Air Quality Monitoring Products

HBD5-AQI Air Quality Index Analyzer

Ref:HBD5AQI_IntE

HBD5-AQI provides AQI (Air Quality Index) suitable to use in various applications and detect air quality and various odors such as swage-sludge gas, smelling breath, particular gas, VOCs, and so on.
HBD5-AQI makes the detecting easily and fun.
HBD5-AQI can mainly detect toxic hydrocarbon compounds and toxic inorganic compounds in the air, especially it responses as that the high toxic of the gases has the more sensitive the sensor detect. HBD5-AQI convert the tested signal to the AQI (Composite Index of Air Quality) shown on the display, according the standard definition if EPA. AQI define that fresh air and/or zero air is "1". According to concentration of the VOC compounds in the air, the AQI is unlimited in theory. Applicant in the living, when concentration of VOC compounds over some limit in the air, the sense of smell will not have multiple effects; therefore AQI is designed in reasonable range in living. Please refer table as below:

Environment and Application	AQI of HBD5-AQI
Fresh air and/or Zero air	1
Living room	1 - 8
Super market, Convenient store	10 - 20
Office	5 - 20
Road side or Bus stop of downtown	10 - 30
Public lavatory	10 - 40
Packing lot or Tunnel of automobile	10 - 40
Hospital or Sickroom	15 - 25
Smoking room of airport	30 - 90
Temple	30 - 50
Fart (close detecting)	50 - 100
Smelling breath (Around blow 5 sec continuously)	20 - 35
Opening sewage	20 - 40

In above table except zero air AQI is absolutely "1", the other index may be different with user actual detecting, but the higher AQI means the more pollutant or toxic VOCs exist. Basically ADS00 is more sensitive than ADS02 in detecting hydrogen, carbon monoxide and smoke smell. If detecting targets are VOC including hydrogen, carbon monoxide and LPG etc, the ADS00 is more suitable.

Environmental index

Local air quality affects how you live and breathe. Like the weather, it can change from day to day or even hour to hour. The U.S. Environmental Protection Agency (EPA) and others are working to make information about outdoor air quality as easy to understand as the weather forecast. A key tool in this effort is the Air Quality Index, or AQI. EPA and local officials use the AQI to provide you with simple information on local air quality, the health concerns for different levels of air pollution, and how you can protect your health when pollutants reach unhealthy levels.

What is the AQI?

The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health.

*AQI becomes popular standard environ parameter for air quality worldwide now

Understanding the AQI

The purpose of the AQI is to help you understand what local air quality means to your health. To make it easier to understand, the AQI is divided into six categories:

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	*...air quality conditions are:*	*...as symbolized by this color:*
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Each category corresponds to a different level of health concern. The six levels of health concern and what they mean are:

- “Good” The AQI value for your community is between 0 and 50. Air quality is considered satisfactory, and air pollution poses little or no risk.
- “Moderate” The AQI for your community is between 51 and 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
- “Unhealthy for Sensitive Groups” When AQI values are between 101 and 150, members of sensitive groups may experience health effects. This means they are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to ozone, while people with either lung disease or heart disease are at greater risk from exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range.
- “Unhealthy” Everyone may begin to experience health effects when AQI values are between 151 and 200. Members of sensitive groups may experience more serious health effects.

- "Very Unhealthy" AQI values between 201 and 300 trigger a health alert, meaning everyone may experience more serious health effects.

- "Hazardous" AQI values over 300 trigger health warnings of emergency conditions. The entire population is more likely to be affected.

How is a community's AQI calculated?

Air quality is measured by monitors that record the concentrations of the major pollutants each day at more than a thousand locations across the country. These raw measurements are then converted into AQI values using standard formulas developed by EPA. An AQI value is calculated for each pollutant in an area (ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide). The highest AQI value for the individual pollutants is the AQI value for that day. For example, if on July 12 a certain area had AQI values of 90 for ozone and 88 for sulfur dioxide, the AQI value would be 90 for the pollutant ozone on that day.

What are typical AQI values in most communities?

In many U.S. communities, AQI values are usually below 100, with values greater than 100 occurring just several times a year. Typically, larger cities have more severe air pollution problems, and the AQI in these areas may exceed 100 more often than in smaller cities. AQI values higher than 200 are infrequent, and AQI values above 300 are extremely rare.

AQI values can vary from one season to another. In winter, for example, carbon monoxide may be high in some areas because the cold weather makes it difficult for car emission control systems to operate effectively. In summer, ozone may be a significant air pollutant because it forms in the presence of heat and sunlight. Particle pollution can be elevated at any time of the year.

