INDUSTRIAL SPEC GAS ANALYZER with BUILT-IN PUMP

Model: FD-600

Headspace Analyzer
Air Quality Analyzer
Welding Analyzer
Ozone Analyzer

USER MANUAL

- Air Inlet 3mm Barb Connector
- USB Recharge Port
- Pump, Battery Mute Icons
- Bright LED Buzzer Alarm Vibration Alarm
- Metal Belt Clip (back)
- Rugged Housing Explosion, Dust and Water Proof
- Large Easy Use Buttons
- ON/OFF Button
- Buzzer Hole
- >10 hours Battery USB Recharge

FORENSICS DETECTORS — CONFIGURATION & COMPONENTS INCLUDED

Serial #:	
O2 sensor	
CO sensor	
LEL% sensor	
H2S sensor	
CO2 sensor	
OZONE sensor	
Telescopic Probe Kit	
Syringe/Headspace Kit	
Welding Kit	
Analyzer	
Hard Carry Case	
USB Charger	
USB Cable	
QC/CAL Certificate	
User Manual	
Other	
Belt Clip	

CUSTOM GAS SENSOR OPTIONS
RANGES & DEFAULT ALARM POINTS
Contact forensicsdetectors@gmail.com to order

Target Gas	Range	Low Alarm	High Alarm
CH4	0-100%LEL	20%LEL	50%LEL
C3H8	0-100%LEL	20%LEL	50%LEL
H2	0-100%LEL	20%LEL	50%LEL
H2	0-1000ppm	35ppm	250 ppm
H2S	0-100ppm	10ppm	15ppm
H2S	0-100ppm	10ppm	20ppm
CO	0-1000ppm	35ppm	200ppm
CO	0-1000ppm	30ppm	60ppm
C2H4O	0-20ppm	10ppm	15ppm
C2H4	0-100%LEL	20%LEL	50%LEL
C2H4	0-20ppm	5ppm	10ppm
O2	0-30%vol	19.5%vol	23.5%vol
C2H5OH	0-100%LEL	20%LEL	50%LEL
NH3	0-100ppm	25ppm	50ppm
CL2	0-20ppm	5ppm	10ppm
O3	0-20ppm	5ppm	10ppm
SO2	0-20ppm	2ppm	5ppm
SO2	0-100ppm	2ppm	5ppm
PH3	0-20ppm	0.3ppm	5ppm
PH3	0-5ppm	0.3ppm	2ppm
NO	0-250ppm	20ppm	50ppm
NO2	0-20ppm	5ppm	10ppm
HCN	0-500ppm	10ppm	20ppm
HCN	0-50ppm	10ppm	20ppm
HCL	0-50ppm	10ppm	20ppm
CH2O	0-10ppm	2ppm	5ppm
VOC	0-100ppm	20ppm	50ppm
C6H6	0-100ppm	20ppm	50ppm
CO2	0-5000ppm	1000ppm	2000ppm
CO2	0-50000ppm	1000ppm	2000ppm

ANALYZER SPECIFICATIONS

Warranty:	1 year limited warranty
Sensor:	Electrochemical for all gases except- Catalytic for %LEL and NDIR for CO2
Sensor Life:	2-3 years
Error:	<±5% F.S.
Response Time:	<30 seconds
Store/Oper. Temp:	0°F - 122°F
Store/Oper. Humidity:	<95%RH
Battery:	DC3.7V Li–Ion battery 3200mAh
Charging Time:	4 hours
Operation Time:	>10 hours
Dimension/Weight:	5.1 x 2.6 x 1.2 inches, 400grams Rating: ATEX certified Ex ib IB T4 Gb. IP65 .
Pump Noise:	<60dB
Inlet Air Barb:	3mm diameter

CARRY CASE DETAILS

Weight:	1.6lb with analyzer and all accessories
Dimension:	9 x 7 x 5 inches

Our Model FD-600 Analyzer is prepared for three primary applications:

1. Air Quality Analyzer: Used for air quality measurements and comes with tubing and a telescopic probe. Used for indoor air quality to detector many gases such as CO, O2, O3, NH3, H2S, combustibles, NOx, SO2 and many others.

2. Headspace Analyzer: Used to measure modified atmosphere packaging (headspace) and comes with filters, needles tubing and septa. Comes in O2 or O2/CO2 variants.

