GMI ◆◆◆

PS1

0 ppm
24 Months

hydrogen sulphide

CONFIGURATION & FIELD CALIBRATION
USER HANDBOOK

GMI welcomes comments on all our publications.

Your comments can be of great value in helping us to improve our customer publications. Please send any comments that you have to our Sales Department at GMI. Contact details are provided on the back cover of this handbook.

Instrument Service / Repair contact details are also provided on the back cover of this handbook.

This Handbook is an important part of the PS1 product. Please note the following points:

- Amendments should be attached.

- Although every care is taken in the preparation of this Handbook it does not constitute a specification for the instrument.

SOFTWARE

DISPOSAL ADVICE

When no longer in use, dispose of the instrument carefully and with respect for the environment. GMI will dispose of the instrument without charge if returned to the factory.

REVISION RECORD

Date	Issue	Description of Change
12/11/2007	1	New Handbook
18/03/2010	2	'SWITCH OFF' sequence amended ; Non-Latching alarms now default ; Alarms table revised to include new part numbers ; Oxygen field calibration kit added.
05/01/2011	3	Revised to include the effect of CN 5047.
13/03/2013	4	Product change from T.ex to PS1 ; the addition of Sulphur Dioxide (SO_2) ; removal of Chapter 6.

CONTENTS

1. INTRODUCTION

This handbook details FIELD CALIBRATION (Chapter 3), ALARM CONFIGURATION (Chapter 4) and CONFIGURATION SETUP (Chapter 5) of the GMI PS1 instrument.

The instrument must first be switched ON in 'Menu Mode' and a three digit code entered, as detailed in Chapter 2, before calibration, alarms or configuration setup modes can be accessed.

The procedures detailed in chapters 3, 4 and 5 illustrate the GMI factory default settings. These settings can be edited by following the procedures detailed in the relevant chapters.

Fig. 1-1 PS1 Instrument

2. SWITCH INSTRUMENT ON / OFF

2.1 SWITCH THE INSTRUMENT ON / ENTER MENU MODE

- Press and hold the RH button ⓪ for one

  second to switch the instrument on.

The instrument begins its warm-up routine. First, all segments are briefly shown, and the LED's will flash, the buzzer beeps, and the vibrator will vibrate.

An example of an initial screen display is shown in Fig. 2-1 opposite.

During the warm-up cycle, a countdown timer is displayed at the bottom / centre of the Screen.

Fig. 2-1 Initial Screen Display

Immediately following the initial screen display, and during the following warm-up displays, enter the menu mode by pressing the LH and RH buttons in the following sequence:

- Press the LH button ●

- Press the RH button ⓪

- Press the LH button ●

- Press the RH button ⓪

Fig. 2-2 Software Version

The following warm-up screens continue while entering the menu mode sequence above:

The software version is displayed, as shown in example Fig. 2-2 opposite.

The next screen displays the target gas.

The target gas in the example shown, Fig. 2-3, is Hydrogen Sulphide.

Fig. 2-3 Target Gas

Next, the different alarm level values are shown. See Figures opposite:

Note: If any particular alarm is disabled, the screen will show 'dis.' (disabled).

Fig. 2-4 Hi Alarm Level

Fig. 2-5 HiHi Alarm Level

Fig. 2-6 STEL Alarm Level

Fig. 2-7 LTEL Alarm Level

The final warm-up screen displays the instrument serial number, as shown in Fig. 2-8, with the last four digits in large font size. In the example shown opposite, the serial number is 120136:

Fig. 2-8 Instrument Serial Number

On completion of warm-up, and providing the menu mode button sequence was entered correctly, the screen shown in Fig. 2-9 is displayed.

Three zero digits are displayed on the instrument screen with the first digit flashing. This prompts the user to enter the first digit of the access code.

Note: The default access code is 316.

Fig. 2-9 Enter Access Code

- Press the LH button ● repeatedly until the required value (3, default) is displayed as first digit.
- Press the RH button ⓪ to step to the next (second) flashing digit.
- Press the LH button ● repeatedly until the required value (1, default) is displayed as second digit.
- Press the RH button ⓪ to step to the next (third) flashing digit.
- Press the LH button ● repeatedly until the required value (6, default) is displayed as third digit, thus completing the access code, as shown in Fig. 2-10.
- Finally, press the RH button ⓪ to accept the access code.

Fig. 2-10 Enter Access Code

Note:

If no button is pressed for a period of 10 seconds, the instrument display will revert to normal operation mode.

