SERVOMEX
ANALYZERS
HIGH-PERFORMANCE GAS ANALYSIS

SERVOTOUGH Oxy 1800

QUICK START MANUAL

Part Number: **01800003B**
Revision: **4**
Language: **UK English**

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GB OPERATING INSTRUCTIONS ☐

I ISTRUZIONI PER L'USO ☐

D BEDIENUNGSANLEITUNG ☐

F MODE D'EMPLOI ☐

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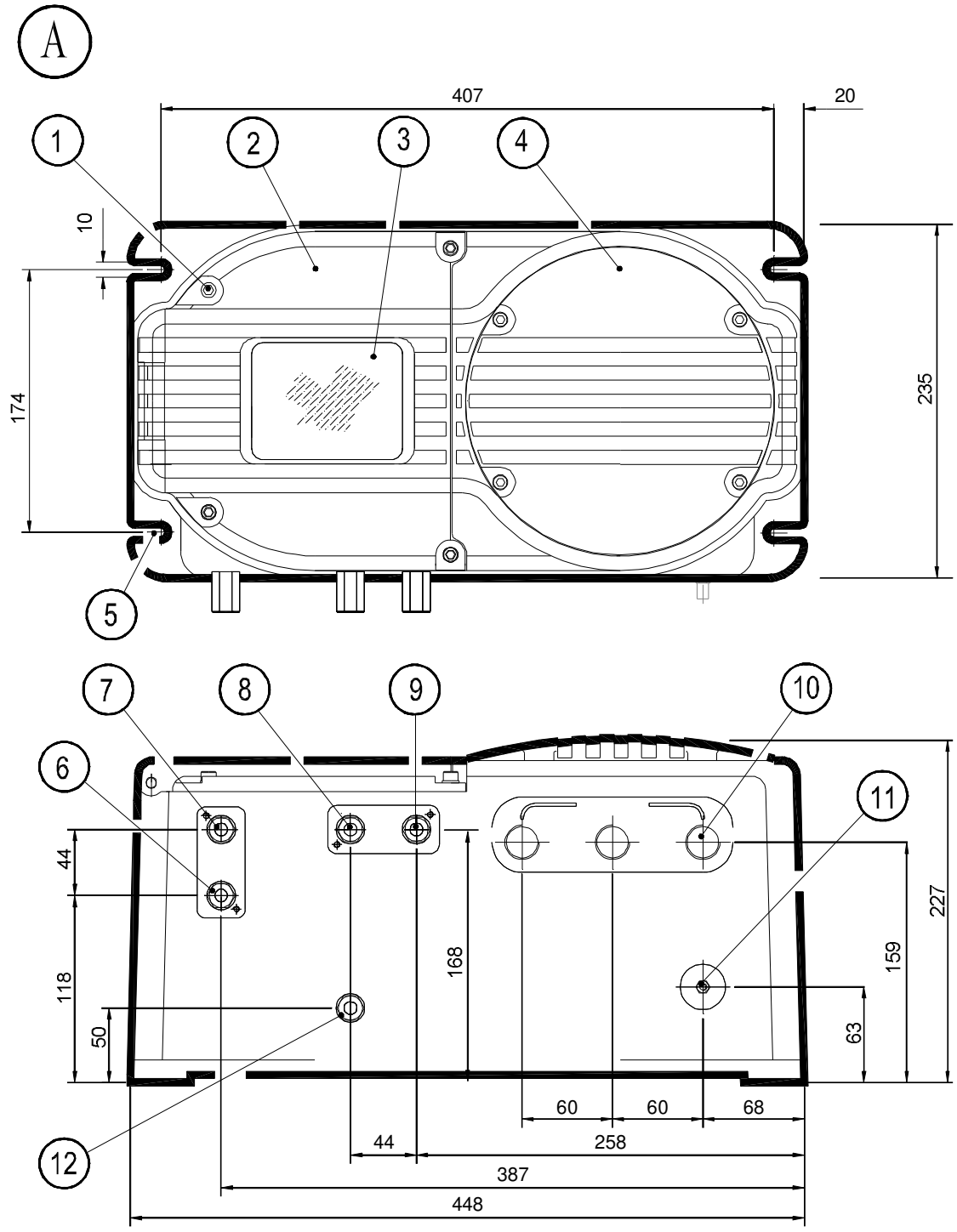
E MANUAL DE INSTRUCCIONES ☐

