D870-ES MiniPurge®

Manual

ML 636

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.

Section 1: System Specification

7 X LC / ss / ES / OV / PA / PC / H7

Size
7 = MiniPurge®
Purge flow rate:
6000 - 14000 Nl/min

Approval / Certification

ATEX Certificate:
Sira 01ATEX1295X
CE 2804 ⟨Ex⟩ II 2(2) G
Ex [pxb] ia IIC T4 Gb
T_{amb} -20°C to +60°C

IECEx Certificate:
IECEx SIR07.0027X
Ex [pxb] ia IIC T4 Gb
T_{amb} -20°C to +60°C

High Temperature =
Tamb: up to +60°C
Purge air Temp: max 70°C

PC = Pressurized Control.
Automatic leakage compensation (CLAPS)

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

OV = Purge Outlet Valve is pneumatically operated

Timing Method
ES = Electronic Timer powered by an EPPS (Electro-Pneumatic Power Supply)

MiniPurge® Housing
ss = Stainless Steel 316L

Pressurization Method
LC = Leakage Compensation

MINIPURGE® SPECIFIC CONDITIONS OF USE:

1. When using the AO, AS and DT options, the recommendations for the additional requirements of Ex p apparatus contained within IEC 60079-14 shall be applied.
2. The installer/user shall ensure that the MiniPurge Control Unit is installed in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
3. The values of the safety parameters shall be set in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
4. This MiniPurge Control Unit shall be incorporated into equipment and the appropriate Conformity Assessment Procedures applied to the combination. This certificate does not cover the combination.
5. The purge controller, low temperature version, shall be protected by a system that ensures that it cannot be energised if the temperature of the controller logic air or purge controller falls below -20°C. This system shall utilise the RTDs that are fitted to the purge controller to provide the appropriate level of system integrity.
6. Where a Vortex cooler is fitted the hot air outlet pipe shall be kept free from obstructions and blockage.

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7. The following routine tests are to be carried out:
   - The vortex cooler is functioning correctly. (H6 and H7 options ONLY)
   - The pneumatic logic isolator is functioning correctly (H6 and H7 options ONLY)
8. When using the 'LD' option, the LEDs have the following IS input parameters and it shall be supplied from a suitable intrinsically safe power supply for Zone 1 or Zone 2 depending on which zone the purge controller is being installed.

   Ui = 30V, Ii = 100mA, Pi = 1W, Ci = 0 and Li = 0

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	5100 Nl/min maximum.
Enclosure Material:	Stainless Steel 316L.
Mounting Method:	Wall mounting straps. Fixing holes as per drawing.
Temperature Limits:	Ambient temperature -20°C to +60°C Purge media temperature -20°C to +70°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:	4.2 to 10 barg (61 to 145 psi).
Main Regulator:	Set at 4.2 barg, 40 µm 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 2" NPT female. Minimum supply line 25 mm (1") ID tube, inlet sized appropriately for flow rate. Reference points & signals $^{1}/_{8}$" 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:	GRP, Ex e IIC T6 Gb / Ex tb IIIC T85°C Db IP66 T_{amb} : -60°C to 75°C. Mounted inside D870 system c/w terminals, front access cover & access for glands on bottom of D870 system.
Power Interlock Switch:	DPNO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db.
Alarm Switch:	SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db.
Intermediate Switch:	SPCO switch, contact ratings 250 Vac 4 Amps (AC-15) / 24V DC 4A, Ex d IIC T6 Gb / Ex tb IIIC T80°C Db.
Minimum Pressure Sensor:	Minimum: 0.5 mbarg. Maximum: 5.0 mbarg. Default Setting: 1.5 mbarg. Tolerance -0, +0.7 mbarg.

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Intermediate Sensor:	Minimum: 2.0 mbarg.	
	Maximum: 7 mbarg.	
	Default Setting: 4.0 mbarg.	
	Tolerance: -0, +10%.	
High Pressure:	Minimum: 20 mbarg.	
	Maximum: 35 mbarg.	
	Default Setting: 30 mbarg.	
	Tolerance: -0, +10%.	

Note: There must be a 1.5 mbarg difference between the minimum pressure and intermediate sensors and a 5 mbarg difference between the RLV lift-off point and the high pressure.

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:	110 kg (242.5lb).

Relief Valve Unit and Purge Outlet Valve with integral spark arrestor

Type:	Design number D200/ss/FS for size 7 Motorpurge.	
Bore:	Purge Outlet Valve Ø 200 mm, Relief Valve Ø 200 mm.	
Relief Valve Lift-Off Pressure:	Minimum:	20 mbarg.
	Maximum:	35 mbarg.
	Default:	30 mbarg (+0, -20%).
Flow Rate:	Range:	6000, 7000, 8000, 10000, 12000, or 14000 Nl/min.
	Default:	6000 Nl/min.
Material:	Housing:	Stainless steel 316L.
	Gasket:	Silicone foam.
	Spark arrestor:	Stainless steel mesh.
Mounting Method:	Rectangular cut-out and fixing holes as per drawing.	
Weight:	23 kg (50.7 lb).	

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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 Regulator 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

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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.

Section 3: 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	ABS	Polyurethane	Silicone
Mild (Carbon) Steel	Aluminium	Polycarbonate	Neoprene
Brass	Nylon	Acrylic	Polyester (glass filled)

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Section 4: Description and Principle of Operation

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

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

The principle of purge and pressurization is as follows:

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

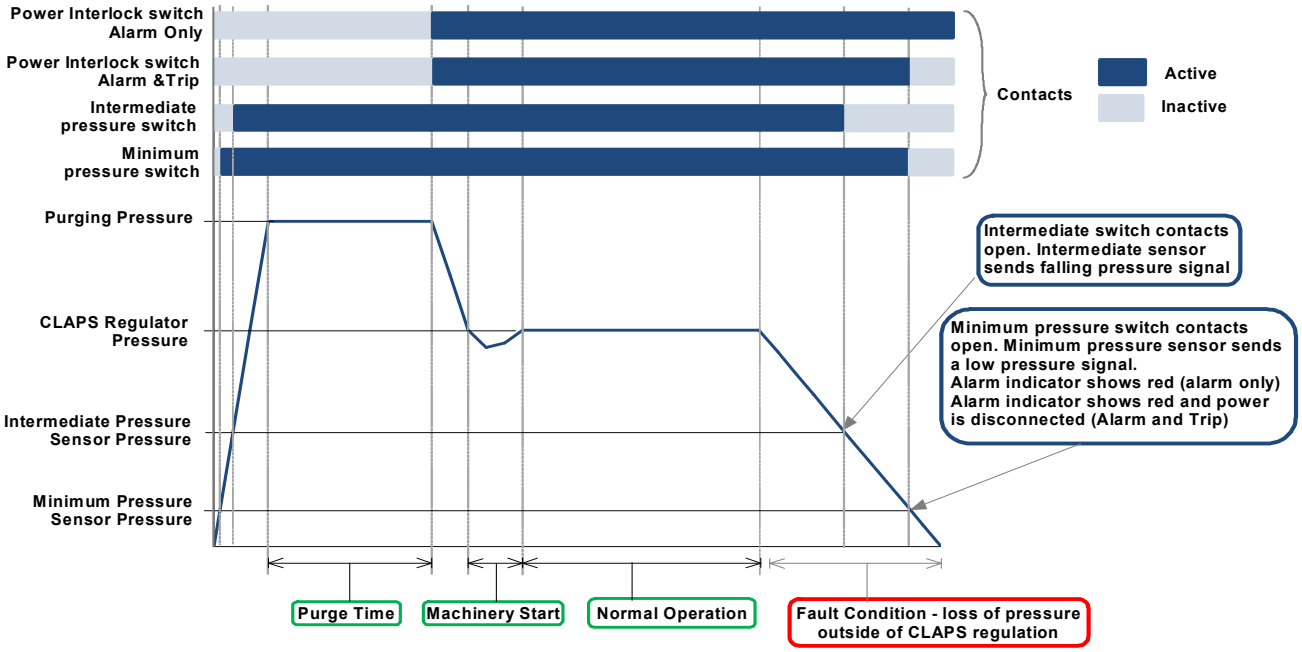
Prior to switching on the power to the electrical equipment, the enclosure must be purged to remove any flammable gas that might have entered the enclosure before pressurization. Purging is the process of removal contaminated air and replacement with air (or inert gas) known to be free from flammable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

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

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

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:



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Section 5: Main Components

Air Supply Filter / Regulator

The unit is provided with a 40 µm 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.

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 drops and provides early warning before the low pressure sensor trips the system.

High Pressure Sensor

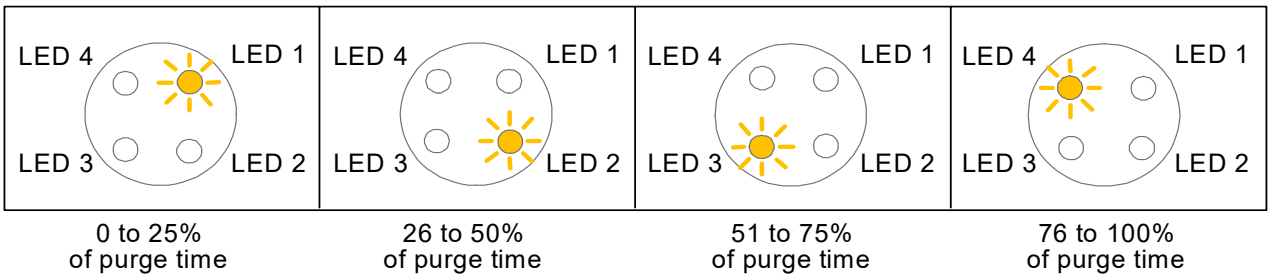
This sensor monitors the pressure inside the pressurized enclosure. When the pressure reaches the pressure setting, this sensor sends a signal to cut the pilot signal operating the volume booster until the pressure falls below the setting of the sensor.

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 is powered by an EPPS (Electro-Pneumatic Power Supply.) Supply air must be available for the EPPS to operate.

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EPPS (Electro-Pneumatic Power Supply)

The EPPS is a flameproof/explosion proof and dust-tight module, which uses a limited amount of air from the logic system to generate sufficient intrinsically safe power to drive the Electronic Timer. When the Electronic Timer is powered by an EPPS up to 30 seconds delay is expected once the flow sensor signal is received for the timer to start.

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 an 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.

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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.

Intermediate Switch

This is a flameproof switch which is activated by the signal from the Intermediate Sensor. The cable from the switch is terminated in the /PA terminal box.

High Pressure Switch (Optional)

This switch is operated by the signal from the High Pressure Sensor. It allows a remote electrical system status indicator to show whether the pressure inside the enclosure has reached the pressure setting of the high Pressure Sensor. 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 Regulator

The purge flow regulator is used to drive a pilot signal to the volume booster. The purge flow regulator is used to restrict the purge flow to the minimum required flow rate. The purge flow regulator 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.

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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.

Pneumatic Vortex Cooling Assembly

The pneumatic vortex cooling assembly is an automatic cooling system that allows the purge control unit to be used in areas with an ambient temperature of up to +60°C. The Vortex Cooling Assembly comprises of the Pneumatic Vortex Cooler and two capillary thermostats; the Vortex Cooler Activation Thermostat and the Logic Isolation Thermostat. These two thermostats are connected to the Pneumatic Vortex Cooler in a parallel configuration and work independently to each other. The Vortex Cooling assembly uses a vortex tube to split the compressed air supply allow the cold stream to ventilate the MiniPurge® housing to lower the ambient temperature for the sensitive logic components and exhaust the hot stream directly outside of the housing. Warning! The hot exhaust protruding through the MiniPurge® housing can reach surface temperatures of +55°C above ambient temperature; caution should be used when placing sensitive components near the exhaust or physical handling during cooling operation.

Vortex Cooler Activation Thermostat

A capillary tube thermostat with pneumatic signal output that is used to activate the Pneumatic Vortex Cooler when the enclosure's internal temperature exceeds a pre-determined set point of 50°C. The temperature set point is slightly lower than the Logic Isolation Thermostat to prevent constant isolation at 60°C.

Logic Isolation Thermostat

A capillary tube thermostat with pneumatic signal output that will isolate the logic supply when the ambient temperature inside of the MiniPurge® housing reaches above the pre-set value that has been set in accordance to ATEX and IECEx certification. The Logic Isolation Thermostat will cut the supply to the logic circuit to protect the operation of the sensitive logic components under high ambient temperatures and will maintain the supply isolation until the temperature within the logic compartment has dropped below the falling switch point of the thermostat.

Section 6: 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.

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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.

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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.

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Section 7: 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:

9. Check all connections and that the Relief Valve Unit is fitted correctly with an unobstructed path to the purge exhaust.
10. Close the Purge Flow Regulator Valve.
11. Fully open external supply shut-off valve where fitted.
12. Check that the internal logic pressure gauge reads 2.5 barg / 36 psi / 250 kPag.
13. Check that the pressure gauge on main air supply reads 4.2 barg / 61 psi / 420 kPag.
14. 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 Regulator 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.
15. Close the Purge Flow Regulator Valve.
16. Remove the manometer and reconnect the minimum pressure sensing pipe to the bulkhead fitting.
17. Remove red plug from the top of the Minimum Pressure Sensor and connect a gauge manometer.
18. Connect a differential manometer to the test points on the flow sensor.
19. 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 Regulator 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 Regulator Valve until the purging indicator stops **flashing yellow.**
    - Take a reading from pressure gauge.
20. To set the purge flow rate:
    - Turn on the compressed air to the MiniPurge®.
    - Gradually open the Purge Flow Regulator 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.

