss / ET / OV / PC / PA


Size

3 = MiniPurge®
Purge flow rate:
1000-1500 NI/min

Approval / Certification

ATEX Certificate:

Sira 01ATEX1295X

CE 2813  II 2(2) GD
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
T_{amb} -20°C to +55°C

IECEX Certificate:

IECEX SIR07.0027X

Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
T_{amb} -20°C to +55°C


TÜV INMETRO Certificate:

TÜV 12.1462X

Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
T_{amb} -20°C to +55°C

UKEX Certificate:

CSAE 21UKEX1067X

UK CA 0518  II 2(2) GD
Ex [pxb] ia IIC T5 Gb
Ex [pxb] ia IIIC T100°C Db
T_{amb} -20°C to +55°C

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

PC = Pressurized Control. Automatic
leakage compensation (CLAPS)

OV = Purge Outlet Valve is
pneumatically operated

Timing Method

ET = Electronic Timer

MiniPurge® Housing

ss = Stainless Steel 316L

Pressurization Method

LC = Leakage Compensation

MiniPurge® Control Unit Data

Action on Pressure Failure:	Alarm and Trip (isolate power to pressurized enclosure), user adjustable Alarm Only.
Type of Operation:	Automatic leakage compensation using the Closed Loop Automatic Pressurization System (CLAPS System).
Leakage Compensation Capacity:	500 NI/min @ 4barg inlet pressure
Leakage Compensation over capacity:	+40%(minimum) of the normal enclosure leakage
Enclosure Material:	Stainless Steel 316L.
Mounting Method	Wall mounting straps. Fixing holes as per drawing.
Temperature Limits:	-20°C to +55°C
Compressed Air Supply:	Clean, dry, oil free air or inert gas. Refer to Air Supply Quality section in Installation of the System.
Supply Pressure:	4 to 8 barg (60 to 120 psi).
Main Regulator:	Set at 4 barg, 40 mm automatic drain supply inlet filter.
Logic Regulator and Gauge:	Fitted and set to 2.5 barg (36 psi).
Process Connections:	Purge supply and outlet to pressurized enclosure $\frac{1}{2}$ " NPT female. Minimum supply line 13 mm ($\frac{1}{2}$ " ID tube, inlet sized appropriately for flow rate. Reference points & signals $\frac{1}{8}$ " NPT female, minimum 6 mm pipe to be used.
Visual Indicators:	Alarm (Red ●) / Pressurized (Green ●). System Purging: 4 LEDs that flash sequentially to indicate elapsed time (black when not purging).
/PA Terminal Box:	Stainless Steel, Ex e IIC T5 Gb / Ex tb IIIC T100°C Db IP66 Tamb : -20°C to +55°C with terminals, front access cover & lower removable gland plate. Stainless Steel, Ex e IIC T4 Gb Tamb : -20°C to +60°C with terminals, front access cover & lower removable gland plate.
Power Interlock Switch:	DPNO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db.
Alarm Switch:	SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db.
Minimum Pressure Sensor:	Minimum: 0.5 mbarg. Maximum: 5.0 mbarg. Default Setting: 1.5 mbarg. Tolerance -0, +0.7 mbarg.
Purge Flow Sensor:	Set at 6.4 mbarg (Tolerance: -0, +10%).
CLAPS Sensor:	Minimum: 5.0 mbarg. Maximum: 15 mbarg. Default Setting: 10 mbarg. Tolerance: -0, +10%
Note: there must be a 2.5 mbarg difference between the intermediate and CLAPS sensor calibration point. For example: Minimum pressure = 5 mbarg, intermediate pressure = 6.5 mbarg, CLAPS sensor = 9 mbarg.	
Purge Time:	User selectable, in 1 minute intervals, up to 99 minutes (tolerance -0, +3 seconds).

Default Setting 99 minutes.

Weight: 16 kg (35lb).

Relief Valve Unit and Purge Outlet Valve with integral spark arrestor

Type:	ARV-0528-107		
Bore:	Purge Outlet Valve Ø 52 mm, Relief Valve Ø 52 mm.		
Relief Valve Lift-Off Pressure:	Minimum:	20 mbarg.	
	Maximum:	50 mbarg.	
	Default:	30 mbarg (+0, -20%).	
Flow Rate:	Range:	500, 1000 or 1500 NI/min.	
	Default:	1500 NI/min.	
Material:	Housing:	Stainless steel 316L.	
	Gasket:	Silicone.	
	Spark arrestor:	Stainless steel mesh.	
Mounting Method:	Rectangular cut-out and fixing holes as per drawing.		
Weight:	4 kg (8.8 lb).		

Note: Special settings are available on request, see Test and Inspection Sheet.

Section 2: Quick User Guide

Installation



The MiniPurge® system must be installed by a competent engineer, in accordance with relevant standards, such as IEC / EN 60079-14 and any local codes or practice.

- Mount the purge system in accordance with the hook-up drawing.
- Ensure the system is installed according to the full instructions in the "Installation of the System" section of this manual.
- All piping must be clean and free of dirt, condensation and debris prior to connection to the purge system or pressurized enclosure.
- It is strongly recommended that a local isolation valve is installed on the air supply upstream of the purge system.

Note: Most faults are due to restricted air supply, inadequate supply pipe work or drop in air supply pressure during the purge process.



Operation of the System

Once the system is installed correctly, turn on the air supply. Refer to Commissioning section.



Indicator	Colour	Status
Alarm / Pressurized	Red 	Low pressure alarm (enclosure pressure too low)
Purging	Black 	Purge flow too low or not in purge mode

The purge system commences the purge cycle:


- The purge air will enter the enclosure.
- The pressurized enclosure will obtain a positive pressure.
- The Purge Outlet Valve will open within the Relief Valve Unit.
- The air will then exit the Relief Valve Unit housing via the spark arrestor.

Indicator	Colour	Status
Alarm / Pressurized	Green 	Pressurized (minimum enclosure pressure achieved)
Purging	Black 	Purge flow too low

Open the Purge Flow Restrictor Valve until the air flow reaches the required rate; the system will initiate the timed purge cycle. Start a stopwatch when the purging indicator flashes yellow.

Indicator	Colour	Status
Alarm / Pressurized	Green 	Pressurized
Purging	Sequential flashing Yellow 	Purge flow rate above minimum

On completion of an uninterrupted purge cycle of the required length, the system will indicate purge complete. Stop the stopwatch when the purging indicator stops flashing.

Indicator	Colour	Status
Alarm / Pressurized	Green 	Pressurized and in leakage compensation mode

Indicator	Colour	Status
Purging	Black ●	No longer in purge mode

Check stopwatch timing to verify that the actual purge time is equal to or greater than the required purge time.

Note: The recorded purge time must never be less than the required purge time.

The system is now operating correctly in leakage compensation mode.

If the system has not performed as expected, check the installation thoroughly and ensure it has been carried out according to the instructions.

If an obvious problem has not been highlighted and corrected, follow the procedures in the Fault Finding section.

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

Application Suitability

MiniPurge[®] 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. Depending on the model the systems may be used in IECEx and ATEX Zone 1 and/or Zone 2 - Categories 2 and 3 respectively.

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

This system is 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 MiniPurge[®] systems. If substances that will adversely affect any of these materials are present in the surrounding environment, please consult Expo Technologies for further guidance.

Materials of Construction		
Stainless Steel	Aluminium	Acrylic
Mild (Carbon) Steel	Nylon	Silicone
Brass	Polyurethane	Neoprene
ABS	Polycarbonate	Polyester (glass filled)

Section 3: Description and Principle of Operation

The MiniPurge[®] system is pneumatic in operation, with electrical interfaces.

Purge and pressurization is a method of protection used in Zone 1 (21) and/or Zone 2 (22) hazardous locations to ensure that the interior of an enclosure is free of flammable gas. Addition of a MiniPurge[®] system allows the electrical equipment within the enclosure to be used safely in a hazardous location.

The principle of purge and pressurization is as follows:

- Clean compressed air or inert gas is drawn from a non-hazardous location.
- The interior of the pressurized enclosure is flushed to remove any hazardous gas or dust.
- This is introduced into the pressurized enclosure to keep the internal pressure at least 0.5 mbarg above the external pressure.
- Whilst pressurized, flammable gas cannot enter the enclosure from the environment.

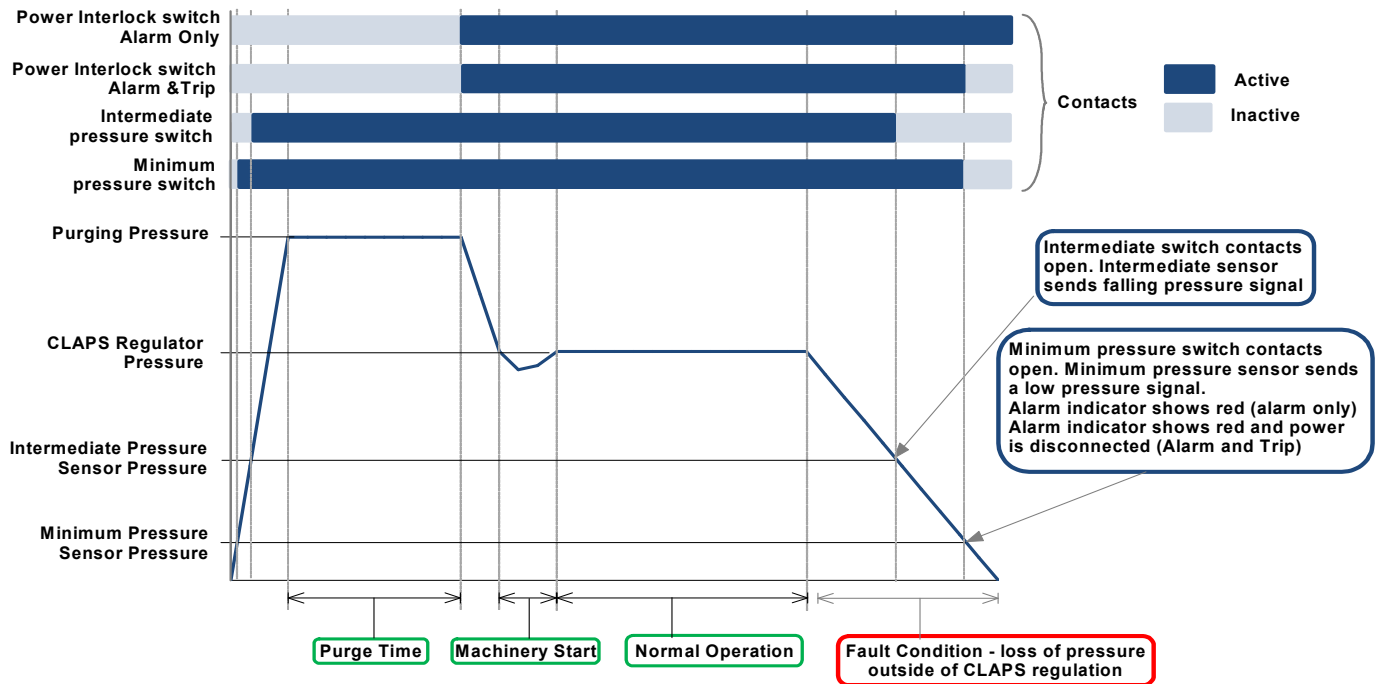
Prior to switching on the power to the electrical equipment, the enclosure must be purged to remove any flammable gas that might have entered the enclosure before pressurization. Purging is the process of removal contaminated air and replacement with air (or inert gas) known to be free from flammable gas. The duration of this purge process is normally ascertained by performing a purge test.

