Combined with complimentary HORIBA products, VA-5000EX series offers wide range of solutions and applications to various fields and industries.

With consistent expertise in gas analysis, HORIBA provides analyzers for wide array of gases. The combination of VA-5000EX series with complimentary HORIBA analyzers provides tailor-made system solutions, which answers the diverse needs of different customers.

Portable Gas Analyzer
PG-300 Series

Capable of measuring five (5) different gas components using a single lightweight, portable, and robust unit. Used for emission monitoring, R&D (fuel cell), stack cross-checking, etc.

NOx | SO_2 | CO | CO_2 | O_2 | CH_4

Magnetopneumatic Oxygen Analyzer
MPA-5000

Sampling pump is installed inside the analyzer. You can start measurement without external sampling unit.*1 Air carrier type: No need to prepare N_2 gas cylinder for carrier gas, which reduces running cost. N_2 carrier type: With N_2 carrier gas, 0-1 vol% measurement for O_2 is achieved.

*1 Sampling unit can be required depending on sample gas condition.

O_2

Stack Gas Analyzer
GI-700 Series

Designed for continuous measurement of up to six (6) combustion gases simultaneously. The integral sample conditioning system ensures accurate measurement.

Fits in a standard 19-inch rack

NOx | CO_2 | CO | SO_2 | NH_3 | O_2

IMS The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System OHSAS18001.
We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

⚠ Please read the operation manual before using this product to assure safe and proper handling of the product.

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HORIBA
Process & Environmental

NEW

Explosion proof type
Multi-Component Gas Analyzer

VA-5000EX Series

Explore the future Automotive Test Systems | Process & Environmental | Medical | Semiconductor | Scientific HORIBA

Safe, Reliable, and Flexible!Multi-Component Gas Analyzer VA-5000EX Series

Certification Related Information

- IECEx Certification

- IECEx Ex pzc IIC T5 -
  IECEx INE 20.0012X

- ATEX Certification

- II 3G Ex pzc IIC T5 Gc -
  INERIS 20ATEX0013X

- Installation environment

VA-5000EX is designed for the following environment.

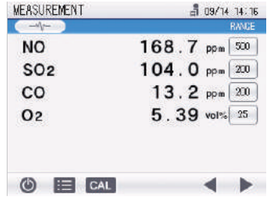
■ Gas
■ Hazard area, Zone 2

WARNING

WARNING – PRESSURIZED ENCLOSURE
WARNING – POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 3 MINUTES AT A FLOW RATE OF 254 L/min
WARNING – BATTERIES ARE LOCATED INSIDE THIS ENCLOSURE. DO NOT OPEN WHEN AN EXEXPLOSIVE ATMOSPHERE IS PRESENT
WARNING – THIS PRESSURIZED ENCLOSURE CONTAINS A BATTERY WHICH REMAINS CONNECTED AFTER THE EXTERNAL POWER HAS BEEN ISOLATED. CONSIDERATION SHOULD BE GIVEN TO THE REMOVAL OF THE BATTERY IF THE ENCLOSURE IS TO REMAIN UNPROTECTED BY EX P FOR A SIGNIFICANT TIME
WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

Flexibility for Various Applications

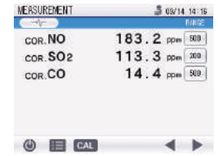
- Provides wide selection of measurement range; from parts per million (ppm) to percent concentration.
- Capability to simultaneously measure up to four gas components.
  * Refer to the specifications table on page 3 for possible combination of modules.
- Automatic internal correction of measurements, such as oxygen (O_2) corrected value. No need for additional external programmable logic controller (PLC).
- Thermostat for optical unit allows use in tougher sample gas conditions.



Measurement

User-Friendly Features

- The 10.4-inch touchscreen LCD with real-time trend graph analysis provides easy recognition of measurement value stabilization.
- Compact size: Enable easy replacement and installation within tight spaces VA-5000EX (Wall mount type): 680mm(W)×250mm(D)×600mm(H)
- Operates in standard Modbus™ TCP communication with optional analog and digital I/O.
- Continuous data for up to 15 days can be stored via 1GB USB.



