

# GC-IMS



## Quickstart Manual



**G.A.S. Gesellschaft für  
analytische Sensorsysteme mbH**

## **GC-IMS – Quickstart Manual**

**Version 1.02, November 2020**

**Valid from GC-IMS Firmware Version 4.00**

All data, texts, designs, images and other elements used in this user manual are protected by copyright law. Any infringement may be subject to legal action.

Passing it on to third parties and producing copies of any kind or form – on the whole or in parts - is not permitted without written agreement of G.A.S. Any infringement may be subject to legal action.

G.A.S. reserves the right to realize technical changes to the product without explicitly mentioning them.

CE-Marking according to:

**International Standard EN ISO 17050-1:2004**  
**Directive 2014/35/EU (Low voltage directive);**  
**Directive 2014/30/EU (Electromagnetic compatibility);**  
**Directive 2011/65/EU (RoHS);**  
**Directive 2012/19/EU on waste disposal (Waste Electrical and Electronic Equipment – WEEE)**

**© Copyright 2020**  
**G.A.S. Gesellschaft für analytische Sensorsysteme mbH**  
**44227 Dortmund - Germany**

**All Rights Reserved.**

**G.A.S. Gesellschaft für analytische Sensorsysteme mbH**  
**Otto-Hahn-Str. 15**  
**D-44227 Dortmund**  
**Germany**  
**Phone: (+49) 231/9742-6550**  
**Fax.: (+49) 231/9742-6555**  
**E-Mail: support@gas-dortmund.de**  
**Internet: www.gas-dortmund.de**

## Table of Content

1	General Information .....	4
1.1	Information about the Manual .....	4
1.2	Explanation of Symbols .....	4
1.3	Notation for dialogs, elements and references.....	5
1.4	Scope of Supply.....	6
1.5	Liability and Guarantee .....	12
1.6	Copyright .....	12
1.7	Return and Disposal .....	12
1.8	Customer Service .....	13
2	Safety.....	13
2.1	Intended Use Only .....	13
2.2	Responsibility of Operator.....	14
2.3	Requirements of Personnel .....	14
2.4	Dangers .....	15
3	Transport, Packing and Storage .....	16
3.1	Inspection after Transport.....	16
3.2	Packing .....	16
3.3	Storage and Transport.....	16
4	Cleaning and Maintenance .....	17
4.1	Cleaning.....	17
4.2	Maintenance .....	17
5	Installation Basic Version GC-IMS .....	18
5.1	Installation Requirements .....	18
5.2	Installing the device (GC-IMS Basic) .....	19
5.3	Installing the device (GC-IMS with CGFU).....	24
5.4	Installing the device (GC-IMS with Airsense $\mu$ TD).....	29
5.5	Prepare the device for operation.....	36
6	Measurement .....	39
6.1	Measurement Requirements.....	39
6.2	Running a measurement.....	39
7	Appendix .....	45
7.1	IMS-Spectrum Examples .....	45
7.2	Corresponding Documents .....	47

# 1 General Information

## 1.1 Information about the Manual



### INFORMATION!

This **Quickstart User Manual** is an excerpt of the most important information for installation and initial setup from the User Manual. It is an **addition to the User Manual** and does not replace the User Manual.

This manual describes a safe and adequate handling of the device. Following the instructions of the indicated safety aspects and instructions as well as the national and/or local rules and general safety regulations concerning the prevention of accidents are absolutely imperative.

Before starting the work with the device read the manual completely and thoroughly particularly the chapter security and respective safety references. Assure that you/the operator comprehend the terms described.

The manual is part of the device. It must be stored together with and next to the device at any time.



### INFORMATION!

The graphics in this user manual are schematic and may differ from the actual conditions. The firmware and PC software screenshots in this user manual may differ from the actual conditions.

## 1.2 Explanation of Symbols

Important and safety-relevant references in this manual are characterized by symbols. These indications which are in-line with industrial safety must be respected and followed at any time.



### INFORMATION

This symbol calls information, which are to be considered for efficient and perfect handling of the equipment.



### WARNING

This symbol indicates references, which can lead to damages, malfunctioning and/or loss of the device.

**DANGER**

This symbol marks references, which can lead to health impairments, injuries, lasting body damages or to death due to electric current.

**DANGER**

This Symbol marks paragraphs, which describe potential dangers and damage due to exposure to radioactive radiation.

### 1.3 Notation for dialogs, elements and references

#### Example Dialog:

**System** › **Connections** › **LAN File Transfer** › **Settings...** › **Test Connection**

#### Example Elements:

**Gas Out**, **Sample gas in**

#### Example: References

**Advanced User Manual**, **Chapter 5.1 Installation Requirements**

#### Example: Information

**keep the transport box**

## 1.4 Scope of Supply

Assure that you have received the full scope of supply. If there is any part missing, please contact the GAS-hotline immediately.

### Standard Scope of Supply



GC-IMS Device (1 piece)



Power supply (1 piece)



GC-IMS Gas tube Kit

- Driftgas/Carriergas (1 piece)
- 2 m 3mm PFA Tubes with 3 mm Swagelok-Connector (6 Pieces)
- Bypass Adapter (1 piece)



Molecular sieve 200 ml with 1/8" connections  
(1 piece)



LAN Cable (1 piece)



GC-IMS Blind plug Set (5 pieces)  
(Swagelok 3mm Blind plug with red cap installed on device connectors)



Torx Tool Kit

- Torx Srewdriver 8 mm (1 piece)
- Torx Srewdriver 10 mm (1 piece)

**GC-IMS – Quickstart Manual**



I/O Connector (1 piece)



Document Map with Documents and Device User Manuals



USB-Stick Box with Software und Documents (1 piece)



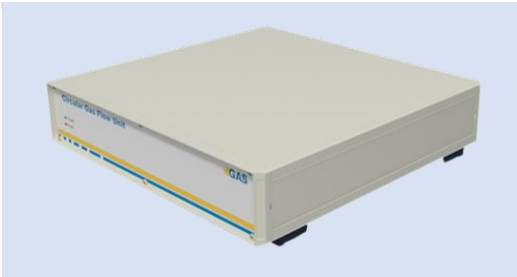
Transport box (1 piece)





GC-IMS Transport palett (60 x 80 cm)

Optional Scope of Supply (only available if ordered)



Circular Gas Flow Unit with accessories



**CGFU-Filter Set** (2 x Moisture-Trap, 1 x Hydrocarbon-Trap)



Nitrogen Generator with accessories  
(example picture)



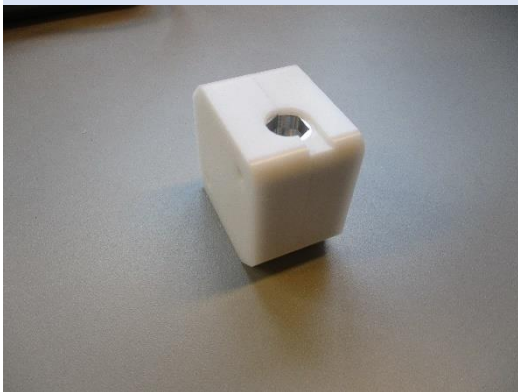
µTD with accessories



Laptop Computer (different design) including software for control and evaluation



Luer Adapter (1 piece)



Luer Adapter Heater (1 piece)



Sampling Syringe 5ml syringe for Luer Adapter) (100 pieces)

### **1.5 Liability and Guarantee**

This user manual describes the safe and proper handling of the device.