3. Welding Analyzer: Use to measure depleted oxygen to ensure good welding with minimal oxygen. Comes with tubing, filters and a stainless-steel probe.

PRODUCT FEATURES

- **32bit microprocessor, color display and graphing**
- **Rugged industrial design and build**
- **ABS and rubber housing, explosion proof**
- **Rechargeable Lithium-ion battery via easy USB charger**
- **Professional aluminum hard-case**
- **ATEX, CNEX, FCC, IP65 certifications**
- **Built-in pump and easy 3mm barb hose connector**

1. INTRODUCTION

You have purchased the FD-600 **INDUSTRIAL GAS DETECTOR by FORENSICS DETECTORS™.** The detector is factory calibrated, TURN ON AND GO! This product is a INDUSTRIAL gas analyzer with graphing, color display and alarm logging. This detector is made with a robust ATEX design using high quality electrochemical sensors made in the UK. This detector was made for industrial usage for oil and gas professionals, technicians, contractors, food technology engineers, energy inspectors, and many other applications that need to analyze air quality in with precision pump control. This detector is made to endure harsh handling with Explosion-proof grade of Ex ib IIB T4 Gb and Protection Grade: IP65.

2. QUICK SETUP

1. Ensure all components are included.
2. Ensure analyzer is fully charged.
3. Double check all tubing is well connected and in place.
4. Turn ON the detector. After countdown the pump turns ON and READY.
5. Start measuring. Real-time measurements are shown on the HOME screen.
6. Read this manual and familiarize yourself with the operation.
7. Always be safe.
8. Before turning OFF, flush/purge the air out the detector by allowing the pump to run for 60 secs to allow fresh air to purge the instrument.
9. Ensure tubing and items are clean before storing as to avoid any contamination, residual odors or toxic gases that may poison the sensor.

3. ANALYZER OPERATION

ON/OFF: Press MIDDLE button for 3 seconds. After 60 sec countdown gas detection begins, pump is ON and real time detected gas levels is show on the **HOME DETECTION SCREEN**. Start measuring. To turn OFF, press MIDDLE button for 3 secs. When in normal operation, the Home Detection Screen will appear like below on the left image. In normal ambient fresh air all sensors should read ZERO except O2 (oxygen) that is normally at 20.9%.

MENU MODE: Press the MIDDLE button to enter the main MENU SCREEN. The menu screen is shown below right. Use LEFT and RIGHT buttons to make your selection, press MIDDLE button to select. Menu option selections are explained in the following sections.

HOME DETECTION SCREEN

MENU SCREEN
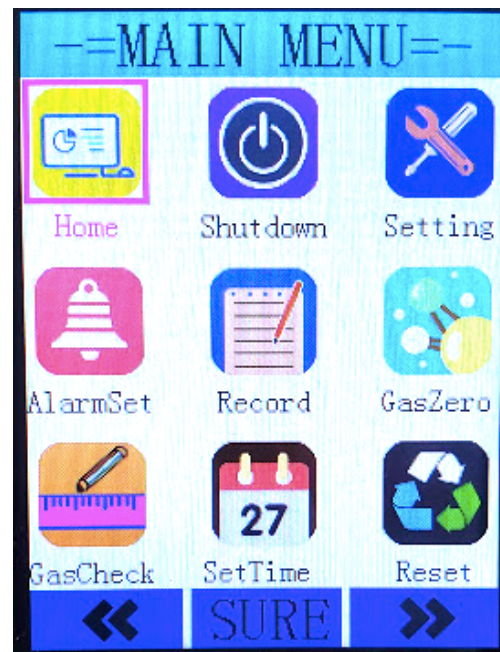
PUMP CONTROL AND MUTE: When in the Home Detection Screen, press the left button (FUNC) selection. This will take you to a screen menu that allows you to control the PUMP ON/OFF and MUTE ON/OFF. Use the left and right button to select and toggle. Press the middle button to go back to the HOME detection screen. Turn the PUMP OFF to preserve battery life when appropriate or to limit sample size such as in a headspace food gas analysis.

CURVE PLOT SCREEN: When in the Home Detection Screen, press the right button (CURVE) selection. You will see the concentration of the sensor data being plotted in real-time over 10 seconds. The dashed lines are at the alarm levels that are set/modified by the user. To toggle to another gas plot simply press the left or right button until your gas selection appears. Press the middle button to return to the Home Detection Screen. Although this device does not have a "print" function, we recommend taking photo pictures of any interesting plots that may be useful for analysis.