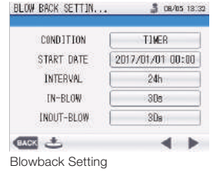
Measurement

Other Features

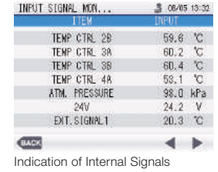
- Blowback control function enabling measurement of sample gases with high dust concentration. VA-5000 series can control blowback via digital output with an internal sequencer.
  *Please consult HORIBA for further details.
- Multiple analog outputs feature, maximum of eight (8) channels, even for the same parameter.
  *Please consult HORIBA for further details.
- Self-diagnosis function enables high/low concentration alarms, calibration error alarm, etc.
- Internal signal data view and logging capabilities for quick system diagnostics, such as "internal temperature control data", "detector voltage signal", etc. Data transfer to users' data logger can be done via Modbus™ TCP.

Concentration Alarm Setting

Auto Calbration Setting



Blowback Setting



Indication of Internal Signals

Application Examples

- Main process of petrochemical plant, LNG supplier, combustible material supplier, Paint plant, LNG producer process, waste gas treatment company, semiconductor factory Mainly installed in the area where flammable materials are used in areas where protection is required from ignition

Customized combination of modules and sampling units satisfies diverse measurement needs.

		NDIR1	NDIR2	NDIR3	Galvanic	Zirconia	PMA
Module	Analyzer	CO・CO_2・CH_4・N_2O・NO・SO_2・NH_3			O_2		
1	VA-5001EX	•					
	VA-5004EX				•		
	VA-5005EX					•	
	VA-5006EX						•
2	VA-5011EX	•	•				
	VA-5014EX	•			•		
	VA-5015EX	•				•	
	VA-5016EX	•	•				•
3	VA-5111EX	•	•	•			
	VA-5114EX	•	•		•		
	VA-5115EX	•	•			•	
	VA-5116EX	•	•				•
4	VA-5214EX	•	•	•	•		
	VA-5215EX	•	•	•		•	
	VA-5216EX	•	•	•			•

*Please consult us about Sampling Unit for VA-5000WM and further information.

Wide selection for the multiple measurement ranges included in each module

Measurement method	Component	Option range	Standard range		Zero drift		Span drift*1		Repeatability
		High Sensitive Min. range	Min. range	Max. range	Standard range	High Sensitive	Standard range	High Sensitive	
NDIR	CO	0-50 ppm	0-200 ppm	0-100 vol%	±2.0%/week of F.S.	±2.0%/day (CO : 0-50–99 ppm range, CO_2: 0-50–99 ppm range, SO_2: 0-100–199 ppm range) ±1.0%/day (CO : 0-100–199 ppm range, CH_4: 0-100–199 ppm range)	±2.0%/week of F.S.	±2.0%/day (CO : 0-50–99 ppm range, CO_2: 0-50–99 ppm range, SO_2: 0-100–199 ppm range) ±1.0%/day (CO : 0-100–199 ppm range, CH_4: 0-100–199 ppm range)	±0.5% of F.S.
	CO_2	0-50 ppm	0-100 ppm	0-100 vol%					
	CH_4	0-100 ppm	0-200 ppm	0-100 vol%					
	N_2O	NA	0-100 ppm	0-5000 ppm					
	NO	NA	0-500 ppm	0-1 vol%					
	SO_2	0-100 ppm	0-200 ppm	0-10 vol%					
	NH_3	NA	0-100 ppm	0-1000 ppm					
Galvanic	O_2	NA	0-5 vol%	0-25 vol%	±1.0%/day of F.S.		±1.0%/day of F.S.		±0.5% of F.S.
Zirconia		NA	0-5 vol%	0-25 vol%	±1.0%/week of F.S.		±2.0%/week of F.S.		±0.5% of F.S.
PMA		NA	0-5 vol%	0-100 vol%	±2.0%/week of F.S.		±2.0%/week of F.S.		±0.5% of F.S.

