Nitrogen Buffer System

NB2 Manual

ML664

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 N2 Buffer system. it is the responsibility of the manufacturer of the compressor to provide instructions for the compressor

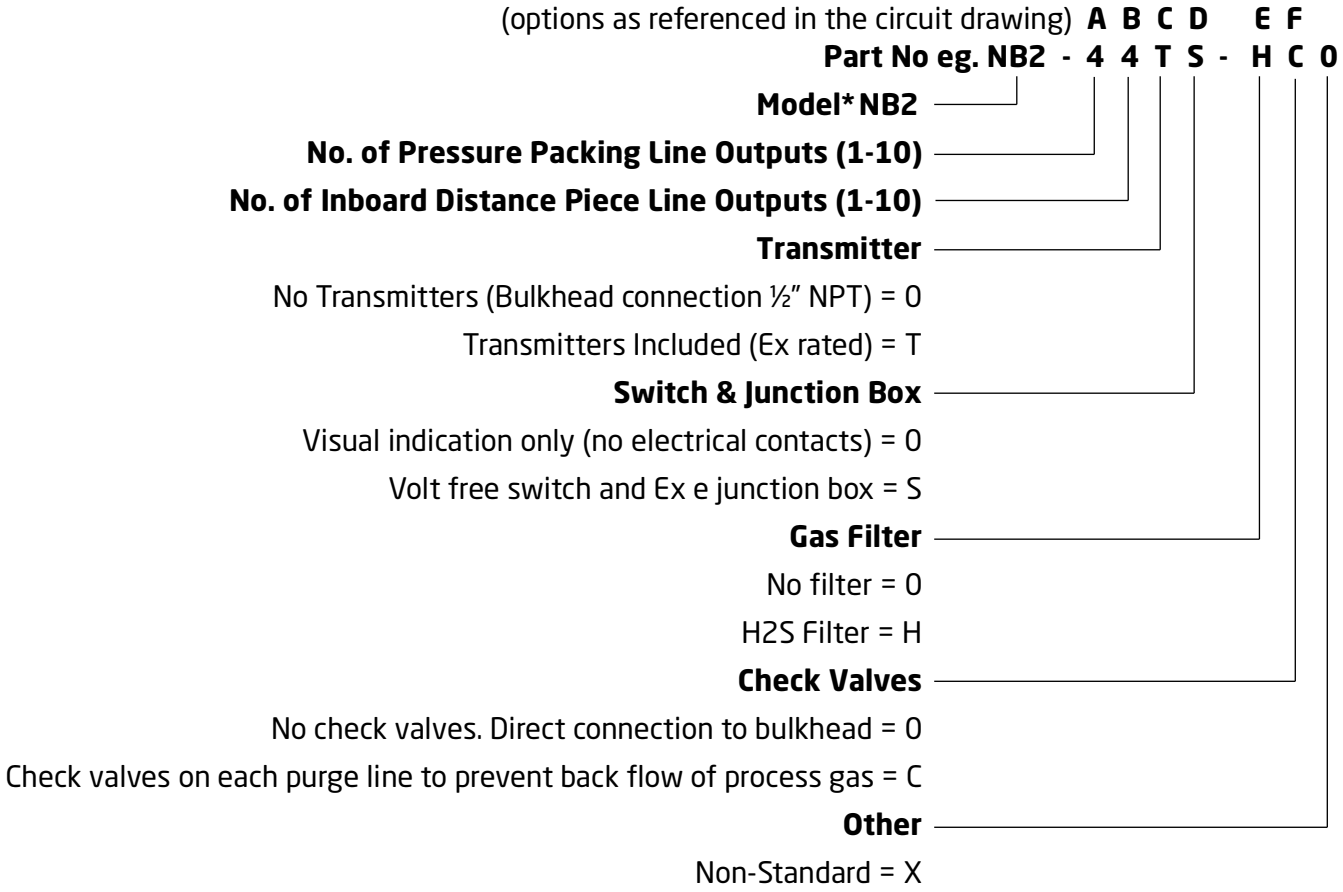
Expo Technologies reserves the right to replace any component, with one of the equivalent functionality.

Expo Technologies have developed a range of nitrogen buffer systems suitable for different types of reciprocating compressors designed to reduce the chance and risk of escaped gas from the compressor.

The NB2 is suitable for type C & D distance pieces. Instruments mounted in the enclosure with local indication as standard. Dual chamber output with 1-off DPCV and 1-off PCV. Multiple output channels on each of the DPCV and the PCV lines.

Section 1: System Specification

1.1: Model Number Selection



1.2: Technical Specifications

Buffer Gas Medium	: Compressed inert gas (generally Nitrogen) Clean, dry and free of corrosive gases or vapours.
Temperature Range	: -20°C to +55°C (-4°F to +131°F)
Supply Pressure	: 4 - 10 Barg (58 To 145 psi)
Supply Connection	: ½" NPT(F)
Maximum Flow Rate	: 500 Nl/min (1059 SCFH)
Nominal Flow rate (Per output)	: 1-25 Nl/min (2- 54 SCFH)
Maximum Leakage Rate	: 5 Nl/min
Filter Condition Indicator	: RED – Replace Filter GREEN – Filter OK
Buffer Gas Differential Pressure Gauge	: RED ZONE – Pressure below set-point GREEN ZONE – Pressure above set-point
System Pressure Gauge	: 0-10 bar

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Differential Pressure Gauge DPG	: 0-5 bar
Constant Pressure Gauge	: 0-10 bar
Housing Material	: 316 Stainless Steel
Pneumatic Output	: ½" NPT connection for Pressure Transmitter (by others)
Switch and Junction Box (Optional)	: Sealed Switch SPCO, rated 250Vac 4A / 24VDC 4A Protection Ex d IIC T6 Gb / Ex tb IIIC T80°C Db Stainless Steel IP66, c/w Exe terminals, front access cover, removable gland plate supplied undrilled. Protection Ex e IIC T5 Gb / Ex tb IIIC T100°C Db IP66
Pressure Transmitter (Optional)	: Ex ia/db IIC T5 Gb (Pyropress PYRP-2000ALW)

1.3: Approvals

The Expo Nitrogen Buffer system conforms to API-618 5th Ed. Annex I (*Distance Piece Vent, Drain & Buffer Systems to Minimize Process Gas Leakage*).

Expo Technologies also confirms suitability of the system for installation in ATEX Zone 1 with respect to both mechanical hazards and electrical hazards.

Section 2: Application Suitability

The Nitrogen Buffer System is designed for use in normal industrial conditions of ambient temperature, humidity and vibration, and in either hazardous or non-hazardous locations. Please consult Expo before installing this equipment in conditions that may cause stresses beyond normal industrial conditions. For example, it is designed to be mounted onto framework in the close vicinity of a reciprocating compressor, but not directly onto the machine itself where it would be exposed to high vibration and temperatures.

This system is designed for use primarily with compressed inert gases, predominantly Nitrogen (N2). Where inert compressed gasses are used, the user must take suitable precautions so that any build-up of 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 risk of asphyxiation exists, a warning label must be fitted. Inlet gas should be clean & dry as to ISO 8573-1 standards, air quality should be Class 3:3:3: 5 micron filter, -20°C dewpoint and <1mg/m^3 oil.

class	max. residual dust content		max. residual water content		max. oil content
	dust density mg/m^3	dust size µm	dew point °C	residual water g/m^3	mg/m^3
1	0,1	0,1	-70	0,003	0,01
2	1	1	-40	0,117	0,1
3	5	5	-20	0,88	1
4	8	15	+3	5,953	5
5	10	40	+7	7,732	25
6	-	-	+10	9,356	-
7	-	-	not specified	not specified	-

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

Stainless Steel	Polycarbonate	Aluminium
Mild (Carbon) Steel	Polyamide	Polyurethane
Brass	ABS	Silicone Rubber
Copper	PVC	

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Section 3: Description and Principle of Operation

Escaped gases from compressors are not only wasteful and inefficient but also potentially dangerous and increases costs. Further more, escaped gasses can increase wear on parts, reducing the service life of the compressor. The Nitrogen Buffer system is designed to reduce the chance and risk of escaped gasses within reciprocating compressors. The Nitrogen Buffer Model 2 is specifically designed for type C&D distance pieces.

The Nitrogen Buffer system provides a 2-part solution, supplying Nitrogen gas or other similar inert gas into two key areas of the compressor; Inboard Distance Piece and the Pressure Package to dilute, remove and prevent the escaping of process gases.

- The Nitrogen Buffer system supplies a constant supply of inert gas into the inboard distance piece to buffer the area, maintaining a constant over pressure.
- The Nitrogen Buffer system supplies inert gas into the distance piece to purge containments and/or lubrication from the compressor into the vent lines.

The Nitrogen Buffer system maintains a pressure above the line pressure in any common drain or vent line. API-618 Appendix I requires that pressure to be maintained at least 15psi (1 Bar) above the drain pressure, even though that pressure may vary due to other process systems injecting gas into the drain line (usually to flare).

The Nitrogen Buffer system takes N2 (or other inert gas) at 5bar nominal and uses a signal from the common drain line as a set-point to a pressure regulator. That pressure regulator has an offset of 1 bar minimum, with the result that the injected buffer gas will be above the drain pressure by the required amount, even with variations in drain line pressure.

Section 4: Main Components

4.1: Inlet Filter

The unit is provided with a 5µm filter element. The filter has a service life indicator which will turn red when the filter change is required.

Note: It is the user's responsibility to ensure the system is supplied with Air Supply Quality inert gas and the filter is replaced as required.

4.2: Pressure Gauges

There are 3 pressure gauges visible on the front of the enclosure:

System Pressure: Indicates the pressure of the set supply pressure within the system.

Differential Pressure Gauge: Indicates the offset pressure set to the differential pressure lines (compartment 1) to the Pressure Packing.

Constant pressure Gauge: Indicates the supply pressure to the constant pressure lines (compartment 2) to the Inboard Distance Piece.

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4.3: Control Valves

There are 4 control valves, controlling the supply pressure to the different sections/outputs to the system:

System Control Valve: Controls the pressure from the inlet supply within the system

Constant Pressure Control Valve: Controls the pressure of the gas to the constant pressure lines which supplies to the Inboard Distance Piece.

Differential Pressure Control Valve: Controls the pressure of the gas to the differential pressure lines which supplies the Pressure Package.

Isolation Valve: Fitted at the inlet to turn the supply ON/OFF within the enclosure.

4.4: Rotameters

The Rotameter measures and controls the flow of gas through each line. The flowrate can be adjusted to match requirement via the knob on the front of each rotameter.

4.5: Pressure Sensor

The Pressure Sensor monitors the pressure across the different areas of the compressor. When the pressure is below the set pressure, the sensor will trigger pressure alarm.

The sensor is factory calibrated and set to operate in falling pressure at or above the minimum specified pressure.

4.6: Alarm / Pressurized Switch

The switch allows a remote electrical status indicator to show either pressurized or a pressure failure alarm. The cable from the switch is terminated in the /PA terminal box.