At the end of the purge cycle the system automatically switches to leakage compensation mode. The Purge Outlet Valve is closed and the airflow is reduced but remains high enough to compensate for the leakage of air from the enclosure whilst maintaining the minimum over pressure state.

In the event of pressure failure within the pressurized enclosure the system will raise an alarm in the form of visual indicators and a volt free contact depending on the specification of the system. The default action on loss of pressurization is alarm and automatic disconnect of power (A&T - Alarm and Trip). This can be changed by the customer to Alarm Only (/AO), please refer to section titled Main Components.

The MiniPurge[®] system incorporates a Closed Loop Automatic Pressurization System (CLAPS). This allows the system to detect a rise or fall of the enclosure's internal pressure and adjust the leakage compensation rate accordingly. Pressure variations are more likely during sudden start up of large rotating electrical machines but can also be caused by changes in running temperature. This system has been specifically designed to maintain a stable internal pressure within the enclosure.

Pressure characteristics during purge and pressurization of a pressurized enclosure using a MiniPurge[®] system that incorporates a CLAPS system:



Section 4: Main Components

Air Supply Filter / Regulator

The unit is provided with a 40 mm liquid / dust filter element as a precaution. The user of the MiniPurge[®] system must ensure that air supply is to the quality stated in Air Supply Quality paragraph found in the Installation of the System section. The regulator is factory set to 4 barg (60 psig) and regulates the pressure of an air supply between 4 and 8 barg (60 to 120 psig). A pressure gauge is fitted down stream of the filter; this should indicate no less than 4 barg (60 psig). During the purge cycle a pressure drop will be indicated on the gauge.

Logic Air Supply Regulator

This device provides the system with a stable air supply pressure to the logic system and allows consistent operation. The pressure level is factory set to 2.5 barg (36 psig) and can be verified by means of the integral pressure gauge.

Minimum Pressure Sensor

This monitors the pressure inside the pressurized enclosure. When the pressure is below the minimum required for safe operation, the pressure sensor causes the system to reset and the Alarm / Pressurized indicator turns **Red** ●. The sensor is factory calibrated and set to operate in falling pressure at or above the minimum specified pressure.

Purge Flow Sensor

The Purge Flow Sensor monitors flow through the Purge Outlet Valve. At correct purge flow rates, above the minimum specified for purging, the sensor sends a signal that activates the purge timer. This sensor is factory calibrated to operate on falling flow rate at or above the minimum specified purge flow rate.

Intermediate Sensor

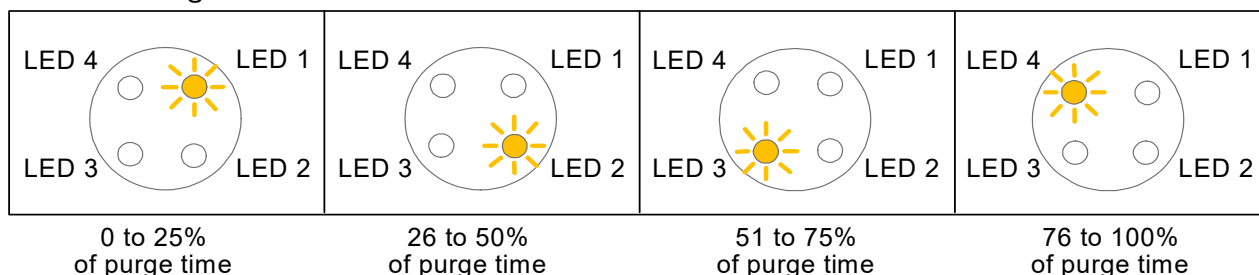
This sensor monitors the pressure inside the pressurized enclosure. It senses when the pressure is drops and provides early warning before the low pressure sensor trips the system.

Electronic Purge Timer

When both the enclosure pressure and the purge flow rate are correct, the Purge Flow Sensor activates the timer and the electronic timer starts. The timing period is selected using switches mounted on the timer module.

Note: Setting the timer to 00 minutes will cause infinite purging; the cycle will never complete.

During timing, the percentage of the purge cycle is indicated by four LEDs which flashes sequentially while the timer is running.



The Electronic Timer contains an intrinsically safe battery pack that needs regular replacement. See Commissioning section.

Purge Complete Valve

This valve receives a signal from the purge timer that indicates the completion of the purge cycle and verifies that the pressurization signal is still present. If both conditions are satisfied a signal is sent to indicate that the purge is complete. This performs two functions: to turn on the electrical supply to the pressurized enclosure and to reduce the high purge flow rate to leakage compensation mode. It also provides a hold-on signal that maintains the leakage compensation mode with the power switch on, even when the purge timer has reset ready for the next purge cycle.

OR Gate

This device provides the Purge Complete Valve with the hold-on function referred to previously. When either the timed-out signal or the purge complete signal is present it allows the pilot signal to be sent to the purge complete valve.

Alarm Only Circuit (/AO)



If the pressure in the pressurized enclosure is too low the system will normally cut off electrical power to it. In certain circumstances, where local codes of practice allow, the system can be altered to provide a hold-on circuit that will maintain the electrical power supply to the pressurized enclosure while also providing a pressure failure alarm. The user must respond to the alarm and either restore the pressure to the pressurized enclosure or otherwise make the installation safe; for example, cut off the electrical supply. The decision to use the Alarm Only facility, and the allowable length of time for non-pressurized operation, is the responsibility of the user.

Warning: It is potentially dangerous to energise the pressurized enclosure in a non-pressurized condition when it is known that there is potentially explosive gas or dust in the hazardous location.



Visual Indicators



Visual indicators are fitted to provide status information to the operator.

Alarm / Pressurized Indicator

Green* 	Pressurized
Red 	Pressure Alarm (enclosure pressure low)

System Purging Indicator

Black* 	Purge flow too low (not in purge mode)
Yellow (flashing) 	Purging (flow above minimum)

* The Green  / Black  combination indicates normal operation of the pressurized enclosure after the initial purging cycle has been completed.

Power Interlock Switch

This flameproof power switch is activated by the signal from the Purge Complete Valve. This activation can be used to turn on the electrical supply to the pressurized enclosure. The cable from the switch is terminated in the /PA terminal box.

Alarm / Pressurized Switch

This flameproof switch is operated by the pressurized signal. It allows a remote electrical system status indicator to show either pressurized or a pressure failure alarm. The cable from the switch is terminated in the /PA terminal box.

System Purging Switch (Optional)

This switch is operated by the purge flow signal that allows a remote electrical system status indicator to signal that the system is purging; sometimes referred to as "purge-in-progress". The cable from the switch is terminated in the /PA terminal box.

Purge Valve

This changeover valve selects between purge air flow or leakage compensation. It is sized to allow sufficient air into the enclosure during purging based on: the specified air supply pressure range, the minimum specified purging outlet flow rate +10% and the expected leakage rate from the pressurized enclosure. At the end of the purge cycle, the purge valve closes in response to the "Purge Complete" signal; it remains in the closed position until the next purge cycle is initiated.

Purge Flow Restrictor

This valve restricts the purge flow to the minimum required flow rate. The Purge Flow Restrictor must be readjusted during commissioning.

CLAPS Sensor

This sensor monitors the pressure within the pressurized enclosure and sends a control signal to the CLAPS Regulator. The normal running pressure must be determined prior to system start-up so that the CLAPS Sensor may be set to the level required to control the CLAPS Regulator.

CLAPS Regulator

This is the regulator that controls the leakage compensation air flow into the enclosure after the purging is complete. It either increases or decreases the air flow into the enclosure as appropriate to maintain a stable running pressure. The CLAPS Regulator must be set at the time of commissioning.

Relief Valve Unit

The Relief Valve Unit allows the purge air to exit the enclosure safely via a built-in spark arrestor. This spark arrestor is designed to prevent the emission of arcs, sparks and incandescent particles produced within the pressurized enclosure.

Purge air passes through the Relief Valve Unit; the preset pressure differential across the appropriate orifice ensures that the purge flow sensor is activated once the selected purge flow has been attained.

During the purge cycle a pneumatic cylinder operates the Purge Outlet Valve that lets the air from inside the enclosure exhaust through the Relief Valve Unit. When the system changes to leakage compensation mode, the Purge Outlet Valve is closed and the enclosure sealed.

The Relief Valve Unit has an in-built relief valve. This is sized to ensure that, if the air supply pressure rises up from the specified maximum, the internal enclosure pressure will not exceed the specified maximum working pressure of the pressurized enclosure.

/PA Terminal Box

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

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

Section 5: Installation of the System

The MiniPurge[®] is designed for use under normal industrial conditions of ambient temperature, humidity and vibration. Please consult Expo before installing this equipment in conditions that may cause stresses beyond normal industrial conditions. The MiniPurge[®] system must be installed by a competent person in accordance with relevant standards, such as IEC / EN 60079-14, and any local codes of practice.

The MiniPurge[®] control unit should be installed either directly on, or close to the pressurized enclosure. It should be installed such that the system indicators and certification labels are in view.

All parts of the system carry a common serial number. If installing more than one system, ensure that this commonality is maintained within each system installed.

Relief Valve Unit

To achieve effective purging, the points where air enters and exits the pressurized enclosure should normally be at opposite ends of the enclosure. The RLV unit must be mounted vertically and there should be a minimum clearance of 300 mm (12") around the spark arrestor (purge outlet).

It is important that the interior and exterior of the spark arrestor is kept clean and debris is not allowed to accumulate; this might affect the calibration of the device. In particular, the exterior of the spark arrestor should not be painted or blocked in any way.

Air Supply Quality

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

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

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

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

With reference to BS ISO 8573-1: 2010, Instrument Air is typically specified as:

Particle Class 1

In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 to 0.5 micron size range, 400 particles in the 0.5 to 1 micron size range and 10 particles in the 1 to 5 micron size range.

Humidity or pressure dew point

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

Oil Class 2

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

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

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

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

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

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

Pipe Work

If the MiniPurge[®] is not connected directly to the pressurized enclosure, pipe work and fittings used to connect the Control Unit to the pressurized enclosure should be either metallic or appropriate to the environment into which the system is installed. No valve may be fitted in any signal pipe connecting the Control Unit to the pressurized enclosure. This pipe work must be fitted in accordance with local codes of practice where relevant.

Multiple Enclosures

This system is suitable for the purge and pressurization of the primary pressurized enclosure and its associated terminal boxes.

Provision and Installation of Alarm Devices

When the pressure inside the pressurized enclosure is above the minimum, the Minimum Pressure Sensor returns a positive (**pressurized**) signal causing the alarm indicator on the control unit to change from **red** to **green**.

When the pressure falls below the minimum permissible the positive (**pressurized**) signal is removed. This absence of signal indicates a **low pressure alarm** condition and causes the alarm indicator on the control unit to go from **green** to **red**.

There are volt free (dry) contacts available within the terminal box for remote usage.

The user must make use of this alarm facility in accordance with the local code of practice for Action on Pressure or Flow Failure. Most codes include the following recommendations:

- **Zone 1 Installations:** Alarm and Automatic Trip of Power.
- **Zone 2 Installations:** Alarm Only on pressure or flow failure with power being removed manually.

Power Supplies and their Isolation

All power entering the pressurized enclosure should have a means of isolation. This requirement also applies to any external power sources that are connected to the equipment such as volt-free (dry) contacts within the pressurized enclosure. This is commonly achieved using the Power Interlock Switch.

Power Interlock Switch

This switch is a Double Pole Normally This switch is a Double Pole Normally Open, double-break switch: it provides two independent contacts that should be connected in series and used to isolate the power. This can be achieved using suitable certified intrinsically safe barriers. These contacts are terminated and accessible to the user in the terminal box.