All data and reference within this manual are compiled under the valid regulations, the state-of-the-art as well as G.A.S. experiences of several years.

This user manual must be stored together with and close to the device at any time and accessible to all persons, who operate or handle the device at any time.

This user manual must be read carefully before starting to work with the device. G.A.S. does not assume any liability for damage and disturbances, resulting from disregard of the instructions contained in this user manual. All claims of any kind related to damage from a not intended use of the device will be rejected.

G.A.S. reserves the right to realize technical changes of the product due to improvements without explicitly mentioning them.

### **1.6 Copyright**

The manual is confidential. It is beyond doubt exclusively made and also meant for the personnel directly dealing with the equipment. All data, texts, designs, pictures and other representations within this manual are protected in the sense of the copyright law and are subject to further commercial patent rights. Each abusive is punishable by law.

Passing it on to third persons as well as duplications in any kind and form - also in part - as well as the use and/or report of contents are not permitted without written agreement of the manufacturer. Offences lead to payment of damages. We reserve ourselves all rights of the practice of commercial patent rights.

### **1.7 Return and Disposal**

For an adequate disposal, the device or/and its equipment must be returned to the G.A.S. or to a third party authorized by the G.A.S.! For questions please contact G.A.S.

### **1.8 Software Updates**

If there are any software updates customers will be contacted by G.A.S. Gesellschaft für analytische Sensorsysteme mbH as soon as the updates are available. The updates are free of charge within the first 12 month after delivery. Users will be

provided with information about the changes and instructions for executing the updates.

## 1.9 Customer Service

For questions concerning G.A.S. products a customer service is available:

G.A.S. Gesellschaft für analytische Sensorsysteme mbH  
Otto-Hahn-Straße 15  
44227 Dortmund  
Germany  
Phone: +49 (0) 231 / 97 42 - 65 50  
Fax: +49 (0) 231 / 97 42 - 65 55  
[support@gas-dortmund.de](mailto:support@gas-dortmund.de)

The telephone hotline is available from monday to friday from 9:00 to 16:00 hours. In urgent cases or if you use fax or email please provide a telephone number for callbacks.

## 2 Safety

### 2.1 Intended Use Only



#### **WARNING!**

Usage other than described in this manual may damage the device and/or harm persons involved.

Do not use the device for other purposes. Damages due to misuse are not covered by the guarantee. Such damage claims will be rejected.

The device and its equipment are not certified for the employment in areas with explosive gas air mixtures.

All claims or requirements of any kind against the manufacturer and/or its authorized persons that arise due to damages from a not intended use of the device will be rejected. All damages that arise from a not intended use are of the operator's responsibility.

## **GC-IMS – Quickstart Manual**

The intended use of the equipment and its correct handling according are described in the operating instructions of this manual. Other parts than the parts belonging to the scope of supply, may only be used after G.A.S. approval.

### **2.2 Responsibility of Operator**

The device may only be operated in a perfect technical condition. Before putting the device into operation the condition of the device and its equipment must be checked. The information and instructions provided in this manual have to be followed at any time.

Besides the instructions provided in this manual the local rules for the prevention of accidents, general safety regulations - valid for the area of application of the device - as well as the valid environmental-protection regulations must be considered and respected.

The responsible technicians and operators have to make sure a failure-free use of the device. Responsibilities among the involved persons regarding installation, operation, maintenance and cleaning must be made clear.

### **2.3 Requirements of Personnel**

Only authorized and trained technical personnel may work with the instruments. The operator must have received an instruction over existing and all possible dangers and should be regularly instructed in safety procedures and environmental protection and that the personnel is fully aware of the complete operating instructions and particularly the safety notes. Personnel that might be under the influence of drugs or alcohol are to be kept off the device at any time.

Technical personnel in this context are defined as skilled employees who are knowledgeable due to their educational background. In case the foreseen personnel do not have the necessary qualifications to operate the instrument, it must be trained. Further to that non-authorized personnel should not operate the device.

The competencies for the work on and with the device must be specified and kept undoubtedly at any time so that with respect to security issues no unclear situation might come up.

Any changes of the equipment, which impair security of the personnel, must immediately be reported to the operator and every person dealing with it.

## 2.4 Dangers

The device and its equipment is subject to an endangerment analysis. The construction and execution of the device corresponds to the today's state-of-the-art. The device is reliable in service when operated according to its intended use.



### INFORMATION!

If the housing of the device is damaged, the device must not be used anymore and must be returned to the G.A.S. by using the original transportation case.



### DANGER

The GC-IMS device contains a radioactive radiation Tritium source of 75 MBq which in all EURATOM countries is below the exemption limit. However, do not open the device! Do not try to recover malfunctions of the device! Malfunction recovery, repairs and any maintenance work may only be performed by G.A.S. or by qualified personnel authorized by G.A.S.



### DANGER

The GC-IMS and its equipment is not certified for the employment in areas with explosive gas air mixtures (Zone 0).



### DANGER

Exercise great care in handling current-carrying parts like the power supply cord. Do not get directly in touch with current-carrying parts. Do not open the housing. Do not use damaged parts.



### DANGER

When Nitrogen is used as drift gas and helium as carrier gas, ignition of a helium plasma may occur due to the high voltage present in conjunction with a radiation source. This can damage the IMS.

## 3 Transport, Packing and Storage

### 3.1 Inspection after Transport

Check the supply immediately after delivery concerning its completeness and/or transport damages. If you detect externally visible transport damage, do not receive the supply, or only under reservation. State the extent of the damage on the provided delivery note and/or the transportation documents of the feeder. Generate a complaint. Lodge a complaint of covered defect immediately after recognizing, as claims due to transport damages can only be made valid within the complaint periods (usually 7 days).

### 3.2 Packing

If no return agreement regarding the packing was agreed upon dispose the packaging material always in an environmentally friendly way and according to valid local regulations. If necessary, ask a recycling company.



#### **INFORMATION!**

It is recommended to **keep the transport box** for a safety return transport.

### 3.3 Storage and Transport

Store the device only under the following conditions:

- **When not in use store the equipment in the supplied casing**
- **Prevent unauthorized access**
- **Do not store outside**
- **Protect the equipment from moisture and dust**
- **Put protective caps on all gas sockets**
- **Avoid mechanical vibrations**
- **Do not expose the equipment to aggressive substances**
- **Protect the equipment from direct sun light**



- **Storage temperature: 5 to 40 °C**
- **Relative Air Humidity: 0- 90%Rh, non condensing**
- **Instrument's position: Horizontal**

The equipment should be moved only within the provided carrying case. By this means, transport damages can be avoided. The above mentioned values are considered for an instrument transported in its original new packing.