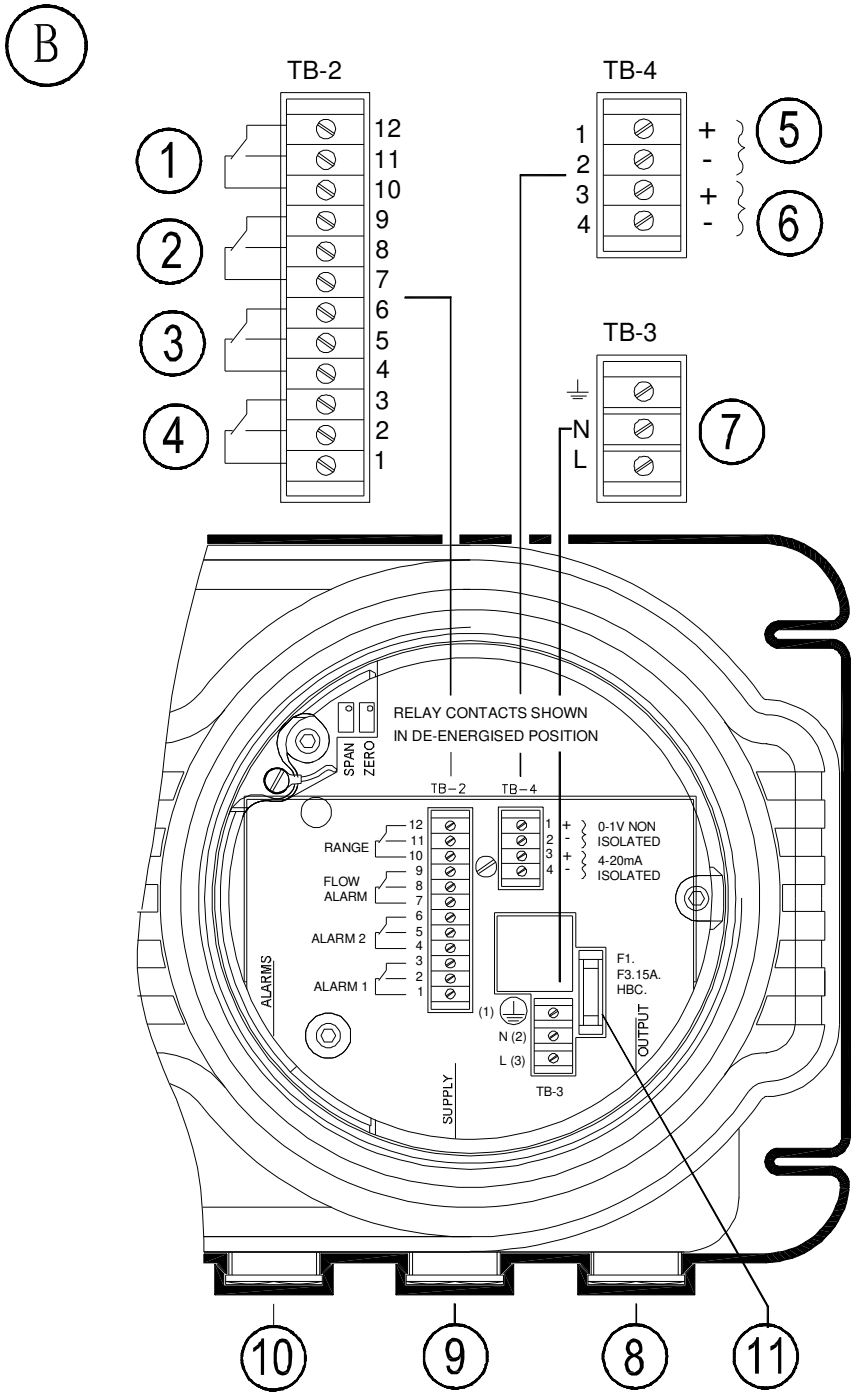
P MANUAL DE INSTRUCOES ☐

J 運転指針 ☐

C 中文 操作指導 ☐



N.B. All dimensions are in millimetres (mm)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TB-4
TB-3
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L
RELAY CONTACTS SHOWN
IN DE-ENERGISED POSITION
SPAN
ZERO
TB-2
TB-4
RANGE
FLOW
ALARM
ALARM 2
ALARM 1
ALARMS
0-1V NON
ISOLATED
4-20mA
ISOLATED
F1.
F3.15A.
HBC.
(1)
N (2)
L (3)
TB-3
OUTPUT
SUPPLY
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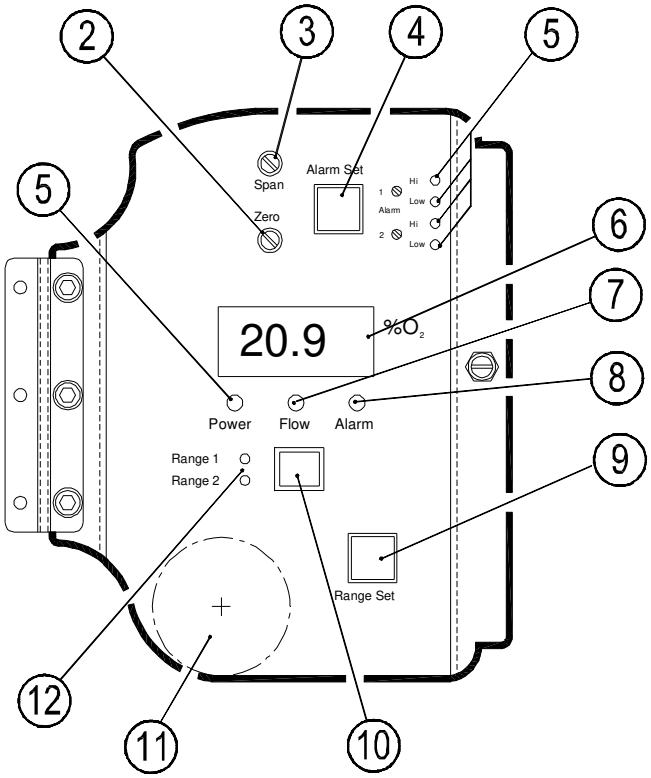
11