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- 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 Regulator Valve, ensure the over pressure within the pressurized enclosure does not exceed the pressure relief valve setting.

21. 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.
22. 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.
23. Gradually turn the CLAPS Regulator anti-clockwise to reduce enclosure pressure.
24. Reduce regulator until intermediate sensor causes contacts to open.
25. Check the manometer on the minimum pressure sensor.
26. Continue to reduce the CLAPS Regulator to test the minimum pressure sensor.
27. To check operation of Minimum Pressure Sensor, check readings on manometer as system will automatically re-purge when it reaches minimum pressure.
28. While the system re-purges, return the CLAPS Regulator to the initial setting.
29. If minimum pressure is below the set point, refer to the Recalibration section
30. 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.
31. 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.
32. To test the CLAPS settings, create a leak in the system by removing a bolt or losening a gland plate in order to create a 15mm hole. Remember to replace bolt or retighten gland plate after testing.
33. 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.
34. 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.

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Section 8: 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.
- Check that the electrical and pneumatic connections to the EPPS are secure.
- Check that the exhaust port on the EPPS is not obstructed.

Additional maintenance checks

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

- 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 EPPS

The EPPS is intended to be maintenance free. However, routine inspection of the electrical and pneumatic connections is required to ensure safe operation. Check that the exhaust port on the EPPS is not obstructed, and firmly secured to the base plate.

The EPPS should not be opened. Any modifications on the EPPS will invalidate the certificate.

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

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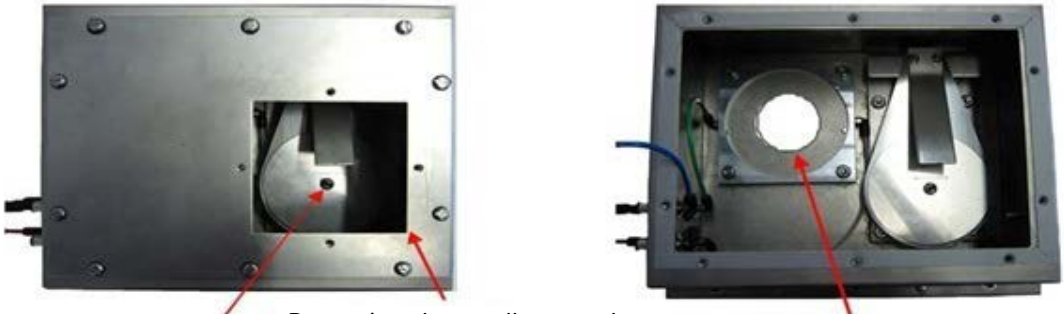
To adjust the lift off pressure of the Relief Valve:

- 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 $^1/_4$ 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 $^1/_8$ of a turn step.
- Turn clockwise to reduce the pressure setting and anti-clockwise to increase.
- Replace sensor, screwing clockwise, then reconnect all pipe work.

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Section 9: 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	The actual Motor Housing pressure below the setting of the Minimum Pressure Sensor.	• Check it with a manometer.
	Enclosure leaking excessively.	• 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.	• Replace tubing.
Leakage Compensation Valve	The Leakage Compensation Valve setting is too low and the Motor Housing is tripping out after purging due to low pressure.	• Try increasing the setting of the Leakage Compensation Valve to raise the pressure in the Motor Housing at the end of purging.
MiniPurge® Control Unit	The Minimum Pressure Sensor setting has drifted above the setting	The Minimum Pressure Sensor needs re-calibrating. • Refer to Re-calibration of Pressure Sensors in the Maintenance section

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Relief Valve opens (continuously or intermittently)

Fault Location	Cause	Solution
Pressurized Enclosure	Enclosure pressure is too high.	• Adjust the Leakage Compensation Valve.
Relief Valve Unit	Relief Valve malfunction.	• Consult manufacturer's manual.

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 4.2 barg must be maintained during purge • 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.	• 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.	• Ensure fitting nuts are tightened. • Check for tube damage. • Repair as necessary.
Relief Valve Unit	Relief Valve opening during purge.	• Check enclosure pressure on start up is less than Relief Valve lift off pressure.
MiniPurge Control Unit	Flow sensor setting incorrect.	• 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	• Reset timer to correct purge time.
	EPPS not working properly	• Check all piping connections to EPPS and connection from EPPS to Timer Module. • Check that the external exhaust port on the EPPS is free of any debris or obstructions. • EPPS may need to be replaced.

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Section 10: Recommended Spares List

Part Number	Description
HF1-A04N-002	Filter Kit for HF1-A04N-001 2" filter
S0030/606	Purge flow sensor factory set to 6.4 mbarg
AGM-PA00-121*	Minimum Pressure sensor
AGM-PA00-121*	Intermediate pressure sensor
AGM-PA00-120*	CLAPS Sensor
AGM-PA00-122*	High Pressure Sensor
S0015/018	Pressure gauge (Air Supply Pressure), 0 - 10 barg
S0015/135	Miniature gauge (Logic Pressure), 0-4 barg
EPW-EPPS-000	EPPS 10.8V 80mA (Electro-Pneumatic Power Supply)

* must be factory set to the value as stated on the Customer Test and Inspection Sheet.

Section 11: Glossary

Acronym	Definition
A&T	Alarm and Trip
AO	Alarm Only
CLAPS	Closed Loop Automatic Pressurization System
CU	Control Unit
EPPS	EPPS (Electro-Pneumatic Power Supply)
FCV	Flow Control Valve
IS	Intrinsically Safe
LC	Leakage Compensation
PA	Power and Alarm
RLV	Relief Valve Unit

Section 12: Drawings and Diagrams

Title	Drawing Number	Number of Sheets
D870 MOTORSYS-S	XBR-7TD0-149	3
RLV200 MOTORPURGE RELIEF VALVE	XBR-RTD0-007	1
D870 HOOK UP DIAGRAM	D870-HU	1
D870 P AND I DIAGRAM	D870-PI	1
D870 CIRCUIT DIAGRAM	AGM-PA00-205	2
D870 & D872 Ex e TERMINAL BOX LAYOUT	AGE-WC00-338	1

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Section 13: Certifications

Download the certificates at www.expoworldwide.com or refer to ML497.

Component	Certificate	Number
Purge System	EU Declaration of Conformity	SC004-CE*
	ATEX Certificate	SIRA 01ATEX1295X
	IECEx Certificate	IECEx SIR07.0027X
MIU/e Ex e Terminal Box	ATEX Certificate	BASEEFA 06ATEX0117X*
	IECEx Certificate	IECEx BAS06.0028X*
Electronic Timer	EU Declaration of Conformity	SC039-CE*
	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
EPPS	EU Declaration of Conformity	SC047*
	ATEX Certificate	DEMKO 17ATEX1795X
	IECEx Certificate	IECEx UL17.0016X
Heater	ATEX Certificate	KEMA 01ATEX2124 X*
	IECEx Certificate	IECEx DEK 11.0017*
Thermostat	ATEX Certificate	LCIE 99 ATEX 6017 X*
	IECEx Certificate	IECEx LCI 07.0003X*

*Certificates attached to manual.

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8	7	6	5	4	3	2	1

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

F

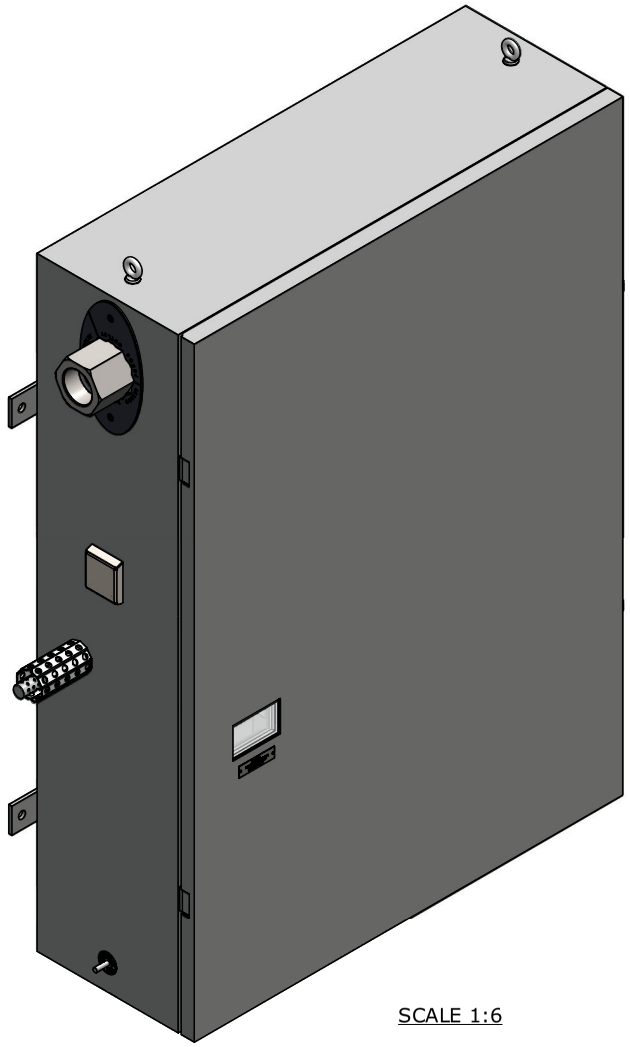
E

D

C

B

A



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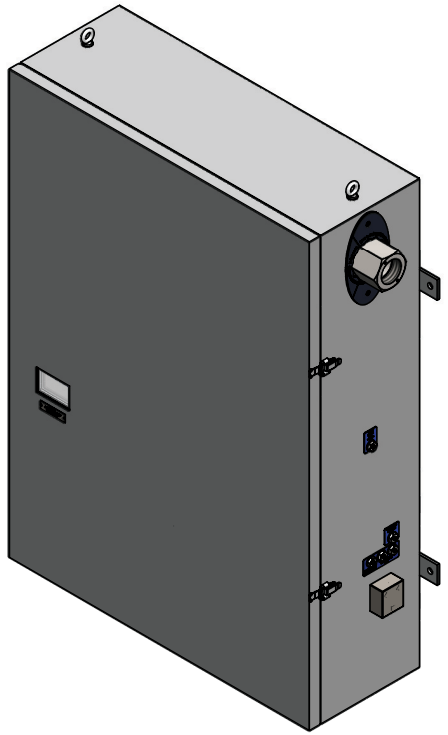

SCALE 1:10

HIGH-TEMPERATURE MOTORPURGE SYSTEM
MODEL: D870MOTORSYS-S

TECHNICAL SPECS:
- SUPPLY: 4.2 - 10barg
- FLOW CAPACITY: 6000-14000Nl/min
- AMBIENT TEMPERATURE: -20 to +60°C
- MEDIA/SUPPLY TEMPERATURE: -20 to +70°C
- RLV200/ss/FS
- SYSTEM NET WEIGHT (Approx.): 115kg
- GROSS SHIPPING WEIGHT (Approx.): 185kg

MATERIALS:
- SYSTEM HOUSING AND FLANGES: STL ST 316.
- BULKHEAD FITTINGS: STL ST 304/316.

