



SMALLEST & LIGHTEST 4 GAS MONITOR

Gas Detection For Life

GX-3R Model



4 World's Smallest and Lightest Gas Monitor

Features

- **Smallest & lightest 4 gas monitor**
 - 2.2" W x 2.55" H x 1.02" D, 3.52 ounces
- **Simultaneous detection of 4 gases**
 - LEL, O₂, H₂S & CO
 - H₂ Compensated CO sensor available
- **Simple 2-button operation**
- **Non-Compliance Indicator**
- **Alarms: audible, visual, & vibration**
- **3 user adjustable alarm levels**
- **Impact resistant body with removable rubber boot**
- **Large LCD Auto-backlit display**
- **25 hours of operation (Lithium-ion battery)**
- **Field replaceable sensors & filters**
- **Water and dust resistant design, IP66/68**
- **Stealth mode for law enforcement**
- **3 Year warranty**

Applications

- **Personal monitoring**
- **Confined spaces**
- **Refineries/petrochemical**
- **Utilities**
- **Oil and Gas**
- **Water/wastewater**
- **Fire services**
- **Construction**

OSHA defines the breathing zone as a ten inch radius around the worker's nose and mouth, and requires that worker exposure monitoring air samples be collected **in the breathing zone**. Air sampling filters may be attached to the collar or lapel. Traditionally this means only a single gas monitor would be small enough for a worker to practically wear a gas monitor **'In the breathing zone'**. Now there is a 4 gas monitor smaller than many single gas monitors.

The GX-3R is the worlds smallest 4 gas monitor weighing only 3.52 ounces and can comfortably be clipped within a worker's breathing zone (2.2" W x 2.55" H x 1.02" D). It simultaneously monitors and displays LEL combustibles, O₂, CO (Hydrogen compensated CO also available), and H₂S.

The GX-3R represents the latest evolution of gas detection technology utilizing a new generation of micro sensors. The LEL sensor has a unique design with two active filaments in one sensor to increase it's resistance to silicone poisoning. If one filament gets poisoned the second filament takes over. The new O₂ sensor is electrochemical with a 3 to 5 year life span. H₂S and CO are now available in a combo micro sensor.

Safety supervisors will appreciate the non-compliance indicator. The instrument flashes it's 3 LED lights every 30 seconds in the following conditions; if the instrument has not been bump tested, or if calibration is due, or if there was a gas alarm event. The 3 LED lights will continue to flash once every 30 seconds until the non-compliance condition has been resolved. The 30 second interval is adjustable.



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GX-3R Model

Gas Detected	(CO) H2 Compensated	Carbon Monoxide(CO)	Hydrogen Sulfide(H2S)	H2S Only	Combustible Gases (Methane as standard)	Oxygen (O2)
Sensor Slot	1			2		3
Detection Principle	EC	Dual EC		EC	Catalytic combustion	Electrochemical cell
Detection Range (Increments)	0 ~ 2,000 ppm (1 ppm)		0 ~ 200.0 ppm (0.1 ppm)		0 ~ 100% LEL (1% LEL)	0 ~ 40.0% Vol. (0.1%)
Sampling Method	Diffusion sampling standard (hand aspirator or clip-on motorized pump optional)					
Display	Digital LCD displays with 7 segment plus 14 segment plus icon					
Preset Alarms (User Adjustable) Overscale alarm (Non-adjustable)	1st alarm: 25.0 ppm 2nd alarm: 50.0 ppm 3rd alarm: 1200.0 ppm TWA alarm: 25.0 ppm STEL alarm: 200.0 ppm Over alarm: 2000.0 ppm		1st alarm: 5.0 ppm 2nd alarm: 30.0 ppm 3rd alarm: 100.0 ppm TWA alarm: 1.0 ppm STEL alarm: 5.0 ppm Over alarm: 200.0 ppm		1st alarm: 10% LEL 2nd alarm: 25% LEL 3rd alarm: 50% LEL Over alarm: 100% LEL	Low 1 alarm: 19.5% Low 2 alarm: 18.0% High alarm: 23.5% Over alarm: 40.0%
Types of Alarms	Gas Alarm: Trouble alarm:	3 Increasing alarms, STEL, TWA, overscale alarm. O2 decreasing/increasing. Sensor disconnection, low battery, circuit error, calibration range error				
Display of Alarm	Gas Alarm: Trouble alarm:	Flashing LEDs, continuous buzzer (100 db @ 30 cm), flashing gas value, vibration Flashing LEDs, intermittent buzzer (95 db @ 30 cm), display of error message				
Operating Temp. & Humidity	-20°C ~ +50°C [-4°F ~ +122°F], 10 to 90% RH, non-condensing (continuous environment) -40°C ~ +60°C [-40°F ~ +140°F], 0 to 95% RH, non-condensing (temporary environment, 15 minutes)					
Response Time	Within 30 seconds (T90)					
Power Source	Lithium-ion battery, Approx. 25 hours after a 3 hour full charge					
Approvals	ATEX, CSA					
Dimension & Weight	2.2" W x 2.55" H x 1.02" D (Approx. 58 W x 65 H x 26 D mm), 3.52 ounces (approx. 100 g) without rubber boot 2.4" W x 2.63" H x 1.06" D (Approx. 61 W x 67 H x 27 D mm), 3.70 ounces (approx. 105 g) with rubber boot					
Case Material	Explosion proof, dust and water resistant to IP-66/68 (2m,1h) approval. Drop height 23 ft					
Controls	Two buttons: POWER / MODE, AIR					
Datalogging	Logs user ID, station ID, Calibration & Bump Test history, Alarm Events & Alarm Interval Trends					
Standard Accessories	Alligator clip, protective rubber boot, charger, and calibration adapter					
Optional Accessories	SDM-3R calibration station RP-3R Clip-on sampling pump with 4" rubber nipple, 10' hose and probe (up to 40' hose available) Padded carrying case for GX-3R and accessories USB to IrDA downloading cable for datalogger					
Warranty	Three years material and workmanship					

Calibration Station SDM-3R



- Charge, calibrate, bump test, and alarm test
- Automatically schedule calibrations & bump test
- Fast bump mode uses less calibration gas
- Ethernet and USB output connections
- Bank up to 10 units with tubeless connection

Clip-On Sampling Pump RP-3R



- 100' sampling range and independent power supply



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SMALLEST & LIGHTEST 5 GAS MONITOR

Gas Detection For Life

GX-3R Pro Model



5 World's Smallest and Lightest Gas Monitor

Features

- **Smallest & lightest 5 gas monitor**
— 2.9" W x 2.6" H x 1.06" D , 4.58 ounces
- **Simultaneous detection of 5 gases**
— Confined Space Gases: LEL, O₂, H₂S, CO
— Toxic/IR Gases: HCN, NH₃, NO₂, PH₃, SO₂, and CO₂
— H₂ Compensated CO sensor available
- **Simple 2-button operation**
- **Bluetooth communication with iOS & Android App**
- **Non-Compliance Indicator**
- **3 user adjustable alarm levels**
- **Panic Alarm**
- **Man Down Alarm**
- **Impact resistant body**
- **Large full dot, auto-backlit display with auto-rotation**
- **Stealth mode for law enforcement**
- **Field replaceable sensors & filters**
- **Water and dust resistant design, IP66/68**
- **3 Year Warranty***

Applications

- **Personal monitoring**
- **Confined spaces**
- **Refineries / petrochemical**
- **Utilities**
- **Oil and Gas**
- **Water / wastewater**
- **Fire services**
- **Construction**

The GX-3R Pro is the world's smallest 5-gas monitor weighing only 4.58 ounces and fits in the palm of your hand (2.9" W x 2.6" H x 1.06" D). It simultaneously monitors and displays 5 different gases. In addition to monitoring standard confined space gases, LEL, O₂, CO, & H₂S, the GX-3R Pro has a 5th channel where you can add infrared or toxic gas sensors. Two of the four sensor slots have interchangeable sensors providing flexible configurations, which can easily be changed in the field.

The GX-3R Pro comes equipped with Bluetooth wireless communication, man-down alarm, the choice of alkaline or rechargeable power supply, and a 3 year warranty. The Lithium-ion battery pack will operate for 25 hours and will fully charge in 3 hours.

The GX-3R Pro utilizes Bluetooth communication to display direct gas readings from the instrument to a phone app, which is available free on either iOS or Android phones. Automatic notifications can be programmed to send text or email messages if there is an alarm event from the GX-3R Pro.