The user must respond to the alarm in accordance with the local code of practice for Action on Loss of Pressure.

4.7: Terminal Box

The Terminal Box is an increased safety (Ex e) box which incorporates the connection terminals for the pressure and alarm contacts. All contacts provided are volt free (dry).

Cable entry methods (i.e. cable glands) must also be certified to match the certification requirement of the area. Cable entry must maintain IP66 (or better) ingress protection.

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Section 5: Installation of the System

- The Nitrogen Buffer system is designed to be installed vertically with the gauges and indicators to the front.
- Ensure that the Nitrogen Buffer system is not located where the visual indicators are obscured.
- On completion of installation, ensure that the main door is closed and secured with the key provided.

5.1: Mounting the System

- Mounting lugs are provided, which can be used on walls, Uni-Strut or other modular mounting framework.
- Suitable fixings for the mounting surface should be used. Vibration-isolating washers and shims should be used.

1. Position the Nitrogen Buffer system into position.
2. Insert the fixing through the mounting holes on the enclosure and fully secure in position.

5.2: Pneumatic Connection

- Inlet gas should be clean & dry and supplied via a dedicated pressure regulator.
- The user needs to install piping connections to the compressor connection points, and it is expected that high quality 316SST tubing will be used.

1. Connect the inert gas supply to bulkhead fitting on the side of the enclosure using a suitable ½" NPT(F) fitting.
2. Connect the pressure packing connections to the ¼" NPT(F) fittings labelled "Compartment 1 Outputs" on the top of the enclosure.
3. Connect the ¼" NPT(F) Inlet drain reference connector on the side of the enclosure
4. Connect the Inboard connections to the ¼" NPT(F) fittings labelled "Compartment 2 Outputs" on the top of the enclosure.
5. Connect the ¼" NPT(F) Filter drain on the bottom of the enclosure to the relevant collection pot.
6. Connect the external transmitter to the two ½" NPT(F) Outlet Purge Pressure connectors on the side of the enclosure (If Required)

5.3: Electrical Connections

Earthing

The Nitrogen Buffer system should be earthed using the M6 earth stud provided on the bottom of the enclosure.

- Earth cable cross-sectional area must be suitable for the local installation standards.
- The connection shall be a ring lug which is properly crimped and fully secured with anti-shake washers so it cannot be accidentally loosened.

Remote Signal (if Required)

If the system includes electrical signal outputs, an Ex e junction box will be fitted to the underside of the main system housing.

- Cables shall be suitably rated for the hazardous area of application.
- Cable entry into the Ex e junction box should be via suitably rated cable gland(s)

1. Make the relevant entry into the gland plate at the bottom of the junction box
2. Fit the cable gland(s) to the junction box
3. Connect the cable wires to the corresponding terminal inside the junction box, refer to circuit drawing.

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Section 6: Commissioning

1. Open the Nitrogen Buffer system door with key provided.
2. All gauges and indicators should read as follows (When not connected to supply pressure)
   a. Differential Pressure : RED ZONE
   b. Filter OK : GREEN
   c. Supply Pressure : 0 Barg
   d. Constant Pressure : 0 Barg
3. Refer to the Test and Inspection Sheet for specific values of the valves and flow meters.
4. Connect the system to the supply pressure 4-10 Barg (58 to 145 psi);
5. Check that the Isolation Valve is Open;
   a. To open the Isolation Valve, turn 90° anti-clockwise.
   b. To close the Isolation Valve, turn 90° clockwise.
6. The System Pressure Control Valve is pre-set to 2.7 Barg; check the supply pressure gauge. If necessary, re-set the supply pressure, pull the cap outwards and;
   a. Turn the Cap/Knob clockwise to increase the pressure.
   b. Turn the Cap/Knob anti clockwise to decrease the pressure.
7. Set the Constant Pressure Control Valve to the required pressure checking the constant pressure gauge, pull the cap outwards and;
   a. Turn the Cap/Knob clockwise to increase the pressure.
   b. Turn the Cap/Knob anti clockwise to decrease the pressure.
8. The Rotameters are typically set to 54 SCFH or 25 LPM. The lines can be adjusted in balance to suit the requirement of customer.
   a. Turn the Knob clockwise to reduce the flowrate.
   b. Turn the Knob anti clockwise to increase the flowrate.
9. The Differential Pressure Control Valve is pre-set to 1.25Barg (approx.) above Drain Pressure Gauge. The Differential Pressure Control Valve can be adjusted to suit customer requirement on site by competent Engineers. If the pressure is less than 1 Barg, slowly increase the Differential Pressure Control Valve (clockwise) until the Differential Pressure Gauge dial turns to GREEN ZONE. Turn further until it is at 1.25 Barg.

Note: The Differential Pressure Control Valve should only be set on the rising pressure because of the hysteresis.

10. Lock the Differential Pressure Control Valve using the nut on the valve stem.
11. All gauges and indicators should read as follow: In ideal working condition.
    a. Differential Pressure Gauge(6): GREEN ZONE (1.25 bar)
    b. Filter OK (3): GREEN
    c. Supply Pressure(10): 2.7 Barg
    d. Constant Pressure: As required by customer
12. Close the Nitrogen Buffer system door and lock with key provided.

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Section 7: Maintenance of the System

The maintenance recommended for the system consists of the following, supplemented by any additional local requirements imposed by the local Code of Practice.

7.1: Initial Maintenance

Expo recommends that the functionality of the flow control valve is inspected 6 months after installation.

7.2: Routine Maintenance

At least every two years, the following additional checks are recommended:

- Inspect the Filter.
- There are no unauthorized modifications
- The flow control valve cap is present
- Seals are undamaged
- The source of air is uncontaminated
- Adequate spares are carried
- Flow lines are still balanced & adjust if needed.
- Functional check: reduce the pressure via the DPCV and verify that the pressure sensor is triggered. Then reset that DPCV pressure as above, back to normal value of 1.25 Barg.

Before conducting any replacement procedures on the system, ensure the isolation valves are completely shut, and the system is de-pressurized.

7.3: Pressure Sensor Calibration / Replacement

If it is decided that the pressure sensor(s) needs recalibrating, they must be returned to Expo for this service.

1. Depress the collet of the push in fittings on the sensor and pull out the plastic tubing (hint: take a photo to record the location of each tube).
2. Firmly grip the sensor's housing with your hand and rotate anticlockwise to unscrew the sensor from the base (yellow block).
3. Screw in the new sensor. Make sure it has been calibrated before screwing it in. There should be a calibration sticker on the sensor which will show if/when it has been calibrated, and to what pressure.
4. Push in the plastic tubing back in to the sensor's connectors.
5. Perform the commissioning test to ensure they are switching at the correct pressures.

7.4: Replacing Gauge

1. Unscrew the nuts of the pneumatic pipes on the bottom of each gauge. You will need a 14mm spanner to do this.
2. Unscrew the 4 hex screws holding the chassis plate to the sides of the enclosure. These do not need to be unscrewed and removed, just unscrewed by around 10mm.

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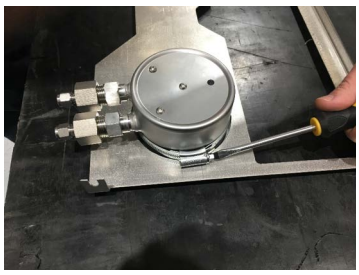
3. Remove pipes from the gauges and remove the chassis plate from it's position. Lie the chassis plate face down.

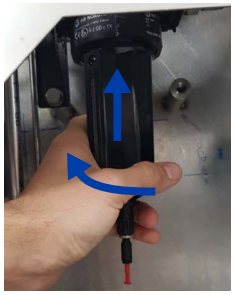
4. Use circlip plyers or a screw driver to loosen and remove the circlip/hose clip holding the gauge onto the chassis plate.
5. Replace the gauge with the new gauge.
6. Place the circlip or hose clip back on and secure the gauge in position.
7. Reposition the chassis plate within the enclosure ensuring to insert the pipes into all the gauges.



8. Secure the chassis plate in place with the 4 hex screws and tighten the nuts to secure the tubing into the gauges.

7.5: Replacing Filter

1. Remove the filter bowl by pushing it up and twisting 90 degrees clockwise.
2. Unscrew the base and remove the filter element.
3. Replace with the new element and secure in position.
4. Replace the bowl and push back up in position, twist until it is set back in place.



Section 8: Fault Finding

If the system does not behave in the manner described above, please contact your local Expo distributor or the Expo factory for further assistance.

Section 9: Recommended Spares List

Part Description	Part Number
Filter	HF1-A03N-010
Differential Pressure Gauge, 0-5 bar	HGA-0000-074
Pressure Gauge, 0-10 bar	HGA-0000-075
Rotameter, 0-30 Nl/min	HRP-0000-004
Pressure Relief Valve (PRV)	S0015/292
Pressure Control Valve (PCV)	HPG-NCB0-000
Differential Pressure Control Valve (DPCV)	HRA-0000-016
Check Valve	HVP-A000-025
Pressure Sensor	AGM-PA00-148
Differential Pressure Sensor	AGM-PA00-135

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Section 10: Drawings and Diagrams

Title	Drawing Number	Sheet(s)
NITROGEN BUFFER MODEL 2	NB2-GA	3
NITROGEN BUFFER MODEL 2 TYPICAL CIRCUIT	NB2-CT	1
NITROGEN BUFFER HOOK-UP DIAGRAM	NB2-HU	1

Drawings for various models can be provided upon request. Contact EXPO for further information.