C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Range Set
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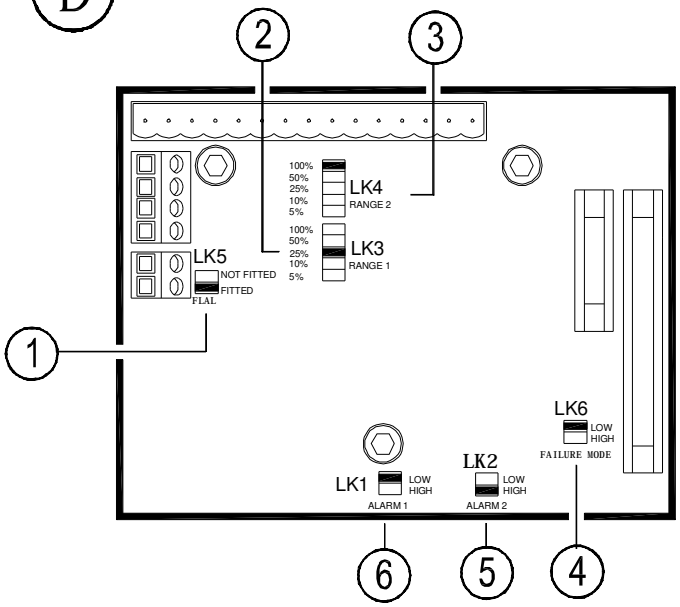
D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RANGE 2
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NOT FITTED
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FLAL
1
LK6
LOW
HIGH
FAILURE MODE
LK1
LOW
HIGH
ALARM 1
LK2
LOW
HIGH
ALARM 2
6
5
4

NOTES

1 INTRODUCTION

1.1 Warnings, Cautions and Notes

This publication includes **WARNINGS**, **CAUTIONS** and **NOTES** which provide information relating to the following:

WARNINGS

Hazards which could result in personal injury or death.

CAUTIONS

Hazards which could result in equipment or property damage.

NOTES

Alert the user to pertinent facts and conditions.

1.2 Scope of this manual

This manual covers installation, normal operation and routine maintenance on xendos 1800 Series analysers.

- For the latest technical specification refer to the Technical Data Sheet.
- Addresses for technical assistance and spares are given on the rear cover.
- A service manual is available for use by qualified personnel, part number **01800002B**.

About this manual

Ref:01800/003B/4
Order as part 01800003B

KEY TO FIGURES

Figure A **Mounting details**

1. M6 bolt (4 off) 5mm allen key
2. LH cover (hinged)
3. Display window
4. RH cover
5. M8 mounting slot (4 off)
6. Purge inlet (if used)
7. Purge outlet (if used)
8. Sample outlet
9. Sample inlet
10. Cable entries (3 off)
11. M6 earth stud
12. Breather Port

(Sample, Purge Inlet / Outlet and Breather Port - ¼"NPT.INT)

Figure B **Electrical connections**

1. Range contacts
2. Flow Fail alarm contacts
3. Alarm 2 contacts
4. Alarm 1 contacts
5. Linear non isolated Output signals
6. Linear isolated Output signals
7. Electrical supply terminals
8. Output cable entry
9. Supply cable entry
10. Alarm cable entry

(Cable entries - ¾"NPT, M20 or Pg13.5)

11. Power Supply Fuse (F1) - F3.15A HBC

Figure C **Control panel (hinged)**

1. Power On LED
2. Set ZERO potentiometer
3. Set SPAN potentiometer
4. Set ALARM push button
5. Alarm LEDs
6. Digital display (0.0 to 100.0% O_2) (optional 0.00 to 100.00% O_2)
7. Flow Failure LED
8. Alarm LED
9. Range change push button
10. Range label (Slip In)
11. Sample filter (Screws in through control panel)
12. Range LEDs

Figure D **Link settings on housekeeping board**

1. Flow alarm (LK5)
2. Range 1 (LK3)
3. Range 2 (LK4)
4. Failure Mode (LK6)
5. Alarm 2 (LK2)
6. Alarm 1 (LK1)

EC Directive Compliance

The xendos 1800 complies with the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC (as amended by Directive 92/31/EEC), both as amended by Directive 93/68/EEC.