Safety supervisors will appreciate the non-compliance indicator. The instrument flashes it's 3 LED lights every 30 seconds in the following conditions; if the instrument has not been bump tested, or if calibration is due, or if there was a gas alarm event. The 3 LED lights will continue to flash once every 30 seconds until the non-compliance condition has been resolved. The 30 second interval is adjustable.

* 3 year warranty on material and workmanship including sensors (1 year for Ammonia sensor)



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Detectable Gases				
Gas		Measuring Range (Increments)	Preset Alarms	
Sensor Slot 1: Carbon Monoxide (CO) & Hydrogen Sulfide (H2S)				
H2S / CO	Dual EC	0 ~ 2000 ppm (1 ppm)	A1: 25 ppm A2: 50 ppm A3:1200 ppm	STEL: 200 ppm TWA: 25 ppm
		0 ~ 200.0 ppm (0.1 ppm)	A1: 5 ppm A2: 30 ppm A3: 100 ppm	STEL: 5.0 ppm TWA: 1.0 ppm
H2S Only	EC	0 ~ 200.0 ppm (0.1 ppm)	A1: 5 ppm A2: 30 ppm A3: 100 ppm	STEL: 5.0 ppm TWA: 1.0 ppm
CO H2 Compensated	EC	0 ~ 2,000 ppm	A1: 25 ppm A2: 50 ppm A3: 1200 ppm	STEL: 200 ppm TWA: 25 ppm
Sensor Slot 2: Combustibles (Methane as standard)				
CH4 / HC	Catalytic	0 ~ LEL (1% LEL)	1st: 10% LEL 3rd: 50% LEL	2nd: 25% LEL Over:100% LEL
Sensor Slot 3: Oxygen (O2)				
O2	EC	0 ~ 40.0% Vol. (0.10%)	Low 1: 19.5% Low 2: 18.0%	High: 23.5% Over: 40.0%
Sensor Slot 4: Toxic & CO2				
HCN	EC	0 ~ 30.0 ppm (0.1 ppm)	A1: 5.0 ppm A2: 10.00 ppm A3: 30.00 ppm	STEL: 10 ppm TWA: 4.7 ppm
NH3		0 ~ 400.0 ppm (0.5 ppm)	A1: 25.0 ppm A2: 35.0 ppm A3: 300.0 ppm	STEL: 1.0 ppm TWA: 0.30 ppm
NO2		0 ~ 20.00 ppm (0.05 ppm)	A1: 2.00 ppm A2: 4.00 ppm A3: 20.00 ppm	STEL: 25.0 ppm TWA: 35.0 ppm
PH3		0 ~ 20.00 ppm (0.01 ppm)	A1: 0.30 ppm A2: 0.60 ppm A3: 0.60 ppm	STEL: 1.0 ppm TWA: 0.30 ppm
SO2		0 ~ 100.0 ppm (0.05 ppm)	A1: 2.00 ppm A2: 5.00 ppm A3: 100.00 ppm	STEL: 5.0 ppm TWA: 2.00 ppm
CO2 %	IR	0 ~ 10.0% Vol. (0.01%)	A1: 0.50% Vol. A2: 3.00% Vol. A3: 4.00% Vol.	STEL: 3.00% Vol. TWA: 0.50% Vol.
CO2 ppm		0 ~ 10,000 ppm (20 ppm)	A1: 5,000 ppm A2: N/A	STEL: N/A TWA: N/A

Calibration Station
SDM-3R



Clip-On Sampling Pump
RP-3R



Common Specifications			
Sampling Method	Diffusion sampling standard (hand aspirator or clip-on motorized pump optional)		
Display	Full dot LCD with Autobacklight and Autorotation		
Alarm Types	Gas Alarm	Trouble Alarm	
	<ul style="list-style-type: none">• 2 increasing alarms• STEL• TWA• Overscale alarm• O2 decreasing/ increasing	<ul style="list-style-type: none">• Sensor disconnection• Low battery• Circuit error• Calibration range error• Cal or bump due alarm	
	<ul style="list-style-type: none">• Man Down Alarm• Panic Alarm		
Display of Alarm	Gas Alarm	Trouble Alarm	
	<ul style="list-style-type: none">• Flashing LED's• Continuous buzzer (100 db @ 30cm)• Flashing gas value• Vibration	<ul style="list-style-type: none">• Flashing LED's• Intermittent buzzer (95 db @ 30cm)• Display of error message	
Operating Temp. & Humidity	-20°C ~ +50°C [-4°F ~ +122°F] 10 to 90% RH, non-condensing (continuous environment)		
	-40°C ~ +60°C [-40°F ~ +140°F] 0 to 95% RH, non-condensing (temporary environment)		
Response Time	Within 30 seconds (T90)		
Power Source	Config	Li-ion	Alkaline
	4-gas + EC	25 hours	16 hours
	with BLE 	23 hours	14 hours
	4-gas + IR	16 hours	7 hours
	with BLE 	15 hours	6 hours
Dimension & Weight	2.9" W x 2.6" H x 1.06" D (Approx. 73 W x 65 H x 26 D mm) 4.58oz (with rubber boot)		
Case Material	Explosion proof, dust and water resistant to IP-66/68 (2m,1h); Drop test height 23 ft		
Bluetooth Communication	BLE: with iOS and Android phone app: <i>RK Link</i>		
Datalogging	Logs user ID, station ID, Calibration & Bump Test history, Alarm Events & Alarm Trends		
Standard Accessories	Alligator clip, protective rubber boot, charger, calibration adapter		
Optional Accessories	<ul style="list-style-type: none">• Padded carrying case• RP-3R Attachable sampling pump with 4" rubber nipple, 10' hose and probe (up to 40' hose available)• USB to IrDA downloading cable for datalogger• SDM-3R calibration station• Hand aspirator		
Approvals	ATEX, CSA		
Warranty	3 years material and workmanship including sensors (1 year for Ammonia sensor)		

*Specifications subject to change without notice



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GX-3R Quick Reference Guide

Turn On

Press & Hold

**POWER
MODE**

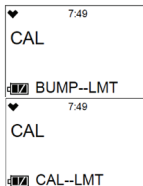
Past Due Bump/CAL

To Bump / CAL

**POWER
MODE**

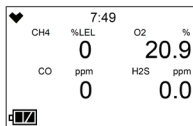
Confirm & Use

AIR



**Normal
Operation**

After brief
warm-up period



Fresh Air

Press & Hold

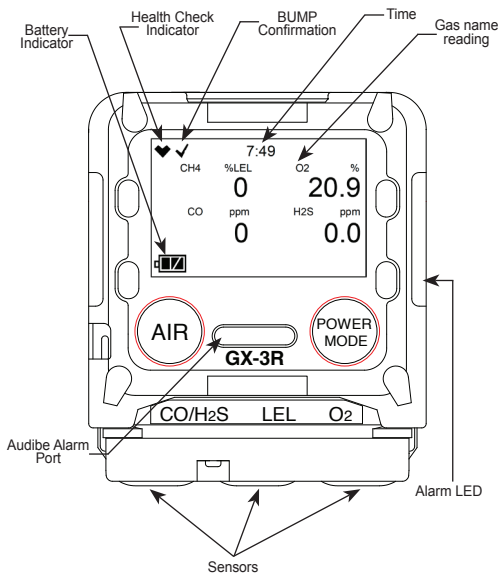
AIR

Turn Off

Press & Hold

**POWER
MODE**

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Turn On

Press & Hold

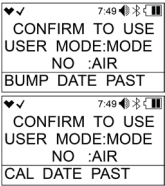


Past Due Bump/CAL

To Bump / CAL



Confirm & Use



Normal Operation

After brief warm-up period

♥✓		7:49		Signal, Bluetooth, Battery icons	
CH4	%LEL	CO	ppm	H2S	ppm
	0		0		0.0
O2	%	CO2	vol%		
	20.9		0.00		

Fresh Air

Press & Hold

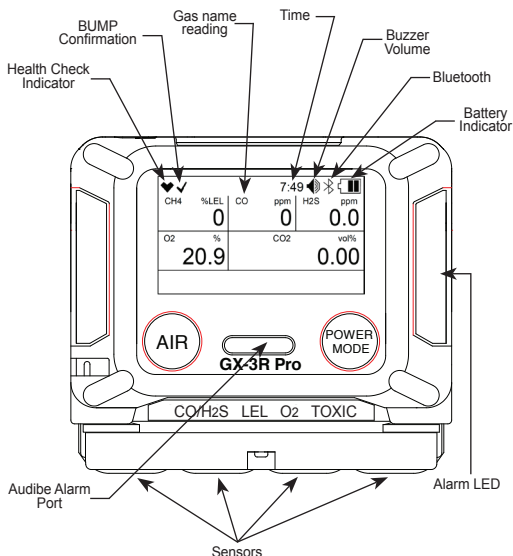


Turn Off

Press & Hold



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GX-3R & GX-3R Pro



Service Training Module

1



Agenda

- Display Mode
- User Mode
- Maintenance Mode
- Gas Select Mode
- Factory Mode
- Calibration
- Filter maintenance
- Sensor replacement
- Disassembly



2



Display Mode

- To enter Display Mode, press **POWER/MODE** when in normal operation/measurement mode.