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
01	10378	12/12/2022	AO	RD	AW
B	10358	28/10/2022	AO	PB	AW
A	-	06/10/2022	AO	PB	AW

DRAWN DATE	CONTROLLED	MATERIAL	WEIGHT (Kg)
06/10/2022		SEE PART DETAILS	115.0
DRAWING STATUS	REVISION	FINISH	TITLE
RELEASED	01	SEE NOTES	D870 MOTORSYS-S
SCALE 1:10	A3		

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DRAWING No. XBR-7TD0-149

SHEET No. 1 OF 3

expo Technologies

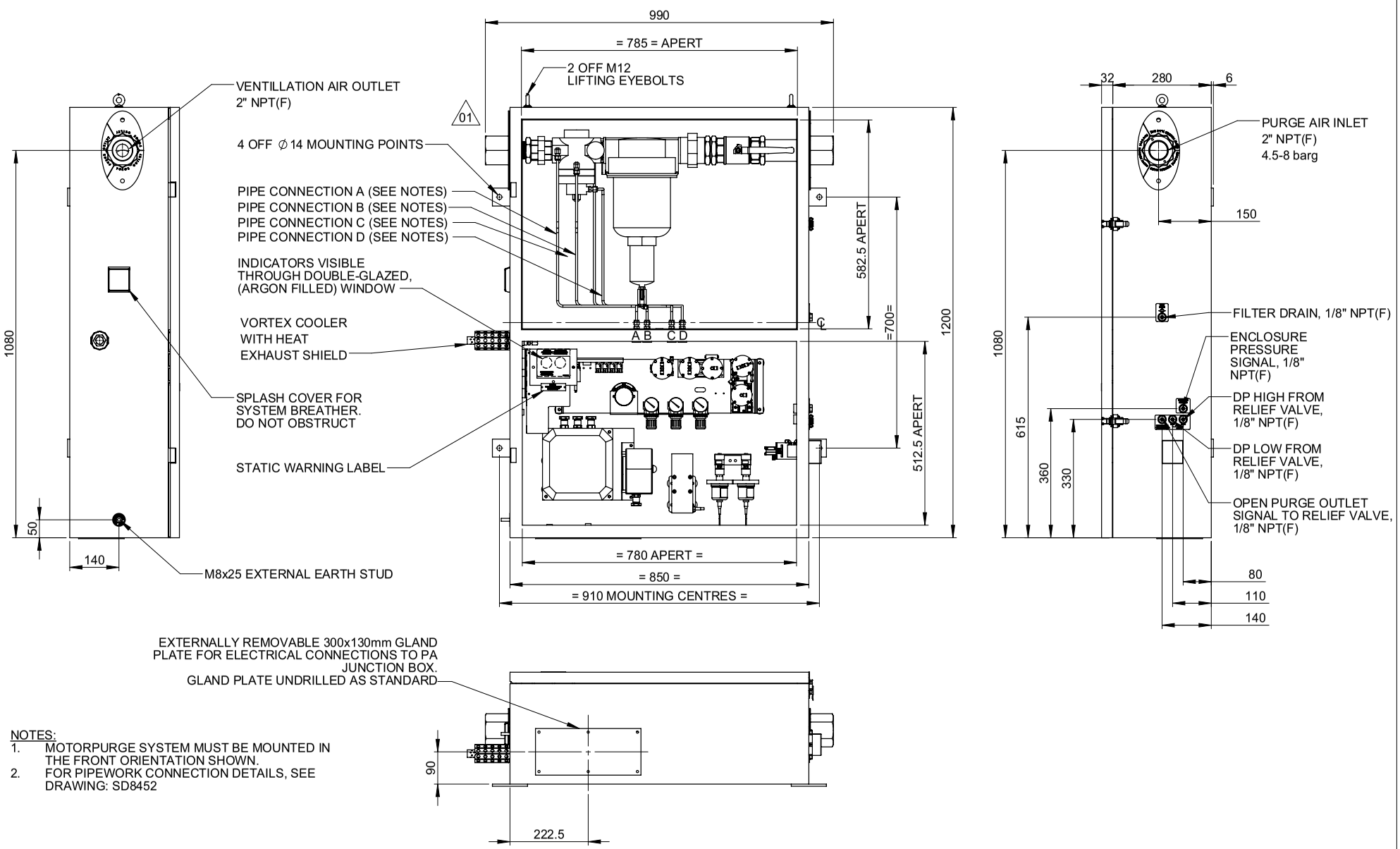
8	7	6	5	4	3	2	1

3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

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

DO NOT SCALE
IF IN DOUBT ASK



NOTES:
1. MOTORPURGE SYSTEM MUST BE MOUNTED IN THE FRONT ORIENTATION SHOWN.
2. FOR PIPEWORK CONNECTION DETAILS, SEE DRAWING: SD8452

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
01	10378	12/12/2022	AO	RD	AW
B	10358	28/10/2022	AO	PB	AW
A	-	06/10/2022	AO	PB	AW

DRAWN DATE: 06/10/2022
CONTROLLED:
DRAWING STATUS: RELEASED
REVISION: 01
SCALE: 1:10
A3

MATERIAL: SEE PART DETAILS
FINISH: SEE NOTES
WEIGHT (Kg): 115.0

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TITLE: D870 MOTORSYS-S

DRAWING No. XBR-7TD0-149

SHEET No. 2 OF 3

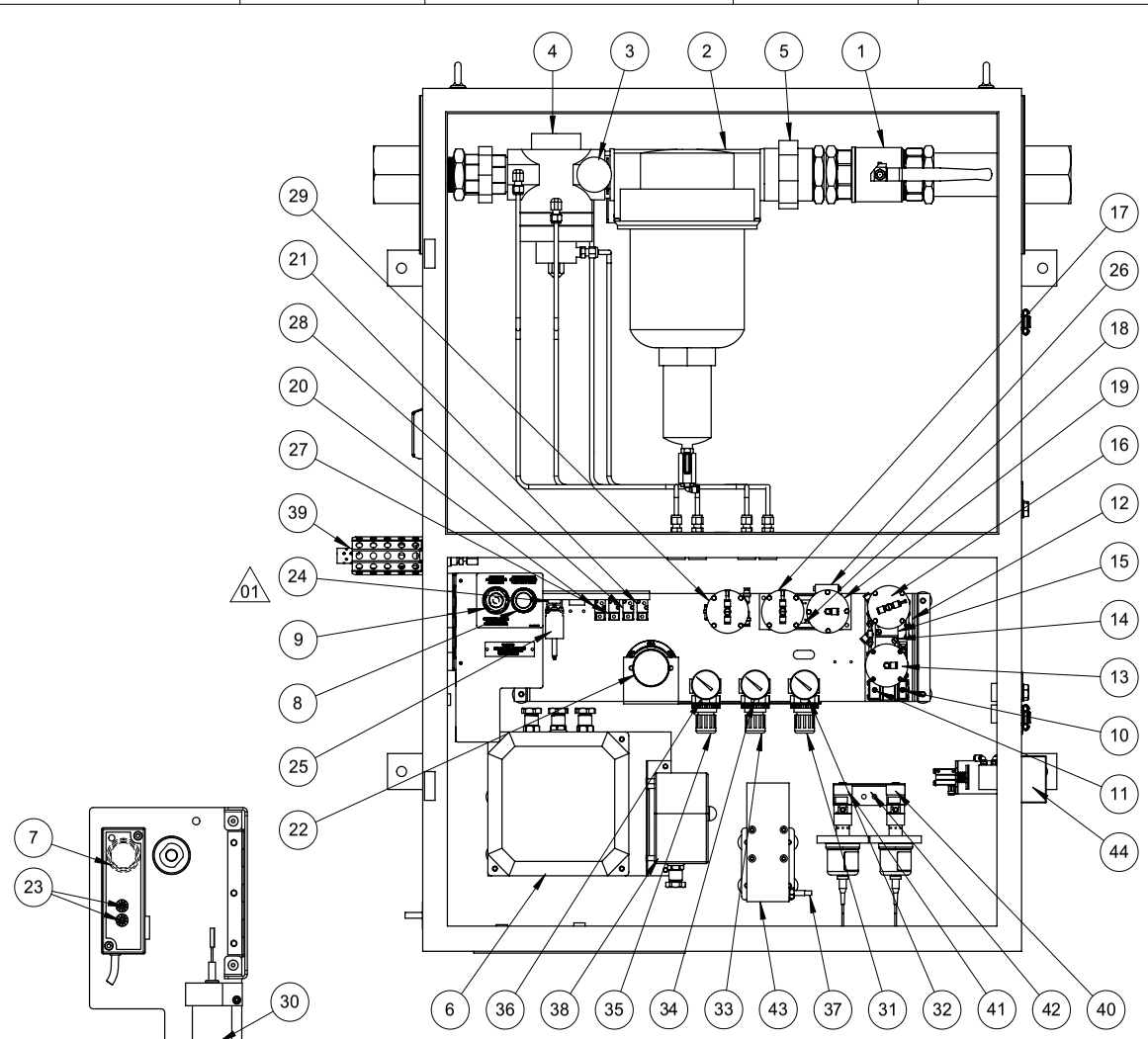
8	7	6	5	4	3	2	1

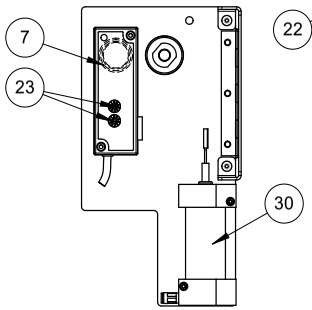
3RD ANGLE PROJECTION

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





BREAK OUT SECTION
OF EPPS MODULE

THIS DRAWING DETAILS THE STANDARD D870 MOTOR PURGE.

No.	DESCRIPTION
1	MAIN AIR SUPPLY SHUT OFF VALVE
2	MAIN AIR SUPPLY FILTER
3	MAIN AIR SUPPLY GAUGE
4	VOLUME BOOSTER
5	CONICALLY SEATED UNION
6	Ex e ELECTRICAL JUNCTION BOX PL620
7	ELECTRONIC PURGE TIMER WITH LED INDICATOR
8	SYSTEM PURGING INDICATOR, QUAD AMBER LEDS
9	LOW PRESSURE ALARM & TRIP INDICATOR, RED/GREEN
10	ALARM/PRESSURIZED SWITCH, AC-15, 250V 4A, SPCO
11	POWER INTERLOCK SWITCH, AC-15, 250V 4A, DPCO
12	LOGIC MANIFOLD
13	PURGE FLOW SENSOR
14	PURGE COMPLETE VALVE
15	TIMER VALVE
16	MINIMUM PRESSURE SENSOR
17	INTERMEDIATE PRESSURE SENSOR
18	PURGE OUTLET OPEN SIGNAL VALVE (2)
19	CLAPS SENSOR
20	PURGE OUTLET OPEN SIGNAL VALVE (1)
21	PURGE SIGNAL ISOLATION VALVE
22	CLAPS REGULATOR
23	TIME SELECTOR SWITCHES
24	INTERMEDIATE PRESSURE SWITCH ACTUATOR
25	INTERMEDIATE PRESSURE SWITCH AC-15 250V 4A SPCO
26	FLOW RESTRICTOR (CLAPS SENSOR SUPPLY)
27	PURGE CHANGEOVER VALVE (1)
28	PURGE CHANGEOVER VALVE (2)
29	HIGH PRESSURE SENSOR
30	EPPS (ELECTRO PNEUTMATIC POWER SUPPLY)
31	SYSTEM REGULATOR
32	SYSTEM REGULATOR GAUGE
33	LOGIC SUPPLY REGULATOR
34	LOGIC SUPPLY REGULATOR GAUGE
35	PURGE FLOW REGULATOR
36	PURGE FLOW REGULATOR GAUGE
37	RTD SENSOR
38	Ex d THERMOSTAT
39	VORTEX COOLER
40	LOGIC ISOLATOR THERMOSTAT
41	VORTEX COOLER OPERATIONAL THERMOSTAT
42	LOGIC ISOLATING VALVE
43	HEATSINK FOR LOGIC ISOLATOR THERMOSTAT
44	SAU25 SPARK ARRESTOR FOR VORTEX COOLER

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01	10378	12/12/2022	AO	RD	AW
B	10358	28/10/2022	AO	PB	AW
A	-	06/10/2022	AO	PB	AW

