

产 品 规 格 书 **PRODUCT SPECIFICATION**

工业甲烷气体传感器 **Industrial NDIR CH₄ Sensor** **U9302 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. 9. 13

1. 产品介绍 Product Introduction

1.1 产品概述 Product Description

U9302系列是一系列不同量程的工业用途的光学烃类（甲烷）气体传感器，本产品利用非色散红外（NDIR）原理探测环境中的烃类（甲烷）气体浓度，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。U9302 series are industrial optical hydrocarbon (HC, specifically CH₄) gas sensors with various measurement range that utilizes the principle of non-dispersive infrared (NDIR) to detect environmental HC (CH₄) gas concentration. 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0.1% Vol; RMS noise less than 0.1% 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 Industrial process control
- ◇ 环境和安全监测 Environment and safety monitoring

2. 产品特性 Product Characteristics

2.1 技术指标 Technical Specification

产品型号 Product Number	U93020001	U93020002	U93020003
检测气体 Target Gas ⁽¹⁾	Methane (CH ₄)		
检测范围 Measurement Range ⁽²⁾	0 ~ 5% Vol. (0~ 100% LEL)	0 ~ 10% Vol.	0 ~ 100% Vol.
检测精度 Accuracy ⁽³⁾	0~1%Vol.: ± 0.06% Vol 1%~ F.S.: ± 6% reading		
零点漂移 Zero Drift ⁽⁴⁾	≤ 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 ⁽²⁾ , 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) ⁽²⁾		
产品寿命 Life Expectancy	10 years		
长期稳定性 Long-term Stability	≤ 2% F.S.		
重量 Weight	26 grams		

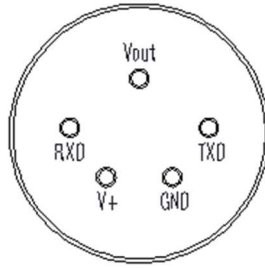
(1) Contact Unitense for measurement of other hydrocarbon gases, e.g., Ethane (C₂H₆), Propane (C₃H₈), Ethylene (C₂H₄), Propylene (C₃H₆), Acetylene (C₂H₂), etc.

(2) Contact Unitense for customized request.

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

(4) 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)

