



AVL M.O.V.E NH3 – Portable Emission Measurement System (PEMS)

AVL M.O.V.E iS+ Extension - Highly accurate and robust NH3 measurement for in-vehicle application

INDUSTRY CHALLENGES

Euro7 and upcoming Global Real Driving Emissions (RDE) regulations like China7/VII will make RDE development and testing with portable emissions measurement systems (PEMS) even more challenging. Euro7 rules for heavy-duty vehicles will introduce new limits, including a limit for NH3. Existing limits will be reduced further. China is expected to follow the original Euro7 proposal in China 7/VII. Global OEMs will need to ensure compliance with the new, tighter limits for both heavy-duty and light-duty vehicles. On-board monitoring (OBM) is an additional upcoming challenge. It uses OBD NOx Sensors, which are known for their NH3 interference. Additional NH3 measurement helps to distinguish between NOx and NH3 during OBM calibration and verification.

THE AVL SOLUTION

The AVL M.O.V.E NH3 PEMS uses robust and tunable diode laser spectroscopy to measure the NH3 concentration during RDE. The device has been developed to address the

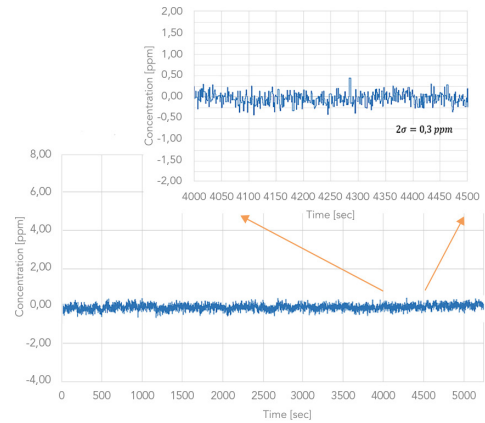
upcoming global RDE requirements and is an extension of the well-known MOVE iS+. Special focus was placed on the lowest measurement uncertainty over the entire ambient boundary range and on robustness.

THE ADDED VALUE

- Can be easily integrated into existing AVL M.O.V.E iS+ and combined with actual and upcoming M.O.V.E devices: There is no need to purchase everything new
- Accurate NH3 measurement within a wide ambient operating range
- Robust due to the chosen analyzer technology and additional measures
- Lightweight and compact device with low power consumption
- User guided RDE test execution and automated data evaluation with the AVL System Control and Concerto MDT post processing software



Installation on tow bar together with GAS PEMS iS+



Zero drift and zero noise

ROBUSTNESS AND RELIABILITY OF RESULTS

The AVL NH3 PEMS is based on Laser Absorption Spectroscopy (LAS). It uses a diode laser and a photo-based detector with high sensitivity for high accuracy and linearity over the entire measurement range. Stability of the results is supported by an internal temperature stabilization, pressure and water compensation. Development work also focussed on the sampling system and sample gas preconditioning to avoid hang-up effects and to protect the device from contamination. The sample line and sample gas path is heated above 170° to avoid any condensation of chemical side-products.

TESTING EFFICIENCY AND COST EFFECTIVENESS

The device can be easily and seamlessly integrated into existing MOVE iS+ systems. Therefore, not everything need be purchased new. Testing efficiency is supported by the AVL M.O.V.E System Control (minimum WIN 10 HW version required) as the central data logger and control device which guides the user through the test. The powerful AVL Concerto MDT post processing tool is available for data evaluation and report generation according to different emission regulations.

FLEXIBILITY OF INSTALLATION

The NH3 PEMS can be either used standalone or with the AVL M.O.V.E iS+ system. It can be mounted either inside the vehicle or externally on a tow bar. Dedicated mounting plates can be ordered for truck installation. Different lengths of heated lines, power and communication cables are available to enable easy installation.

TECHNICAL DETAILS

Measurement principle	Tunable Diode Laser (TDLAS)
Measurement value	NH3 (ppm)
Measurement range	0 – 1,500 ppm
Ambient operating range	-10 °C to +45 °C; 700 to 1,050 hPa (~ 0 – 3000 m)
Operating voltage	22 to 28.8 VDC/ appr. 350 W after warm-up
Accuracy	0 - 999: +-1.5 ppm or 1% rel. 1,000 - 1,500 ppm: +-2% rel.
Zero drift	≤ 1.5 ppm/ 4 hrs.
Weight/dimensions (WxHxD)	~ 17.5 / ~ 490 × 180 × 330 mm

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