Section 11: Certificates

Component	Certificate Number
N2 Buffer System	EXPO 18ATEX1376X SC043 ExVeritas 18FILE0415
Bartec Limit Switch	EPS 14ATEX 1 766 X
Ex e Junction Box*	19ATEX0542X
Ex e Terminal Block*	DEMKO 14 ATEX 1338U
Pyropress Pressure Transmitter*	KDB 12ATEX0009X

* If supplied with the System

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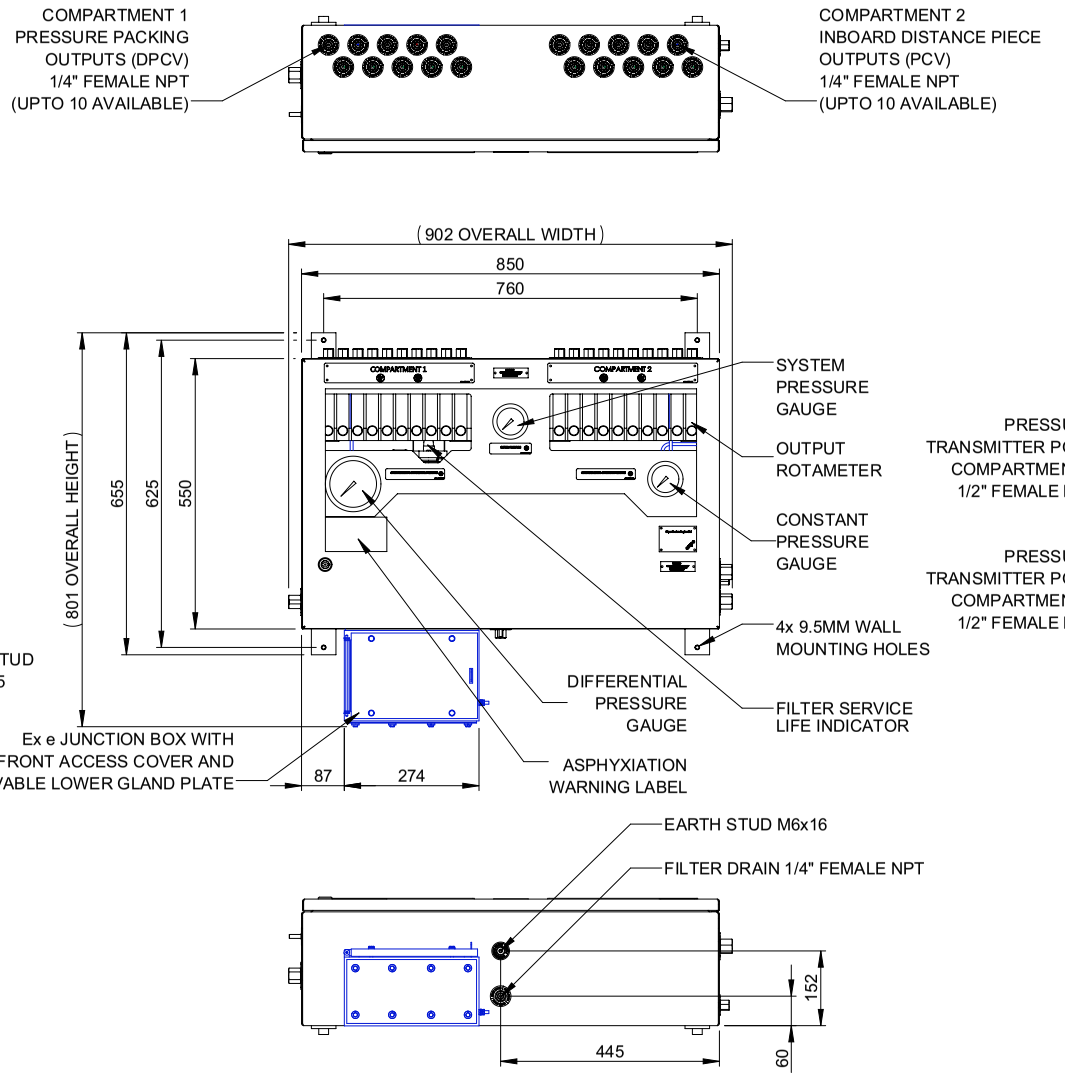
3RD ANGLE PROJECTION	GENERAL TOLERANCES TO ISO 2768 - m K																						UNLESS OTHERWISE STATED:	DO NOT SCALE
BS8888	LINEAR	>0.5 to 6	>6 to 30	>30 to 120	>120 to 400	>400 to 1000	>1000 to 2000	>2000 to 4000	EXTERNAL RADIUS & CHAMFER HEIGHTS	>0.5 to 3	>3 to 6	>6	ANGULAR (SHORTER LEG)	≤10	>10 to 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	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	0.2 x 45° TYP; INTERNAL CORNERS R0.2 TYP	



REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
01	24/106	RD	SH	TH	14/06/2024

DRAWING No.	TITLE	DRAWING TYPE	SCALE	SIZE	SHEET
NB2-GA	NITROGEN BUFFER MODEL 2	GENERAL ASSEMBLY	1:10	A3	1/2

LIFECYCLE STATE	REVISION
RELEASED	01

MATERIAL	SEE PART DETAILS	(MASS [Kg])
FINISH	SEE PART DETAILS	47.58
COMPLIANCE REQUIRED: REACH; RoHS & 3TG	SCHEDULE DOC. REF ✓	ML648 - Nitrogen Buffer

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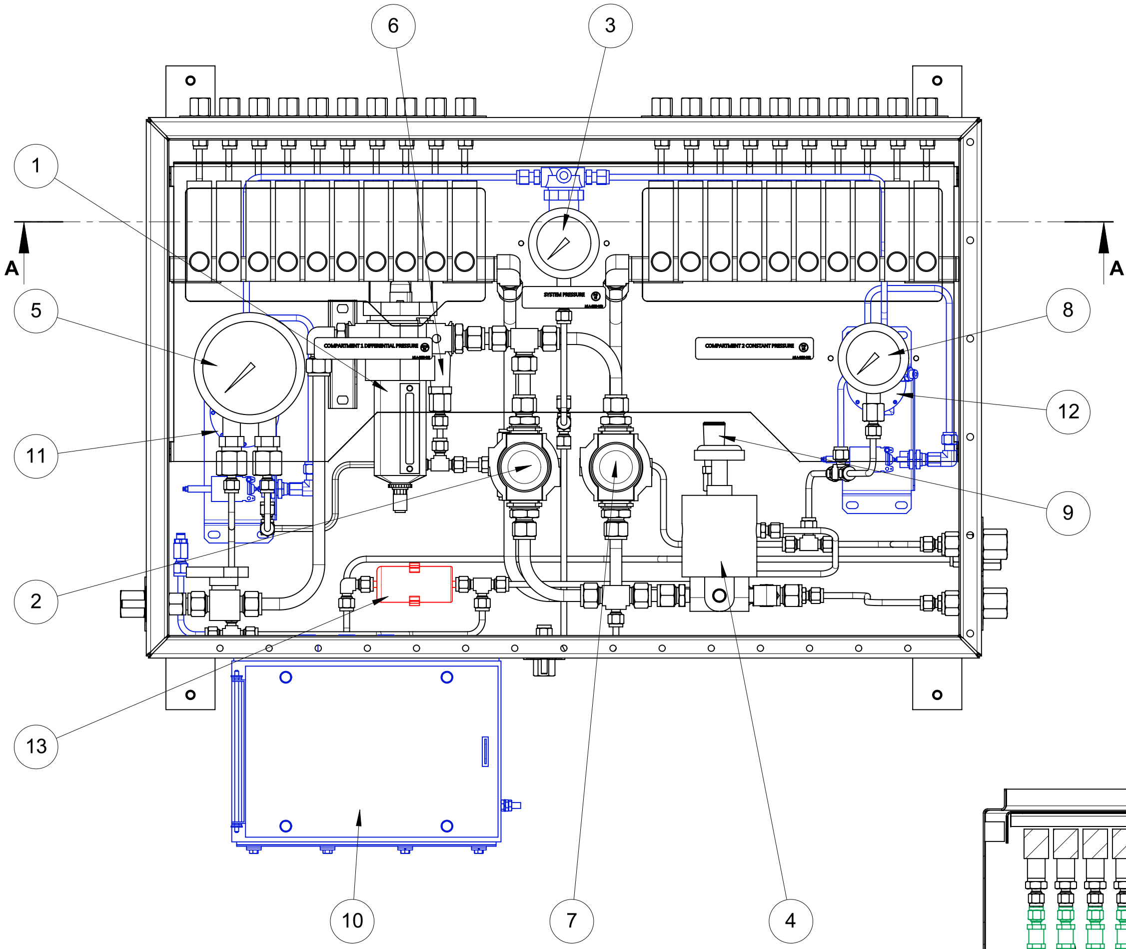
3RD ANGLE PROJECTION BS8888	GENERAL TOLERANCES TO ISO 2768 - m K	UNLESS OTHERWISE STATED: DIMENSIONS IN mm; [ ] DENOTES IMPERIAL REMOVE ALL BURRS AND SHARP EDGES 0.2 x 45° TYP; INTERNAL CORNERS R0.2 TYP	DO NOT SCALE IF IN DOUBT ASK

LINEAR	>0.5 to 6	>6 to 30	>30 to 120	>120 to 400	>400 to 1000	>1000 to 2000	>2000 to 4000
	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

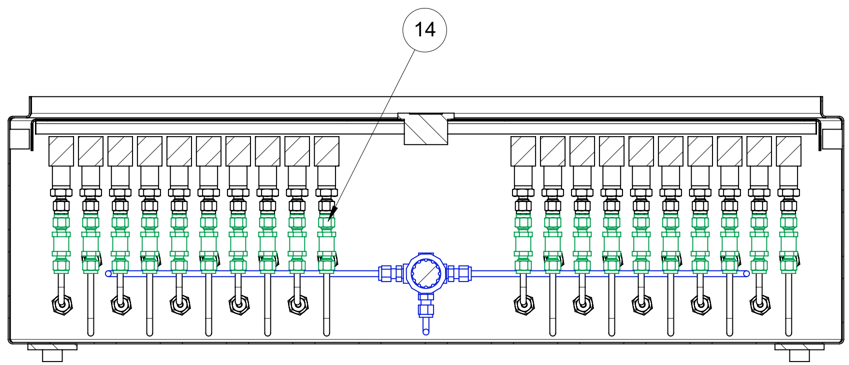
EXTERNAL RADIUS & CHAMFER HEIGHTS	>0.5 to 3	>3 to 6	>6
	±0.2	±0.5	±1.0

ANGULAR (SHORTER LEG)	≤10	>10 to 50	>50 to 120	>120 to 400	>400
	±1°	±0°30'	±0°20'	±0°10'	±0°5'

STRAIGHTNESS & FLATNESS	≤10	>10 to 30	>30 to 100	>100 to 300	>300 to 1000	>1000 to 3000
	0.05	0.1	0.2	0.4	0.6	0.8



ITEM	DESCRIPTION	OPTION ID
1	FILTER	N/A
2	SYSTEM PRESSURE REGULATOR	N/A
3	SYSTEM PRESSURE GAUGE	N/A
4	DIFFERENTIAL PRESSURE CONTROL VALVE	N/A
5	DIFFERENTIAL PRESSURE GAUGE	N/A
6	DIFFERENTIAL PRESSURE RELIEF VALVE	N/A
7	CONSTANT PRESSURE CONTROL VALVE	N/A
8	CONSTANT PRESSURE GAUGE	N/A
9	CONSTANT PRESSURE RELIEF VALVE	N/A
	OPTIONS	
10	EX e JUNCTION BOX	D
11	DIFFERENTIAL PRESSURE SENSOR SWITCH ASSEMBLY	D
12	CONSTANT PRESSURE SENSOR SWITCH ASSEMBLY	D
13	H2S ASORPTION FILTER	E
14	CHECK VALVES	F



SECTION A-A

NOTES

1. DOOR REMOVED & CHASSIS PLATE MADE TRANSPARENT TO SHOW INTERNAL COMPONENTS.

REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
01	24/106	RD	SH	TH	14/06/2024