FUNCTION SET SCREEN
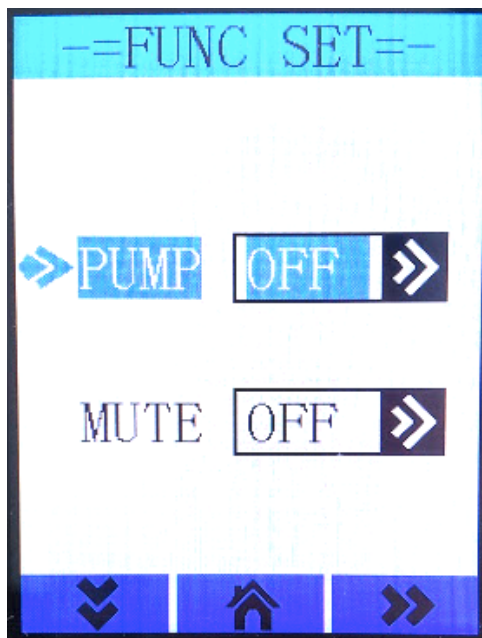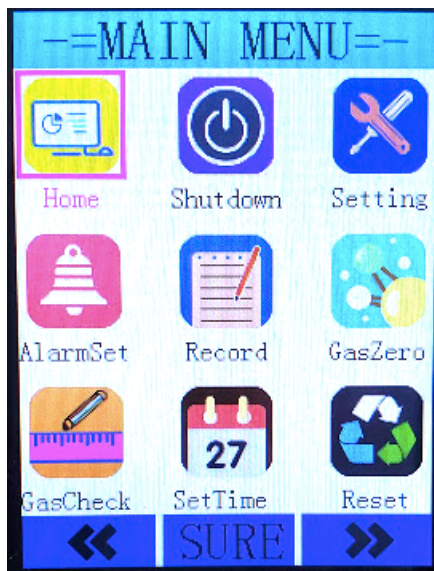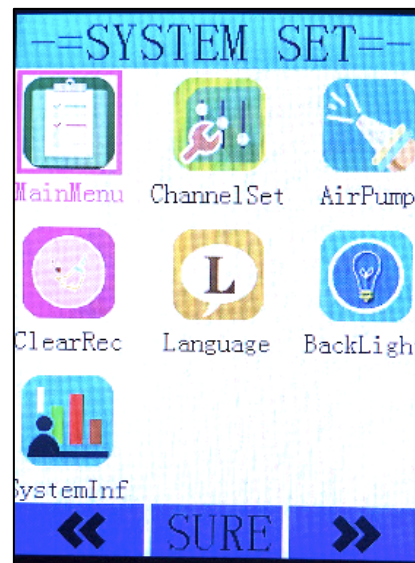
CURVE PLOT SCREEN
(Example O2 plot)
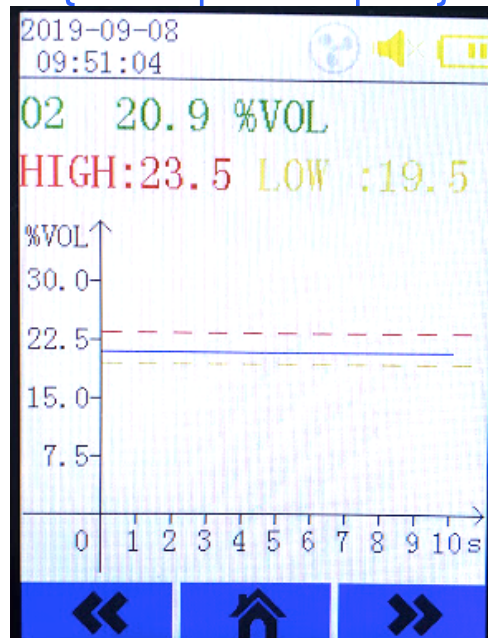
MENU OPTIONS

MENU: To enter the MENU mode, press the middle button when in the HOME Detection Screen. The MENU screen is like the picture in the below left.

MENU SCREEN   SETTING SCREEN

Shutdown: This is an alternative way to shutdown the device.

