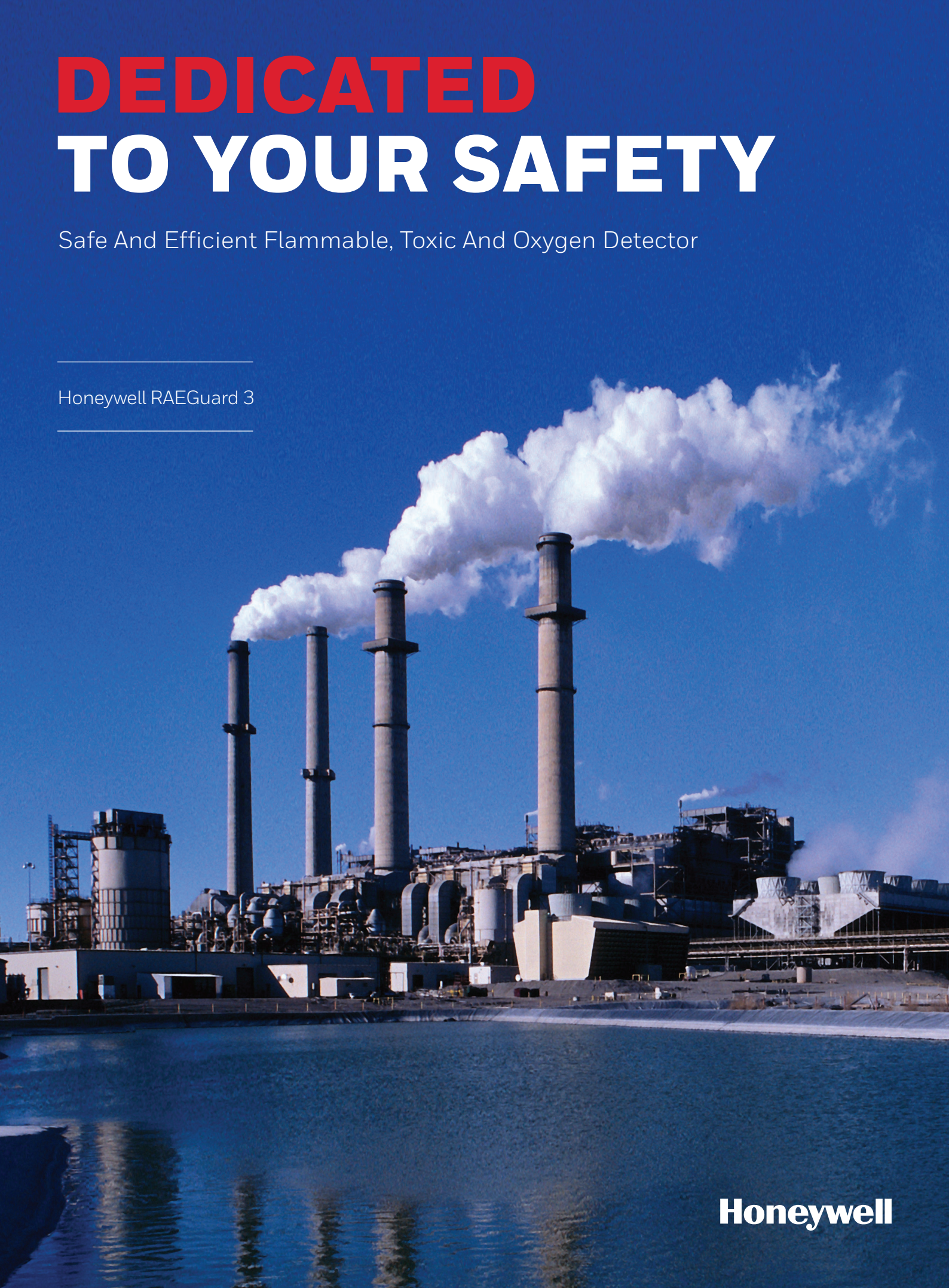
# DEDICATED TO YOUR SAFETY

Safe And Efficient Flammable, Toxic And Oxygen Detector

Honeywell RAEGuard 3



Honeywell


## Dedicated to Your Safety

Bluetooth

# RAEGuard 3

RAEGuard 3 Series is Honeywell's masterpiece detector of toxic and flammable gas that represents advanced technology and development potential in the future. It provides users with safer, more stable, more reliable and more effective field transmitter, and can be applied in indoor and outdoor hazardous environments, to monitor the dangerous degree of hazardous gases in real time, so as to rapidly and effectively protect the safety of the installation site and production personnel.