2-5

Once the correct code has been accepted, the instrument screen will show 'CAL' (Calibration Mode). See Fig. 2-11.

- Press the LH button ⬤ repeatedly to select:

    'ALAR' (Alarm Mode) shown in Fig. 2-12,

    'SEt' (Setup Mode) shown in Fig. 2-13,

    and returning to 'CAL' (Calibration Mode).

Fig. 2-11 Calibration Mode

Fig. 2-12 Alarm Mode

Fig. 2-13 Setup Mode

When required mode is displayed,

- Press the RH button ⓞ to enter selected mode.

Refer to relevant chapter for details, as follows:

Chapter 3:   Field Calibration
Chapter 4:   Alarm Configuration
Chapter 5:   Configuration Setup

Note: When accessing any of the three modes listed above, 'tE' (Test) symbol is displayed in the lower centre portion of the screen, as shown in example Fig. 2-14.

Fig. 2-14 Test Symbol

2.2 EXIT MENU MODE / SWITCH THE INSTRUMENT OFF

To exit Calibration / Alarm / Setup mode and return to normal operating display,

- Press and hold the RH button ⓞ.

To switch the instrument OFF,

- Press and hold both the LH ● and RH ⓞ buttons simultaneously.

The instrument screen will now start a countdown from three (3) to OFF as shown in Fig. 2-15 opposite. The buttons must be pressed until the display shows OFF, then release the buttons.
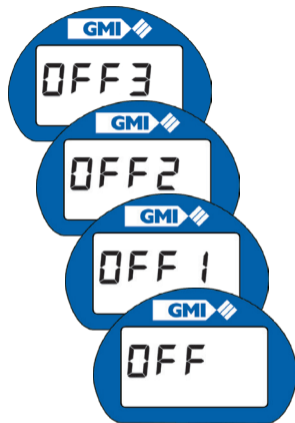
Fig. 2-15 OFF Sequence

3. FIELD CALIBRATION

Field Calibration allows calibration of the PS1 instrument to be carried out without the use of additional equipment such as PC's or tools.

Note: Alternatively, the PS1 Auto Bump / Calibration Station can be used (GMI Part No. 63450). Refer to PS1 Auto Bump / Calibration Station User Handbook (GMI Part No. 63461).

To calibrate the PS1 instrument, you must first switch the instrument ON in 'Menu Mode'. Once a three digit security code is entered, 'CAL' mode can be selected as detailed in Chapter 2.

-   For instruments with a toxic sensor, refer to section 3.1.
-   For instruments with an oxygen sensor, refer to section 3.2.

3.1 INSTRUMENT WITH TOXIC SENSOR

The instrument sensor must be zeroed before accurate calibration can commence. Make sure that the instrument is zeroed in fresh air.

3.1.1 Zero Sensor

On entering 'CAL' mode, as detailed in Chapter 2, the detected value alternates with four dashes (- - - -) as shown in (ppm) example Fig. 3-1.

To zero the sensor, in fresh air,

  • Press and hold the RH button ⓞ for one second.

A zero reading is then displayed, as shown in example Fig. 3-2.
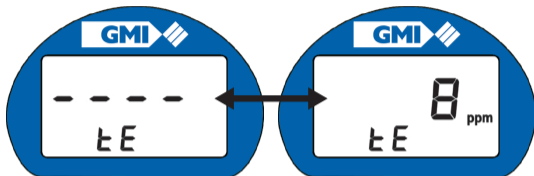
Fig. 3-1 Alternating Screen Display

Fig. 3-2 Instrument Sensor Zeroed

If, for any reason, you wish to exit CAL mode at this stage (e.g. no gas available), press and hold the LH

button ⬤ for one second to exit to menu mode.

3.1.2 Calibration Requirements

For calibration, a 'Field Calibration Kit' is required. The kit includes a gas cylinder, regulator and tubing with connector. The following GMI calibration kits are available as accessories:

Hydrogen Sulphide (H_2S) Pack - Part No. 63104

Carbon Monoxide (CO) Pack - Part No. 63105

Oxygen (O_2) Pack - Part No. 63106

Sulphur Dioxide (SO_2) - Part No. 63107

3.1.3 Calibrate Instrument

In this example, an instrument with a Carbon Monoxide (CO) sensor is calibrated.

Attach connector with tubing from gas cylinder regulator to instrument inlet, as shown in set-up Fig. 3-3.

Fig. 3-3 Calibration Set-up

With a zero instrument reading displayed, open the regulator and supply gas to the instrument (100 ppm CO in example). A flow rate of 250 ml./min. is recommended.

