

NO **NO₂** **N₂O** **NH₃**

HORIBA ONE Series Introduces N-Compounds Analyzer

High accurate nitrogen compounds measurement system using QCL-IR method employs "HORIBA ONE PLATFORM". This system provides the usability and expandability for your test laboratories, as well as other HORIBA ONE series instruments.



For R&D of Advanced NO_x After-Treatment Systems

- Simultaneous real-time measurement of four nitrogen compounds (NO, NO₂, N₂O and NH₃)
 - Using Quantum Cascade Laser Mid-infrared Spectroscopy
 - Wide dynamic range (e.g. NH₃: 0.6 ppm to 2000 ppm)
 - Fast response measurement with the analyzer installed near the engine*¹
- NO / NO₂ / N₂O : Less than 2 seconds t_{10-90} response
 NH₃ : Less than 5 seconds t_{10-90} response

*1 For details of verification condition, refer to the specification table.



Trend Chart



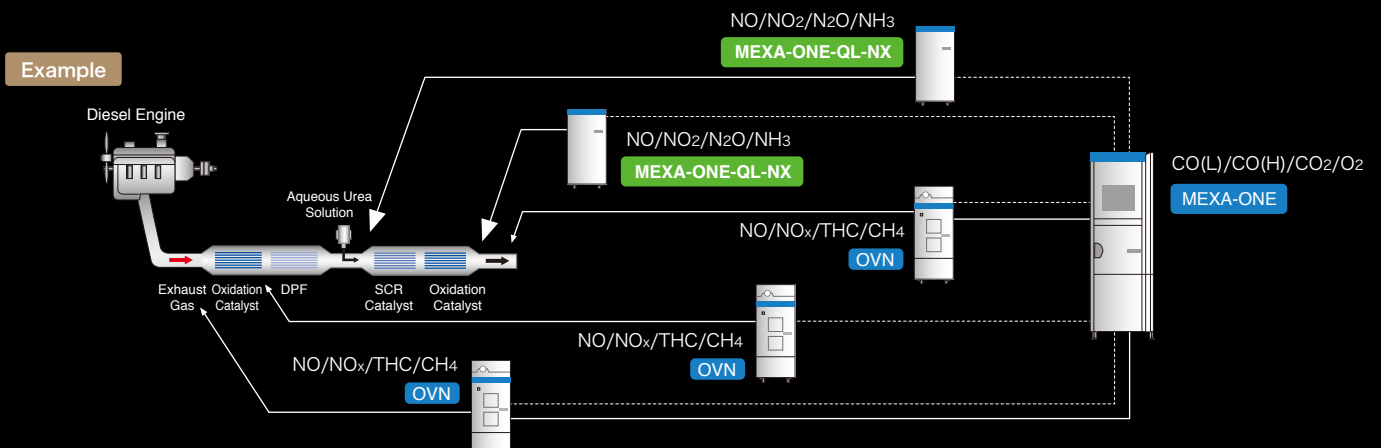
Integrated Operating Platform for managing all test devices and functions on one single display



Applications

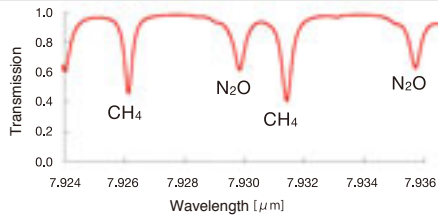
- Development of new NO_x after-treatment systems, such as urea-SCR, CRTs and LNTs
- As an R&D tool for new regulations - Certification or reporting of GHG*² emissions (EPA)
 - Direct measurement of N₂O from Heavy-duty and non-road engines
 - R&D related to Euro VI
 - Direct measurement of NO₂•NH₃ from Heavy-duty engines

*2: GHG = Greenhouse Gas



Key Features of QCL-IR Spectroscopy

1. Mid-IR laser with long optical path provides ultra high sensitivity
2. Dual path in a single cell gives wide dynamic measurement range
3. Minimum interference from co-existing components :
High resolution spectrum (up to 0.001cm⁻¹)
4. Ease of use : No liquid N₂ required for detector



