

ANALOX 50

Carbon Dioxide Detector

Technical Manual

Analox Sensor Technology Ltd
Units 4 & 5, Wainstones Court,
Stokesley Industrial Park,
STOKESLEY
Cleveland
TS9 5JY

Tel: +44 (0)1642 711400
Fax: +44 (0)1642 713900
Email: info@analox.net
Web: www.analox.net

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1 INTRODUCTION

Options that can be fitted to the basic Analox 50 instrument include:

- a) Remote Alarm Repeater(s)
- b) Liquid Crystal Display
- c) Oxygen sensor
- d) Two relay contacts
- e) 0-1V output
- f) 4-20mA output

This document details all of the options. Some details may not apply to your version of the Analox 50. You should refer to your calibration certificate to check options fitted.

2 INSTALLATION

Please refer to the User Manual.

The following items are not covered in the basic User Manual, as they involve gaining access to the enclosure.

2.1 0-1V ANALOGUE OUTPUT MODELS

Instruments with a voltage output are normally supplied with a pre-fitted two core cable which provides the voltage output. The red core is the positive signal and the blue core is the negative signal or 0V reference.

Internally these connect to two screw terminals marked ST5 ANOP. The polarity of each terminal is marked on the PCB. Pot VR3 controls the span of the voltage output (For VR3 location see highlighted component in Figure 1).

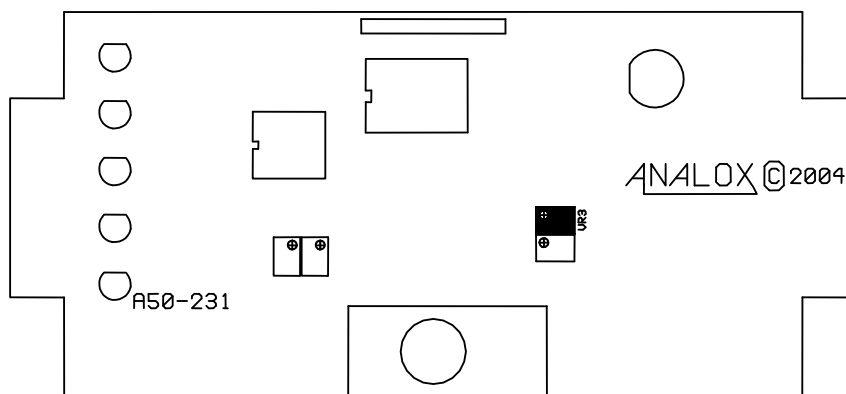


Figure 1 Location of VR3 on Analox 50 PCB

2.2 4-20mA ANALOGUE OUTPUT MODELS

Instruments with a 4-20mA current output are normally supplied with a pre-fitted two core cable which provides the signal output. The red core is the positive signal and the blue core is the negative signal.

Internally these connect to two terminals marked ST1 AN.OUT on the small 4-20mA option board. The polarity of each terminal is marked on the PCB. The pots RV1 and RV2 on the 4-20mA option board control the zero and span of the current output respectively.

2.3 SINGLE/DUAL RELAY OUTPUT MODELS (MAIN PCB)

One or two light duty relays may be fitted to the main printed circuit board within the enclosure. This relay may be used to switch 240VAC OR 30VDC at 1A. Connections are made to the screw terminals marked ST2 and ST4. There are three terminals, marked C, NO and NC giving access to the Common, Normally Open and Normally Closed contacts of the relay.

Unless specifically requested otherwise, when relays are fitted they are operated in 'fail safe' mode. The relays will be energized (NO and COM are connected), after the instruments warm up period, in the absence of any alarms.

The instrument can only be configured at the time of manufacture, default settings are as follows:-

- 1 relay fitted – assigned to Alarm 2 non-latching
- 2 relays fitted – assigned to Alarm1 and Alarm 2 non-latching

When the appropriate alarm condition is present, the relay will be de-energized (NC and COM are connected, this applies in 'fail safe' mode only).

Relays can also be configured as latching. If specified as latching, the relay can only be re-energized after having pressed the Mode switch to accept the alarm condition.

NOTE: When an oxygen sensor is fitted, the instrument can normally only be fitted with one relay. Where an oxygen sensor and one relay are fitted the default setting is to Alarm 2 and Oxygen Alarm, non-latching.

3 OPERATION

Please refer to the User Manual.

4 FAULT CONDITIONS

During normal operation, the instrument carries out a continuous self-test procedure. If operation is satisfactory, the 'OK' indicator will be on, blinking off momentarily every 4 seconds.

If there are no indications on the Analox 50, check that power is connected and that the fuse in the plug is OK.

If the 'OK' indicator is off, and the alarm indications are believed to be incorrect, perform the Auto Zero Operation. If this does not resolve the problem, contact the supplier or manufacturer.

In the unlikely event that the InfraRed (IR) source or detector fails the appropriate indications are provided.

- a) IR source failure is signaled by the internal buzzer sounding at its fast speed, and the 'Alarm 1', 'Alarm 2' and 'Fault' indicators flashing. The Alarm Repeaters will provide the same indications if fitted.
- b) IR detector failure is signaled by mid rate pulsing, of the internal buzzer together with the 'Alarm 2' and 'Fault' indicators only. The Alarm Repeaters will provide the same indications if fitted.

If either of these faults occur, the user should perform the Auto Zero operation. If this does not resolve the problem, contact the supplier or manufacturer.

A summary of the indicator lamps and buzzer operations is provided in Appendix B.

5 INSTRUMENT TEST AND CALIBRATION

5.1 INSTRUMENT TEST

It is recommended that the Analox 50 be checked regularly. The extent of the test depends on the instrument version.

For basic instruments providing alarm status indication only, perform the following:

- 1) Press the Mode switch once and ensure that all LED's illuminate and the buzzer sounds. Once complete ensure the unit returns to working mode (green lamp on/blip off).

5.2 CALIBRATION

For instruments featuring either a numeric display or analogue output, perform the following:

- 1) A Zero Test, see Section 5.3.
- 2) A Span Test, see Section 5.5.
- 3) An Alarm Test, see Section 5.7.

Instruments with displays do not require calibration gas to set the alarms. They rely on the instrument's internal linearization being correct.

The calibration required for basic instruments providing only alarm status indication, is an Alarm Test (see Section 5.7).