The core of RAEGuard 3 — the sensors passed through strict selection and can ensure reliable and stable operation of the transmitter. Combustible gas detector uses catalytic sensor technology with long life (> 5 years) and high anti-poisoning. Toxic and Oxygen detectors adopt a variety of compensatory electrochemical sensor technology, especially Oxygen detector can avoid zero-free (nitrogen) calibration. At the same time, NDIR infrared detection technology with long life, anti-poisoning and Oxygen-free NDIR infrared detection technology allows RAEGuard 3 to be used in a wider and more harsh gas detection environment.

HART COMMUNICATION PROTOCOL

Functional Safety Type Approved TÜVRheinland FS

## To Your Safety

- All adopt advanced sensor technology
- Wider compensation for temperature and environmental factors keeps the instrument reliable and stable.
- Redundant design to ensure no “false alarm”
- Clear indications of status can perceive the degree of environmental hazards even at long distances.
- Optional integrated visible and sound alarm, light and sound constantly remind, alarm signal will not be ignored
- Optional built-in surge protection device to make sure outdoor installation of “worryfree”
- IP66/67
- TUV SIL2


## Self-Management

- Life expiration reminder
- Calibration period expiration reminder
- Alarm, STEL/TWA, fault, warning and other event reminders
- Fault code reminder

## Universal Transmitter

- Simplified and reduced cost of installation
- Decreased material management
- Reduced user’ s spares and training
- Minimal maintenance required

## Easy to Use

- Easy read backlit LCD with text, bar graph, digits and icons, support EN and CN
- 3 high-recognized and visible LED status indicators
- 3-wire 4-20mA current output can be fine-tuned to avoid the signal attenuation caused by wiring
- Optional HART® communications as standard for remote diagnostics/configuration
- Optional Bluetooth® for easy remote operation and maintenance via mobile app
- RS485 Modbus RTU for multi-drop networking and remote real-time monitoring
- Local or remote sensor installation options

## Cost Effective

- Auto-identify sensor gas types, allow full scale range setting of toxic and Oxygen detectors
- Hot swap toxic and Oxygen sensor module on site
- Fully configurable via non-intrusive magnetic switches by single person
- Auto-inhibit during maintenance

## Easy to Install

- Integral mounting plate or optional rewarded backboard mount kit for easy wall or pipe mounted
- 3/4" NPT M, 1/2" NPTM/F, G3/4" M/F, G1/2" F and M20 F varied glands selectable
- Flip-up PCB block removes to give access to terminal area
- Removable plug/socket type terminal blocks for ease of wiring



## Certification

- EU: CE, EMC, ATEX
- IECEx
- TUV SIL2
- INMETRO

## Applications

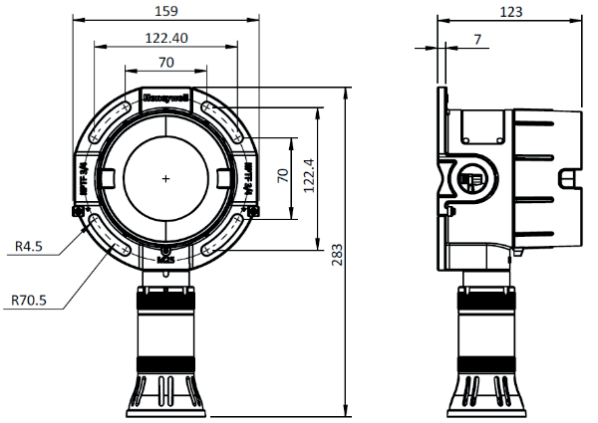
- Oil & Gas
- Chemical industry
- Oil & Gas Storage and Transportation
- Food/beverage
- Refineries
- Power plants
- Steel plants
- Laboratory
- Waste water facilities
- Utilities
- Pharmaceutical plant
- Chemical Storage
- Automotive industry