1.3 Unpacking

WARNING

The xendos 1800 weighs approximately 26kg (57lbs) and care must be taken when handling. It is recommended that it is lifted with the fingers positioned underneath the rear casting.

- Remove the xendos 1800 from its packing and inspect it for damage.
- If damage has occurred, inform **Servomex** or its agent immediately.
- Please retain all packing and shipping information for future use.

2 INSTALLATION

2.1 Location

Select a location which allows convenient access for installation and maintenance and will minimise ambient temperature fluctuations and vibration.

The analyser must be mounted securely to a rigid vertical surface capable of supporting the weight of the analyser, using the four fixing lugs provided or the panel mounting option.

The xendos 1800 must be mounted horizontally with the sample connections and electrical entries on the underside.

The sample conditioning system where required should be located below the analyser to prevent possible carry-over of condensate into the measuring cell and please take careful note of the ambient temperature requirements.

The xendos 1800 is rated in accordance with IEC 664 for:
'INSTALLATION CATEGORY II' which is characterised as being local level (ie not distribution level), appliances and portable equipment with over-voltage impulse withstand up to 2500V.

Ambient Operating Conditions:

Operating Temperature:	-10°C to +50°C (+14°F to +122°F)
Storage Temperature:	-20°C to +55°C (- 4°F to +131°F)
Atmospheric pressure:	79 to 124 kPaa/11 to 18psia (for operating altitudes to 2000m)

2.2 Panel Mounting

A panel mounting option is available, please consult **Servomex** for further details.

2.3 Conditions for Safe Use

WARNINGS

- The xendos 1800 is only suitable for installation in a safe non-hazardous area. If the application requires the oxygen analyser to be installed in a hazardous area, then a xendos 1900 Series analyser must be used.
- The xendos 1800 is not suitable for use with flammable sample gases. If your sample is flammable, then a xendos 1900 Series analyser must be used.
- Personal injury or equipment damage may occur if the xendos 1800 is not installed and operated in accordance with the instructions in this manual.

2.4 Electrical installation

WARNINGS

- The installer must be satisfied that the xendos 1800 installation conforms to the relevant safety requirements, National Electrical Code and any other local regulations, and that the installation is safe for any extremes of conditions which may be experienced in the operating environment of the analyser.
- This appliance must be connected to a protective earth.
- The electrical installation must include a means of isolating electrical power by a switch or circuit breaker external to the analyser and within easy reach of the operator. It must be marked as the disconnecting device for the equipment.
- It is essential that only suitably trained and competent personnel are allowed to access hazardous live parts by removing or opening covers of the analyser.
- To comply with the European Community EMC Directives for industrial environments the interconnecting cables used for the mains supply, relay contact outputs and/or analogue output signals should be screened or provide equivalent protection.

CAUTION

Connections to TB-4, analogue output signal/s terminals should not exceed 30 V RMS (42.4 V peak) or 60 V dc to earth when connected to associated equipment.

1 Electrical terminations are suitable for 20 AWG (0.5 mm^2) to 14 AWG (2.5 mm^2) solid conductors or stranded conductors.

2 Gland entry sizes and positions are shown in Figure (A). Two of the three cable entries are fitted with appropriate blanking plugs.

3 Do not exceed the maximum current output load impedance of 600 Ohms.

4 Electrical power should be supplied at 100V to 240Vac ± 10% - 50/60Hz. (Note: The optional internal sample pumps are AC voltage dependant. Ensure that the correct AC input voltage is connected to analysers fitted with a sample pump. A power on LED is illuminated when power is present at the analyser).

5 For compliance with the EMC standards, the external earth / ground connection must always be connected to a local earth / ground. Refer to Figure (A). In addition, the connections to TB2, TB3 and TB4 must always be made using a screened or shielded cable with the earth termination being made at the cable gland. Ensure good EMC practices are observed when making connections.

6 All electrical connections and access to the power supply fuse, F1, are made to the terminal board inside the right hand side of the analyser. Refer to Figure (B) for details and full specifications are given in the following table. To gain access refer to Figure (A) and remove the right hand cover by unbolting the four M6 bolts using a 5mm allen key. After electrical connections are complete ensure the lid is fully bolted down.