All tests using gases assumes that the technician is familiar with the instructions in the section 'Using Test Gas on the Analox 50' as detailed in Appendix A.

5.3 ZERO TEST

This test is only applicable to instruments with display or analogue outputs.

- 1) Apply a zero gas consisting of 100% Nitrogen to the sensor.
- 2) Confirm that the reading is correct within acceptable limits.

If the reading is incorrect, perform an Auto Zero adjustment.

5.4 AUTO ZERO ADJUSTMENT

This test is applicable to all instruments. Note that it involves the use of zero gas. For instruments with no oxygen sensor fitted, zero gas must have no carbon dioxide (pure nitrogen is suitable). For instruments with an oxygen sensor fitted, the zero gas must have 20.9% oxygen and 0% carbon dioxide. The balance gas will usually be nitrogen.

- 1) Whilst the Analox 50 is switched on, press the Mode switch three times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press).
- 2) If this is done successfully, the instrument will enter 'Technician Mode'. This is signified by the green indicator, which instead of flashing off for a brief period every few seconds will now flash on for a brief period every few seconds. If the instrument is left in this mode, it will return to normal operation after a short period. If Technician Mode is inadvertently selected, press the Mode switch once to return to normal operation mode.
- 3) From Technician Mode, press the Mode switch four times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press). If this is done successfully, the instrument will show both the Alarm 1 and Alarm 2 indicators, indicating that Auto Zero mode has been selected. If this is done inadvertently, or if another mode is selected, press the Mode switch once to return to Technician Mode and then repeat this selection.
- 4) Pass zero gas over the sensor for 2 minutes.
- 5) To proceed with the Auto Zero operation, press the Mode switch twice. (Each press must be within 1 second of the previous press).

The instrument will then perform its Auto Zero operation for a period of 1 to 2 minutes. It will bleep once on completing the test, after which the green indicator will stop flashing.

During the Auto Zero period, the 'Alarm 1' and 'Alarm 2' indicators show whether the sensor signal is within acceptable bounds. When the signal is acceptable, neither indicator will be on. If either indicator remains on, ensure that

- (a) The sensor is exposed to zero gas
 - (b) The adapter is held over the sensor properly.
- 6) On completion of the test the user may accept the new setting by pressing the Mode switch twice, or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode. The reading can only be accepted provided the Alarm 1 and Alarm 2 indicators are not illuminated.
- 7) To exit from Technician Mode, press the Mode switch once. The Analox 50 then restarts by performing the normal power on sequence (4 flashes). If the Auto Zero procedure failed to work correctly, the procedure should be performed again, and if still faulty, contact the supplier or manufacturer.

5.5 SPAN TEST

This test is only applicable to instruments with displays or analogue output options.

- 1) Apply a test gas containing carbon dioxide with a concentration of between 50 and 100% of the range of the instrument. E.g. for a 5% range instrument use a test gas with between 2.5% and 5% CO₂.
- 2) Confirm that the reading is correct within acceptable limits.

If the reading is incorrect, perform a Span Adjustment.

5.6 SPAN ADJUSTMENT

This procedure need only be performed when the Span of the instrument is unsatisfactory.

Different methods are used depending on whether the instrument has a display or an analogue output.

5.6.1 SPAN ADJUSTMENT - DISPLAY MODELS

This test is only applicable to instruments with the display option.

- 1) Whilst the Analox 50 is switched on, press the Mode switch three times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press).
- 2) If this is done successfully, the instrument will enter 'Technician Mode'. This is signified by the green indicator, which instead of flashing off for a brief period every few seconds will now flash on for a brief period every

few seconds. If the instrument is left in this mode, it will return to normal operation after a short period. If Technician Mode is inadvertently selected, press the Mode switch once to return to normal operation mode.

- 3) From Technician Mode, press the Mode switch five times. The buzzer will beep on each press. (Each press must be within 1 second of the previous press). If this is done successfully, the instrument will show the Alarm 1, Alarm 2 and Fault indicators, indicating that Span Adjust mode has been selected. The present value of the Span Correction Factor is also displayed. If the incorrect mode is selected press the Mode switch once to return to Technician Mode, and then repeat this selection.
- 4) Pass the relevant span gas (refer to Section 5.5) over the sensor for 2 minutes.
- 5) To proceed with the Span Adjust operation, press the Mode switch twice (Each press must be within 1 second of the previous press).
- 6) The instrument will then perform its Span Adjust operation for a period of 1 to 2 minutes. It will beep once on completing the test, after which the green indicator will stop flashing.
- 7) On completion of the test the instrument will display (liquid crystal display and analogue output options when fitted) the measured gas value with a minimum adjustment factor applied.
- 8) Press and hold the Mode switch. The displayed value will count up at approximately two counts per second. Release the switch when the displayed value is equal to the span gas concentration used. The display will only count up as far as the maximum adjustment factor acceptable to the instrument. If the required value does not appear on the screen, the span cannot be adjusted, and the instrument will need to be returned to the manufacturer/distributor.
- 9) Press the Mode switch twice, to accept the new setting or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode.
- 10) To exit from Technician Mode, press the Mode switch once. The Analox 50 then restarts by performing the normal power on sequence (4 flashes).

5.6.2 SPAN ADJUSTMENT - 4-20mA ANALOGUE OUTPUT MODELS

This procedure is only applicable to instruments with a 4-20mA current output, which are not fitted with displays. For instruments with displays, please refer to Section 5.6.1. It is necessary to gain access to the inside of the instrument to adjust a potentiometer. It is easier to perform the necessary adjustments with the instrument on a suitable work surface.

EXTREME CAUTION MUST BE EXERCISED FOR MAINS POWERED INSTRUMENTS AS HAZARDOUS VOLTAGES ARE PRESENT WITHIN THE ENCLOSURE. THIS WORK MUST ONLY BE PERFORMED BY TRAINED PERSONNEL.

