



MSA Altair Five 4-Gas Monitor

Air Monitoring
Instrumentation



Objectives

- Discuss instrument calibration procedure, as appropriate.
- Discuss the procedure for instrument use.
- Review appropriate sampling procedures.

Introducing...

The MSA Altair Five 4-Gas Monitor



Instrument Operation #1

Turning the Instrument On



Turn the instrument ON by depressing the center ON/OFF button.

One beep will sound and the alarm lights will flash once.

Instrument Operation #2



- Monitor will prompt “PUMP TEST.” Cover inlet with finger to test. Display will read “Pump Test Pass.”
- Pump will run through self checks.

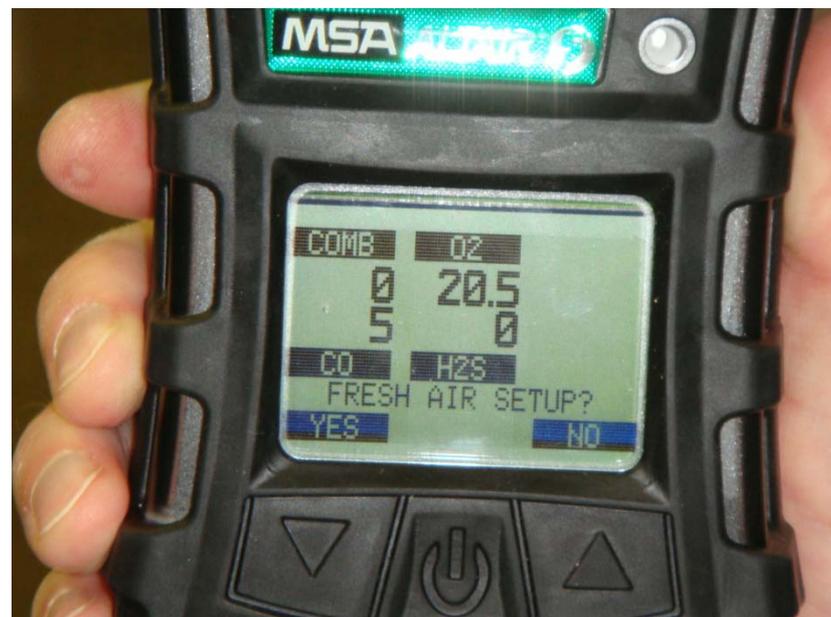
Instrument Operation #3

Fresh Air Setup

User will be prompted for Fresh Air Setup?

Select NO (Right *Page* button) NO is also the default response.

Select YES (Left *Reset* button) if in clean air and the GATS unit has not been used.



Instrument Operation #4

Display



Instrument Operation #5

Battery Check



Check remaining battery life by looking in the lower right hand corner of the display.

If the battery is dying, an alarm will sound.

Instrument Calibration



- Place the instrument into the holder upside down and slide it down, making sure of a tight connection with the gas delivery fitting.
- Close cover to automatically start calibration. The display shows the calibration progress.
- Once finished, you will see the prompt saying calibration complete and a PASS – you are free to use the instrument.
- If the calibration FAILS – DO NOT USE the instrument. Notify division/section ES&H personnel immediately.

Instrument Operation #6

Shutdown



Press and hold the ON/OFF button.

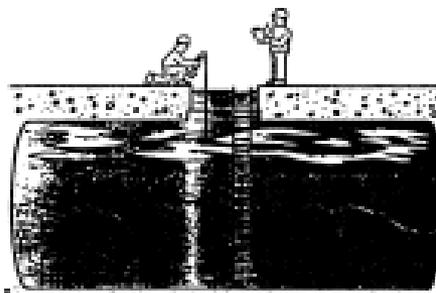
The display will show a countdown.



When the countdown reaches zero, the instrument will be turned off and the user can release the ON/OFF button.

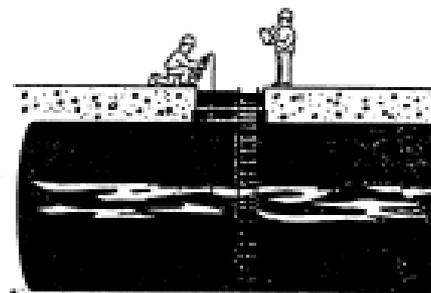
Atmospheric Testing

Depending on their weights, hazardous gases could be at the bottom, middle or top of a given confined space. Some gases are heavier than air, others lighter, some the same weight. Therefore, the only safe way to test the atmosphere of a confined space is to sample all levels (top, middle, bottom) at 4 foot intervals with properly CALIBRATED INSTRUMENTS.

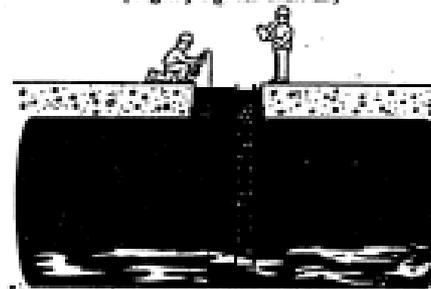


Methane Combustible Gas
(lighter than air)

If toxic gases, combustible gases or oxygen deficiency/enrichment are discovered, the confined space has to be ventilated and retested before any entry is permitted.



Carbon Monoxide (CO)
(slightly lighter than air)



Hydrogen Sulfide (H₂S)
(heavier than air)

Remember to put your trust in a properly calibrated instrument and not your senses. You can't see or smell many toxic gases, combustible gases or determine how much oxygen is present without a reliable instrument.

Atmospheric Testing Comparison of Gases

The following gases are **lighter** than air:

Name	Vapor Density (Air=1)
Acetylene	0.9
Ammonia	0.6
Carbon Monoxide	~1.0
Ethylene (Ethene)	~1.0
Helium	0.1
Hydrogen	0.1
Methane	0.6
Nitrogen	~1.0

The following gases are **heavier** than air:

Name	Vapor Density (Air=1)
Argon	1.4
Butane	2.0
Carbon Dioxide	1.5
Chlorine	2.5
Ethane	~1.0
Hexane	3.0
Hydrogen Sulfide	1.2
Methyl Ethyl Ketone	2.5
Methyl Mercaptan	1.7
Nitrogen Dioxide	1.6
Nitrous Oxide	1.5
Oxygen	1.1
Propane	1.6
Propylene	1.5
Sulfur Dioxide	2.2

The gases in bold and larger text are those commonly found at Fermilab.

LEL Correlation Data Table

	Gas	Methane
G	Acetone	1.7
a	Acetylene	1.3
s	Ammonia	0.8
	Benzene	1.9
	Butane	1.7
	Carbon Monoxide	1.1
B	Dodecane	3.0
e	Ethane	1.3
i	Ethanol	1.5
n	Ethylene	1.3
g	Hexane	2.3
	Hydrogen	1.0
	Isopropanol	1.9
	Methane	1.0
S	Methanol	1.1
a	Pentane	1.9
m	Propane	1.6
p	Styrene	2.2
l	Tolulene	2.1
e	Vinyl Chloride	2.5
d	Xylene	2.5