DRAWN DATE: 06/10/2022
CONTROLLED:
DRAWING STATUS: RELEASED
REVISION: 01
SCALE: 1:7
A3

MATERIAL: SEE PART DETAILS
FINISH: SEE NOTES
WEIGHT (Kg): 115.0

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: D870 MOTORSYS-S

DRAWING No.: XBR-7TD0-149

SHEET No. 3 OF 3

expo Technologies

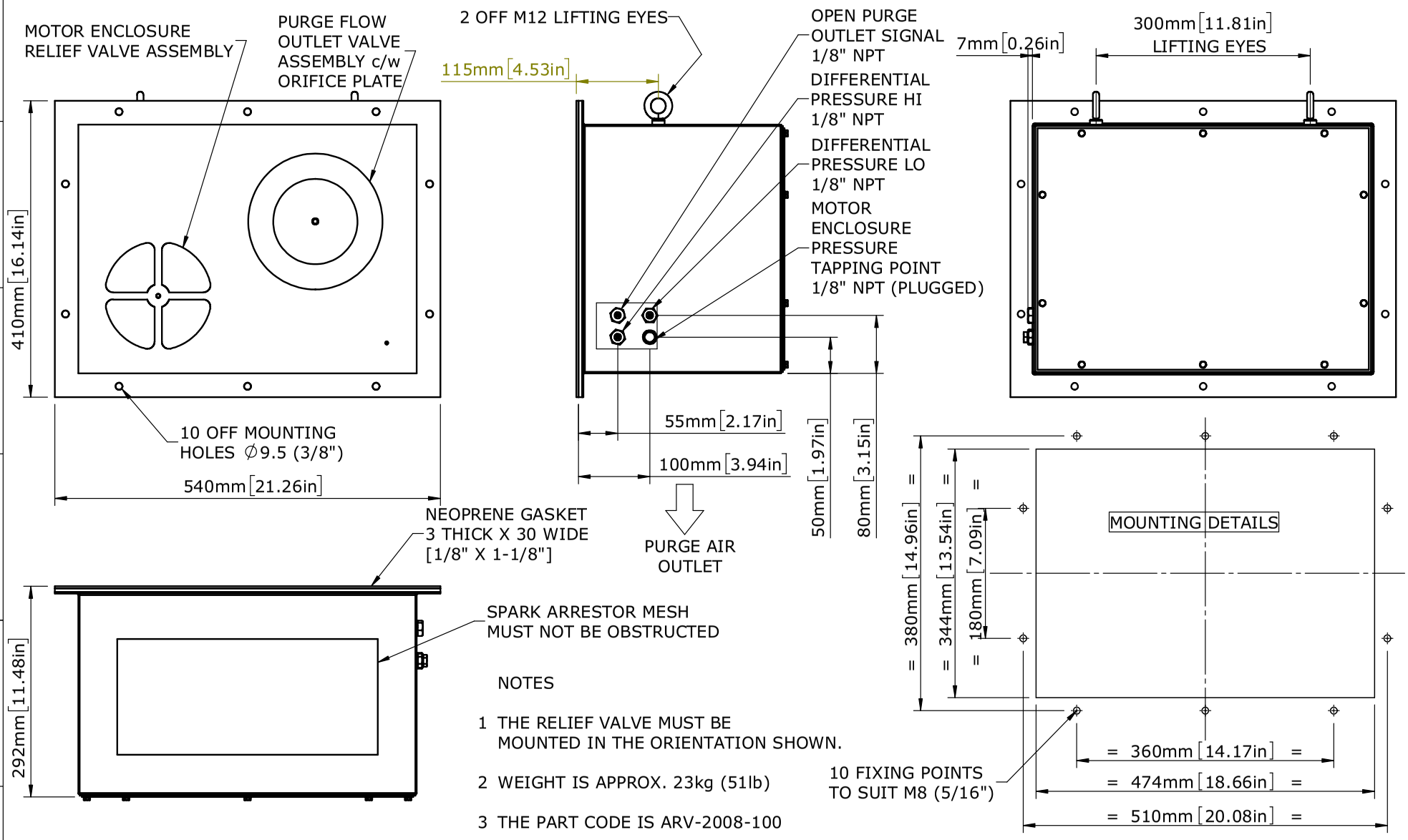
8	7	6	5	4	3	2	1

3RD ANGLE PROJECTION

DIMENSIONS IN mm
[ ] DENOTES IMPERIAL

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

DO NOT SCALE
IF IN DOUBT ASK



NOTES

1 THE RELIEF VALVE MUST BE MOUNTED IN THE ORIENTATION SHOWN.

2 WEIGHT IS APPROX. 23kg (51lb)

3 THE PART CODE IS ARV-2008-100

REVISION	MOD No.	DATE	DRAWN	CHECKED	APPROVED
09	DQN-12447	02/09/2020	CE	RJ	AR
08	6787	22/01/2020			PB
07	6597	17/08/2017			JG

DRAWN DATE: 26/09/2007
CONTROLLED:
DRAWING STATUS: RELEASED
REVISION: 09
SCALE: 1:5
A3

MATERIAL: STAINLESS STEEL 316L 2.0mm THK
FINISH: NROB
WEIGHT (Kg): 23.0

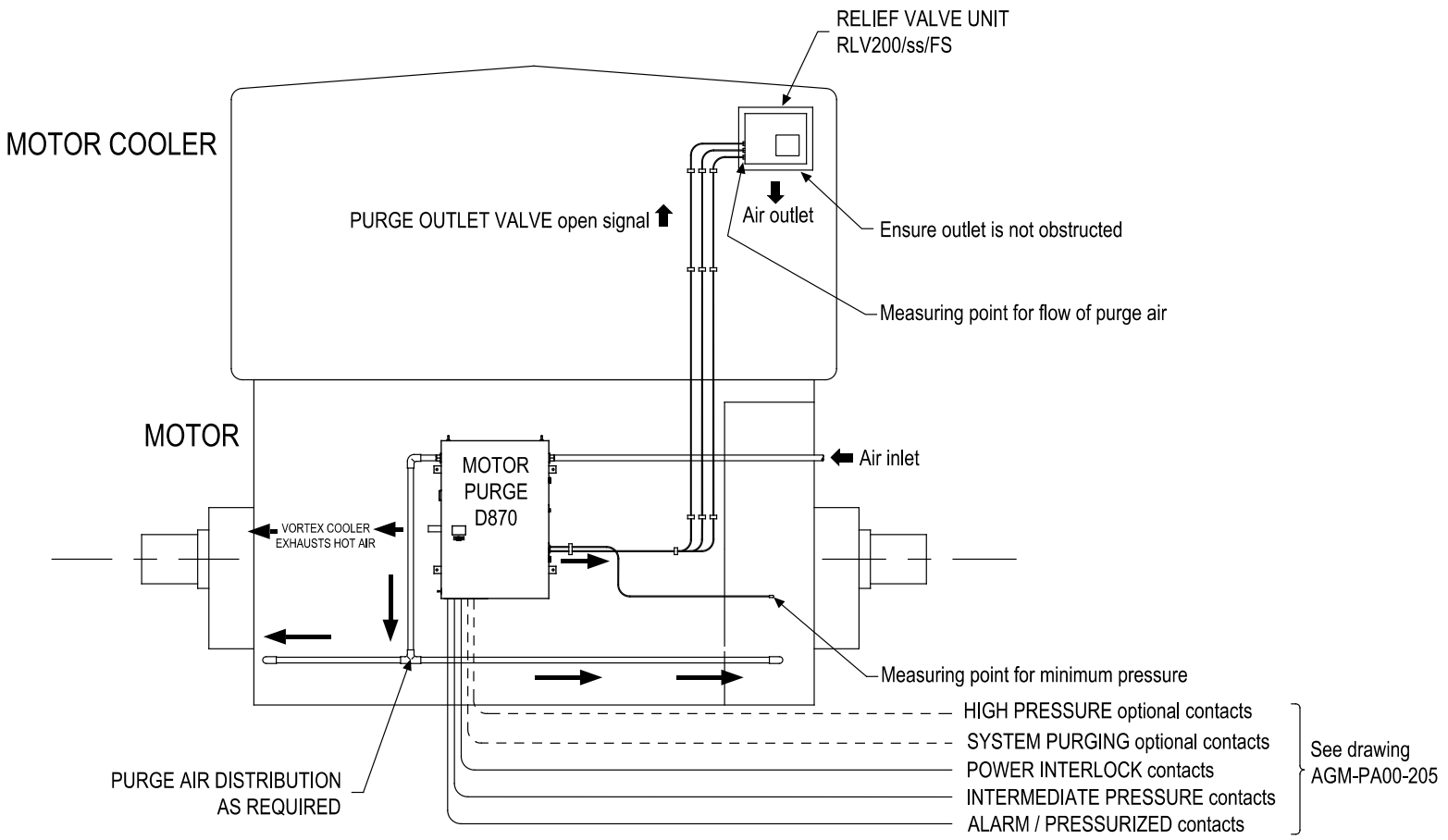
Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: RLV200 MOTORPURGE RELIEF VALVE

DRAWING No. XBR-RTD0-007

SHEET No. 1 OF 1

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



REVISION	MOD #	DATE	DRAWN	CHECKED	APPROVED
01	-	21/10/22	AO	RD	AW

DRAWN DATE	CONTROLLED
21/10/2022	
DRAWING STATUS	REVISION
RELEASED	01
SCALE N.T.S	A3

MATERIAL: N/A

FINISH: N/A

WEIGHT (Kg):

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

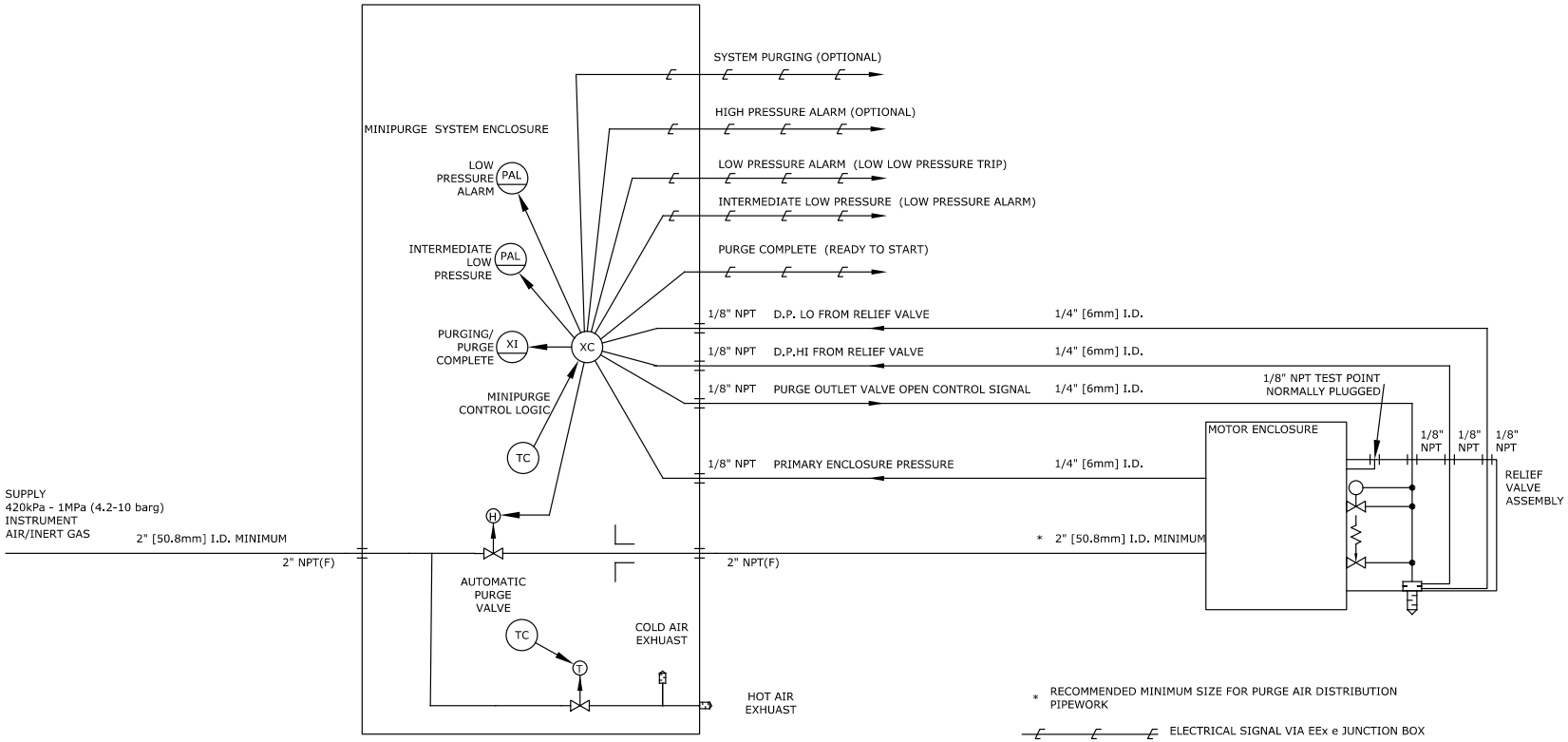
TITLE: D870 HOOK UP DIAGRAM

DRAWING No.: D870-HU

SHEET1

expo Technologies

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



REVISION	MOD #	DATE	DRAWN	CHECKED	APPROVED
01	-	21/10/22	AO	PB	AW

DRAWN DATE	CONTROLLED
21/10/2022	
DRAWING STATUS	REVISION
RELEASED	01
SCALE N.T.S	A3

MATERIAL: N/A

FINISH: N/A

WEIGHT (Kg):

