BELLMINI Manual Contents

1. Warning/Caution/Disposal (Read before operating)

◆ **Warning**

- Do not change or replace components as this will damage intrinsically safe structure and will void the warranty even if the warranty period remains.
- Before using the product, it's recommended that you periodically test the sensor response with gas that exceeds the alarm level.
- Regularly check detector operation, battery life, LEDs, buzzers, and vibrations to ensure they are functioning properly, and maintain as necessary.
- The detector must be used within specified temperature and humidity ranges. Environments outside this range may cause malfunction or failure of the device. Be careful not to use in extreme environments.

- The gas concentration measurement value of the sensor used in the device may vary depending on the operating environment (temperature, pressure, humidity). Therefore, when calibrating the device, perform the calibration in an environment that is the same or similar to the device's operating environment (temperature, pressure, humidity).
- If a rapid change in temperature occurs when using the device (for example, when using it in a place where the temperature difference between indoors and outdoors is large), the measured gas concentration value may change suddenly, so use it after the gas concentration value is stable.
- If the device is subjected to severe vibration or shock, the measured gas concentration value may change suddenly. Therefore, use it after the gas concentration value is stable. Excessive shock to the device may cause sensor or device failure.
- Since the alarm value is set according to international standards, changes to the alarm value must be made by an authorized person.
- If the device does not work or you suspect a mechanical defect, please call +82 70-8804-3982.

◆Caution

- Prior to using this product, be sure to thoroughly review these instructions for this product as well as those provided for any related products.
- This product is a gas detector, not a prevision gas measurement device.
- If calibration fails continuously, discontinue use and contact the manufacturer.
- To ensure the accuracy of your gas detector, we recommend gas calibration at least once every 180 days.
- The device should be cleaned with a soft cloth, and no chemicals should be used to clean it.
- STEALTH Mode forcibly blocks the alarm signal, making it difficult for users to recognize the alarm, so caution is required when using it.

This symbol indicates that this product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling. Please dispose of this product according to local regulations.

2. Product Overview

GDI Solution BELLMINI™ is a portable single gas detector that protects users' safety by running High brightness LEDs, Buzzers, and vibrating alarms when exposed to oxygen deficiency or toxic gases.

There is an option to select one of 16 gas sensors, including O2, CO, H2S, H2, NH3, Cl2, SO2 and PH3 sensors. A wider and clearer LCD Display (1.6") shows measured value in real time.

The low power designed BELLMINI™ provides over 2 years of operation without battery replacement. And it cost effectively guarantees durability and reliability (Using condition: 8 hours of use a day, Alarm activated within 5 minutes, BLE Off).

For the user's or administrator's convenience, the BELLCONNECT™ App allows them to change its configuration, perform calibration, or handily manage stored data.

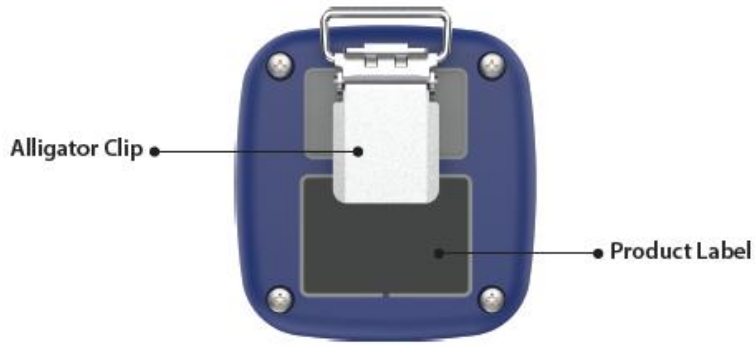
The standard built in NFC and BLE communication make wireless connections between detectors and portable devices quicker and easier.

The measured data is transmitted to the Cloud in real time, and the administrator can monitor the value and check risks in advance by accessing the web. (To be updated later)

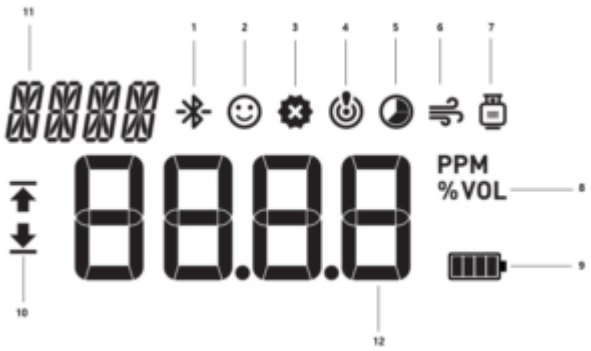
3. Package component list

Detector, Gas calibration cap, Quick Start Guide

4. Appearance of Device



5. LCD Display Overview



<Icon Function>

1. Bluetooth State (: Disconnected : Connected)
2. Normal Mode
3. Error Symbol
4. Warning (When the calibration interval has passed, or the last calibration failed)
5. TWA/STEL (TWA: , STEL:)
6. Zero Calibration(Fresh Air)
7. Span Calibration

8. Units of Measurement
9. Battery State
10. Low/High Alarm(Primary alarm or Low alarm: , Secondary alarm or High alarm:)
11. Information (Gas type, Low battery, alarm, etc.)
12. Reading value

6. BELLMINI™ ON/OFF

1) Turn on the detector in a safe place without harmful gases in the air.