WARNING

If the relay connections to TB2 are used to switch a combination of 240V ac and 28V dc signals, then all parts of the dc relay circuits must be protected to a minimum of IP20

Power Connection		Terminal
Electrical Power, 100V to 240Vac ±10%, 50 / 60 Hz, 50VA maximum	Protective Earth Neutral Live	TB3-1 TB3-2 TB3-3

Alarm Connection		Terminal
Alarm 1 250Vac, 3A 28Vdc, 1A	Closes on Alarm 1 or Power Fail Opens on Alarm 1 or Power Fail Common	TB2-1 TB2-2 TB2-3
Alarm 2 250Vac, 3A 28Vdc, 1A	Closes on Alarm 2 or Power Fail Opens on Alarm 2 or Power Fail Common	TB2-4 TB2-5 TB2-6
Flow Fail Alarm 250Vac, 3A 28Vdc, 1A	Closes on Flow Fail Alarm or Power Fail Opens on Flow Fail Alarm or Power Fail Common	TB2-7 TB2-8 TB2-9

Range Selected Output Connection		Terminal
Range 2 selected 250Vac, 3A 28Vdc, 1A	Closes on Range 2 or Power Fail Opens on Range 2 or Power Fail Common	TB2-10 TB2-11 TB2-12

Linear Analogue Output Signal Connection		Terminal
0 to 1 Vdc Oxygen output signal, (non isolated), output impedance 470 Ohms typical	+ ve - ve	TB4-1 TB4-2
4 to 20mA Oxygen output signal, (<22mA maximum) (isolated), maximum load impedance 600 Ohms	+ ve - ve	TB4-3 TB4-4
The full scale of the above outputs represents the range selected by the push button Range switch on the front panel.		

2.5 Sample and calibration gas connections

CAUTION

- The sample gas must not be admitted to the analyser until a period of 4 hours has been allowed for warm up, this will prevent condensation of the sample in the measuring cell.
- The inlet pressure and flow rate for the sample or calibration gas must not exceed the limits specified in the following table or damage could occur. If necessary, an external pressure reducing device must be used to reduce the pressure to the stated limits.
- When pressurising the sample system for the purpose of leak testing ensure that pressure is increased and decreased slowly. High internal flow rates created when the pressure is changed rapidly will damage the measuring cell.

xendos 1800 Series - Sample and Calibration Gas Condition Requirements					
Sample	**Base Analyser**	**High-flow cell or Bypass**	**AFCD**	**AFCD + Sample Pump**	**AFCD + BPR**
Inlet Pressure	# 0.04 psig 0.3 kPag min	# 0.05 psig 0.4 kPag min	1 to 5 psig 7 to 35 kPag	-0.03 to 1 psig -0.2 to 7 kPag	17 to 22 psia 119 to 154 kPaa
Flow Rate	50 to 250 ml/min	50 to 70l/hour (60l/hr nominal.)	1.2 to 3.5 l/min	1.6 to 1.8 l/min	1.0 to 2.0 l/min
Vent Pressure	11.5 to 18 psia (80.5 to 126 kPaa) - DO NOT RESTRICT ANALYSER VENT				
Dew Point	Non-condensing at ambient temperature				
Temperature	-10°C to +50°C (+14°F to +122°F)				
Particulates	< 3 µm (micro metres)				
Condition	Clean, non-flammable* and free from oil and condensate**				
Connections	¼" NPT.INT Inlet / Outlet Connectors (See Figure A) (Female)				

Adjust pressure and flow externally to provide sample flow rate
* For flammable samples use a xendos 1900 Series analyser
** For corrosive samples use a solvent resistant cell option
AFCD - Automatic Flow Control Device **BPR** - Back Pressure Regulator

- If the automatic flow control device option is fitted no external flow control is necessary, the sample pressure must be between the limits specified in the previous table and/or the latest Technical Data Sheet.

- If the optional automatic flow control device option is not fitted it will be necessary to regulate the sample pressure / flow within the limits specified in the previous table to ensure stable operation and to prevent damage to the measuring cell.

- If an external sample pump is used it may be necessary to reduce pressure pulsing with a reservoir.

- The sample exhaust from the analyser should be vented freely to atmosphere.

WARNING

- Verify that connections are leak free at full operating pressure before applying sample or calibration gases. These gases may be toxic or asphyxiant.
- Consideration should be given to the toxicity, corrosiveness and asphyxiant nature of the sample and enclosure purging gas when selecting a vent location.

2.6 Enclosure purge connection

WARNING

If the sample gas is of a toxic or corrosive nature it is recommended that the enclosure purge option is fitted. If fitted the enclosure purge must be operational before removing any covers.

The enclosure purge inlet and outlet connection sizes and location are shown in Figure (A). Supply air or inert gas at 100 to 200ml/minute. Vent the outlet freely to atmosphere.