You will know you are in display mode if you see a display mode menu title on the bottom of your screen



To return to normal operation, scroll all the way through the display menu using the **POWER/MODE** button, or wait 20 seconds and the unit will automatically return to normal mode



Display Mode

Display Mode menu options:

- PEAK – Displays peak readings for each sensor
- STEL – Displays STEL readings (CO, H2S, and CO2/Super-Toxic only)
- TWA - Displays TWA readings (CO, H2S, and CO2/Super-Toxic only)
- HC GAS LIST – Change the target gas for the LEL sensor
- CAL DATA – Displays the last calibration date for each sensor
- TEMPERATURE – Displays temperature, date and time
- ALARM-PT – View alarm points

EXAMPLES: Re-setting PEAK readings, changing the LEL target gas



Display Mode

Re-setting the PEAK readings

- Enter Display Mode by Pressing **POWER/MODE**
- Press and hold **AIR**, The screen should read, "**CLEAR**"
- Release **AIR** when prompted to release

Changing the LEL target gas

- Enter Display Mode by pressing **POWER/MODE**
- Scroll to **HC GAS** using **POWER/MODE**
- Press **AIR** to select, CH4 should be blinking
- Scroll to desired gas using **AIR**
- Select the gas (listed by atomic number) by pressing and releasing **POWER/MODE**
- You will be returned to the previous screen



Display Mode

Display Mode menu options (GX-3R Pro only):

- USER ID – View/change the User ID
- STN ID – View/change the Station ID
- INVERT SELECT – Screen auto rotation, ON/OFF
- LCD BACKGROUND –
 - ON – black background white characters
 - OFF – white background black characters
- BLUETOOTH – Turn BlueTooth functionality ON/OFF
- BUZZER VOLUME – Set buzzer volume, HIGH/LOW



User Mode

To enter User Mode:

- Make sure instrument is off
- Press and hold "**AIR**"
- Then press and hold "**POWER/MODE**"
- Release after 1 beep



User Mode

PASSWORD

- The default is set to **OFF**
- If PASSWORD is set to on, then, "**PASSWORD 0000**" will be displayed
- If you turn it on, the default password is **0405**

NOTE: 0405 will act as backdoor password if assigned one is forgotten or not given by end user

NOTE: A small "M" will appear at the top of the screen, "MAINT" on the Pro. This indicator appears whether you are in User, Maintenance, Gas Select or Factory Mode



User Mode

User Mode menu options:

- BUMP – Perform a bump test
- GAS CAL – Perform a fresh air adjustment, perform a span adjustment, change calibration gas concentration, set the cylinder group
- CAL SET – Change parameters related to calibration
- BUMP SET – Change parameters related to bump testing
- ALARM-PT/ALARM SETTING – Set alarm points for all channels(WARNING, ALARM, ALARM H, STEL, TWA) or restore alarm defaults
- LUNCH – turn lunch break on/off
- BEEP/CONFIRMATION – Set confirmation beep parameters
- BL TIME – Set backlight timer
- KEY TONE – set key tone on/off
- DISP SET/ D MODE – Adds or removes certain menu items from Display Mode
- ZEROFLWR – Not intended for field adjustment*
- ZEROSUP – Not intended for field adjustment
- DATE – Set the date and time
- PASSWORD – Password needed to access user mode on/off, set password
- ROM/SUM – View firmware info
- START- start up and enter measurement mode

*Factory setting is on except O2 channel, O2 channel does not support zero follower functionality



User Mode

User Mode menu options (GX-3R Pro only):

- MAN DOWN – Turn Man Down and Panic alarms on/off, set intervals for Man Down alarm
- AUTO BACKLIGHT – The GX-3R Pro's backlight automatically turns on in a low-light environment, on/off
- LANGUAGE - Set the language of the instrument (10 options)
- IR UNIT SELECT – Select the units for the IR CO2 sensor (%vol/ppm)*
- CO2 AIR SETTING –
 - On: channel is set to 400ppm (0.04%vol) when performing demand zero, auto zero or air calibration
 - Off: channel is not adjusted in those processes
- DATE FORMAT – Set the date format
- RADIO STANDARD – Approval number for radio agencies



User Mode

Navigation

- To enter any menu option, select it and press the “**POWER/MODE**” button
- To scroll to the next option press the “**AIR**” button

EXAMPLE: CAL SET



User Mode

CAL SET

- CAL RMDR – turn calibration reminders on or off (default is ON)
- CAL INT – Set the interval of your CAL RMDR (default – 90 days)
(REMEMBER: if you need to reverse the direction of your numbers, press **AIR** and **POWER/MODE** together quickly, then use **AIR** to scroll back)
- CAL EXPD (default: CONFIRM)
 - CONFIRM – allow the end user to acknowledge they are out of compliance and continue without calibration
 - CANT USE – will not allow the instrument to be used if not calibrated
 - NONE – The user can decide to calibrate, or if they do nothing the instrument will go into measurement (normal) mode



Maintenance Mode

To enter Maintenance Mode:

- Make sure instrument is off
- Press and hold "**AIR**"
- Then press and hold "**POWER/MODE**"
- Release after 2 beeps



Maintenance Mode

PASSWORD

- The default is set to **ON**
- If PASSWORD is required, then, "**PASSWORD 0000**" will be displayed
- The default password is **8102**

NOTE: 8102 will act as backdoor password if assigned one is forgotten or not given by end user



Maintenance Mode

Maintenance Mode menu options:

- GAS CAL - Perform a fresh air adjustment, perform a span adjustment, change calibration gas concentration, set the cylinder group
- GAS TEST - Apply gas to test sensor and observe alarm indications without alarm event being recorded
- SEN DATE - View replacement date of sensors and battery
- BUMP - Perform a bump test
- LATCHING - Turn alarm latching on/off
- DEM ZERO - Allow "Fresh Air" adjustment in measuring mode, on/off
- AUTOZERO - Offer "Fresh Air" adjustment at end of start-up, on/off
- ID DISP - User IDs and Station IDs appear in start-up, on/off
- ZERO SUP - Default is ON. Not intended for field adjustment. The suppression values are: LEL: 2%, O2: 0.5%vol, H2S: 0.3ppm, CO: 2ppm, CO2: 0ppm, SO2: 0.2ppm
- ZEROFLWR - Factory setting is on except O2 channel, O2 does not support zero follower functionality
- ZSUP.DISP - Zero Suppression menu appears in User Mode, on/off
- Z.FLW.DISP - Zero follower menu appears in User Mode, on/off

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Maintenance Mode

Maintenance Mode menu options continued:

- DATE - Set the date and time
- PASSWORD - Password needed to access Maintenance Mode on/off, set password
- ROM/SUM - View firmware info
- M.DEFAULT - Set all parameters back to RKI factory settings
- START - start up and enter measurement mode

Maintenance Mode menu options (GX-3R Pro only):

- DATE FORMAT - Set the date format
- LANGUAGE - Set the language of the instrument (10 options)
- LCD CONTRAST - Adjust contrast of the LCD display

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Gas Select Mode

Gas Select Mode is essential for changing target gases for each channel on your instrument, or for turning those channels off if desired.

