

INDUSTRIAL FIXED GAS DETECTOR

Model: FD-60
Manual Print Version: 9.0

USER MANUAL



FORENSICS
DETECTORS



Serial #:

Gas Sensor	
Remote Control	
Hex Tool	
24V Wall Adapter	
Gas Detector	
Power Cable	
LED/Buzzer Fixture	
Calibration Cap	
QC/CAL Certificate	
User Manual	
Other?	

INDUSTRIAL FIXED GAS DETECTOR | FD-60 | **FORENSICS DETECTORS™**

1. INTRODUCTION

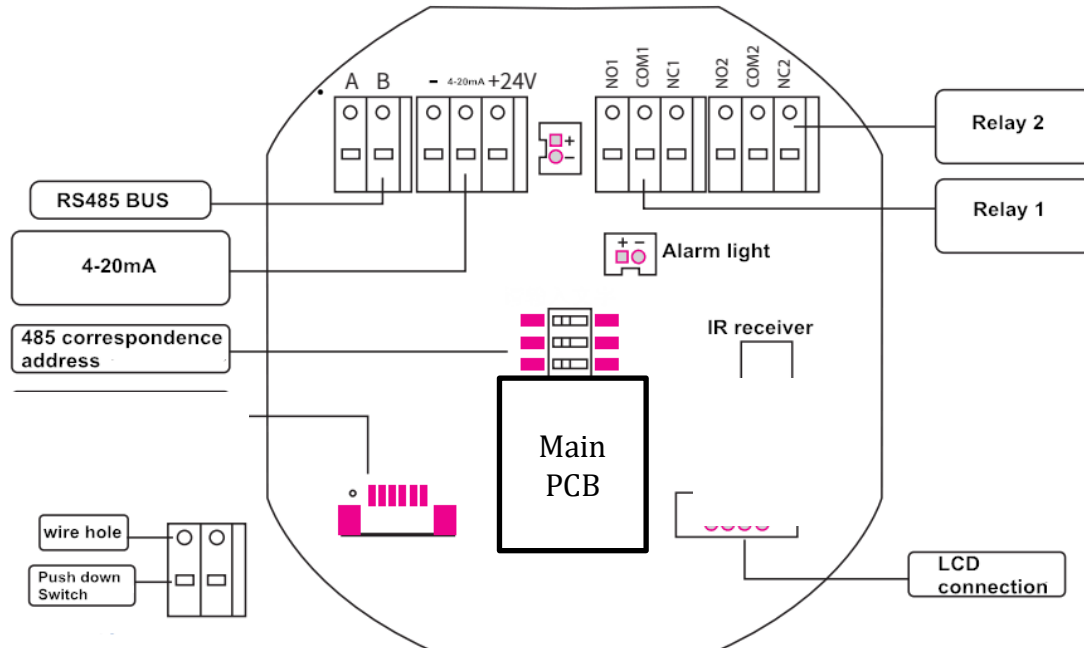
The **FORENSICS DETECTORS FD-60 FIXED GAS DETECTOR** is designed to operate continuously 24/7 monitoring. The wall mount detector can be used to detect gas in various industrial environments such factory, refinery, chemical plant, process rooms, exhaust prone facilities, toxic gas, boiler rooms, painting plants/rooms and other places where toxic gas may be prone to exist. Please note, these types of detectors are referred to as “fixed gas”, since they are fixed at one location when mounted.

FEATURES

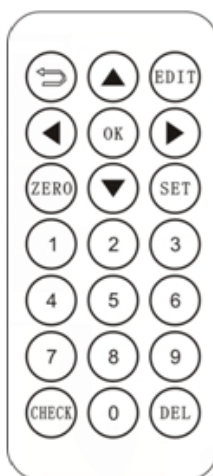
- **INDUSTRIAL:** Heavy duty fixed gas detector. Comes FACTORY CALIBRATED. Mount and Operate.
- **USE:** Remote Control up to 8 meters, Analog Output (4-20mA), 2 x relay alarm triggered switch (50W) to control fans, pumps, electrical items, garage doors or additional alarms.
- **FEATURES:** Large LED alarm and buzzer. Adjustable audio, visual. Alarm digital time stamp. Remote Control.
- **ROBUST:** Explosion, dust, water, and flame resistant. Explosion proof grade: Exd II C T6 Gb with IP66 ingress protection.
- **SAFE:** With over-voltage protection, lightning protection, short circuit protection, reverse connection protection, anti-static dry disturbance, anti-magnetic field interference.
- **REMOTE:** Can be operated with infrared remote control, no need to open the wall fixture.
- **TRUST:** * * 1-year limited warranty * * Arrives with calibration and QA certificate * * 100% product test and verification in the USA * *