**WARNING!**

Protective caps should be put on gas sockets in case the device is stored or transported.

## 4 Cleaning and Maintenance

Natural aging and the wear of certain components of the equipment require a regular cleaning and maintenance.

### 4.1 Cleaning

Clean the device only with a dry or easily damp cloth.

**WARNING!**

Do not use cleaning agents, which contain solvents, acids or bases.

### 4.2 Maintenance

**INFORMATION!**

Maintenance of the device should only be carried out at G.A.S. or through specially trained and by G.A.S. authorized personnel.

The recommended **maintenance interval is 12 months.**

## 5 Installation GC-IMS Device

### 5.1 Installation Requirements

The following requirements must be fulfilled by the customer:

#### Location of Installation

- Available space of 600 x 700 x 300 mm (W x D x H)
- Ambient temperature of 5 – 40 °C
- Humidity: 0-90 % RH, non-condensating

#### Electricity

- Electricity supply free of interferences
- Power Supply of 230 V  $\pm$  10%, 50- 60 Hz  $\pm$  1%

#### Gas supply

- Nitrogen (Quality 5.0 (99,999%) or Synthetic Air (Quality 5.0 (99,999%))
- Stainless steel pressure reducer adjustable adjustable pressure range of 3 – 6 bar and 3 mm Swagelok connector

#### Safety

- Availability of exhaust system for device exhaust gas tubes (Gas out and Sample Gas out)

#### Computer

- Computer with current Microsoft Windows operating system
- Administrator right to install G.A.S. software

**INFORMATION!**

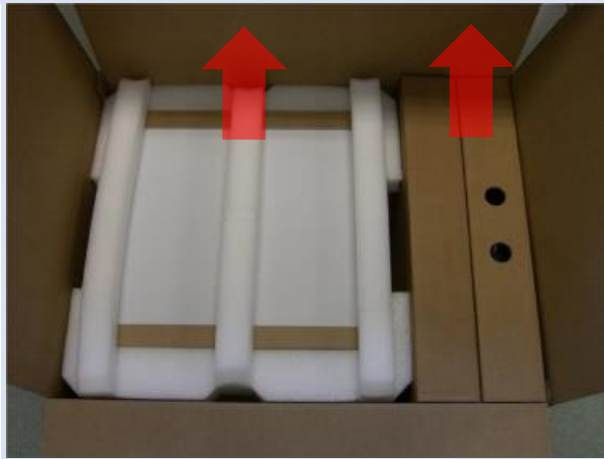
To ensure correct measurements it is absolutely necessary to **connect the supplied exhaust tubes** (Gas out and Sample gas out).

The exhaust tubes (Gas out and Sample gas out) **must be led separately into the exhaust system and must not be connected.**

The exhaust system must **not generate any negative pressure.**

## 5.2 Installing the device (GC-IMS Basic)

# 1



Unpack the device.

Remove the foam spacers.

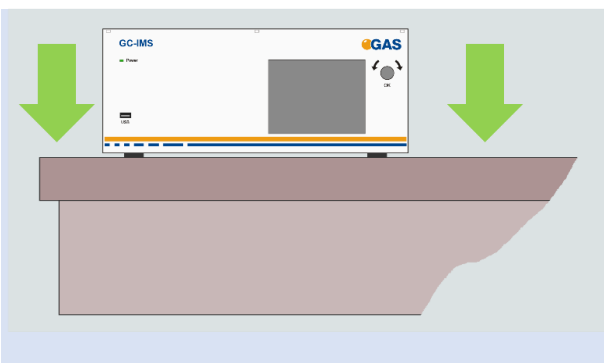
Remove the accessories boxes.

Lift the device from the transport box.

**WARNING!**

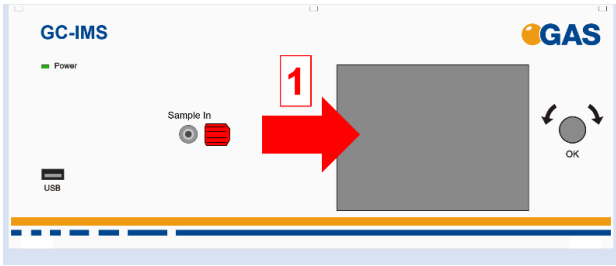
Do not deploy the device in areas exposed to explosive substances or mixtures!

# 2



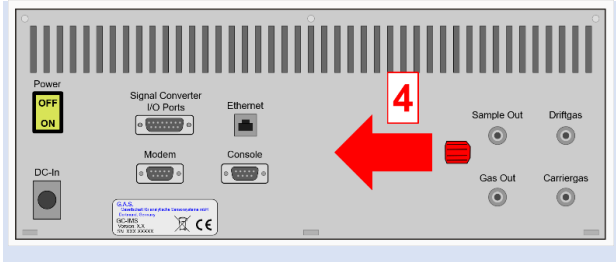
Place it on a robust table top of minimum footprint size of 60 cm x 70 cm. Ensure that there is enough working space at the rear side of the device.

3



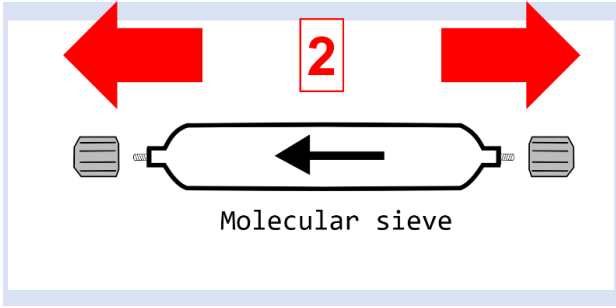
Remove red protective caps from gas sockets at front of housing. Retain for future use.

4

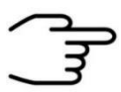


Remove red protective caps from gas socket at rear of housing. Retain for future use.

5



Remove protective caps from molecular sieve. Retain for future use.



**INFORMATION!**  
Protective caps should be put on gas sockets in case the device is stored or transported.

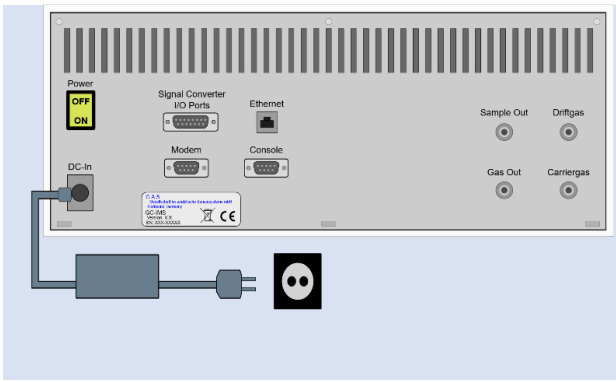


**WARNING!**  
It is absolutely necessary to **remove all protective caps before the system is switched on.**



**INFORMATION!**  
Make sure that the power switch is set to OFF before connecting the power supply.

6



Connect device to power supply.  
Connect power supply to power socket.