2) Press and hold the power button for 3 seconds to turn on the BELLMINI™.

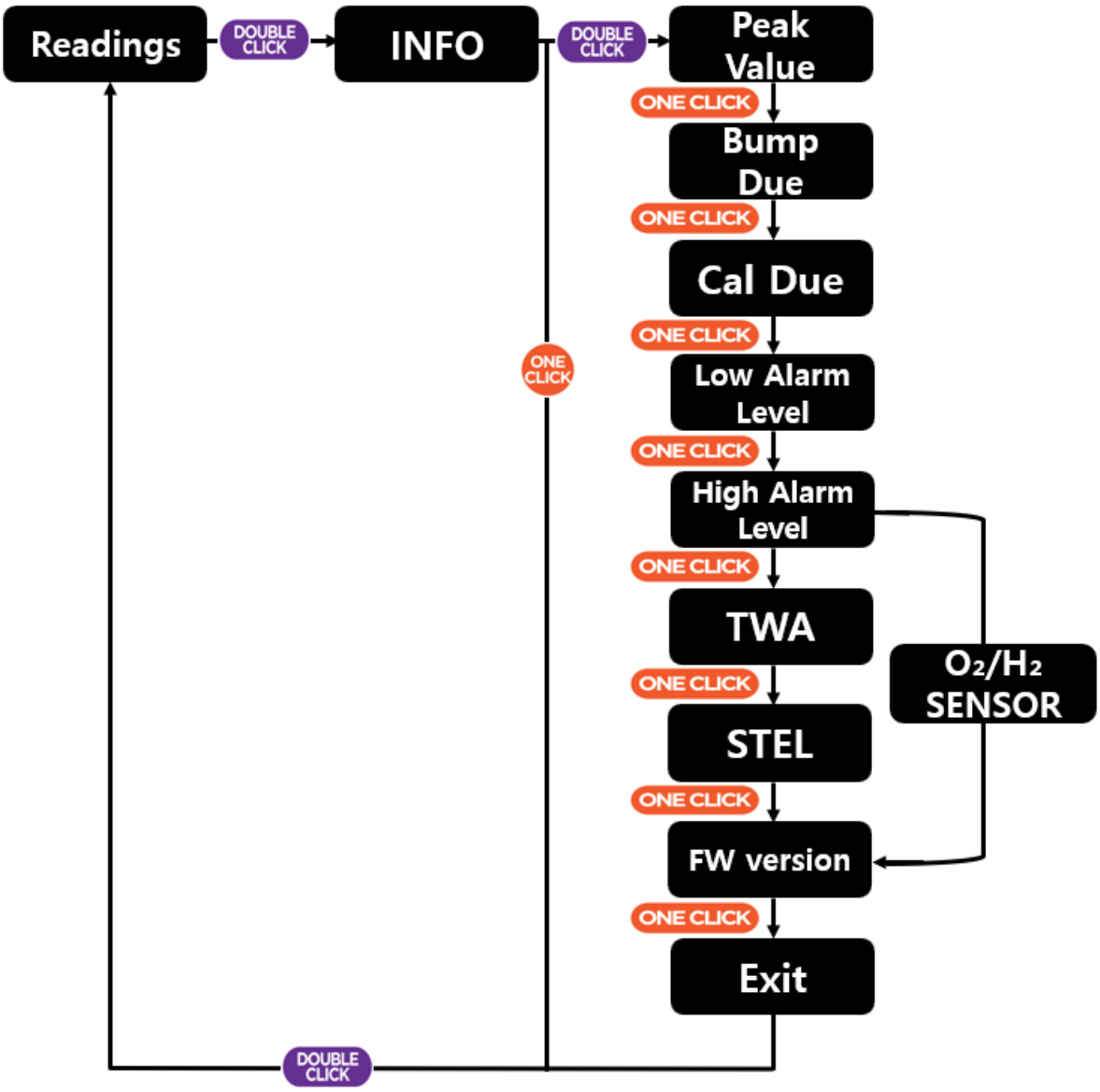
3) A self-test will be performed.

4) After company logo appears, BELLMINI™ turns on.

*Note: Warm-up may occur depending on sensor stabilization. (Warm-up time may vary for each sensor.)

