

G210



Operating Manual



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Introduction

The G210 analyser is specifically designed for highly accurate measurement and verification of the quality of piped N_2O and O_2 gases in hospitals. This instrument enables up to four gases to be measured, easy user calibration, quick verification of gas quality, user maintained site and sample point IDs for monitoring as well as identification of contaminants CO and CO_2

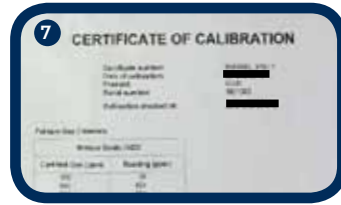
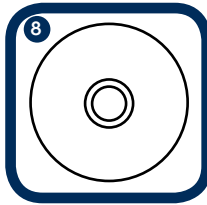
The analyser monitors these gases at the following measurements:

- N_2O 0 - 100%
- O_2 0 - 100%
- CO 0 - 500 ppm (Optional)
- CO_2 0 - 2000 ppm

Please note: Throughout the guide the gas used as an example in the diagrams is O_2 , the instructions follow the same procedures for the other three gasses that the G210 monitor detects.

Pack Contents List

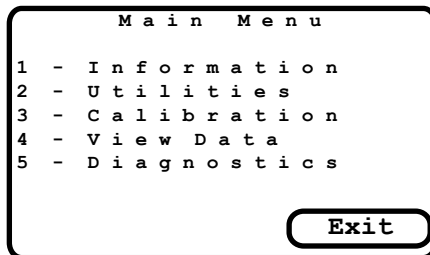
- 1 G210 monitor
 - 2 UK charging plug
 - 3 3x Universal plug adapters
 - 4 1x Moisture filter
 - 5 1x Section of tubing
 - 6 Hard surrounding carry case
 - 7 Factory calibration certificate
 - 8 G210 manual (CD format)
- and also a G210 manual (paper copy)



General Operation

- 1 Press the Red power button to turn the unit on and wait 60 seconds for the unit to warm up. During this time attach the moisture filter and pressure regulator kit.
- 2 The unit will automatically run a test to identify any problems or indicate if it is due a calibration. Once this test has run it will sit in a dormant monitoring mode.
- 3 From this dormant mode you can press Menu and then you have a list of additional options;

A Information (Informs you of the Serial number, Version of firmware, when the service is due and the unit is ready to come back to 'Bedfont Scientific Ltd' to be serviced, when the unit was last factory calibrated and when the last user calibration was conducted.)



B Utilities (Allows the user to change the time and date, set the contrast if the unit is hard to see, set alarms for the dormant monitoring mode to alert staff if an area has reached dangerous levels of gas, additional user settings, flow fail options, logging options for the data collected and a reset tool, which should only be used when instructed to do so).


C Calibration (This is where the unit is calibrated to avoid the sensor from drifting. Please find calibration procedure in the relevant section. Please note; the calibration procedure states the user should conduct a Zero calibration prior to using the monitor on a daily basis and the unit should also be calibrated at least once a month with the calibration gas).

D View Data (This option will give a digital read out of the last data that was logged on the unit. Data settings can also be accessed through this option. This data is more detailed through the G210 software kit).

E Diagnostics (This section is only used when diagnosing any faults with the monitor. Bedfont will ask you to provide information from this section, should you encounter any problems).


Monitoring Procedure

The G210 monitor should be connected to the gas outlet safely by using a MED-REG-KIT supplied by Bedfont Scientific Ltd. At each outlet, allow for a stable reading. We recommend testing outlets the same method as calibration, with a Y-piece connector (ensuring that the gas is vented away from the user) and testing with the pump activated when using the MED-REG-KIT.

| | | |
|---|-----|---------|
|  | O2 | 20.9% |
| | N2O | 0.1% |
| | CO2 | 500 ppm |
| | CO | 0.1 ppm |
| <div style="display: flex; justify-content: space-around;"> Peak Store Hold </div> | | |