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

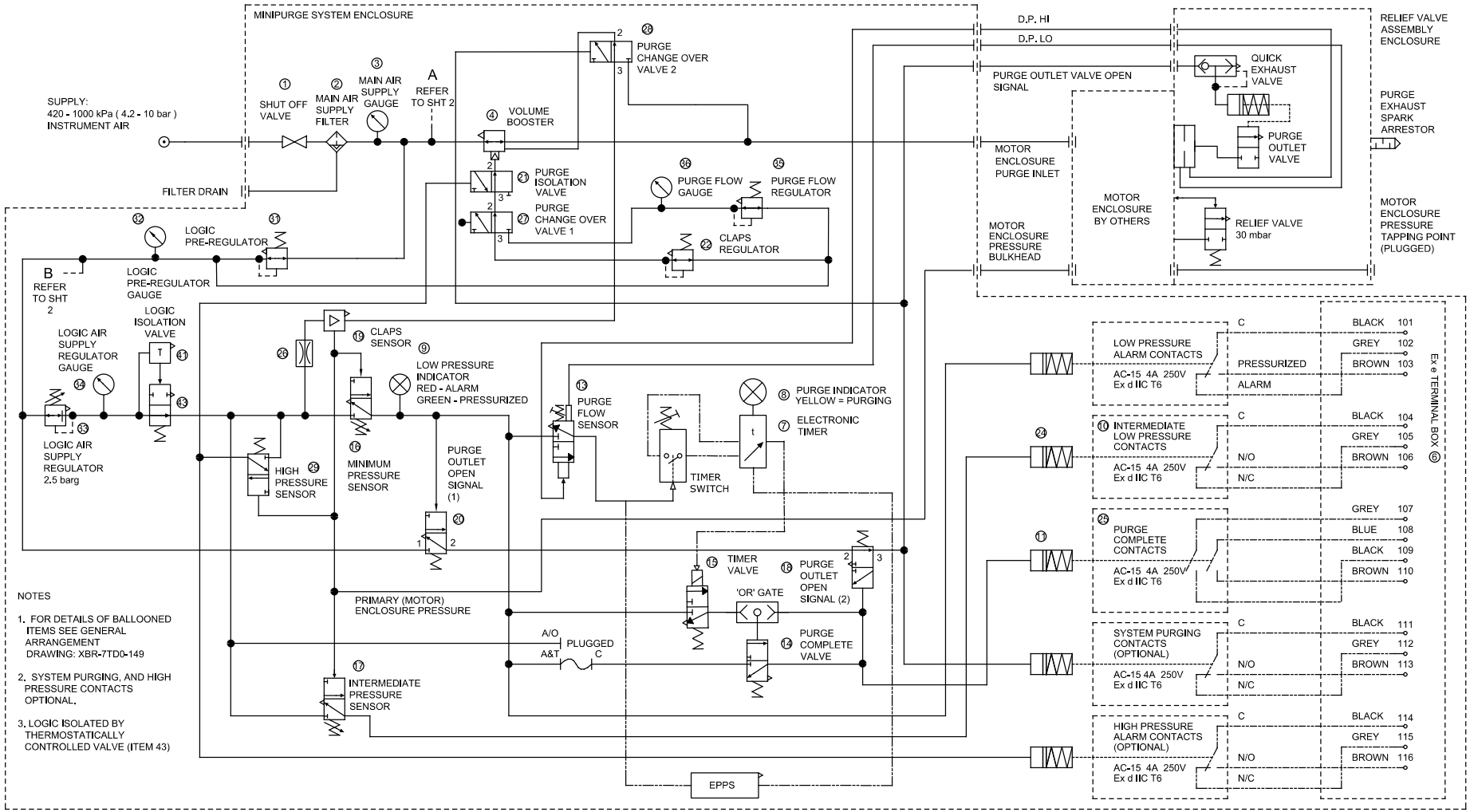
TITLE: D870 P AND I DIAGRAM

DRAWING No.: D870-PI

SHEET No. 1 OF 1

expo Technologies

1	2	3	4	5	6	7	8
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	The contents of this drawing / document are Copyright © Expo Technologies Limited. They are to be treated as confidential and are returnable upon request. They are not to be copied or communicated in part or in whole without written consent from Expo Technologies Limited, neither are they to be used in any way against our interests.			



REVISION	MOD #	DATE	DRAWN	CHECKED	APPROVED
01	-	12/10/22	AO	RD	AW

DRAWN DATE	CONTROLLED
12/10/2022	
DRAWING STATUS	REVISION
RELEASED	01
SCALE N.T.S	A3

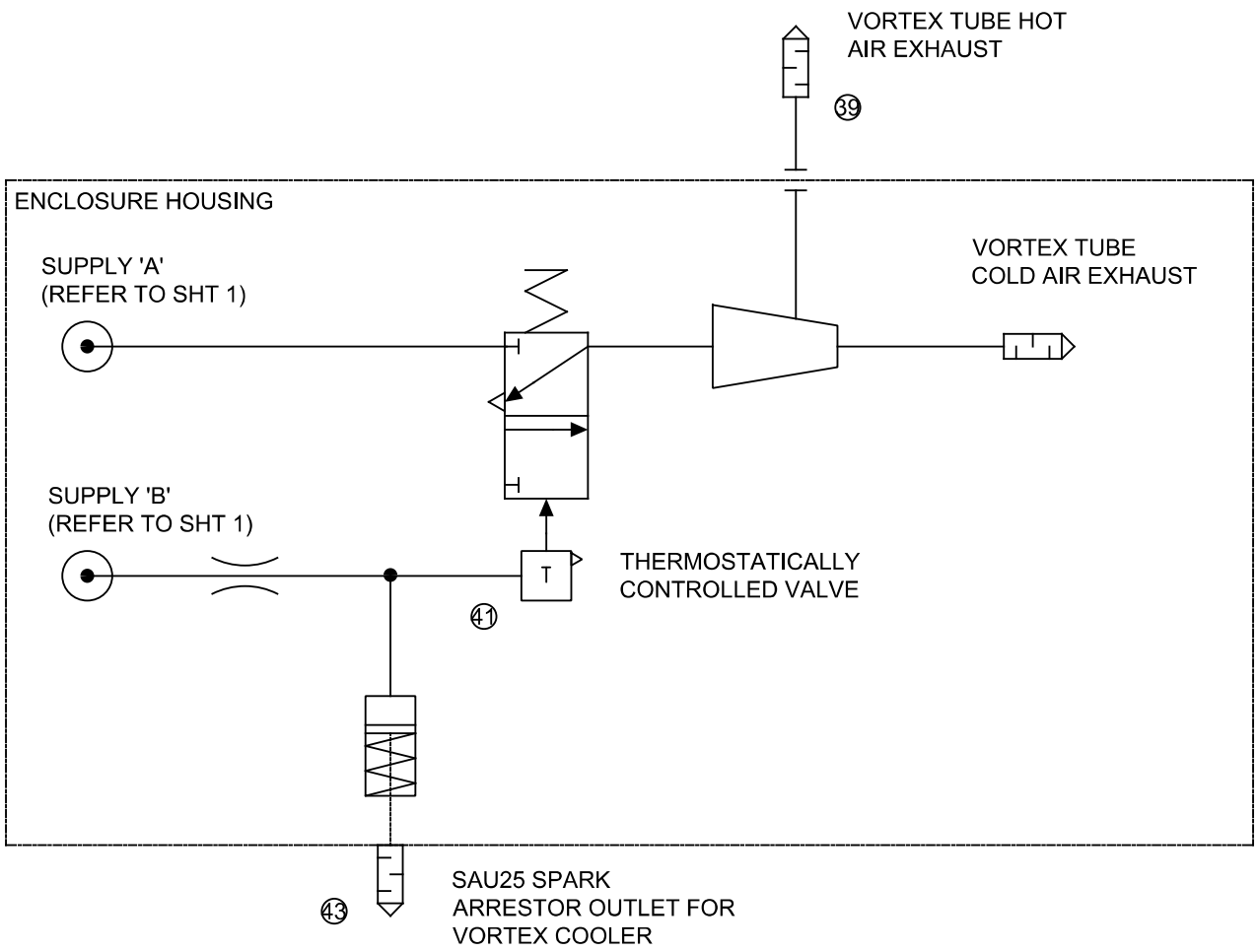
MATERIAL: N/A
FINISH: N/A
WEIGHT (Kg):

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

TITLE: D870 CIRCUIT DIAGRAM

DRAWING No.: AGM-PA00-205
SHEET1

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



REVISION	MOD #	DATE	DRAWN	CHECKED	APPROVED
01	-	12/10/22	AO	RD	AW

DRAWN DATE	CONTROLLED
12/10/2022	
DRAWING STATUS	REVISION
RELEASED	01
SCALE N.T.S	A3

MATERIAL: N/A

FINISH: N/A

WEIGHT (Kg):

Expo Technologies Limited
SURREY TW16 5DB UNITED KINGDOM

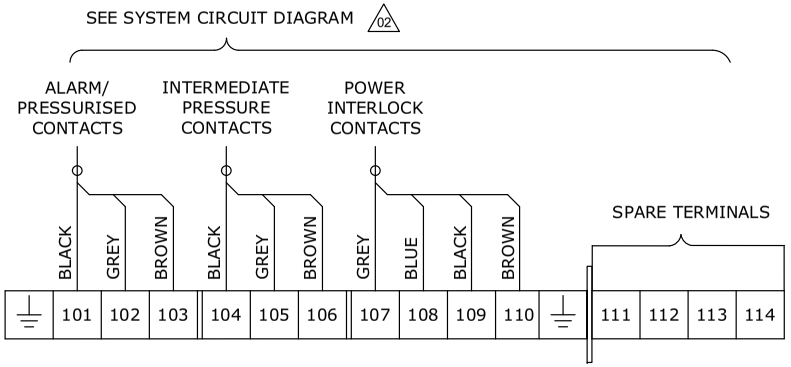
TITLE: D870 CIRCUIT DIAGRAM

DRAWING No.: AGM-PA00-205

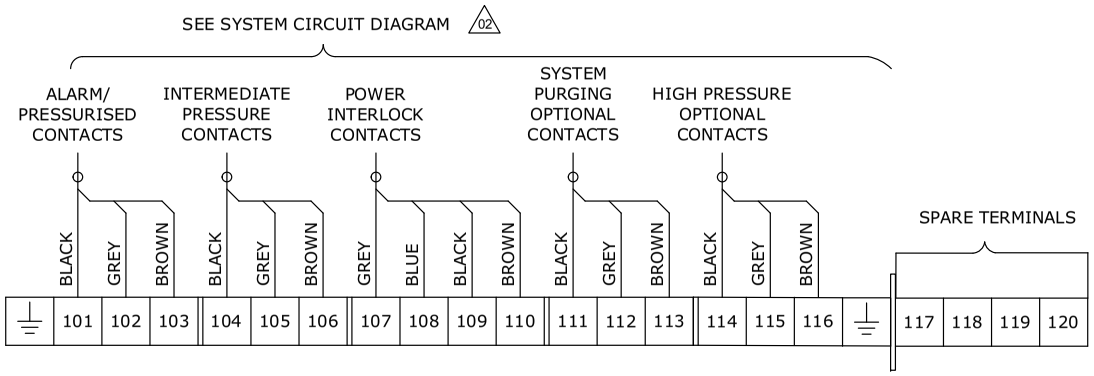
SHEET No. 2 OF 2

expo Technologies

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		



TERMINAL LAYOUT



TERMINAL LAYOUT FOR SYSTEM FITTED WITH OPTIONAL "SYSTEM PURGING" & "HIGH PRESSURE" CONTACTS

NOTES: 1) DOUBLE LINES SHOW THE POSITION OF TERMINAL END PLATES AND SEPARATORS

2) MAXIMUM PER TERMINALS 101-113 AT 55°C: 250V 4A (AC-15)

REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
02	24/112	AO	BA	SH	11/04/2024
01	-	AO	RD	AW	16/12/2022

DRAWING No.: AGE-WC00-338

LIFECYCLE STATE: RELEASED

REVISION: 02

TITLE: D870 & D872 Ex e TERMINAL BOX LAYOUT

MATERIAL: N/A (MASS [Kg]): N/A

FINISH: N/A N/A

COMPLIANCE REQUIRED: REACH; RoHS & 3TG SCHEDULE DOC. REF ✓ ML643 - MIU/e & MIU/d

DRAWING TYPE: SCHEMATIC

SCALE: N.T.S SIZE: A3 SHEET: 1/1

expo Technologies

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

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

EU Declaration of Conformity CE

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

Object of the declaration:

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

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

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

The Following harmonised standards and technical specifications have been applied:

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

Notified Body:

NB Name:	ExVeritas
NB Number:	2804

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

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

Date: 7th May 2024

1

EC - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 EC - Type Examination Certificate Number: **Baseefa06ATEX0117X**

4 Equipment or Protective System: **PL6** Range of Junction Boxes**

5 Manufacturer: **Hawke International**

6 Address: **Oxford Street West, Ashton-under-Lyne, Lancashire, OL7 0NA**

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

8 Baseefa (2001) Ltd., Notified Body number 1180, in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **GB/BAS/Ex/TR06.0033/00**

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

EN 60079-0:2004, EN60079-7:2003, EN 61241-0: 2004, EN 61241-1: 2004

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 equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. 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 the following :

Ex II 2GD Exe II Ex tD A21 T(see schedule) 80°C Tamb -60°C to (see schedule)

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **0500**

Project File No. **04/0901**

This certificate is granted subject to the general terms and conditions of Baseefa (2001) Ltd. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

Baseefa
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Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
e-mail info@baseefa.com web site www.baseefa.com
Baseefa is a trading name of Baseefa (2001) Ltd
Registered in England No. 4305578 at the above address

R S SINCLAIR
DIRECTOR
On behalf of
Baseefa (2001) Ltd.

Re-issued 06/07/10 – minor clarifications

13 # Schedule

14 **Certificate Number Baseefa06ATEX00117X**

15 **Description of Equipment or Protective System**

The PL6** Range of Junction Boxes consist of the type ZPL6* range of plastic empty enclosures covered by Baseefa06ATEX0116U Exe II. The junction boxes are fitted with a variety of different terminal arrangements. All the terminals are covered by their own component certificates and are coded Exe II. The terminals are listed on D9160 held on Baseefa General Technical File 0500. The actual terminals fitted to each junction box will be listed in the schedule of the instruction sheet supplied with the junction box.

The terminals must be used within their relevant temperature range, voltage and current limitations, and fitted in accordance with IEC 60079 with regard to creepage and clearance distances by Hawke International. Details on drawing C2542 describe partitioning arrangements which allow for the termination of intrinsically safe (i.s.) circuits and non i.s. circuits within the same junction box. When i.s. circuits are present an additional label is fitted to the outside of the junction box stating 'INTRINSICALLY SAFE CIRCUITS ENCLOSED'.