5) When shutting down, press and hold the button for 3 seconds.

7. Button Functions



8. Battery

1) Rated Voltage

A. Nominal Voltage: 3.6V

B. Maximum Voltage: 3.9V

2. Battery Replacement

The battery is designed to be replaceable; however, opening it may compromise the intrinsically safe structure, rendering it non-explosion-proof. In case of battery replacement, it is essential to contact an authorized service center to ensure the integrity of the intrinsically safe design.

3. Battery Warning Sign

A. WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

B. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD

9. Span calibration/Bump test/Zero calibration

1) For Span Calibration, press the BELLMINI™ power button for 9 seconds. (Exit for 3 seconds, press for 6 more seconds without releasing to enter Span Calibration-excluding O2 sensor)

2) Double-click to enter auto zero calibration.

3) If auto zero calibration passes, it will show Span APPL on the display.

4) If it shows Span APPL on the display, lace the calibration cap on the sensor and inject the gas to be measured using a flow regulator. (300cc/min)

5) After the Span Calibration ends, it automatically switches to measurement mode.

6) For Bump Test, enter Span Calibration and click once.

7) Double-click to run the bump test, and it will show bump APPL on the display.

8) Place the calibration cap on the sensor and inject the gas to be measured using a flow regulator. (300cc/min)

9) After bump APPL display appears, Bump test will be processed.

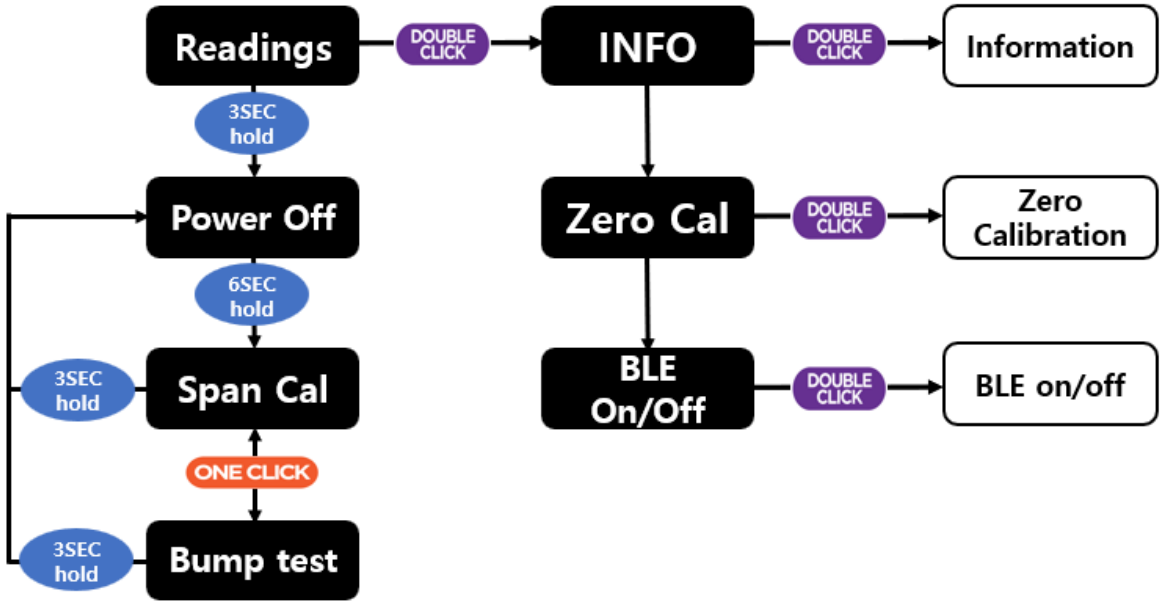
10) After the Bump Test ends, it automatically switches to measurement mode.

11) Double-click on the main screen and then click once to enter Zero Calibration. Zero calibration should be performed in clean air with 20.9% of oxygen.

12) Double-click to run the Zero Calibration.

13) If the Zero Calibration ends, it automatically switches to measurement mode.

*Note: If calibration fails, try again. If calibration continues to fail, shut down the detector and contact the manufacturer.



10. BELLCONNECT™ App Connection (NFC/Bluetooth)

1) Install the BELLCONNECT™ application.

*In case you don't have BELLCONNECT™ App, NFC tagging will take you to Play store to download it or you can use download QR below. (NFC tagging is not available for iPhone.)

2) The app turns on when you tag your smartphone with an NFC device on the back where the product label is located.

3) If you tag the NFC device once more, the app and detector will be linked.

