

产 品 规 格 书 **PRODUCT SPECIFICATION**

工业二氧化碳气体传感器 **Industrial NDIR CO₂ Sensor** **U9103 series Rev. A0**



版本 Version	修订记录 Revision Record	发行日期 Issue Date
A0	初次发放 Initial Release	2022. 7. 3

1. 产品介绍 Product Introduction

1.1 产品概述 Product Description

U9103系列是一系列不同量程的工业用途的光学二氧化碳传感器，本产品利用非色散红外（NDIR）原理探测空气中的CO₂浓度，它采用优化的光学设计、电路设计、数字信号处理算法和补偿算法，相较于市场同类型产品，它具有信噪比高、重复性好、响应快的特点。得益于其额外的参考通道，它具有更好的稳定性。此外，通过稳健性设计，产品通过了多项严苛的环境测试和寿命测试，具有优越的可靠性。U9103 series are industrial optical carbon dioxide (CO₂) sensors with various measurement range that utilizes the principle of non-dispersive infrared (NDIR) to detect CO₂ concentration in the air. Because of its dual-beam design, it has better stability compared with single-beam NDIR sensors. This product applies optimized optical design, circuit design, digital signal processing algorithm, and compensation algorithm. Compared with the like products in the market, it has a high signal-to-noise ratio, good repeatability, and fast response. In addition, through the robust design, the product has passed several environmental and life tests that guarantee superior reliability.

1.2 产品特性 Product Features

- ◇ 多温度点/全量程校准 Full-measurement-range calibration at multi-points temperature
- ◇ 双通道设计，性能稳定 Dual-beam design to ensure stable output
- ◇ RMS噪声小于0.01% Vol; RMS noise less than 0.01% Vol
- ◇ 使用寿命大于10年 Work-life more than 10 years
- ◇ 结构紧凑、便于安装 Compact mechanical structure for easy installation
- ◇ 提供自动校准模式和手动校准模式 Auto-calibration and Manual-calibration available
- ◇ 信号输出方式 UART and Voltage output signal

1.3 应用领域 Application Field

- ◇ 工业过程控制和安全监测 Industrial process control and safety monitoring
- ◇ 室内空气监测和暖通空调系统 Indoor air quality monitoring and HVAC system
- ◇ 农业和畜牧业过程监控 Agriculture and livestock process monitoring and control

2. 产品特性 Product Characteristics

2.1 技术指标 Technical Specification

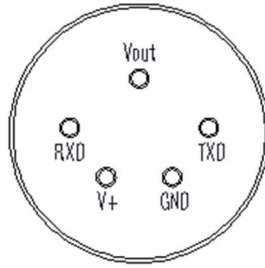
产品型号 Product Number	U9103 0001	U9103 0002	U9103 0003	U9103 0004	U9103 0005	U9103 0006	U9103 0007	U9103 0008
检测气体 Target Gas	Carbon Dioxide (CO ₂)							
检测范围 Measurement Range ⁽¹⁾	0 ~ 5000 ppm	0 ~ 10000 ppm	0~3% Vol.	0~5% Vol.	0~10% Vol.	0~20% Vol.	0~50% Vol.	0~100% Vol.
检测精度 Accuracy ⁽²⁾	± (100 ppm + 10% reading)		± (0.05% Vol. + 5% reading)		0~5%Vol.: ± (0.05% Vol + 5% reading) 5%~ F.S.: ± 10% reading			
零点漂移 Zero Drift ⁽³⁾	≤ 1% F.S.							
响应时间 Response Time	< 30 seconds							
工作条件 Operation Conditions	-20~60 °C; 0~95% RH (Non-condensing)							
存储条件 Storage Conditions	-40 °C~85 °C							
供电电压 Power Supply	DC 3.6 V~5.5 V ⁽¹⁾ , Ripple voltage < 50 mV							
平均工作电流 Average Current	< 40 mA							
峰值电流 Peak Current	< 300 mA							
通讯接口 Communication Interface	1) UART TTL (3.3 V) 2) Voltage output (0.4 V - 2 V) ⁽¹⁾							
产品寿命 Life Expectancy	10 years							
长期稳定性 Long-term Stability	≤ 2% F.S.							
重量 Weight	26 grams							

(1) Contact Unitense for customized request.

(2) Specification is referenced to certificated calibration gas mixture (±2% uncertainty).

(3) Ambient condition: 20 to 30 °C, 50% to 70%RH.

2.2 引脚定义 Pin Definition



Bottom view from pin surface

引脚 Pin-out	描述 Description
GND	GND
V+	DC power supply
RXD	UART_RXD
Vout	Voltage output (0.4 V - 2 V) corresponding to 0 – 100% full range
TXD	UART_TXD

3. 外形尺寸 Product Outlines (unit: mm)