The maximum power dissipation within each junction box is as follows:

BOX TYPE	Maximum Power Dissipation (Watts)																	Max. Cable Length per Terminal (M)
	T_{ratng} T6	T_{amb} 80°C	T_{amb} -60 +40°C	T_{ratng} T6	T_{amb} 80°C	T_{amb} -60 +55°C	T_{ratng} T6	T_{amb} 80°C	T_{amb} -60 +65°C	T_{ratng} T5	T_{amb} 80°C	T_{amb} -60 +40°C	T_{ratng} T5	T_{amb} 80°C	T_{amb} -60/ +55°C	T_{ratng} T5	T_{amb} 80°C	T_{amb} -60/ +65°C	
PL612	4.1			2.5			1.5			5.6			4.1			3.0			0.127
PL615	6.4			4.0			2.4			8.8			6.4			4.8			0.175
PL620	11.4			7.1			4.2			15.6			11.4			8.5			0.240
PL626	11.4			7.1			4.2			15.6			11.4			8.5			0.275
PL630	20.8			13.0			7.8			28.6			20.8			15.6			0.365

The maximum number of terminals which may be fitted into each junction box is calculate using the following formula:

Power = $I^2 \times N (R_t + R_c)$ Watts

Where:
I = Actual current through the conductor up to the maximum permitted certified current of the terminal when fitted in a junction box (Amps).
N = Number of terminals
R_t = Terminal resistance (Ohms at 20°C)
R_c = Resistance of one conductor (Ohms at 20°C) when using a maximum diagonal cable length listed in the above table.

Earth facilities and cable entries are described on the component certificate for the empty enclosures Basefa06ATEX0116U. A suitable certified internal rail mounted earth terminal may be used. If a 'clean earth' is required a rail mounted power terminal may be used.

When required a component certified breather, drain or breather-drain may be fitted to the junction box as specified on the component certificate Basee06ATEX0116U. When fitted the IP rating of the junction box is reduced to the IP rating of the breather drain fitted, but must be a at least IP54, and may no longer be suitable for category 2D. Breather drains must be installed in their correct orientation in the bottom face of the junction box.

16 **Report Number**

GB/BAS/Ex/TR06.0033/00

17 Special Conditions for Safe Use

1. When used under dust layers the maximum depth shall be no greater than 50mm.

2. Unused cables entries must be fitted with the following stopping plugs:
Hawke type 375 to Baseefa06ATEX0236U / IECEx BAS 06.0056U
Hawke type 387 to Baseefa06ATEX0118U / IECEx BAS 06.0029U
Redapt type PU-E-4 to SIRA00ATEX3091
Redapt type PU-D to SIRA00ATEX1094
Raxton types CK, CQ, CF and CB to SIRA00ATEX1073U

   The enclosure is limited to the temperature range of the stopping plug fitted.

3. Any breathing and draining device must be installed in its correct orientation in the bottom face of the enclosure.

4. All terminal screws, used and unused, shall be fully tightened down by the end user.

5. Insulation of conductors must extend to within 1mm of the metal of the terminal throat unless specified otherwi on the terminal certificate.

6. No more than one single or multi-stranded lead shall be connected to either side of any terminal unless multip conductors have been joined in a suitable manner, e.g. two conductors into a single insulated bootlace ferrule, any method indicated on the terminal certificate.

7. Terminals shall be installed in such a manner that the creepage and clearance distances between the terminal ar adjacent components, enclosure walls and covers complying with the requirements of IEC 60079 for the rat voltage of the equipment.

8. Terminal temperatures must not exceed the operating range specified on the component certificate.

9. All terminals, and accessories such as cross-connectors, shall be installed in accordance with the termin manufactures instructions. Hawke International will supply the relevant terminal manufacturer's instructions wi each junction box covered by this certificate.

10. The maximum voltage, current and dissipated power shown on the rating label must not be exceeded.

11. When connecting conductors of cross section below the maximum allowed for the particular terminal then t maximum amps per pole must be reduced inline with the maximum amps permitted for a terminal equivalent the conductor size fitted e.g. If a terminal that can take a 10mm² conductor at 40Amps is fitted with a 4mr conductor then the current shall be reduced to a maximum of 22Amps, or the rating marked on the apparat label, whichever is the lower.

18 Essential Health and Safety Requirements

All relevant Essential Health and Safety Requirements are covered by the standards listed at item 9.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
C2542	-	B	31/07/06	PL6** General Arrangement
9004	-	B	03/08/06	PL626 General Arrangement

All drawings are common to and held on IECEx BAS 06.0028X

1 **SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3	Supplementary EC - Type Examination Certificate Number:	**Baseefa06ATEX0117X/1**
4	Equipment or Protective System:	**PL6** RANGE OF JUNCTION BOXES**
5	Manufacturer:	**HAWKE INTERNATIONAL**
6	Address:	**Oxford Street West, Ashton-under-Lyne, Lancashire, OL7 0NA**

7 This supplementary certificate extends EC – Type Examination Certificate No. Baseefa06ATEX0117X to apply to equipment or protective systems designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

Baseefa Customer Reference No. **0500**

Project File No. **10/0532**

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Baseefa is a trading name of Baseefa Ltd
Registered in England No. 4305578. Registered address as above.

R S SINCLAIR
DIRECTOR
On behalf of
Baseefa

13 **Schedule**

14 **Certificate Number Baseefa06ATEX0117X/1**

15 **Description of the variation to the Equipment or Protective System**

Variation 1.1

To allow the use of the following stopping plug:

Manufacturer	Product	Type	Certificate Number	IP Rating
Hawke	Stopping Plug	387/1	Sira06ATEX1240U Operating Temperature -20°C to +60°C	IP66

16 **Report Number**

GB/BAS/TR10.0155/00

17 **Special Conditions for Safe Use**

None additional to those listed previously

18 **Essential Health and Safety Requirements**

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 **Drawings and Documents**

None

1 **SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 Supplementary EC - Type Examination Certificate Number: **Baseefa06ATEX0117X/2**

4 Equipment or Protective System: **PL6** RANGE OF JUNCTION BOXES**

5 Manufacturer: **HAWKE INTERNATIONAL**

6 Address: **Oxford Street West, Ashton-under-Lyne, Lancashire, OL7 0NA**

7 This supplementary certificate extends EC – Type Examination Certificate No. Baseefa06ATEX0117X to apply to equipment or protective systems designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

Baseefa Customer Reference No. **0500**

Project File No. **10/0718**

Baseefa
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e-mail info@baseefa.com web site www.baseefa.com
Baseefa is a trading name of Baseefa Ltd
Registered in England No. 4305578. Registered address as above.

pp R S SINCLAIR
DIRECTOR
On behalf of
Baseefa

13 **Schedule**

14 **Certificate Number Baseefa06ATEX0117X/2**

15 **Description of the variation to the Equipment or Protective System**

Variation 2.1

Addition of further Special Condition for Safe Use regarding closing of unused entries.

16 **Report Number**

GB/BAS/TR10.0270/00

17 **Additional Special Conditions for Safe Use**

Unused entries may be fitted with alternative stopping plugs and or breather drains to those listed in the schedule. The user is responsible for ensuring that the protection concept, temperature class and relevant IP rating are maintained.

18 **Essential Health and Safety Requirements**

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 **Drawings and Documents**

None

1 **SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3	Supplementary EC - Type Examination Certificate Number:	**Baseefa06ATEX0117X/3**
4	Equipment or Protective System:	**PL6** RANGE OF JUNCTION BOXES**
5	Manufacturer:	**HAWKE INTERNATIONAL**
6	Address:	**Oxford Street West, Ashton-under-Lyne, Lancashire, OL7 0NA**

7 This supplementary certificate extends EC – Type Examination Certificate No. Baseefa06ATEX0117X to apply to equipment or protective systems designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 Item 9 of the original Certificate is replaced by "Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

IEC 60079-0: 2011 EN 60079-7: 2007 EN 60079-31: 2009

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

9 The marking of the equipment has changed from the original Certificate and shall include the following:

Ⓔx II 2GD Ex e IIC T(see schedule) Gb Ex tb IIIC T80°C Db IP66 and IP67
Tamb -60°C to +(see schedule)

This certificate shall be held with the original certificate and may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **0500**

Project File No. **12/0352**

This certificate is granted subject to the general terms and conditions of Baseefa. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

Baseefa
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Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
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Baseefa is a trading name of Baseefa Ltd
Registered in England No. 4305578. Registered address as above.

pp R S SINCLAIR
DIRECTOR
On behalf of
Baseefa

13 **Schedule**

14 **Certificate Number Baseefa06ATEX0117X/3**

15 Description of the variation to the Equipment or Protective System

Variation 3.1

To confirm that the equipment covered by this certificate has been reviewed against the requirements of IEC 60079-0: 2011, EN 60079-7: 2007, EN 60079-31: 2009 in respect of the differences from EN 60079-0: 2004, EN 60079-7: 2003, EN 61241-0: 2004 and EN 61241-1:2004, and the equipment has been assessed and is in compliance with the requirements of the latest standards.

The marking is now as follows:

⟨Ex⟩ II 2GD Ex e IIC T(see schedule) Gb Ex tb IIIC T80°C Db IP66 and IP67

Tamb -60°C to +(see schedule)

16 Report Number

GB/BAS/TR12.0113/00

17 Specific Conditions of Use

None additional to those listed previously

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
C2542	---	C	03/04/12	General arrangement type 'PL6' series junction box
9004	1 of 1	C	03/04/12	PL626 Certification drawing

Drawings held on IECEx BAS 06.0028X and common to Baseefa06ATEX0117X

IECEx Certificate of Conformity

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

Certificate No.: IECEx BAS 06.0028X issue No.:4

Status: **Current**

Date of Issue: **2014-02-11** Page 1 of 4

Certificate history:
Issue No. 4 (2014-2-11)
Issue No. 3 (2012-4-30)
Issue No. 2 (2010-11-25)
Issue No. 1 (2010-7-7)
Issue No. 0 (2006-8-11)

Applicant:
Hawke International
A Division of Hubbell Ltd.
A member of the Hubbell Group of Companies
Oxford Street West
Ashton-under-Lyne, Lancashire
OL7 0NA
United Kingdom

Electrical Apparatus: **PL6** Range of Junction Boxes**
Optional accessory:

Type of Protection: **Ex e II**

Marking: **Ex e IIC T (see schedule) Gb**
Ex tb IIIC T80°C Db IP66 and IP67
Tamb -60°C to + (see schedule)

Approved for issue on behalf of the IECEx Certification Body: pp R S Sinclair

Position: General Manager

Signature: (for printed version)

Date: 11/2/14

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 the Official IECEx Website.

Certificate issued by:
SGS Baseefa Limited
Rockhead Business Park
Staden Lane
Buxton
Derbyshire
SK17 9RZ
United Kingdom

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0028X

Date of Issue: **2014-02-11** Issue No.: **4**

Manufacturer:
Hawke International
A Division of Hubbell Ltd.
A member of the Hubbell Group of Companies
Oxford Street West
Ashton-under-Lyne, Lancashire
OL7 0NA
United Kingdom

Additional Manufacturing location (s):

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 electrical apparatus 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 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical 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:
GB/BAS/ExTR06.0033/00 GB/BAS/ExTR10.0155/00 GB/BAS/ExTR10.0270/00
GB/BAS/ExTR12.0113/00

Quality Assessment Report:

GB/BAS/QAR06.0061/03

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0028X

Date of Issue: **2014-02-11** Issue No.: **4**

Schedule

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

The PL6** Range of Junction Boxes comprises the type ZPL6** range of empty glass filled polyester enclosures, covered by IECEx BAS 06.0027U Exe II, fitted with a variety of different terminal arrangements.

All the terminals are covered by their own component certificates and are coded Exe II. Drawing D9160, held on Baseefa General Technical File 0500, gives details of the permitted terminals, their rated conductor sizes and their maximum permitted current ratings when used in this application. Note that the ratings for junction box use may be lower than the maximum ratings given in the terminal certificate.