## Installation

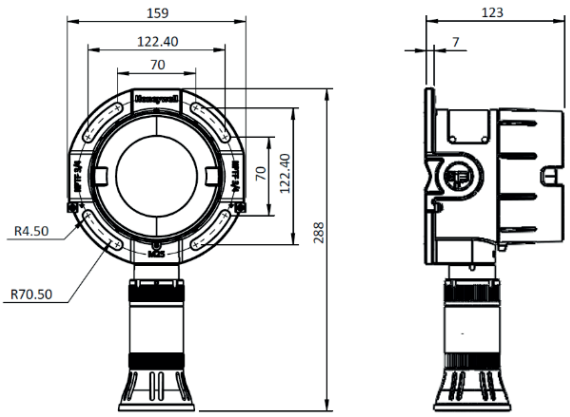
Installation Dimension

RAEGuard 3 Series detector is designed for use in potentially explosive atmosphere. The installation of detectors should ensure their explosion-proof performance and strictly follow the relevant national standards, to use industrial-grade armored cables and explosion-proof glands and conduits.

Use 0.5mm$^2$ (20AWG)to 2.5mm$^2$(13AWG) cross sectional area cable as needed to ensure minimum operating voltage at the detector,depending on installed cable length.



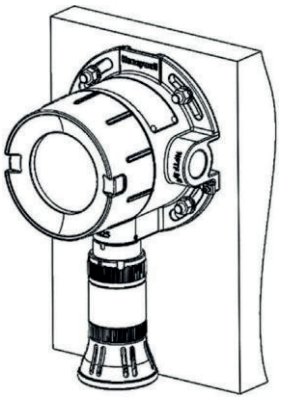

Dimension of RAEGuard 3 Toxic and Oxygen



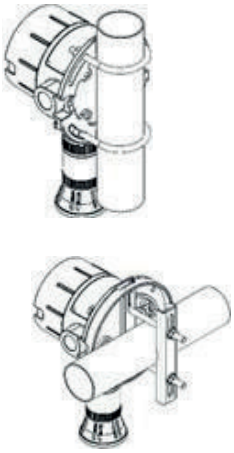

Dimension of RAEGuard 3 Flammable and NDIR

Unit: mm

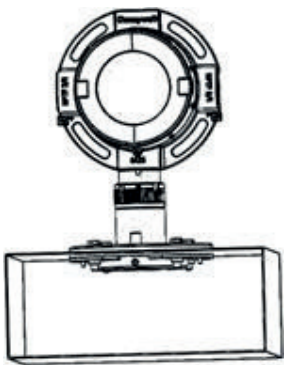
## Mounted Mode



**Wall Mounted**



**Vertical or horizontal pipe mounted (Mounting plate kit can be selected directly)**

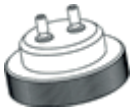


**Duct Mounted**

## Other Accessories

Sunshade/delug

Collecting Cone



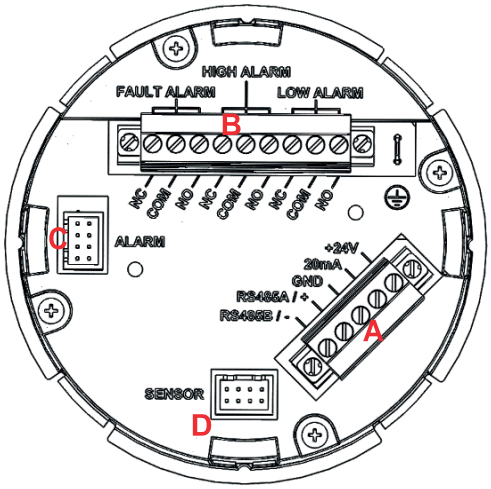
Gas Flow Adapter

Mounting Plate Kit

## Electrical

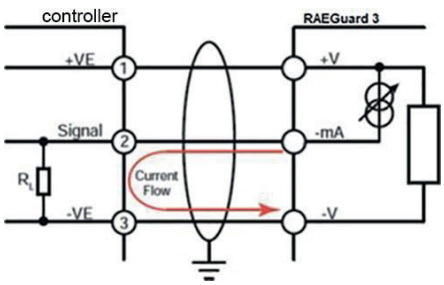
RAEGuard 3 transmitter only provides source current output. The maximum supported cable length can refer to the recommended values in the User's Manual.