Note 1: Select multiple measurement ranges within the above minimum and maximum range table in accordance to the following conditions.
[NDIR] Five (5) ranges; the highest range must be within the maximum limit ratio of 10x the lowest range. Maximum limit of 20x the lowest range is also an available option, which may be limited by the cell length.
[CLA] Eight (8) ranges; the highest range must be within the maximum limit ratio of 100x the lowest range. If the maximum range exceeds 2000ppm, the minimum range should be at least 50ppm or more.
[MPA] Five (5) ranges; the highest range must be within the maximum limit ratio of 10x the lowest range.
[Galvanic] Five (5) ranges; the highest range must be within the maximum limit ratio of 5x the lowest range.
[Zirconia] Five (5) ranges; the highest range must be within the maximum limit ratio of 5x the lowest range.
[PMA] Three (3) ranges; the highest range must be within the maximum limit ratio of 10x the lowest range.
Note 2: Contact HORIBA if you require measurement of special gases or ranges.
*1% of span drift for NDIR is achievable with special adjustment at factory. Please contact the HORIBA team for further details.

Various combinations of sensor modules provide excellent flexibility

The free combination of measurement modules, which utilizes different technologies to measure various gases, makes the VA-5000 series truly applicable to the diverse needs of gas analysis for process control, environmental monitoring, research and development (R&D) testing, etc. The sensors lineup includes: the dual-beam non-dispersive infrared (NDIR) absorption method, which measures nine (9) different gases in wide ranges; the chemiluminescence (CLA) method, which allows measurement of mono-nitrogen oxides (NOX) in low concentrations; and three (3) types of oxygen (O2) detectors that users may select from to meet measurement requirements.

SO_2, CO, CO_2, CH_4, N_2O, NO, NH_3

NDIR

Dual-beam Non-Dispersive Infrared Absorption Method

As sample gas flow through the measurement cell, a beam of infrared energy (at a wavelength appropriate for the gas being measured) travels through the sample gas and strikes the infrared (IR) detector. The gas being measured absorbs infrared energy and reduces the energy reaching the IR detector. As a result, the pressure of the gas in the first chamber of the detector is reduced, causing gas to flow from the first chamber to the other. This gas flow passes over the precise temperature sensor between the chambers and reduces the resistance value of the sensor element. Since the resistance value was previously calibrated relative to a specific gas concentration, the measured resistance value can be displayed as a gas concentration reading for the sample gas. HORIBA' s Micro Electro Mechanical Systems (MEMS) technology allows the manufacture of IR temperature sensor that is very small yet very sensitive, highly reliable, and vibration-resistant.

*When using the NDIR carbon dioxide (CO_2) analyzer, ensure that the background concentration of CO_2 in the operating environment is stable.
*CO interference for N_2O measurement is eliminated by improved NDIR detector.

O_2

Choose from four analysis methods for the oxygen (O_2) analyzer module.
Select the sensor module based on your specific requirements and sample gas conditions.

Zirconia

Zirconia

Stable measurement unaffected by environmental conditions

Galvanic Cell

Galvanic cell

Stable measurement with a compact and lightweight sensor

PMA

Paramagnetic

High accuracy, fast response time, and absolute linearity measurement advantages.