To enter Gas Select Mode:

- Make sure instrument is off
- Press and hold "**AIR**"
- Then press and hold "**POWER/MODE**"
- Release after 3 beeps



Gas Select Mode

PASSWORD

- The default is set to **ON**
- If PASSWORD is required, then, "**PASSWORD 0000**" will be displayed
- The default password is **2014**



Gas Select Mode

Gas Select Mode menu options:

- GAS COMB – Change target gas for channels, turn channels ON/OFF
- SAVE AP – Set current alarm points as default alarm points
- MAX SPAN – Maximum span screen appears after calibration, ON/OFF
- STEALTH – Disable backlight, LED and buzzer, ON/OFF
- CHG LEL – Apply standard, IEC, or ISO settings for LEL ppm values



Gas Select Mode

CHANGE LEL: PPM Values for Different Standards

Gas	Standard (ppm)	IEC (ppm)	ISO (ppm)
Methane (CH ₄)	50,000	44,000	44,000
Isobutane (i-C ₄ H ₁₀)	18,000	13,000	15,000
Hydrogen (H ₂)	40,000	40,000	40,000
Methanol (CH ₃ OH)	55,000	60,000	60,000
Acetylene (C ₂ H ₂)	15,000	23,000	23,000
Ethylene (C ₂ H ₄)	27,000	23,000	24,000
Ethane (C ₂ H ₆)	30,000	24,000	24,000
Ethanol (C ₂ H ₅ OH)	33,000	31,000	31,000
Propylene (C ₃ H ₆)	20,000	20,000	18,000
Acetone (C ₃ H ₆ O)	21,500	25,000	25,000
Propane (C ₃ H ₈)	20,000	17,000	17,000
Butadiene (C ₄ H ₆)	11,000	14,000	14,000
Cyclopentane (C ₅ H ₁₀)	14,000	14,000	14,000



Gas Select Mode

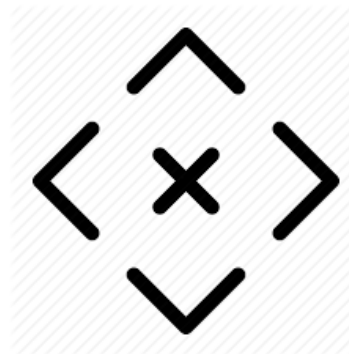
CHANGE LEL: PPM Values for Different Standards

Gas	Standard (ppm)	IEC (ppm)	ISO (ppm)
Benzene (C6H6)	12,000	12,000	12,000
N-hexane (n-C6H14)	12,000	10,000	10,000
Toluene (C7H8)	12,000	10,000	10,000
N-heptane (n-C7H16)	11,000	8,500	8,000
Xylene (C8H10)	10,000	10,000	10,000
N-nonane (n-C9H20)	7,000	7,000	7,000
Ethyl acetate (EtAc)	21,000	20,000	20,000
Isopropyl alcohol (IPA)	20,000	20,000	20,000
Methyl ethyl ketone (MEK)	18,000	15,000	15,000
Methyl methacrylate (MMA)	17,000	17,000	17,000
Dimethyl ether (DME)	30,000	27,000	27,000
Methyl isobutyl ketone (MIBK)	12,000	12,000	12,000
Tetrahydrofuran (THK)	20,000	15,000	15,000

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Calibration



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Calibration



If your instrument is past its 90 day (factory set default) calibration limit, you will see a CAL-LMT reminder at start-up



Acknowledge and use

Press the **AIR** button to continue without performing a calibration



Perform a calibration

Press the **POWER/MODE** button to perform calibration.



Calibration

- To perform a fresh air calibration
 - Make sure you are in a gas free environment
 - Press and hold the “**AIR**” button
 - When prompted, release the button

Note: If you are unable to perform a Fresh Air adjustment, it may be that “DEM ZERO” in Maintenance Mode has been turned off.

In this case, you will have to enter User Mode and select GAS CAL → AIR CAL to perform one.



Calibration

To perform a calibration without being prompted by the calibration reminder (CAL RMDR) turn the instrument off and restart it in User Mode

To enter User Mode:

- Turn the GX-3R off
- Press and hold the “**AIR**” button
- Then press and hold the “**POWER/MODE**” button
- Release after one beep

25



Calibration

In the User Mode menu

- Use the “**AIR**” button to scroll options
- Use the “**POWER/MODE**” button to select

Select “**GAS CAL**”

- Note your sub-menu options are “**AIR CAL**” and “**AUTO CAL**”

(NOTE: This is where you can do a “fresh air” calibration if you did not on start-up)

- Select “**AUTO CAL**”
- Calibration values will be displayed (LEL – 50%, O₂ – 12%, CO – 50ppm, H₂S – 25ppm)

(factory set default values)



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Calibration

If the calibration values displayed do **NOT** match the gas cylinder values:

- Enter the **AUTO CAL** menu (User Mode → Gas Cal → Auto Cal)
- Scroll with "**AIR**" and select "**CAL-P**" with "**POWER/MODE**"
- You should see the active channel marked with 3 dashes (- - -)
- Use "**AIR**" to select which gas you want to change the value of
- Press "**POWER/MODE**" to select
- Use "**AIR**" to adjust to the value matching your cylinder
(*HINT: if you need to reverse the direction of your numbers, press **AIR** and **POWER/MODE** together quickly*)
- Press the "**POWER/MODE**" button to save
- Press "**AIR**" to move to the next gas. Repeat as necessary
- Select "**ESCAPE**" to return to the Auto Cal menu

27



Calibration

Applying gas to the GX-3R

- Attach a fixed flow regulator to the calibration gas cylinder
- Attach the calibration adapter to the instrument and connect it to the 0.25 LPM regulator with tubing
- With "**AUTO CAL**" highlighted, press "**POWER/MODE**"
- Turn on the regulator



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Calibration

- **"AUTO CAL/CYL A"** should be alternating on the display
- Press **"POWER/MODE"**
- Apply gas until readings stabilize or for 2 minutes maximum
- Press **"POWER/MODE"**
Turn the gas regulator off



29



Calibration

- If the calibration is successful, the unit will read **"PASS"**
- If the calibration is unsuccessful, the unit will read **"FAIL"**



Note that the fail message gives status for each sensor

30



Calibration

AUTO CAL pass

- Remove the calibration adapter
- The unit will read "PASS," then go through its start up sequence and enter measurement mode, ready for use

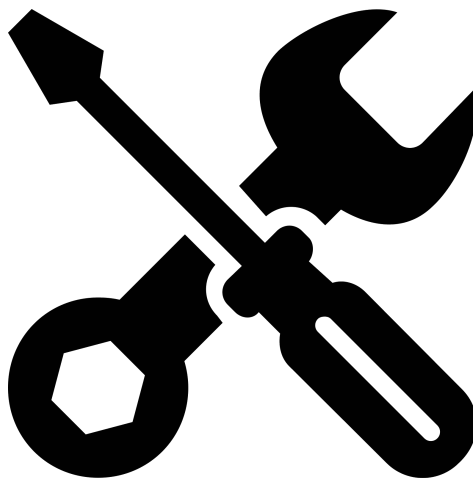
AUTO CAL fail

- The unit will read "FAIL" and return to the AUTO CAL menu in User Mode

NOTE: In the "CAL EXPD" User Mode menu item, you can set the instrument to "CANT USE" to prevent the end user from continuing without calibration



Maintenance





Sensor/Filter replacement



33



Sensor/Filter replacement



Unscrew the screws on the bottom of the unit

34



Sensor/Filter replacement



Use the flat side of your small screwdriver to gently pop up the edges of the sensor cap to remove it

35



Sensor Replacement

- Replace sensors when they cannot be calibrated or readings become unstable
- Remember to always calibrate your instrument after replacing a sensor
- Make sure the tabs of the sensors are aligned with the contacts and placed correctly



36



Sensor Replacement



ESR-A1DP – H₂S/CO
combo



ESR-A1CP-CO-H w/ H₂
compensation



NCR-6309 – LEL



ESR-A13P – CO



ESR-X13P – O₂



ESR-A13i – H₂S



ESR-A13D – SO₂



ESR-A13D-NO₂



IRR-0409 – CO₂, 0-
10% volume



ESR-A13D-HCN

IRR-0433 – CO₂ 0-
10,000 ppm

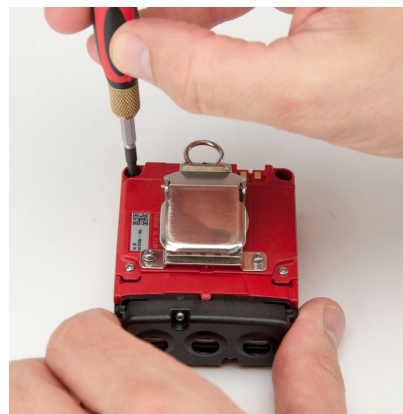
NH₃ Q4 2021
CI₂ Q1 2022

37



Disassembly

- Turn the instrument off
- Remove the rubber boot
- Using a small Phillips head screwdriver, remove the 4 screws that are holding the 2 halves of the casing together



38



Disassembly

Grab the casing and separate it



39



Disassembly

Gently grab the plastic tabs, and pull the display and buzzer straight out

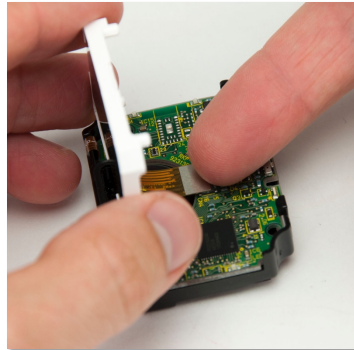


40



Disassembly

Carefully detach the ribbon connector for the display from the board by very gently pulling it straight out. If you have a small plastic tool, use it. If not, your fingernail will do. Do **NOT** use your flathead screwdriver.