### RAEGuard 3 Wiring Terminals




| Terminals | Identification | Definition | Remarks |
|---|---|---|---|
| A | +24V | +VE Supply (16~32VDC) | Controller |
| | 4-20mA | 4-20mA current & HART output | |
| | GND | -VE Supply | |
| | RS485A/+ | MODBUS A(+) | MODBUS RTU |
| | RS485B/- | MODBUS B(-) | |
| B | LOW ALARM-NO | Low Alarm - Normally Open | Note: If the function is not purchased at the time of ordering, there is no terminal. |
| | LOW ALARM-COM | Low Alarm - Common | |
| | LOW ALARM-NC | Low Alarm - Normally Closed | |
| | HIGH ALARM-NO | High Alarm - Normally Open | |
| | HIGH ALARM-COM | High Alarm – Common | |
| | HIGH ALARM-NC | High Alarm - Normally Closed | |
| | FAULT ALARM-NO | Fault - Normally Open | |
| | FAULT ALARM-COM | Fault – Common | |
| | FAULT ALARM-NC | Fault - Normally Closed | |
| C | ALARM | External + INMETRO | Optional |
| D | SENSOR | Connect with sensor | |

### RAEGuard 3 Source Configuration




## Technical specifications

| | |
|---|---|
| **RAEGuard 3 Gas Detector** | |
| Use | Universal transmitter with standard configuration of 3-wire, 4-20mA and RS485 MODBUS output for use with a wide range of applications for the detection of flammable, toxic and Oxygen gas hazards. |
| **Electrical parameters** | |
| Input Voltage Range | 16-32VDC (24VDC nominal) |
| Max Power Consumption | Electrochemical Cells: 5.5 watts; Catalytic or NDIR: 7.5 watts |
| Current Output | Completely configurable 4~20mA (source type) with optional HART® 7.2 protocol as following as default configurations of current output.<br>1mA Fault<br>2mA Inhibit (during configuration or setup)<br>3mA Warning<br>4mA~20mA Normal<br>22mA Overrange<br>Note: When the current output is less than 3mA, HART communication will not work properly. |
| Terminals | 5 terminals (14 terminals for use with relay output), wire diameter 0.5mm2 (20AWG) to 2.5mm2 (13AWG) |
| Relays | 3 x 2A@30VDC. Selectable normally open or normally closed and energised/de-energised(programmable) and latch/non-latch<br>Alarm relays default energised/non-latch. Fault relay default energised/non-latch |
| Communication | RS485, Modbus RTU Optional Bluetooth |
| **Construction** | |
| Transmitter Housing Material | Aluminum Alloy or 316 Stainless Steel |
| Sensor Housing Material | 316 Stainless Steel |
| Weight (Approx) | Aluminum Alloy: 3.0kg; Stainless Steel: 5.0kg |
| Mounting | Integral mounting plate with 4 x mounting holes suitable for M8 to fit onto Wall or Pipe |
| Entries | 2 x 3/4'' NPT cable/conduit entries and 1 x M25 sensor entry. 1 x plug supplied for use for only 1 entry used. Seal to maintain IP rating |
| **Performance****** | |
| Repeatability | <2% |
| Response Time(T90) | Depending on the gas being detected |
| **Certification** | |
| Hazardous Location Certifications | ATEX:<br>LEL/NDIR: CE2460 Ⓔx II 2G Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP66 Ta = -40°C to +65°C<br>Toxic & Oxygen: CE2460 Ⓔx II 2G Ex db ia IIC T6 Gb Ex tb IIIC T85°C Db IP66 Ta = -20°C to +55°C<br><br>IECEx:<br>LEL/NDIR: Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP66 Ta = -40°C to +65°C<br>Toxic & Oxygen: Ex db ia IIC T6 Gb Ex tb IIIC T85°C Db IP66 Ta=-20°C to+55°C<br><br>China Ex:<br>LEL/NDIR: Ex d IIC T6 Gb Ex tD A21 IP66 T85°C<br>Toxic & Oxygen: Ex d ia IIC T6 Gb Ex tD A21 IP66 T85°C |
| India | CCOE/PESO |
| Brazil | INMETRO |
| EMC | EN50270:2015, IEC61000-4-5 |
| Performance | IEC 60079-29-1, EN 50104<br>IEC 61508 (SIL Assessment, SIL2) |
| Surge Immunity | Optional Surge Protection Device, Compliance with GB/T 17626.5-2008/IEC61000-4-5:2005, Meets "Installation Class 4" |
| **Environmental** | |
| IP Rating | Toxic and Oxygen: IP66/67 LEL/NDIR: IP66 |
| Operating Temperature*** | -40°C〜+70°C |
| Operating Humidity | LEL/NDIR: 0~95%RH (Non-condensing)<br>Toxic and Oxygen: 15%~95%RH (Non-condensing) |
| Operating Pressure | 90〜110kPa |
| Storage Conditions | -20°C~+50°C, 45-75%RH(Non-condensing), in clean air |