It is the responsibility of the user to ensure that the switch is only operated within appropriate technical limits.

The switch must be replaced after any short circuit that occurs within the main circuit; the switch is a piece of encapsulated equipment and as such it is not possible to check the state of the contacts. Technical modifications to the switch are not permitted.

Prior to commissioning, check that the terminal box is clean, the connections have been made properly, the cables laid correctly and all screws in the terminals are secure.

In all cases the application and isolation of power must be controlled by the MiniPurge[®] system using the power interlock signal.

No switches are permitted between the power switch and the MiniPurge[®] system other than an authorized manual override circuit.

The safe use of this switch is the responsibility of the user, all electrical installations must conform to local codes of practice.

Exception

Power to apparatus that is already suitable for use in hazardous locations need not be isolated by the MiniPurge[®] system.

Commissioning

Commissioning the System

Note: The steps 11 and 15 to 21 represent detailed commissioning tests

The following equipment is needed for this process:

- Continuity meter
- Gauge manometer (0 to 200 mbarg)
- Differential manometer

If, after commissioning, the system does not perform as expected, refer to the Fault Finding Section.

Follow the steps as outlined:

1. Check all connections and that the Relief Valve Unit is fitted correctly with an unobstructed path to the purge exhaust.

2. Close the Purge Flow Restrictor Valve.
3. Fully open external supply shut-off valve where fitted.
4. Check that the internal logic pressure gauge reads 2.5 barg / 36 psi / 250 kPag.
5. Check that the pressure gauge on main air supply reads 4 barg / 60 psi / 400 kPag.
6. Check that the Pressure Relief Valve is correctly set by disconnecting the minimum pressure sensing pipe at the bulkhead fitting on the input to the MiniPurge[®]. This will disable all of the pressure sensors.
 - Using a 4 mm nylon tube, connect a manometer to the bulkhead fitting from which the minimum pressure sensing pipe was removed.
 - Open the Purge Flow Restrictor Valve very slowly, until the Pressure Relief Valve opens
 - Check the opening pressure is within calibration limits.
 - This test can be carried out several times to ensure repeatability and compliance.Refer to the Maintenance of the System section if the Relief Valve needs recalibrating.
7. Close the Purge Flow Restrictor Valve.
8. Remove the manometer and reconnect the minimum pressure sensing pipe to the bulkhead fitting.
9. Remove red plug from the top of the Minimum Pressure Sensor and connect a gauge manometer.
10. Connect a differential manometer to the test points on the flow sensor.
11. To check sensor calibration
 - The internal pressure in the pressurized enclosure must be below Relief Valve lift off pressure and above the CLAPS pressure
 - At this time the pressurized indicator should be **green**.
 - gradually open Purge Flow Restrictor Valve until purging indicator **flashes yellow**.

Note: For large volumes it may take a long time for the purge flow to start.

 - very slowly close Purge Flow Restrictor Valve until the purging indicator stops **flashing yellow**.
 - Take a reading from pressure gauge.
12. To set the purge flow rate:
 - Turn on the compressed air to the MiniPurge[®].
 - Gradually open the Purge Flow Restrictor Valve until the **black / yellow** indicator changes to **yellow (flashing)**.
 - The flashing yellow indicator confirms the correct flow rate.
 - The differential pressure should be greater than 6.4 mbarg.
 - The relief valve is supplied with different orifice plates for the specified flow rate. This orifice plate is held in position by two M3 screws and can easily be changed by removing the large cover plate from over the outlet valve assembly and screws.

Warning: When opening the Purge Flow Restrictor Valve, ensure the over pressure within the pressurized enclosure does not exceed the pressure relief valve setting.
13. The purge timer will start as soon as the Purging Indicator **flashes yellow**. Check that the time delay between the indicator turning to **yellow (flashing)** and returning to **black** is not less than the minimum time required for complete purging of the pressurized enclosure. Times in excess of minimum are permitted.
14. After the purge has been completed, the Purge Valve will close and the air flow into the pressurized enclosure will be controlled by the CLAPS Regulator. The initial setting may be too high or too low.
15. Gradually turn the CLAPS Regulator anti-clockwise to reduce enclosure pressure.
16. Reduce regulator until intermediate sensor causes contacts to open.

17. Check the manometer on the minimum pressure sensor.
18. Continue to reduce the CLAPS Regulator to test the minimum pressure sensor.
19. To check operation of Minimum Pressure Sensor, check readings on manometer as system will automatically re-purge when it reaches minimum pressure.
20. While the system re-purges, return the CLAPS Regulator to the initial setting.
21. If minimum pressure is below the set point, refer to the Recalibration section
22. If the setting is too high, continual rising and falling of the enclosure pressure will be seen as the CLAPS Regulator automatically shuts off and reinstates the flow. The CLAPS Regulator should be adjusted to reduce the flow into the pressurized enclosure by turning the adjuster screw anti-clockwise.
23. If the initial setting is too low the CLAPS Regulator may not provide enough air flow causing a gradual decline in enclosure pressure. To increase the flow into the pressurized enclosure, adjust the CLAPS Regulator Relief Valve unit by turning the adjuster screw clockwise.
24. To test the CLAPS settings, create a leak in the system by removing a bolt or loosening a gland plate in order to create a 15mm hole. Remember to replace bolt or retighten gland plate after testing.
25. The setting of the CLAPS Sensor is factory calibrated to the normal working pressure expected in the pressurized enclosure, typically 10 mbarg. The pressure in the pressurized enclosure should be stabilized as close as possible to this figure. This can be checked by a manometer attached to the minimum pressure sensor.
26. Remove the air supply to the system, remove all test equipment and replace all plugs.

Normal Operation

For normal operation of the system, after commissioning has been carried out it is possible to turn the air supply valve on or off to start or stop the system. After this, the purge and pressurization sequence is automatic.

Section 6: Maintenance of the System

General maintenance

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

The following checks should be carried out every 6 - 36 months dependent on environment according to IEC / EN 60079-17

- Tests outlined in the Detailed Commissioning section.
- Ensure that the Relief Valve Unit is free from contamination prior to making any adjustment. To do this:
 - Remove large cover plate using a 8 mm spanner (wrench).
 - Check that the interior and all components are clean and free from contamination.
 - Replace large cover plate.
- Check the condition of the air supply filter element. Clean or replace as necessary.

Additional maintenance checks

The following additional checks are recommended at least every 3 years:

Check that:

- Apparatus is suitable for use in the hazardous location.
- There are no unauthorised modifications.
- The air supply is uncontaminated.
- The interlocks and alarms function correctly.
- Approval labels are legible and undamaged.
- Adequate spares are carried.
- The action on pressure failure is correct.

Maintenance of Electronic Timer

This should be carried out every 3 years.

- The intrinsically safe battery pack associated with the electronic timer should be replaced and the commissioning tests repeated.
- After the timing phase has elapsed, the battery may be hot-swapped in the hazardous location without affecting the operation of the MiniPurge® system

Re-calibration of the Relief Valve Unit

Warning

Incorrect adjustment of the Relief Valve Unit can lead to significant over pressure and result in damage to the enclosure.

If maximum pressure setting is reached, stop adjustment, and reduce the pressure.

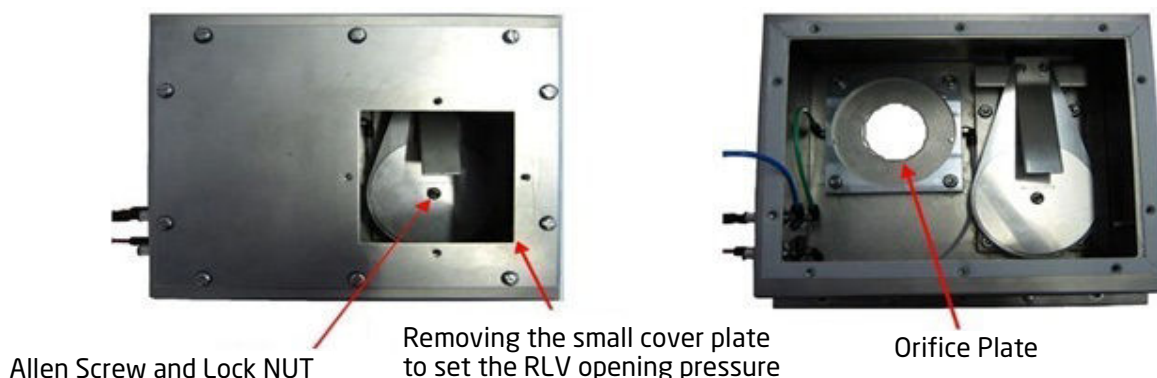
To perform the following adjustments, an 8 mm spanner (wrench) and a 2.5 mm hex key will be required. Ensure that the Relief Valve Unit is free from contamination prior to making any adjustment. To do this:

- Remove large cover plate using an 8 mm spanner (wrench).
- Check that the interior and all components are clean and free from contamination.
- Replace large cover plate

To adjust the lift off pressure of the Relief Valve:

- Attach test equipment as described in the Commissioning Section.

- Remove small cover plate.
- Whilst holding the central adjustment screw in position using the hex key, loosen the retaining nut.
- Adjust the hex key clockwise to increase, or anti-clockwise to reduce the lift off pressure.
- Before testing, retighten the locking nut whilst holding the adjustment screw in place.
- Carry out the commissioning tests to check the correct setting of the relief valve after adjustment.
- The adjustment is sensitive, and it is recommended that a $\frac{1}{4}$ turn (maximum) adjustments are applied between tests.



Re-calibration of the Pressure Sensors

The brass nozzle on the sensor is sealed into position using Loctite thread sealant. If the thread has seized up, remove to a safe area and heat slightly to soften prior to making any adjustment. This prevents potential damage to the brass of the nozzle.

- Disconnect pipe work from the sensor, including pipe located below the sensor.
- Remove sensor by unscrewing anti-clockwise.
- The nozzle is located under the sensor.
- The adjustment is sensitive, turn the nozzle in $\frac{1}{8}$ of a turn step.
- Turn clockwise to reduce the pressure setting and anti-clockwise to increase.
- Replace sensor, screwing clockwise.
- Reconnect all pipe work.

Fault Finding

General Information

If you are having problems that cannot be corrected using one of the methods described, please call Expo or your supplier for further assistance. If the system is less than 12 months old, parts under warranty should be returned to Expo for investigation. A full report of the fault and the system serial number should accompany the parts.

It is common for problems with the MiniPurge[®] system to be caused by contamination of the air supply with oil, water, or dirt. To prevent these problems, the air supply must contain a dust filter and a water filter. This will ensure that the air is instrument quality and protect both the purge system and the equipment being purged. This filtration system is not provided by Expo and must be sourced separately.

Contamination can enter the system from a number of sources. To prevent this, it is essential that the procedures described in the Installation section are carried out prior to first use of the system. These procedures should also be carried out following any disconnection and re-connection of the pipe work. Failure to perform these procedures may cause damage to the system that will not be covered by the warranty.

The system has been designed for ease of fault finding and many of the components fitted are plug-in or chassis mounted. Check components by substitution only after establishing that such action is necessary.

Before carrying out the fault finding procedures, ensure that:

- Both the main air pressure to the system and for Motor Purge Systems, the regulated pressure to the logic manifold are as specified on the settings sheet.
- Air pressure does not drop below the minimum supply pressure during purging; most faults reported are due to insufficient air supply during the purge cycle.

System purges correctly but trips and auto re-purges at the end of the purge time.

This is a result of the pressure within the pressurized enclosure being below the minimum pressure sensor setting. The pressure can be checked using a manometer. The most common causes of this problem are outlined below.