High resolution laser spectroscopy From HITRAN

Model	MEXA-ONE-QL-NX	
Measuring Principle	Quantum Cascade Laser Infrared (QCL-IR) Spectroscopy	
Measuring Components	NO·NO ₂ ·N ₂ O·NH ₃	
Measuring Range	NO : (Low) 0-100 ppm	(High) 0-5000 ppm
	NO ₂ : (Low) 0-50 ppm	(High) 0-2000 ppm
	N ₂ O : (Low) 0-100 ppm	(High) 0-2000 ppm
	NH ₃ : (Low) 0-50 ppm	(High) 0-2000 ppm
Zero Noise (2σ) (σ: Standard Deviation)	NO : Low range : 0.4 ppm or less	High range : 20 ppm or less
	NO ₂ : Low range : 0.2 ppm or less	High range : 8 ppm or less
	N ₂ O : Low range : 0.4 ppm or less	High range : 20 ppm or less
	NH ₃ : Low range : 0.2 ppm or less	High range : 8 ppm or less
Sample Line Temperature	113 ± 6°C	
Response Time (t ₁₀₋₉₀)	NO·NO ₂ ·N ₂ O : 2 seconds or less NH ₃ : 5 seconds or less *	
Dimensions / Mass	Main unit: W440xD660xH877 (mm) Approx. 120 kg (excluding protruding objects)	

* Verification condition: Flow NH₃ gas (50 ppm) from sample gas inlet at flow rate 8 L/min; Using a sample probe of 0.3 m, a heated filter and a heated line of 6 m.

For Certification Tests — EPA GHG Regulation Compliant

N₂O QL-N2O

- Highly sensitive N₂O measurement in diluted exhaust gas such as CVS-diluted gas
- HORIBA QCL technology purchased by the US EPA

US EPA GHG regulation and QCL-IR Spectroscopy

In 2010 and 2011, EPA^{*1} and NHTSA^{*2} officially announced the GHG Emission Standards and Fuel Efficiency Standards for Light-, Medium- and Heavy-duty Engines and Vehicles. Meeting the standards requires the ability to accurately measure low concentrations of N₂O. EPA has designated Laser Infrared Spectroscopy as an approved measurement method for N₂O, and HORIBA's QCL-IR Spectroscopy meets the requirements identified in Part 1065.

*1:EPA=United States Environmental Protection Agency
*2:NHTSA=National Highway Traffic Safety Administration

Measuring Components	N ₂ O	
Measuring Range	(Low) 0-5 ppm	(High) 0-200 ppm
Zero Noise (2σ) (σ: Standard Deviation)	Low range : 0.01 ppm or less	High range : 0.4 ppm or less
Response Time (t ₁₀₋₉₀)	4.5 seconds or less	
Dimensions / Mass	Main unit: W430xD590xH262 (mm) Approx. 35 kg (Mounted in 19 inch rack)	



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.

- The specifications, appearance or other aspects of products in this catalog are subject to change without notice.
- Please contact us with enquiries concerning further details on the products in this catalog.
- The color of the actual products may differ from the color pictured in this catalog due to printing limitations.
- It is strictly forbidden to copy the content of this catalog in part or in full.
- The screen displays shown on products in this catalog have been inserted into the photographs through compositing.
- All brand names, product names and service names in this catalog are trademarks or registered trademarks of their respective companies.

<http://www.horiba.com> e-mail: info@horiba.co.jp

HORIBA, Ltd. Japan

Head Office

2 Miyano Higashi, Kisshoin, Minami-ku, Kyoto, Japan
Phone: 81 (75) 313-8121 Fax: 81 (75) 321-5725

Tokyo Sales Office

2-6, Kanda-Awaji-cho, Chiyoda-ku, Tokyo, 101-0063, Japan
Phone: 81 (3) 6206-4721 Fax: 81 (3) 6206-4730

HORIBA (China) Trading Co., Ltd. China

Unit D, 1F, Building A, Synnex International Park, 1068 West Tianshan Road, Shanghai, 200335, China
Phone: 86 (21) 6289-6060 Fax: 86 (21) 6289-5553

Beijing Branch

12F, Metropolis Tower, No.2, Haidian Dong 3 Street, Beijing, 100080, China
Phone: 86 (10) 8567-9966 Fax: 86 (10) 8567-9066