DRAWING No.: NB2-GA
LIFECYCLE STATE: RELEASED
REVISION: 01
TITLE: NITROGEN BUFFER MODEL 2
MATERIAL: SEE PART DETAILS
FINISH: SEE PART DETAILS
(MASS [Kg]) 41.28
COMPLIANCE REQUIRED: REACH; RoHS & 3TG
SCHEDULE DOC. REF ✓ ML648 - Nitrogen Buffer
DRAWING TYPE: GENERAL ASSEMBLY
SCALE: 1:5
SIZE: A3
SHEET: 2/2

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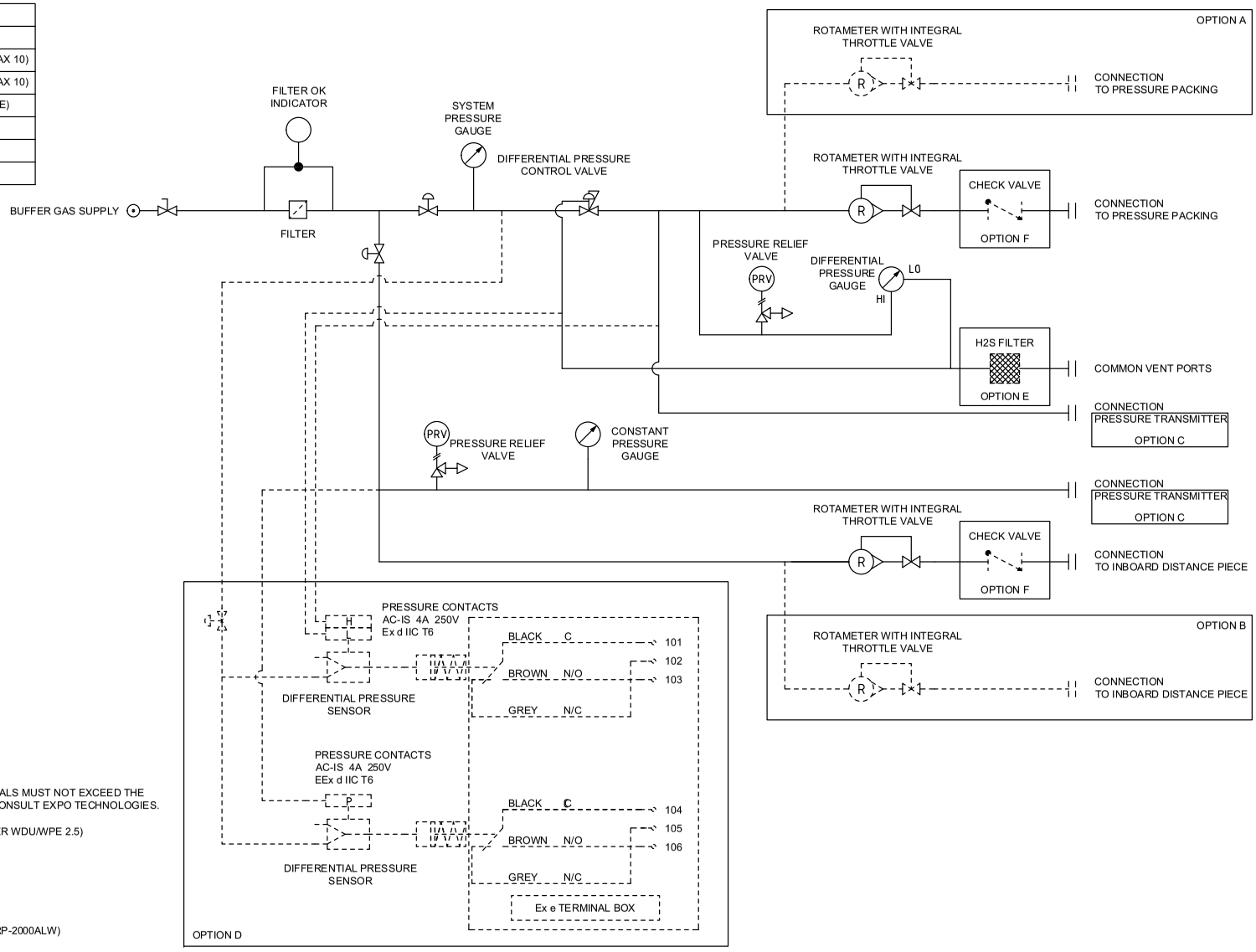
		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0		±0.2	±0.5	±1.0		±1°	±0°30'	±0°20'	±0°10'	±0°5'		0.05	0.1	0.2	0.4	0.6	0.8	0.2 x 45 ° TYP; INTERNAL CORNERS R0.2 TYP	

OPTIONS TABLE	
OPTION	DESCRIPTION
A	NUMBER OF CYLINDERS FOR COMPARTMENT 1 (MAX 10)
B	NUMBER OF CYLINDERS FOR COMPARTMENT 2 (MAX 10)
C	Ex RATED TRANSMITTER (SEE NOTES FOR TYPE)
D	SWITCH & JUNCTION BOX
E	H2S FILTER
F	CHECK VALVES



NOTES

- EXTRA TERMINALS MAY BE FITTED. THE NUMBER OF TERMINALS MUST NOT EXCEED THE MAXIMUM SPECIFIED IN THE TERMINAL BOX CERTIFICATE - CONSULT EXPO TECHNOLOGIES.
- ALL TERMINALS MUST BE Ex eb IIC T5 CERTIFIED (WEIDMÜLLER WDU/WPE 2.5)
- MAXIMUM PER TERMINAL AT 55°C: 250V 4A (AC-15)
- TERMINAL BOX : IP66 STAINLESS STEEL 316
- SWITCHES: Ex d IIC T6 Gb (BARTEC 07-2511)
- PRESSURE TRANSMITTER Ex ia/db IIC T5 Gb (PYROPRESS PYRP-2000ALW)

REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
01	24/106	RD	AO	TH	10/04/2024

DRAWING No.	TITLE	DRAWING TYPE	SCALE	SIZE	SHEET
NB2-CT	NITROGEN BUFFER MODEL 2 TYPICAL CIRCUIT	SCHEMATIC	N/A	A3	1/1

LIFECYCLE STATE	REVISION
RELEASED	01

MATERIAL	N/A	(MASS [Kg])
FINISH	N/A	N/A
COMPLIANCE REQUIRED: REACH; RoHS & 3TG	SCHEDULE DOC. REF ✓	ML648 - Nitrogen Buffer

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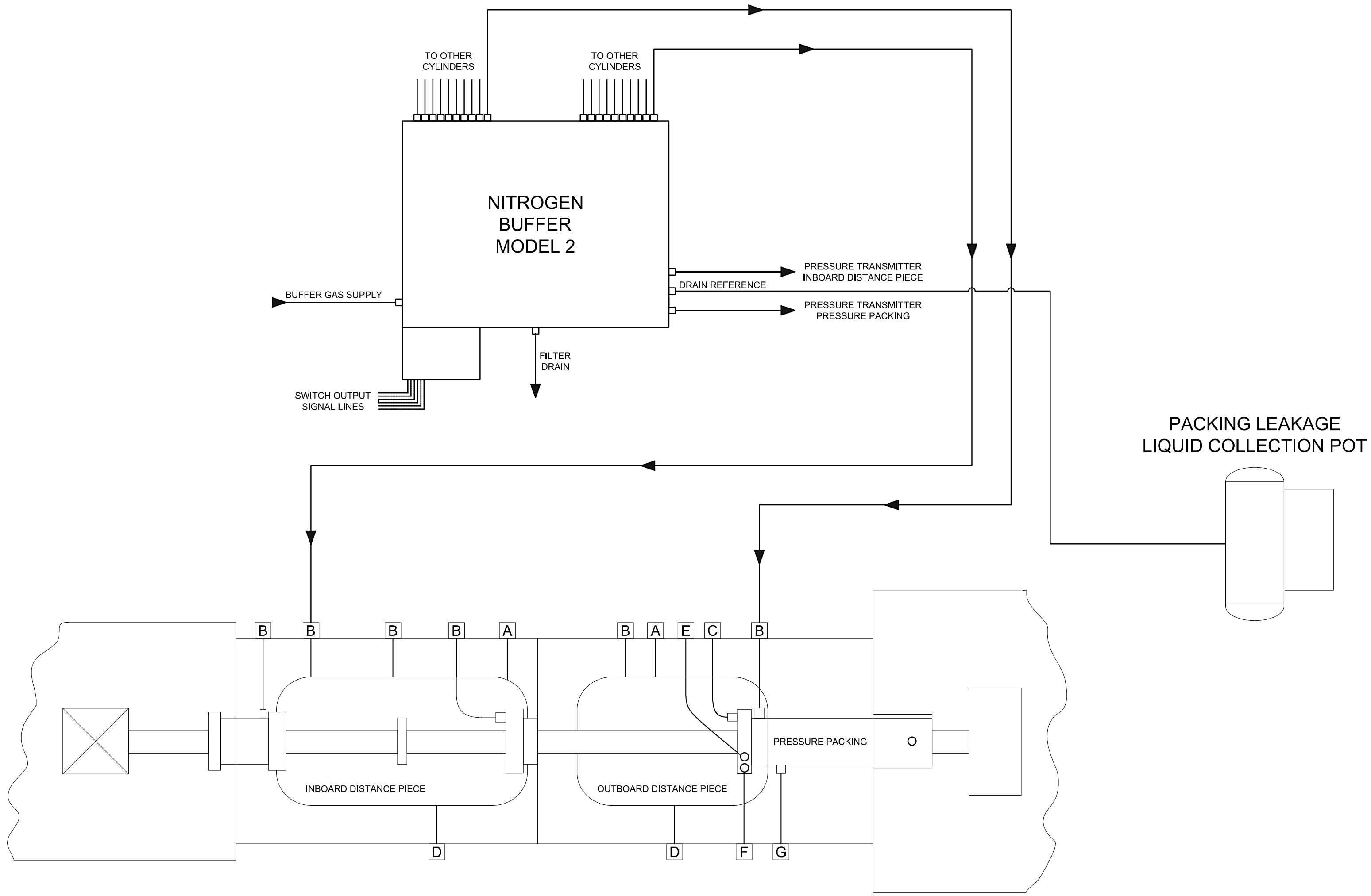
3RD ANGLE PROJECTION BS8888	GENERAL TOLERANCES TO ISO 2768 - m K	UNLESS OTHERWISE STATED: DIMENSIONS IN mm; [ ] DENOTES IMPERIAL REMOVE ALL BURRS AND SHARP EDGES 0.2 x 45° TYP; INTERNAL CORNERS R0.2 TYP	DO NOT SCALE IF IN DOUBT ASK

LINEAR	>0.5 to 6	>6 to 30	>30 to 120	>120 to 400	>400 to 1000	>1000 to 2000	>2000 to 4000
	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

EXTERNAL RADIUS & CHAMFER HEIGHTS	>0.5 to 3	>3 to 6	>6
	±0.2	±0.5	±1.0

ANGULAR (SHORTER LEG)	≤10	>10 to 50	>50 to 120	>120 to 400	>400
	±1°	±0°30'	±0°20'	±0°10'	±0°5'

STRAIGHTNESS & FLATNESS	≤10	>10 to 30	>30 to 100	>100 to 300	>300 to 1000	>1000 to 3000
	0.05	0.1	0.2	0.4	0.6	0.8



RECIPROCATING COMPRESSOR CYLINDER
TYPE D DISTANCE PIECE SHOWN FOR REFERENCE
SCHEMATIC CAN BE USED FOR TYPE C DISTANCE PIECE

REVISION	ECR No.	DRAWN	CHECKED	APPROVED	DATE
01	24/106	RD	SH	TH	14/06/2024

DRAWING No.	TITLE	DRAWING TYPE	SCALE	SIZE	SHEET
NB2-HU	NITROGEN BUFFER MODEL 2 HOOK-UP	SCHEMATIC	N/A	A3	1/1

LIFECYCLE STATE	REVISION
RELEASED	01

MATERIAL	N/A	(MASS [Kg])
FINISH	N/A	N/A
COMPLIANCE REQUIRED: REACH; RoHS & 3TG	SCHEDULE DOC. REF ✓	ML648 - Nitrogen Buffer

expo Technologies

(1) # MANUFACTURERS DECLARATION OF CONFORMITY

(2) Expo Technologies Document Number

EXPO 18ATEX1376X Iss. 1

(3) This declaration is issued for the non-electrical equipment:

Nitrogen Buffer System with part no. CSP *-**** and with part no. NB *-****

(4) Manufacturer:

Expo Technologies Ltd,
Unit 2 The Summit, Hanworth Road, Sunbury-on-Thames, Surrey, TW16 5DB, U.K.