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PCB Connections (main PCB)



Remote Control



	Return
	Direction key
	Edit
	Confirm
	Zero calibration
	Set
	Calibration
	Delete
	Number

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2. DETECTOR SPECIFICATIONS

Target Gas	AS PURCHASED – See Next Table
Range	AS PURCHASED – See Next Table
Sampling Method	Natural diffusion
Alarm Point	AS PURCHASED – See Next Table
Error	≤±5% F.S.
Alarm Type	Audible buzzer alarm; Visual LED light alarm; Relay x 2 (extendable)
Warm-up Time	60 seconds
Response Time	AS PURCHASED – See Next Table
Protection Level	IP66
Explosion-proof Grade	ATEX certified Ex d IIC T6 GB
Sensor Type	Electrochemical sensor for all sensors except pellistor sensor for combustibles EX LEL, NDIR sensor for CO2 and laser scattering sensor for PM.
Sensor Life	2 to 3 years for Electrochemical & Catalytic >5 years for CO2 NDIR and laser scattering sensor
Power Supply	DC 24V±15%
Working Condition	Temperature: 0-122F Humidity: ≤95% RH with no condensation.
Storage Condition	Temperature: 0-122F Humidity: ≤85% RH
Connection	G1 / 2 male proof hose pipe thread size - Thread size M20x1.5mm. Sensor housing cap M37 x 1.5.
Electrical Output	2 x relay contact output, max power 50W
Communication	4-20mA (only) and RS485 (see YouTube video)
Weight	Approx. 3 pounds.
Dimension	200×180×90mm
Warranty	1-year limited warranty
Key Recommendations	<u>Normal Indoor Environment:</u> - Monthly Bump Testing & Calibration Every 12month <u>Harsh Environments:</u> - Weekly Bump Testing & Monthly Calibration We recommend purchasing the necessary gas bottle to undertake bump testing and calibration. Recommended gas bottles are on our FORENSICS DETECTORS website.

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3. GAS SPECIFIC SPECIFICATIONS

GAS SENSOR RANGES, RESOLUTION & DEFAULT ALARM SET POINTS

[check which sensor your FD-60 is equipped with by checking the product label]

Gas	Range	Detection Accuracy	90% Response Time	Minimum Readout	Alarm Set Point Low/High
O ₂	0-30%vol	±5%(F.S)	≤60s	0.1%	19.5%/23.0%
EX	0-100%LEL	±5%(F.S)	≤60s	1%LEL	25.0%/50.0%LEL
CO	0-1000ppm	±5%(F.S)	≤60s	1ppm	50ppm/100ppm
CO ₂	0-5000ppm	±5%(F.S)	≤60s	1ppm	1000ppm/2000ppm
H ₂ S	0-100ppm	±5%(F.S)	≤60s	1ppm	10ppm/20ppm
CL ₂	0-20ppm	±5%(F.S)	≤60s	0.1ppm	1ppm/10ppm
NH ₃	0-100ppm	±5%(F.S)	≤60s	1ppm	25ppm/50ppm
H ₂	0-1000ppm	±5%(F.S)	≤60s	1ppm	50ppm/10ppm
CH ₄	0-100%LEL	±5%(F.S)	≤60s	1%LEL	25.0%/50.0%LEL
VOC	0-100ppm	±5%(F.S)	≤60s	1ppm	20ppm/50ppm
O ₃	0-20ppm	±5%(F.S)	≤60s	0.1ppm	5ppm/10ppm
O ₃ [low]	0-5ppm	±5%(F.S)	≤60s	0.01ppm	1ppm/3ppm

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4. OPERATION

SETUP: Unbox detector. Identify your power source. The detector comes with a power supply that connects to the power cord. To set up the detector remove the 5 hex screws with the hex driver provided. Ensure (1) the power cable is secured on the PCB (2) connect the LED/BUZZER fixture (3) sensor assembly is secure. Please note, for flexibility the power cable and alarm LED/BUZZER fixture can be swapped on either side to accommodate installation and aesthetics.