**INFORMATION!**

Only use **stainless steel pressure reducers**, **PFA tubes** with 3 mm outer diameter and **3 mm Swagelok** connectors.

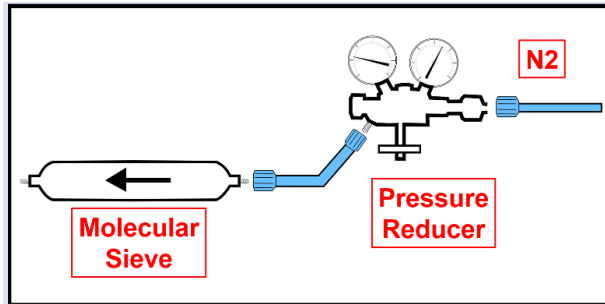
Screw on the Swagelok caps manually and fix them by screwing a further half-turn using a 12 mm open-end wrench.



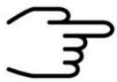
**WARNING!**

**Do not introduce aggressive gases or liquids into the device.**

7



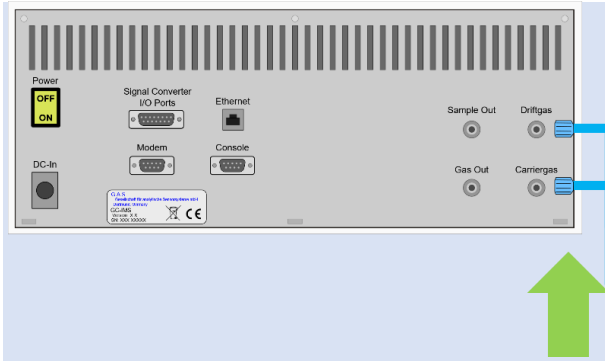
Connect nitrogen gas (Purity 5.0 or better) source to input of supplied molecular sieve using a PFA tube.



**INFORMATION!**

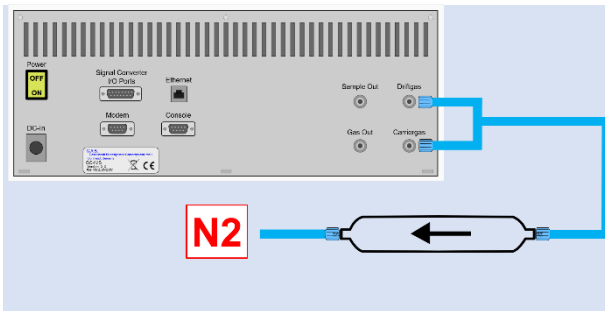
Recommended pressure of **Operation Gas** (Driftgas / Carriergas) is **3 bar (300 kPa)**. 6 bar (600 kPa) must not be exceeded.

8



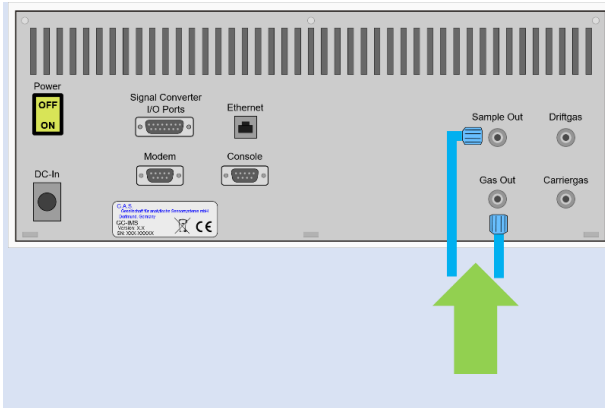
Connect the **Driftgas-/Carriergas-Adapter** to the **Driftgas-** and the **Carriergas-Connector**.

9

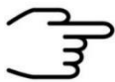


Connect molecular sieve outlet to **Driftgas-/Carriergas-Adapter** using a PFA tube.

10



Separately connect sockets **Sample Out** and **Gas Out** to appropriate waste gas ventilation system.



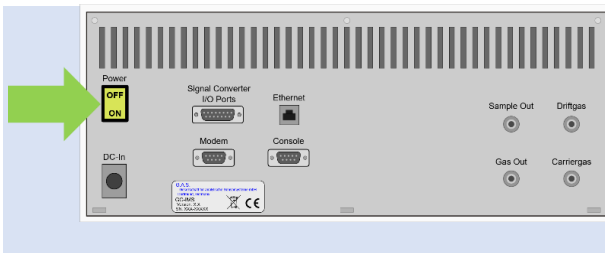
**INFORMATION!**

To ensure correct measurements it is absolutely necessary to **connect the supplied exhaust tubes** (Gas out and Sample gas out).

The exhaust tubes (Gas out and Sample gas out) **must be led separately into the exhaust system and must not be connected.**

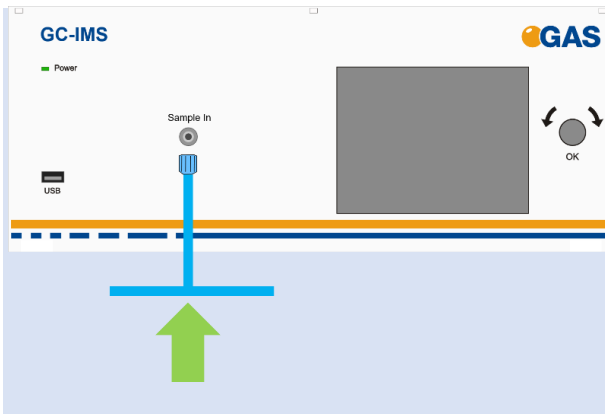
The exhaust system must **not generate any negative pressure.**

11



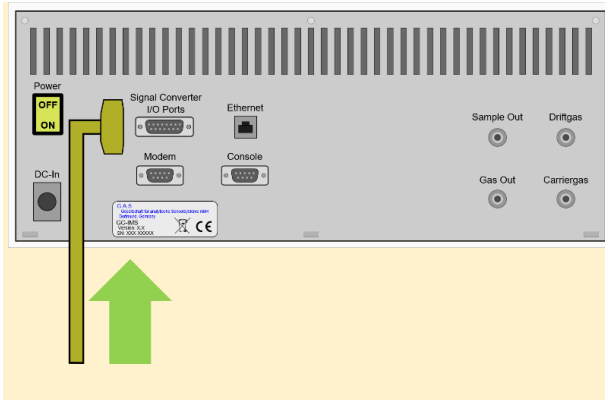
Switch on device.

12



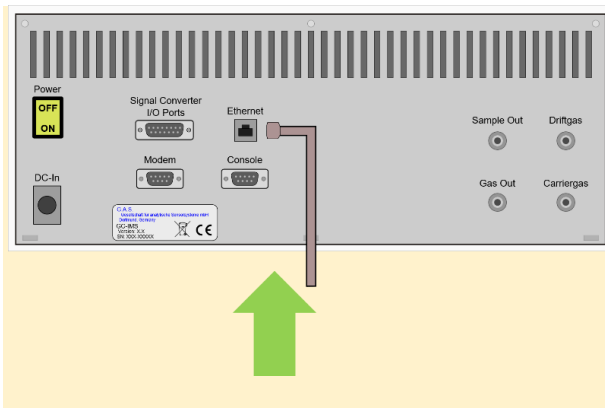
Connect a sample gas source to socket **Sample In** with the delivered **bypass adapter**.