41



Disassembly



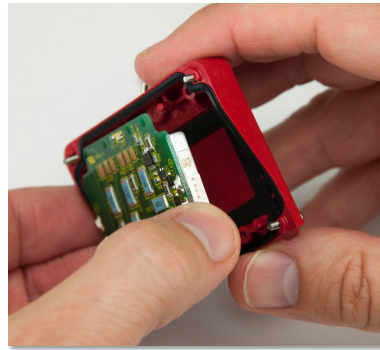
Display assembly pieces

42



Disassembly

Now remove the battery and board from the other side by unscrewing the 3 small screws, then pull the battery and PCB straight out to remove.



43

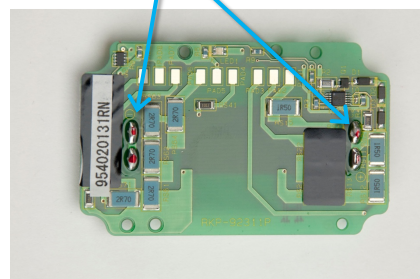


Disassembly

- The Li-Ion battery is replaceable



Please note, the initial runs of the product have the battery soldered to the board. If this is the case, please send to RKI for service



44



Disassembly

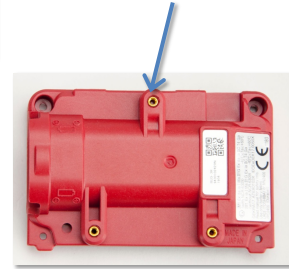
Alkaline battery pack (optional) for the GX-3R Pro

Turn the slot with your thumbnail until it aligns with "open," then pull the cap straight out



Insert 2 AAA batteries according to diagram

Screw the alkaline battery pack back on the unit to replace the Li-Ion battery assembly



45



Questions?



46





SAMPLE DRAW 4 GAS MONITOR

Gas Detection For Life

GX-Force Model



Features

- 2 Operating modes
 - Normal and Leak Check (Q4)
- Internal sample pump with 100' sample range
- 30 hours of operation (Lithium-ion battery)
- Easy to grip lightweight design
 - 2.5" W x 6.81" H x 1.85" D, 9.87 ounces
- Water and dust resistant design, IP67
- Field replaceable sensors & filters
- Impact resistant body
- Intrinsically safe
- Large LCD Auto-backlit display
- 3 Year warranty

Applications

- | | |
|----------------------------|--------------------|
| • Personal monitoring | • Oil and Gas |
| • Confined spaces | • Water/wastewater |
| • Refineries/petrochemical | • Fire services |
| • Utilities | • Construction |

The GX-Force is RKI's smallest personal 1-4 gas monitor with a strong internal sample pump capable of a 100' sampling range. Weighing only 9.8 ounces, the GX-Force can monitor the standard confined space gases (LEL combustibles, Oxygen, Carbon Monoxide, and Hydrogen Sulfide). Utilizing the same micro-sensor technology, which are compatible with the GX-3R, GX-3R Pro, 04 Series, and Gaswatch 3 instruments.

With the GX-Force, you have multiple tools in one instrument. Having 2 operating modes, the GX-Force can be used for confined space, safety monitoring in its Normal Operating mode. A Leak Check mode (*firmware available Q4*) is the solution for leak investigations. In Leak Check Mode, the GX-Force can monitor for combustibles in the ppm range.

The GX-Force operates 30 hours on a Li-ion battery, and has a large LCD display showing all gas readings, battery level, current time and automatically backlights in alarm conditions. Standard alarm types include vibration, visual, and audible alarms, which can be set to latching or non-latching. Controlled by a microprocessor, the GX-Force continuously checks itself for sensor connections, low battery, circuit trouble, low flow, and calibration errors.

Calibration and bump test intervals and reminders are user adjustable and can be set to either go into alarm or to lock the user out of normal measurement mode once a calibration period has expired. Calibration can be done individually or in a group.

GX-Force Model

Model	GX-Force
Sampling Method	Internal sample pump, flow rate nominal 0.5 LPM, includes hydrophobic filter
Suction Flow Rate	Minimum 0.35 L/min (open flow rate)
Gas Alarm Pattern	Lamp flashing, continuous modulating buzzer sounding, gas concentration display flashing, vibration
Gas Alarm Reset Operation	Self-resetting or latching
Fault Alarm/Self-Diagnosis	System, clock, or sensor abnormality; battery voltage drop; calibration failure; pump abnormality; low flow rate
Fault Alarm Pattern	Lamp flashing, intermittent buzzer sounding, detail display
Fault alarm reset operation	Self-resetting
Display	LCD digital (7-segment + 14-segment + icons) with backlight
Individual Operations	Operational status, clock, battery level, peak reading, pump status, calibration notification
Sound Pressure	Approx. 90 dB (30 cm)
Data Logger Function	Maximum storage capacity: 3,600 items Interval: 5 minutes (adjustable)
Communication Specifications	USB, 2.0 (for data logger) Connector: Type-C
Power Source	Rechargeable lithium ion battery
Continuous Operating Time	Approx. 30 hours (25 °C, fully charged, no alarm, no backlight)
Operating Ambient Temperature / Humidity Range	-20 °C to +50 °C (no sudden changes), 0 - 95 % RH (no condensation) (-4 °F to +122 °F)
Approvals	Intrinsically safe construction IECEX (Ex da ia IIC T4 Ga/Ex ia IIC T4 Ga) ATEX (II1G Ex da ia IIC T4 Ga/II1G Ex ia IIC T4 Ga)
Certifications	ATEX / IECEX, QPS (pending)
Protection Level	IP67 equivalent
External Dimensions / Weight	Approx. 2.52 (W) × 6.81 (H) × 1.85 (D) (excluding protrusions) / Approx. 9.87 oz.
Warranty	Three years material and workmanship

Detection target gas	Combustible gas (CH ₄ or HC)	Oxygen (O ₂)	Carbon monoxide (CO)	Hydrogen sulfide (H ₂ S)
Detection principle	Catalytic combustion	Electrochemical type		
Detection range	0 - 100 % LEL	0.0 - 40.0 vol %	0 - 2,000 ppm	0.0 - 200.0 ppm
Resolution	1 % LEL	0.1 vol %	1 ppm	0.1 ppm
Alarm setpoints (User-defined setting)	1st alarm: 10 % LEL 2nd alarm: 25 % LEL 3rd alarm: 50 % LEL OVER alarm: 100 % LEL	L alarm: 19.5 vol % LL alarm: 18.0 vol % H alarm: 23.5 vol % OVER alarm: 40.0 vol %	1st alarm: 25 ppm 2nd alarm: 50 ppm 3rd alarm: 1200 ppm TWA alarm: 25 ppm STEL alarm: 200 ppm OVER alarm: 2,000 ppm	1st alarm: 5.0 ppm 2nd alarm: 30.0 ppm 3rd alarm: 100.0 ppm TWA alarm: 1.0 ppm STEL alarm: 5.0 ppm OVER alarm: 200.0 ppm
Response time (T90)	CH ₄ : Within 30 seconds, HC: Within 40 seconds	Within 20 seconds	Within 30 seconds	Within 30 seconds



INSTRUMENTS
Gas Detection For Life

(800) 754-5165
www.rkiinstruments.com

Authorized Distributor:

GX-Force Quick Reference Guide

Turn On

Press & Hold

POWER
MODE

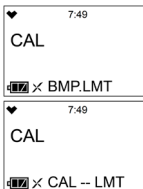
Past Due Bump/CAL

To Bump / CAL

POWER
MODE

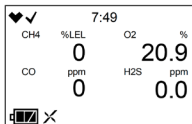
Confirm & Use

AIR



Normal Operation

After brief
warm-up period



Fresh Air

Press & Hold

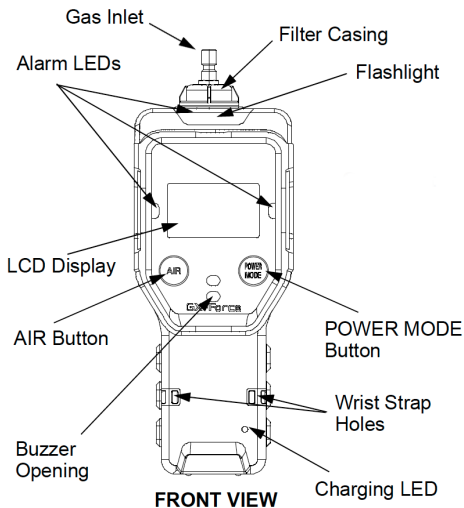
AIR

Turn Off

Press & Hold

POWER
MODE

GX-Force Quick Reference Guide



Scan QR code for
GX-Force Manual

RKI Instruments, Inc. 33248 Central Ave, Union City, CA 94587

Phone (510) 441-5656 • (800) 754-5165 • www.rkiinstruments.com

230913/10000

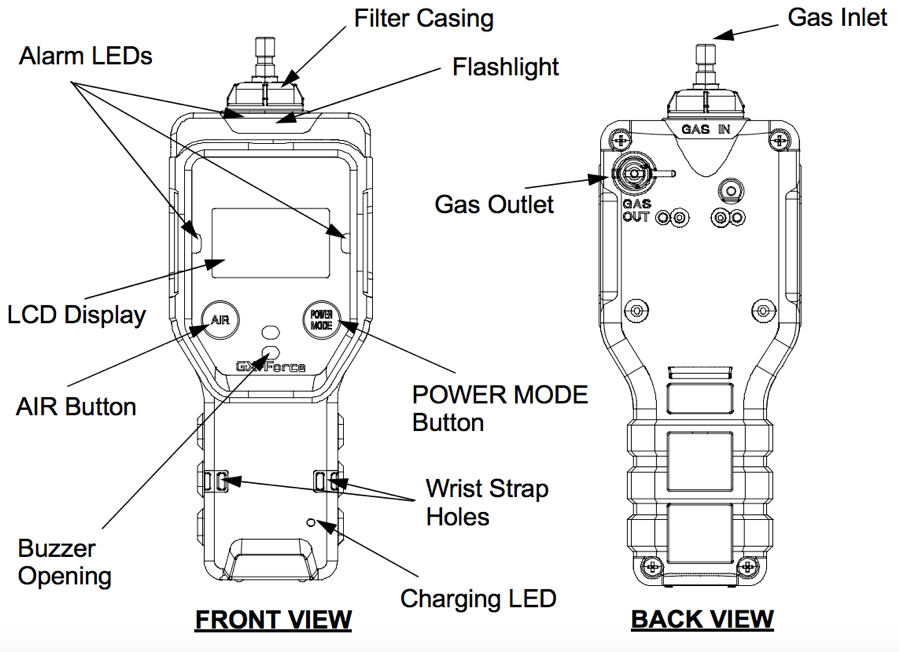


GX-Force

Service PowerPoint



1



2

Agenda

- Control Buttons
- Start-up procedure
- Fresh air adjust
- Display Mode
- Calibration
- Filter & sensor replacement

3


Control Buttons

GX-Force

Button	Function(s)
AIR	<ul style="list-style-type: none"> Turns on LCD backlight Reset alarm button for latching alarms Enters User Mode, Maintenance Mode, and Gas Select mode when used with POWER MODE Activates the demand zero for fresh air reading Changes the value of a parameter available for adjustment Scrolls through parameter options
Power MODE	<ul style="list-style-type: none"> Turns the GX-Force on and off Turns on LCD backlight Enters and scrolls through Display Mode Save button Reset alarm button for latching alarms Enters User Mode, Maintenance Mode, and Gas Select mode when used with AIR

4

Start-up Procedure



Press and hold **POWER MODE** button.
Release the button when you hear a beep.


GX-Force

5

Start-up Procedure

Start-up sequence will commence

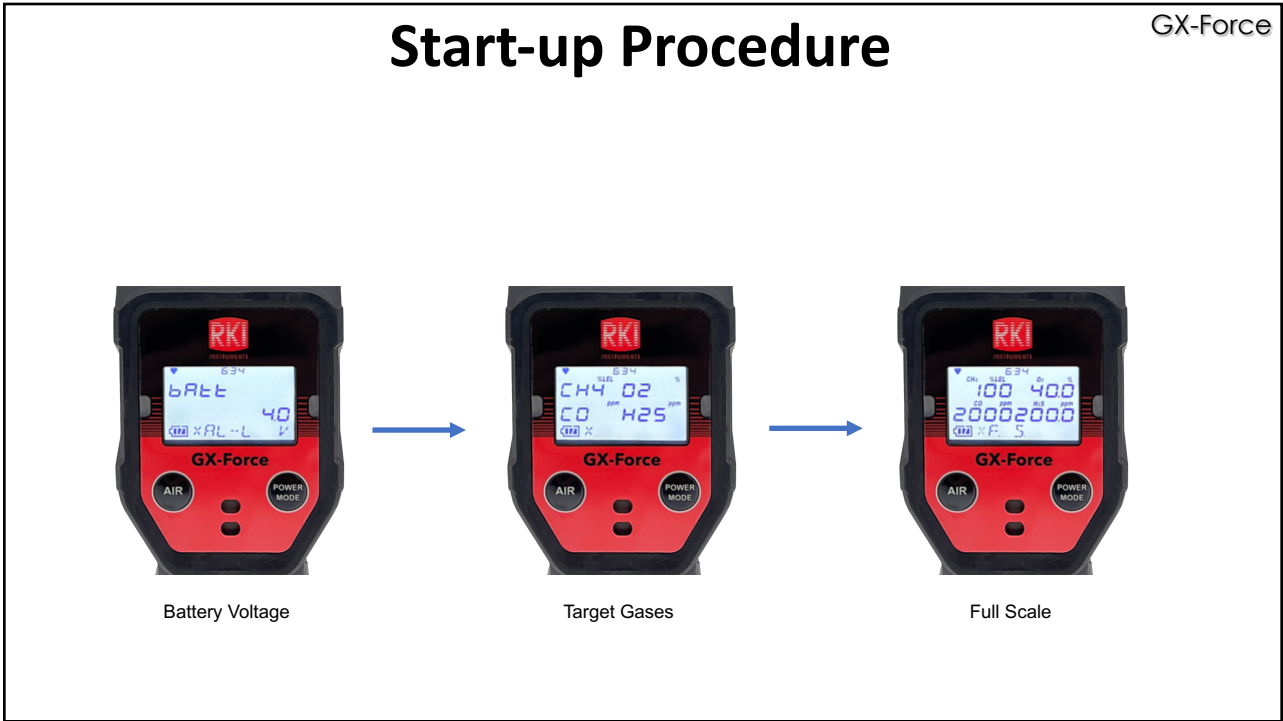
If CAL.RMDR is set to ON (factory setting) and a calibration is due, the screen that appears next depends on the CAL.EXPD setting in User Mode.



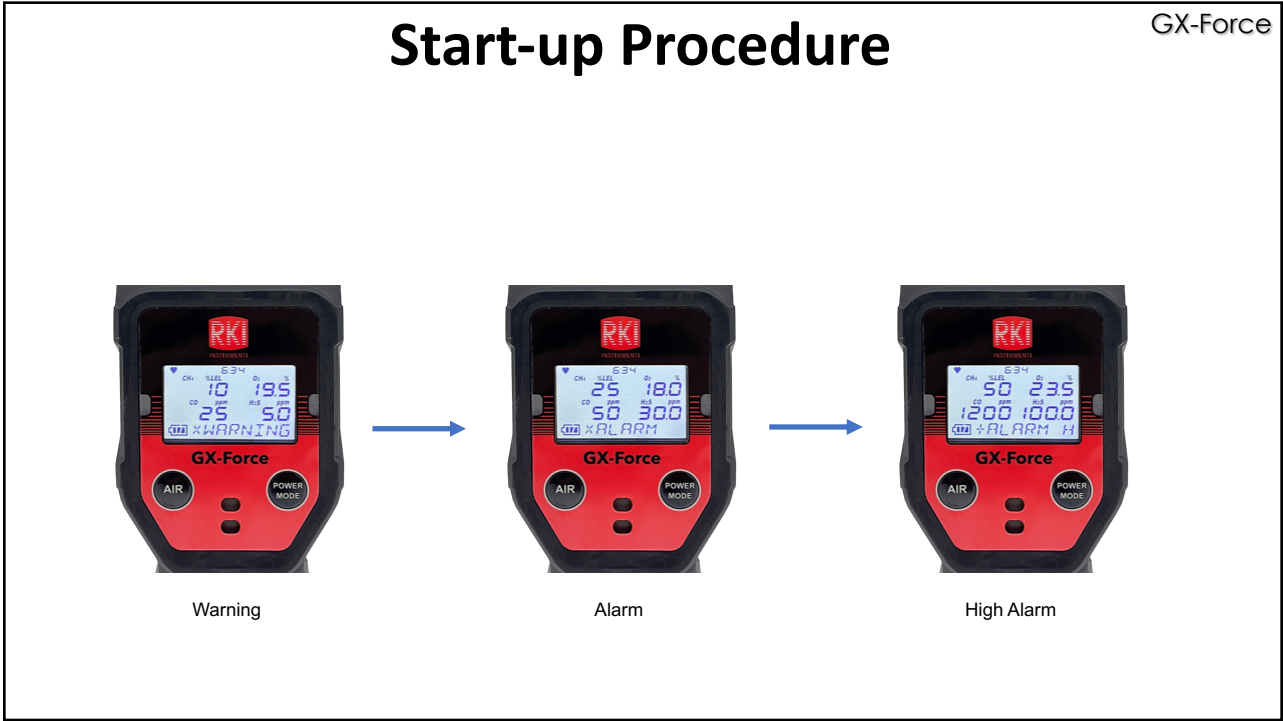
- Press the **AIR** button to bypass the CAL.RMDR and continue using the GX-Force
- Press the **POWER/MODE** button to calibrate the instrument in User Mode

