Alcohol Tester (Detector)

CA-2010

CA2010™

HIGHLY RELIABLE, ACCURATE & QUICK

BREATH ALCOHOL ANALYZER

1. PRODUCT SYNOPSIS

CA2010 is an unique & highly-sophisticated alcohol analyzer utilizing the variation of electrical property value of the oxide-semiconductor when the alcohol substance is detected. And, with the development of new ceramic material combined with relevant catalyst, it can selectively analyze the alcohol concentration to the ppm unit existing in the human breath. Our laboratory made it in developing the highly-selective semi-conductive sensor **(CA2010)** reactive to alcohol substance only, which can be differentiated from the other semi-conductive sensor products (which are often affected by the other substances like smokes and smells of food). Furthermore, it did improve to the large extent the standby, response & recovery time which could be crucial in measuring gas concentration.

***Detection mechanism of our unique semi-conductive sensor**

When the oxide having the property of n-type conductivity is open to the atmosphere, it decreases the number of electron affecting on electrical property by the adsorbed oxygen and results in increasing the resistance. And, afterwards, if the specific gas (reducing gas) exists in the atmosphere, it reacts with the adsorbed oxygen and increase the electron in the oxide, resulting in decreasing the resistance. So to speak, the electrical property of the oxide is getting changed when a specific gas is exposed from the outside and our sensor can analyze the gas concentration from the variation of quantity.

*** Remark: *1 - Conditions that increase the amount of ketones on the breath, such as diabetes and low caloric intake, may cause a false positive test. (i.e., showing a non-zero reading despite not drinking alcohol)

2. FEATURES

1) The cutting edge alcohol sensor technology

CA2010 adopts a highly-selective semiconductor sensor (**reactive to only alcohol substance**) designed by KAIST(**K**orea **A**dvanced **I**nstitute of **S**cience and **T**echnology). CA2010 is an unique breath tester adopting this most sophisticated technology of sensor.

2) *Stable testing data*

It allows you to get stable data for successive testing.

3) *Dual light LCD display* ;

It displays by 3 digits (0.xx% BAC/BRAC) on LCD together with sound in each stage.

4) Wide detection range : 0.00 ~ 0.40% BAC or 0.00 ~ 2.00 BRAC.

5) *Long-term stability*

CA2010 can analyze very precisely even after long time of uses.

6) *Flow check technology.*

Display “Err” in case that you don’t blow steadily and/or continuously for 3 - 5 seconds into the Mouthpiece

7) *Calibration check technology*

This feature is to check periodically to ensure whether it is in good condition or needs for re-calibration.

8) *Short warm-up & response Time*

After power on, less than 20sec. of warming up count up (000 to 100%) is needed to make it ready for testing. And, exhaling just for a few seconds will reach you to instantly read the testing numeric digits.

9) *Quick Recovery Time*

The sensor of CA2010 can be purged in 30seconds for another time of testing. You don’t need to be too patient to do consecutive testing.

10) Easy calibration & longer sensor life time : 3,000 times testing

11) *Power*

9V Alkaline battery & one cigar Jack DC adapter included

12) *Sanitary Testing*

CA2010 includes 3pcs of mouthpiece for sanitary direct testing.

13) *Compact & light weight hand-held device*

14) *Sophisticated and elegant design*

CA2010 is adopted with titanium colored glossy front panel & soft touch grip back panel

3. HOW TO USE

1. Insert a mouthpiece into the mouthpiece inlet.

2. Slide up the ON/OFF power switch that is located in the right side of the unit.

   - The detector will show “on” together with a sound and then start to count up from 000 to 100% on the display. This warm-up process prepares the sensor and circuit for testing.

3. When you hear beep sound & “Read” display is on, please blow steadily into the mouthpiece until you would hear the “Beep” sound again. Stop blowing.

   - In this stage, if you don’t blow within 30 seconds, it automatically turns off.