Peak Reading

The operator can toggle the reading mode between normal (current) and peak readings. Whilst in peak reading mode the instrument will only display peak values for each of the channels. These values can be stored by pressing the 'store' key or automatically at the appropriate logging interval (if logging is enabled).

| | | |
|---|-----|---------|
|  | O2 | 20.9% |
| | N2O | 0.1% |
| | CO2 | 500 ppm |
| | CO | 0.1 ppm |
| <div style="display: flex; justify-content: space-around;"> Peak Store Hold </div> | | |


Store Reading

The 'store' reading option allows the operator to store the current reading. Upon selecting this option the operator is then prompted to enter or select a 'Site ID' and 'Sample Point ID' to identify the reading. Select the 'Accept' button to confirm the ID choices.

| | |
|--|------------|
|  | Select ID |
| | 1 -Site ID |
| | test ID |
| | 2 -ID |
| | test ID |
| <div style="display: flex; justify-content: space-around;"> Accept Reject </div> | |

Hold Reading

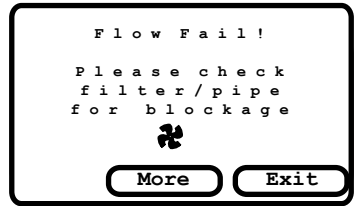
The 'Hold' reading option allows the operator to freeze the currently displayed reading. This allows it to be manually recorded or moved away from the sample point. To activate, press the soft key 'Hold' and the readings are fixed until the 'Hold' key is pressed again or until the reading is stored.

| | | |
|---|-----|---------|
|  | O2 | 20.9% |
| | N2O | 0.1% |
| | CO2 | 500 ppm |
| | CO | 0.1 ppm |
| <div style="display: flex; justify-content: space-around;"> Peak Store Hold </div> | | |

Note: Please be careful not to leave the hold button activated

Flow Fail

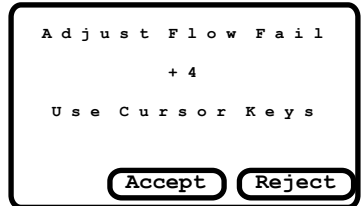
A rare occurrence with the G210 is when the monitor displays 'Flow Fail', represented by a flashing fan icon. If, during monitoring the G210 unit displays 'Flow Fail' you will need to follow the below steps to diagnose the problem:



1 Note: Dirty or discoloured filters should be changed before use.

2 From the main screen, press the 'Menu' key on the instrument panel

3 From here press Menu/ 2-Utilities/ 5-Flow Fail and ensure the monitor states +4 as shown in the diagram.

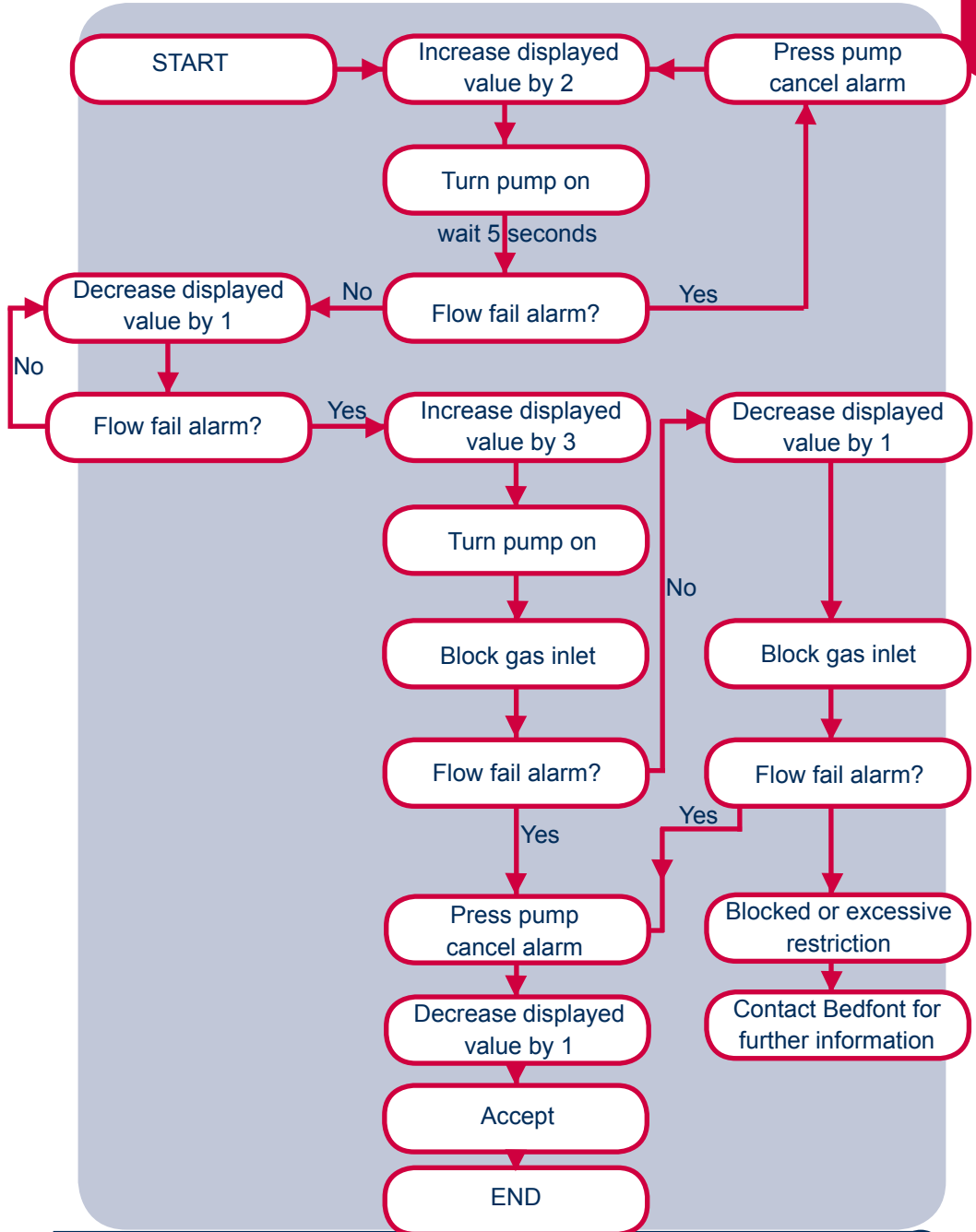


4 If the monitor states anything different use the < left and > right cursor keys to adjust the value displayed. The larger the value, the less sensitive the flow fail detection is.

5 Once this step is complete return to the main screen by pressing Accept/ Exit/ Exit.

6 Please refer to the chart on the next page for more information on the flow fail process

Flow Fail Chart



Calibration

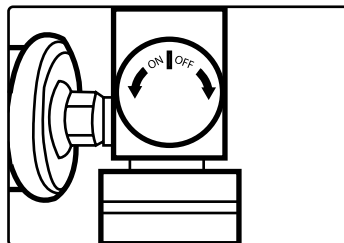
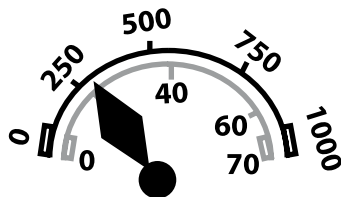
There are two types of calibration that the G210 unit requires; a zero and a span gas calibration. The 'zero' calibration needs to be done prior to use on a daily basis and the 'span gas' calibration needs to be done monthly. The example gas in the Span Gas section of the guide is O_2 . To complete these types of calibration please follow the below steps:

Zero Calibration: This type of calibration is to be completed with an N_2 provided by Bedfont. Connect the cannister as shown in the diagram below.