Android

iOS

11. Alarm Setpoints

Gas(단위)	Low	High	TWA	STEL	Calibr. Conc.	Measuring range	Resolution	Temperature
H_2S(ppm)	10	15	10	15	25	0-100	0.1	-30℃ to 50℃
CO(ppm)	30	100	30	200	100	0-1000	1	-30℃ to 50℃
CO-H(ppm)	30	100	30	200	100	0-500	1	-30℃ to 50℃
CO-E(ppm)	30	100	30	200	1000	0-2000	1	-30℃ to 50℃
O_2(%Vol)	19.5	23.5	X	X	0.0	0-30	0.1	-30℃ to 50℃
O_2 lead free (%Vol)	19.5	23.5	X	X	0.0	0-30	0.1	-40℃ to 60℃
H_2(ppm)	100	500	X	X	100	0-1000	1	-30℃ to 50℃
Cl_2(ppm)	0.5	1.0	0.5	1.0	10	0-50	0.1	-20℃ to 50℃
PH_3(ppm)	0.3	1.0	0.3	1.0	1.0	0-20	0.1	-30℃ to 50℃
SO_2(ppm)	2.0	5.0	2.0	5.0	10	0-20	0.1	-30℃ to 50℃
NO_2(ppm)	2.0	5.0	0.5	1.0	10	0-30	0.1	-30℃ to 50℃
NO(ppm)	25	50	25	50	50	0-250	1	-30℃ to 50℃
NH_3(ppm)	25	35	25	35	50	0-100	1	-40℃ to 50℃
NH_3-E(ppm)	25	35	25	35	500	0-1000	1	-40℃ to 50℃
O_3(ppm)	0.1	0.2	0.1	0.2	0.8	0-5	0.01	-20℃ to 50℃
ETO(ppm)	1.0	5.0	1.0	5.0	10	0-20	0.1	-20℃ to 50℃
HCN(ppm)	2.5	4.7	2.5	4.7	10	0-100	0.1	-30℃ to 50℃
HCl(ppm)	1.0	2.0	1.0	2.0	10	0-15	0.1	-30℃ to 50℃

12. BELLMINI™ Specifications

Size	66 x 69 x 24 mm(w/o clip), 66 x 69 x 41 mm(w clip) / 2.59 x 2.71 x 0.94in(w/o clip), 2.59 x 2.71 x 1.61in(w clip)
Weight	105g(w/Belt Clip) (3.70 oz)
Humidity	0% to 95% RH (non-condensing)
Display	FSTN LCD display (1.6 inch)
Ingress Protection	IP68
Alarm	Visual Alarm(LEDs), Vibrating Alarm, Audible Alarm(Buzzer; 100dB@10cm): Low, High, TWA, STEL
User Options	Peak, TWA, STEL reset, Adjustable alarm setpoints, Alarm Latching On/Off Adjustment of calibration and bump test interval Zero and gas calibration, Data download, FW update
Self-Test	Breakdown of sensor and circuitry, Battery
Battery	Lithium Battery size 2/3 AA 3.6V: 24months (TBC)
Wireless Connection	Bluetooth Low Energy (BLE) – BELL CONNECT App or Cloud connection Near Field Communication (NFC) – Easy close-range connection
Data Logging	Up to 200 alarm events, 5,000 data log
Approvals(Pending)	ATEX: Ⓔx II 1G Ex ia IIC T4 Ga KCs: EX ia IIC T4 IECEx: Ex ia IIC T4 Ga
Warranty	2years (Please refer to the Sensor data)

13. Warranty

This warranty and repair policy applies for two years from the time of purchase of the product. During this period, you can receive free repair or replacement service for problems caused by product defects or manufacturing defects. However, you must comply with the conditions below.

1. Coverage: The warranty applies only to defects resulting from the manufacturing process or parts of the product. Damage caused by user negligence or malfunction due to excessive use may be excluded from the warranty.

2. Repair within the warranty period: Problems that occur within the product warranty period will be repaired or replaced free of charge. (Excluding sensors)

3. Repairs after the warranty period: Paid repairs may be required for problems that occur after the warranty period. In this case, please contact the service center or manufacturer for detailed information regarding repair costs.

4. Exclusions from warranty: Warranty may not apply under some specific conditions. These conditions may include damage caused by user negligence, abnormal use, poor

power supply, unauthorized disassembly, or modification, etc. Additionally, the warranty is not valid for the same symptoms within 3 months after receiving the repair for the same problem.

5. Repair and replacement procedures: If the product requires or replacement, please contact the manufacturer's official service center to receive instructions on the procedures. You can receive smooth service by providing necessary documents and information.

6. Cautions: When using the product, you must strictly follow the manufacturer's instructions and perform maintenance consistently to do your best to maintain the lifespan and performance of the product.

14. Approvals

Certification marking and certificate numbers are listed in the table below.

- ATEX :  II 1G Ex ia IIC T4 Ga
- IECEx : Ex ia IIC T4 Ga
- FCC
- KCs : Ex ia IIC T4
- RoHS 3 Compliant