AQI values also can vary depending on the time of day. For example, ozone levels often peak in the afternoon, while carbon monoxide is usually a problem during morning or evening rush hours. Particle pollution can be high at any time of day.

Air Quality Index (AQI): Ozone

Index Values	Levels of Health Concern	Cautionary Statements
0-50	Good	None
51-100*	Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.
101-150	Unhealthy for Sensitive Groups	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors.
151-200	Unhealthy	Active children and adults, and people with lung disease, such as asthma, should avoid prolonged or heavy exertion outdoors. Everyone else, especially children, should reduce prolonged or heavy exertion outdoors.
201-300	Very Unhealthy	Active children and adults, and people with lung disease, such as asthma, should avoid all outdoor exertion. Everyone else, especially children, should avoid prolonged or heavy exertion outdoors.
301-500	Hazardous	Everyone should avoid all physical activity outdoors.

* Generally, an AQI of 100 for ozone corresponds to an ozone level of 0.08 parts per million (averaged over 8 hours).

Air Quality Index (AQI): Particle Pollution

Index Values	Levels of Health Concern	Cautionary Statements
0-50	Good	None
51-100*	Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion.
101-150	Unhealthy for Sensitive Groups	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
151-200	Unhealthy	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
201-300	Very Unhealthy	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
301-500	Hazardous	People with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. Everyone else should avoid all physical activity outdoors.

*An AQI of 100 for particles up to 2.5 micrometers in diameter corresponds to a level of 40 micrograms per cubic meter (averaged over 24 hours). An AQI of 100 for particles up to 10 micrometers in diameter corresponds to a level of 150 micrograms per cubic meter (averaged over 24 hours).

Air Quality Index (AQI): Carbon Monoxide (CO)

Index Values	Levels of Health Concern	Cautionary Statements
0-50	Good	None
51-100*	Moderate	None
101-150	Unhealthy for Sensitive Groups	People with heart disease, such as angina, should reduce heavy exertion and avoid sources of CO, such as heavy traffic.
151-200	Unhealthy	People with heart disease, such as angina, should reduce moderate exertion and avoid sources of CO, such as heavy traffic.
201-300	Very Unhealthy	People with heart disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic.
301-500	Hazardous	People with heart disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic. Everyone else should reduce heavy exertion.

- An AQI of 100 for carbon monoxide corresponds to a CO level of 9 parts per million (averaged over 8 hours).

Air Quality Index (AQI): Sulfur Dioxide (SO_2)

Index Values	Levels of Health	Cautionary Statements

	Concern	
0-50	Good	None
51-100*	Moderate	None
101-150	Unhealthy for Sensitive Groups	People with asthma should consider reducing exertion outdoors.
151-200	Unhealthy	Children, asthmatics, and people with heart or lung disease should reduce exertion outdoors.
201-300	Very Unhealthy	Children, asthmatics, and people with heart or lung disease should avoid outdoor exertion. Everyone else should reduce exertion outdoors.
301-500	Hazardous	Children, asthmatics, and people with heart or lung disease should remain indoors. Everyone else should avoid exertion outdoors.

* An AQI of 100 for sulfur dioxide corresponds to an SO_2 level of 0.14 parts per million (averaged over 24 hours).

AQI functions Odor detecting

The smell and sense of human is difficult to define, some of scent sense good but some persons might not accept the smell. Although everybody has various different sense of smell that cannot define. Anyway, the smell depends on the concentration of special functional organic hydrocarbon compounds in the air.

Smoke detecting

ADS00 is very sensitive of hydrogen, which generated from smoking or incomplete combustion.Therefore, ADS00 is suitable for air-conditioner management and non-smoking surveillance. Besides, ADS00 fire detective performance is superior to normal smoking detector.

Leakage detection of LPG and LNG

HBD5-AQI is very sensitive and suitable to detect leakage of Natural Gas (Methane / City Gas) and LPG (Propone).

Detection of VOCs emission

It is hard work to find out the source of emission of VOCs? HBD5-AQI will help user to detect the source of leakage easily.

Nose Index

In order to win some person favor, pay attention to the politeness is necessary. Bad breath affects most people at some stage of their life, but HBD5-AQI is simple detector to prevent it and help you win the favor.

Air-conditioner management and air cleaner

There are various factors such as smoking, odor of rotten food, using volatile solvent, using liquid eraser, bad ventilating and so on, cause polluted air and high AQI. In order to improve air quality, we may use air cleaner. But nobody knows what is the air cleaner performance? HBD5-AQI will help user to know if the air quality and air cleaner is effective or not.