**13**  
Option



For the output of concentration values through the 0-20 mA current loop connect an appropriate cable to the **Signal Converter - I/O Ports** socket.

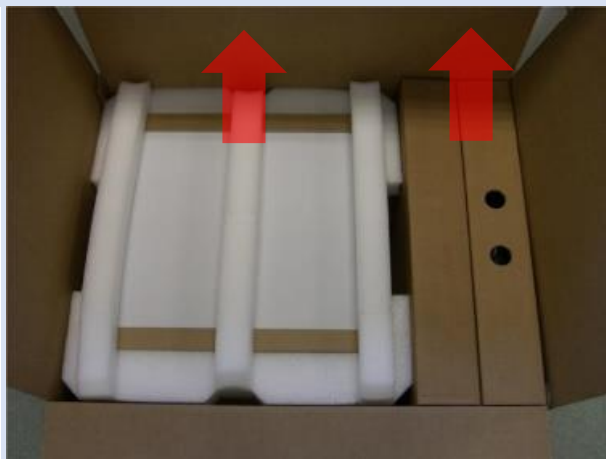
**14**  
Option



For file transfer via LAN: Connect the **Ethernet** socket with an appropriate Ethernet cable to a LAN.

### 5.3 Installing the device (GC-IMS with CGFU)

1



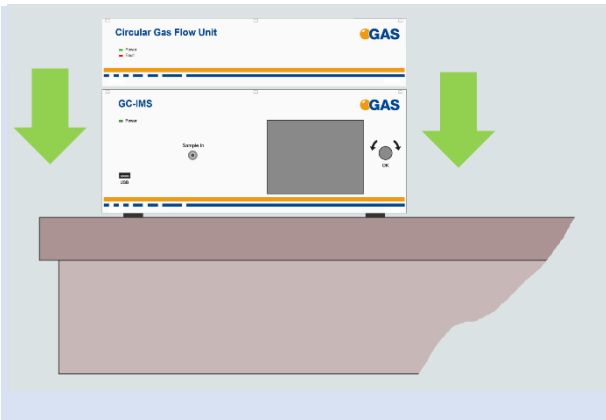
Unpack the device.  
Remove the foam spacers.  
Remove the accessories boxes.  
Lift the device from the transport box.



**WARNING!**

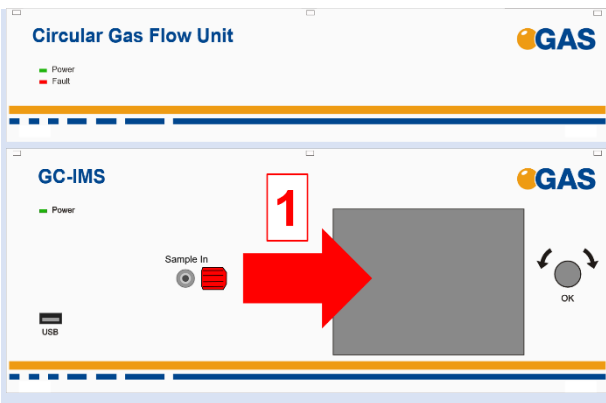
Do not deploy the device in areas exposed to explosive substances or mixtures!

2



Place it on a robust table top of minimum footprint size of 60 cm x 70 cm. Ensure that there is enough working space at the rear side of the device.

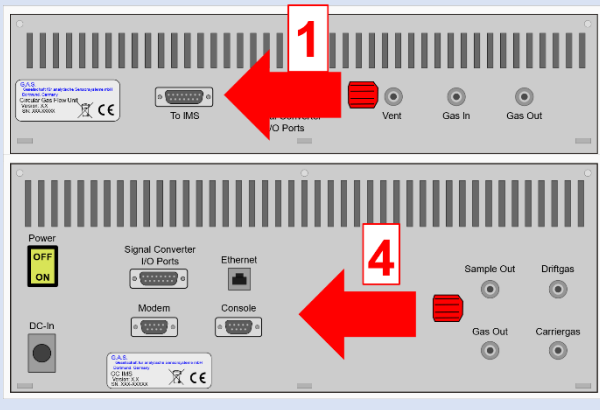
3



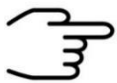
**Remove red protective caps** from gas sockets at front of housing. Retain for future use.



4



Remove red protective caps from gas socket at rear of housing. Retain for future use.



**INFORMATION!**

Protective caps should be put on gas sockets in case the device is stored or transported.



**WARNING!**

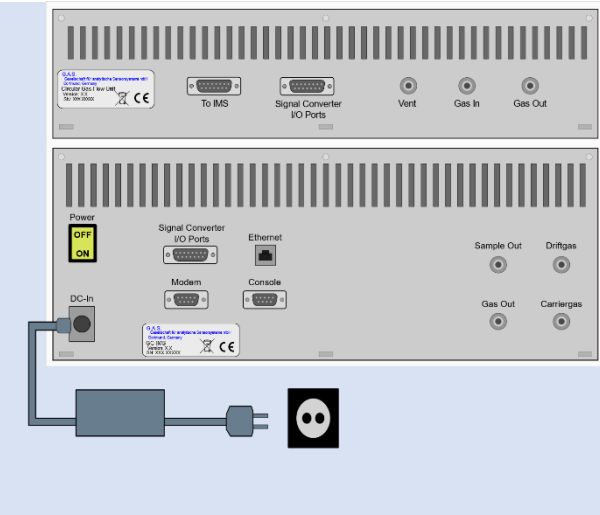
It is absolutely necessary to remove all protective caps before the system is switched on.



**INFORMATION!**

Make sure that the power switch is set to OFF before connecting the power supply.

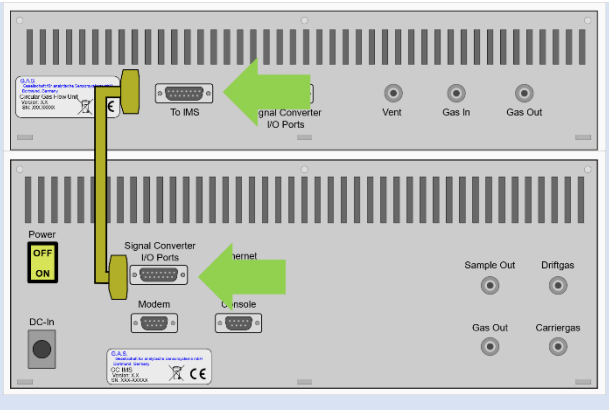
5



Connect device to power supply.

Connect power supply to power socket.

