SPECIFICATION

Product Name: Automotive CO2 Sensor

Item No.: ACDS-1001-A

Version:V211231C-02

Date: July. 15th, 2022

Revision

No.	Version	Content	Date
1	V0.1	Preliminary version	2021-12
2	V0.2	Single beam version	2022-07

Automotive CO2 Sensor

ACDS-1001-A

Applications

- Automotive HVAC system
- In-cabin residual life detection
- Automotive air conditioner refrigerant leakage monitoring

Description

ACDS-1001 - A is CO2 sensor based on NDIR (non-dispersive infrared) technology. The single channel diffusion sampling method makes it applicable for automotive HVAC automatic control system. It enables the constant cabin fresh air supply and improves the cabin comfort. At the same time, it can also be applied to automotive air conditioner refrigerant leakage monitoring to ensure the automobile system safety. The sensor has advantages of high accuracy, fast response, no cross interference, low power consumption and long lifetime.

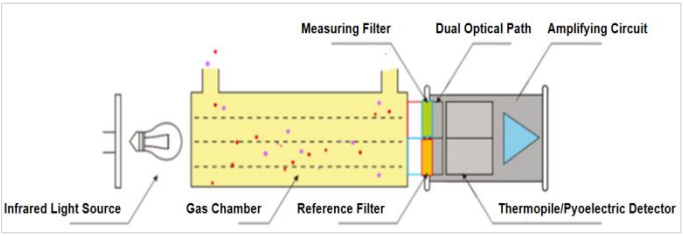
Features

- NDIR (non-dispersive infrared) technology to ensure high accuracy for whole measurement range
- Fast response: T90⩽25s
- No cross interference
- Low power consumption in μA level
- Automotive level mature circuit design for harsh vehicle environment
- IP54 protection grade
- 15+ years lifetime

Working Principle

NDIR (dual beam non-dispersive infrared) Technology

CO2 gas has a strong absorption of infrared ray with a specific wavelength. According to the Lambert-Beer law, the infrared absorption is highly correlated to CO2 gas concentration. The technology is commonly referred as NDIR (non-dispersive infrared) technology. Compared with other technologies like electrochemistry, catalytic combustion, solid electrolyte, semiconductor, NDIR technology has the following advantages: good selectivity, anti-poisoning to harmful gas, fast response and good stability, high signal-to-noise ratio, long life, etc.



Specifications

General Performance	
Working principle	NDIR(single channel non-dispersive Infrared) technology
Target gas	CO2
Measurement range	0 ~ 1 0000ppm (can up to 40000ppm)
Resolution	1ppm
Accuracy	±（50ppm+5% of reading）①
Data refresh cycle	1s
Response time	T_{90}≤25s
Communication	LIN②
Lifetime	+15 years
Environmental Conditions	
Working condition	-40~+85℃,0-99%RH (non-condensing)
Storage condition	-40~+95℃,0-99%RH (non-condensing)
Working pressure	80kPa~120kPa③
Protection grade	IP54
Electrical Conditions	
Power supply	9~16 VDC, standard voltage +12 VDC
Working current	≤100mA @+12VDC
Standby current	≤100μA（sleep mode）

Remark:

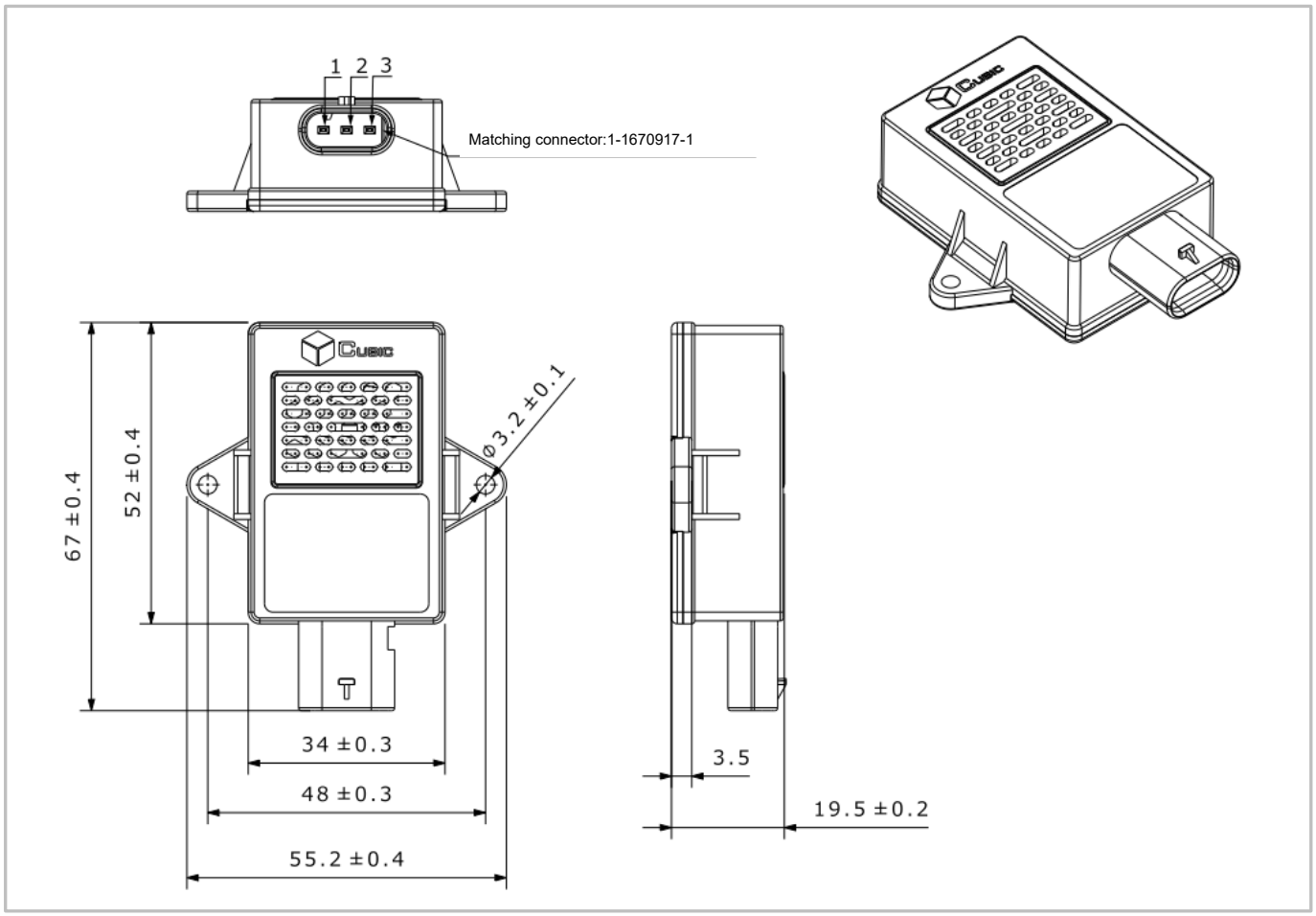
① The accuracy is based on 0~10000ppm measurement range under standard atmospheric pressure, -20~+60℃working temperature, for complete measurement range and working condition, accuracy is ±（100ppm+10% of reading）.

② Default communication is LIN, for other communication requirements please contact Cubic for more solutions

③ Working pressure here means the sensor can work normally under this pressure range. If need pressure compensation, please contact Cubic for supports

Product Dimensions and Connector

1. Dimensions (Unit: mm)



2. Pin Definition

Pin	Name	Description
1	Power	Power input（+12V）
2	LIN	LIN communication
3	GND	Power input (ground)