- 1) Switch off the power to the Analox 50.
- 2) To remove the enclosure lid from the Analox 50 first remove the Analox 50 from the wall. Once removed, the 4 screws at the rear of the unit can be accessed and unscrewed. Finally unscrew the green locking ring on the front fascia and the front lid can then be eased off.
- 3) Identify the small option board fitted to the instrument to provide the 4-20mA output. It is a small 34 x 36mm rectangular board plugged into the main printed circuit board. It has two screw terminals for the output signal and 2 potentiometers marked RV1 (ZERO) and RV2 (SPAN).
- 4) Cover the Mains voltage areas of the PCB (area around the transformer on both sides of the Main PCB) with a suitable electrical insulator and turn on the power to the Analox 50.
- 5) Pass the relevant span gas (refer to Section 5.5) over the sensor for between 2 and 5 minutes.
- 6) Measure the current signal generated by the instrument using a current meter. Adjust RV2 such that the 4-20mA output is at the correct value corresponding to the calibration gas.
- 7) Now pass zero gas over the sensor for between 2 and 5 minutes.
- 8) Measure the current signal generated by the instrument using a current meter. Adjust RV1 such that the 4-20mA output reads 4.00mA.
- 9) Repeat the process from Step 4 until no further adjustment of the potentiometers is necessary.
- 10) Switch off the power to the Analox 50 and reassemble the instrument. Ensure the lid is correctly secured, such that the instrument remains waterproof.

5.6.3 SPAN ADJUSTMENT - 0-1V ANALOGUE OUTPUT MODELS

This procedure is only applicable to instruments with a 0-1V analogue output, which are not fitted with displays. For instruments with displays, please refer to Section 5.6.1. It is necessary to gain access to the inside of the instrument to adjust a potentiometer. It is easier to perform the necessary adjustments with the instrument on a suitable work surface.

EXTREME CAUTION MUST BE EXERCISED FOR MAINS POWERED INSTRUMENTS AS HAZARDOUS VOLTAGES ARE PRESENT WITHIN

THE ENCLOSURE. THIS WORK MUST ONLY BE PERFORMED BY TRAINED PERSONNEL.

- 1) Switch off the power to the Analox 50.
- 2) To remove the enclosure lid from the Analox 50 first remove the Analox 50 from the wall. Once removed, the 4 screws at the rear of the unit can be accessed and unscrewed. Finally unscrew the green locking ring on the front fascia and the front lid can then be eased off.
- 3) Cover the Mains voltage areas of the PCB (area around the transformer on both sides of the Main PCB) with a suitable electrical insulator and turn on the power to the Analox 50.
- 4) Pass the relevant span gas (refer to Section 5.5) over the sensor for between 2 and 5 minutes.
- 5) Measure the voltage signal generated by the instrument using a voltage meter. Adjust VR3 such that the analogue output is at the correct value corresponding to the calibration gas.
- 6) Switch off the power to the Analox 50 and reassemble the instrument. Ensure the lid is correctly secured, such that the instrument remains waterproof.

5.7 ALARM TEST

On basic instruments without displays or analogue outputs, it is only possible to determine if the alarm thresholds operate correctly by applying test gas to the instrument. On enhanced instruments, the accuracy of the display and/or output may similarly be checked using calibration gases.

The extent of the test depends on the customer's requirements. To correctly verify operation of each alarm point the following tests are required:

- a) Check that at a selected tolerance below the alarm threshold, the alarm is not annunciated (e.g. at 1.3% CO₂ for a 1.5% CO₂ alarm)
- b) Check that at a selected tolerance above the alarm threshold, the alarm is annunciated (e.g. at 1.7% CO₂ for a 1.5% CO₂ alarm)

Some customers will be satisfied if only the second of these tests is performed, particularly if it is an enhanced instrument, and it is clearly evident how close the measured value is to the alarm setting. It is possible to judge by the time taken for an alarm to annunciate, whether the first test is likely to be satisfactory. Similarly, if only the Alarm 2 threshold is tested, the time taken to announce Alarm 1 can be used to judge the effectiveness of the Alarm 1 setting.

For the appropriate test method applicable to the use of the instrument:

- 1) Pass the appropriate test gas across the sensor.
- 2) Verify that the alarm operates as expected, and that the display readings (if fitted) are correct.

If the alarms fail to operate, adjust the Alarm Setpoints as detailed in Section 5.8.

5.8 ADJUSTING THE ALARM SETPOINTS

This procedure need only be performed when either the alarm setting is to be changed, or when the operation of the existing alarm is unsatisfactory.

Different methods are used depending on whether the instrument is a basic version, or whether it is enhanced with either a display or an analogue output.

5.8.4 ADJUSTING ALARM SETPOINTS - NON DISPLAY MODELS

In the absence of a display the alarm settings may be defined using calibration gas. The procedure is very similar for either the Alarm 1 or Alarm 2 setting.

It would be normal to have completed the Auto Zero operation prior to setting the alarms.

The calibration gas must be carefully selected for the desired mode of operation. If an alarm MUST be annunciated at say 1.5% CO₂, 1.5% CO₂ is not the ideal calibration gas. Within the specification of the instrument, when measuring actual 1.5% gas, the instrument could measure 1.5% $\pm$ 2% of full scale. For a 5% full scale instrument, 2% full scale equates to 0.1% CO₂. In this particular example, the calibration gas would ideally be selected as 1.4% CO₂.

- 1) Whilst the Analox 5 is switched on, press the Mode switch three times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press).
- 2) If this is done successfully, the instrument will enter 'Technician Mode'. This is signified by the green indicator, which instead of flashing off for a brief period every few seconds will now flash on for a brief period every few seconds. If the instrument is left in this mode, it will return to normal operation after a short period. If Technician Mode is inadvertently selected, press the Mode switch once to return to normal operation mode.
- 3) From Technician Mode, press the Mode switch as follows:
 - a) 2 times to set Alarm 1
 - b) 3 times to set Alarm 2

The buzzer will bleep on each press. (Each press must be within 1 second of the previous press). If this is done successfully, the instrument will show the Fault indicator and the appropriate Alarm indicator. If this is

done inadvertently, or if another mode is selected, press the Mode switch once to return to Technician Mode and then repeat this selection.

- 4) Pass the alarm calibration gas over the sensor for 2 minutes.
- 5) To proceed with the Alarm Set operation, press the Mode switch twice (Each press must be within 1 second of the previous press).

The instrument will then perform the Alarm Set operation for a period of 1 to 2 minutes. It will bleep once on completing the test, after which the green indicator will stop flashing.

- 6) On completion of the test the user may accept the new setting by pressing the Mode switch twice, or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode.
- 7) To exit from Technician Mode, press the Mode switch once. The Analox 50 then restarts by performing the normal power on sequence (4 flashes).

