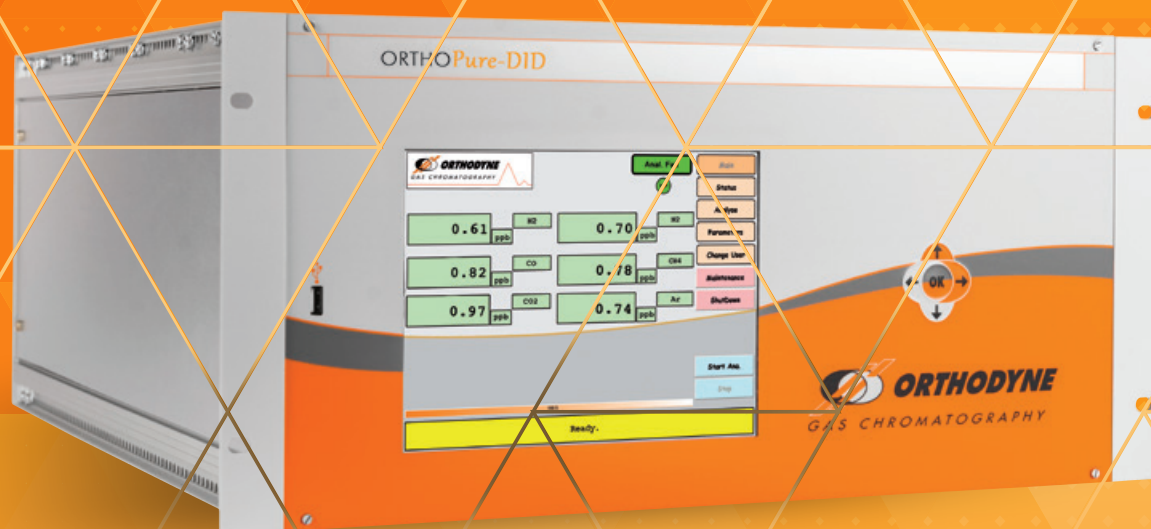


ORTHOPure ANALYSER

INNOVATIVE *ultra-trace instruments*
for **UHP** *gases applications.*



The **ORTHOPure** instruments are specifically designed for the semiconductors market, measuring a wide range of components at the ultra-trace level with highest reliability. Using our advanced electronic platform and our exclusive and high performance data acquisition system, The **ORTHOPure** provides considerable improvement in front of the traditional HDID and FID.

Two **distinct models** are available to detect a wide range of common gas impurities.

 **ORTHODYNE®**
GAS CHROMATOGRAPHY

Your expert in gas chromatography



ORTHOpure-HDID

Analysis of H₂, O₂+Ar, Ar, N₂, CH₄, CO and CO₂ in PPB level.

Technology :
HFDID Helium

The ORTHOPure-HDID Gas Chromatograph detector has been designed to make use of the variations in electrical conductivity found in highly ionized gas. The ionization is created by a single high frequency discharge within the detector (HF Plasma), causing a high energy photon emission. This emission is capable of ionizing all the gases within the cell with the exception of the Helium. Thanks to some specific features, the ORTHOPure-HDID can improve its detection thresholds and meet the high demand of the Semiconductors market.

MODEL DESIGNATION AND DETECTION LIMIT SPECIFICATIONS

COMP./GAS	Argon	Hydrogen	Nitrogen	Oxygen	Helium
H ₂	< 0.5 ppb	/	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
O ₂ + Ar	/	< 0.5 ppb	< 0.5 ppb	/	< 0.5 ppb
Ar	/	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
N ₂	< 0.5 ppb	< 0.5 ppb	/	< 0.5 ppb	< 0.5 ppb
CH ₄	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
CO	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
CO ₂	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb

INSTALLATION REQUIREMENTS

HELIUM CARRIER :

INLET FITTINGS	1/8-inch VCR Face seal fittings.
INLET PRESSURE	7 bar / 102 psig.
INLET PRESSURE STABILITY	Around 2%; UHP regulator required.
FLOW RATE	Between 100 and 300 ml/min. (depending on the configuration required)
HELIUM PURITY	99,9999% before the inlet of the purifier.
HELIUM CARRIER GAS	The use of a purifier with an outlet quality of 9.0, < 1 ppb on each component measured is mandatory