   - In case you drink very little (if actual concentration would be below 0.01% BAC/0.05mg/l BRAC), it may not be activated. However, it shows still 0.00% and you’re said to be in safe range.

4. After the circling line is on the display for 5 seconds, the test result (BAC or BRAC) will be displayed by 3 digits for 20 seconds along with beep sound.

   - If the BAC/BRAC data would be over 0.05%/0.25mg/l (default setting) respectively, the LCD color will be changed from blue to red and “WARN” signal will be displayed along with “Alarm” sound.

5. Finally, the unit will turn off automatically along with a sound.

6. For the successive testing, try again from No.2 to No.4.

7. Space tests at least 2 minutes apart.

4. TECHNICAL SPECIFICATION

ITEM	SPECIFICATIONS
Size	5.6 x 12.3 x 2.3 cm / 2.2 x 4.8 x 0.9 inch
Weight	111g / 3.9oz (with a battery and a mouthpiece)
Housing	Shock resistant, molded plastic
Sensor	Highly selective semi-conductive oxide alcohol sensor
Response time	3 sec.
Warm up time	20 sec.
Recovery time (sensor purge)	30 sec.
Battery life	Over 300 tests
Battery	9V alkaline
External power supply	12V DC adapter
Accuracy	≤ ±0.01% at 0.10% BAC ≤ ±0.05mg/liter at 0.50mg/liter BRAC
Detection range	0.00 ~ 0.40% BAC 0.00 ~ 2.00 mg/liter BRAC
Calibration	BAC simulator(Model Guth10-4/Guth Laboratory,USA)
Digital display	Three digits in numeric readout
Packing	Tester, 9V alkaline,Cigar-Jack DC adapter, 3 pcs of mouthpieces, User's manual, Carrying Bag
Warranty	1 year

5. COMPARISION TABLE

	Other semi-conductive sensor analyzer	**CA2010**	Fuel-cell sensor analyzer (Consumer purpose)	Fuel-cell sensor analyzer **(Law enforcement purpose)**
Measuring method	Variation of Electro-conductivity	**Variation of Electro-conductivity**	Variation of Electromotive-force	Variation of Electromotive-force
Error range	≥±0.01%BAC	**≤ ±0.01%BAC**	≤ ±0.01%BAC	±0.005%BAC
Adopted sensor type	General gas sensor *1	**Highly selective semi-conductor oxide alcohol sensor developed by our own Lab.**	Normal fuel-cell alcohol sensor *2	Specific alcohol sensor *3
Accuracy & reliability	- Comparatively inaccurate - Low selectivity	**- Comparatively accurate and stable repeatability** **- Positive false *4**	- Comparatively accurate but deviation is getting increased under consecutive and high concentration as well as blowing pressure - Negative false *4	- Accurate - Negative false *4
Maintenance & A/S	- No comment	**- Easy calibration** **- Low cost maintenance *5** **- Long sensor life-time**	- Complicate re-calibration procedure required - High cost maintenance *6 - Short sensor life-time *7	

Remark:

*1 – There's so few manufacturer that develop & produce their own sensor to adopt into breathalyzer except us. Most of them are buying & using a general (not-specified for alcohol substance) gas sensor.

*2 – Almost of suppliers are using the low quality & cheaper fuel-cell sensor that are provided from U.K.or U.S.

*3 – Developed & consumed only by/for themselves (Intoximeters, Lion, etc.)

*4 – a. Positive false: The test result is likely increased under consecutive test or after long-time storage. So, it is supposed to be safe for self-testing by end user.

b. Negative false: The test result is likely **decreased** under consecutive test or after long-time storage. So, it is supposed to be **unsafe** for self-testing by end user and it is required an accuracy check before testing.

*5 – You need to change just the sensor and re-calibrate.

*6 – Fuel-cell sensor module consists of a whole package (Sensor, Gas sampling equipment, etc.), so it might be changed all in case you need to change the sensor.

*7 – Either you use it or not, you shall change the sensor package periodically such as every 6 months.