Date and Time

6




7




8

Start-up Procedure


GX-Force



STEL



TWA




Normal Operation Screen

9


Fresh Air Adjust

GX-Force


Verify that the instrument is in a fresh air environment




Press and hold the **AIR** button



Keep holding the **AIR** button until prompted to release it





10

Display Mode

GX-Force

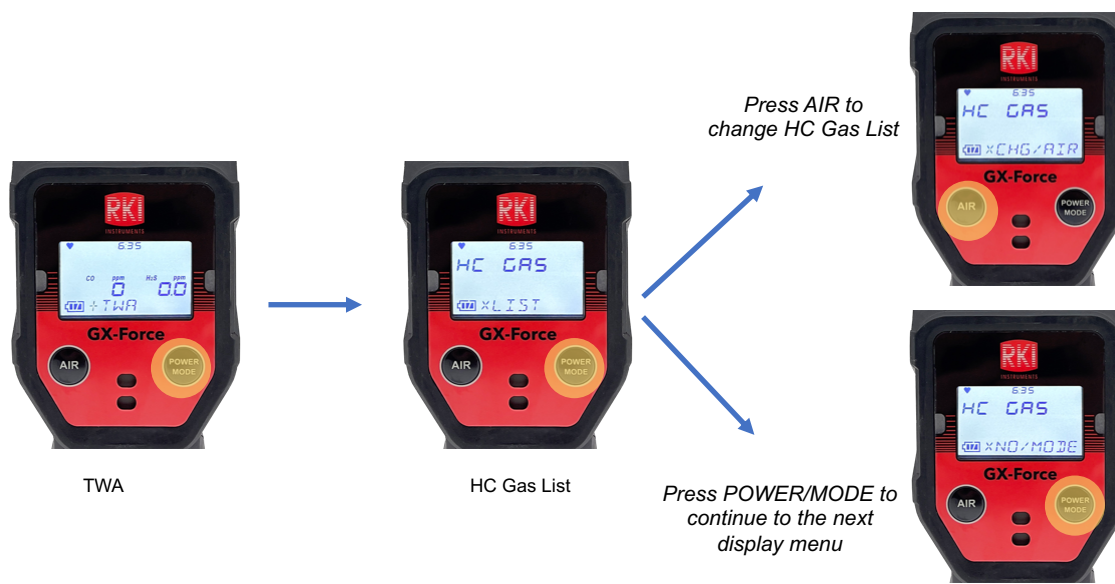
From the Normal Operation Screen (Measuring Mode)
Press **POWER/MODE** to cycle through Display Mode's menu items