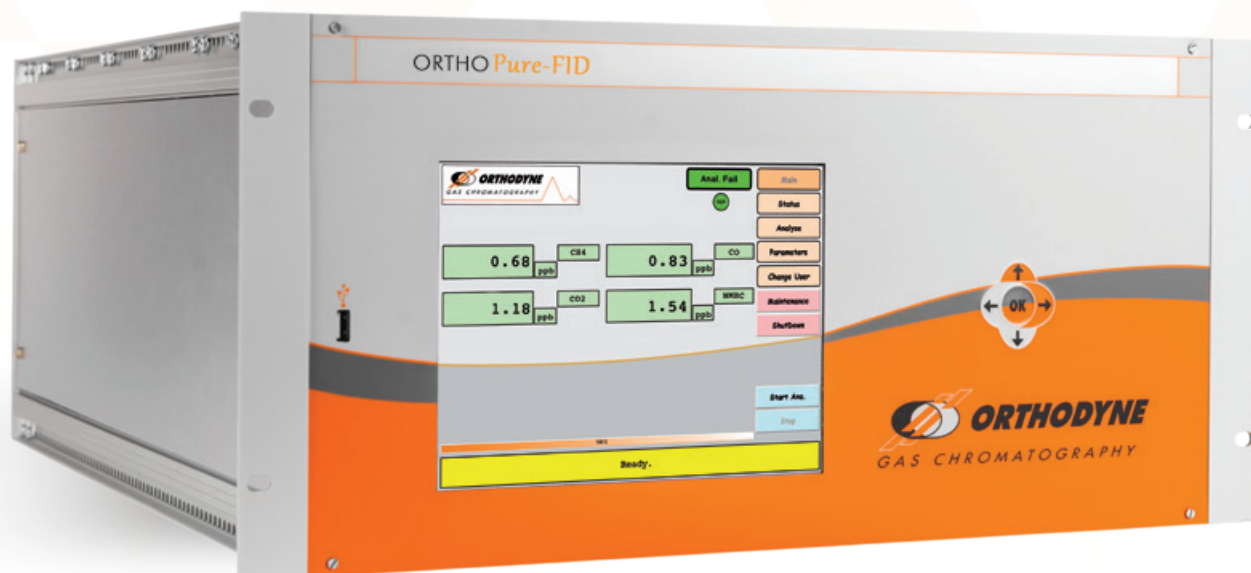
For the measurement of Argon at ppb level in Oxygen, the use of a cryogenic Argon trap is highly recommended.

SAMPLE GAS :

INLET FITTINGS	1/8-inch VCR Face seal fittings.
INLET PRESSURE	Atmospheric pressure with stable flow.
INLET PRESSURE STABILITY	Around 2%; UHP regulator required.
FLOW RATE	Around 80 ml/min.
VENT PRESSURE	Atmospheric pressure vent is optimal.

Common features

- * *The calculated measurement of the LDL is based on Signal-to-Noise ratio.* Determination of the signal-to-noise ratio is made by comparing measured signals from samples with known low concentrations of an impurity with those blank samples and establishing the minimum concentration at which the impurity can be reliably detected. A signal-to-noise ratio of 3 is generally considered acceptable to be estimated as the low detection limit (LDL).
- ** *The LDL given in this table are general;* depending on the configuration and application requested by the customer and the development and tests made by Orthodyne, these LDL could either be lower or higher.
- *** *The LDL given for the Ar component is achievable,* if your Helium carrier gas does not contain Argon; if you think the risk of presence might be real, the use of a cryogenic Argon trap is highly recommended.



ORTHOpure-FID

Analysis of CH₄, CO, CO₂ & NMHC in PPB

Technology :
Flame Ionization

The ORTHOPure-FID Gas Chromatograph is placed in a temperature regulated chamber. It is designed to detect traces of hydrocarbons in neutral gases. The combustion of Hydrogen and Synthetic Air creates a flame in which are burning the organic components contained in the gas to be analysed. When burning, these components produce ions which are collected by an electrode. Thanks to some specific features, the ORTHOPure-FID can improve its detection thresholds and meet the high demand of the Semiconductors market.

MODEL DESIGNATION AND DETECTION LIMIT SPECIFICATIONS

COMP./GAS	Argon	Helium	Hydrogen	Nitrogen	Oxygen
CH ₄	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
CO	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
CO ₂	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb
NMHC	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb	< 0.5 ppb

INSTALLATION REQUIREMENTS

ARGON/NITROGEN/HYDROGEN CARRIER (THE CARRIER GAS DEPENDS ON THE APPLICATION REQUIRED) :	
INLET FITTINGS	1/8-inch VCR Face seal fitting.
INLET PRESSURE	7 bar / 102 psig.
INLET PRESSURE STABILITY	Around 2%; UHP regulator required.
FLOW RATE	Between 100 and 300 ml/min. (depending on the configuration required)
Ar/N ₂ /H ₂ PURITY	99,9999% before the inlet of the purifier.
ARGON/NITROGEN/HYDROGEN CARRIER GAS	The use of a purifier with an outlet quality of 9.0, < 1 ppb on each component measured is mandatory.