6



Connect CGFU-Connection-Cable.  
**(normally pre-installed!)**

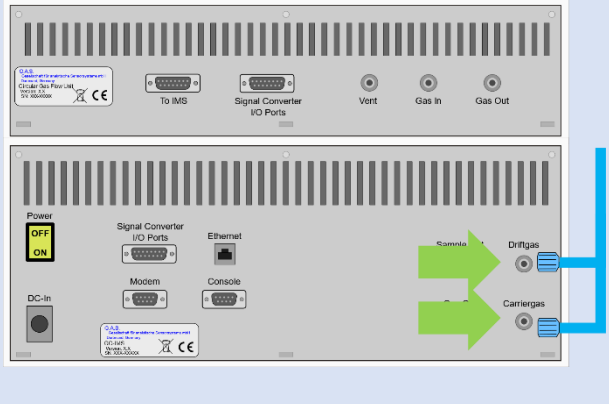


**INFORMATION!**  
Only use **PFA tubes** with 3 mm outer diameter and **3 mm Swagelok** connectors.  
Screw on the Swagelok caps manually and fix them by screwing a further half-turn using a 12 mm open-end wrench.



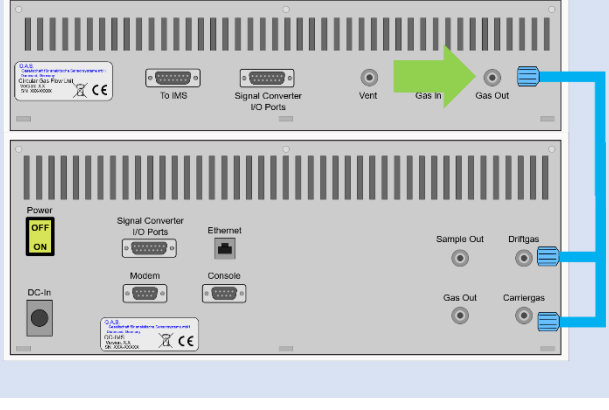
**WARNING!**  
Do not introduce aggressive gases or liquids into the device.

7



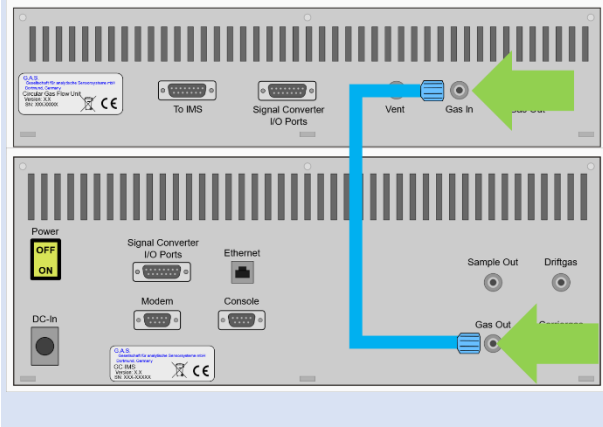
Connect the **Driftgas-/Carriergas-Adapter** to the **Driftgas-** and the **Carriergas-Connector**.  
**(normally pre-installed!)**

8



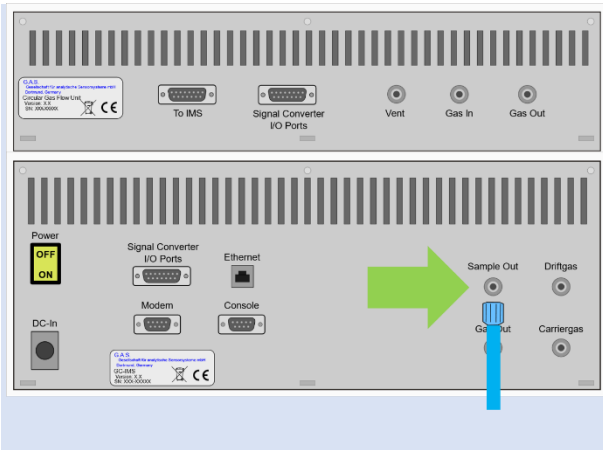
Connect CGFU **Gas Out** outlet to **Driftgas-/Carriergas-Adapter** using a PFA tube.  
**(normally pre-installed!)**

9

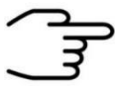


Connect CGFU **Gas In** inlet to GC-IMS **Gas Out** outlet using a PFA tube. (normally pre-installed!)

10



Connect socket **Sample Out** to appropriate waste gas ventilation system.

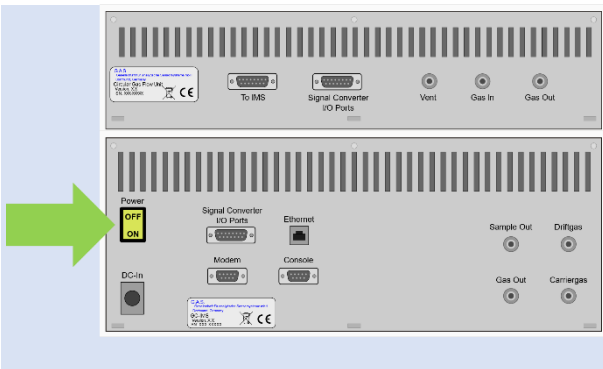


**INFORMATION!**

To ensure correct measurements it is absolutely necessary to **connect the supplied exhaust tubes** (Sample gas out).

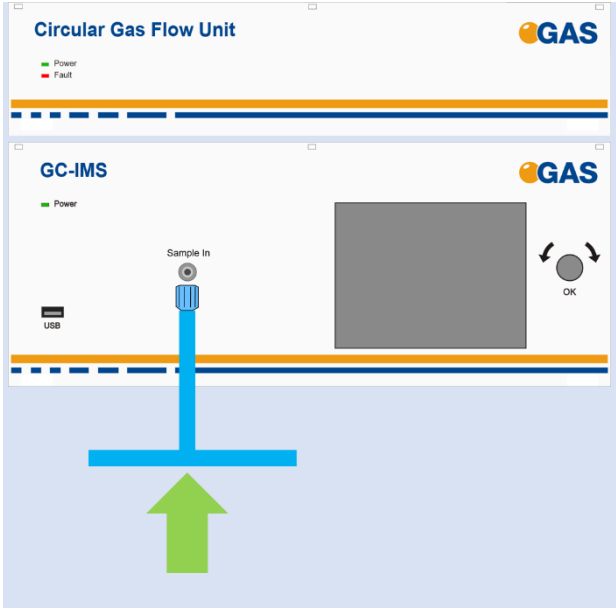
The exhaust system must **not generate any negative pressure**.

11



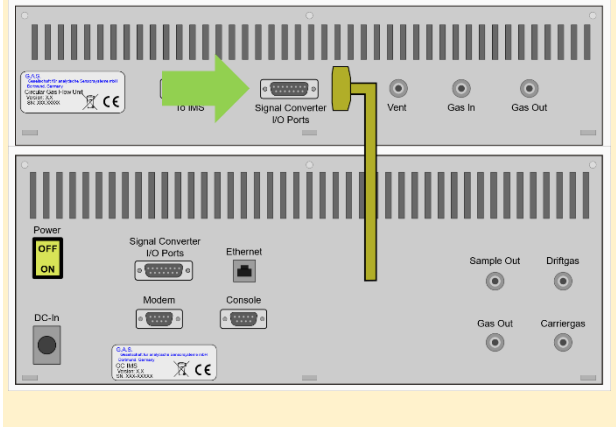
Switch on device.

