Aurora Pro Scientific (US distributor)
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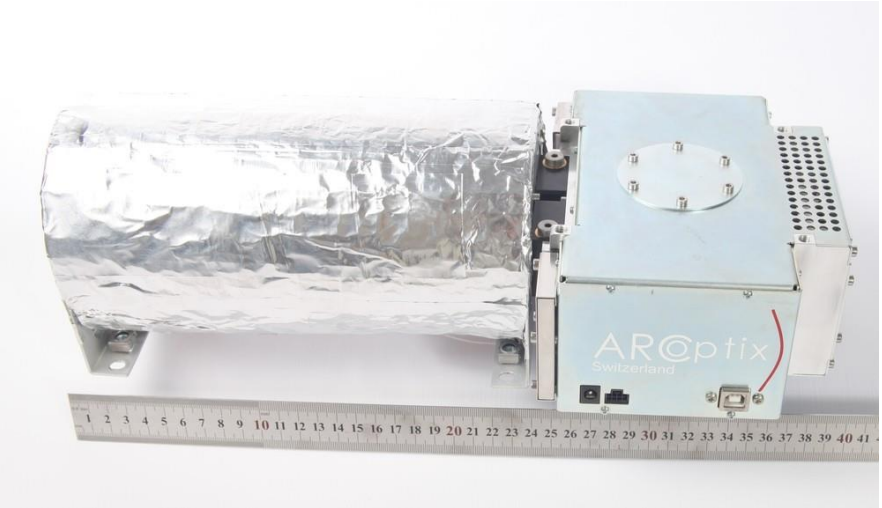
**Specifications sheet (short)**

# GASEX OEM HD-05-xx

## FTIR – gas cell unit for gas analyzers




**Arcoptix presents GASEX OEM HD-05:**

**GASEX OEM HD-05** is a follow up model of the very succesful GASEX OEM modules. It is sharing the same body outline with the previous models, however in the inrerrior I bares several major changes significantly extending the possibilities of deployment in the area of gas analysis.

Our approved high stability, vacuum tight "Rocket" FTIR core, has been rearranged and upgraded to provide 0.5 $cm^{-1}$ resolution, to match the needs of the new up-comming legistation for FTIR gas analyzers and to validate the module in the future gas analyzers. The FTIR core is seamlessly matched to a low volume (0.2L) gas cell providing five meters long optical path in your gas sample. Besides its stable and high sensitivity performance as an analytical instrument, GASEX is extraordinarily compact, lightweight and rugged, which makes it ideal for conception of new industrial - and field- analytical systems as well as for integration into the state of the art gas analyzers for a vast variety of analytical, process control and long term observation applications.

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## Features

Arcoptix S.A. presents Gasex HD-05(TM) - an OEM gas spectrometer, comprising an approved high stability vacuum tight "Rocket" FTIR, seamlessly matched to a 5 meters gas cell, with rhodium coated chemically resistant optics.

- Compact, rugged and high-performance FTIR module with 4TE-MCT detector;
- Long path (5m), low volume (0.2L) heated gas cell seamlessly matched to the FTIR for high sensitivity and very short response time;
- Rhodium coated chemically resistant optics;
- Most compact FTIR Gas Analyzer Bench on the market, only 40cm x 19cm x 12cm and 3.9 kg in weight.
- Resolution of 0.5 $cm^{-1}$ (IUPAC definition) to match the newest regulations in the area of emission measurements.
- 0.7 scan per second rate.
- Mechanical outline identical to that of previous models – in order to facilitate an upgrade of previously developed applications – if needed.
- Modern and very stable data acquisition software solution, extending the field of application to Linux based systems.
- Optionally an on-board embedded computer (Toradex single board) featuring the spectral acquisition.
- On board measurements of essential physical parameters like the cell temperature, atmospheric pressure and differential pressure in the gas cell allowing for data correction for these parameters.