(5) The electrical equipment is specified in the Annex to this certificate and the documents therein referred to.

(6) This declaration and schedule confirms compliance of each unit with the following standards:

BS EN IEC 60079-0: 2018	General requirements
BS EN 60079-14: 2014	Electrical installations design, installation & erection
BS EN ISO 80079-36: 2016	Non-electrical equipment for explosive atmospheres - basic method and requirements

(7) The Nitrogen Buffer System is non-electrical apparatus which fulfils the requirements for Group II Category 2 equipment in accordance with European Directive 2014/34/EU. The construction of the Nitrogen Buffer System is inherently safe for use in Zone 1 hazardous areas.

(8) This assessment is documented in Expo Technologies Ltd. technical file number 53468 and lodged with ExVeritas Limited, Unit 16-18, Abenbury Way. Wrexham Industrial Estate, Wrexham, LL13 9UZ, United Kingdom, Notified Body No. 2585, under the Technical Documentation Storage ExVeritas 18FILE0415.

(9) The Nitrogen Buffer System shall be marked as follows:

Model	Marking	Tamb
CSP*-**00-*** / NB*-**00-***	II 2 G Ex h IIC T5 Gb	-20°C to +55°C
CSP*-**T0-*** / NB*-**T0-***	II 2 G Ex h db ia IIC T5 Gb	-20°C to +55°C
CSP*-**0S-*** / NB*-**0S-***	II 2 G Ex h db eb IIC T5 Gb	-20°C to +55°C
CSP*-**TS-*** / NB*-**TS-***	II 2 G Ex h db eb ia IIC T5 Gb	-20°C to +55°C

For and on behalf of Expo Technologies Ltd.

J.P. de Beer
Managing Director
20th May 2020

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Annex to EXPO 18ATEX1376X Iss. 1

(10) Description

The Nitrogen Buffer System is designed to minimize the leakage of process gasses from a reciprocating compressor by controlling the pressure within the distance pieces to be above the line pressure in any common drain or vent line. API Standard API-618 Appendix I requires the pressure in the distance piece to be maintained at least 15 psi (1.03 bar) above the drain pressure, even when the pressure varies due to other process systems injecting gas into the drain line (usually to flare).

The Nitrogen Buffer System takes N2 (or other inert gas) and uses a pneumatic signal from the common drain line as a set-point to a pressure regulator. That pressure regulator has an offset of 1 bar minimum, with the result that the injected buffer gas will be above the drain pressure by the required amount even with variations in drain line pressure.

The Nitrogen Buffer System is essentially pneumatic and does not require any electro-electronic power source to operate. Product variations selected by the end user permit additional functions through electro-electronic components, therefore the Nitrogen Buffer System may contain one or more of the following Ex certified apparatus, suitable for use in Zone 1 without further assessment.

Manufacturer / Type / Model	Ex Certificate (ATEX / IECEx)	Marking	Tamb
Expo Technologies Ex e Junction Box MIU e	ITS 10ATEX37092X IECEx ITS 10.0003X	II 2 G Ex e IIC T5 Gb	-20°C to +55°C
Weidmüller Ex e Terminal Block WDU 2.5 WPE 2.5	DEMKO 14ATEX1338U IECEX ULD 14.0005U	II 2 G Ex eb IIC T5 Gb	-60°C to +55°C
Pyropress Pressure Transmitter PYRP-2000ALW	KDB 12ATEX0009X IECEx KDB 17.0002X	II 2 G Ex ia/db IIC T5 Gb	-40°C to +75°C
Bartec Limit Switch 07-2511	EPS 14ATEX1766X IECEx EPS 14.0092X	II 2 G Ex db IIC T6 Gb	-20°C to +60°C

Static Electricity

The Nitrogen Buffer enclosure may have a polycarbonate window (non-metallic), nominal thickness 5mm with a total surface area not exceeding 0.25m^2. Therefore, a warning sign is placed close to the window as defined in BS EN ISO 80079-36:2016 Table 11.

WARNING
RISK OF STATIC ELECTRICITY
CLEAN ONLY WITH A DAMP CLOTH
SOLVENTS MUST NOT BE USED

An external equipotential bonding connection is provided, and all the metal parts are bonded to the enclosure wall. A cable lug shall be used so that the conductor is secured against loosening or twisting and that contact pressure is permanently secured.

(11) Installation instructions

The connection of power and communication signals are the sole responsibility of the user. Any cable entry devices into the Ex e Junction Box and/or Pressure Transmitter shall be suitable for the area classification and shall meet the required standards and/or local codes of practice.

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(12) Schedule drawings

Document	Title	Revision	Sheets
SD8341	N2 Buffer - Non-Electrical Assessment	03	5
SD8345	Nitrogen Buffer System - Typical Certification Label	03	1
SD8365	N2 Buffer System GA (Typical)	01	2
SD8366	N2 Buffer System Mk2 - P&ID	01	1

(13) Revision

Issue	Date	Comment
0	27th November 2018	Initial release of the Declaration of Conformity
1	20th May 2020	Revision of document layout & company logo. Change from IIB to IIC

Variation 1 – 20th May 2020

This variation is issued to

(1) revise the document layout and general presentation in line with a new corporate scheme,
(2) to review the technical report in order to change the applicable Gas Group from IIB to IIC.
(3) to record a change in QAR/QAN authority from Notified Body No. 0518 to No. 2813.

As a result, SD 8341 (N2 Buffer Non-Electrical Assessment) and SD8345 (Nitrogen Buffer System Typical Certification Label) are updated to Rev 3.

Variation 1 – End

For and on behalf of Expo Technologies Limited

M C O'Neill
Consultant Engineer – Certification
20th May 2020

Expo Technologies Ltd

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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:	Nitrogen Buffer Systems – Code T
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 flameproof enclosures "d"	EN 60079-1:2014
	Equipment protection by increased safety "e"	EN 60079-7:2015+A1:2018
	Non-electrical equipment for explosive atmospheres basic method and requirements	EN ISO 80079-36:2016

Notified Body:

NB Name:	ExVeritas
NB Number:	2804

Technical documentation and assessments are in the Expo Technologies Ltd confidential technical file SC043.

For and on behalf of Expo Technologies Ltd.

John Paul De Beer
Managing Director

Date: 16th June 2024

ExVeritas®

1. Technical Documentation Receipt and Storage
2. Module A I Annex VIII of ATEX 2014/34/EU
3. File Number: ExVeritas 18FILE0415
4. Equipment: N2 Buffer System
5. Manufacturer: Expo Technologies Ltd
6. Address: Unit 2, The Summit, Hanworth Road,

   Sunbury On Thames, Surrey, TW16 5DB
7. The Referenced Dossier has been received and stored at ExVeritas, Notified Body Number 2585.
8. ExVeritas takes no responsibility for the validity of any information or data supplied within the file by the manufacturer on which parts of the ATEX assessment may be based upon. ExVeritas undertakes that all documents lodged in its care will not be opened or reviewed.
9. Any modification to the product affecting the product as described in the Referenced Dossier must be include in the Referenced Dossier via the ExVeritas File Change process.
10. The file will be held for 10 years after the expiry date, but no further products can be placed on the market after the expire date.
11. File Receipt Date: 19th November 2018
12. Manufacture Period: 5 Years
13. File Lodge Expire Date: 19th November 2033

On behalf of ExVeritas

ATEX Notified Body Number 2585 ExVeritas Technical File Lodged

Sam F
Certification Manager

Date: 19th November 2018

(1) # EU - Type Examination Certificate

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

(3) EU - Type Examination Certificate Number

EPS 14 ATEX 1 766 X **Revision 1**

(4) Equipment: Limit switch type 07-25*1-****/**** and Position switch type 07-291*-****/****

(5) Manufacturer: BARTEC GmbH

(6) Address: Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

(7) This equipment and any acceptable variation thereto are specified in the annex to this certificate and the documentation therein referred to.

(8) Bureau Veritas Consumer Products Services Germany GmbH, notified body No. 2004 in accordance with Article 21 given in the Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in the confidential documentation under the reference number 14TH0090.

(9) Compliance with the essential health and safety requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 **EN 60079-1:2014**

FprEN 60079-0:2017 (IEC 60079-0:2017) **EN 60079-31:2014**

(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 annex to this certificate.

(11) This EU - Type Examination Certificate relates only to the design and examination of the specified equipment in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture of this equipment and its placing on the market. Those requirements are not covered by this certificate.

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

II 2G Ex db IIC T6,T5 Gb

II 2D Ex tb IIIC T80°C,T95°C Db

Certification department of explosion protection

Nuremberg, 2018-06-22

H. Schaffer

BUREAU VERITAS
Consumer Products Services Germany GmbH
Thurn-und-Taxis-Straße 18, 90411 Nürnberg, Germany
Phone: + 49 40 74041-0
cps-nuernberg@de.bureauveritas.com
www.bureauveritas.de/cps

(13) # Annex

(14) **EU - Type Examination Certificate EPS 14 ATEX 1 766 X** **Revision 1**

(15) Description of equipment:

The limit switch type 07-2511-****/**** and 07-2581-****/**** as well as the position switch type 07-291*-****/**** is used as equipment or utility power switch for signal and control circuits. The connection is made by cemented hose cables. The position Switch is designed with a guard (protective enclosure) which protects against the risk of high mechanical hazards according to the EN 60079-0, Table 13b, group II.