4.1 Turn ON/ OFF

Connect 24V power to the detector. The detector enters a 60-second countdown. Once complete, it then enters into normal detection mode. Once ON, allow 30 minutes for the gas detector to stabilize then the data displayed in the main display is the gas concentration value of instantaneous detection. The detector has been FACTORY calibrated. Hence, it is NOT necessary to perform CALIBRATION after unboxing. Do ensure ALARMS are set to the users satisfaction and local exposure limit requirements (as necessary per your safety officer advice or consult with local, state or federal authorities). The detector can be turned off by directly disconnecting the power supply. We recommend BUMP testing to confirm operation of alarms once installed.

4.2 Menu Item Operation Description

The detector should be operated and controlled via the remote control. Otherwise, one can use the detector button control on the main panel, but will need to remove the cover. To do so, with the hex screwdriver delivered, unscrew 5 screws to open the metal cover and display 4 buttons: return, up, down, and OK. Three operation interfaces:

1. Detection interface
2. Function menu
3. Parameter setting interface.

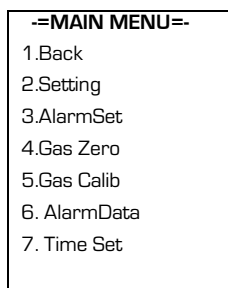
	Detection interface	Main menu	Parameter setting interface
RETURN	View STEL, TWA data analysis	Return detection interface	Return to last menu
UP		Move up	Move up/ plus
DOWN		Move down	Move down/ minus
OK	Enter main menu	Enter Submenu	Ok/ select/ save

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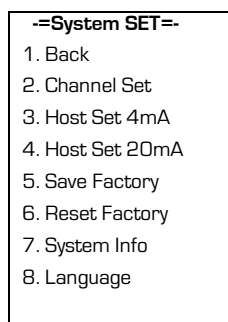
5. MENU DESCRIPTIONS

5.1 MAIN MENU

Press OK on the remote control to enter the MAIN MENU. Use up and down arrows on the remote control to scroll through the menu. Press OK to select.



5.2. "SETTING" Menu



- | | |
|-------------------|--|
| 1. Back: | Takes you back to the MAIN MENU |
| 2. Channel Set: | Used to setup MODBUS (see YouTube Video) |
| 3. Host Set 4mA: | Manufacturer only access. |
| 4. Host Set 20mA: | Manufacturer only access. |
| 5. Save Factory: | Manufacturer only access. |
| 6. Reset Factory: | Manufacturer only access. |
| 7. System Info: | Summarized alarms and Software Version. |
| 8. Language: | English or Chinese |

5.3. “ALARM SET” Menu

Users can use this option to set the warning value and alarm mode. The detector is equipped with two alarm point settings. The alarm modes are LOW alarm and HIGH alarm values. The corresponding two sets of relays are triggered/switched. The instrument is in a LOW alarm state when the detected concentration is higher than the set LOW detected concentration value. The instrument is in a HIGH alarm state when the detected concentration is higher than the set concentration value. Before leaving the factory, the alarm value has been set. Please check the default settings to ensure they meet your local or preferred exposure alarm levels.

- The LOW alarm corresponds to the first set of relay output (COM1 NO1, NC1) on the detector main board.
- The HIGH alarm, the second set of relay output (COM2, NO2, NC2) corresponds to the detector main board.
- The Relay (30VDC 2A/220VAC 2A) COM and NO are normally open, COM and NC are normally closed.