Setting: The setting looks like the image above right. There are several options in the setting mode:
1. **ChannelSet:** Summarizes the sensor channel information for each available sensor. It is also used to change/toggle the displayed concentration unit of measure (i.e. ppm, mg/m^3 or other). Changes will not be required as the most popular settings are always preset as default.
2. **AirPump:** This is a load calibration value. If a value >70, the pump is under load and will beep to let the user know too much load is being experienced by the pump. Check for any blockage or kinks in the tubing. One can also SAVE the load value so the alarm warning is not activated.
3. **ClearRec:** Password 1111 enter. This option allows the user to clear the alarm records in the memory of the device.
4. **Language:** Language options.
5. **Backlight:** Select the time for the screen to remain ON or Auto OFF delay.
6. **SystemInf:** Summarizes alarm points, and maximum detection limits.
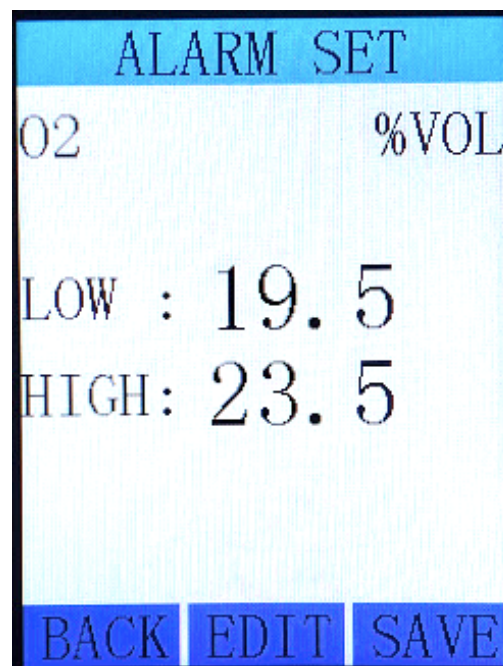
ALARM SETTINGS

AlarmSet: Alarms are triggered (LED flashes, Buzzer and Vibration) when alarms points are met/exceeded. To change the alarm set points select AlarmSet in the Main Menu (see prior section). A screen to select your gas will appear like the image below on the left. Select your gas and edit to change the alarm set point / trigger point as shown in the right image. When alarms are triggered a warning symbol is shown within the corresponding gas display section within the HOME DETECTION SCREEN. When triggered, the alarm is highlighted in YELLOW (LOW alarm) or RED (HIGH alarm) on the HOME Detection Screen. To avoid any annoying alarm, set the alarm either as LOW or HIGH as possible so the alarms are not triggered.

ALARM SET
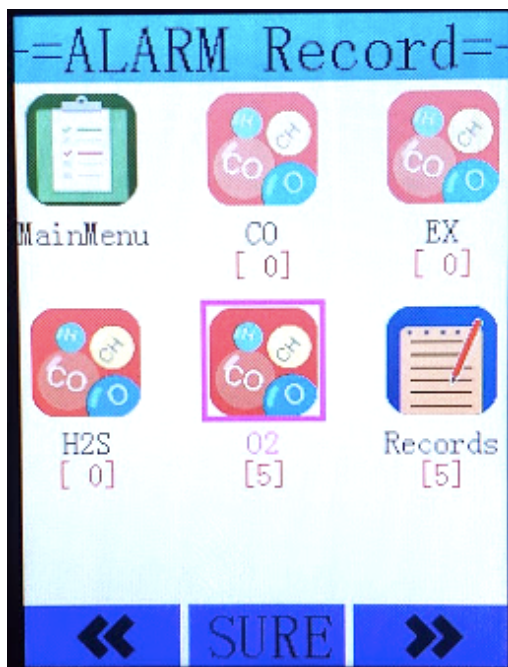(select gas)

ALARM SET
(Example: O2 alarm value)

**NOTE: If ALARM triggers are critical to your application, always check the alarm setting to ensure you are protected and alarm settings are as you anticipate to avoid harmful exposure levels.

RECORDING ALARM DATA

Record: When alarms are triggered they are automatically recorded with a date and time stamp along with the (min or max) alarm data point. This is useful for safety personnel to keep track of exposures for record keeping and exposure analysis purposes. To explore this information, select Record in the Menu Screen. This will take you to the various gases as seen on the below image on the left. Each gas will be listed along with the number of alarm records shown in parenthesis. Select a gas and a list of alarm records will be shown similar to the example image below on the right.