12



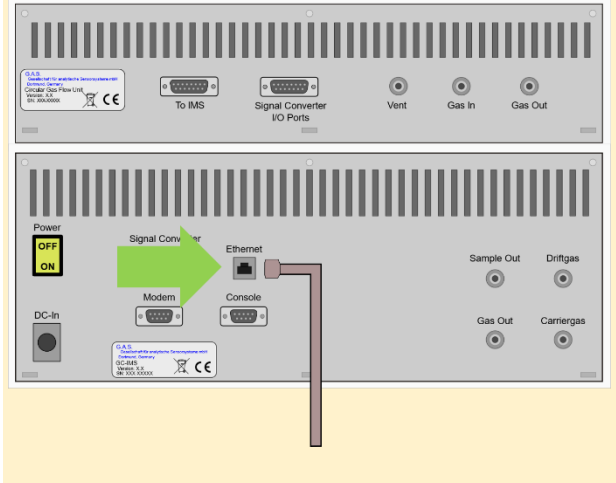
Connect a sample gas source to socket **Sample In** with the delivered **bypass adapter**.

13  
Option



For the output of concentration values through the 0-20 mA current loop connect an appropriate cable to the **Signal Converter - I/O Ports** socket.

14  
Option



For file transfer via LAN: Connect the **Ethernet socket** with an appropriate Ethernet cable to a LAN.

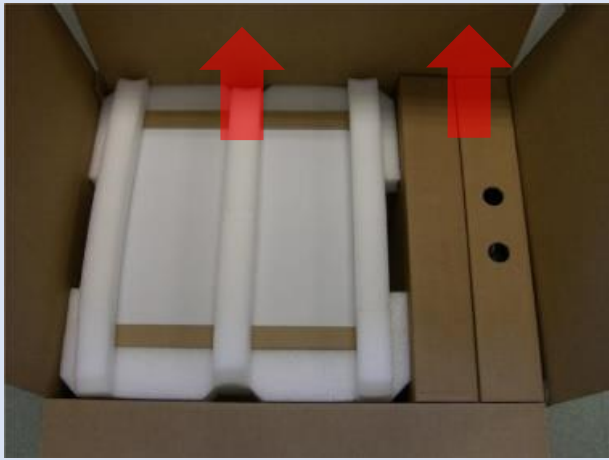


**INFORMATION!**

When using a CGFU unit the total flow (EPC1 and EPC2) is limited to 400ml/min.

## 5.4 Installing the device (GC-IMS with Airsense $\mu$ TD)

**1**



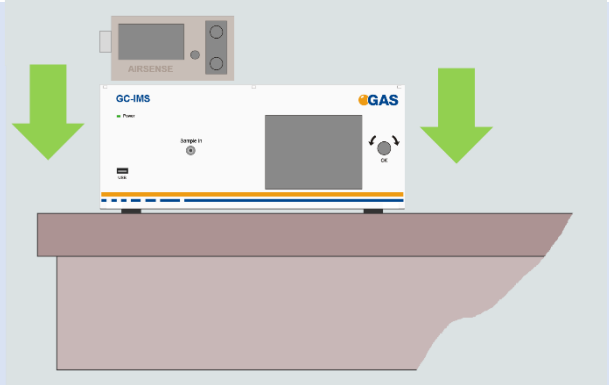
Unpack the device.  
Remove the foam spacers.  
Remove the accessories boxes.  
Lift the device from the transport box.



### WARNING!

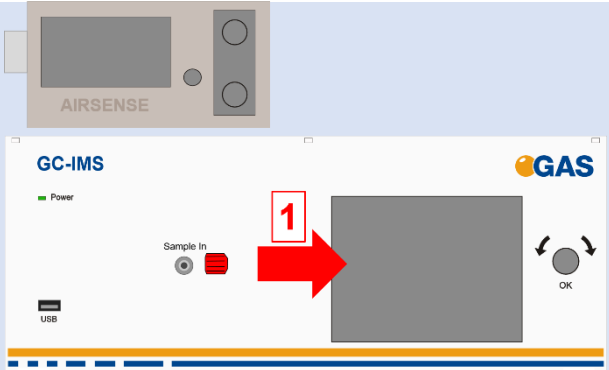
Do not deploy the device in areas exposed to explosive substances or mixtures!

**2**



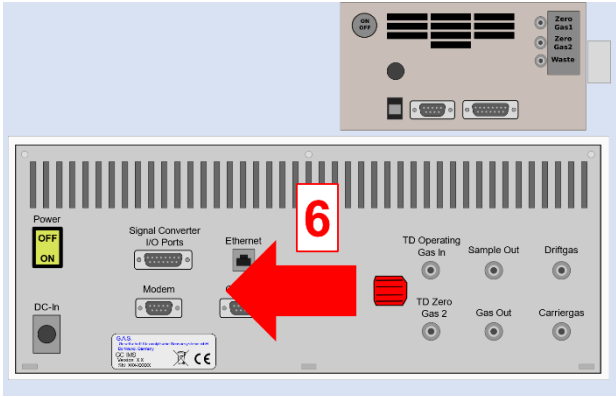
Place it on a robust table top of minimum footprint size of 60 cm x 70 cm. Ensure that there is enough working space at the rear side of the device.

**3**



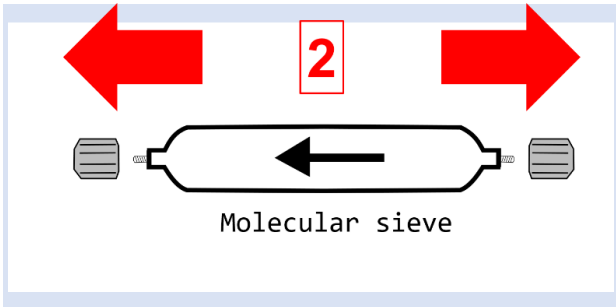
Remove red protective caps from gas sockets at front of housing. Retain for future use.

4



Remove red protective caps from gas socket at rear of housing. Retain for future use.

5



Remove protective caps from molecular sieve. Retain for future use.



**INFORMATION!**

Protective caps should be put on gas sockets in case the device is stored or transported.