Characteristics of O_2 analyzers

		Zirconia	Galvanic	PMA
Performance	Stability of design	◉		◉
	Warm-up and start-up performance	◉	◉	
Sample gas condition	Flammable gas is present			
	High-concentration acidic gas is present			
	Sample flow rate should be minimized			◉
Installation environment	Carrier gas is not available	◉	◉	◉
	VS-5000 sampling system is not used	◉	◉	◉
	Installation environmental is vibrating	◉	◉	
Cost and other factors	Operation costs should be minimized	◉		◉
	Maintenance should be minimized	◉		◉

*When using the zirconia oxygen (O_2) analyzer and the sample gas contains reducing gases, such carbon monoxide (CO), total hydrocarbons (THC), and/or hydrogen (H_2), to prevent rapid deterioration of the zirconia sensor, the coexisting oxygen and water vapor concentrations must exceed the total concentration of the reducing gases.
The sample gas must meet this requirement: Reducing gas + H_2 < H_2O + O_2

Types of reducing gas: CO, H_2, and THC
Allowable concentrations: CO < 5000 ppm,
H_2 < 1000ppm, when THC is included, CO + H_2 < H_2O + O_2

Sample computation of reducing gases concentration acceptability

Types of reducing gas: CO H_2 THC

Allowable concentrations: CO <5000 ppm, H_2 <1000 ppm. When THC is included, CO +H_2 <H_2O + O_2

- Example 1: THC 1000ppm + CO 2000ppm + H_2 1000ppm < H_2O 8000ppm + O_2 1000ppm (acceptable)
- Example 2: THC 5000ppm + CO 4000ppm + H_2 1000ppm < H_2O 8000ppm + O_2 1000ppm (unacceptable)

Specifications

VA-5000EX Analyzer

Measurement principle			NDIR		Magnetopneumatic	Galvanic cell	Zirconia	Paramagnetic
Performance	Linearity	Standard	±1.0% F.S.					
		Option	±2.0% F.S.(range ratio 1:20)		–	–	–	–
	Response time		30 sec or less (T_{90}), 40 sec or less (Td+T_{90}); single component*1					45 sec (Td+T_{90})
	Warm-up time		60 min (90 min for SO_2)		60 min	40 min	20 min	120 min
Flow rate	Standard		0.5L/min		0.5L/min	0.5L/min	0.5L/min	0.5L/min
	Option		1.0L/min*2		–			1.0L/min*2
Communication			Ethernet (Modbus™/TCP)					
Data storage	Option		USB memory					
Input/Output (option)	Analog	Input	Maximum 4ch, 0-16 mA / 4-20 mA / 0-20 mA or 0-1 V isolated					
		Output	Maximum 8ch, 0-16 mA / 4-20 mA / 0-20 mA or 0-1 V isolated, Current output: load resistance < 750Ω, Voltage output: input impedance > 100k Ω					
	Digital	Input	Maximum 16ch isolated, Open voltage: 24 V, Short-circuit current 10mA Maximum load resistance < 50 Ω, Minimum pulse width: 0.5 sec					
		Output	Maximum 16ch isolated, Maximum voltage DC 30 V, Maximum current 1A Minimum voltage DC 0.1 V, Minimum current 0.1 mA					
Sample condition			Ambient temperature, dust free, H_2O less than 5°C saturation, Pressure 0 to 490 Pa Other: Shall contain no corrosive gas, combustible gas, and explosive gas.					
Gas connections			Inlet and outlet - 6 mm/4 mm PTFE: a single gas inlet is provided standard; the gas flows sequentially from one module to the next; as an option separate gas inlets can be provided for each module.					
Gas tubing			PTFE; stainless steel optional					
Joint			Sample Inlet: Rc 1/8(φ6/φ4mm SUS joint), Exhaust: φ6/φ4mm SUS joint					
Installation			Temperature 0-45°C, Humidity 90% (No condensation), Altitude Max 3000m (combination with only NDIR)					
Protection degree			Equivalent to IP20					
Power			100-240 V AC (±10%, maximum voltage 250 VAC), 50/60 Hz (±1.0%), Consumption: 100 to 350 VA					
Display			14.4-inch touch screen					
Case			VA-5000EX: Mounted on wall					
Exterior dimensions			VA-5000EX: 680 (W) × 250 (D) × 600 (H) mm / Approx. VA-5000WM: 424 (W) × 206 (D) × 484 (H) mm / Approx. 17 (W) x 8 (D) x 19 (H) in *protrusions excluded					
Mass			VA-5000EX: 40-48kg, Approx. 15-40lb / VA-5000WM: 14-24kg, Approx. 31-53lb					

