



# OMNISTAR™ / THERMOSTAR™

The efficient solution for gas analysis.  
Intelligent software. Wide range of applications.

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## **What are OmniStar™ and ThermoStar™?**

OmniStar and ThermoStar are compact benchtop analysis systems for sample gases at, or below atmospheric pressure. They are the perfect complete solution for gas analysis, especially in chemical processes, the semiconductor industry, in metallurgy, fermentation, catalysis, laser technology and environmental analysis.

The analysis systems consist of an inlet system, a PrismaPlus mass spectrometer, a dry-compressing diaphragm vacuum pump and a HiPace turbopump.

The gas inlet is equipped with a capillary that can be heated to 350°C; this capillary is made of stainless steel in the OmniStar and of quartz glass in the ThermoStar. The heated capillary prevents vapors from condensing during analysis of the sample gas.

This 2-stage inlet enables a quasi segregation-free gas supply. A pressure-regulated gas inlet is optionally available for varying inlet pressures from 1000 hPa (mbar) down to 10<sup>-3</sup> hPa (mbar).

The Quadera mass spectrometer software enables both qualitative and quantitative analyses to be performed on up to 128 different masses. The systems cover the mass ranges of 1-100 amu, 1-200 amu and 1-300 amu

## **ThermoStar™ – Special solution**

The ThermoStar solution was specifically developed for coupling with thermo balances. The inlet system incorporates a quartz capillary and platinum orifice, assuring that even minute concentrations can still be analyzed. In contrast to competitive analysis methods, such as FTIR and IR, it is possible to detect all gases within the mass range.



Laser technology



Catalysis



Semiconductor industry



### Advantages at a glance

- Qualitative and quantitative gas analysis, connection port for calibration gas inlet systems
- Low detection limit (< 1 ppm), even for condensable gases
- Compact, easy-to-operate analysis unit
- Heated capillary inlet, up to 350 °C
- Bakeable all-metal sealed high vacuum chamber for low backgrounds
- Utmost sensitivity thanks to enclosed ion source and field axis technology
- Reliable identification of unknown gases
- Monitoring of up to 128 masses
- Mass ranges of 1 to 100 amu, 1 to 200 amu and 1 to 300 amu
- Applications from vacuum up to atmospheric pressure
- Gas analysis under varying sample pressures – pressure-regulated gas inlet (optional)
- Fast, reliable and precise measurement of non-polar and noble gases
- Soft Ionization option

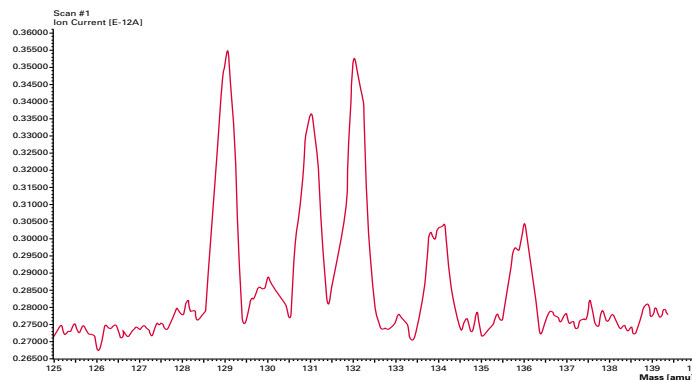
## Analysis software for total analysis

### Quadera® analysis software

The Quadera analysis software enables you to easily monitor your processes on a PC in realtime. The unit's short response time enables the sample analysis to be quickly conducted. With its modular design, the Quadera software offers a clearly organized, user-friendly platform for the capture and presentation of measurement data and parameter records. Complete measurement procedures can be programmed.