2.7 Shut down procedure

Before removing power from the analyser disconnect the sample gas and flush

the analyser sample pipework with dry nitrogen or good quality instrument air for 10 minutes.

3 SETTING UP

3.1 Configuration

The analyser is supplied with a digital display which is always ranged 0 - 100% Oxygen, an isolated current and non-isolated voltage outputs. These outputs may be used simultaneously. The push button Range switch on the front panel and/or the settings of Link 3/4 selects the full scale range of both outputs.

The default analyser configuration is as follows:

Link	Parameter	Setting	Link	Parameter	Setting
LK 1	Alarm 1	Low = 0.0% O_2	LK 4	Range 2	0 - 25% O_2
LK 2	Alarm 2	High = 21.0% O_2	LK 5	Flow Alarm	"Fitted" if option included
LK 3	Range 1	0 - 10% O_2	LK 6	Failure Mode*	Low on Fault

* Failure Mode - If the sample flow fail alarm option is fitted and a low sample flow condition is detected then the isolated 4-20mA output signal (depending on the link setting selected) will go to either 0mA (default) or >20mA to indicate that this fault is present. ***Note:** Transducer failure will produce a 'Low on Fault' condition.

The flow alarm indicator will flash if the sample flow falls below a satisfactory level and the flow alarm relay will go to the alarm condition. The alarm and relay are automatically cleared when the flow returns to normal.

To change the above configuration on **housekeeping** board:

1. Switch off the analyser.

2. Open the hinged front left cover by undoing the four M6 bolts using a 5mm allen key.

3. Open the hinged display cover with the screw situated in the middle of the right hand side.

4. Set the links on the **housekeeping** board to the required position with reference to Figure (D). The links should be removed and replaced using a pair of snipe nosed pliers.

5. Spare range labels are provided with the analyser that slip into the side of the front panel to indicate the new ranges selected.

6. Switch on the analyser, the Range LED indicator on the front panel will show whether Range 1 or Range 2 has been selected, see Figure (C).

3.2 Alarm Set Point Adjustment

The alarm set-point range is equal to the full scale range of the analyser and its digital display (0-100% O_2). The alarm level is set as an Oxygen concentration value. It is independent of the scaling selected for the analogue outputs. Changing the ranges of the output signals with the Range Change push button switch on the front panel does not affect the alarm set-points. Adjusting the alarm set-point does not affect the current or voltage output signals.

1. Open the hinged front left cover using an 5mm allen key.

2. Press the 'Alarm set' button; one of the LED indicators will be illuminated. The set-point for this alarm will be shown on the display. Adjust the alarm set-point control adjacent to the illuminated indicator to achieve the desired alarm set-point.

3. Press the 'Alarm set' button again, a LED indicator for the other alarm will now illuminate. Adjust the alarm set-point displayed to the desired level.

The LED indicators also indicate whether the alarm is configured to be a High or Low alarm, they will flash if an alarm is present and will automatically clear when the oxygen concentration returns to normal. Refer Figure (C).

4 CALIBRATION

4.1 Zero and Span adjustment

CAUTION

The pressure and flow rates of the zero and span gases used to calibrate the xendos analysers must not exceed the values detailed in the table in **Section 2.5 Sample Gas Connection**.

The analyser should have been running for at least four hours before carrying out calibration. It is recommended that the sample outlet from the xendos analyser be vented directly to atmosphere.

In oxygen purity applications changes in atmospheric pressure can affect the measurement. Fitting the Back Pressure Regulator option will reduce this effect. (See the table in Section 7.1)

The zero and span calibration gas can be introduced into the analyser via a 3-way valve fitted into the sample inlet pipework or directly into the analyser sample inlet by disconnecting the sample pipework and isolating the sample flow elsewhere.

1. Open the hinged front left cover using a 5mm allen key.

2. To set the zero, introduce zero calibration gas, this should be high purity nitrogen (99.9% min.). Once the reading has stabilised, adjust the zero control so that the display reads 0.0% oxygen.*

3. To set the span, introduce span calibration gas, normally this can be good quality clean dry instrument air (nominally 20.95% oxygen) is recommended for all ranges except where the sample will have an oxygen content greater than 21%. For samples with oxygen content above 21%, a suitable certified calibration gas is essential. Once the reading has stabilised, adjust the span control so that the display reads 20.9 % oxygen* or the actual level of oxygen in the calibration gas cylinder.

* with the optional 4.5 digit display board, the zero can be set to 0.00% and span to 20.95%

The calibration should be checked either weekly, monthly or 3 monthly depending on application.

4.2 Zero and Span adjustment of the Isolated 4-20mA analogue output signal

Located in the top left hand corner of the terminal compartment of the enclosure are two potentiometers for the Zero and Span adjustment of the isolated current output signal.