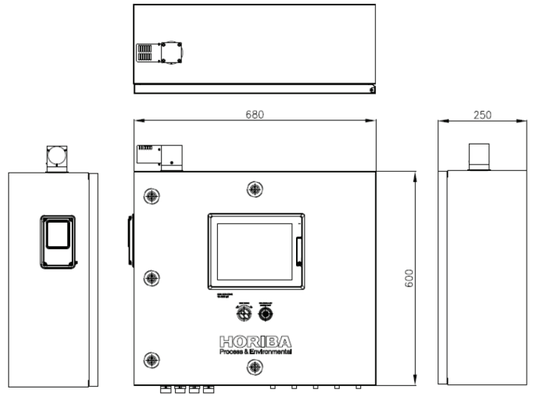
*1 When single component: flow rate is 0.5L/min

*2 Available when all components are NDIR and PMA

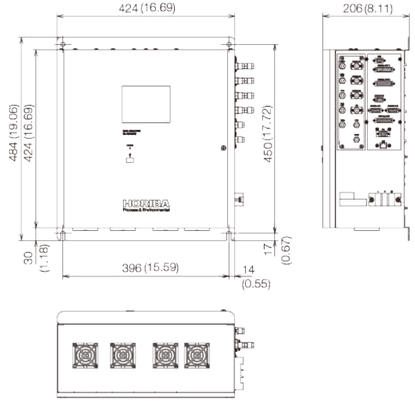
Dimensional Outlines

Rubber feet, deozonator unit and mounting brackets (e.g. slide rails, and rack mounting plates) are optional. Unit: mm(in)

VA-5000EX
(Analyzer)



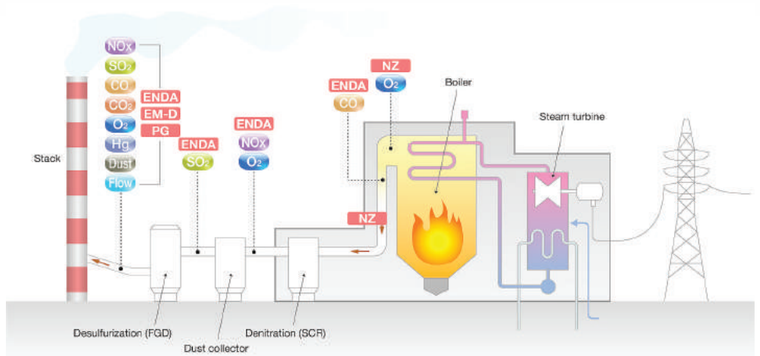
VA-5000WM
(Analyzer)



Gas monitoring Power Plant

For the stable operation of power plants and supply of electricity

Meeting electricity demand requires the stable operation of power plants, stable supply of electricity, and more accurate management of combustion efficiency. HORIBA is contributing to the analysis of the power generation process with its extensive product lineup ranging from stack gas analysis needed for the power generation process to the waste water treatment.



	Application	Measurement Components	Model
1	Combustion efficiency management by O_2 measurement	O_2	NZ
2	Combustion efficiency management by CO measurement	CO	ENDA
3	NOx measurement after denitration process	NOx	ENDA
4	NH_3 measurement after denitration process for controling ammonium additive amount	NH_3	ENDA
5	SO_2 measurement after desulfurization process	SO_2	ENDA
6	Stack gas measurement after denitration and desulfurization process	NOx, SO_2, CO, CO_2, O_2	ENDA
7	Dust measurement	Dust	EM-D
8	For intermittent measurement instead of ENDA	NOx, SO_2, CO, CO_2, O_2	PG