RECORD
(Select gas)

RECORD LIST
(Example memory records)

ZERO CALIBRATION

GasZero: GasZero should not be used very often - only if for some reason the baseline zero value of the sensor value is flickering or drifting and does not maintain a zero value. For gases such as oxygen however, exposing the sensor to pure ZERO nitrogen gas is important to maintain accuracy and for good measure this should be undertaken periodically between 6-12 months (i.e. every calibration cycle). For most gases (other than O2), if the sensor continues to read above zero, cross sensitivity to vapors or other gases may be possible. Ensure a fresh environment to diagnose this situation, particularly after high concentration exposure.

Select GasZero from the Main Menu Screen. Select Gas to ZERO. Expose to ZERO air for 1 min. Use fresh air for H2S, CO and %LEL. For O2 expose to pure N2. Maintain a flow of about 0.5L/min to deliver the gas to the detector (i.e. via the inlet). Then press SAVE button to confirm the zero value. When complete, "SAVE SUCCESS" is displayed.
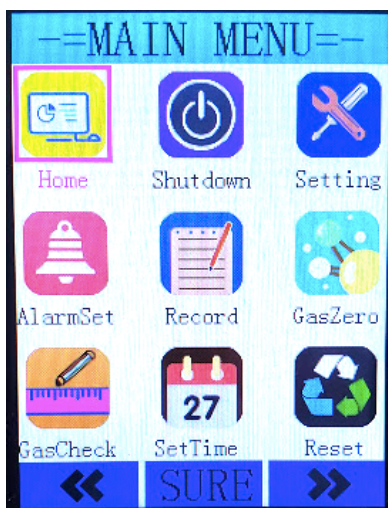
MENU SCREEN
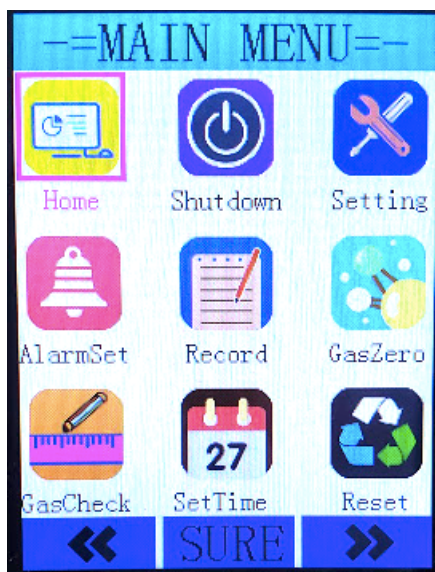
Gas Zero
(Example CO sensor)
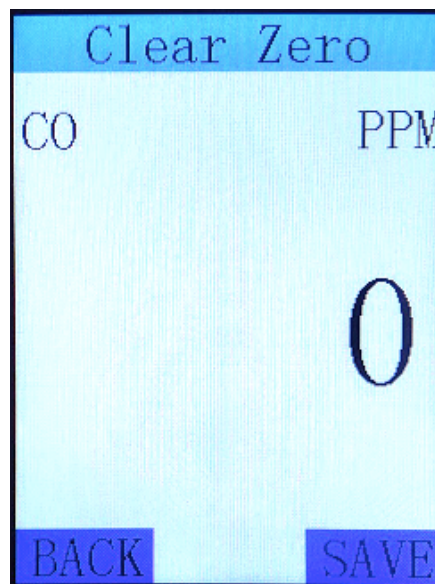
SPAN CALIBRATION

GasCheck: Span calibration is undertaken to ensure accurate gas concentration reading (i.e. ensure that the display reading in ppm is accurate and true). For example, an OSHA safety officer using a CO detector used in the field would want to calibrate to a concentration of 50ppm, since ambient CO is usually in the lower range. The span calibration gas concentration chosen is best chosen to represent the concentration that the sensor typically is exposed to, as to ensure maximum accuracy for daily application usage. We recommend calibration to be undertaken every 6 months. For analytical and highly specific applications, calibration can be undertaken more often to ensure the highest accuracy. If left beyond 6 months, the accuracy of the analyzer will be compromised.

To undertake span calibration from the MENU SCREEN select GasCheck. Select passcode 1111. Select Gas to Span Calibrate. Expose to CAL gas for 1 min. For O2, simply expose the analyzer to fresh air, which will have 20.9% of O2. When using gas bottles, maintain a flow of about 0.5L/min when using gas bottles. Enter and edit the gas concentration so the detector knows the concentration of the calibration gas. After exposure, press SAVE. When complete, "SAVE SUCCESS" is displayed. Use an appropriate multigas mixture is OK or single gas mixture is also OK to calibrate a single sensor. Again, for oxygen, don't forget to simply use fresh ambient air 20.9%.