Fault Location	Cause	Solution
Pressurized Enclosure	There is debris on the face of the Relief Valve disk held in place by the magnet.	<ul style="list-style-type: none"> • Remove debris and ensure RLV disk is clean.
	Enclosure leaking excessively.	<ul style="list-style-type: none"> • Ensure all doors and covers are closed and that all conduit and cable glands are properly sealed. • Seal any other leaks.
	Pressure sensing tube damaged.	<ul style="list-style-type: none"> • Replace tubing.
CLAPS Regulator	The CLAPS Regulator setting is too low.	<ul style="list-style-type: none"> • Increase the setting of the CLAPS regulator to raise the pressure in the pressurized enclosure after purging. • To do this, turn clockwise.
MiniPurge [®] Control Unit	the Minimum Pressure Sensor setting has drifted above the CLAPS setting	<p>The Minimum Pressure Sensor needs re-calibrating.</p> <ul style="list-style-type: none"> • Refer to Re-calibration of Pressure Sensors in the Maintenance section

Relief Valve opens (continuously or intermittently)

Fault Location	Cause	Solution
Pressurized Enclosure	Enclosure pressure is too high due to CLAPS Regulator being open to far.	Adjust the CLAPS Regulator.
Relief Valve Unit	Debris on the Relief Valve disk allowing air to leak from the valve.	Remove Relief Valve cover and clean the valve disk.

System enters purging but purge indication does not occur

Fault Location	Cause	Solution
Air Supply	Insufficient flow rate due to inadequate air supply pressure. Often due to pressure drop in the supply pipe.	Static pressure of 5 barg must be maintained during purge <ul style="list-style-type: none"> Check air supply pressure at the inlet to the control unit. Ensure that the supply pipe bore is suitable for the flow rate
Pressurized Enclosure	Excessive leakage from the pressurized enclosure.	<ul style="list-style-type: none"> Check around the enclosure while purging is taking place. Total leakage at purge outlet valve should not exceed 10% of purge flow sensor setting. Check for leakage down cables and conduit.
Pipe Work	Tubing from Relief Valve flow sensing point not airtight.	<ul style="list-style-type: none"> Ensure fitting nuts are tightened. Check for tube damage. Repair as necessary.
Relief Valve Unit	Relief Valve opening during purge.	<ul style="list-style-type: none"> Check enclosure pressure on start up is less than Relief Valve lift off pressure.
MiniPurge Control Unit	Flow sensor setting incorrect.	<ul style="list-style-type: none"> Check the pressure is correct on the flow sensor.

System begins purging but cycles fail to complete

Fault Location	Cause	Solution
Electronic Timer	Time set to 00	<ul style="list-style-type: none"> Reset timer to correct purge time.
	The intrinsically safe battery pack is discharged	<ul style="list-style-type: none"> Replace as necessary.

Recommended Spares List

Part Number	Description
S0015/250	Filter kit for main air supply filter/regulator
S0030/606	Purge flow sensor factory set to 6.4 mbarg
S0030/016	Minimum Pressure sensor, must be factory set to the value as stated on the Customer Test and Inspection Sheet
S0030/588	CLAPS Sensor must be factory set to the value as stated on the Customer Test and Inspection Sheet

Part Number	Description
S0015/018	Pressure gauge (Air Supply Pressure), 0 - 10 barg
S0015/135	Miniature gauge (Logic Pressure), 0-4 barg
ETM-IS31-001	IS battery pack for electronic timer module
AGE-GE00-168	Electronic Timer Assembly c/w potted Timer Switch

Section 7: Glossary

Acronym	Definition
A&T	Alarm and Trip
AO	Alarm Only
CLAPS	Closed Loop Automatic Pressurization System
CU	Control Unit
ET	Electronic Timer
FCV	Flow Control Valve
IS	Intrinsically Safe
LC	Leakage Compensation
PA	Power and Alarm
RLV	Relief Valve Unit

Section 8: Drawings and Diagrams

Title	Drawing Number	Number of Sheets
D818 Control Unit Motorsys-E	XBR-7TD0-068	2
Motorpurg Hook-Up	MOTOR-HU	1
P and I Diagram	XBR-7TD0-064	1
D818 Circuit Diagram	XBR-7TD0-071	1
D818 Ex e Terminal Box Layout	AGE-WC00-224	1
Manual Override Switch Hook-up	AGE-WC00-117	1
Size 3 MotorPurge Relief Valve	XBR-RTD0-010	1

Section 9: Certifications

Certificates can be found in the accompanying booklet (ML497) or download the certificates at www.expoworldwide.com/downloads.

Component	Certificate	Number
Purge System	EU Declaration of Conformity	SC004 *
	UKCA Declaration of Conformity	SC004-UK *
	ATEX Certificate	SIRA 01ATEX1295X
	IECEX Certificate	IECEX SIR07.0027X
	UKCA Certificate	CSAE 21UKEX1067X
	INMETRO/TÜV Certificate	TÜV 12.1462X
MIU/e Ex e Terminal Box	EU Declaration of Conformity	SC027 *
	UKCA Declaration of Conformity	SC027-UK *
	ATEX Certificate	Sira 99ATEX3173X*
	IECEX Certificate	IECEX SIR 06.0087X*
	UKCA Certificate	ExVeritas 21UKEX1051X
	CCC Certificate	2020312303000422
Electronic Timer	EU Declaration of Conformity	SC039 *
	ATEX Certificate	FM 10 ATEX0003X
	IECEX Certificate	IECEX FME 10.0001X
Electronic Switches	ATEX Certificate	EPS 14 ATEX 1766 X
	IECEX Certificate	IECEX EPS 14.0092X

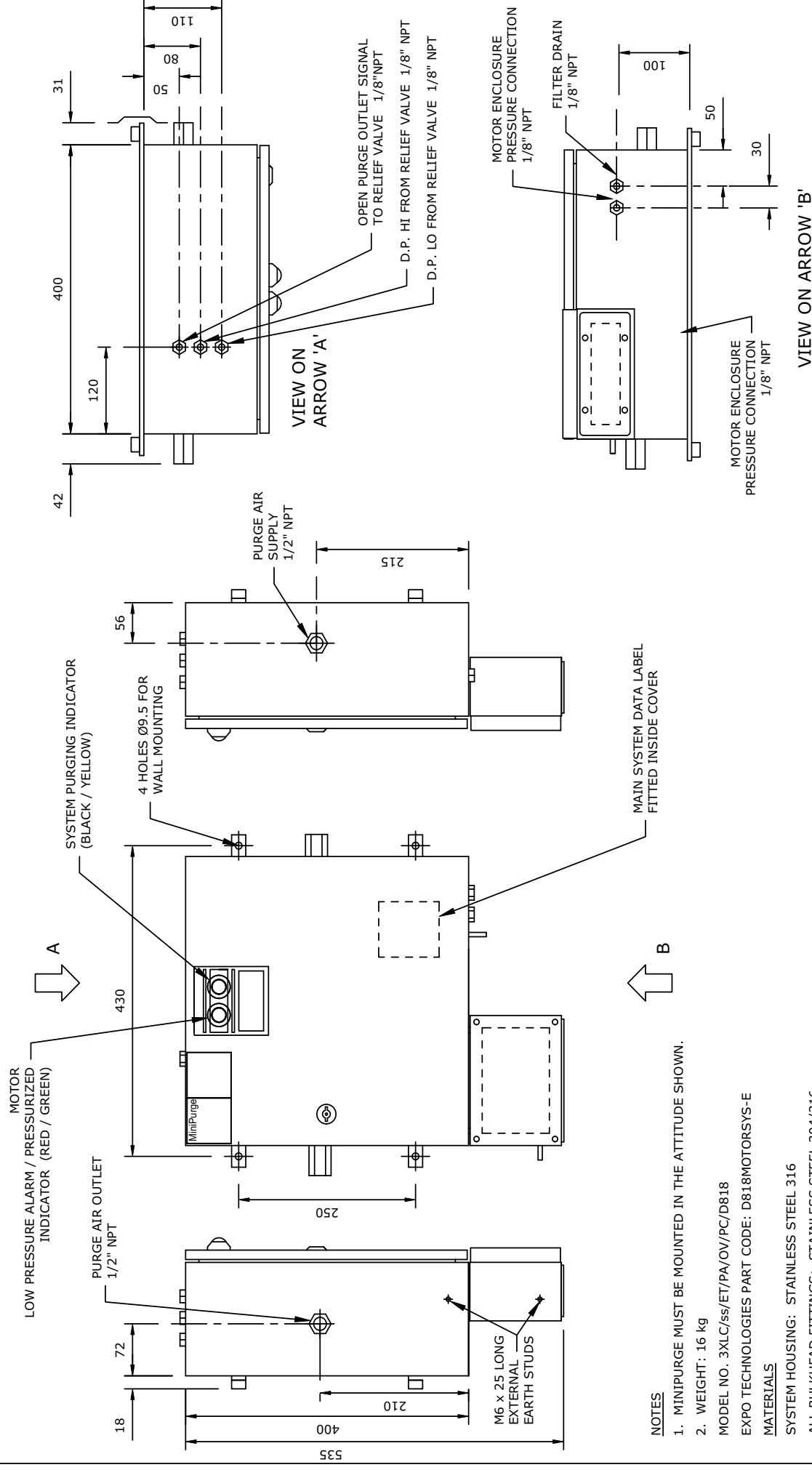
*Certificates are attached to the manual.