SYNTHETIC AIR/NITROGEN/HYDROGEN FEEDING GASES : (THE FEEDING GAS DEPENDS ON THE APPLICATION REQUIRED)	
INLET FITTINGS	1/8-inch VCR Face seal fittings.
INLET PRESSURE	Hydrogen : 1 bar / 15 psig. Synthetic air : 2 bar / 29 psig. Nitrogen : 2 bar / 29 psig.
INLET PRESSURE STABILITY	Around 2%; UHP regulator required.
FLOW RATE	Hydrogen : 40 ml/min. Synthetic air : 300 ml/min. Nitrogen : 40 ml/min.
N ₂ /H ₂ PURITY	Minimum : 99,9999% (we recommend to use a purifier on these feeding Gases).
SYNTHETIC AIR PURITY	Minimum : 99,999%.

SAMPLE GAS :	
INLET FITTINGS	1/8-inch VCR Face seal fitting.
INLET PRESSURE	Atmospheric pressure with stable flow.
INLET PRESSURE STABILITY	Around 2%; UHP regulator required.
FLOW RATE	Around 80 ml/min.
VENT PRESSURE	Atmospheric pressure vent is optimal.

Benefits

- **Comprehensive solution for ultra-trace** measurement of a lot of components in a wide range of background gases.
 - **A complete stand-alone UHP** gas analysis solution for process and bulk gases applications.
 - **Total preconfiguration and validation** in our test laboratory (Plug and play solution).
 - **Easy to use** with its own synoptic display and a user-friendly interface.
 - **Low cost of ownership**, thanks to a cost-efficient maintenance and operations (no consumables) and to an available and easy remote control interaction.
 - **Unique performance**, the ORTHOPure is the only GC analyser that provides the highest level of performance, accuracy and reliability available on the market, manufactured by a company who owns an experience of more than 40 years in the chromatographic analysis in gaseous phase.
 - **New technology and development**, on our HDID and FID sensing detectors, our own data acquisition system and our specific software for ultra-trace applications.
- The analytical sensitivity of the ORTHOPure is enhanced by the analytical signal recovery; this system allows a higher sensitivity and more selective measurement thanks to the specially developed chromatographic filtering method available in our chromatographic software.

MODEL DESIGNATION AND SPECIFICATIONS

Configuration of the analytical circuit

- VCR Face seal fitting.
- Diaphragm valves.
- Back Pressure Regulator on the Helium carrier gas.
- Electronic Pressure Regulator on the Argon/Nitrogen or Hydrogen carrier gas.
- FID H₂ Shut-Off valve.

Range available :

Broad measurement range with high sensitivity.
0 - 200 ppb with LDL for some components < 0,5 ppb.
0 - 1000 ppb with LDL for some components < 1 ppb.
Response time :

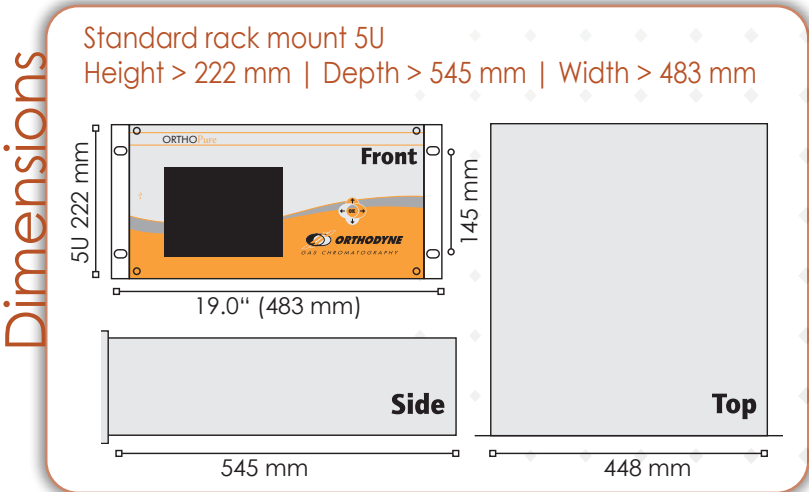
The analysis time depends on the application and the configuration of the analytical circuit.

Outputs

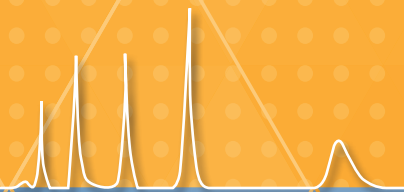
DISPLAY	LCD graphics color, 130 x 170 mm.
ALARMS	Alarms H, HH for the components and General failure. (Volt free single pole relays)
4 TO 20 MA	Optional for each components.
COMMUNICATION PORTS	Optional : Profinet/Profibus/Modbus/RS232/RS485 (on request).
DIGITAL COMMUNICATION	RJ45/Ethernet for the Remote Control of the analyser.

Sample dilution system

Blender with a fixed dilution ratio
(available on request).



Your expert in gas chromatography



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