Electrical data:

Type	max. Rated current[(1)]	max. Rated voltage
07-2511-1***/****, 07-2581-1***/****, 07-2511-5***/****, 07-2581-5***/****, 07-2511-7***/****, 07-2581-7***/****, 07-2911-****/****, 07-2915-****/****, 07-2917-****/****	AC 2 A	AC 400 V
	AC 7 A	AC 250 V
	DC 0,5 A	DC 250 V
	DC 7 A	DC 30 V
07-2511-3***/****, 07-2581-3***/****, 07-2511-6***/****, 07-2581-6***/****, 07-2511-8***/****, 07-2581-8***/****, 07-2913-****/****, 07-2916-****/****, 07-2918-****/****	0,4 A	30 V

Number of hose cables[(1)]: 1 or 2

Cross section[(1)]: 0,5 mm² up to 1,5 mm²

Ambient temperature range[(1)]: Max. -60 °C ≤ T_a ≤ +75 °C (T6),
Max. -60 °C ≤ T_a ≤ +90 °C (T5)

[(1)] = type depending values

The classification of a specific temperature class depends on ambient temperature, current load, cable type and cross section. These data are defined on the marking plate and they are also provided by the manufacturer within the technical documents and instruction manual.

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www.bureauveritas.de/cps

EU-Type Examination Certificate EPS 14 ATEX 1 766 X **Rev. 0**

(16) Reference number: 14TH0090

(17) Special conditions for safe use:

The limit switch and position switch shall be used within its operating range and rating ac-cording to manufacturer's documents and marking.

The limit switch shall be installed that it is protected by a guard against the risk of high mechanical danger, which meets at least the requirements of IEC 60079-0, Table 13 b), group II. Resistance to light exposure is fulfilled by the housing material according to EN 60079-0.

The specific installation standards and manufacturer's instructions must be respected.

(18) Essential health and safety requirements:

Met by compliance with standards.

Certification department of explosion protection

Nuremberg, 2018-06-22

H. Schaffer

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cps-nuernberg@de.bureauveritas.com
www.bureauveritas.de/cps

1 EU - Type Examination Certificate

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

3 Certificate Number: ExVeritas 19ATEX0542X Issue: 1

4 Equipment: MiniPurge Interface Units MIUe

5 Manufacturer: Expo Technologies Ltd

6 Address: Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey, TW16 5DB, UK

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

8 ExVeritas, Notified Body number 2804 in accordance with Article 17 of the Council Directive 2014/34/EU of 26 February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems for use in potentially explosive atmospheres given in Annex II to the Directive

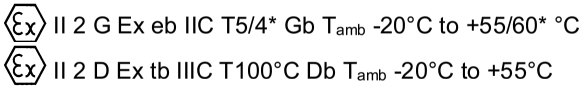
9 Compliance with the applicable Essential Health and Safety Requirements has been assured by compliance with the following Standards and section 16 of this certificate:

EN IEC 60079-0: 2018 EN 60079-7: 2015+A1: 2018 EN 60079-31: 2014

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

12 The marking of the equipment shall include the following:



DANAK
PROD Reg.No. 7044
Member of EA MLA

On behalf of ExVeritas

Peter Lauritzen
Managing Director

13 Description of Equipment or Protective System

The Minipurge Interface Units are part of a series of IP66 rated enclosures that are used as Junction Boxes. The construction of the boxes has been assessed under the component certificate ExV19ATEX0454U. A permitted content of the boxes is specified on drawing SD7623. The current rating and maximum voltage for each terminal box is specified on the label and the general assembly drawings. Three types of boxes have been covered by this certificate:

MIU/e1 – 7A, 400V, IP66 assembly drawing SD7851
MIU/e2 – 7A, 400V, IP66 assembly drawing SD7850
MIU/e1/MO – 2A, 400V, IP66 assembly drawing SD7861

13.1 Details of change:

The following changes are introduced in issue 1 of the certificate:

- Transfer of the certificate from ExVeritas UK, Notified Body number 2585 to ExVeritas Denmark, Notified Body number 2804. Certificate number remains unchanged.

14 Descriptive Documents

14.1 Associated Report and Certificate History:

Report Number	Cert Issue Date	Issue	Comment
R2328/A/1	17th Oct 2019	0	Initial issue of the Prime Certificate
EXV3094A	12th Jan 2021	1	Issue of the first variation, see section 13.1.

14.2 Compliance Drawings:

Issue 0

Title:	Drawing No.:	Rev. Level:	Date:
MIU/e Permitted Contents	SD7623	2	02/10/19
MIU IECEX & ATEX Certificate label	SD7624	4	02/10/19
MIU User Instructions	SD7644	3	02/10/19
Minipurge Interface Unit	SD7850	3	02/10/19
Minipurge Interface Unit	SD7851	3	02/10/19
MIU with manual override	SD7861	3	02/10/19

15 Conditions of Certification

15.1 Special Conditions for Safe Use

- Cable glands, breathers, drains and plugs shall be appropriately ATEX certified types, suitable for the cable and conditions for use and installed in accordance with their manufacturers' instructions. They shall maintain the IP66 rating of the enclosure.

15.2 Conditions for Use (Routine tests)

- None

16 Essential Health and Safety Requirements

Essential Health and Safety Requirements are addressed by the standards listed in section 9 and where required the report listed in section 14.1

The manufacturer shall inform the Notified Body of any modifications to the design of the product described by this schedule.

[1]

EU-TYPE EXAMINATION CERTIFICATE

[2] **Component intended for use on/in Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

[3] EU-Type Examination Certificate Number: **DEMKO 14 ATEX 1338U Rev. 2**

[4] Component: **Feed through and protective conductor terminal blocks, types WDU and WPE**

[5] Manufacturer: **Weidmüller Interface GmbH & Co. KG**

[6] Address: **Klingenbergstrasse 16, 32758 Detmold, Germany**

[7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the Council Directive 2014/34/EU of the European Parliament and the Council, dated 26 February 2014, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to design and construction of components 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. **4787519345**

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

EN 60079-0:2012+A11:2013 EN 60079-7:2007

[10] The sign "U" is placed after the certificate number. It indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

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

[12] The marking of the component shall include the following:

II 2 GD Ex eb IIC

Certification Manager
Jan-Erik Storgaard

This is to certify that the sample(s) of the Component described herein (□Certified Component□) has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the component sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured component. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all products to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2014-10-06
Re-issued: 2016-11-22

Notified Body UL International Demko A/S, Ballerup 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

[13]
[14]

Schedule
EU-TYPE EXAMINATION CERTIFICATE No.
DEMKO 14 ATEX 1338U Rev. 2

[15] Description of Component:
Feed through terminal blocks type WDU and protective conductor terminal blocks type WPE are for the connection of copper conductors in enclosures. The type of protection is increased safety, □eb□, insulating parts made of Wellamid, with optional accessories, type WQV screw in cross-connectors, type ZQV plug-in cross-connectors, type LS2.8 shield bus, type WEW end brackets, type WTW partitions and type WAP end plates for fixing on mounting rails.

Types & electrical data:

TYPE	Rated voltage (V)	Rated Current (A)	Resistance across terminals (u□)	Strip length for min wire size (mm)	Solid wire size (mm^2)	Stranded wire size (mm^2)	Flexible wire size (mm^2)	2 wires in one terminal (mm^2)
WDU 1.5/R3.5	275	15	430	7	0,14-1,5	0,14-1,5	0,14-1,5	0,5-0,75
WDU 1.5/ZZ	550	17,5	740	7	0,14-2,5	0,14-2,5	0,13-1,5	0,5 -1,0
WDU 2.5N	440	24	430	10	0,14-4,0	0,14-4,0	0,5-2,5	0,5-1,5
WDU 2.5/1.5/ZR	550	20	720	10	See NTI	See NTI	See NTI	See NTI
WDU2.5	690	24	369	10	0,14-4,0	0,14-4,0	0,14-4,0	0,5-1,5
WDU 2.5/TC B	55	8	3300	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC E	55	8	8650	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC J	55	8	5808	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC K	55	8	6705	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC N	55	8	9104	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC SR	55	8	2055	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 2.5/TC T	55	8	4611	10	0,14-2,5	0,14-2,5	0,14-2,5	0,5-1,5
WDU 4	690	32	298	10	0,14-6,0	0,14-6,0	0,14-6,0	0,5-2,5
WDU 4 N	352	31	270	11	0,13-6,0	0,13-6,0	0,13-4,0	0,5-1,5
WDU 4/ZR	690	31	440	10	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WDU 4/ZZ	690	29,5	560	10	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WDU 4 SL	440	32,0	300	13	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WDU 4 SL/EN	690	32,0	300	13	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WDU 6	690	41	176	12	0,14-10,0	0,14-10,0	0,14-10,0	0,5-2,5
WDU 6 SL	275	40	360	16	0,14-10,0	0,14-10,0	0,14-6,0	0,5-2,5
WDU 6 SL/EN TS 32	440	40	360	16	0,14-10,0	0,14-10,0	0,14-6,0	0,5-2,5
WDU 6 SL/EN TS 35	690	40	360	16	0,14-10,0	0,14-10,0	0,14-6,0	0,5-2,5
WDU 10	690	57	152	12	1,31-16,0	1,31-16,0	1,31-16,0	0,5-6,0

[13]
[14]

Schedule
EU-TYPE EXAMINATION CERTIFICATE No.
DEMKO 14 ATEX 1338U Rev. 2

WDU 10 SL /EN TS 32	550	55	280	17	1,5-16,0	1,5-16,0	0,5-10,0	1,5-4,0
WDU 10 SL /EN TS 35	690	55	280	17	1,5-16,0	1,5-16,0	0,5-10,0	1,5-4,0
WDU 10 SL	352	55	280	17	1,5-16,0	1,5-16,0	0,5-10,0	1,5-4,0
WDU 16	690	76	161	16	1,5-16,0	1,5-25,0	1,5-25,0	1,5-4,0
WDU 35	690	115	145	18	2,5-16,0	2,5-50,0	2,5-35,0	2,5-16,0
WDU 35N	352	110	122	18	2,5-16,0	2,5-50,0	2,5-35,0	2,5-6,0
WDU 50N	690	126	151	24	5,26-16,0	5,26-70,0	5,26-50,0	6,0-16,0
WDU 70N/35	690	184	142	22	10-16	10-95	10-70	10-25
WDU 70N/95	1100	218	53	30	16	16-120	16-95	16-35
WDU 95N/120N	880	221	129	27	16	16-150	16-120	10-35
WDU 120/150	1100	265	44	35	16	35-150	35-150	35-70
WPE 1.5/R3.5	N/A	N/A	1150	7	0,14-1,5	0,14-1,5	0,14-1,5	0,5-0,75
WPE1.5/ZZ	N/A	N/A		7	0,14-2,5	0,14-2,5	0,13-1,5	0,5 -1,0
WPE 2.5/1.5/ZR	N/A	N/A	660	10	See NTI	See NTI	See NTI	See NTI
WPE 2.5	N/A	N/A	833	10	0,14-4,0	0,14-4,0	0,14-4,0	0,5-1,5
WPE 2.5N	N/A	N/A	380	10	0,14-4,0	0,14-4,0	0,5-4,0	0,5-1,5
WPE 4	N/A	N/A	643	10	0,14-6,0	0,14-6,0	0,14-6,0	0,5-2,5
WPE 4/ZZ	N/A	N/A	584	10	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WPE 4/ZR	N/A	N/A	570	10	0,14-6,0	0,14-6,0	0,14-4,0	0,5-1,5
WPE 4N	N/A	N/A	740	11	0,13-6,0	0,13-6,0	0,13-4,0	0,13-1,5
WPE 6	N/A	N/A	256	12	0,14-10,0	0,14-10,0	0,14-10,0	0,5-2,5
WPE 10	N/A	N/A	221	12	1,31-16,0	1,31-16,0	1,31-16,0	0,5-6,0
WPE 16	N/A	N/A	178	16	1,5-16,0	1,5-25,0	1,5-25,0	1,5-4,0
WPE 35	N/A	N/A	173	18	2,5-16,0	2,5-50,0	2,5-35,0	2,5-16,0
WPE 35N	N/A	N/A	147	18	2,5-16,0	2,5-50,0	2,5-35,0	2,5-6,0
WPE 50N	N/A	N/A	189	24	5,26-16,0	5,26-70,0	5,26-50,0	6,0-16
WPE 70/95	N/A	N/A	76	30	16	16-120	16-120	16-35