5.4. Gas Zero

Sometimes the gas sensor drifts due to electronics and sensor degradation. Sometimes, the sensor does not return to its ZERO baseline. Also sometimes, the sensor is exposed to HIGH concentrations of toxic gas and the sensor may be permanently “poisoned”. Please ensure fresh air is exposed to the sensor for at least 30 minutes, before making this determination. If the zero drift of the sensor is unacceptable, the user can perform a ZERO calibration operation. Pass pure nitrogen or clean air for at least 2 minutes through the sensor. Click on the “3. Gas Zero” menu. Enter into the menu items by selecting your gas then press SAVE after exposure to fresh air or pure nitrogen and a stable reading has been achieved. Please note, if you have an OXYGEN or CARBON DIOXIDE sensor, you will need to use Pure Nitrogen to achieve a ZERO Calibration. Other toxic gases will suffice using fresh air as a ZERO gas.

5.5. Gas Calib / Span Calibration

Only perform calibration if you are an experience technician. Otherwise please contact the manufacturer for instructions. We have special calibration cap fittings to undertake precise calibration with (in/out) tube ports.

5.6. AlarmData

The detector can save 1000 alarm records. The interface can view the maximum alarm concentration in the environment recorded in the "detection interface", as well as the time point and alarm state of the highest concentration.

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5.7. Time Set

The detector has a back-up battery, edit precise time to save. The detector will remain in accurate operation after the power is turned off.

6. INSTALLATION GUIDE

What Area does the Wall Mount Monitor Cover?

Wall Mount Gas Monitors have no specific coverage area. Wall mount gas detectors detect gas molecules with a gas sensor. The sensor detects gas molecules that are directly adjacent to the physical sensor. The efficacy of the wall mount detector being representative and or correlated (gas concentration) to a larger area, is strongly dependent on the indoor physical layout, ventilation and any potential gas sources, obstructions or special exhaust considerations. Lets take some examples to illustrate some recommendations:

- **Example 1:** Standard Indoor Room with normal ventilation (>1 ACH).
1x unit per 500 sq ft.
- **Example 2:** Warehouse industrial with normal ventilation (>4 ACH).
1x unit per 4000 sq ft. No obstructions. Other arrangement, like a wall is (2000 sq ft) or a corner setup is (1000 sq ft). See image below.
- **Example 3:** Active manufacturing line in an open floor plan space with gas (toxic or oxygen displacing) and potential leak sources. Coverage as close to potential gas leak failure locations.