MENU SCREEN

GasCheck
Example O2 sensor
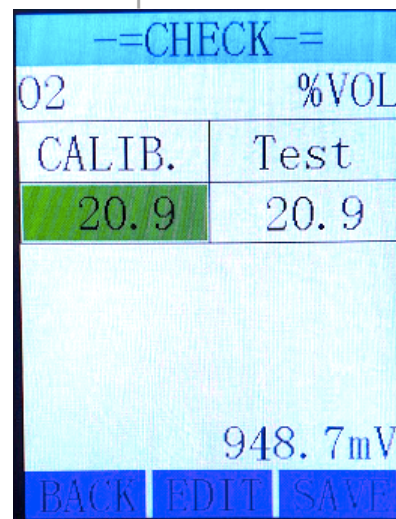
TIME AND DATE

SetTime: Select SetTime from the Main Menu Screen. Select EDIT to make the necessary date and time changes.

4. BATTERY CHARGING

The ANALYZER has a built-in lithium battery and can be charged via micro-USB port. Any USB charger will work, ensure >1.0A for fast charging. Before charging, TURN OFF the analyzer to avoid any potential damage. Charging takes about 4 hours. When charging is required the screen will display LOW BATTERY along with two beeps/minute. Do not charge the device in a combustible area.

5. OPERATIONAL TIPS

- ✓ When in the ON state, after the display has switched OFF, the LED will flash every 20 seconds to reassure the user the detector is still ON and operating – useful for dark situations and when the screen is OFF (to save power).
- ✓ Before turning the detector off don't forget to flush/purge out the detector by allowing the pump to run for 60 secs to allow clean air to purge.
- ✓ Ensure tubing and items are clean before storing as to avoid any contamination, residual odors or toxic gases that may poison the sensor.
- ✓ The sensors have a rated life of 2 years. If well taken care of, they can last longer (up to 3 years) but will require more frequent calibration.
- ✓ Ensure periodic calibration every 6 months so that the performance of the detector remains within specification. If the calibration period is >6 months, the detector still operates but accuracy will be compromised.

* * WARNING * *

- ➢ KEEP DETECTOR **AWAY** FROM ELECTROMAGNETC & MAGNETIC INTERFERENCES (i.e. PHONES & MAGNETS)
- ➢ STORE DETECTOR **WITHIN SPECIFICATIONS**
- ➢ IF UNWELL, SEEK CLEAN AIR & MEDICAL ATTENTION.
- ➢ **FOLLOW INSTRUCTIONS AS THE DETECTOR IS VERY SENSITIVE**
- ➢ **TO ENSURE** ACCURACY, CALIBRATE DEVICE AT LEAST **EVERY 6 MONTHS**
- ➢ THE DETECTOR IS NOT RECOMMENDED FOR USE IN FLUE GAS AS THE UNIT DOES NOT HAVE A WATER TRAP NOR A NOX FILTER and PROBE WILL NOT WITHSTAND TYPICAL FLUE GAS TEMPERATURES.
- ➢ CHECK AND SET ALARM LEVELS APPROPRIATELY TO AVOID HARMFUL EXPOSURE - CONSULT WITH YOUR SAFETY OFFICER OR WITH STATE/FEDERAL AGENCIES.

AIR QUALITY ANALYZER WITH TELESCOPIC PROBE

FORENSICS
DETECTORS

Multigas Analyzer
Built-in Pump
4 Foot Probe
Charger & Cable
English Manual
Calibration Certificate
Heavy Duty Case
1 Year Warranty
USA Quality Control
USA Customer Care