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## Application fields

- Ambient air (environmental and pollution) monitoring;
- Continuous emissions monitoring (CEM);
- Exhaust emissions;
- Combustion monitoring;
- Food processing;
- Security and defense;
- Fire fighting;
- Cement kilns;
- Toxic gas detection;
- Petrol-chemistry;
- Process monitoring and control in chemical industry;
- Mining;
- Aeration control;
- Laboratory practice;
- Agriculture;
- Aerospace;
- Medical devices;
- Forensic science;
- Work safety and security;
- Bio sciences and medicine;

ARCoptix
Switzerland

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# Specifications sheet (short)

## • Specifications

| | |
|---|---|
| **FTIR** | |
| **Design** | Permanently aligned, maintenance free, hermetic. |
| **Resolution [ $cm^{-1}$ ]** | 0.5 |
| **Beamsplitter / window material** | ZnSe |
| **Spectral range [ $cm^{-1}$ ]** | 5000 - 830 (5000 – 1800 - optional) |
| **Detector** | MCT (4-TE cooled) |
| **Detectivity D* [cm $Hz^{1/2}W^{-1}$]** | > $2.5x10^{9}$ ( $4x10^{10}$ - optional) |
| **Light source** | Broadband SiC, 1550 K |
| **Reference laser** | Stabilized semiconductor laser |
| **Scan frequency [ $s^{-1}$ ]** | 0.7 |
| **Signal-to noise ratio** | > 3,500:1 (for one single scan) |
| **Mounting orientation (operation)** | Position independent |
| **Absotrans (TM)** | Active suppression of $H_2O$ and $CO_2$ |
| **GAS CELL** | |
| **Path length** | 5m |
| **Internal volume** | 0.2L |
| **Transmission** | >50% |
| **Temperature range [ °C ]** | 20 to 200 (not condensing) |
| **Construction** | Aluminum with inert coating. |
| **Mirrors parabolic,** | Rhodium protected, gold coated aluminum |
| **Windows** | BBAR ZnSe |
| **Gas connectors** | For 6mm (Swagelok) or ¼" diameter tubing (customizable) |
| **SYSTEM** | |
| **Communication** | USB 3.0 or Ethernet |
| **Operating system** | Windows 7/8/10 and Linux |
| **API** | Software or hardware server for data retrieval, GUI for spectral acquisition, Optionally Panorama by Labcognition. |
| **Power consumption** | FTIR only: 32W @ 12VDC (adapter supplied)<br>Gas cell heaters: 400W (peak) 20W (in the heated state) @ 110-230VAC (50-60Hz) or 12 V (customizable) |
| **Dimensions [mm]** | 380 x 180 x 120 |
| **Weight** | 3.9 kg |

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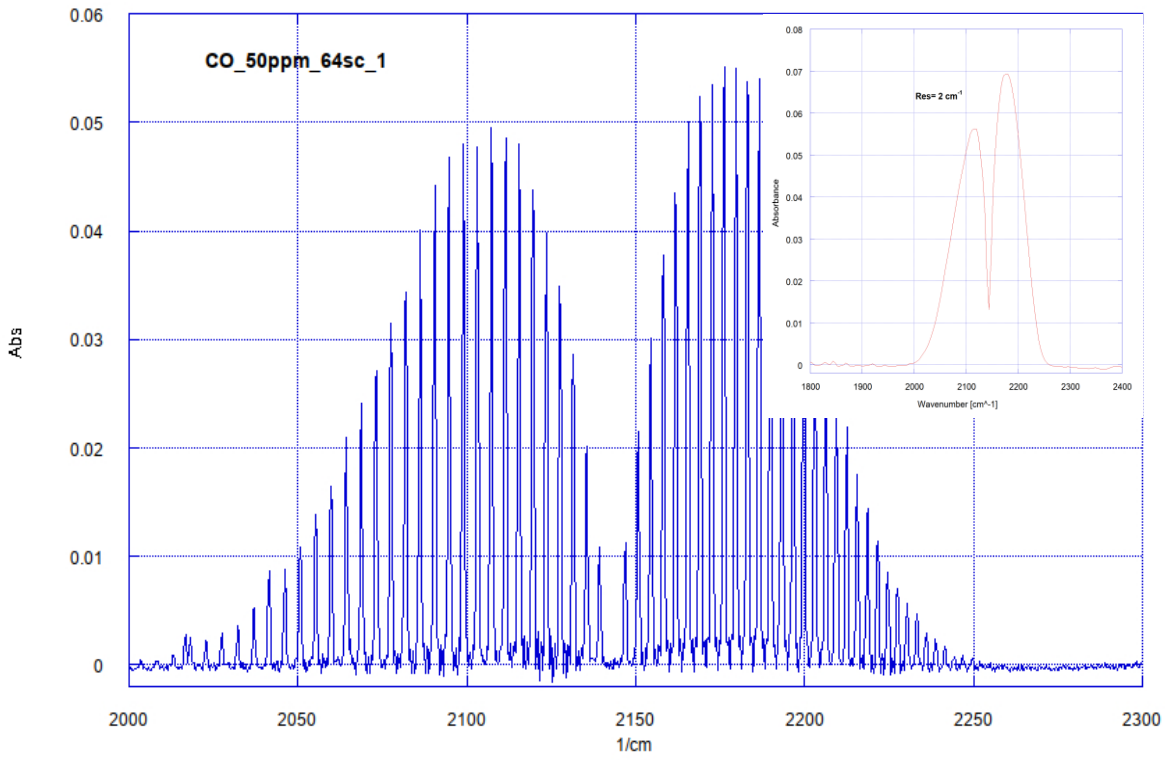
# Specifications sheet (short)