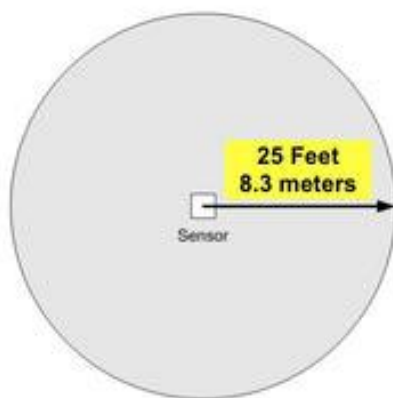


Fig. 1:
Open Coverage Area

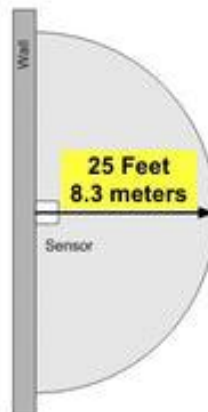


Fig. 2:
Wall Coverage Area

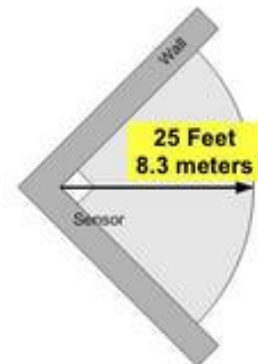


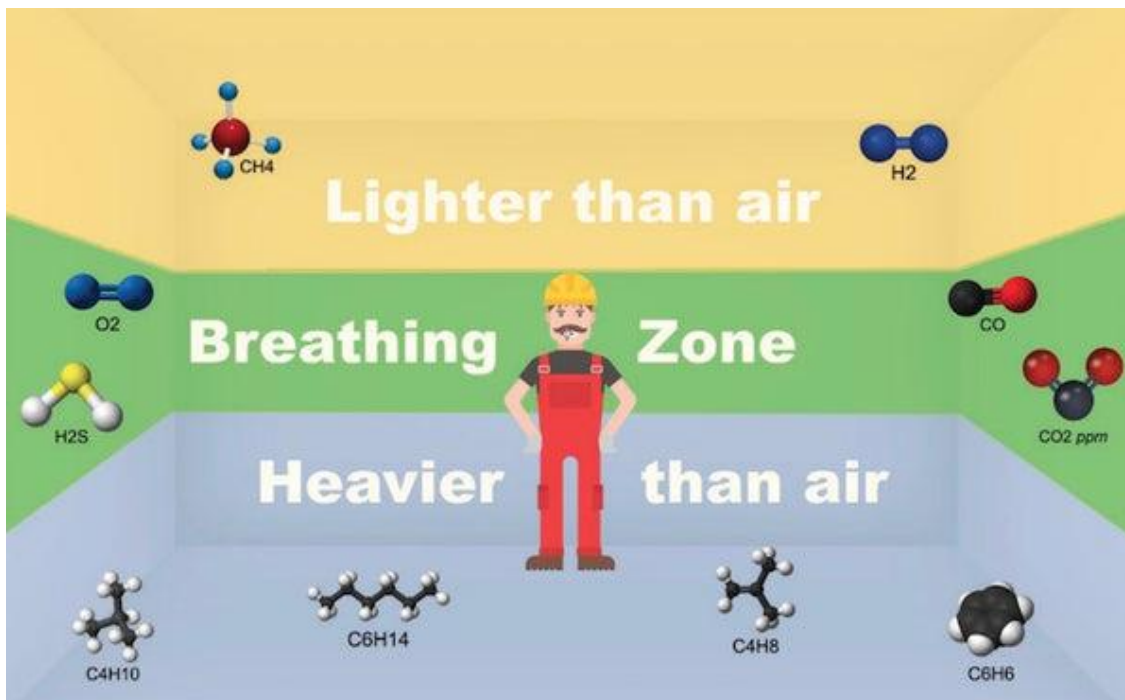
Fig. 3:
Corner Coverage Area

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At what height shall I mount the Wall Mount Monitor?

This depends on the gas detector and the relative gas density in air.