1. Connect a current meter with the range set to 0 to 100mA between Pin 3 (+ve) of TB4 and Pin 4 (-ve) of TB4.

2. Connect a voltage meter with the range set to 0 to 2Vdc between Pin 1 (+ve) of TB4 and Pin 2 (-ve) of TB4.

3. Set the output measurement range to 0 to 25% O_2.

4. Apply Nitrogen to the inlet of the analyser at the correct pressure and flow rate. When the analyser reading has stabilised adjust the Zero potentiometer on the analyser front panel so that the voltage output reads 0.000Vdc.

5. Then adjust the 4-20mA Zero potentiometer located in the terminal compartment to give an output current of 4.00mA. Then apply high quality clean instrument air (i.e. 20.95% O_2) to the inlet of the analyser at the correct pressure and flow rate.

6. When the analyser reading has stabilised adjust the Span potentiometer on the analyser front panel so that the voltage output reads 0.838Vdc.

7. Then adjust the 4-20mA Span potentiometer located in the terminal compartment to give an output current of 17.41mA.

Where required the Display board has the facility to change the range of the Span adjustment for local altitudes or sample pressures. Adjust as follows:

1. Open the sample compartment hinged cover and open the hinged display panel.
   The coarse span adjustment potentiometer (RV3) is accessible from the side of the display board just above the display panel latch.

2. Apply high quality clean instrument air to the analyser and set the front panel Span control to maximum (fully clockwise).
   Adjust the coarse span potentiometer on the display board until the

display reading is approximately 24% oxygen.

3. Reset the front panel Span control to calibrate the analyser as in part 6 above.

5 ROUTINE MAINTENANCE

5.1 Filter Replacement

If the automatic flow control option is fitted, replace the filter element, located protruding through the front panel, Reference Figure C at 3 month intervals. This period may be extended for clean samples. The analyser must be isolated from the sample or calibration gas while the filter element is being changed. The filter element is removed by unscrewing the large filter cap on the front panel. The old element must be disposed of safely. If the element is wet or very dirty check that the sample conditioning is adequate. Once the filter cap is replaced the filter seal should be checked for leaks. The analyser must not be operated without the filter element in place as dust and other particulates may permanently damage the measuring cells.

5.2 Cleaning

The exterior of the analyser may be cleaned using a slightly damp cloth. Do not use solvents or abrasive cleansers to clean the analyser.

6 SPARES

The following spares are required to maintain normal operation of the analyser.

Part Number	Description - xendos 1800 Series	Quantity
S1800986	Enclosure seals kit (10 off)	1 pkt.
S1800987	Fuse kit (F3.15A HBC) (10 off)	1 pkt.
	with AFCD fitted	
S1800985	AFCD filter element kit (10 off)	1 pkt.

The following spare items are also available for the analyser.

Part Number	Description - xendos 1800common parts	Quantity
S1800911	Housekeeping pcb complete	1 off
S1800902A	3.5 digit display pcb complete	1 off
S1800912A	4.5 digit display pcb complete	1 off
S1800913C	Terminals pcb complete	1 off
2822-2028	Switch mode power supply module	1 off
3950-6087	Anti-static glass window	1 off

Part Number	Description - xendos 1800 sample option - standard	Quantity
S1800966	Sample Inlet & Outlet Tubes (SS316) Kit	1 off
S1800981	Sample Flow Alarm (xendos 1800)	1 off
S1800989B	Standard O_2 Transducer Assy.	1 off
S1800988	Back Pressure Regulator	1 off
00570915	AFCD for analysers without optional flow alarm	1 off
S1420935	AFCD for analysers fitted with optional flow alarm	1 off

Part Number	Description - xendos 1800 sample option - solvent resistant/high-flow cell	Quantity
S1802966	Sample Inlet & Outlet Tubes (Hastelloy C-276) Kit	1 off
S1802989B	solvent resistant O_2 Transducer Assy.	1 off
S1804989B	high-flow O_2 Transducer Assy.	1 off
S1806989B	solvent resistant high-flow O_2 Transducer Assy.	1 off

7 TECHNICAL SPECIFICATION - xendos 1800 Series

7.1 Analyser Performance

	Base Analyser	AFCD	AFCD + BPR	High Flow Transducers: Standard or Solvent Resistant
Intrinsic Error (accuracy)	< 0.2% of reading or 0.05% O_2 #			
Linearity Error	<0.05% O_2 ##			
Repeatability	< 0.1% of reading or 0.05% O_2 #			
Noise (peak to peak) / %O_2	<0.04	< 0.05	< 0.04	< 0.04
Zero Drift	< 0.05% O_2 per week			
Span Drift	< 0.1 % of reading or 0.05% O_2 per week #			
Response Time (T_{90})	< 4	< 7	< 7.5	< 5
Ambient Temperature Coefficient per 10°C	0.2% O_2 ± 0.5% of reading			
Ambient Pressure Coefficient	1	1	< 0.13	1
	% of reading for a 1% change in ambient pressure			
Sample Flow Rate Effect	< 0.1% O_2 over 50 to 250 mls/min	N/A	N/A	< 0.2% O_2 over 50 to 70 litres/hour

Whichever is the greater.
Inherently linear, value dependent on calibration gases
The performance specification has been written, and verified, in accordance with the international standard IEC 1207-1:1994 “Expression of performance of gas analysers”.