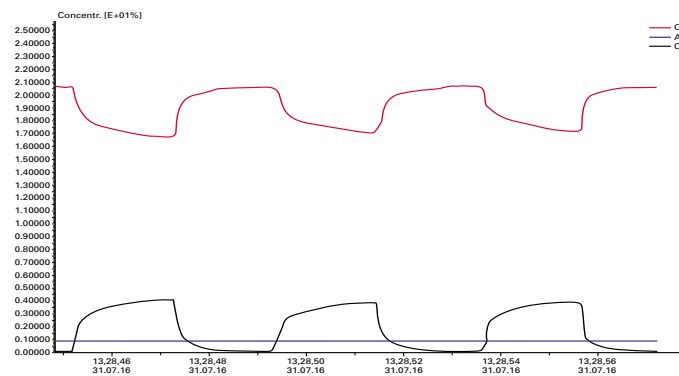


### Xe in air/OmniStar™



The graph (mass range 125–140 amu) shows the xenon isotopes and the excellent detection limit of the OmniStar. Xenon has stable isotopes at 129, 131, 132, 134 and 136 amu. The concentration of 136Xe in air is 7.8 ppb.

### Respiratory Gas Analysis/OmniStar™



Three breathing cycles of an endurance test. The breath is characterized by the gases O<sub>2</sub> and CO<sub>2</sub>. The argon in the air serves as a reference gas for demonstrating the stability of the system. Very quickly measured by the OmniStar at atmospheric pressure in the Multiple Concentration Determination (MCD) mode.

### Advantages at a glance

- User-friendly, intuitive operation
- Customer-specific user interface
- Automated measurement procedures, programmable by means of the integral Microsoft® VSTA® script editor
- I/O module for exchanging measurement data
- Integral library of mass spectral data
- Simple definition of measurement recipes
- Mass spectrometer data can be linked with external signals

# THERMOSTAR™

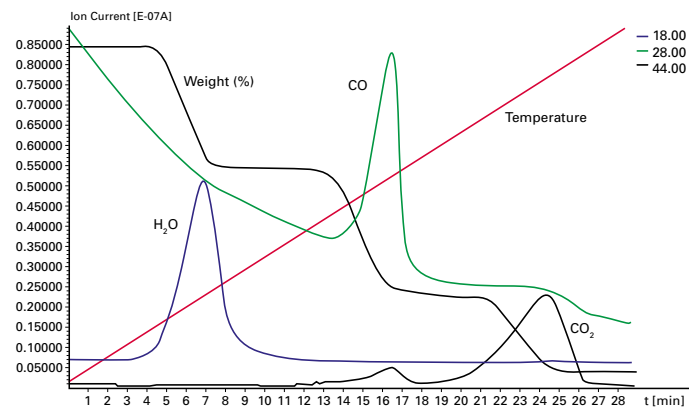
The special solution in connection with thermo balances.

## ThermoStar™

The ThermoStar gas analysis unit is a version that is specially designed for being coupled with thermo balances. Hightemperature gas samples can be admitted by means of a quartz capillary.



## TGA-MS



The gases water vapor (18), carbon monoxide (28) and carbon dioxide (44) that evolve when conducting a thermal analysis of calcium oxalate are shown as a function of time together with weight and temperature.