5.8.5 ADJUSTING ALARM SETPOINTS - DISPLAY MODELS

The presence of the display makes it possible to define the alarm settings without the use of calibration gas.

The procedure is very similar for either the Alarm 1 or Alarm 2.

- 1) Whilst the Analox 50 is switched on, press the Mode switch three times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press).
- 2) If this is done successfully, the instrument will enter 'Technician Mode'. This is signified by the green indicator, which instead of flashing off for a brief period every few seconds will now flash on for a brief period every few seconds. If the instrument is left in this mode, it will return to normal operation after a short period. If Technician Mode is inadvertently selected, press the Mode switch once to return to normal operation mode.
- 3) From Technician Mode, press the Mode switch as follows:
 - a) 2 times to set Alarm 1
 - b) 3 times to set Alarm 2

The buzzer will bleep on each press. (Each press must be within 1 second of the previous press). If this is done successfully, the instrument will show the Fault indicator and the appropriate Alarm indicator. If this is done inadvertently, or if another mode is selected, press the Mode switch once to return to Technician Mode and then repeat this selection.

- 4) The display will indicate the present value of the alarm.

- 5) Press the Mode switch twice to proceed to define a new setting, or once to abort and return to Technician Mode.
- 6) When setting Alarm 1, the display will show the minimum display value (usually 0.0).

When setting Alarm 2, the display will show the maximum display value (full scale).

- 7) Press and hold the Mode switch. The displayed value will count up (Alarm 1) or down (Alarm 2) at approximately two counts per second. Release the switch when the displayed value is equal to the desired alarm value.
- 8) Upon release of the Mode switch, the display will continue to show the new value just entered. Accept the new setting by pressing the Mode switch twice, or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode
- 9) To exit from Technician Mode, press the Mode switch once. The Analox 50 then restarts by performing the normal power on sequence (4 flashes).

6 OXYGEN SENSOR OPTION

6.1 OXYGEN SENSOR CALIBRATION

This operation calibrates only the Oxygen Sensor. This procedure should only be performed if the CO₂ sensor is not being calibrated or if the appropriate calibration gas is not available to calibrate both sensors at the same time. Calibration gas with 20.9% oxygen or fresh air must be used for this calibration (Note: fresh air calibration must be performed outside or in a well ventilated room).

- 1) Whilst the Analox 50 is switched on, press the Mode switch three times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press).
- 2) If this is done successfully, the instrument will enter 'Technician Mode'. This is signified by the green indicator, which instead of flashing off for a brief period every few seconds will now flash on for a brief period every few seconds. If the instrument is left in this mode, it will return to normal operation after a short period. If Technician Mode is inadvertently selected, press the Mode switch once to return to normal operation mode.
- 3) From Technician Mode, press the Mode switch four times. The buzzer will bleep on each press. (Each press must be within 1 second of the previous press). If this is done successfully, the instrument will show both the Alarm 1 and Alarm 2 indicators, indicating that Auto Zero mode has been selected. If this is done inadvertently, or if another mode is selected, press the Mode switch once to return to Technician Mode and then repeat this selection.

- 4) Pass the calibration gas over the sensor for 2 minutes.
- 5) To proceed with the Oxygen calibration operation, press the Mode switch **three times**. (Each press must be within 1 second of the previous press).

The instrument will then perform its calibration operation for a period of 1 to 2 minutes. It will bleep once on completing the test, after which the green indicator will stop flashing.

During the calibration period, the 'Alarm 1' and 'Alarm 2' indicators show whether the sensor signal is within acceptable bounds. When the signal is acceptable, neither indicator will be on. If either indicator remains on, ensure that

- a) The sensor is exposed to calibration gas
 - b) The adapter is held over the sensor properly.
- 6) On completion of the test the user may accept the new setting by pressing the Mode switch twice, or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode. The reading can only be accepted provided the Alarm 1 and Alarm 2 indicators are not illuminated.
- 7) To exit from Technician Mode, press the Mode switch once. The Analox 50 then restarts by performing the normal power on sequence (4 flashes). If the calibration procedure failed to work correctly, the procedure should be performed again, and if still faulty, contact the supplier or manufacturer.

6.2 OXYGEN SENSOR REPLACEMENT

The oxygen sensor is mounted in a special housing on the under-side of the Analox 50 enclosure. This housing allows the oxygen sensor to be easily replaced when necessary.

The procedure for replacing the **0.1-25%** Oxygen cell is as follows:

- 1) Switch off the instrument.
- 2) Use a large flat blade screwdriver to release the push fit housing. This is done by inserting the blade into the recess under the flange of the housing and twisting the screwdriver.
- 3) The oxygen sensor will now be visible. Gently pull the sensor downward to release it from the bulkhead. The electrical connector will retain it.
- 4) Carefully pull the electrical connector from the rear of the oxygen sensor.
- 5) Fit the new oxygen sensor to the connector, note it will only connect one way round.

- 6) Remove the old O-Ring from the side of the housing and fit the new one supplied with the replacement sensor.
- 7) Carefully push the sensor into the housing and then firmly push the housing and wiring back into the Bulkhead on the under-side of the Analox 50 enclosure.
- 8) Switch the instrument back on.
- 9) Perform an Auto Zero adjustment (Section 5.4) or Oxygen sensor calibration (Section 6.1) to calibrate the new sensor.
- 10) Test the operation of the oxygen alarm by subjecting the sensor to a low concentration of oxygen.

7 REPEATER INFORMATION

Analox 50 instruments are shipped with one of two types of repeater. These are the Quick Connect model and the older Hard-wired version, which is still supplied on request to some customers.

7.1 QUICK CONNECT REPEATER

The Quick Connect repeater uses an RJ45 connector to connect the repeater cable to the repeater. Contact the manufacturer for details of extension cables. The user therefore does not need to know details of the cable cores within the cable.

7.2 HARD-WIRED REPEATER

The Hard Wired repeater is hard wired to the Analox 50. The cable cores must be inserted into the correct terminals at the time of installation. The repeater also has an internal link (marked 8Wr)

Remote Unit Terminal No	Cable Core Colour
1	Black
2	White
3	Red
4	Blue
5	Yellow
6	Green
7	Brown
8	Violet

APPENDIX A: USE OF TEST GAS ON THE ANALOX 50

It is necessary to use test gases on the Analox 50 when verifying operation or recalibrating.