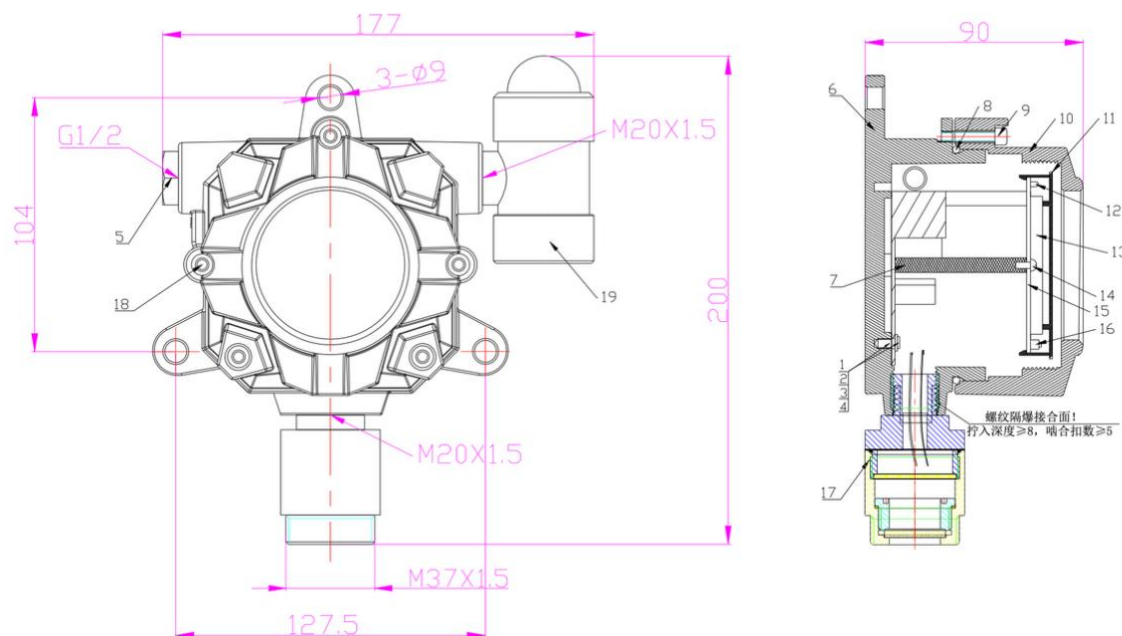
Lighter than air Location: On or near the ceiling	Hydrogen (H ₂) Methane (CH ₄)
Breathing Zone Location: 4-6 feet above the floor	Acetylene (C ₂ H ₂), Ammonia (NH ₃) ppm, Carbon Dioxide (CO ₂) ppm, Carbon Monoxide (CO), Chlorine (Cl ₂), Ethylene (C ₂ H ₄), Formaldehyde (CH ₂ O), Fluorine (F ₂), Hydrogen Chloride (HCl), Hydrogen Cyanide (HCN), Hydrogen Fluoride (HF), Hydrogen Sulfide (H ₂ S), Methanol (CH ₄ O), Oxygen (O ₂), Ozone (O ₃), Nitric Oxide (NO), Nitrogen Dioxide (NO ₂), Phosphine (PH ₃), Silane (SiH ₄), Sulphur Dioxide (SO ₂), TVOC (target gas dependent)
Near The Floor Location: 6 inches above floor	Alcohol, Benzene (C ₆ H ₆), Carbon Dioxide (CO ₂) %Vol., Diesel Fuel, Ethanol (C ₂ H ₆ O), Gasoline, Hexane (C ₆ H ₁₄), Isobutane (i-C ₄ H ₁₀), Isobutylene (C ₄ H ₈), Jet Fuel, Propane (C ₃ H ₈), Pentane (C ₅ H ₁₂), Propylene (C ₃ H ₆), Refrigerants, Toluene (C ₇ H ₈), Xylene (C ₈ H ₁₀)



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Other Considerations (do's and dont's)

- Do not install in areas where the temperature is close to detector extreme specifications (temp 0-122F).
- If installing in the outdoors, consider installation and location avoids direct contact with the natural elements (rain & sun rays).
- Do not install within 5 ft. of heating or cooking appliances.
- Do not install near vents, flues, chimneys or air ventilation openings.
- Do not install near fans, doors, windows or areas directly exposed to the weather so external air which may create a "micro" fresh air plume and not representative of the general indoor air quality.
- Do not install on a switched or dimmer-controlled outlet.
- Do not obstruct the sensor on the sensor head housing. Do not place the monitor where furniture or objects may block the flow of air to the sensor and alarm.
- Do not operate the unit in a dusty / dirt environment.
- Do add an extension alarm if the monitor is mounted in an isolated room.
- Depending on local code, conduit for power wires / RELAY lines may be required, so please ensure a qualified electrical technician undertakes the installation.
- Most installation are custom installations, hence please install detectors using qualified technical personnel. To help with installation the detector dimensions are shown below.



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*** * WARNING * ***

- KEEP DETECTOR **AWAY** FROM SWITCHING ELECTROMAGNETIC & MAGNETIC INTERFERENCES
- STORE DETECTOR **WITHIN SPECIFICATIONS**
- IF UNWELL, SEEK CLEAN AIR & MEDICAL HELP
- **ENSURE QUALIFIED PERSONNEL INSTALLS THE UNIT**
- **KEEP AWAY** FROM DUST & PARTICULATE AND NEVER EXPOSE TO EXHAUST GAS or CONCENTRATED VAPORS, HARSH CHEMICALS OR EXTREMELY HIGH CONCENTRATION LEVELS AS IT MAY POISON THE SENSOR
- **FOLLOW INSTRUCTIONS AS THE DETECTOR IS VERY SENSITIVE**
- Don't open the cover when the power is on.

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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

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