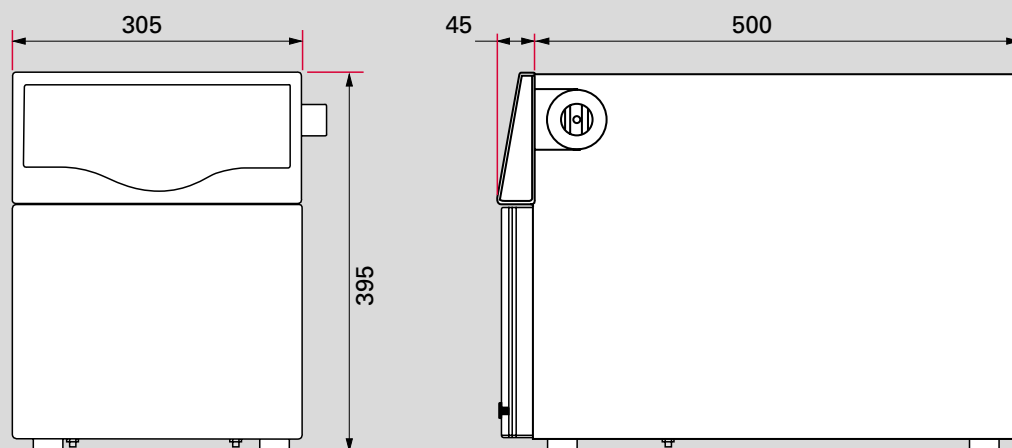
## Advantages at a glance

- Even small concentrations of reactive and condensable gases can be detected
- Inert inlet, no change in gas composition
- Gas inlet heatable up to 350 °C
- Multi-gas analysis

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## Dimensions



Dimensions in mm

## Technical data

Gas analysis system	OmniStar™	ThermoStar™
Mass ranges, amu		1 – 100 / 1 – 200 / 1 – 300
Gas connection	Stainless steel capillary	Quartz capillary
Gas inlet	Via software-controlled inlet valve, or user interface	Continuously open
Pressure reduction		2-stage, segregation-free
Gas flow rate, sccm		1 – 2
Sample gas pressure, hPa (mbar)		Up to 1,000
Capillary operating temperature, °C		Up to 350
Analyzer		QMA 200 M gas tight
Rod system, material / diameter / length, mm		Stainless steel/6/100
Detector		C-SEM/Faraday
Mass spectrometer electronics		QME 220 M
Software		Quadera®
Contribution to neighboring mass: 40 to 41		<10 ppm / <20 ppm / <50 ppm
Min. detection limit, C-SEM		<1 ppm / <1 ppm / <1 ppm
Min. detection limit, Faraday		<20 ppm / <40 ppm / <100 ppm
Resolution, adjustable at 10 % peak height, amu		0.5 – 2.5
Dimensions (L x B x H), mm		545 x 305 x 395
Weight, kg		35
Mains requirement: voltage (range), VAC		100 – 230
Interface		Ethernet Analog input: 5x ± 10 V / 12 bit Analog output: 4x 0...10 V / 12 bit Digital input: 4x Digital output: 7x sink, optical insulated, 24 V

System	a
OmniStar	8
ThermoStar	9

Analyzer/Filament	bc
Filament: Yttriated iridium, integrated option for mass calibration	01
Filament: Yttriated iridium	02
Filament: Tungsten, integrated option for mass calibration	05
Filament: Tungsten	06
Filament: Yttriated iridium, integrated option for mass calibration, corrosive gas version with inert gas inlet	11
Filament: Yttriated iridium, corrosive gas version with inert gas inlet	12
Filament: Tungsten, integrated option for mass calibration, corrosive gas version with inert gas inlet	15
Filament: Tungsten, corrosive gas version with inert gas inlet	16

Gas inlet system	def
ThermoStar, quartz, 1 m temperature-regulated gas sampling line, 200 °C	111
ThermoStar, quartz, 2 m temperature-regulated gas sampling line, 200 °C	112
ThermoStar, quartz, 1 m temperature-regulated gas sampling line, 350 °C	113
OmniStar, quartz (special), 1 m temperature-regulated gas sampling line, 200 °C	151
OmniStar, quartz (special), 2 m temperature-regulated gas sampling line, 200 °C	152
OmniStar, stainless steel, 1 m temperature-regulated gas sampling line, 200 °C	171
OmniStar, stainless steel, 2 m temperature-regulated gas sampling line, 200 °C	172
OmniStar, stainless steel, 1 m temperature-regulated gas sampling line, 350 °C	173
Pressure-regulated gas inlet, 5 decades, $5 \cdot 10^{-3}$ mbar up to atmospheric pressure	555

Mass range	g
1–100 amu	1
1–200 amu	2
1–300 amu	3

Front panel	h
OmniStar	1
ThermoStar	2



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