

HORIBA

HYDROGEN GAS ANALYZER

HyEVO

— HYEVO-1000 —

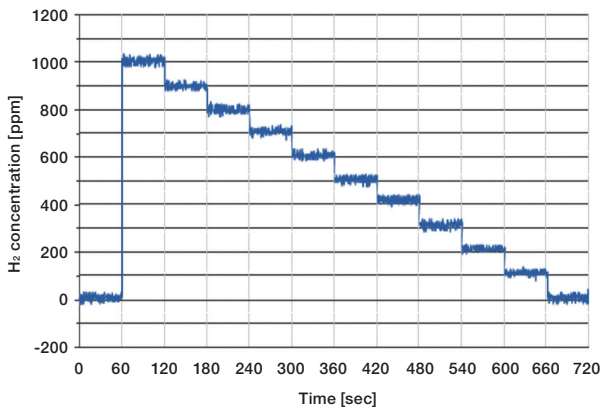
**High-accuracy, fast-response hydrogen gas analyzer
designed to support the development
of the hydrogen supply chain**

Essential for the development of technologies necessary to produce,
transport and use hydrogen and hydrogen related materials such as ammonia.

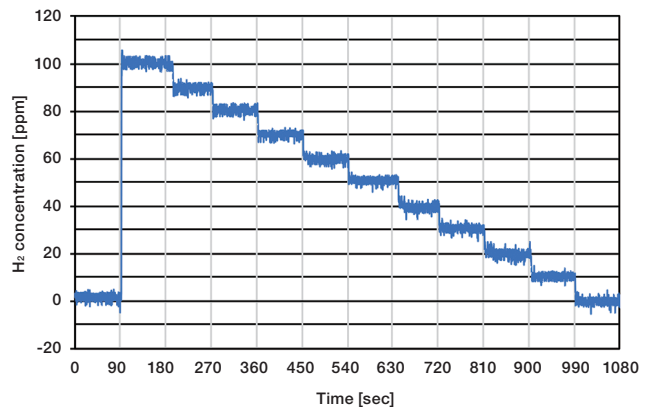


High resolution hydrogen concentration measurement

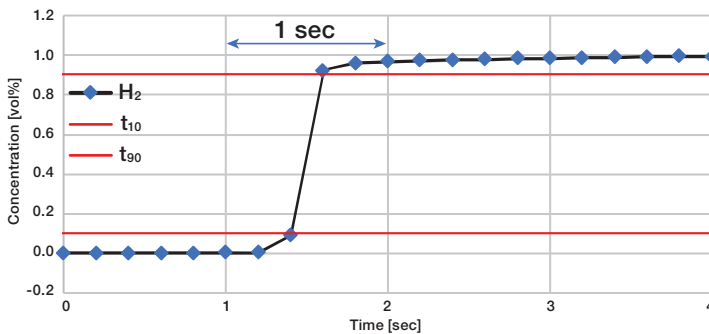
Capable of measuring hydrogen concentration differences of 100 ppm in the 0-5% or 0-10% range.



Capable of measuring hydrogen concentration differences of 10 ppm in the 0-1% range.



Fast response even with low-flow gases



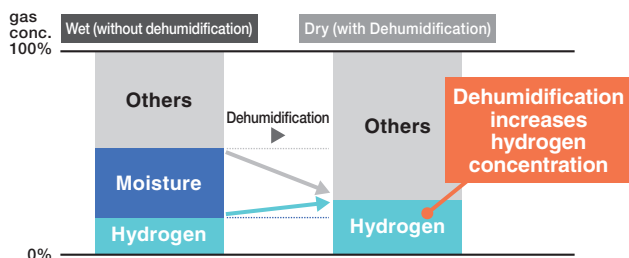
Sample gas flow rate: 3.5L/min.
Response time (T_{10-90}) within 1 second for both rise and fall even at low flow rates.

The data output frequency is 5Hz, which enables precise measurement of transient responses.

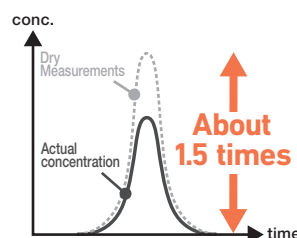
Why wet measurement of hydrogen combustion is more accurate

The concentration of other components increases as the moisture decreases when dehumidifying exhaust gas containing high concentrations of moisture.