- 1 Initiate the calibration by pressing Menu/ 3-Calibration/ 1-Zero with N_2 .
- 2 Turn the cannister on, then press the Pump button. Wait approximately 5 minutes and then press the Start soft key to start the Zero calibration.
- 3 The monitor will read 'Waiting for the gas to stabilise'. At this point you must wait between 60-120 seconds for the gas to stabilise and then the monitor will show 'Completed OK'.
- 4 To finish press Accept/ Exit/ Exit to take you back to the original dormant screen. The monitor should now read 0ppm or 0% to show it has been zeroed.

Span Gas Calibration: This type of calibration is to be completed with the correct calibration gas canister. The example gas given in this section of the guide is O_2 , and must be carried out in the same way with the other three calibration gases. This type of calibration must be completed on a monthly basis. It is strongly advised that you only use the gases supplied by Bedfont Scientific Ltd.

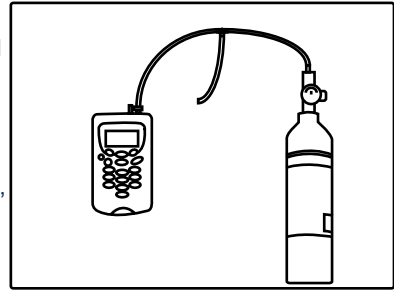
- 1 Attach the flow regulator onto the top of the canister of O_2 safely by holding the regulator in one hand and twisting the canister with the other away from your body.
- 2 Ensure there is gas inside the canister by observing the needle on the regulator has moved up the scale.
- 3 Remove connecting tubes attached to the G210 monitor.
- 4 Connect the G210 unit to the canister of gas with the tubes provided by referring to the label.



5 The tubing should be connected to the canister and then split at the Y piece. One way will supply the unit and the other way will act as a route for waste gas to escape without over pressurising the unit.

6 When all the tubes are connected as per the label diagram (previous page), revert to the unit and press Menu/ 3-Calibration/ 2-Span Gas/ 1-Span with O₂.

7 At this point the monitor should show '1-O₂ 99.9%' (if for any reason the monitor states a different value of gas press 1-O₂/ Input the value of O₂ stated on the canister/ press the Enter key).

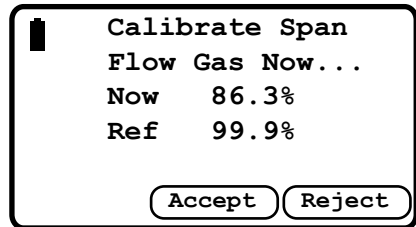


8 At this point you must turn the gas on by twisting the valve on the side of the regulator attached to the canister to the ON position and then press the Start soft key.

9 The monitor will now display 'flow gas now' and two values, as seen in the image. The 'Now' value will be increasing/decreasing and the 'Ref' value will state 99.9%.

10 Now leave the monitor until it gives a stable reading.

11 You will now find that the 'Now' value has stopped increasing/decreasing and stabilised. At this point press the 'Accept' soft key and the span gas calibration will now be complete.



12 Exit back to the original dormant screen and you will find the monitor is still reading 99.9%.

13 At this point twist the valve to 'OFF' on the cannister and remove the tubing.

14 This Calibration type is now complete and will not need calibrating again for one month.

Please note: This must be repeated with the other calibration gases supplied using their retrospective menu selections.