DIMENSIONS IN mm

DO NOT SCALE

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NOTES

1. MINIPURGE MUST BE MOUNTED IN THE ATTITUDE SHOWN.
2. WEIGHT: 16 kg

MODEL NO. 3XLC/ss/ET/PA/OV/PC/D818

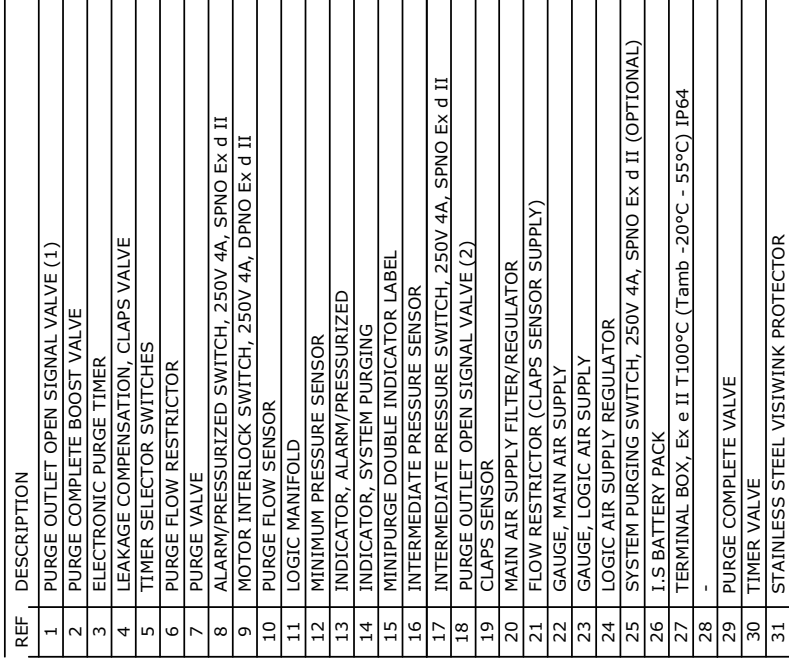
EXPO TECHNOLOGIES PART CODE: D818MOTORSYS-E

MATERIALS

SYSTEM HOUSING: STAINLESS STEEL 316

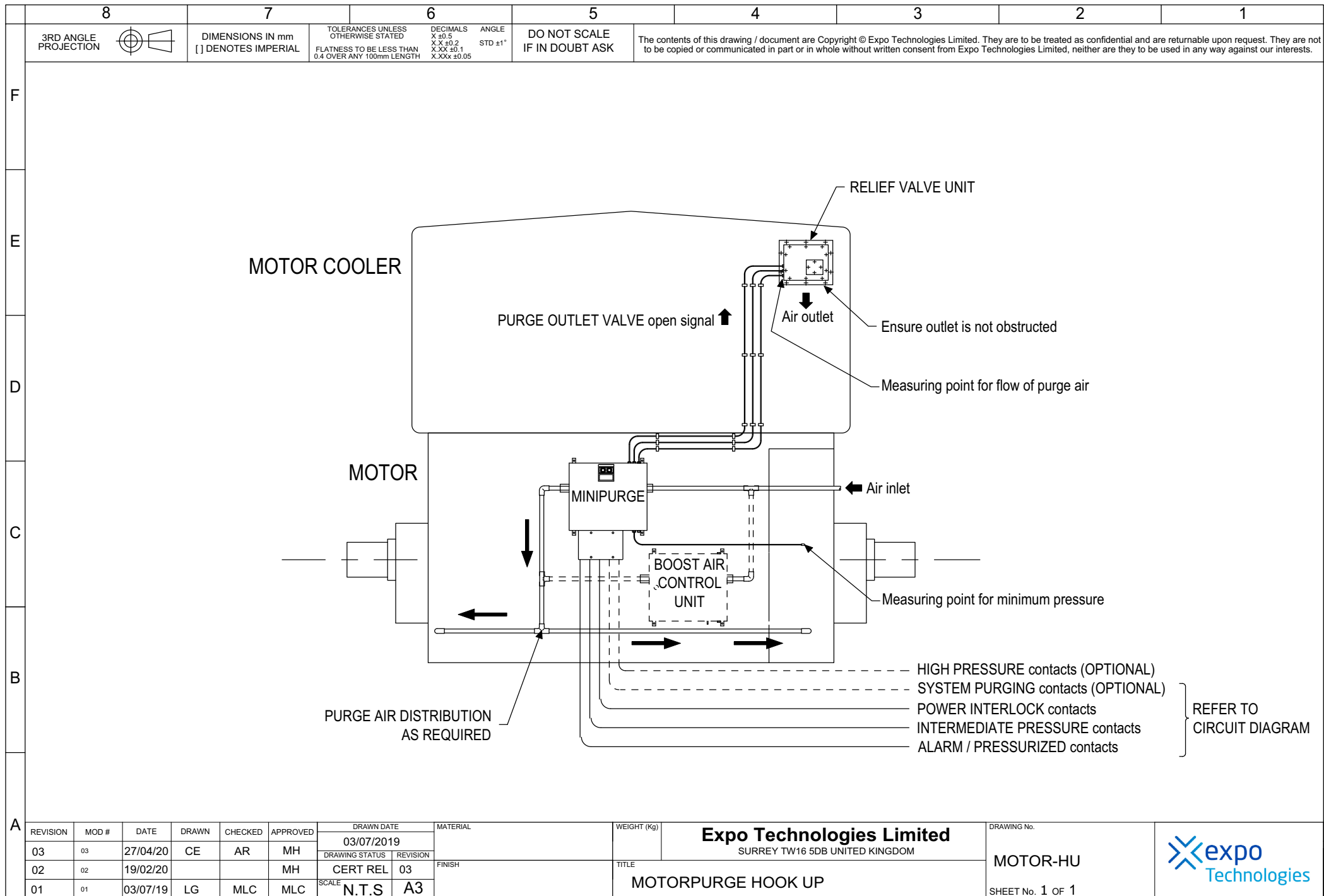
ALL BULKHEAD FITTINGS: STAINLESS STEEL 304/316

APP'D	SB	ISSUE: 1	3	4	5	MATERIAL SEE DRAWING	SURREY TW16 5DB UNITED KINGDOM	SCALE N.T.S
CHK'D	JP/DB	MOD. No: DRAWN	5933	5981	DGN-124.33			
DRW'N	NRB	DATE: 17/01/2013	18/9/13	21/2/13	9/02/2020			
		APPROVED: SB	SM	SM	MH	FINISH	TITLE	
		DRAWING STATUS: CERT		DRAWING STATUS: CERT		VAPOUR BLASTED XFN-0000-035	D818 CONTROL UNIT MOTOR SYS-E	
		JOB No:		CUSTOMER:		DRAWING No. XBR-7TD0-068		
						SHEET No. 1 OF 2		



1. CERTIFICATION LABEL FITTED INSIDE DOOR OF SYSTEM ENCLOSURE.

<div>Expo Technologies Limited</div>							SURREY TW16 5DB UNITED KINGDOM		SCALE	N.T.S		
TITLE							D818 CONTROL UNIT MOTOR SYS-E				DRAWING No.	XBR-7TD0-068
JOB No:							CUSTOMER:				SHEET No.	2 OF 2
DRAWING STATUS: CERT RELATED												
APP'D	SB	ISSUE:	1	3	4	5	SEE DRAWING					
		MOD. No:	DRAWN	5933	5981	DON-12433						
CHK'D	JPdB	DATE:	17/01/2013	18/9/13	21/2/13	19/02/2020	FINISH					
DRWN	NRB	APPROVED:	SB	SM	SM	MH	VAPOUR BLASTED XFN-0000-035					





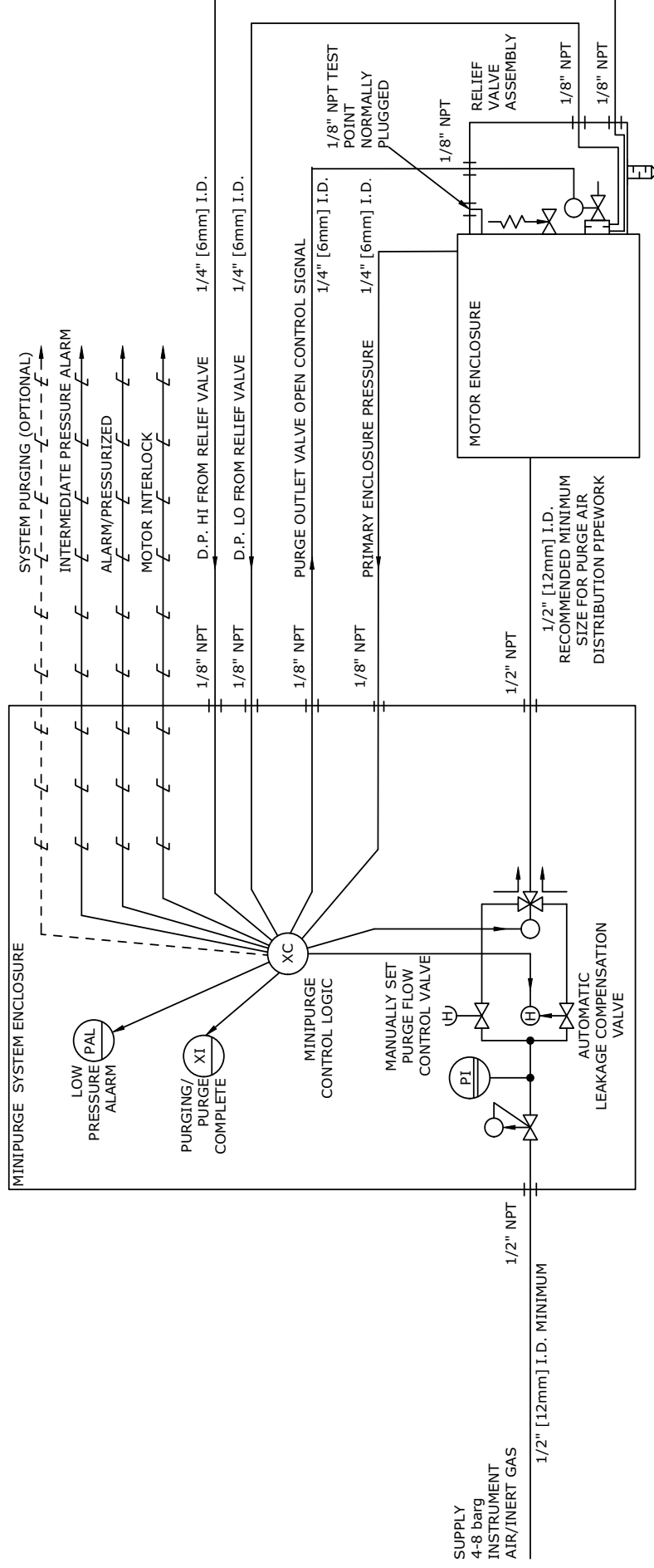
DIMENSIONS IN mm
DO NOT SCALE

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

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—f—f—f— ELECTRICAL SIGNAL VIA Ex e JUNCTION BOX
----- OPTIONAL

APPD	SB	ISSUE:	1	2	MATERIAL	<div>Expo Technologies Limited</div> <div>SURREY TW16 5DB UNITED KINGDOM</div>	<div>SCALE</div> <div>DRAWING No.</div> <div>XBR-7TD0-064</div> <div>SHEET No. 1 OF 1</div>
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CHK'D	BRD	DATE:	18/1/13	19/02/2020	FINISH		
DR'WN	NRB	APPROVED:	SB	MH			
DRAWING STATUS:						JOB No: CUSTOMER:	

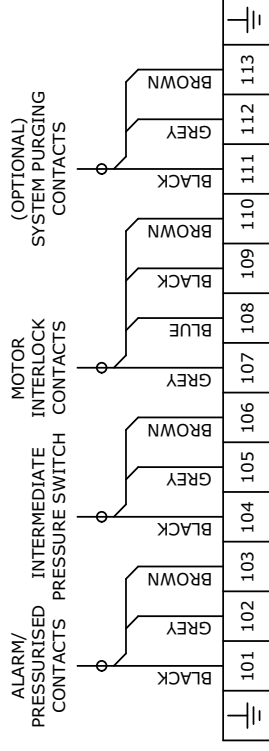


DIMENSIONS IN mm
DO NOT SCALE

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			

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VERSION		CIRCUIT DIAGRAM
PNEUMATIC TIMER		XBR-7TD0-060
ELECTRONIC TIMER		XBR-7TD0-071

NOTES

REFER TO CERTIFICATES IECEX 10.0003X AND ITS 10ATEX37092X
FOR RESTRICTIONS AND PERMITTED CONTENTS

APPD	SB	ISSUE:	1	2	3	4	MATERIAL
		MOD. No:	DRAWN	6234	624-2	DQN-12433	
CHKD	NRB	DATE:	21/12/2012	28/11/14	15/12/2020	FINISH	
DRWN	DR	APPROVED:	SM	MLC	MLC	MH	
DRAWING STATUS: CERT RELATED							
JOB No:			CUSTOMER:				
TITLE			D818 Ex e TERMINAL BOX LAYOUT				
Expo Technologies Limited			SURREY TW16 5DB UNITED KINGDOM				
SCALE			NTS				
DRAWING No.			AGE-WC00-224				
SHEET No.			1 OF 1				

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[illegible]

EU Declaration of Conformity



This is to declare that the products listed below are manufactured in conformity with the following EU Directives under the sole authority of Expo Technologies Ltd:

Electromagnetic Compatibility Directive 2014/30/EU

MiniPurge Systems with a /PO suffix in the type number are non-electrical and are outside the scope of the EMC Directive. MiniPurge Systems with suffices /PA or /IS incorporate one or more volt-free ("dry") contacts which work in circuits specified by others. In normal operation these circuits are "benign" and no CE mark is appropriate. MiniPurge Systems with Electronic Timer (Option /ET and /ES) are designed to conform to the EMC Directive, in compliance with EN 61000-6-4:2007 and EN 61000-6-2:2005 (Intertek Report EM10048000) and 61000-6-4:2007 + A1:2011 and EN 61000-6-2:2005 (Intertek Report 102569070LHD-001) respectively.