Measurement Range:	0.0 - 100.0% of Oxygen (O_2)
Analogue Output ranges:	Two user configurable analogue output ranges selectable from 0 - 2.5, 5, 10, 25 and 100% O_2
Analyser Outputs:	
Digital display -	3.5 digit backlit LCD (0.0 to 100.0% O_2)
Optional -	4.5 digit LCD (0.00 to 100.00% O_2)
Display resolution -	0.1% O_2 (or optional 0.01% O_2)
Current output -	4-20mA, isolated, maximum 600 Ohms
(Linear)	(< 22mA maximum) the current output signal corresponds to the full scale range selected
Fault states (flow fail) -	High on Fault = >20mA. Low on Fault = 0mA
Voltage output -	0-1Vdc, non-isolated,
(Linear)	output impedance 470 Ohms typical the voltage output signal corresponds to the full scale range selected
Fault states (flow fail) -	High on Fault = +1.2V. Low on Fault = -1.2V
Range indication -	Volt free relay outputs and LED
ALARMS:	
Concentration alarms -	Two volt-free relay outputs and LED User configurable as High or Low. Set point field adjustable over range 0-100% O_2
Concentration:	
alarm hysteresis -	0.2 to 0.3% O_2
Sample flow fail alarm -	Volt free relay output and LED
Alarm relay contact -	250V ac / 3A or 28V dc / 1A (non-inductive)
rating	maximum and 5V / 10mA ac/dc minimum.
Transducer Fault -	current and voltage outputs go to Low on Fault state. (see above)

Physical:

Size - 448mm W x 235mm H x 229 mm D
(17¾" W x 9¼" H x 9" D approx.)

Weight - 26kg (57lbs)

Power Supply - 100 to 240Vac ±10%, 50/60Hz, 50VA maximum

Materials in contact with the sample -

	Basic Analyser	Standard Cell + Flow Alarm	Standard Cell + AFCD	Standard Cell + BPR	High Flow Rate Cell / Stainless Steel Pipework	Solvent resistant Cell + Stainless Steel Pipework	Solvent resistant Cell + Hastelloy Pipework
Beryllium-Copper				✓			
Borosilicate Glass	✓	✓	✓	✓	✓	✓	✓
Bonded Borosilicate Glass Fibre			✓				
Brass		✓					
Phospher Bronze		✓					
Flourocarbon Rubber	✓	✓	✓	✓			
Hastelloy C-276							✓
Nickel (electroless)	✓	✓	✓	✓	✓	✓	✓
Neoprene Rubber		✓					
Glass Filled Nylon 12		✓					
Polysulphone		✓					
Platinum	✓	✓	✓	✓	✓	✓	✓
Platinum / Iridium Alloy	✓	✓	✓	✓	✓	✓	✓
Glass Filled Polypropylene			✓				
Polypropylene	✓	✓	✓	✓			
PVC				✓			
PVDF				✓			
Gold Plated Silver		✓					
302 / EN58A Stainless Steel			✓				
303 Stainless Steel	✓	✓	✓	✓			
316 Stainless Steel	✓	✓	✓	✓	✓	✓	✓
Viton (325 Cell)	✓	✓	✓	✓	✓		
Viton – A			✓				
Chemraz (364 Cell)						✓	✓
PTFE (364 Cell)						✓	✓

Ingress protection - IP 66 to IEC 529:1989 and BS EN60529 (1992).
NEMA 4X to NEMA standards publication No.250

Design standards:
Conforms to the following normalized European and International standards for product safety and electromagnetic compatibility:

Electromagnetic compatibility	
Europe:	European Union Electromagnetic Compatibility Directive:
	Emissions Class A: Equipment suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.
	Immunity: Industrial.
Canada:	This ISM device complies with Canadian ICES-001.
	Cet appareil ISM est conforme à la norme NMB-001 du Canada.
US:	The analyser complies with Part 15 of the FCC Rules for Class A equipment. It is not suitable for operation when connected to a public utility power supply that also supplies residential environments.

Electrical Safety

IEC 61010-1/ EN 61010-1 for electrical safety including any additional requirements for US and Canadian national differences.

Overvoltage Category: Category II.

Pollution Degree: 2

NOTES