Measurement by



Example: Theoretical combustion of hydrogen produces about 35 vol% water, so **Dry measurement would show about 1.5 times the concentration of components other than water.**



HyEVO uses **Wet** measurement without a dehumidifier

It meets the need for more accurate measurement of combustion of alternative fuels.

FEATURES

- High-accuracy, high-resolution hydrogen concentration measurement
- Direct measurement of gases with moisture concentrations up to 35% without removing moisture*¹
- Response time ≤ 1 sec, Output frequency 5Hz
- Can respond to transient changes in gas concentration
- Warm-up time of 3 hours (approx. 1/3 compared to conventional models) *²
- Power saving function during standby operation

*1 : Use a dehumidification cooler (optional) when measuring with dehumidification or when measuring gases with a moisture concentration of more than 35%.

*2 : Comparison with our conventional product (MSHA-1000)

Applications

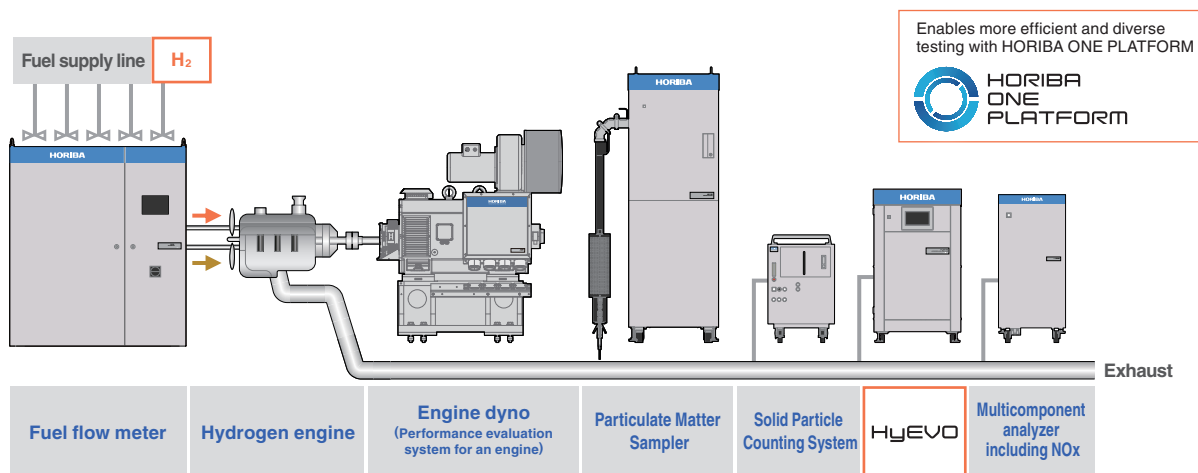
HyEVO can be used for many applications in combination with other measurement devices.

Field	Application example
Environment / Energy	<ul style="list-style-type: none"> • Hydrogen combustion in hydrogen gas turbines, hydrogen boilers • Hydrogen production through electrolyzer • Development of fuel cells as power generation devices • Production of synthetic fuels made from hydrogen and carbon dioxide
Mobility	Hydrogen measurement for fuel cells, hydrogen engines, gasoline engines

