Agrinovo

AGRINOVO-GF-201-NH3

Fixed Ammonia (NH_3) Gas Detector

1. Overview

The AGRINOVO-GF-201-NH3 is a fixed-point ammonia (NH_3) gas detector for continuous monitoring in agricultural and industrial environments. A sensing cell with automatic temperature compensation and zero/span drift correction delivers stable readings, while a flameproof aluminium alloy enclosure (Ex d IIC T6) makes it suitable for hazardous areas. The on-board LCD shows live concentration and alarm status, and three independent output paths (4-20 mA, RS485 Modbus-RTU, and two relays) integrate the unit into a controller, PLC, or DCS.

Key Features

- NH_3 range: 0-100 ppm
- Resolution: 0.1 ppm
- Accuracy: ≤±3% FS
- Temperature-compensated sensing cell
- 4-20 mA + RS485 Modbus-RTU + two relays
- Two-stage alarm, freely configurable
- Flameproof Ex d IIC T6, IP65
- Wide supply: 12-30 VDC

Applications

- Poultry houses and confined livestock housing
- Composting and manure handling areas
- Fertilizer storage and handling
- Refrigeration plants using ammonia

2. Specifications

Sensing and Performance

Parameter	Specification
Target Gas	Ammonia (NH_3)
Measuring Range	0-100 ppm (0-50, 0-200, 0-500, 0-1000 ppm on request)
Resolution	0.1 ppm
Accuracy	≤±3% FS
Repeatability	≤±1%
Sampling Method	Diffusion (pump-suction optional)
Response Time	≤30 s (T90)
Display	LCD with backlight
Temperature Compensation	Automatic

The same detector platform accepts replacement sensing cells for other gases; contact us for the full selection.

Electrical and Outputs

Parameter	Specification
Supply Voltage	24 VDC (12-30 VDC)
Power Consumption	≤2 W
Analog Output	4-20 mA, 3-wire (2-wire optional)
Digital Output	RS485, Modbus-RTU, 4-wire
Alarm Output	Two relays, normally open, AC 120 V 0.5 A / DC 24 V 1 A

Mechanical and Environmental

Parameter	Specification
Mounting	Wall mount or pipe flow-through
Enclosure	Aluminium alloy, flameproof
Ex Rating	Ex d IIC T6
Protection Rating	IP65
Cable Entry	M20×1.5 internal thread
Operating Temperature	-20 to 50°C
Humidity	10-95% RH, non-condensing
Pressure Range	86-106 kPa
Dimensions	196 × 140 × 91 mm
Weight	1.2 kg

3. Wiring

Terminals are accessed by unscrewing the enclosure cover. Disconnect power before opening the housing in any area where gas may be present.

Power and Analog Output (P2)

Terminal	Function	Description
24V+	V+	Power Supply (12-30 VDC)
GND	GND	Power ground / 4-20 mA return
mA	4-20 mA	Analog current output (+)

RS485 (P3)

Terminal	Function	Description
A+	RS485-A	Data+
B-	RS485-B	Data-

Alarm Relays

Terminal	Function	Contact
P4 (AL)	Low alarm relay	NO, dry contact
P5 (AH)	High alarm relay	NO, dry contact

> Relay contacts are voltage-free (passive). Do not exceed the rated contact capacity (AC 120 V 0.5 A / DC 24 V 1 A) or the relay may be damaged. Connect the cable shield to the internal ground terminal.

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4. Communication Settings

Parameter	Value
Protocol	Modbus-RTU
Baud Rate	9600 bps
Data Bits	8
Parity	None
Stop Bits	1
Default Address	0x01

RS485 is half-duplex. Use shielded twisted-pair cable, keep the bus below 1200 m, and terminate long runs as needed.

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5. Register Map

Measurement Registers (Function 0x03)

Address (Hex)	Description	Data Type	Range	Scaling
0x0000	Gas Concentration	UINT16	0-65535	Value ÷ 10^(decimals)
0x0011	Resolution (decimal places)	UINT16	0-3	Direct
0x0013	Full-Scale Range	UINT16	0-65535	Value ÷ 10^(decimals)

On the 0-100 ppm / 0.1 ppm unit the decimal-places register (0x0011) reads `1`, so the concentration register (0x0000) is divided by 10 (a raw value of 253 reads as 25.3 ppm) and the range register (0x0013) reads `1000`.

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6. Reading Data

Read one register from 0x0000 to obtain the live concentration:

```
Request:  01 03 00 00 00 01 84 0A
Response: 01 03 02 XX XX [CRC]
```

Decoding (decimals = 0):

Register	Hex	Decimal	Scaling	Result
Concentration	0x00FD	253	÷ 10	**25.3 ppm**

To confirm scaling on any unit, read register 0x0011 for the number of decimal places and divide the raw concentration by 10 raised to that value.

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7. Address Configuration

The device address is set from the front-panel menu (Settings → Device Address), not over the bus. Assign a unique address to each unit before wiring multiple detectors onto the same RS485 trunk. Example request frames reading concentration from successive addresses:

```
Address 1:  01 03 00 00 00 01 84 0A
Address 2:  02 03 00 00 00 01 84 39
Address 3:  03 03 00 00 00 01 85 E8
```

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8. Calibration

Calibration is performed from the front-panel menu and must be carried out by trained personnel using certified gas. Recommended interval is at least once every six months.

Zero Calibration

In clean air with no target gas present, open Calibration → Zero, wait for the reading to stabilise, then save.

Span Calibration

1. Apply certified NH_3 span gas (a value near 50% of full scale is recommended) to the sensor for 2-3 minutes.
2. Open Calibration → Span and confirm the standard-gas concentration matches the cylinder.
3. Wait for the reading to stabilise, then save.

A menu option restores factory calibration parameters if a setting is changed in error.

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9. Installation Notes

Placement

- NH_3 is lighter than air: mount high, 0.3-0.6 m below the ceiling
- In livestock housing, keep the detector above animal reach
- Install near likely accumulation zones and ventilation dead spots
- Keep clear of splashing water, dust jets, and mechanical impact

Maintenance

- Keep the sensor gas inlet free of dust and deposits
- Recalibrate periodically with certified gas
- Verify alarm and output response after each calibration
- Replace the cell at end of life to maintain accuracy