SYSTECH INSTRUMENTS

MODEL EC96

AMBIENT AIR ANALYSER (GENERAL ELECTRIC)

OPERATOR'S INSTRUCTION MANUAL

CONTENTS

DRAWING: B 096 013

PREFACE

We are always trying to improve our product, of which this manual is part, and so we would greatly appreciate any information that you can give us of any difficulties you may encounter with the monitor or the manual.

IMPORTANT

Please read this manual before attempting to install or operate the equipment.

The equipment should be electrically connected and grounded in accordance with the installation drawing at the rear of this manual and in accordance with good standard practice.

No responsibility is accepted by Systech Instruments for accidents resulting from improper use of this equipment.

WARRANTY

This Instrument is guaranteed for a period of three years from its delivery to the purchaser covering faulty workmanship and replacement of defective parts. This assumes fair wear and tear and usage specified on the data sheet. It does not cover routine calibration and housekeeping.

We maintain comprehensive after sales facilities and the instrument should be returned to our factory for repairing or servicing if this is necessary. The type and serial number should always be quoted together with full details of any fault.

Warranty repair or replacement will be made without charge noting the above comments. Equipment must be shipped prepaid after return authorisation has been obtained.

All service and technical enquires are covered from our factory in Thame, Oxfordshire, where we will endeavour to give a quick and helpful response. Systech are happy to quote for routine servicing or maintenance of the equipment at the customer's premises.

The factory address details are

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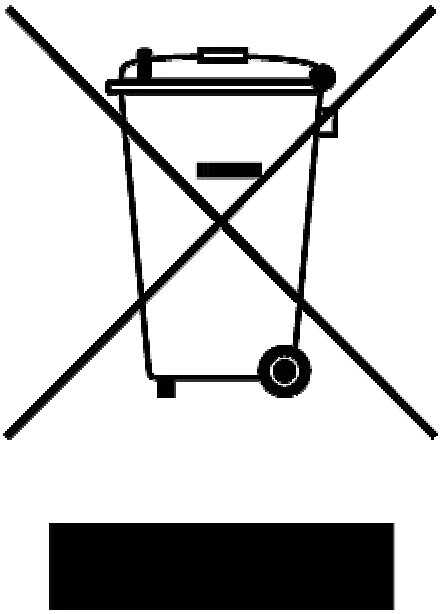
1. INTRODUCTION

The EC96 oxygen monitor uses an electrochemical or fuel cell type of detector which, when exhausted, is simply replaced.



This symbol is known as the 'Crossed-out Wheelie Bin Symbol'. When this symbol is marked on a product it means that consideration should be given to the disposal of the product, parts or accessories. Only discard electrical/electronic items in separate collection schemes which cater for the recovery and recycling of the materials contained within. Your co-operation is vital to ensure the success of these schemes and for the protection of the environment.

2. PRINCIPLE OF OPERATION

The detector contains an anode, electrolyte and an air cathode to which the diffusion of oxygen is limited by a diffusion barrier. At the air cathode oxygen is reduced to hydroxyl ions which in turn oxidise the metal anode.

The following reaction takes place at the cathode:

$$O_2 + 4H^+ + 4e^- \rightarrow 2H_2O$$

and at anode

$$2Pb + 2H_2O \rightarrow 2PbO + 4H^+ + 4e^-$$

and the complete chemical reaction is represented by

$$O_2 + 2Pb \rightarrow 2PbO$$

3. SPECIFICATIONS

POWER SUPPLY:	230V or 115V (±10% 50-60 Hz)
RANGES:	0-30%
DISPLAY:	Analogue
MEASURING CELL:	Electrochemical fuel cell
ACCURACY:	±0.1% O_2
RESPONSE TIME:	90% within 20 seconds
SAMPLE GAS PRESSURE:	Ambient
SAMPLE TEMPERATURE:	-5ºC to 45ºC
RELATIVE HUMIDITY:	0-99% non-condensing
DIMENSIONS:	200 W x 200 H x 175 D mm
ENCLOSURE:	IP65 enclosure (polyester)
WEIGHT:	3 kg
MOUNTING:	Wall mounting
CELL WARRANTY:	36 months
INSTRUMENT WARRANTY:	36 months

4. START UP

Installation

Components Supplied:

1. EC96 Analyser control unit

2. Assembly oxygen cell with holder

3. Coax cables
   a) 27 metre length - 9w'D' plug to BNC (wall to cell)
   b) 30 metre length - 9w'D' socket to BNC (inst to wall).

Mount the control unit on a wall or a bracket at a convenient height to view the display. Electrical connections to the alarm relays and analogue outputs may be connected in accordance with the drawing B096 013 at the rear of the manual and the associated section within the manual.

The oxygen cell should be mounted where there is reasonable circulation of ambient air consistent with the point of measurement. Use the interconnecting cables to connect the measuring cell to the control unit.

5. POWER CONNECTION

The instrument is operated from AC line power either 230V ±10% or 115V ±10% 50 - 60 Hz.

The instrument voltage is marked on the serial number label and should be checked before the power is connected.

Power is connected to the 3-way terminal strip located on the lower right hand side inside the housing.

6. CALIBRATION

Ambient air has an oxygen content of 20.9%.

Ensure the sensor is exposed to a free flow of ambient air. The SPAN potentiometer can now be adjusted until the display reads 20.9%.

If the cell is disconnected, the display should read zero. The zero is factory set and the adjustment potentiometer sealed.

Note: as the cell depletes the SPAN will need to be increased. If it is not possible to reach 20.9% with the available adjustment the cell is exhausted and should be replaced.