VOCs, THC and Particular gases detecting

It is not easy to buy suitable gas detector for some of particular gases. In the case, HBD5-AQI might be a substitute and solution. There are some notices that the concentration of target gas should be 0.1~30/100ppm, balance gas should be air without interfered gases or exist few stables interfered gases. For example HBD5-AQI is more sensitive and practical than other professional detector to detect exist less than 100 ppm of hydrogen. If the gas cannot measure by diffusion or high concentration that out of AQI range, dilute detection is possible, put HBD5-AQI in the bottle and takes the sample gases then inject bottle and read the AQI. Neither diffusion or dilute, Silicon compounds gases is not suitable to use HBD5-AQI, e.g.

SiH4.

The best partner of canary

People knew apply canary to detect unknown gas or toxic gas since long ago. Canary will die while exposed toxic gas that warns people. Especially faced with unknown toxic gas, canary has the un-substitute status.
The function of ADS0X series gas detector is similar canary and sensitive most of hydrocarbon compounds in the air. Therefore, ADS0X series gas detector is the best complement with canary while dispatch canaries face unknown gas or toxic gas.

It is an actual case study that applies FID and ADS02 together and made a table as below.

THC (Total Hydrocarbons), mg/cubic meter	**AQI**
14.9	15
29.9	22
59.9	32
119.8	43
149.8	47
199.7	54
249.6	58
299.6	60
399.4	67
499.3	71

Specifications for Sensors

Model	Range and typical gases	Sensitivity	Applications	Specifications
ADS02	Organics and effluvium Typical Sensitive to Toluene:<1~30ppm H2S:<0.1~3ppm EtOH:<1ppm-30ppm NH3:<1~30ppm H2:3~30ppm	 100 36.7 4.8 2.75 0	Air quality monitor	Repeatability: ≤ ±5%F; Range: 0~100% LEL;
ADS00	Air quality,General Air Contaminants test Typical Sensitive to H2:0.5-180ppm EtOH:0.3-300ppm C4H10:<1-400ppm CH4:<3-1000ppm CO:<2-1200ppm CSC:0.1-100ppm COC:0.1-100ppm	 101 100 56.1 0 6.3 100 100	Indoor and outdoor air quality indication; Industry Safety explore before engineering; Quality monitor in HVAC equipment and other air cleaner products	Repeatability: ≤ ±3%F Range: 1-30ppm
ADS02	Air quality,General Air Contaminants test Typical Sensitive to Toluene:1-30ppm H2S:0.1-3ppm EtOH:1-30ppm NH3:1-30ppm H2:<3-30ppm+ CSC:0.07-30ppm COC:0.1-30ppm Warfare:0.07-30ppm	 101 36.7 4.8 2.75 0 100 100 100	Indoor and outdoor air quality indication; Industry Safety explore before engineering; Quality monitor in HVAC equipment and other air cleaner products	Repeatability: ≤ ±3%F Range: 1-30ppm

Specifications of Instruments

Sensor Model	ADS00	ADS02
Sensor	Semiconductor	Semiconductor
Major Detection	Hydrogen, CO, Toxic&VOCs	Toxic&VOCs
	Air Quality	Air Quality
	VOCs emission	VOCs emission
	Smoke	Smoke
	Odor	Odor
	Hydrogen	Toluene
Available / Target gases		
	Ethanol	Hydrogen sulfide
	Iso-butane	Ethanol
	Carbon monoxide	Ammonia
	Methane / LNG	Hydrogen
	Hydrocarbon Compounds	Hydrocarbon Compounds
Major Application	Air Quality	Air Quality
Sampling frequency	Continuance	Continuance
Alarm	High alarm (Reset available)	High alarm (Reset available)
Audible alarm / Alarm message	Available	Available
Backlight alphanumeric LCD	Available	Available
Standard language	English	English
System clock	Year, month, day, hour, minute	Year, month, day, hour, minute
Battery management	Available	Available
Dimensions		
Analyzer:	98W×180H×35T (mm)	98W×180H×35T (mm)
Sensor:	Dia 35×110 （mm）	Dia 35×110 （mm）
Weight	300g	300g
Battery	120mAH rechargeable	120mAH rechargeable
	Backup power supply recommended	Backup power supply recommended
Standard accessory	Adaptor	Adaptor
International standard met	CE	CE
Package size	112*370*465 (mm)	112*370*465 (mm)

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