Specification

| | |
|------------------------|---|
| Model | G210 |
| Gas Detected | N ₂ O, O ₂ , CO ₂ , (CO optional) |
| Detection Range | N ₂ O 0-100% O ₂ 0-100% CO ₂ 0-2000 ppm CO 0-500 ppm |
| Detection Resolution | |
| Fumigation range: | 1 mg/L |
| Sensor Type: | Internal Electrochemical Cell |
| Accuracy | N ₂ O Resolution: 0.1% Accuracy: ±(1% of range + 2% of reading) ¹ O ₂ Resolution: 0.1% Accuracy: ±2% full scale CO ₂ Resolution: 5ppm Accuracy: ±(2% of range or 2% of reading) ¹ CO Resolution: 1ppm Accuracy: ±5% of range at constant temperature and pressure |
| Display: | Liquid crystal display, 128 x 64 pixel with RGB LED back-light |
| Controls: | Resin capped silicone rubber keys |
| Warm-up Time: | < 60 seconds |
| Response Time: | < 40 seconds N ₂ O < 60 seconds O ₂ < 60 seconds CO ₂ |
| Operating Temperature: | 0 – 40°C |
| Sensor Life: | 2 - 3 years expected 6 month guarantee |
| Power Supply: | Mains power lead, USB connector, Internal rechargeable Li-Ion battery |
| Time to Full Charge: | Approximately 3 hours. |
| Dimensions: | L 165mm, W 100mm, D 55mm |
| Weight: | 500 grams |
| Connectivity: | USB |
| Extra Features: | Data logging Capability Visual and audible alarm |

¹Conditions during factory calibration, typically 20°C, 1,000 mBar

Returns Procedure

The G210 requires servicing every 12 months. The servicing shall be carried out by Bedfont alone. Please contact Bedfont's Customer Service Specialist before returning any goods. If equipment was not purchased direct from Bedfont, please contact the local distributor.

- When the monitor serial number and description of the fault have been supplied, the Customer Repairs Department will issue a Returns Number.
- State this number when returning the monitor, ensuring full details, including telephone and fax numbers, are clearly provided.
- Bedfont advise using a courier service and not local postal services when returning monitors.
- Confirmation will be sent when goods are received.
- An Engineer's Report and a quotation for the repair will be sent following investigation. This includes an Authorisation Form.
- If the monitor is still within warranty, Bedfont will repair and return it with an Engineer's Report, free of charge. If, after inspection, no fault is found, a fee will be charged.
- If outside of warranty, complete the Authorisation Form within the quotation to proceed with the repair or calibration. Ensure an official Purchase Order Number is included, and return to Bedfont. Contact the Customer Repairs Department with any queries.
- If it is decided not to proceed with the repair, a handling fee will be charged. Ensure the completed Authorisation Form is returned with an official Purchase Order Number.
- The equipment will be returned as soon as Bedfont have received all the relevant paperwork. A carriage fee will be charged if the monitor is no longer in warranty.
- Return the unit in the original packaging, in the sealed container.

Spares

| Part Number | Description |
|----------------------|---|
| G210-CO-CAL | Calibration kit -this contains all replacement gases, calibration tube assembly, and replacement pressure regulator |
| G200/10-CASE | Carry case for personal monitoring with clear front and shoulder strap |
| 068296/5 | Replacement moisture filters |
| 034 - 19 - 01000 - V | Replacement N ₂ Gas for calibration |
| 034 - 21 - 01000 - V | Replacement N ₂ O (99.5%) Gas for calibration |
| 034 - 22 - 10000 - V | Replacement O ₂ (100%) Gas for calibration |
| 034 - 07 - 12211 - V | Replacement CO ₂ (500 ppm) Gas for calibration |
| 034 - 08 - 05010 - V | Replacement CO (100 ppm) Gas for calibration |
| G210SERV | Annual factory service and calibration |
| LAB411 | G210 Operating Manual |

Warranty

Bedfont Scientific Ltd warrants the G210 (batteries excepted) to be free from defects in materials and workmanship for a period of one year from date of shipment. Bedfont's sole obligation under this warranty is limited to repairing or replacing at its choice, any item covered under this warranty when such an item is returned intact, pre-paid to Bedfont Scientific Limited or the local representative.

Note: Sensors are guaranteed for a period of six months from the date of shipment from Bedfont.

These warranties are automatically invalidated if the products are repaired, altered or otherwise tampered with by unauthorised personnel, or have been subject to misuse, neglect or accident.



At the end of the product's life, do not dispose of any electronic instrument in the domestic waste, but contact Bedfont or its distributor for disposal instructions.



Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



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Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.