As the calibration gas flows, the instrument reading increases and finally stabilises, at say 90 ppm, as shown in Fig. 3-4.

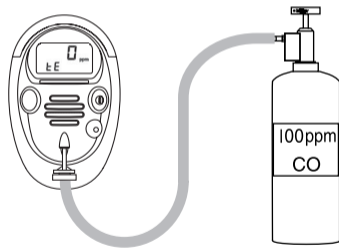To calibrate the instrument correctly, the displayed value must be increased to match the gas cylinder concentration value, i.e. 100 ppm.

- Each press of the RH button (I) increases the displayed value by1 ppm. Continue pressing the RH button until 100 ppm is displayed, as shown in Fig. 3-5.

  (Note: Each press of the LH button ● decreases the displayed value by 1 ppm).

When the instrument's displayed value matches the gas cylinder concentration value, store the calibration value setting.

Fig. 3-4 Initial Reading

Fig. 3-5 Adjusted Reading

To store the new calibration value setting,

- Press and hold the RH button ⓪ for one second.

The instrument then automatically displays the next menu mode 'ALARMS'.

3.2 INSTRUMENT WITH OXYGEN SENSOR

The instrument oxygen sensor must be calibrated in fresh air.

3.2.1 Calibrate Instrument

On entering 'CAL' mode, as detailed in Chapter 2, the current (%) value alternates with four dashes (- - - -) as shown in example Fig. 3-6.

To calibrate the instrument,

- Press and hold the RH button ⓪ for one second.
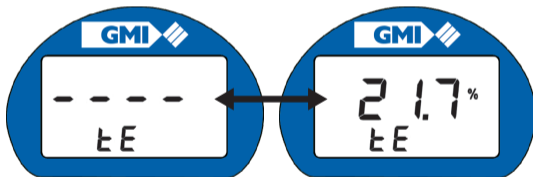
Fig. 3-6 Alternating Screen Display

The value will be adjusted to 20.9%, as shown in example Fig. 3-7.

The instrument then automatically displays the next menu mode 'ALARMS'.
GMI recommends that oxygen instruments are regularly tested for exposure to reduced concentrations of oxygen by breathing into the inlet on the front face of the instrument.

Fig. 3-7 Oxygen Sensor Calibrated

3.3 FAILED ZERO / CALIBRATION

If zeroing of the instrument sensor has failed, the reading flashes in the display.
If calibration of the instrument has failed, again the reading flashes in the display.

In either case,

•   Press and hold the RH button ⓞ to confirm that this has been observed.

The instrument display then returns to the 'CAL' mode screen.

4. ALARM CONFIGURATION

Alarm Configuration allows simple set up of the PS1 instrument alarms, to be carried out without the use of additional equipment such as PC's or tools.

To configure the PS1 instrument alarms, you must first switch the instrument ON in 'Menu Mode'. Once a three digit security code is entered, 'ALAR' mode can be selected as detailed in Chapter 2.

By default, all instrument alarms are non-latching.

Note 1:   Alarm levels are set in accordance with current standards.

Note 2:   Warning alarms do not vibrate.

PS1 Part No.	Gas Type	Hi	HiHi	Lo	LoLo	STEL	LTEL
63002	O_2	N/A	23.5%	Disabled	19.5%	N/A	N/A
63324	H_2S	10 ppm	20 ppm	N/A	N/A	10 ppm	5 ppm
62403						20 ppm	10 ppm
63424	CO	30 ppm	200 ppm	N/A	N/A	200 ppm	30 ppm
62404		35 ppm	50 ppm				35 ppm
63524	SO_2	Disabled	1 ppm	N/A	N/A	1 ppm	1 ppm
62405		Disabled	5 ppm			5 ppm	5 ppm

Fig. 4-1 Alarms Table (Default Values)

Note: By default, all instrument alarms are non-latching.

When alarm mode is selected, the first alarm setting (Hi) is automatically displayed, as shown in Fig. 4-2.

The 'Hi' symbol is displayed at the top of the display and the (oxygen example) alarm is disabled (dIS.) by default.

To edit the setting and enter a value for the 'Hi' alarm:

- Press the RH button ⓪ repeatedly to increase the alarm value in 0.1% steps.

- Each press of the LH button ● decreases the displayed value by 0.1%.

Note: If either button is pressed ten times (x10) consecutively, the next press of that button will increase / decrease the step value by ten times (x10) the normal change, i.e. 1.0%. To revert to 0.1% steps, press the other button.