Low Voltage Directive 2014/35/EU

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

Pressure Equipment Directive 2014/68/EU

MiniPurge Systems are classified as not higher than category I under Article 13 of this Directive and intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Pressure Equipment Directive. MiniPurge Systems are covered under ATEX Directive 2014/34/EU.

ATEX Directive 2014/34/EU

MiniPurge Systems are designed to conform to the above Directive in fulfilment of the Essential Health & Safety requirements of Annex II and in compliance with:

EN IEC 60079-0:2018

EN 60079-2:2014

EN 60079-11:2012

MiniPurge Systems are certified under EU Type-Examination Certificate Sira 01ATEX1295X by CSA Group (Netherlands) B.V., in compliance with:

EN 60079-0:2012 + A11:2013

EN 60079-2:2014

EN 60079-11:2012

MiniPurge Systems are manufactured under Production Quality Assurance Notification SIRA S9ATEXM043, issued by CSA Group (Netherlands) B.V. (EU Notified Body No. 2813).

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

For and on behalf of Expo Technologies Ltd

A handwritten signature in blue ink, appearing to read 'John Paul De Beer'.

John Paul De Beer
Managing Director

Date 23rd November 2021

UK Declaration of Conformity



This is to declare that the products listed below are manufactured in conformity with the following UK Product Regulations under the sole authority of Expo Technologies Ltd

MiniPurge® Purge & Pressurization Systems

A range of systems intended to provide explosion protection of electrical enclosures through purge & pressurization under international and national standards.

Electromagnetic Compatibility Regulations 2016 (SI 2016/1091)

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

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

MiniPurge Systems with Electronic Timer (Option /ET and /ES) are designed to conform to the EMC Regulations, in compliance with EN 61000-6-4:2007 and EN 61000-6-2:2005 (Intertek Report EM10048000) and 61000-6-4:2007 + A1:2011 and EN 61000-6-2:2005 (Intertek Report 102569070LHD-001) respectively.

Electrical Equipment (Safety) Regulations 2016 (SI 2016/1101)

MiniPurge Systems are intended to be used in potentially explosive areas (hazardous areas) and are therefore excluded from the Regulation.

Pressure Equipment (Safety) Regulations 2016 (SI 2016/1105)

MiniPurge Systems are classified as not higher than Category I under article 13 of this Regulation and also intended for use in potentially explosive atmospheres and are therefore excluded from this Regulation.

Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres Regulations, UKSI 2016:1107 (as amended) - Schedule 3A Part 1

MiniPurge Systems are designed to conform to the above Regulations in fulfilment of the Essential Health & Safety requirements of Annexe II and in compliance with:

EN IEC 60079-0:2018

EN 60079-2:2014

EN 60079-11:2012

MiniPurge Systems are certified under UK Type-Examination Certificate CSAE 21 UKEX 1067X by CSA Group Testing UK Ltd. (UK Conformity Assessment Body No. 0518) in compliance with:

EN 60079-0:2012 + A11:2013

EN 60079-2:2014

EN 60079-11:2012

MiniPurge Systems are manufactured under Production Quality Assurance Notification CSAE 21 UKQAN 0005, issued by CSA Group Testing UK Ltd. (UK Conformity Assessment Body No. 0518).

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

For and on behalf of Expo Technologies Ltd

A handwritten signature in blue ink, appearing to read 'John Paul De Beer'.

John Paul De Beer
Managing Director

Date 15th December 2021

EU Declaration of Conformity



This is to declare that the products listed below are manufactured in conformity with the following EU Directives under the sole authority of Expo Technologies Ltd:

Expo Technologies MiniPurge Interface Units Type MIU/e1, MIU/e2 and MIU/e1-M0

Electromagnetic Compatibility Directive 2014/30/EU

Clause 1.1.3 Equipment covered by other specific Community Directives: Compliance with the Essential Health and Safety Requirements has been assured to conform to the following list of Standards:

EN IEC 60079-0:2018

EN 60079-7:2015

EN 60079-31:2014

Clause 1.1.4 Inherently benign equipment: the electrical equipment associated with the MIU/e are Ex d switch(es) certified under EPS 14ATEX1766X and used within the MiniPurge Control system. These switches are terminated inside the MIU/e at Ex e terminal(s) certified under DEMKO 14ATEX1388U and are not capable of generating or contributing to electromagnetic emission. These switches are capable of operating without degradation in the presence of electromagnetic disturbance in their intended environment.

Low Voltage Directive 2014/35/EU

MiniPurge Interface Units MIU/e are intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Low Voltage Directive. Electrical safety conforms to EN 61010:2010

Pressure Equipment Directive 2014/68/EU

MiniPurge Interface Units MIU/e are classified as not higher than category I under Article 13 of this Directive and intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Pressure Equipment Directive.

ATEX Directive 2014/34/EU

MiniPurge Interface Units MIU/e are designed to conform to the ATEX Directive in fulfilment of the Essential Health & Safety requirements of Annexe II, in compliance with:

EN IEC 60079-0:2018

EN 60079-7:2015+A1:2018

EN 60079-31: 2014.

MiniPurge Interface Units MIU/e are certified by ExVeritas, Units 16-18, Abenbury Way, Wrexham Industrial Estate, Wrexham, United Kingdom, LL13 9UZ, under EU Type Certification ExVeritas 19ATEX0542X in compliance with:

EN IEC 60079-0:2018

EN 60079-7:2015+A1:2018

EN 60079-31: 2014.

MiniPurge Interface Units MIU/e are manufactured under Production QAN Sira 99ATEXM043, issued by CSA Group (Netherlands) B.V. (EU Notified Body No. 2813).

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

For and on behalf of Expo Technologies Ltd

A handwritten signature in blue ink, appearing to read 'John Paul De Beer'.

John Paul De Beer
Managing Director

Date 2nd November 2021

UK Declaration of Conformity



This is to declare that the products listed below are manufactured in conformity with the following UK Product Regulations under the sole authority of Expo Technologies Ltd

Expo Technologies MiniPurge Interface Units Type MIU/e1, MIU/e2 and MIU/e1-M0

Electromagnetic Compatibility Regulations 2016 (SI 2016/1091)

Clause 1.1.3 Equipment covered by other specific Regulations: Compliance with the Essential Health and Safety Requirements has been assured to conform to the following list of Standards:

EN IEC 60079-0:2018

EN 60079-7:2015

EN 60079-31:2014

Clause 1.1.4 Inherently benign equipment: the electrical equipment associated with the MIU/e are one or more Ex d switch(es) used within the MiniPurge Control system and terminated inside the MIU/e at terminals suitable for the intended use. These circuits are not capable of generating or contributing to electromagnetic emission. These switches can operate without degradation in the presence of electromagnetic disturbance in their intended environment.

Electrical Equipment (Safety) Regulations 2016 (SI 2016/1101)

Mini Interface Units MIU/e are intended to be used in potentially explosive areas (hazardous areas) and are therefore excluded from the Regulation.

Pressure Equipment (Safety) Regulations 2016 (SI 2016/1105)

Mini Interface Units MIU/e are classified as not higher than Category I under article 13 of this Regulation and also intended for use in potentially explosive atmospheres and are therefore excluded from this Regulation.

Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres Regulations, UKSI 2016:1107 (as amended) - Schedule 3A Part 1

Mini Interface Units MIU/e are designed to conform to the above Regulations in fulfilment of the Essential Health & Safety requirements of Annex II and in compliance with:

EN IEC 60079-0:2018

EN 60079-2:2014

EN 60079-31:2014

Mini Interface Units MIU/e are certified under UK Type-Examination Certificate CSAE 21UKEX1051X by CSA Group Testing UK Ltd. (UK Conformity Assessment Body No. 0518) in compliance with:

EN 60079-0:2012 + A11:2013

EN 60079-2:2014

EN 60079-31:2014

Mini Interface Units MIU/e are manufactured under Production Quality Assurance Notification CSAE 21 UKQAN 0005, issued by CSA Group Testing UK Ltd. (UK Conformity Assessment Body No. 0518).

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

For and on behalf of Expo Technologies Ltd



John Paul De Beer
Managing Director

Date 15th December 2021



EU-TYPE EXAMINATION CERTIFICATE

Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

Certificate Number: **Sira 99ATEX3173X** Issue: **12**

Equipment: **BPG Range of Junction Boxes**

Applicant: **ABTECH Limited**

Address: Sanderson Street
Lower Don Valley
Sheffield S9 2UA
UK

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

CSA Group Netherlands B.V., Notified Body Number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 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 the confidential reports listed in Section 14.2.

Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012 EN 60079-7:2007 EN 60079-11:2012 EN 60079-26:2007 EN 60079-31:2009

If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

The marking of the equipment shall include the following:

II 2 GD Ex e IIC T6 Gb (Ta = -65°C to +65°C)
Ex e IIC T5 Gb (Ta = -65°C to +65°C)
Ex e IIC T4 Gb (Ta = -65°C to +65°C)
Ex Ib IIC T6 Gb (Ta = -65°C to +65°C)
Ex Ib IIC T5 Gb (Ta = -65°C to +65°C)
Ex Ib IIC T4 Gb (Ta = -65°C to +65°C)
Ex tb IIC T85°C Db (Ta = -65°C to +65°C)
Ex tb IIIC T100°C Db (Ta = -65°C to +65°C)

or

II 1 GD Ex Ia IIC T6 Ga (Ta = -65°C to +65°C)
Ex Ia IIC T5 Ga (Ta = -65°C to +65°C)
Ex Ia IIC T4 Ga (Ta = -65°C to +65°C)
Ex ta IIIC T85°C Da (Ta = -65°C to +65°C)
Ex ta IIIC T100°C Da (Ta = -65°C to +65°C)

Project Number 1839

Signed:

Title: Director of Operations

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Utrechtseweg 310,
6812 AR, Arnhem,
Netherlands

SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 99ATEX3173X
Issue 12

DESCRIPTION OF EQUIPMENT

The BPG range of junction boxes utilises a BPG enclosure covered by certificate number Sira 99ATEX3172U and are fitted with an arrangement of suitably certified terminals.