[13]
[14]

Schedule
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DEMKO 14 ATEX 1338U Rev. 2

WPE 70N/35	N/A	N/A	156	22	10-16	10-95	10-70	10-25
WPE 95N/120	N/A	N/A	126	27	16	16-150	16-120	10-35
WPE 120/150	N/A	N/A	67	35	35	35-150	35-150	35-70
WAP 2.5-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WAP 16+35WTW 2.5-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WEW 35/1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WEW 35/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WTW EN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LS 2.8	See NTI	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ZQV 1.5N/R3.5	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
ZQV 2.5N	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
ZQV 4N	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 2.5	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 4	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 6	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 10	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 16	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 35	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 35N	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 50N	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 70/95/2	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 70	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 95/120/2	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A
WQV 120/2	See NTI	See NTI	N/A	N/A	N/A	N/A	N/A	N/A

NOTE: NTI = Notice to installer

Temperature range
The ambient temperature range is
- T6 (- 60°C □Tamb □+40 °C)

[13] **Schedule**

[14] **EU-TYPE EXAMINATION CERTIFICATE No.**
DEMKO 14 ATEX 1338U Rev. 2

- T5 (- 60°C Tamb +55 °C)
- T4 (- 60°C Tamb +70 °C)

Installation instructions:
For ambient temperatures below 10 °C and above +60 °C use field wiring suitable for both minimum and maximum ambient temperature.

Mounting instructions:
See schedule of limitations [17].

Routine tests
According to EN 60079-7 clause 7.1 in combination with clause 6.1 a dielectric strength test has to be carried out. The routine tests may be performed on a statistical basis according to ISO 2859-1 with an acceptance quality limit (AQL) of 0,04. Routine test is to be carried out according to Weidmuller procedure High voltage test Document -NR: A_10_54.

[16] Descriptive Documents
The scheduled documents are listed in the report no. provided under item no. [8] on page 1 of this EU-Type Examination Certificate.

[17] Schedule of limitations:

- The feed through and protective conductor terminal blocks are suitable for use in enclosures in atmospheres with flammable gases and combustible dust. For flammable gases these enclosures must satisfy the requirements according to EN 60079-0 and EN 60079-7. For combustible dust these enclosures must satisfy the requirements according to EN 60079-31.
- The terminal blocks shall be placed inside a suitable ATEX certified IP54 enclosure for gas atmosphere. For dust atmosphere the terminal blocks shall be mounted inside a suitable ATEX certified t enclosure (EN60079-31).
- The enclosure shall be constructed to block all sun and UV light from affecting the terminal blocks.
- Under normal operating conditions the temperature rise of the terminal blocks is max 40 K, measured with the max permitted rated current . Due to the above mentioned the terminal blocks may be used in apparatus of temperature classes T6 T1as long as the terminal block ambient temperature range is not exceeded as shown below. No part of terminal block must exceed 110 °C under any condition.
    - T6 (- 60°C Tamb +40 °C)
    - T5 (- 60°C Tamb +55 °C)
    - T4 (- 60°C Tamb +70 °C)
- When using the types WDU and WPE with other terminal blocks series or sizes or accessories, the requirements for clearance and creepages distances according to table 1 of EN 60079-7 must be observed. Regarding the use of covers, cross-connectors and end brackets the instructions of the manufacturer must be followed.
- For terminal jumper accessories current ratings and the resistances across the terminals please refer to the table under types & electrical rating above. Details on creepage and clearance values and the required torque values are in the respective Notice to installers.
- The terminal can be used with either one or two wires into either side of the terminal. When two wires are used they must be of the same type, and of equal sizes. No other wire sizes or types than the ones specified in instructions must be used. The terminal blocks must either be mounted next to another block of the same type and size or with an end plate.
- If smaller conductor cross sections than the rated conductor cross sections are used, then the corresponding lower current shall be stated in the Certificate of the complete apparatus
- Unused terminals shall be tightened.

[18] Essential Health and Safety Requirements
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9

Additional information

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in Annex III to Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014.

PE163/5 **EU DECLARATION OF CONFORMITY**

Issuer: Pyropress Engineering
Address: Bell Close, Plympton, Plymouth, Devon, England, PL7 4JH

The Manufacturer hereby declares that the flameproof products types:-

PYRP-2000ALWD, PYRP-2000ALWD Ex Safety	Pressure Transmitter
PYRD-2000ALWD, PYRD-2000ALWD Ex Safety	Differential Pressure Transmitter
PYRD-2000GALWD, PYRD-2000GALWD Ex Safety	Differential Pressure Transmitter
PYRD-2200ALWD	Differential Pressure Transmitter
PYRL-2000YALWD	Level Transmitter

As being in compliance with the requirements of EU Directive 2014/34/EU, for the use in potentially explosive atmospheres:

I M2 Ex db ia I Mb (316 housing version only)
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T85°C/T100°C Da/Db

Or

I M2 Ex db ia I Mb (316 housing version only)
II 2G Ex ia/db IIC T6/T5 Ga/Gb
II 2D Ex ia/tb IIIC T85°C/T100°C Db

When used within the limitations & conditions of the product specifications, working instructions &
EC Type Examination Certificate Number: KDB 12ATEX0009X
IECEx Type Examination Certificate Number: IECEx KDB 17.0002X

Harmonised standards applied:
EN 60079-0:2012 + A11:2013, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60079-31:2014

Other Directives applied:
EMC – 2014/30/EU,
Conformity assessment procedure: module A. Standard applied EN61326-1:2013Pressure Equipment 2014/68/EU(UE), modules, H1D + H1 (category IV).

Other standards applied:
IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-11:2011, IEC 60079-26:2006, IEC 60079-31:2013, EN61326-1:2009

Notified Body responsible for EC & IECEx Type Examination Certificates:
Glowny Instytut Gornictwa, 40-166 Katowice, Plac Grarkow 1, Poland.
Notified body No 1453.

Notified Body responsible for Quality Assurance:
Intertek Testing & Certification Ltd, Intertek House, Cleeve Road, Leatherhead, Surrey, England KT22 7SB. Notified body No 0359.

Notified Body responsible for PED assessment:
Bureau Veritas S.A., Newtime – 52 Boulevard du Parc – Lle de la Jatte, 92200, Neuilly Sur Seine, France. Notified body No 0062.

Equipment Specification: Product specifications are listed in the Technical file TCF 1061

This Declaration may only be used in its entirety & without change.
Modification of this equipment / product without prior approval from Pyropress Engineering will render this declaration null & void.

Stephen Burns, General Manager, On Behalf of Pyropress Engineering

Signed.....Dated...27th October 2017.

KDBEx.eu

EU-TYPE EXAMINATION CERTIFICATE

[1]

[2] Equipment and protective systems intended for use in potentially explosive atmospheres. Directive 2014/34/EU

[3] EU – type examination certificate (module B):

KDB 12ATEX0009X **issue 1**

[4] Equipment:

Smart Pressure Transmitter type PYRP-2000ALWD, PYRP-2000ALWD Ex Safety
Smart Differential Pressure Transmitter type PYRD-2000ALWD,PYRD-2200ALWD, PYRD-2000ALWD Ex Safety, PYRD-2000GALWD, PYRD-2000GALWD Ex Safety
Smart Level Probe type PYRL-2000YALWD

[5] Manufacturer:

Pyropress Engineering

[6] Address:

Bell Close, Plympton, Plymouth, Devon PL7 4JH
United Kingdom

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate.

[8] Główny Instytut Górnictwa, Notified Body number 1453 in accordance with Directive 2014/34/EU of 26 February 2014, 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 2014/34/EU. The examination and test results are recorded in confidential report **KDB Nr 12.010-2 [T-6847]**

[9] Compliance with the Essential Health and Safety Requirements has been met by compliance with:

EN 60079-0:2012 + A11:2013; EN 60079-1:2014;
EN 60079-11:2012; EN 60079-26:2015; EN 60079-31:2014

[10] In case if the sign „X" is placed after the certificate number, it indicates special conditions for safe use, specified in the schedule to this certificate.

[11] This EU-type examination certificate relates only to the construction, evaluation and tests of product accordance with Directive 2014/34/EU. The certificate does not include other requirements of the Directive relating to manufacturing process and putting into the market of the equipment or protective device.

[12] Marking of the equipment shall include:

I M2 Ex db ia I Mb
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T85°C/T100°C Da/Db
or
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T85°C/T100°C Da/Db
or
I M2 Ex db ia I Mb
II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T85°C/T100°C Db
or
II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T85°C/T100°C Db

mgr inż. Piotr Madej
ATEX Certification Specialist

Główny Instytut Górnictwa w Katowicach – Jednostka Certyfikująca – Zespół Certyfikacji Wyrobów KD „Barbara" Mikołów

KIEROWNIK Zespołu Certyfikacji Wyrobów KD "BARBARA" Mikołów
dr hab. inż. Krzysztof Cybulski, prof. GIG

Date of issue: **31.01.2017 r.** Page **1** of **4**

Główny Instytut Górnictwa, 40-166 Katowice, Plac Gwarków 1, POLAND, www.gig.eu
(Certification Body-Certification Team-Kopalnia Doświadczalna "Barbara" Mikołów)
Certification Body accredited by PCA, Nr AC038

[15] Description:

Pressure transmitters type PYRP-2000ALWD, PYRP-2000ALWD Ex Safety and differential pressure transmitters type PYRD-2000ALWD,PYRD-2200ALWD, PYRD-2000GALWD, PYRD-2000ALWD Ex Safety, PYRD-2000GALWD Ex Safety and level probes type PYRL-2000YALWD work by converting proportional to the measured pressure resistance changes of piezoresistive bridge, located in the single crystal of silicon diaphragm, into a standard current signal 4 ÷ 20 mA with HART communications signal.