3. Connector Specification

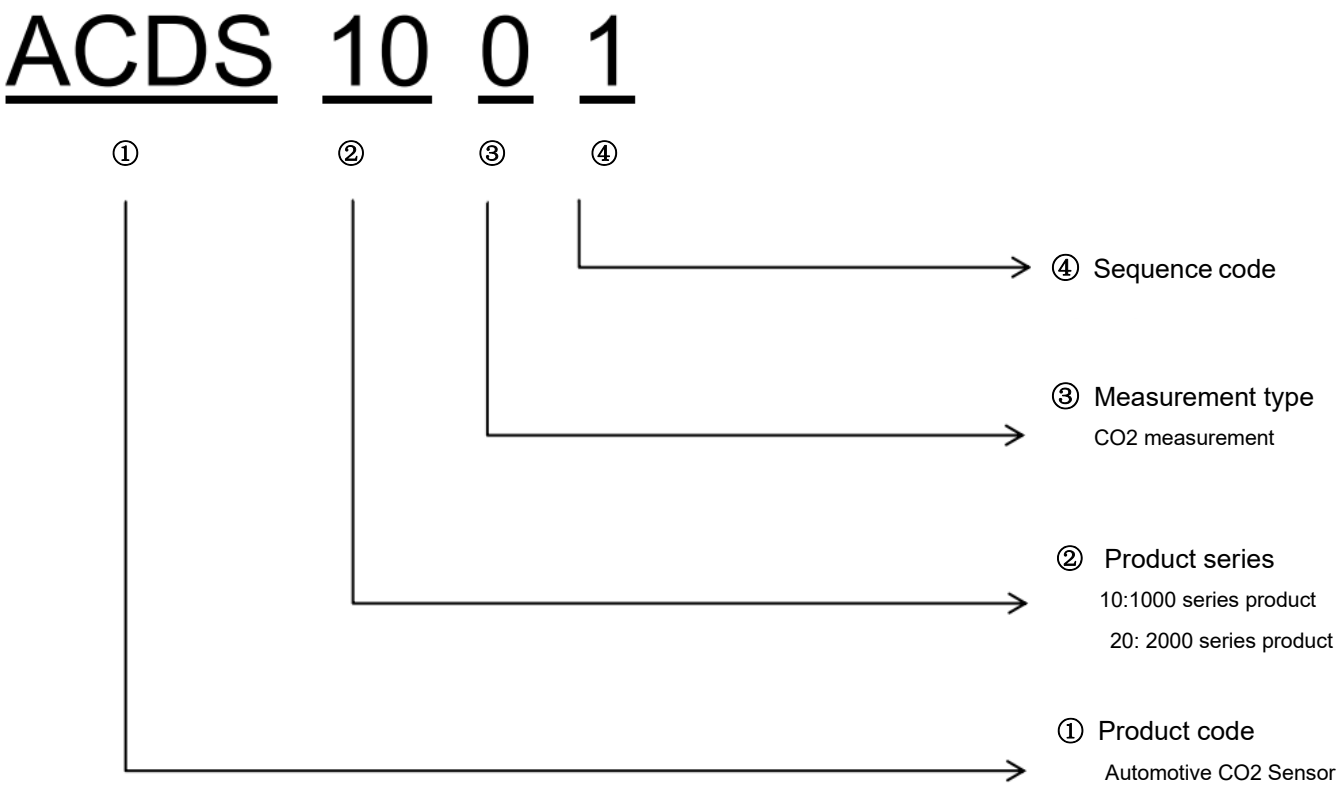
Item	Part Number	Pitch	Brand
Matching Connector	TE 1-1670917-1	4mm	TE

Communication Protocol

LIN Communication

Name	Parameter
LIN interface	UART
LIN Version	LIN2.1
LIN Baud rate	19.2 kbps
LIN ID	0x33

Product Code Definition



User Attentions

※ Please follow recommended matching connector specification to ensure the product water and dust protection.

※ Please ensure a good gas exchange condition, and the sensor can directly contact the measured gas during installation and operation.

ACDS-1000 Series Recommendation

Product picture			
Product code	**ACDS-1000**	**ACDS-1001-A**	**ACDS-1002**
Target gas	CO2	CO2	CO2
Measurement range	0 ~ 5000ppm	0 ~ 10000ppm (up to 40000ppm)	400 ~ 5000ppm
Accuracy	± 10% of reading	±（50ppm+5% of reading）	± 10% of reading
Communication	LIN	LIN	LIN
Dimension	73.6*30*35 （mm）	67*55.2*19.5 (mm)	52*49*35 (mm)
Matching connector	Tyco 1473672-1	TE 1-1670917-1	Tyco 1473672-1
Applications	1.Automotive HVAC system 2.In-cabin residual life detection 3.CO2 heat pump air conditioner		

After-Sales Services and Consultancy

Cubic Sensor and Instrument Co., Ltd

Add: Fenghuang No.3 Road, Fenghuang Industrial Park, Eastlake Hi-tech Development Zone, Wuhan 430205, China

E-mail: info@gassensor.com.cn

Tel: +86 (0)27 81628827

Fax: +86 (0)27 81628821

Website: http://www.gassensor.com.cn