

Instruction Manual

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SCS56 Ethylene Analyser.



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SCS56 Ethylene Analyser.

Introduction:

The SCS56 is a battery powered portable instrument for measuring ethylene and is particularly suited to fruit and vegetable storage, ripening and curing applications.

The instrument uses an electrochemical detector that is sensitive to ethylene and the reading is displayed on a Liquid crystal digital display.

The display has a resolution of 0.1ppm and with care indications of ethylene lower than 1ppm can be obtained.

An internal sampling pump provides a flowing sample and a sampling tube can be extended by up to 5 meters from the instrument.

A front panel adjustment allows the zero to be set against ethylene free air.

A screwdriver adjustment is available to calibrate the span against a standard gas with a certified ethylene concentration.

Unlike some ethylene measuring instruments there is no interference of the reading from hydrogen and carbon dioxide but care is required to minimise the effects of Carbon Monoxide and Ethanol.

Specification:

Range: 0 – 100 ppm Ethylene

Resolution: 0.2 ppm

Temperature: range: 0-35 degC
compensation:
+/- 5% reading over range 5 to 30 degC

Response time: T80: <40 seconds

Pump flow: typically 0.8 l/min

Cell and cell battery life: Minimum 12 Months, typically 18-22 months

Note: cell and battery continually energised to maintain cell stability. The RED led illuminates when cell and battery are nearing the end of their life.

Main battery: type: MN1604 (PP3)
Life without pump: >1000 operational hours
Life with pump :>20 Hrs
Symbol on LCD display when battery is towards the end of its life

Cross sensitivity:

The ethylene detector will respond to some other gases as shown in the table below. This is shown as a % sensitivity to the interfering gases. For example if there was 10ppm of carbon monoxide present the instrument would read 4 ppm. The practical implication is that this instrument cannot be used to measure Ethylene where fossil fuelled forklift trucks are operating. It will be appreciated that the lower the ethylene reading expected, the greater the proportional effect of the background gases.

CO	CO ₂	H ₂ S	SO ₂	NO	NO ₂	Cl ₂
40	0	0	0	0	0	0

H ₂	NH ₃	Ethylene Oxide	Ethanol	Toluene	MEK	HCl
0	0	100	55	20	10	0

Operation:

The measuring cell is always active, powered by its own battery, and therefore there is no instrument warm up time.

Always take readings with the pump operational but be careful not to leave the pump on unnecessarily which will reduce battery life.

Before taking a series of readings make sure the zero is set using ethylene free air. This can most conveniently be outside fresh air providing it is away from traffic fumes or ripening fruit. The zero can be set with the adjustment on the front panel.

Place the instrument or extend the sampling tube in to the area to be investigated and observe the display for a response. Note that a response should be well under way in 30 seconds but if a more accurate result is required a sampling time of 2 minutes should be allowed, after which time the reading should have settled to a stable value.

Do not sample gases in excess of the instrument range and if you see the reading is going to exceed 100 ppm turn off the pump and return to fresh air.

After reading a high value of ethylene it will be 5 to 10 minutes before the cell has been flushed out with sufficient fresh air to give a stable zero reading.

The pump and display is operated from a 9v battery. When this is exhausted a battery symbol is displayed on the LCD display. The battery is contained in the battery compartment at the rear and should be changed with a Duracell MN1603 or suitable equivalent.

The low capacity zinc carbon batteries are unsuitable for this use.

When the red led comes ON it is time to change the measuring cell and associated battery. There should be another week or two of life before a change becomes essential.

The change is relatively simple and a replacement kit can be supplied by SCS Ltd through the distributor that supplied the instrument. The calibration will need to be checked when a new cell is fitted and full instructions will be supplied with the replacement cell.

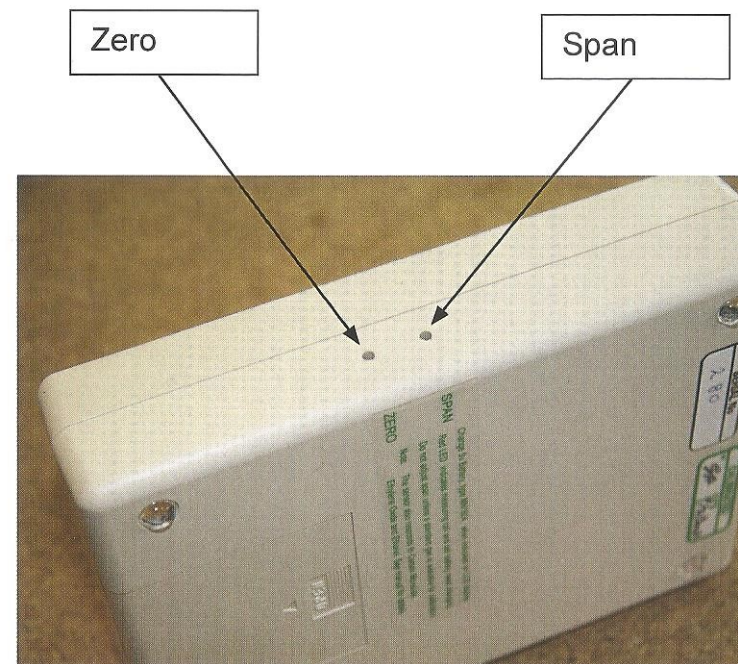
SCS Ltd can replace and recalibrate instruments returned to them for service.