The basic units of the transmitter and probe is a measuring head (Ex i) with a silicon diaphragm sensor. Measuring head can be equipped with different pressure connections. Inside the head there is the "pressure chamber" filled with manometer liquid. On the side of measured medium it is limited by a diaphragm welded tightly to the head's body (differential pressure transmitters have two separated diaphragms for the inputs: "+" and "-"). The measuring head is mounted in the housing and secured with two screws.

In the heads to measure differential pressure and absolute pressure the tight bushings are applied. For overpressure measurements at a pressure range head to 7MPa, bushings are used with the opening from which a tube connecting the rear side of the measuring diaphragm to the atmosphere is pulled out; there are cylindrical flameproof joints used additionally in this case and in some versions of pressure difference heads. The transmitters with the head versions described above have category 1/2G, 1/2D.

In the versions pressure transmitters PYRP... and differential pressure transmitters PYRD... of category 2G and 2D (measured in zone 1 or 21) all pressure heads are allowed, including those without additional flame-proof joints.

Enclosures of transmitters are made of die-cast aluminium alloy or stainless steel. Enclosure consists of a body and two screwed covers (display and electrical connection). The cable line is introduced into the enclosure by flameproof cable gland with thread M20x1,5 or 1/2NPT depending on the version of the housing body. In the non-used opening the explosion-proof plug (cap) prod. Pyropress Engineering is mounted.

The transmitters may be fitted with diaphragm seals, which enable them to be used in a variety of conditions such as thick or highly reactive media, high and low temperatures. Elements of the diaphragm seals can be coated with Teflon.

[13]
[14]

SCHEDULE
EU-type Examination Certificate
KDB 12ATEX0009X issue 1

Marking:

version with steel enclosure:

I M2 Ex db ia I Mb
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T85°C/T100°C Da/Db

or

I M2 Ex db ia I Mb
II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T85°C/T100°C Db

version with aluminium alloy enclosure:

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T85°C/T100°C Da/Db

or

II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T85°C/T100°C Db

Technical parameters:

Range of the measured pressure:
-100kPa ÷ 100MPa (PYRP-2000ALWD, PYRP-2000ALWD Ex Safety)
-160kPa ÷ 7MPa (PYRD-2000ALWD, PYRD-2200ALWD, PYRD-2000ALWD Ex Safety)
-10 kPa ÷ 10 kPa (PYRD-2000GALWD, PYRD-2000GALWD Ex Safety)

Range of the measured liquid level:
0 ÷ 10mH_2O (PYRL-2000YALWD)

Output signal:
4÷20mA in a two-wire system + HART

Supply voltage:
13,5V ÷ 55V- standard version
16V ÷ 45V- safety version

Ingress protection:
IP66 / IP67

Ambient temperature:
-40 °C ÷ 45°C/75°C (depending on the temperature class)

[13] -
[14]

SCHEDULE
EU-type Examination Certificate
KDB 12ATEX0009X issue 1

[16] Test report:

„Sprawozdanie z oceny ATEX" KDB Nr 12.010-2

[17] Special conditions for safe use:

- Only those elements can be used as replacing ones which are specified in the descriptive documentation;

- Some of the permitted gaps in the flameproof joints are smaller and the lengths of the flameproof joints are greater than the ones specified in table 1 EN 60079-1. The relevant information for the user is included in the manual;

- In areas where there is a risk of dust explosion, transmitters in aluminium alloy casing covered with lacquer and transmitters with plastic rating plates or with diaphragm seals covered by Teflon should be installed in a way to prevent electrostatic charging according to the operation manual.

[18] Essential health and safety requirements:

Met by compliance with standards listed below:
EN 60079-0:2012 + A11:2013; EN 60079-1:2014;
EN 60079-11:2012; EN 60079-26:2015; EN 60079-31:2014
(PN-EN 60079-0:2013-03 + A11:2014-03; PN-EN 60079-1:2014-12;
PN-EN 60079-11:2012; PN-EN 60079-26:2015-04; PN-EN 60079-31:2014-10)

Document's history:

- EC-Type Examination Certificate KDB 12ATEX0009X of 25.01.2012 with all supplements, initial certification (issue 0).
- EU-Type Examination Certificate KDB 12ATEX0009X issue 1, **this document**, there is a modification in the construction of the pressure transmitters type PYRP-2000ALWD, differential pressure transmitters type PYRD-2000ALWD, PYRD-2200ALWD, and level probes type PYRL-2000YALWD. Pressure transmitters and differential pressure transmitters of category 2 have been introduced. The new performances of the pressure transmitters and differential pressure transmitters PYRD-2000ALWD Ex Safety, PYRP-2000ALWD Ex Safety, PYRD-2000GALWD, PYRD-2000GALWD Ex Safety have been introduced. The changes in the parameters of power supply to 55V have been introduced.

Główny Instytut Górnictwa w Katowicach
Jednostka Certyfikująca
Zespół Certyfikacji Wyrobów KD „Barbara" Mikołów

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 KDB 17.0002X	Issue No: 0	Certificate history: Issue No. 0 (2017-01-31)
Status:	**Current**	Page 1 of 4	
Date of Issue:	**2017-01-31**		
Applicant:	**Pyropress Engineering** Bell Close, Plympton, Plymouth, Devon PL7 4JH **United Kingdom**		
Equipment:	**Smart Pressure Transmitter type PYRP-2000ALWD, PYRP-2000ALWD Ex Safety; Smart Differential Pressure Transmitter type PYRD-2000ALWD, PYRD-2200ALWD, PYRD-2000ALWD Ex Safety, PYRD-2000GALWD, PYRD-2000GALWD Ex Safety; Smart Level Probe type PYRL-2000YALWD**		
Optional accessory:			
Type of Protection:	**Flameproof enclosure "d", Dust protection by enclosure "t", Intrinsic safety "i"**		
Marking:	version with steel enclosure: Ex db ia I Mb, Ex ia/db IIC T6/T5 Ga/Gb, Ex ia/tb IIIC T85°C/T100°C Da/Db or Ex db ia I Mb, Ex ia/db IIC T6/T5 Gb, Ex ia/tb IIIC T85°C/T100°C Db version with aluminium alloy enclosure: Ex ia/db IIC T6/T5 Ga/Gb, Ex ia/tb IIIC T85°C/T100°C Da/Db or Ex ia/db IIC T6/T5 Gb, Ex ia/tb IIIC T85°C/T100°C Db		
Approved for issue on behalf of the IECEx Certification Body:	mgr inż. Ksawery Graboś		
Position:	Head of ExCB		
Signature: (for printed version)			
Date:	31.01.2017		

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:
Główny Instytut Górnictwa, Kopalnia Doświadczalna "BARBARA"
(Central Mining Institute Experimental Mine "Barbara")
ul. Podleska 72
43-190 Mikołów
Poland

GIG

IECEx Certificate of Conformity

Certificate No: IECEx KDB 17.0002X Issue No: 0

Date of Issue: **2017-01-31** Page 2 of 4

Manufacturer: **Pyropress Engineering**
Bell Close, Plympton, Plymouth, Devon PL7 4JH
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 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition:2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*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:

PL/KDB/ExTR17.0002/00

Quality Assessment Report:

GB/ITS/QAR11.0004/04

IECEx Certificate of Conformity

Certificate No: IECEx KDB 17.0002X Issue No: 0

Date of Issue: **2017-01-31** Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Pressure transmitters type PYRP-2000ALWD, PYRP-2000ALWD Ex Safety and differential pressure transmitters type PYRD-2000ALWD, PYRD-2200ALWD, PYRD-2000GALWD, PYRD-2000ALWD Ex Safety, PYRD-2000GALWD Ex Safety and level probes type PYRL-2000YALWD work by converting proportional to the measured pressure resistance changes of piezoresistive bridge, located in the single crystal of silicon diaphragm, into a standard current signal 4 ÷ 20 mA with HART communications signal. The basic units of the transmitter and probe is a measuring head (Ex i) with a silicon diaphragm sensor. Measuring head can be equipped with different pressure connections. Inside the head there is the "pressure chamber" filled with manometer liquid. On the side of measured medium it is limited by a diaphragm welded tightly to the head's body (differential pressure transmitters have two separated diaphragms for the inputs: "+" and "-"). The measuring head is mounted in the housing and secured with two screws. In the heads to measure differential pressure and absolute pressure the tight bushings are applied. For overpressure measurements at a pressure range head to 7MPa, bushings are used with the opening from which a tube connecting the rear side of the measuring diaphragm to the atmosphere is pulled out; there are cylindrical flameproof joints used additionally in this case and in some versions of pressure difference heads. The transmitters with the head versions described above have EPL Ga/Gb and Da/Db.

CONDITIONS OF CERTIFICATION: YES as shown below:

- Only those elements can be used as replacing ones which are specified in the descriptive documentation;
- Some of the permitted gaps in the flameproof joints are smaller and the lengths of the flameproof joints are greater than the ones specified in table 1 IEC 60079-1. The relevant information for the user is included in the manual;
- In areas where there is a risk of dust explosion, transmitters in aluminium alloy casing covered with lacquer and transmitters with plastic rating plates or with diaphragm seals covered by Teflon should be installed in a way to prevent electrostatic charging according to the operation manual.

IECEx Certificate of Conformity

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EQUIPMENT (continued):

In the versions pressure transmitters PYRP... and differential pressure transmitters PYRD... of EPL Gb and Db (measured in zone 1 or 21) all pressure heads are allowed, including those without additional flame-proof joints. Enclosures of transmitters are made of die-cast aluminium alloy or stainless steel. Enclosure consists of a body and two screwed covers (display and electrical connection). The cable line is introduced into the enclosure by flameproof cable gland with thread M20x1,5 or 1/2NPT depending on the version of the housing body. In the non-used opening the explosion-proof plug (cap) prod. Pyropress Engineering is mounted. The transmitters may be fitted with diaphragm seals, which enable them to be used in a variety of conditions such as thick or highly reactive media, high and low temperatures. Elements of the diaphragm seals can be coated with Teflon.

Technical parameters:

Range of the measured pressure:
-100kPa ÷ 100MPa (PYRP-2000ALW, PYRP-2000ALW Ex Safety)
-160kPa ÷ 7MPa (PYRD–2000ALW, PYRD–2200ALW, PYRD-2000ALW Ex Safety)
-10 kPa ÷ 10 kPa (PYRD-2000GALW, PYRD-2000GALW Ex Safety)

Range of the measured liquid level:
0 ÷ 10mH2O (PYRL–2000YALWD)

Output signal:
4÷20mA in a two-wire system + HART

Supply voltage:
13,5V ÷ 55V- standard version
16V ÷ 45V- safety version

Ingress protection:
IP66 / IP67

Ambient temperature:
–40 °C ÷ 45°C/75°C (depending on the temperature class)

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