You will require:

- a) Appropriate test gas cylinders with flow indicator and control valve
- b) A gassing cap with plastic tubing

Procedure:

- 1) Fit the flow indicator and control valve securely to the test gas cylinder, note that there will be a small escape of gas as it is fitted.
- 2) Connect the gassing cap to one end of the plastic tubing, and the other end of the plastic tubing to the outlet on the flow indicator.
- 3) Carefully unscrew the control valve until the floating ball is around the mid-scale position (1.0 litres/minute approx.)
- 4) Place the gassing cap over the flow adapter on the Analox 50 for at least 2 minutes.
- 5) When the test is complete, the test gas should be removed and the flow indicator control valve should be closed. The flow indicator and fine control valve should be removed from the test gas cylinder to prevent leakage.

Note that on instruments fitted with an oxygen sensor, two gassing caps are connected in series to subject both of the sensors to calibration gas.

APPENDIX B: SUMMARY OF INDICATOR LAMP STATUS

GOOD LAMP (GREEN)	ALARM1 LAMP (RED)	ALARM2 LAMP (RED)	FAULT LAMP (YELLOW)	MEANING
OFF	OFF	OFF	OFF	Power Off
ON/ BLIP OFF	OFF	OFF	OFF	Normal Operation
OFF	FLASHING AND SLOW BUZZER	OFF	OFF	CO ₂ Level is > 1.5% *
OFF	FLASHING	FLASHING AND MED. BUZZER	OFF	CO ₂ Level is > 4.0% *
OFF	OFF	OFF	FLASHING AND SLOW BUZZER	Calibration Error at Switch On **
OFF	OFF	FLASHING	FLASHING AND MED. BUZZER	Detector Fault **
OFF	FLASHING	FLASHING	FLASHING AND FAST BUZZER	I.R. Source Fault ***

* Note that Alarm levels may be set at different values, depending on customer specification. Refer to details below

** A Calibration error or a Detector fault requires the attention of a Service Engineer. Recalibration procedure may overcome the problem.