7. ALARM CONTACTS

Configuring the alarms

An alarm trip is provided and it is fail safe. (If the instrument is in a non-alarm state and the power is disconnected the alarm will change state). The alarm output may be configured according to the following table:

SWITCH B	FUNCTION	LOW	HIGH
DIP 1	Alarm 2	Open	Close
DIP 2	Alarm 2	Close	Open
DIP 3	Alarm 1	Close	Open
DIP 4	Alarm 1	Open	Close
DIP 5	Alarm 2 latch	Close to latch	
DIP 6	Alarm 1 latch	Close to latch	
DIP 7	Not used		
DIP 8	Not used		

NOTE: DO NOT ALTER ANY OTHER DIP SWITCH SETTINGS

If a latching alarm is desired, then a customer supplied (normally from the control room or computer) switch will be required to unlatch the alarm. This switch should be wired to the terminals according to the electrical installation drawing.

A latched alarm will stay in an alarm position even if the instrument reading reverts to a non-alarm state. If the alarm has been set to be latched, when the instrument goes from an alarm into a non-alarm state, it will still show an alarm. To cancel or accept the alarm, actuate the ACK (acknowledge) switch.

Setting the alarms

1. To set alarm 1, move the switch (see picture) to position 1. The display will show the alarm setting. Adjust potentiometer 1 to set the alarm to the desired value.

2. Repeat the procedure for alarm 2, as above.

3. The alarms may be tested by disconnecting the cable between the EC96 and the cell. The display will read 0 (zero) and both alarms will activate, indicated by the red LEDs on the front panel and closure of the alarm contacts.

There is one volt free changeover contact per alarm at 5A (240V) resistive available on the terminal strip. (See electrical installation drawing).

A buzzer warning device is connected to Alarm 1, it may, however, be connected to Alarm 2.

8. ANALOGUE OUTPUTS

The output (which is available on the 5-way electrical connector - see the electrical installation drawing at the back of this manual), will normally be a 4-20 mA output, but may be reconfigured to 0-20mA.

Switch A may be used to configure the desired output:

Switch A	**0-20mA**	**4-20mA**
DIP 1	Closed	Open
DIP 2	Open	Closed
DIP 3	Closed	Open

NOTE: DO NOT ALTER ANY OTHER DIP SWITCH SETTINGS

Maximum loop resistance is 600R.

9. MAINTENANCE

If when trying to calibrate the instrument not enough adjustment is left on the potentiometer, then this indicates that the detector will need replacing.

Sensor Warranty

The sensor is warranted for a period of 36 months normal service. If the sensor has been working properly and it fails within the 36 month period from the date of shipment, then Systech will credit the amount of time left on the warranty.

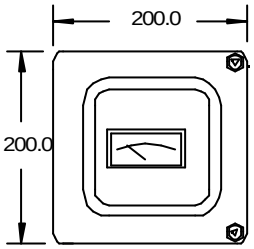
The sensor or the instrument should be returned carriage paid to Systech for evaluation.

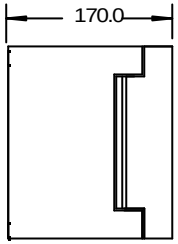
10. SPARE PARTS

Part Number	Description
096 002	Assy pcb ambient
100 538	Power supply 240V
100 545	Analogue meter
100 711	Power supply 110V
096 010	Cell ambient
100 909	Buzzer
096 014	Coax cable 30mts 9w'D' socket/BNC free plug (inst/wall)
096 015	Coax cable 27mts 9w'D' plug/BNC free plug (wall/cell)

Important Note

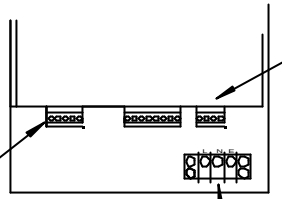
The serial number of the instrument for which the spare parts are required must be quoted on all orders.





SIDE

ELECTRICAL CONNECTIONS



ALARMS (OPTIONAL)

1 ACKNOWLEDGE SEE MANUAL
2 ACKNOWLEDGE SEE MANUAL
3 ALARM 1B N/O
4 ALARM 1B N/C
5 ALARM 1B COM

6 ALARM 1A N/O
7 ALARM 1A N/C
8 ALARM 1A COM

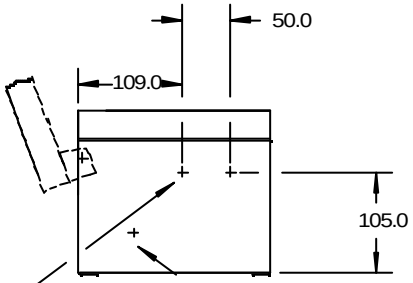
SENSOR+ Cell Positive(core)
SENSOR- Cell Negative(braid)

OUTPUT1 Current Output(Std. 4-20mA.)
OUTPUT2 Voltage Output(Std. 0-100mV.)
OUTPUT3 Current & Voltage Common

ALARM1 BUZZER
ALARM2 BUZZER
NOTE

THE INTERNAL BUZZER MAY BE CONNECTED TO ALARM 1 OR 2

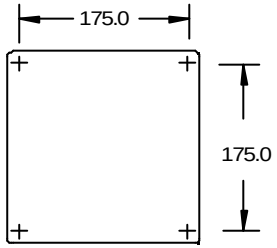
POWER CONNECTION
230V OR 115V +/- 10% 50/60Hz
SEE DATA SHEET IN MANUAL



BOTTOM

CABLE GLANDS (2 OFF) PG 7
ELECTRICAL INPUT/OUTPUT

ALARM BUZZER



MOUNT DIMS.

B	ADDRESS CHANGED		19/10/99
1	First Issue		23/08/96
rev	description	appd	date

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DATE 08/96		
REV/DT.	DRAWING NO. B 096 013	REV. 1