The actual terminals fitted to each junction box will be listed in the schedule of the instruction sheet supplied with the junction box. The method of calculating the overall rating of the junction box, according to the ambient temperature range and temperature class, is given with the full equipment description in Annexe 1 to this certificate.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. When used under dust layers the maximum depth shall be no greater than 50mm.
2. Unused entry holes must be fitted with one of the following stopping plugs:
   Hawke Type 375 to Baseeefa06ATEX0236U / IECEx BAS 06.0056U
   Hawke Type 387 to Baseefa06ATEX0118U / IECEx BAS 06.0029U
   Redapt Type PD-E-4 to SIRA00ATEX3091
   Redapt Type PD-U to SIRA00ATEX1094
   Raxton Types CK, CQ, CF and CB to SIRA00ATEX1073U
3. Any breathing and draining device as listed on the ZPL6** Component Certificate must be installed in its correct orientation in the bottom face of the enclosure.
4. All terminal screws, used and unused, shall be fully tightened down by the end user.
5. Insulation of conductors must extend to within 1mm of the metal of the terminal throat unless specified otherwise on the terminal certificate.
6. No more than one single or multi-stranded lead shall be connected to either side of any terminal unless multiple conductors have been joined in a suitable manner, e.g. two conductors into a single insulated bootlace ferrule, or any method indicated on the terminal certificate.
7. Terminals and their accessories shall be installed in such a manner that the creepage distances and clearances between the terminal and adjacent components, enclosure walls and covers comply with the requirements of IEC 60079-7 for the rated voltage of the equipment.
8. Terminal temperatures must not exceed the operating range specified on the component certificate for the terminal.
9. All terminals, and accessories such as cross-connectors, shall be installed in accordance with the terminal manufactures instructions. Hawke International will supply the relevant terminal manufacturer's instructions with each junction box covered by this certificate.
10. The maximum voltage, current and dissipated power shown on the rating label must not be exceeded.
11. When connecting conductors of cross section below the maximum allowed for the particular terminal then the maximum amps per pole must be reduced inline with the maximum amps permitted for a terminal equivalent to the conductor size fitted e.g. If a terminal that can take a 10mm² conductor at 40Amps is fitted with a 4mm² conductor then the current shall be reduced to a maximum of 22Amps, or the rating marked on the apparatus label, whichever is the lower.
12. The enclosure is limited to the temperature range of the stopping plug fitted.
13. Unused entries may be fitted with alternative stopping plugs and or breather drains to those listed in the schedule. The user is responsible for ensuring that the protection concept, temperature class and relevant IP rating are maintained.

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0028X

Date of Issue: **2014-02-11** Issue No.: **4**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Variation 4.1

To correct minor typographical error.

Annex: IECEx BAS 06.0028X Issue 4 Annex 1.pdf

SGS Baseefa Limited
Rockhead Business Park
Staden lane, Buxton, Derbyshire
SK17 9RZ
United Kingdom

ANNEX to IECEx BAS 06.0028X | Issue No. 1 | Date: 2014/02/11

The PL6** Range of Junction Boxes comprises the type ZPL6** range of empty glass filled polyester enclosures, covered by IECEx BAS 06.0027U Exe II, fitted with a variety of different terminal arrangements.

All the terminals are covered by their own component certificates and are coded Exe II. Drawing D9160, held on Baseefa Genera Technical File 0500, gives details of the permitted terminals, their rated conductor sizes and their maximum permitted current ratings when used in this application. Note that the ratings for junction box use may be lower than the maximum ratings given in the termina certificate.

The terminals are used within their relevant temperature range, voltage and current limitations, and fitted in accordance with IEC 60079-7 with regard to creepage distances and clearances by Hawke International. A specified partitioning arrangement allows for the termination of intrinsically safe (i.s.) circuits and non i.s. circuits within the same junction box. When i.s. circuits are present, an additional label is fitted to the outside of the junction box stating 'INTRINSICALLY SAFE CIRCUITS ENCLOSED'.

The maximum power dissipation within each junction box is as follows:

BOX TYPE	Maximum Power Dissipation (Watts)																	
	T_{rating}	T_{dust}	T_{amb}	T_{rating}	T_{dust}	T_{amb}	T_{rating}	T_{dust}	T_{amb}	T_{rating}	T_{dust}	T_{amb}	T_{rating}	T_{dust}	T_{amb}	T_{rating}	T_{dust}	T_{amb}
	T6	80°C	-60 +40°C	T6	80°C	-60 +55°C	T6	80°C	-60 +65°C	T5	80°C	-60 +40°C	T5	80°C	-60 +55°C	T5	80°C	-60 +65°C
PL612	4.1			2.5			1.5			5.6			4.1			3.0		
PL615	6.4			4.0			2.4			8.8			6.4			4.8		
PL620	11.4			7.1			4.2			15.6			11.4			8.5		
PL626	11.4			7.1			4.2			15.6			11.4			8.5		
PL630	20.8			13.0			7.8			28.6			20.8			15.6		

The maximum number of terminals which may be fitted into each junction box is calculated using the following formula:

Power = $I^2 \times N (R_t + R_c)$ Watts

Where:
I = Actual current through the conductor up to the maximum permitted certified current of the terminal when fitted in a junction box (Amps).
N = Number of terminals
R_t = Terminal resistance (Ohms at 20 DegC)
R_c = Resistance of one conductor (Ohms at 20 DegC) when using a maximum diagonal cable length listed in the above table.

Earth facilities and cable entries are described on the component certificate for the empty enclosures IECEx BAS 06.0027U.

A suitable certified internal rail mounted earth terminal may be used. If a 'clean earth' is required a rail mounted power terminal may be used. (Earth terminals are not considered to contribute to the power dissipation.)

When required, a component certified breather, drain or breather-drain may be fitted to the junction box as specified on the component certificate IECEx BAS 06.0027U.

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

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

EU Declaration of Conformity CE

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

Object of the declaration:

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

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

Type of Legislation:
ATEX Directive 2014/34/EU

The Following harmonised standards and technical specifications have been applied:

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

Notified Body:

NB Name:	ExVeritas
NB Number:	2804

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

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

Date: 7th May 2024

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

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

EU Declaration of Conformity CE

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

Object of the declaration:

Product Name:	Electro Pneumatic Power Supply (EPPS)
Product Options:	This declaration covers all variants associated with the above product

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

Type of Legislation:
Electromagnetic Compatibility Directive (EMC) 2014/30/EU
ATEX Directive 2014/34/EU

The Following harmonised standards and technical specifications have been applied:

Type of Legislation:	**General Standard:**	**Reference Standard:**
EMC Directive:	Generic standards – Immunity for industrial environments	EN 6100-6-2:2005
	Generic standards – Emission standard for industrial environments	EN 61000-6-4:2007 +A1:2011
ATEX Directive:	Equipment general requirements	EN IEC 60079-0:2018/AC:2020
	Equipment protection by intrinsic safety "i"	EN 60079-11:2012
	Equipment protection by flameproof enclosure "d"	BS EN 60079-1:2014
	Equipment dust ignition protection by enclosure "t"	EN 60079-31, 3rd Edition (2022-01)

Notified Body:

NB Name:	ExVeritas
NB Number:	2804

Technical documentation and assessments are in the Expo Technologies confidential technical file SC047.

For and on behalf of Expo Technologies Ltd

John Paul De Beer
Managing Director

Date: 7th May 2024

(1) # EC-TYPE EXAMINATION CERTIFICATE

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **KEMA 01ATEX2124 X** Issue Number: **3**

(4) Equipment: **Self-limiting heating element Cameo-S, Models CT-*A, LP-*A, LP-*S, CS-*S, SP-*A, LP-0AHP and LP-0SHP and Smart Heater, Models SM-*A, SM-0AHP, SMLP-*A and SMLP-0AHP**

(5) Manufacturer: **Condor Technology Ltd.**

(6) Address: **Havenstraat 66, 1271 AG Huizen, The Netherlands**

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

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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 212100300.

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

EN 60079-0 : 2006 **EN 60079-1 : 2004**
EN 61241-0 : 2006 **EN 61241-1 : 2004**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

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

II 2 G Ex d IIC T4 or T3
II 2 D Ex tD A21 IP6x T 135 °C or T 200 °C

This certificate is issued on January 15, 2009 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

KEMA Quality B.V.

C.G. van Es
Certification Manager

PRODUCTS RvA C 001

KEMA Quality B.V. Utrechtseweg 310, 6812 AR Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 26 3 56 20 00 F +31 26 3 52 58 00 customer@kema.com www.kema.com Registered Arnhem 09085396

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 01ATEX2124 X** Issue No. **3**

(15) **Description**

Self-limiting heating element Cameo-S, models CT-*A, LP-*A, LP-*S, CS-*S, SP-*A, LP-0AHP and LP-0SHP and Smart Heater, models SM-*A, SM-0AHP, SMLP-*A and SMLP-0AHP for fixed installation, made of aluminium or stainless steel, provided with PTC-heating elements.

The relation between the Model and the Temperature class/ code is given in the following table:

Model	Temperature class/ code
xx-0x / xx-1x	T3 / T200 °C
xx-2x / xx-3x / xx-4x	T4 / T135 °C

Electrical data

Rated voltage ..... 12-36 V or 110-240 V
Power ..... Max. 500 W

Routine tests

Routine tests according to Clause 16 of EN 60079-1 are not required since the free internal volume is less than 10 cm^3.

(16) **Test Report**

KEMA No. 212100300.

(17) **Special conditions for safe use**

Ambient temperature range -60 °C to +90 °C.

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

Assured by compliance with the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 212100300.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.:	IECEx DEK 11.0017	Issue No: 0	Certificate history: Issue No. 0 (2011-05-25)
Status:	**Current**	Page 1 of 3	
Date of Issue:	**2011-05-25**		
Applicant:	**Condor Technology Ltd.** Havenstraat 66 1271 AG Huizen **The Netherlands**		
Electrical Apparatus:	**Heaters Cameo-S and Smart Heaters, Thermostat FIX-THERM96**		
Optional accessory:			
Type of Protection:	**Ex d, tD**		
Marking:	Heaters: Ex d IIC T4 or T3 Ex tD A21 IP66 T 135 °C or T 200 °C Thermostat: Ex d IIC T6 or T4 Ex tD A21 IP66 T 85 °C or T 135 °C		

Approved for issue on behalf of the IECEx Certification Body: T. Pijpker

Position: Certification Manager

Signature:
(for printed version)

Date:

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 the Official IECEx Website.

Certificate issued by:

DEKRA Certification B.V.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands

DEKRA

IECEx Certificate of Conformity

Certificate No:	IECEx DEK 11.0017	Issue No: 0
Date of Issue:	**2011-05-25**	Page 2 of 3
Manufacturer:	**Condor Technology Ltd.** Havenstraat 66 1271 AG Huizen **The Netherlands**	

Additional Manufacturing location(s):

Condor Technology Ltd.
Havenstraat 66
1271 AG Huizen
The Netherlands

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 electrical apparatus 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 : 2004 Edition:4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2007-04 Edition:6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 61241-0 : 2004 Edition:1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition:1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical 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/ExTR11.0013/00

Quality Assessment Report:

NL/DEK/QAR11.0002/00

IECEx Certificate of Conformity

Certificate No: IECEx DEK 11.0017 Issue No: 0

Date of Issue: **2011-05-25**

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Description heaters:
Self-limiting heating element Cameo-S, models CT- *A, LP-*A, LP-*S, CS-*S, SP-*A, LP-0AHP and LP-0SHP and Smart Heater, models SM-*A, SM-0AHP, SMLP-*A and SMLP-0AHP for fixed installation. It consists of a body made of aluminium or stainless steel, alternatively with fins, complete with PTC-heating element, cable gland and cable as an integral part of the heater.

The relation between the Model and the Temperature class/ code is given in the following table:

Model	Temperature class / code
xx-0x / xx-1x	T3 / T200 °C
xx-2x / xx-3x / xx-4x	T4 / T135 °C

Ambient temperature range -60 °C to +90 °C.

Description thermostat:
Thermostat FIX-THERM96 Model TH-../.. for fixed installation. It consists of a body made of aluminium or stainless steel, complete with cable gland and cable as an integral part of the thermostat.
Maximum measuring temperature for T6 / T 85 °C is 80 °C.
Maximum measuring temperature for T4 / T 135 °C is 130 °C.

Ambient temperature range:
-50 °C to +75 °C for T6 / T 85 °C
-50 °C to +90 °C for T4 / T 135 °C

Electrical data:

Heaters:	
Rated voltage	12-36 V or 110-240 V
Power	max. 500 W
Thermostat:	
Voltage	max. 240 V
Current	max. 6 A

CONDITIONS OF CERTIFICATION: NO

1 **ATTESTATION D'EXAMEN CE DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 99 ATEX 6017 X

4 Appareil ou système de protection

Thermostat antidéflagrant
Type : HFT

5 Demandeur : HEATEX LIMITED

6 Adresse : Threxton Road Industrial Estate
Watton, Thetford, Norfolk, IP25 6NG
UNITED KINGDOM

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 11 320 010.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :

- EN 50014 (1992)
- EN 50018 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :

Ex II 2 G
EEx d IIC T6

1 **EC TYPE EXAMINATION CERTIFICATE**

2 Equipment or Protective System Intended for use in Potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 99 ATEX 6017 X

4 Equipment or Protective system

Flameproof Thermostat
Type : HFT

5 Applicant : HEATEX LIMITED

6 Address : Threxton Road Industrial Estate
Watton, Thetford, Norfolk, IP25 6NG
UNITED KINGDOM

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

8 LCIE, notified body number 0081 in accordance with article 9 of the directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to the directive.
The examination and test results are recorded in confidential report No 11 320 010.

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

- EN 50014 (1992)
- EN 50018 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of Directive applies to the manufacture and supply of this equipment or protective system.