** An IR source fault will necessitate returning the unit for repair.

APPENDIX C: TECHNICIAN MODE – NON DISPLAY MODEL

CHART 1: NON DISPLAY MODEL - ACCESS TO TECHNICIAN MODE

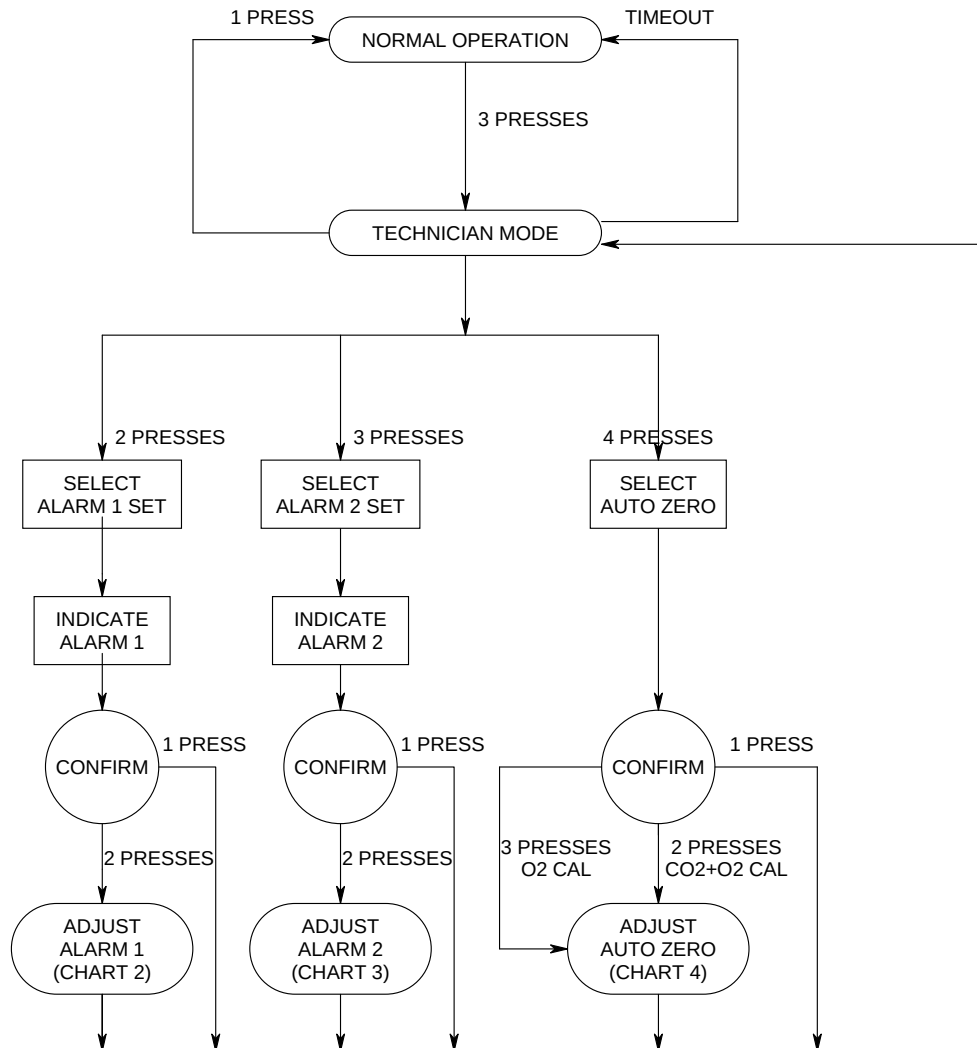


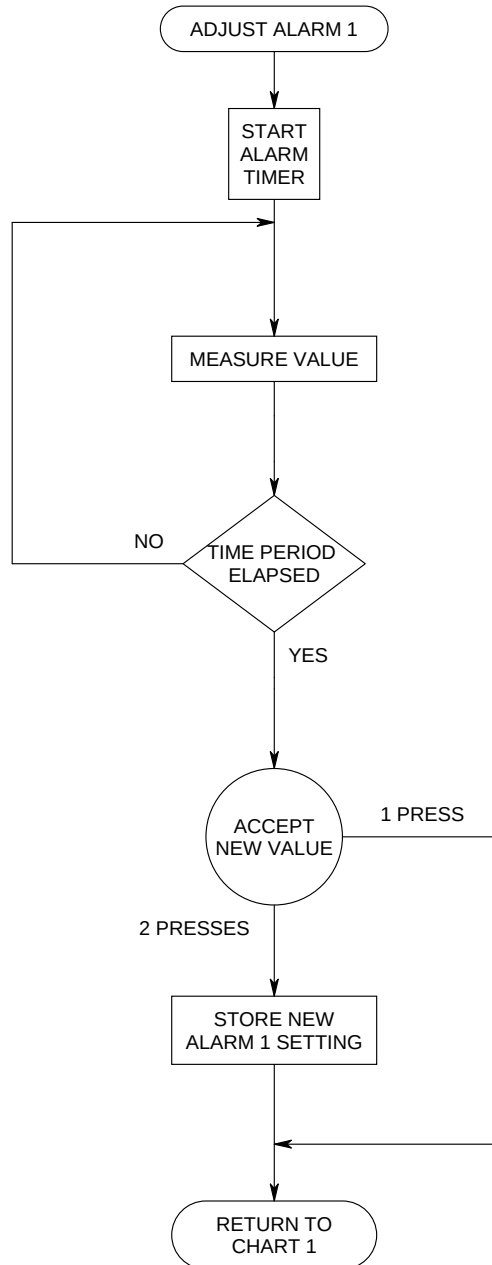
CHART 2: NON DISPLAY MODEL - ADJUST ALARM1

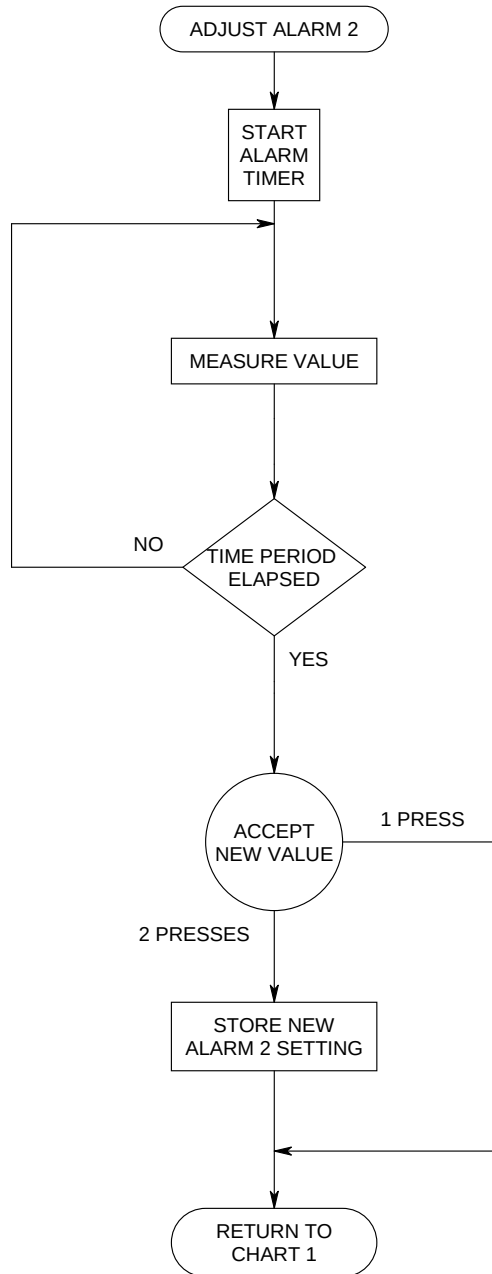
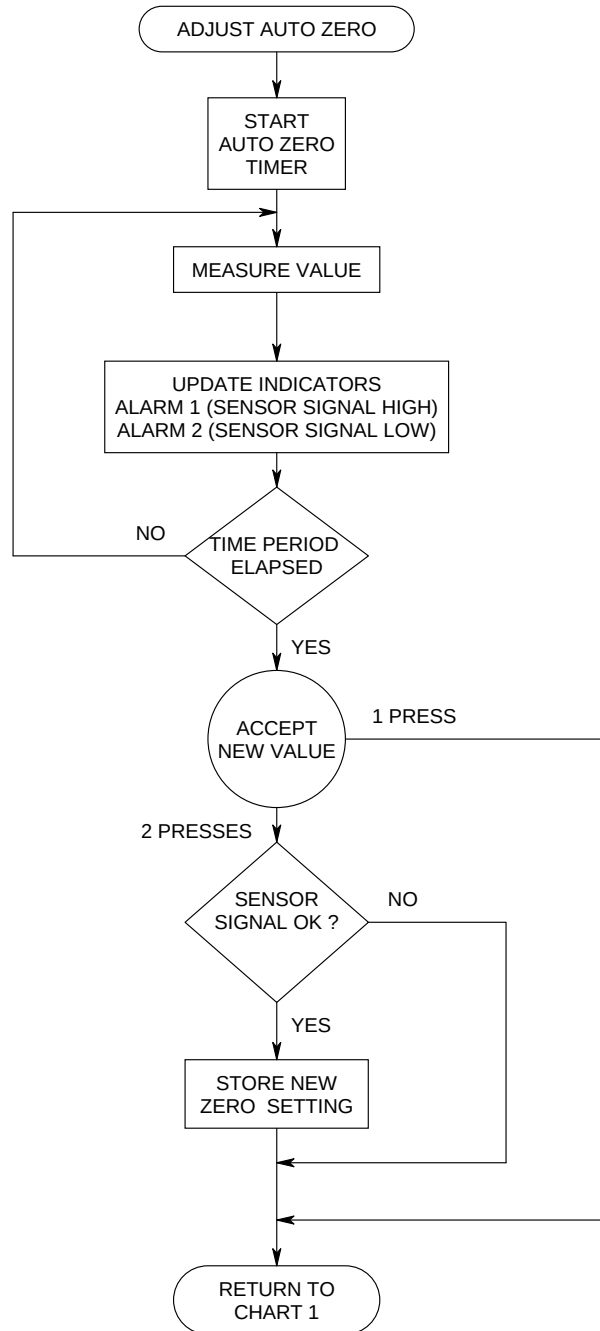
CHART 3: NON DISPLAY MODEL - ADJUST ALARM2