## Example 1 : Isotope ratio of $^{35}Cl$ and $^{37}Cl$ with GASEX HD-05-XX




**Examples of CO spectrum measured with GASEX HD-05-12 in comparison to the GASEX ST-20-12 with 2 $cm^{-1}$ (inset of the picture) resolution.**

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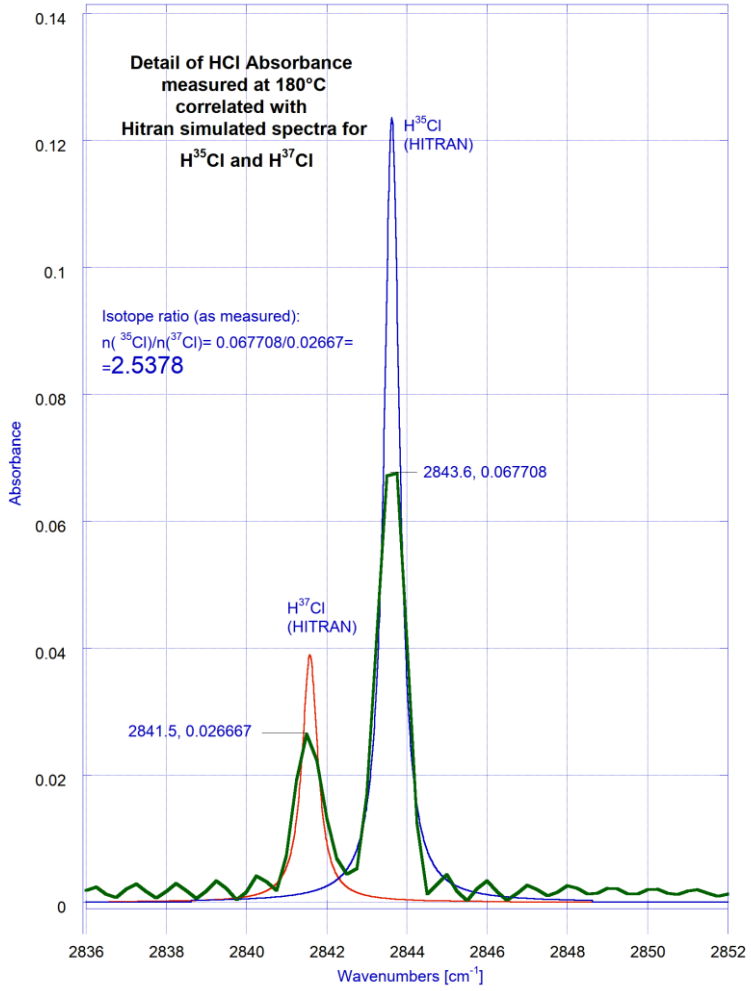
# Specifications sheet (short)

## Example 2 : 50ppm Carbon monoxide spectrum measured with GASEX HD-05




**Examples of HCl measurments using a GASEX HD-05-12 together with HITRAN simulation of the spectra for HCl with $^{35}$Cl and $^{37}$Cl isotopes in the molecule. The isotope ratio can be detetmined.**

