HovaCAL

Calibration gas generator
for highly accurate gas-vapor mixtures

Due to the sophisticated HovaCAL evaporation technology, nearly all kinds of liquids, like water, acids, alkaline solutions and organic solvents can be evaporated continuously and pulsation free and mixed with carrier gas.

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Technical Advantages

- ✓ Traceable on primary methods like gas meter and balance
- ✓ Quick gas response time due to minimized adsorption effects
- ✓ Water vapor content up to 80 Vol.-%
- ✓ Wide range of output, continuously adjustable
- ✓ Gas flow up to 1000 l/h as standard, higher gas flows as options
- ✓ Independent of temperature since complete evaporation
- ✓ Gas temperatures adjustable depending on the application
- ✓ Quick change of components by replacing the standard solution
- ✓ Gas mixtures produced from combined standard solutions
- ✓ Customer-defined components can be generated by the user
- ✓ Point-of-use generation: the separate evaporation unit generates the span gas where it is needed
- ✓ Easy portable in the portable case

What is HovaCAL?

HovaCAL is based on the principle of dynamic evaporation of liquids and mixture with carrier gas. Liquid is continuously pumped into an electrically heated evaporator, vaporized and mixed with carrier gas. Liquid pump, flow controller for carrier gas and temperature controller are installed in the supply unit.

The evaporator is installed separate from the supply unit. Both are connected via a link for carrier gas, liquid and power supply. The gas output of the evaporator can be fed in a heated line or directly in the gas analyzer. Accuracy, reproducibility and stability of the calibration gas mixture are achieved with precision mass flow controllers for carrier gas and a metering pump for liquid. The liquid flow can be verified with the help of a balance, the carrier gas flow by means of a gas meter. This guarantees the verification with primary standards at any time.

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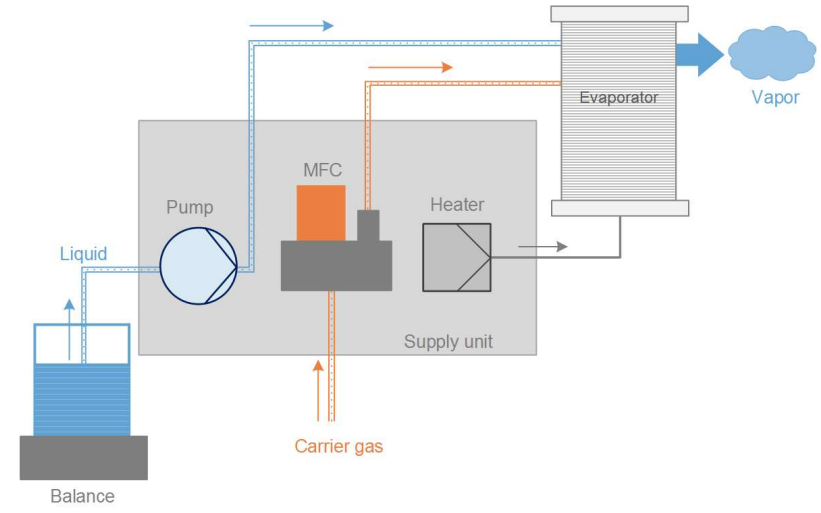

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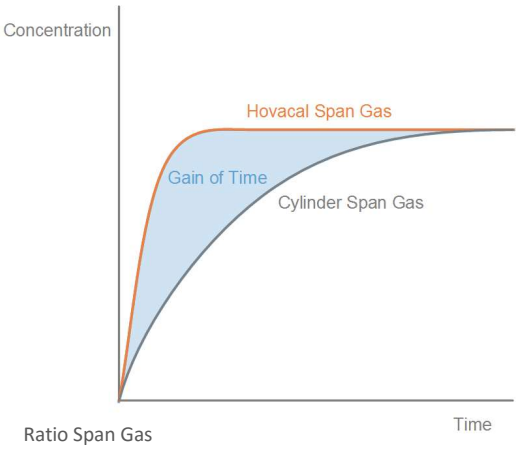
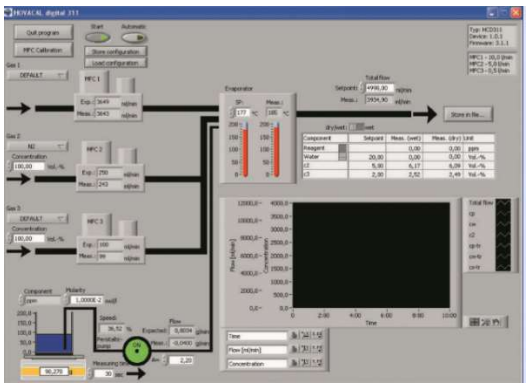
For the calibration and testing of continuous emission monitoring systems the components hydrogen chloride, ammonia, hydrogen fluoride and mercury chloride, are generated by evaporating their aqueous solutions and mixing them with nitrogen or air.
Pure water vapor mixtures for the calibration of moisture analyzers or for gas humidifying are produced by evaporating distilled water.

Vapor gas mixtures with organic components can be generated from pure solutions or organic reagents. Span gas for multi component analysis can be easily obtained with mixed reagents. The elevated temperature of the gas vapor mixture avoids adsorption and corrosion at gas exposed surfaces and minimizes gas response times.



Ratio Span Gas


User Interface

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Specification

Typical concentration range

Water vapor	0.1 – 80 Vol.%
Hydrogen chloride	0.1 – 2000 mg/m³
Ammonia	0.1 – 1000 mg/m³
Hydrogen fluoride	0.1 – 1000 mg/m³
Mercury chloride	1.0 – 100 µg/m³
Other components and ranges on request	

Performance based on reading

Linearity	< 2 %
Setting accuracy	< 2 %
Fluctuation	< 2 %
Stability	< 2 % /year, liquid measured by weighing

Time characteristics

Warm-up time	30 min
Response time	< 1 s to 30 s, depending on component and total flow

Adjustable parameters

Carrier gas flow	3 – 10 l/min
Liquid flow	0.01 – 8 ml/min
Total flow	up to 1000 l/h
Evaporation temperature	up to 200°C
Other parameters on request	

Gas connections

Supply unit	6 mm Swagelok®
Evaporator	6 mm Swagelok®

Supply

Carrier gas	Compressed air, dry and oil free, Nitrogen, Span gas, 2 – 6 bar
Liquid	reagent solution, distilled water, organic solvents

Power supply

Alternating voltage	110 V or 230 V, 48 – 62 Hz
Power consumption	max. 1000 W

System design

Supply unit	portable case
Dimensions	approx. 510 x 160 x 440 mm (W x H x D)
Weight	approx. 15 kg
Degree of protection	IP54 (closed case)
Ambient temperature	5 – 40°C

Evaporator

Dimensions	approx. 245 x 100 mm (H x Ø)
Weight	approx. 3.0 kg
Ambient temperatures	5°C – 200°C

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