ANALYZER WITH FOOD HEADSPACE KIT
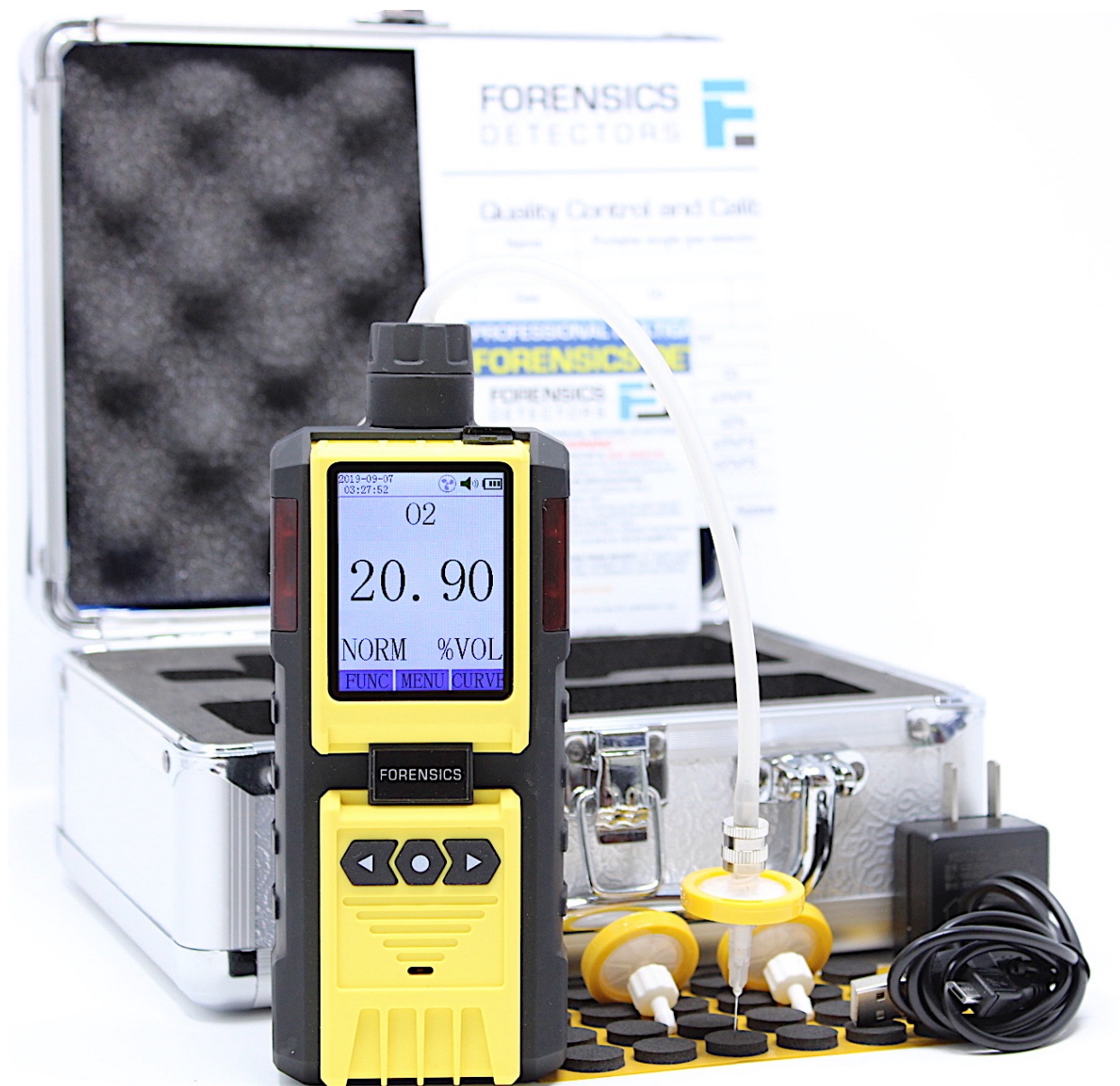
WARRANTY DISCLAIMERS

This product is covered by a one year limited warranty.
This warranty does not cover damage resulting from accident, misuse, disassembly, abuse or lack of reasonable care of the product, or applications not in accordance with the user manual. It does not cover events and conditions outside of our control, such as Acts of God (fire, severe weather etc). It does not apply to retail stores, service centers or any distributors or agents. We will not recognize any changes to this warranty by third parties. We shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration for 1 year.

THIS PRODUCT CANNOT BE REPAIRED IF THE UNIT IS TAMPERED WITH IT WILL INVALIDATE THE GUARANTEE. IF THE UNIT IS FAULTY PLEASE RETURN IT TO YOUR ORIGINAL SUPPLIER WITH YOUR PROOF OF PURCHASE.

Product Designed in California, USA,
Product Tested, QA/QC in California, USA,
Product Made in China

Support & Sales

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