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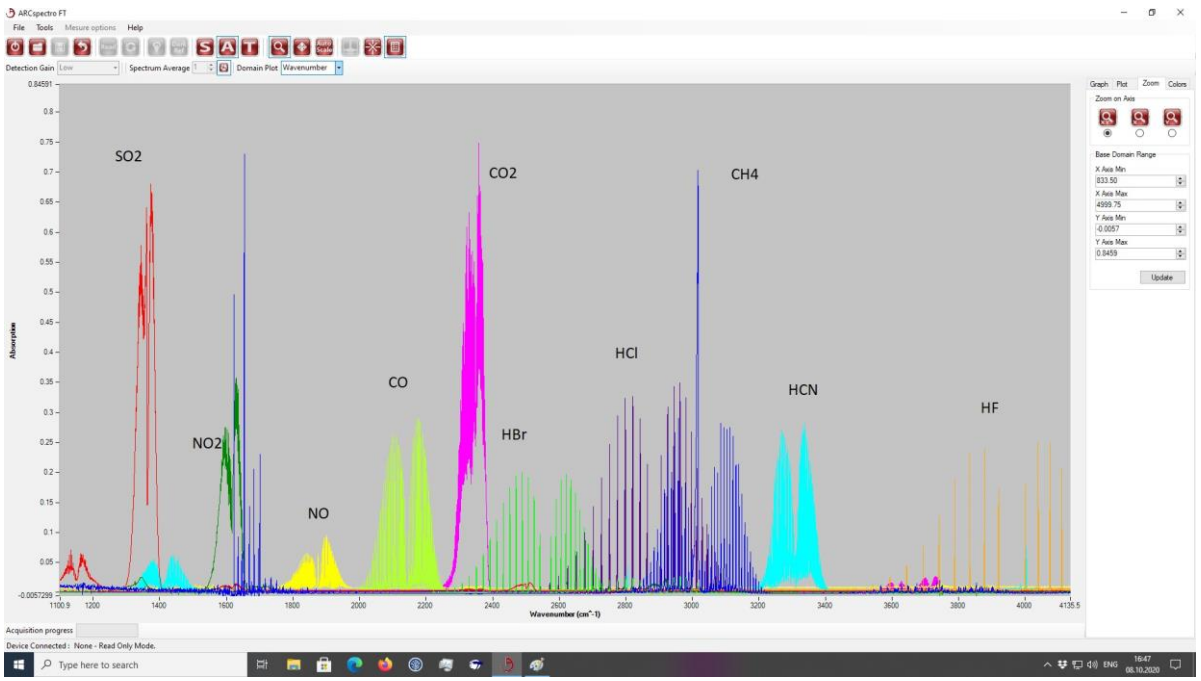


**Examples of various gases spectra measured using using a GASEX HD-05-12 (screenshot) shorwng a variety of substances measured, within the 2-12 micons range or operation of these spectrometers.**

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| Substance | LOD* [ppm] | Substance | LOD* [ppm] |
|---|---|---|---|
| HF | 0.18 | HBr | 0.18 |
| HCl | 0.14 | CO2 | 0.15 |
| HCN | 0.32 | n-Octane | 0.14 |
| NH3 | 0.12 | Formaldehyde | 0.21 |
| CO | 0.2 | Acetone | 0.28 |
| N2O | 0.03 | Phosgene | 0.013 |
| NO | 1** | Chloroform | 0.032 |
| NO2 | 0.26 | Methanol | 0.43 |
| SO2 | 0.03 | Ethanol | 0.14 |

* Values estimated from as three times standard deviation for 64 spectra averaged

** Measured with one single scan using a short wavelength - 6 micron cut-off detector.

**Limits of detection** – indicative values, for various gases – mostly with relevance to the environmental protection. Since the overall performance of an analyzer integating GASEX OEM depends on the way it is integrated into the system (sample conditioning unit chemometrics…) this list can be used only as a reference. The final LOD list is to be provided by system integrator. Arcoptix guarantees the performance of the GASEX OEM module according to parameters listed in page 3 of this specification sheet.

**Notices :**

**(1) The product is released and typical delivery time is 6 weeks.**

**(2) The actual look of the device may differ from the photo (while conserving the dimensions.**