BPG ref.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Length	80	110	160	190	230	122	220	160	260	360	560	255	400	600	400
Width	75	75	75	75	75	120	120	160	160	160	160	250	250	250	405
Height	55	55	55	55	55	90	90	90	90	90	90	120	120	160	120

(All dimensions are in mm)

Before the Junction Box is installed, its total dissipated power for the particular application will be calculated in accordance with EN 60079-7:2003, Annex E. E.2 and will not exceed the values given in the tables below (Junction boxes of size not specified in the tables may be manufactured subject to the maximum dissipated power being based on a smaller enclosure):

BPG ref.	Maximum Power Dissipation (W)														
	T6/T85°C Ta +40°C (max)	T6/T85°C Ta +55°C (max)	T6/T85°C Ta +60°C (max)	T6/T85°C Ta +65°C (max)	T5/T100°C Ta +55°C (max)	T4/T100°C Ta +90°C (max)									
1	8.390	2.23	1.73	1.45	8.390	8.390									
2	8.551	2.00	1.70	1.45	8.551	8.551									
3	8.833	2.00	1.70	1.45	8.833	8.833									
4	9.012	2.07	1.80	1.29	9.012	9.012									
5	9.260	2.00	1.70	1.10	9.260	9.260									
6	9.378	2.00	1.70	1.45	9.378	9.378									
7	10.500	2.30	1.70	1.10	10.500	10.500									
8	10.348	2.00	1.70	1.10	10.348	10.348									
9	11.933	2.30	1.70	1.10	11.933	11.933									
10	13.793	4.50	3.29	2.10	13.793	13.793									
11	18.338	6.68	5.20	4.00	18.338	18.338									
12	15.474	2.30	1.70	1.10	15.474	15.474									
13	20.867	5.20	4.00	3.00	20.867	20.867									
13.5	20.867	5.20	4.00	3.00	20.867	20.867									
14	30.384	7.97	6.59	4.79	30.384	30.384									
15	31.350	8.26	6.00	4.40	31.350	31.350									



SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 99ATEX3173X
Issue 12

BPG ref.	EPL Da									
	Maximum Power Dissipation (W)									
	T6/T85°C Ta +40°C (max)	T6/T85°C Ta +55°C (max)	T6/T85°C Ta +60°C (max)	T6/T85°C Ta +65°C (max)	T5/T100°C Ta +55°C (max)	T4/T100°C Ta +90°C (max)				
1	4.195	1.115	0.865	0.725	4.195	4.195				
2	4.2755	1	0.85	0.725	4.2755	4.2755				
3	4.4165	1	0.85	0.725	4.4165	4.4165				
4	4.506	1.035	0.9	0.645	4.506	4.506				
5	4.63	1	0.85	0.55	4.63	4.63				
6	4.689	1	0.85	0.725	4.689	4.689				
7	5.25	1.15	0.85	0.55	5.25	5.25				
8	5.174	1	0.85	0.55	5.174	5.174				
9	5.9665	1.15	0.85	0.55	5.9665	5.9665				
10	6.8965	2.25	1.645	1.05	6.8965	6.8965				
11	9.169	3.34	2.6	2	9.169	9.169				
12	7.737	1.15	0.85	0.55	7.737	7.737				
13	10.4335	2.6	2	1.5	10.4335	10.4335				
13.5	10.4335	2.6	2	1.5	10.4335	10.4335				
14	15.192	3.985	3.295	2.395	15.192	15.192				
15	15.675	4.13	3	2.2	15.675	15.675				

Variation 1 - This variation introduced the following changes:

- The BPG range of junction boxes were permitted to have alternative power dissipation ratings that enable them to be used in an upper ambient temperature of either +40°C or +55°C or +60°C or +65°C, the associated ratings and markings were recognised.

Variation 2 - This variation introduced the following changes:

- The recognition of a minor revision of the information marked on the label.

Variation 3 - This variation introduced the following changes:

- When certified, intrinsically safe terminals are used, alternative marking, 'ia' and 'ib', was recognised.

Variation 4 - This variation introduced the following changes:

- The BPG 13.5 junction box covered by certificate number Sira 99ATEX3172U was added to the range.

Variation 5 - This variation introduced the following changes:

- The option to fit slotted trunking inside the Junction Boxes, this trunking may be sited as required. The instructions were modified to recognise additional restrictions associated with this change and a new Condition of Manufacture was introduced.
- The recognition of minor drawing modifications including the introduction of a new company logo; these amendments are administrative or involve changes to the design that do not affect the aspects of the product that are relevant to explosion safety.

Variation 6 - This variation introduced the following changes:

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SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 99ATEX3173X
Issue 12

- Following appropriate re-assessment to demonstrate compliance with the requirements of the EN 60079 series of standards, the documents previously listed in section 9, EN 50 014:1997 (amendments A1 to A2), EN 50 019:1994, EN 50020:2002 and EN 50281-1-1:1998, were replaced by those currently listed. As part of this change, the markings in section 12 were updated accordingly and the 'ia' marking previously included as Variation 1 (dated 30 March 2005) was removed. The Condition of Certification that defined the ambient temperature range of specific types of gaskets was removed because only silicone rubber gaskets are now used in the construction of these Junction Boxes.
- It was recognised that a new procedure for selecting terminals has been adopted by the manufacturer; this allows the terminals to be chosen from an Approved Component Document, Sira 12AC087, that is issued and controlled by Sira. The relevant Condition of Certification was amended to recognise this change.
- The recognition of drawing modifications required for use with other certification associated with these products.
- The Condition of Certification dealing with power dissipation was modified.
- A Condition of Certification that requires the manufacturer to monitor the status of previously certified devices was added.

Variation 7 - This variation introduced the following changes:

R30711A/00

- Using EN 60079-26, the junction boxes were allowed to be marked with 'Ex ia' and 'Ex ta' concepts for EPL levels Ga and Da, as a result of this change, the maximum power dissipation table was modified and a Special Condition for Safe Use was introduced necessitating the addition of an 'X' suffix to the certificate number.
- IEC 60079-0:2011 was replaced by EN 60079-0:2012 in the list of standards.

R32242A/00

- The BPG range of junction boxes were allowed to be used in an upper ambient +55°C with a temperature class/surface temperature of T5/T100°C, the associated maximum power dissipation ratings (W) and markings were recognised.

Variation 8 - This variation introduced the following changes:

- To permit the replacement of the term 'ceramic' with 'the terminals shall have an insulation limiting temperature of 130°C minimum' in the Condition of Manufacture, when the junction boxes are marked for T4/T100°C.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexes.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report/File no.	Comment
0	19 January 2000	R51X6055E	The release of the prime certificate.
1	25 May 2001	R51A6746A	The introduction of Variation 1.
2	28 September 2001	53V7936	The introduction of Variation 2.

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SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 99ATEX3173X
Issue 12

Issue	Date	Report/File no.	Comment
3	23 July 2002	R53A9009A	The prime certificate was re-issued to permit the following: <ul style="list-style-type: none">• The operation of previous variations 1 and 2.• The lower ambient temperature range was confirmed as -65°C.• The introduction of the changes included in Sira report number R53A9009A.
4	30 March 2005	R53V10438A	The introduction of Variation 3.
5	10 March 2008	R51A17881A	This Issue covers the following changes: <ul style="list-style-type: none">• All previously issued certification was rationalised into a single certificate, Issue 5, Issues 0 to 4 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format.• The change of the Applicant's name, first recognised 31 January 2007, was re-confirmed.• The introduction of Variation 4.
6	03 April 2012	R26585A/00	The introduction of Variation 5.
7	11 June 2012	R26585A/01	Report R26585A/01 replaced report R26585A/00.
8	24 October 2012	R25164A/00	This Issue covers the following changes: <ul style="list-style-type: none">• The introduction of Variation 6.• Because this certificate was re-issued, some Variations 1 and 2 were duplicated, this has been clarified and reflected in the certificate history; no technical changes were involved.
9	07 April 2014	R30711A/00 R32242A/00	The introduction of Variation 7.
10	08 July 2014	R70004712A	The introduction of Variation 8.
11	30 July 2014	N/A	Issued to correct a typographical error.
12	15th October 2019	1839	<ul style="list-style-type: none">• Transfer of certificate from Sira 99ATEX3173X Sira Certification Service to CSA Group Netherlands B.V..• EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU, (in accordance with Article 41 of Directive 2014/34/EU, EC Type-Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC Type-Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)

15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 When used in an EPL ta (Da) application the power supply to the equipment is to be rated for a prospective short circuit current of not more than 10 kA.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

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SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 99ATEX3173X
Issue 12

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

Certificate Annexe



Certificate Number: Sira 99ATEX3173X
Equipment: BPG Range of Junction Boxes
Applicant: ABTECH Limited

Issue 0 to 2: The drawings associated with these Issues were rationalised by those listed in Issue 3.

Issue 3

Number	Sheet	Rev.	Date	Description
ABT 10260	1 of 1	C	25 Jun 02	External Label (BPG)
ABT 10304	1 of 1	A	16 Nov 99	BPG Manufacturing Specification

Issue 4

Number	Sheet	Rev.	Date	Description
ABT 14842	1 of 1	-	01 Feb 05	BPG Range EEx ia Label
ABT 14845	1 of 1	-	01 Feb 05	BPG Range EEx Ib Label

Issue 5: No new drawings were introduced.

Issue 6

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
ABT 10260	1 of 1	D	30 Mar 12	BPG External label – Junction Boxes
ABT 10304	1 of 1	B	30 Mar 12	BPG Manufacturing specification
ABT 14842	1 of 1	B	30 Mar 12	BPG Range EEx ia Label
ABT 14845	1 of 1	B	30 Mar 12	BPG Range EEx Ib Label

Issue 7 (No new drawings were introduced.)

Issue 8

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
ABT 10260	1 of 1	E	30 Sep 12	BPG Nameplate – Junction Box
ABT 10304	1 of 1	C	30 Sep 12	BPG Manufacturing specification
ABT 10305	1 of 1	C	30 Sep 12	BPG Range of Enclosures

Issue 9

R30711A/00

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
ABT10260	1 of 1	F	30 Oct 13	BPG Range Ex e Label
ABT14842	1 of 1	C	10 Oct 13	BPG Range Ex ia Label

R32242A/00

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
ABT26528	1 of 1	A	19 Dec 13	External ATEX Label (BPG)
ABT16689	1 of 1	C	19 Dec 13	BPG Manufacturing Spec

Issues 10 and 11 (No new drawings were introduced.)

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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 SIR 06.0087X**

Page 1 of 4

Certificate history:

Status: **Current**

Issue No: 6

Issue 5 (2014-07-30)

Issue 4 (2014-05-20)

Issue 3 (2014-05-08)

Issue 2 (2012-10-25)

Issue 1 (2010-07-27)

Issue 0 (2006-10-25)

Date of Issue: 2021-09-30

Applicant: **ABTECH Limited**
A B Controls & Technology
Sanderson Street
Lower Don Valley
Sheffield S9 2UA
United Kingdom

Equipment: **BPG Range of Junction Boxes**

Optional accessory:

Type of Protection: **Increased Safety and Dust**

Marking: Ex e IIC T6 Gb (Ta -65°C to +#°C) or Ex ia IIC T6 Ga (Ta -65°C to +#°C)
Ex e IIC T5 Gb (Ta -65°C to +#°C) Ex ia IIC T5 Ga (Ta -65°C to +#°C)
Ex e IIC T4 Gb (Ta -65°C to +#°C) Ex ia IIC T4 Ga (Ta -65°C to +#°C)
Ex ib IIC T6 Gb (Ta -65°C to +#°C) Ex ta III C T85°C Da (Ta -65°C to +#°C)
Ex ib IIC T5 Gb (Ta -65°C to +#°C) Ex ta III C T100°C Da (Ta -65°C to +#°C)
Ex ib IIC T4 Gb (Ta -65°C to +#°C)
Ex tb III C T85°C Db (Ta -65°C to +#°C)
Ex tb III C T100°C Db (Ta -65°C to +#°C)
(Temperature class, marking for dust and Ta maximum depends upon the maximum power dissipation, refer to Annexe)

Approved for issue on behalf of the IECEx
Certification Body:

Neil Jones

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:

CSA Group Testing UK Ltd
Unit 6, Hawarden Industrial Park
Hawarden, Deeside CH5 3US
United Kingdom





IECEX Certificate of Conformity

Certificate No.: **IECEX SIR 06.0087X**

Page 2 of 4

Date of issue: 2021-09-30

Issue No: 6

Manufacturer: **ABTECH Limited**
A B Controls & Technology
Sanderson Street
Lower Don Valley
Sheffield S9 2UA
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 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

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

IEC 60079-31:2008 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
Edition:1

IEC 60079-7:2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:4

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/SIR/ExTR06.0101/01

GB/SIR/ExTR12.0245/00

GB/SIR/ExTR14.0107/00

Quality Assessment Report:

GB/CML/QAR16.0021/06



IECEX Certificate of Conformity

Certificate No.: **IECEX SIR 06.0087X**

Page 3 of 4

Date of issue: 2021-09-30

Issue No: 6

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The BPG Junction Boxes comprise a polyester, BPG Enclosure, component certified as IECEx SIR 06.0086U, that is fitted with terminals. Refer to certificate Annexe for a full product description.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. When used in an EPL ta (Da) application the power supply to the equipment is to be rated for a prospective short circuit current of not more than 10 kA.