An example of a 'Hi' alarm value is shown in Fig. 4-3.

Fig. 4-2 Hi Alarm Setting

Fig. 4-3 Hi Alarm Value Entered

4-3

The 'L' and 'NL' symbols, at bottom left hand and bottom right hand corner of display are for setting alarms as either 'Latching' or 'Non-Latching and correspond with the LH and RH buttons respectively.

A 'Non-Latching' alarm (default) will reset automatically once the displayed value has returned within the pre-set alarm limits. The alarm will not clear until the reading has returned within the limits for a period of 20 seconds. This prevents the alarm from activating / de-activating regularly when the reading is hovering around the alarm set-point. Alternatively, the alarm can be muted.

A 'Latching' alarm (configurable option) will remain activated until reset by the user when the displayed value has returned within the pre-set alarm limits. A 'Latching' alarm cannot be muted.

Note: By default, Time Weighted Average (TWA) and warning Hi / Lo alarms are set as Non-Latching. TWA alarms vibrate. Warning alarms do not vibrate. HiHi and LoLo alarms are set as Latching. (see following page for explanation of TWA).

To set the displayed alarm value as 'Non-Latching',

*   Press and hold the RH button ⓞ for one second.

To set the displayed alarm value as 'Latching',

*   Press and hold the LH button ● for one second.

Note: If alarm is set as 'dIS' (disabled) i.e. zero value, e.g. Lo (oxygen),

   •   Press and hold either LH button ● or RH button ⓪ for one second to store setting.

Once the selection is made, the 'Hi' value is stored and the instrument alarm configuration steps to the next level, 'HiHi'.

The procedure for setting / editing the remaining 'HiHi', 'Lo', 'LoLo', 'STEL' and 'LTEL' alarms is consistent with the 'Hi' alarm configuration previously detailed.

Note 1:   When operating normally, the instrument records minimum and maximum readings and toxic gas ranges calculate the Short Term Exposure Limit (STEL) and Long Term Exposure Limit (LTEL). These are known as Time Weighted Average (TWA) readings.

   TWA value is the mean average gas level over a specific period. The STEL is 15 minutes and the LTEL is 8 hours. In accordance with UK legislation, this requires the TWA's to be over a 24 hour period whether the instrument is ON or OFF. Such averaging essentially makes the instrument single user applicable.

Note 2:   The toxic gas alarm levels are set at the same time as instrument manufacture. It is important that the user ensures that the levels are in accordance with their company's alarm levels and with health and safety legislation.

After the last alarm setting is selected as latching or non-latching, the instrument will display the next menu mode: 'SEt' (Setup).

5. CONFIGURATION SETUP

Setup options allow the user to easily configure the PS1 instrument to their personal needs, or their company's safety rules, without the use of additional equipment such as PC's or tools.

To access the PS1 instrument setup options, you must first switch the instrument ON in 'Menu Mode'. Once a three digit security code is entered, 'SEt' mode can be selected as detailed in Chapter 2.

On entering Setup mode, as detailed in Chapter 2, the screen displays the first option, 'User', as shown in Fig. 5-1.

The 'L' and 'NL' symbols, at bottom left hand and bottom right hand corner of the display, are for setting user as either 'Limited' (single user) or 'Not-Limited' (multiple users). These symbols correspond with the LH and RH buttons respectively.

Note: Single User means that the TWA alarm value is the mean value for the LTEL (8 hours exposure) and is calculated over a 24 hour period without resetting the value.

Multiple Users means that the TWA value will be reset to zero after the end of each setting, i.e. at switch off, and the TWA alarm will be reset.

Fig. 5-1 User Options

- To set the instrument as 'single user' option, press and hold the LH button ● for one second.

- To set the instrument as 'multiple users' option, press and hold the RH button ⓪ for one second.

Once the selection is made, the instrument automatically moves on to the display option.

The factory default display option, shown in Fig. 5-2, or current setting is displayed.

Three options are available: 'FULL', 'NONE' or 'OK', as shown in Figs. 5-2, 5-3 and 5-4.

FULL: Displays the current gas value at all times.

NONE: The screen remains blank until an alarm is activated, then displays the actual value.

OK: The screen shows 'OK' until an alarm is activated, then displays the actual value.

   •   Press the LH button ● repeatedly until required option is displayed.

Fig. 5-2 'Full' Option   *Fig. 5-3 'None' Option*   *Fig. 5-4 'OK' Option*

Once the required option is displayed,

- Press and hold the RH button ⓪ for one second to confirm selection and exit to 'CAL' mode.

INDEX