Application example

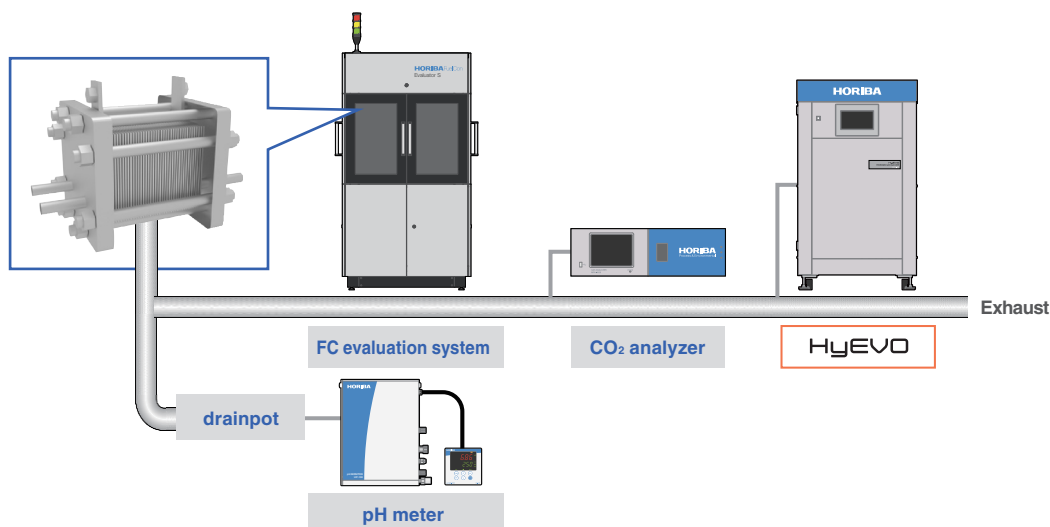
Measurement solution for hydrogen combustion (100% or mixed)

- Confirmation of the behavior of unburned hydrogen emitted and the evaluation of combustion efficiency



Measurement solutions in fuel cells

- Evaluation of fuel cell performance by measuring unreacted hydrogen permeating (cross-leaking) through the electrolyte membrane
- Evaluating the degradation of fuel cells by measuring water quality in exhausted condensate and CO₂ in exhaust gas



Overview

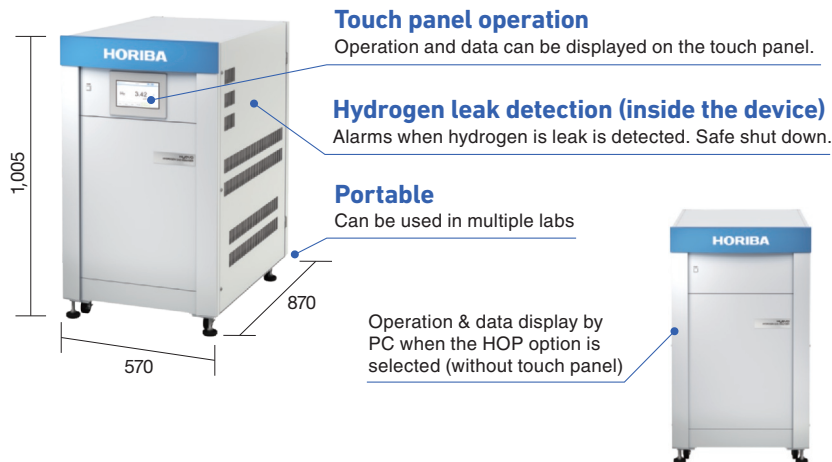
Measuring principles	Mass spectrometry
Measuring component	Hydrogen
Measuring range	0-5% (standard), 0-1%, 0-10% (HOP option*1)
Sampling condition	Direct
Response time	$t_{10-90} \leq 1$ s
Repeatability	Zero : $\leq 0.1\%$ F.S. Span : $\leq 0.3\%$ F.S.

Sample gas flow rate	3.5±0.5L/min
Sample line temperature	113±6°C
Environment temperature	5-35°C
Warm-up time	3 h
Dimensions	570(W) × 870(D) × 1,005(H) mm

*1 Low range and high range can be selected only when HORIBA ONE PLATFORM (HOP) is chosen.

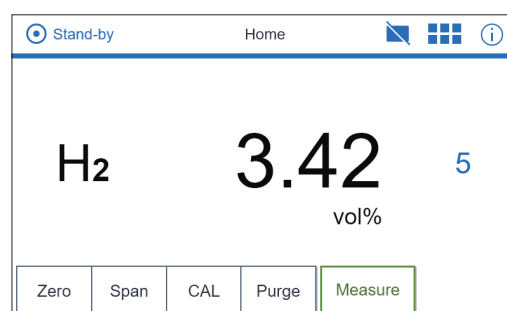
Dimensions / Operation panel

■ Dimensions/System configuration



■ Operation touch panel

- Easy to use HOME screen
- Simple to operate
- Display can be switched between vol% and volppm.



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 ISO45001. 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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