| Gas | Default Range | Selectable Full-Scale Range | Resoluti on | Lower Detecta ble Limit | Default Cal Point | Selectable Cal Gas Range | Response Time (T90/T10) | | Detection Error | Default Alarm 2 | Default Alarm 1 | STEL | TWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O2 | 30.0%vol | 25.0-30.0%vol | 0.1%vol | - | 20.9%vol | 20.9%vol (Fixed) | <20s | <30s | <±0.7%vol | 23.5%vol ▲ | 19.5%vol ▼ | n/a | n/a |
| H2S | 100ppm | 20.0-200.0ppm | 0.1ppm | 0.5ppm | 50ppm | 30%~70% of Full-Scale Range | <25s | <25s | <±2ppm | 20ppm ▲ | 10ppm ▲ | 5ppm | 1ppm |
| CO | 500ppm | 50-1000ppm | 1ppm | 3ppm | 250ppm | | <25s | <25s | <±5ppm | 50ppm ▲ | 25ppm ▲ | 27ppm | 18ppm |
| LEL | 100%LEL | 100%LEL | 1%LEL | - | 50%LEL | | <25s | <30s | <±5%LEL | 50%LEL ▲ | 25%LEL ▲ | n/a | n/a |
| CH4-IR | 100%LEL | 100%LEL | 1%LEL | - | 50%LEL | | <30s | <35s | <±5%LEL | 50%LEL ▲ | 25%LEL ▲ | n/a | n/a |
| NH3-L | 100ppm | 20.0-100.0ppm | 0.1ppm | 2ppm | 50ppm | 20%~80% of Full-Scale Range | <60s | <35s | <±5ppm | 70ppm ▲ | 35ppm ▲ | 35ppm | 25ppm |
| NH3-H | 500ppm | 200-1000ppm | 1ppm | 3ppm | 250ppm | | <90s | <120s | <±10% or ±5%FS | 300ppm ▲ | 150ppm ▲ | 35ppm | 25ppm |
| Cl2 | 10ppm | 5.0-50.0ppm | 0.05ppm | 0.1ppm | 5ppm | | <40s | <50s | <±1ppm | 6ppm ▲ | 3ppm ▲ | 1ppm | 0.5ppm |
| SO2 | 20ppm | 10.0-50.0ppm | 0.1ppm | 0.2ppm | 5ppm | | <25s | <40s | <±0.5ppm | 10ppm ▲ | 5ppm ▲ | 3.8ppm | 1.9ppm |
| C2H3Cl | 100ppm | 10.0-100.0ppm | 0.1ppm | 0.3ppm | 50ppm | | <90s | <180s | <±10% | 10ppm ▲ | 5ppm ▲ | 7.6ppm | 3.8ppm |
| Cl2-L | 5ppm | 1.00-5.00ppm | 0.01ppm | 0.2ppm | 2ppm | | <70s | <60s | <±0.2ppm | 0.6ppm ▲ | 0.3ppm ▲ | 1ppm | 0.5ppm |
| H2 | 1000ppm | 1000ppm | 1ppm | 5ppm | 200ppm | | <90s | <90s | <±10% or ±5%FS | 400ppm ▲ | 200ppm ▲ | n/a | n/a |
| ETO | 100ppm | 10.0-100.0ppm | 0.1ppm | 0.3ppm | 50ppm | | <150s (T50<45s) | <260s | <±10% or ±5%FS | 10ppm ▲ | 5ppm ▲ | 2ppm | 1ppm |
| HCl | 30ppm | 10.0-30.0ppm | 0.1ppm | 0.3ppm | 10ppm | | <45s | <30s | <±10% or ±5%FS | 10ppm ▲ | 5ppm ▲ | 2ppm | 1ppm |
| NO2 | 20ppm | 10.0-50.0ppm | 0.1ppm | 0.3ppm | 10ppm | | <12s | <12s | <±10% or ±5%FS | 10ppm ▲ | 5ppm ▲ | 5.2ppm | 2.6ppm |