CHART 4: NON DISPLAY MODEL - ADJUST AUTO ZERO

APPENDIX D: TECHNICIAN MODE – DISPLAY MODEL

CHART 5: DISPLAY MODEL – ACCESS TO TECHNICIAN MODE

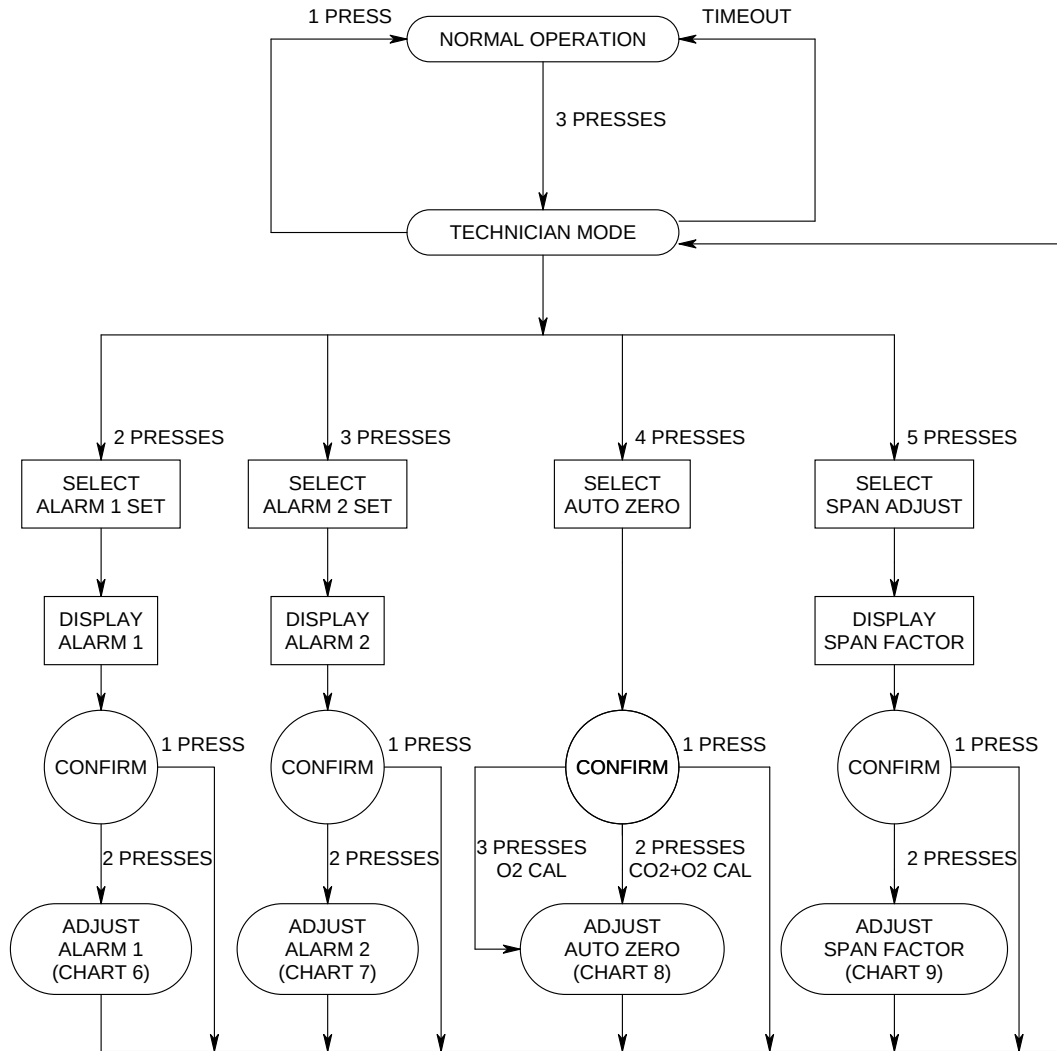


CHART 6: DISPLAY MODEL – ADJUST ALARM1

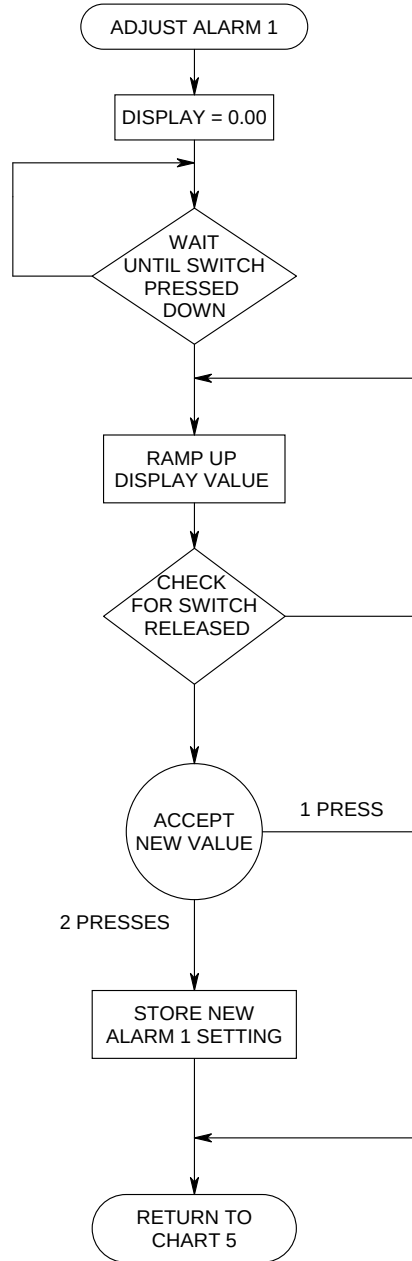