Calibration.

Zero:

The instrument should be set to zero on ethylene and contaminant free fresh air. Please be aware the room air often contains some ethylene and other contaminants. Bottled laboratory synthetic air or Nitrogen can conveniently be used and that is what is used for factory calibration before dispatch. If this is not available calibrate with air well away from traffic and town pollution.

The reading can be set to zero with the black knob on the front of the instrument. If this has run out of range it should be set to the middle and the reading adjusted to zero using the ZERO adjustment on the side. A small (2mm) screwdriver is needed to adjust this trimmer which has 20 turns of travel.



Span:

DO NOT adjust the span unless you have access to a standard gas for calibration within the operating range of the analyser. Instruments are calibrated in the factory against a standard mixture of ethylene in air or nitrogen in the range 30 to 50 ppm. They are also checked against at least one other mixture. In normal operation the Span calibration does not change by a significant amount and an annual check should be sufficient.

Warranty

SCS Ltd warrant that this instrument is free from defect in workmanship and materials for 12 months from installation or 18 months from delivery whichever is soonest.

Any defective parts during this time will be repaired or replaced at no charge.

The warrantee becomes void if there is evidence of misuse due to moisture, corrosion, excessive heat or damage caused by dropping

SCS Ltd shall not be responsible for any damage or losses however caused, which may be experienced as a result of the use of this product. SCS's liability for any breach of this agreement will not exceed the purchase price paid.

Designed and manufactured in the UK by:

Storage Control Systems Ltd
Paddock Wood Kent.

www.storagecontrol.com

Replacement of cell and Battery:

The measuring sensor and internal battery have a limited life of between 18 months and 2 years depending on usage.

The end of the battery life is indicated by the front panel RED light coming ON.

These items can most easily be changed and recalibrated by returning to SCS Ltd.

If this is difficult a replacement sensor and battery can be fitted by following the instructions below.

Calibration:

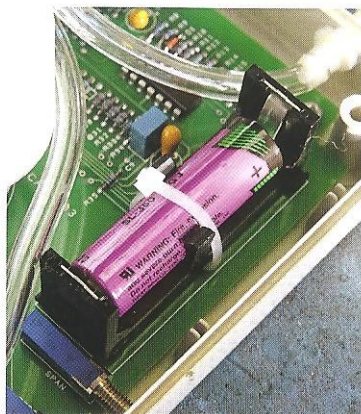
For a correct and accurate calibration a certified calibration gas of typically 30ppm ethylene in air is required. If this is not available when a new cell is fitted then the instrument accuracy is compromised. If the use for the instrument is to determine if for example the ethylene concentration is 5ppm or 5.5ppm then calibration is essential. If however the instrument use is to determine for example if the ethylene is 1 ppm or 5ppm then exact calibration is not so important. A zero calibration should always be made and fresh clean air can be used.

1. Disconnect the external 9 v battery
2. Open the case by removing the 4 fixing screws on the rear. These are protected by the 4 removable plastic button feet
3. Lift off the cell housing as photo



4. Remove and replace the internal battery.

Note that this is a special 3.6v long life and high stability battery. In no circumstances should a regular type AA battery be used. Check that the contacts are clean and that the spring clips are making good contact with the battery terminals. Secure the battery with a ty-rap



5. Pull out the measuring cell from its socket as shown here. Replace with the new cell. Check that the cell is fully plugged in and the black O ring is correctly positioned



6. Refit the cell cover and refit the instrument case. Take care that the pipes are not kinked or trapped when replacing case.
7. Replace 9v external battery, switch on and check the red front light is not ON and there is a reading on the display.

THE INSTRUMENT WILL NOT GIVE A SENSIBLE READINGS AT THIS STAGE. LEAVE SWITCHED OFF FOR AT LEAST 48 HOURS.

8. After 48 hours the instrument can be calibrated in the normal way as described earlier in this manual.

The cell needs a constant bias voltage for stable operation. This is provided by the internal battery that is permanently connected to the cell.