| HCN | 30ppm | 10.0-50.0ppm | 0.1ppm | 0.4ppm | 15ppm | | <45s | <35s | <±10% or ±5%FS | 10ppm ▲ | 5ppm ▲ | 4.7ppm | 2.4ppm |
| CO2 | 50000ppm | 10000-50000ppm | 10ppm | 200ppm | 20000ppm | | <30s | <35s | <±10% or ±5%FS | 8000ppm ▲ | 4000ppm ▲ | 30000ppm | 5000ppm |
| PH3 | 5ppm | 5.0-20.0ppm | 0.01ppm | 0.3ppm | 2.5ppm | | <30s | <40s | <±10% or ±5%FS | 4ppm ▲ | 2ppm ▲ | 1.0ppm | 0.3ppm |
| C3H3N | 10ppm | 4.0-20.0ppm | 0.1ppm | 0.4ppm | 5ppm | | <120s | <240s | <±10% or ±5%FS | 18ppm ▲ | 5ppm ▲ | 1.0ppm | 0.5ppm |
| NO | 100ppm | 50.0-250.0ppm | 0.5ppm | 2.0ppm | 50ppm | | <25s | <30s | <±10% or ±5%FS | 60ppm ▲ | 30ppm ▲ | 35ppm | 25ppm |
| Propane- IR | 100%LEL | 100%LEL | 1%LEL | - | 50%LEL | 30%~70% of Full-Scale Range | <30s | <35s | <±5%LEL | 50%LEL ▲ | 25%LEL ▲ | n/a | n/a |
| "Propylene-IR" | 100%LEL | 100%LEL | 1%LEL | - | 50%LEL | | <30s | <35s | <±5%LEL | 50%LEL ▲ | 25%LEL ▲ | n/a | n/a |

Remarks:
* RAEGuard 3 will provide users more communication interfaces and gas types in the future, such as wireless. For availability, please contact Honeywell Analytics.
*** Catalytics and NDIR-CH4 sensor can work continuously at -40°C ~ +70°C; toxic and oxygen sensor can work continuously at -20°C ~ +55°C, intermittently at -40°C ~ +70°C (The accuracy and response time of sensors operating in this temperature range will be affected, and long-term operation may lead to sensor sensitivity decline or even damage.)
**** The performance characteristics of the products mentioned above are typical results tested in an environment with a temperature 20°C and a humidity of 50% RH. When calibrating, use the calibration cap and recommended flow for detection. If the sunshade/deluge cover is used instead or the detection is carried out at low temperature, the response time will be slowed down.
FGM-6a00b, "a" indicates sensor type, includes 1(LEL), 2(NDIR), 3(EC). "b" indicates material of main housing, includes S (stainless steel) and blank(aluminum alloy).
* Tests have been done to prove that the operating temperature can be extended to 60°C for H2S and SO2 sensor without impacting performance;

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