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

Ex II 2 G
EEx d IIC T6

Fontenay-aux-Roses, le 22 septembre 1999

Le Directeur de l'organisme certificateur
Manager of the certification body

Michel VIEILLEFOSSE
Président et directeur général

Timbre sec/dry seal

13-b

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
Société anonyme à Directoire et Conseil de surveillance au capital de 103 592 000 Francs - RCS Nanterre B 408 363 174
Siège social : 33, avenue du Général Leclerc - F 92260 Fontenay-aux-Roses - Tél. : +33 (0)1 40 95 60 60

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**

LCIE 99 ATEX 6017 X

(A4) **Description de l'équipement ou du système de protection**

Appareil de forme carrée, d'un volume interne libre de 384 cm^3 qui contient un thermostat et une sonde de température.

Le marquage sera le suivant :

- HEATEX LTD NORFOLK ENGLAND
- Type : HFT
- N° de fabrication
- Année de fabrication
- Ex II 2 G
- EEx d IIC T6
- LCIE 99 ATEX 6017 X
- NE PAS OUVRIR SOUS TENSION

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système de qualité (0081 pour le LCIE).

(A4) **Documents descriptifs**

Dossier technique N° 2004.15.01 Rév. 1 du 24.03.1999.
Ce document comprend 6 rubriques (7 pages).

(A5) **Conditions spéciales pour une utilisation sûre**

Le transfert calorifique de l'élément de mesure ne devra en aucun cas transmettre un échauffement de plus de 80 °C, température ambiante incluse, à toute partie du thermostat susceptible d'être directement en contact avec une atmosphère explosible.

(A6) **Exigences essentielles en ce qui concerne la sécurité et la santé**

La conception de cet équipement satisfait aux normes européennes EN 50014 et EN 50018 (seconde édition).

Épreuve individuelle

Le matériel est dispensé d'épreuve individuelle.

(A1) **SCHEDULE**

(A2) **EC TYPE EXAMINATION CERTIFICATE**

LCIE 99 ATEX 6017 X

(A4) **Description of Equipment or Protective System**

Apparatus square form, 384 cm^3 internal free volume who contain a thermostat and temperature probe.

The marking will be the following :

- HEATEX LTD NORFOLK ENGLAND
- Type : HFT
- Serial number
- Year of construction
- Ex II 2 G
- EEx d IIC T6
- LCIE 99 ATEX 6017 X
- DO NOT OPEN WHILE ENERGIZED

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the quality system (0081 for the LCIE).

(A4) **Descriptive documents :**

Technical file N° 2004.15.01 Rev 1 dated 24.03.1999.
This file includes 6 items (7 pages).

(A5) **Special conditions for safe use**

The calorific transfer of sensor shall not transmit, in any case a heating above 80 °C, including ambiant temperature, to all thermostat part directly in contact with explosive atmosphere.

(A6) **Essential Health and Safety Requirements**

The design of the equipment complies to European Standards EN 50014 and EN 50018 (second edition).

Routine test

The equipment is exempt from individual test.

05.01

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 99 ATEX 6017X du 22 septembre 1999

AVENANT 99 ATEX 6017X /01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU SYSTEME DE PROTECTION :

Thermostat antidéflagrant
Type : HFT
Construit par : HEATEX LIMITED.

(A3) OBJET DE L'AVENANT, DESCRIPTION DE L'APPAREIL OU DU SYTEME DE PROTECTION :

- Possibilité d'utiliser un boîtier antidéflagrante alternative équipée d'un thermostat ajustable.

Le marquage de ce nouveau modèle est le suivant :

HEATEX LTD NORFOLK ENGLAND
Type : HFT
n° de fabrication
Année de fabrication
Ex II 2 G/D
EEx d IIC T6
IP6X, T85°C pour D
LCIE 99 ATEX 6017X
NE PAS OUVRIR SOUS TENSION.
Ne pas ouvrir en présence d'atmosphère poussière.

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique N°2004-15-TF Rev 4 du 13/06/2003
Ce dossier comprend 10 rubriques (11 pages).

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION SURE :

Inchangées.

(A6) EXIGENCES ESSENTIELLES EN CE QUI CONCERNE LA SECURITE ET LA SANTE :

Complétées par :

Conformité à la norme européenne EN 50281-1-1 (1998).

Fontenay-aux-Roses, le 18 septembre 2003

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/Dry seal

LCIE — 33, av du Général Leclerc — Tél : +33 1 40 95 60 60 — Société anonyme à directoire
Laboratoire Central — BP 8 — Fax : +33 1 40 95 86 56 — et conseil de surveillance
des Industries Electriques — 92266 Fontenay-aux-Roses cedex — contact@lcie.fr — au capital de 15 745 984 €
Une société de Bureau Veritas — France — www.lcie.fr — RCS Nanterre B 408 363 174

L-01

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 99 ATEX 6017X dated September 22, 1999

VARIATION 99 ATEX 6017X /01

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Flameproof thermostat
Type : HFT
Manufactured by : HEATEX LIMITED.

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF EQUIPMENT OR PROTECTIVE SYSTEM :

- Optional thermostat adjuster added with an alternative enclosure.

The marking of this new model is the following :

HEATEX LTD NORFOLK ENGLAND
Type : HFT
Serial number
Year of construction
Ex II 2 G/D
EEx d IIC T6
IP6X, T85°C for D
LCIE 99 ATEX 6017X
DO NOT OPEN WHILE ENERGIZED
Do not open in presence of dust atmosphere.

(A4) DESCRIPTIVE DOCUMENTS :

Technical file N°2004-15-TF Rev 5 dated June 13th, 2003
This file includes 10 items (11 pages).

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Supplemented by :

Conformity to the European standard EN 50281-1-1 (1998).

1 **AVENANT D'ATTESTATION D'EXAMEN CE DE TYPE**

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'avenant :
LCIE 99 ATEX 6017 X / 02

4 Appareil ou système de protection :
Thermostat antidéflagrant
Type : HFT, AFT

5 Demandeur : EXHEAT LIMITED

15 **DESCRIPTION DE L'AVENANT**
- Mise à jour selon les normes EN 60079-0 (2006), EN 60079-1 (2004), EN 61241-0 (2006) et EN 61241-1 (2004)
- Température ambiante minimale : -60°C
- Nouveau type : AFT (gaz et poussières)
- Changement de raison sociale

Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 77475-566018/02.

Paramètres spécifiques du ou des modes de protection concerné(s) :
Inchangés

Le marquage doit être modifié comme suit :

EXHEAT au lieu de HEATEX
HFT : Ex II 2G Ex d IIC T6 AFT : Ex II 2GD Ex d IIC T6 Ex tD A21 IP6X T85°C

AVERTISSEMENT – NE PAS OUVRIR SOUS TENSION
NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE POUSSIÉREUSE EXPLOSIVE

16 **DOCUMENTS DESCRIPTIFS**

Dossier de certification 2004-15-TF rév. 03 du 01/08/08.
Ce dossier comprend 15 rubriques (16 pages).

17 **CONDITIONS SPECIALES POUR UNE UTILISATION SURE**
-60°C ≤ Tamb ≤ +60°C

18 **EXIGENCES ESSENTIELLES DE SECURITE ET DE SANTE**
Conformité aux normes européennes EN 60079-0 (2006), EN 60079-1 (2004), EN 61241-0 (2006) et EN 61241-1 (2004).

19 **VERIFICATIONS ET ESSAIS INDIVIDUELS**
Néant

Fontenay-aux-Roses, le 1er octobre 2008

Le responsable de certification ATEX
ATEX certification manager
Marc GILLAUX

LCIE — 33, av du Général Leclerc — Tél : +33 1 40 95 60 60 — Société par Actions Simplifiée
Laboratoire Central — BP 8 — Fax : +33 1 40 95 86 56 — au capital de 15 745 984 €
des Industries Electriques — 92266 Fontenay-aux-Roses cedex — contact@lcie.fr — RCS Nanterre B 408 363 174
Une société de Bureau Veritas — France — www.lcie.fr

L-01

EC DECLARATION OF CONFORMITY

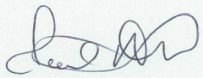
Issued in accordance with the

ATEX Directive 94/9/EC

EXHEAT LIMITED
of
Threxton Road Industrial Estate, Watton, Norfolk, IP25 6NG, UK.

Declare that, in compliance with the above Directive, the product detailed below has been manufactured in conformity with
EC Type Examination Certificate Number LCIE 99 ATEX 6017 X
Issued by LCIE (Notified Body Number 0081)
of 33, Avenue du Général Leclerc, 92260 Fontenay-aux-Roses, France

Product description:	**HFT Type Flameproof Thermostat**
Protection concept(s):	Flameproof 'd'
Marking:	Ⓔx II 2 G Ex d IIC T6 Gb
Harmonised standards applied:	EN 60079-0: 2009 EN 60079-1: 2007
Other applicable Directives:	2004/108/EC Electromagnetic Compatibility Directive
Other standards applied:	EN 60519-2: 2006 (Safety) EN 61000-6-4: 2007 (Emissions) EN 61000-6-2: 2005 (Immunity)

Authorised signature: 

Name: P Alford

Date: 20 December 2012

EC DECLARATION OF CONFORMITY

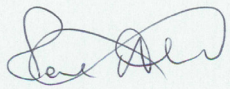
Issued in accordance with the

ATEX Directive 94/9/EC

EXHEAT LIMITED
of
Threxton Road Industrial Estate, Watton, Norfolk, IP25 6NG, UK.

Declare that, in compliance with the above Directive, the product detailed below has been manufactured in conformity with
EC Type Examination Certificate Number LCIE 99 ATEX 6017 X
Issued by LCIE (Notified Body Number 0081)
of 33, Avenue du Général Leclerc, 92260 Fontenay-aux-Roses, France

Product description:	**HFT Type Flameproof Thermostat** **(Aluminium / externally adjustable variant)**
Protection concept(s):	Flameproof 'd' Enclosure 't'
Marking:	Ⓔx II 2 G D Ex d IIC T6 Gb Ex t IIIC T85°C Db IP6X
Harmonised standards applied:	EN 60079-0: 2009 EN 60079-1: 2007 EN 60079-31: 2009
Other applicable Directives:	2004/108/EC Electromagnetic Compatibility Directive
Other standards applied:	EN 60519-2: 2006 (Safety) EN 61000-6-4: 2007 (Emissions) EN 61000-6-2: 2005 (Immunity)

Authorised signature: 

Name: P Alford

Date: 20 December 2012

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.:	IECEx LCI 07.0003X	Issue No: 1	Certificate history: Issue No. 1 (2008-11-17)
Status:	**Current**	Page 1 of 4	Issue No. 0 (2007-05-11)
Date of Issue:	**2008-11-17**		

Applicant: **EXHEAT LIMITED**
Threxton Road Industrial Estate
Watton, Thetford, Norfolk
IP25 6NG
United Kingdom

Electrical Apparatus: **...FT Flameproof thermostat**
Optional accessory:

Type of Protection: **Flameproof 'd' and Dust 'tD' (AFT model only)**

Marking:
EXHEAT LIMITED
Type : HFT or AFT
Ex d IIC T6
Ex tD IP6X A21 T85°C (AFT only)
Serial Number
Year of construction
LCI 07.0003 X
WARNING - DO NOT OPEN WHILE ENERGIZED
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE DUST ATMOSPHERE IS PRESENT

Approved for issue on behalf of the IECEx Certification Body: Marc GILLAUX

Position: Certification manager

Signature:
(for printed version)

Date:

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 the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

L C I E

IECEx Certificate of Conformity

Certificate No:	IECEx LCI 07.0003X	Issue No: 1
Date of Issue:	**2008-11-17**	Page 2 of 4

Manufacturer: **EXHEAT LIMITED**
Threxton Road Industrial Estate
Watton, Thetford, Norfolk
IP25 6NG
United Kingdom

Additional Manufacturing location(s):

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 electrical apparatus 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 : 2004 Edition:4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 61241-0 : 2004 Edition:1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition:1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical 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:

FR/LCI/ExTR07.0003/01

Quality Assessment Report:

FR/LCI/QAR06.0005/00

IECEx Certificate of Conformity

Certificate No: IECEx LCI 07.0003X Issue No: 1

Date of Issue: **2008-11-17** Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Thermostat contained in a flameproof enclosure with an external air temperature sensing probe contained in a suitable housing. An optional externally adjustable version is included. This equipment is designed to operate in an ambient temperature of -60°C to +60°C.

The enclosure is a flameproof enclosure with a spigot flamepath lid to body joint, made of stainless steel (HFT model) or aluminium (AFT model).

The maximum total capacity of components included is rated to 20A up to 300V. There are 2 models of enclosures. Each model is equipped with a probe housing.One model can be equipped by an optional external adjuster.

HFT model is suitable for a use in gas explosive atmospheres.
AFT model is suitable for a use in gas and dust explosive atmospheres.

Refer to the manufacturer technical documents for complete description.

CONDITIONS OF CERTIFICATION: YES as shown below:

The calorific transfer of sensor shall not transmit, in any case a heating above 80°C, including ambient temperature, to all thermostat part directly in contact with explosive atmosphere.

IECEx Certificate of Conformity

Certificate No: IECEx LCI 07.0003X Issue No: 1

Date of Issue: **2008-11-17** Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Change of company name : EXHEAT instead of HEATEX

- Compliance for low ambient temperature -60°C.
Tamb : -60°C up to +60°C

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