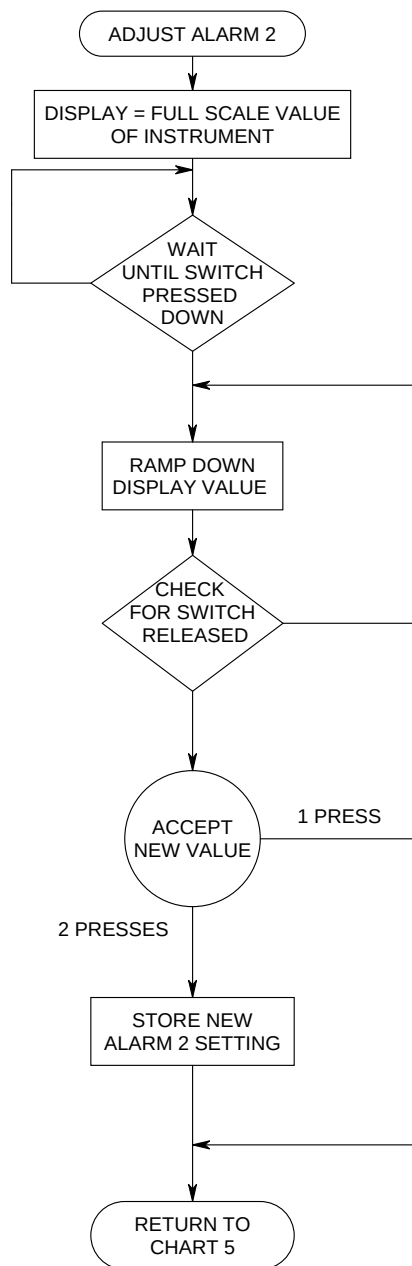
CHART 7: DISPLAY MODEL – ADJUST ALARM2

CHART 8: DISPLAY MODEL – ADJUST AUTO ZERO

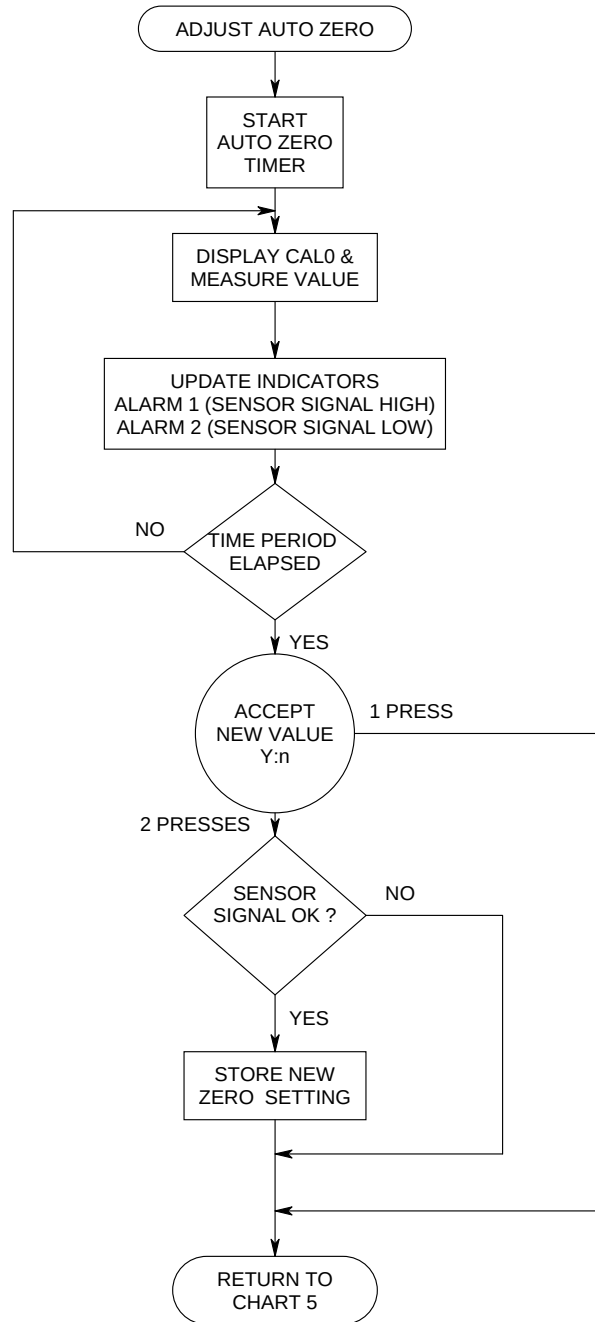
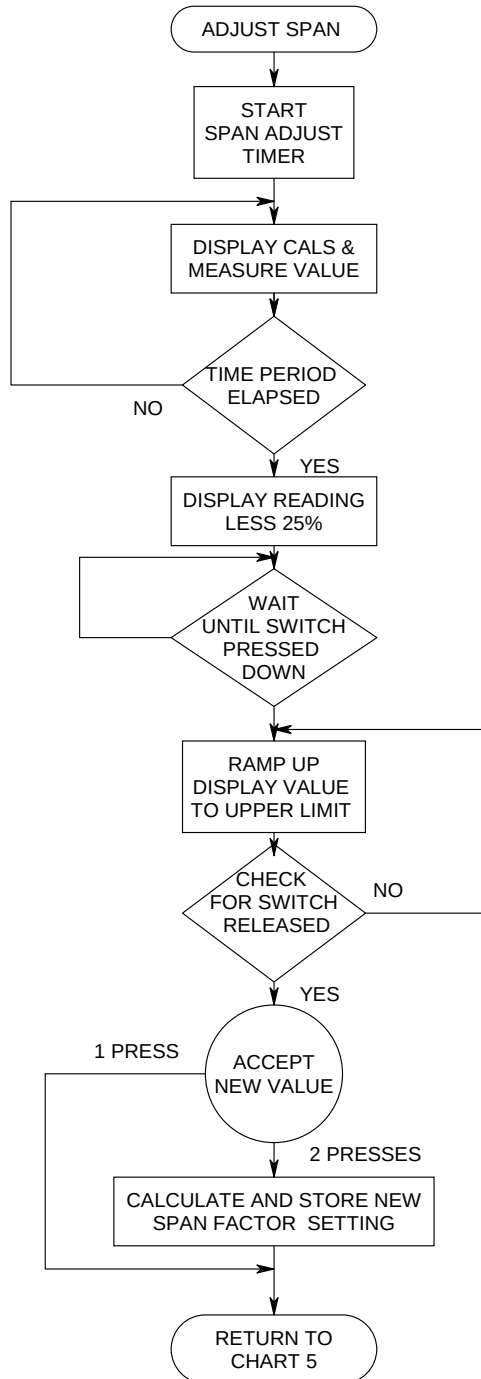


CHART 9: DISPLAY MODEL – ADJUST SPAN



NOTES