HORIBA Instruments (Singapore) Pte Ltd. Singapore

3 Changi Business Park Vista #01-01 Akzonobel House, Singapore 486051
Phone: 65 (6) 745-8300 Fax: 65 (6) 745-8155

HORIBA Vietnam Co., Ltd. Vietnam

Unit 6, 10 Floor, CMC Tower, Duy Tan Street, Dich Vong Hau Ward, Cau Giay District, Hanoi, Vietnam
Phone: 84 (24) 3795-8552 Fax: 84 (24) 3795-8553

PT HORIBA Indonesia Indonesia

Jl. Jalur Sutera Blok 20A, No.16-17, Kel. Kunciran, Kec. Pinang Tangerang-15144, Indonesia
Phone: 62 (21) 3044-8525 Fax: 62 (21) 3044-8521

HORIBA (Thailand) Limited Thailand

East Office
850 / 7 Soi Lat Krabang 30 / 5, Lat Krabang Road, Lat Krabang, Bangkok 10520, Thailand
Phone: 66 (0) 2734 4434 Fax: 66 (0) 2734 4438

HORIBA KOREA Ltd. Korea

Seoul Branch

10, Dogok-Ro, 6-Gil, Gangnam-Gu, Seoul-Si, 06259, Korea
Phone: 82 (2) 753-7911 Fax: 82 (2) 756-4972

HORIBA India Private Limited India

246, Okhla Industrial Estate, Phase 3 New Delhi-110020, India
Phone: 91 (11) 4646-5000 Fax: 91 (11) 4646-5020

Technical Center

D-255, Chakan MIDC Phase-II, Bhamboli Village, Pune-410501, India
Phone: 91 (21) 3567-6000

HORIBA Instruments Incorporated USA

9755 Research Drive, Irvine, CA 92618, U.S.A.
Phone: 1 (949) 250-4811 Fax: 1 (949) 250-0924

Ann Arbor Facility

5900 Hines Drive Ann Arbor, MI 48108 U.S.A.
Phone: 1 (734) 213-6555 Fax: 1 (734) 213-6525

TCA/HORIBA Sistema de Testes Automotiva Ltda. Brazil

Rua Goiás 191 Vila Oriental, Diadema, São Paulo, Brazil CEP 09941-690
Phone: 55 (11) 4224 0200 Fax: 55 (11) 4227 3133

HORIBA UK Limited UK

Northampton Office

Kyoto Close Moulton Park, Northampton NN3 6FL, UK
Phone: 44 (1604) 542-500 Fax: 44 (1604) 542-699

HORIBA Europe GmbH Turkey

Istanbul Office

Küçükbakkalköy Mah. Kayışdağı Cad., Flora Residence No:3 / 2504 34750 Ataşehir / Istanbul
Phone: (90) 216 572 1166 Fax: (90) 216 572 1167

HORIBA FRANCE SAS France

Les Ulis Office

12, Av des Tropiques Hightec Sud, F-91955 Les Ulis, France
Phone: 33 (1) 69-29-96-23 Fax: 33 (1) 69-29-95-77

HORIBA OOO Russia

Altufievskoe shosse, 13, building 5, 127106, Moscow, Russia
Phone: 7 (495) 221-87-71 Fax: 7 (495) 221-87-68

HORIBA Europe GmbH Germany

Hans-Mess-Str.6 D-61440 Oberursel Germany
Phone: 49 (6172) 1396-0 Fax: 49 (6172) 1373-85

Leichlingen Office

Julius-kronenberg Str.9 D-42799 Leichlingen Germany
Phone: 49 (2175) 8978-0 Fax: 49 (2175) 8978-50

HORIBA Europe GmbH Sweden

Sweden Branch (Sodertalje)

Sydhamnsvagen 55-57, SE-15138, Sodertalje, Sweden
Phone: 46 (8) 550-80701 Fax: 46 (8) 550-80567

HORIBA ITALIA SRL Italy

Torino Office

Via Ferraggio, 30, 10151 Torino, Italy
Phone: 39 (11) 904-0601 Fax: 39 (11) 900-0448

HORIBA Czech Czech

Prague Office

Prumyslova 1306 / 7, CZ-10200, Praha 10, Czech Republic
Phone: 420 (2) 460-392-65

HORIBA (Austria) GmbH Austria

Kaplanstrasse 5 A-3430 Tulln, Austria
Phone: 43 (2272) 65225 Fax: 43 (2272) 65230