IECEX Certificate of Conformity

Certificate No.: **IECEX SIR 06.0087X**

Page 4 of 4

Date of issue: 2021-09-30

Issue No: 6

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

This issue, Issue 6, recognises the following change; refer to the certificate annex to view a comprehensive history:

1. Issued to Update the QAR.

Annex:

[IECEX SIR 06.0087X Issue 6 Annexe.pdf](#)

Annexe to: IECEx SIR 06.0087X Issue 6

Applicant: ABTECH Limited



Apparatus: BPG Range of Junction Boxes

The BPG range of junction boxes utilises a BPG enclosure covered by certificate number Sira 99ATEX3172U and are fitted with an arrangement of suitably certified terminals.

BPG ref.	1	2	3	4	5	6	7	8	9	10	11	12	13	13.5	14	15
Length	80	110	160	190	230	122	220	160	260	360	560	255	400	400	600	400
Width	75	75	75	75	75	120	120	160	160	160	160	250	250	250	250	405
Height	55	55	55	55	55	90	90	90	90	90	90	120	120	160	120	120

(All dimensions are in mm)

Before the Junction Box is installed, its total dissipated power for the particular application will be calculated in accordance with EN 60079-7:2003, Annex E, E.2 and will not exceed the values given in the tables below (Junction boxes of size not specified in the tables may be manufactured subject to the maximum dissipated power being based on a smaller enclosure):

EPL Ga Gb Db						
BPG ref.	Maximum Power Dissipation (W)					
	T6/T85°C Ta +40°C (max)	T6/T85°C Ta +55°C (max)	T6/T85°C Ta +60°C (max)	T6/T85°C Ta +65°C (max)	T5/T100°C Ta +55°C (max)	T4/T100°C Ta +90°C (max)
1	8.390	2.23	1.73	1.45	8.390	8.390
2	8.551	2.00	1.70	1.45	8.551	8.551
3	8.833	2.00	1.70	1.45	8.833	8.833
4	9.012	2.07	1.80	1.29	9.012	9.012
5	9.260	2.00	1.70	1.10	9.260	9.260
6	9.378	2.00	1.70	1.45	9.378	9.378
7	10.500	2.30	1.70	1.10	10.500	10.500
8	10.348	2.00	1.70	1.10	10.348	10.348
9	11.933	2.30	1.70	1.10	11.933	11.933
10	13.793	4.50	3.29	2.10	13.793	13.793
11	18.338	6.68	5.20	4.00	18.338	18.338
12	15.474	2.30	1.70	1.10	15.474	15.474
13	20.867	5.20	4.00	3.00	20.867	20.867
13.5	20.867	5.20	4.00	3.00	20.867	20.867
14	30.384	7.97	6.59	4.79	30.384	30.384
15	31.350	8.26	6.00	4.40	31.350	31.350

EPL Da						
BPG ref.	Maximum Power Dissipation (W)					
	T6/T85°C Ta +40°C (max)	T6/T85°C Ta +55°C (max)	T6/T85°C Ta +60°C (max)	T6/T85°C Ta +65°C (max)	T5/T100°C Ta +55°C (max)	T4/T100°C Ta +90°C (max)
1	4.195	1.115	0.865	0.725	4.195	4.195
2	4.2755	1	0.85	0.725	4.2755	4.2755
3	4.4165	1	0.85	0.725	4.4165	4.4165
4	4.506	1.035	0.9	0.645	4.506	4.506
5	4.63	1	0.85	0.55	4.63	4.63
6	4.689	1	0.85	0.725	4.689	4.689
7	5.25	1.15	0.85	0.55	5.25	5.25

Date: 30 September 2021

Page 1 of 3

CSA Group Testing UK Ltd.
Unit 6 Hawarden Industrial Park,
Hawarden Deeside CH5 3US, UK.

Annexe to: IECEx SIR 06.0087X Issue 6

Applicant: ABTECH Limited

Apparatus: BPG Range of Junction Boxes



EPL Da						
BPG ref.	Maximum Power Dissipation (W)					
	T6/T85°C Ta +40°C (max)	T6/T85°C Ta +55°C (max)	T6/T85°C Ta +60°C (max)	T6/T85°C Ta +65°C (max)	T5/T100°C Ta +55°C (max)	T4/T100°C Ta +90°C (max)
8	5.174	1	0.85	0.55	5.174	5.174
9	5.9665	1.15	0.85	0.55	5.9665	5.9665
10	6.8965	2.25	1.645	1.05	6.8965	6.8965
11	9.169	3.34	2.6	2	9.169	9.169
12	7.737	1.15	0.85	0.55	7.737	7.737
13	10.4335	2.6	2	1.5	10.4335	10.4335
13.5	10.4335	2.6	2	1.5	10.4335	10.4335
14	15.192	3.985	3.295	2.395	15.192	15.192
15	15.675	4.13	3	2.2	15.675	15.675

Conditions of Manufacture

- When the manufacturer has equipped the junction boxes with terminals, a routine electric strength test shall be carried out only if the components are wired. This test shall be carried out according to the following standards:
 - industrial control equipment: IEC 60947
 - measurement, control and laboratory use: IEC 61010
- The terminals used in these Junction Boxes will be IECEx approved devices chosen from the Approved Component Document number Sira 12AC087 that is issued by Sira. All terminals will be installed in accordance with their certificate conditions and the relevant codes of practice/wiring regulations paying particular attention to the following:
 - The maximum service temperature range.
 - The minimum creepage and clearance distances shall be maintained.
 - The rated voltages and currents may vary if cross-connection facilities are used.
 - The reduction in rating of adjacent terminals shall be observed, where applicable.

The terminals fitted into the junction boxes shall also conform to the following requirements:

Temperature class/ Dust marking	Requirement
T6/T85°C	The terminals shall have an insulation limiting temperature of 100°C minimum
T4/T100°C	The terminals shall have an insulation limiting temperature of +130°C.

- Suitably certified Ex e equipment such as breathing devices and blanks may be fitted to the enclosure providing the enclosure maintains compliance with IEC 60529 code IP64 or better.
- The manufacturer will take all reasonable steps to ensure that the power dissipated by the Junction Box does not exceed the maximum value stipulated in the table detailed in the Description of Equipment, in addition, the manufacturer will supply all the relevant information that will enable the user/installer to calculate the dissipated power in Watts for each Junction Box in accordance with IEC 60079-7 Annex E, E2.
- When the junction boxes are used for intrinsically safe applications, a 3 mm separation distance between the enclosure is required, there shall also be a minimum of 6 mm between different intrinsically safe circuits.
- When trunking is fitted, it may be sited as required and the minimum creepage and clearance distances shall still be met.
- The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer will inform Sira of any modifications of the devices that may impinge upon the explosion safety design of their products.

Date: 30 September 2021

Page 2 of 3

CSA Group Testing UK Ltd.
Unit 6 Hawarden Industrial Park,
Hawarden Deeside CH5 3US, UK.

Annexe to: IECEx SIR 06.0087X Issue 6

Applicant: ABTECH Limited

Apparatus: BPG Range of Junction Boxes



Full certificate change history

Issue 1 – this Issue introduced the following change:

1. To allow GB/SIR/ExTR06.0101/01 to replace GB/SIR/ExTR06.0101/00

Issue 2 – this Issue introduced the following changes:

1. The Description was aligned with certificate no. Sira 99ATEX3173 associated with this Junction Box, this included recognising the following changes assessed as part of that certificate.
 - The BPG 13.5 enclosure was added to the range.
 - The option to fit slotted trunking inside the enclosures, this trunking may be sited as required. The instructions were modified to recognise additional restrictions associated with this change and a new Condition of Manufacture was introduced.
2. Following appropriate re-assessment to demonstrate compliance with the requirements of the latest standards, the documents previously used for assessment were replaced by those currently listed, the markings were updated accordingly. In addition, the enclosure was allowed to be used for intrinsically safe applications and IEC 60079-11:2012 Edition 6 was included in the list of supporting standards.
3. The Condition of Certification related to static was removed; in addition, the Conditions of Manufacture were rationalised to bring them into line with Sira 99ATEX3173.
4. It was recognised that a new procedure for selecting terminals has been adopted by the manufacturer; this allows the terminals to be chosen from an Approved Component Document, Sira 12AC087, that is issued and controlled by Sira.

Issue 3 – this Issue introduced the following change:

1. Issued to correct the numbering of the changes in Issue 2 and to edit change
3. GB/SIR/ExTR14.0113/00 was removed.

Issue 4 – this Issue introduced the following changes:

1. Using IEC 60079-26, the junction boxes were allowed to be marked with 'Ex ia' and 'Ex ta' concepts for EPL levels Ga and Da, as a result of this change, the maximum power dissipation table was modified and a Special Condition for Safe Use was introduced necessitating the addition of an 'X' suffix to the certificate number.
2. The BPG range of junction boxes were allowed to be used in an upper ambient +55°C with a temperature class/surface temperature of T5/T100°C, the associated maximum power dissipation ratings (W) and markings were recognised.

Issue 5 – this Issue introduced the following change:

1. Issued to correct a typographical error

Issue 6 – this Issue introduced the following change:

1. Issued to Update the QAR

EU Declaration of Conformity



This is to declare that the products listed below are manufactured in conformity with the following EU Directives under the sole authority of Expo Technologies Ltd:

Electronic Timer Modules Type ETM-IS_*****

The ETM-IS is a powered electronic timer module designed to be powered by a battery or power supply. The battery pack contains a non-rechargeable battery. The timer settings are controlled by two BCD switches. Connections from the timer to a switch to enable timing and a solenoid valve which is used to terminate the timing cycle are provided. The solenoid valve is supplied with the timer and battery or power supply (certified separately). Four LED's are used to indicate the status of the timer circuit.

Low Voltage Directive 2014/35/EU

Electronic Timer Modules Type ETM-IS**-*** are intended for use in potentially explosive atmospheres (Hazardous Areas) and are therefore excluded from the Low Voltage Directive.

ATEX Directive 2014/34/EU Equipment for explosive atmospheres

Electronic Timer Modules Type ETM-IS**-*** are designed to conform to the ATEX Directive in fulfilment of the essential health and safety requirements set out in Annex II, and in compliance with:

EN 60079-0: 2018

EN 60079-11: 2012

Electronic Timer Modules Type ETM-IS**-*** are certified by FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin, Ireland. D02 E440, under EU Type-Examination Certificate FM10ATEX0003, in compliance with:

EN 60079-0: 2012 + A11:2013

EN 60079-11: 2012

Electronic Timer Modules Type ETM-IS**-*** are rated and shall be marked as follows:

Group II Category 1 G



Group II Category 1 D



Electronic Timer Modules Type ETM-IS**-*** are manufactured under Production Quality Assurance Notification SIRA 99 ATEX M043, issued by CSA Group Netherlands B.V. (CSA), Notified Body No 2813.

Signed for and on behalf of Expo Technologies Ltd.,



John Paul De Beer
Managing Director

Date 2nd November 2021
Confidential Assessment file reference SC039

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