11

Display Mode

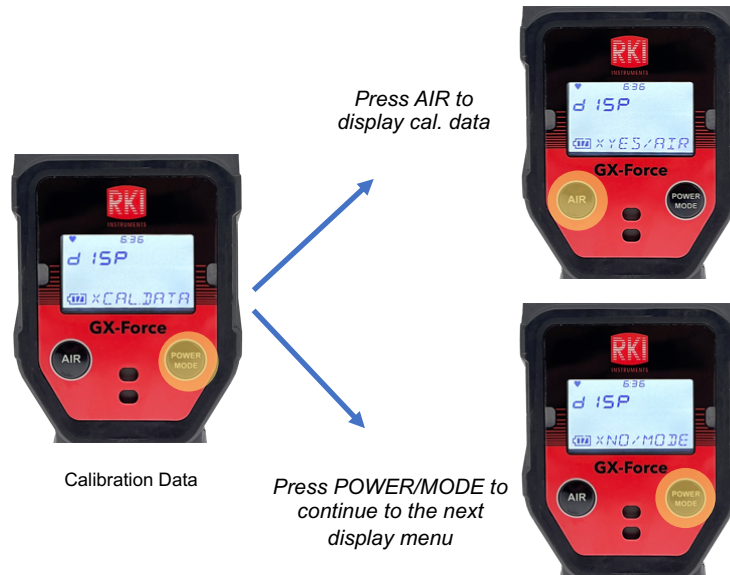
GX-Force



12

Display Mode

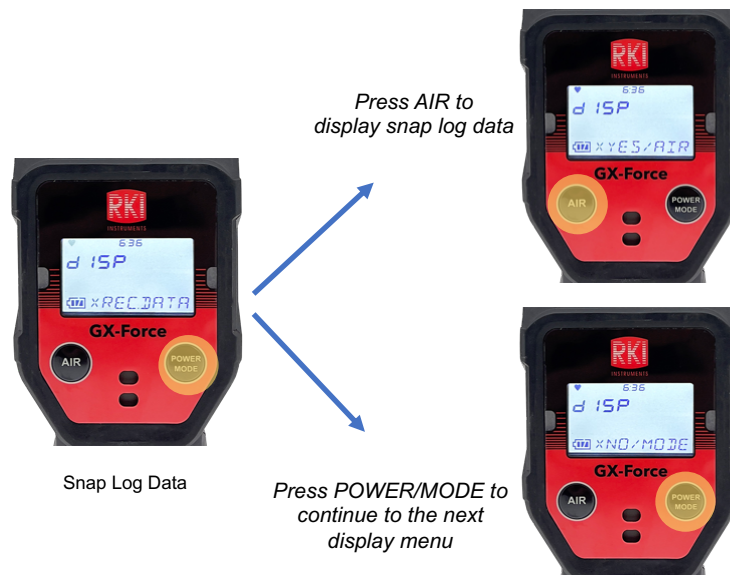
GX-Force



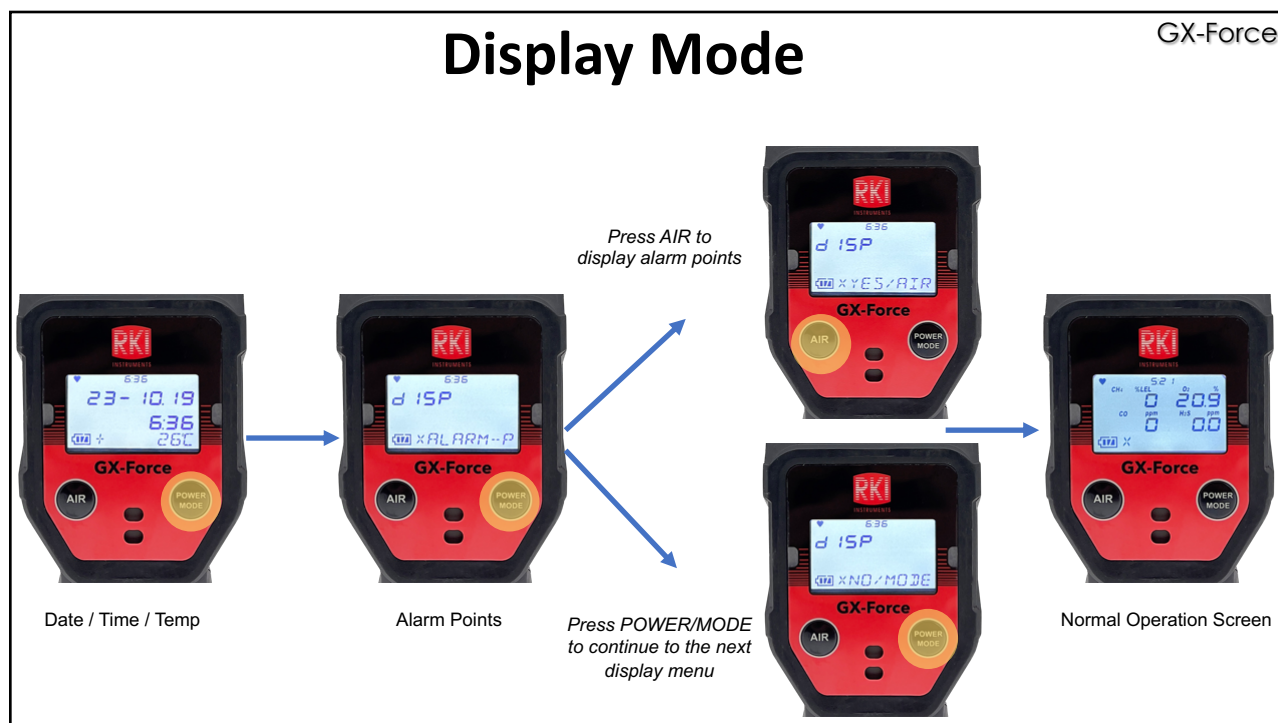
13

Display Mode

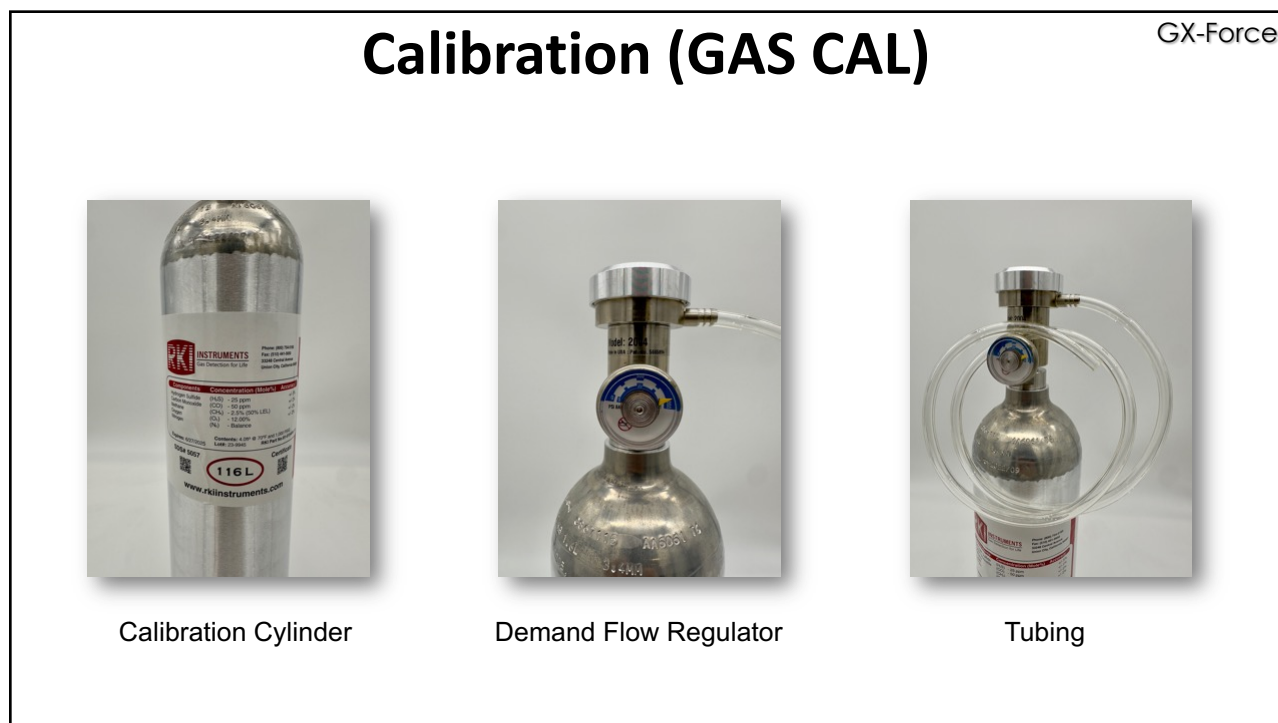
GX-Force



14



15



16

Calibration (GAS CAL)

GX-Force



With the instrument off, Press **AIR** and then **POWER/MODE** to enter User Mode
2023



BUMP is the first menu to appear



Press **AIR** to scroll to **GAS CAL** and then press **POWER/MODE**

17

Calibration (GAS CAL)

GX-Force



AIR CAL appears on the screen. Press **POWER/MODE**

2023



- Press and hold **AIR** until prompted to release it



18

Calibration (GAS CAL)

GX-Force



- Press **AIR** to scroll to **AUTOCAL**

2023



- Press **POWER/MODE** to enter **AUTOCAL**



- Connect the demand flow regulator to the calibration cylinder, attach the hose to the demand flow regulator and the instrument

19

Calibration (GAS CAL)

GX-Force



- The screen will show the calibration values, which should match the calibration cylinder. Press **POWER/MODE**, and let the gas flow for 1 minute

2023



- After the reading stabilizes, press **POWER/MODE**. The result will show **PASS**. The instrument will automatically start up to Normal Operation



- If the result shows **FAIL**, press **POWER/MODE**. The instrument will prompt you to repeat the calibration process

20

Filter & Sensor Replacement

GX-Force

Take the GX-Force to a non-static environment and turn it off if it is on.

Unscrew the four captive screws



21

Filter & Sensor Replacement

GX-Force



Part # 21-1982

Lift up the **Rear Case Assembly** and set it aside

22

Filter & Sensor Replacement

GX-Force



Lift up the **Filter Gasket**, and replace if needed. *Part # 07-6064*

23

Filter & Sensor Replacement

GX-Force



Filter Part #'s

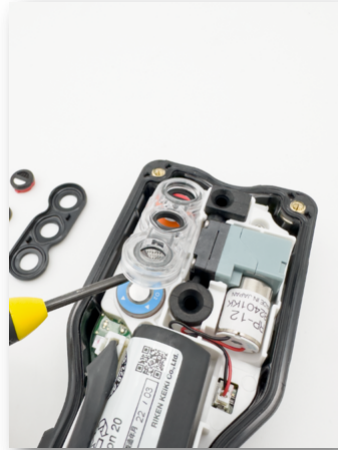
- 33-7130: Scrubber disk filter for dual CO/H2S
- 33-7131: Scrubber disk filter for LEL
- 33-7132: Scrubber disk filter for CO and CO(-H2)
- 33-7133: Humidity filter disk for H2S

Lift up the **Sensor Filters**, and replace if needed

24

Filter & Sensor Replacement

GX-Force

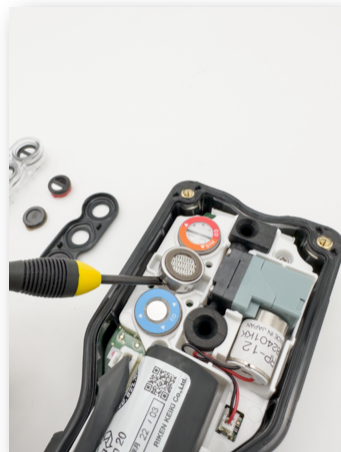


Lift up the **Sensor Retainer**, and replace if needed. *Part # 21-1983*

25

Filter & Sensor Replacement

GX-Force



Sensor Part #'s

ESR-A13i-H2S: **H2S** Sensor
 ESR-A1DP-COHS: **CO/ H2S** Combo Sensor
 ESR-A13P-CO: **CO** Sensor
 ESR-A1CP-CO-H: **CO** with H2 comp.
 ESR-X13P-OXY: **O2** Sensor
 NCR-6309: **LEL** Sensor

Lift up the **Sensors**, and replace if needed

26

Filter & Sensor Replacement

GX-Force



Remove the **Rubber Nozzle** and replace if needed. *Part # 17-1001RK*



Remove the **Filter Holder** (twist it counter clockwise) and replace if needed. *Part # 21-1833RK*

27

Filter & Sensor Replacement

GX-Force



Remove the **Teflon Filter Disk** and **Wire Mesh Disk Filter** and replace if needed. *Part # 33-0159RK / 33-1112RK*



Remove the **Gasket** and replace if needed. *Part # 07-2005RK*

28



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