**WARNING!**

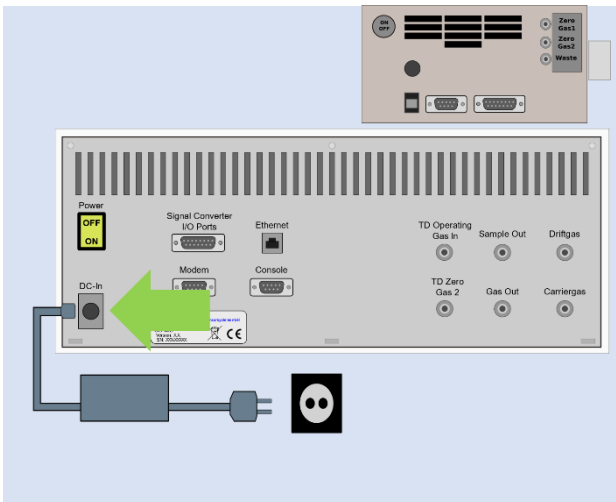
It is absolutely necessary to **remove all protective caps before the system is switched on.**



**INFORMATION!**

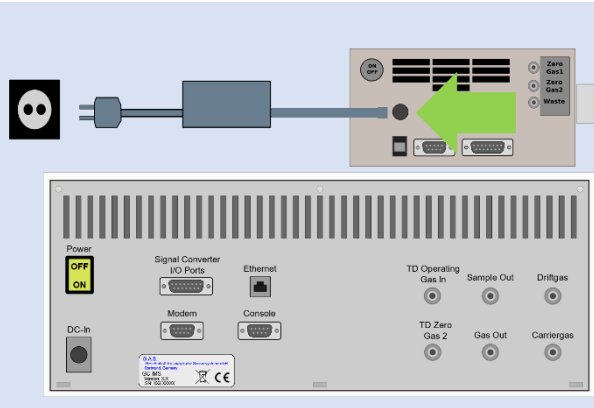
Make sure that the power switch is set to OFF before connecting the power supply.

6



Connect GC-IMS device to power supply.  
Connect power supply to power socket.

7



Connect  $\mu$ TD device to power supply.

Connect power supply to power socket.



**INFORMATION!**

Only use **stainless steel pressure reducers**, **PFA tubes** with 3 mm outer diameter and **3 mm Swagelok** connectors.

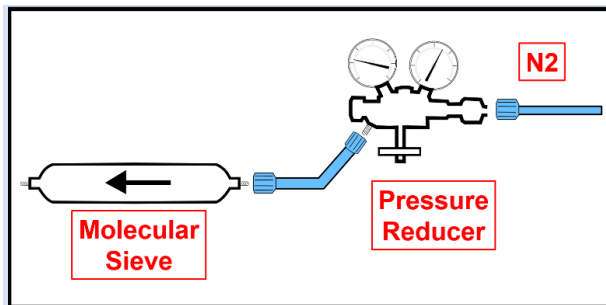
Screw on the Swagelok caps manually and fix them by screwing a further half-turn using a 12 mm open-end wrench.



**WARNING!**

**Do not introduce aggressive gases or liquids into the device.**

8



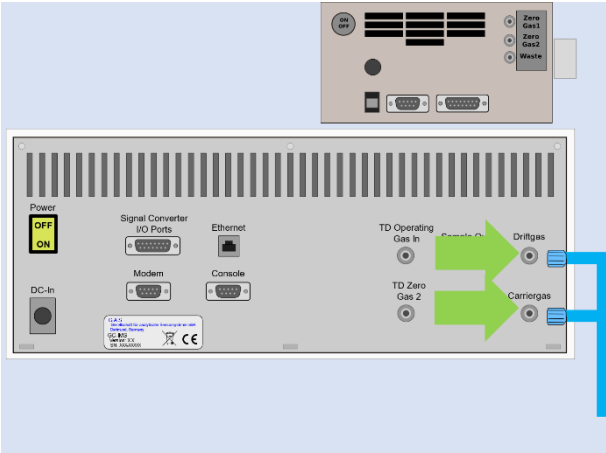
Connect nitrogen gas (Purity 5.0 or better) source to input of supplied molecular sieve using a PFA tube.



**INFORMATION!**

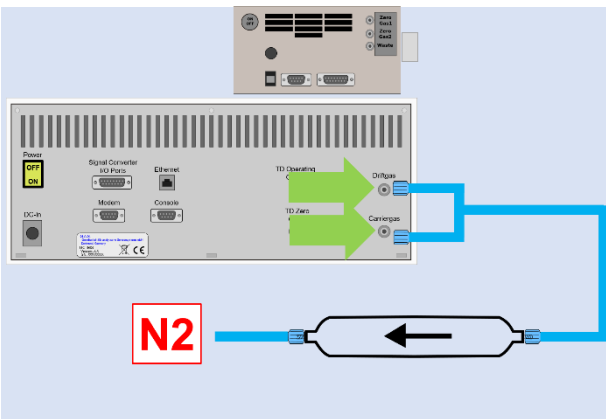
Recommended pressure of **Operation Gas** (Driftgas / Carriergas) is **3 bar (300 kPa)**. 6 bar (600 kPa) must not be exceeded.

8



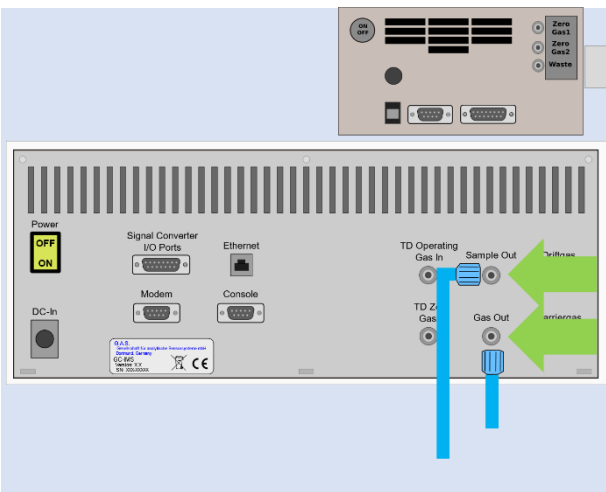
Connect the Driftgas-/ Carriergas-Adapter to the Driftgas- and the Carriergas-Connector.

9

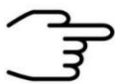


Connect molecular sieve outlet to **Driftgas-/ Carriergas-Adapter** using a PFA tube.

10



Separately connect sockets **Sample Out** and **Gas Out** to appropriate waste gas ventilation system.



**INFORMATION!**

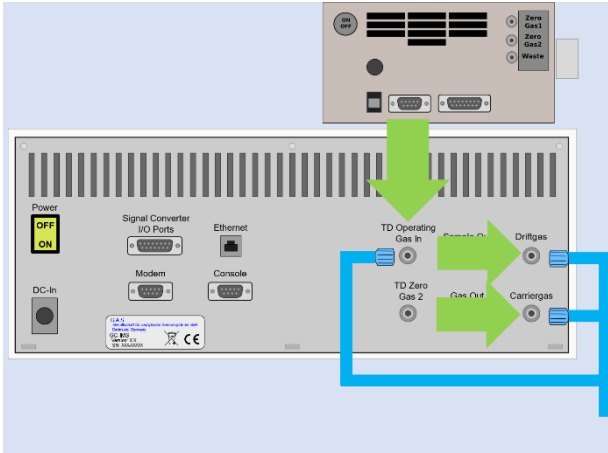
To ensure correct measurements it is absolutely necessary to **connect the supplied exhaust tubes** (Gas out and Sample gas out).

The exhaust tubes (Gas out and Sample gas out) **must be led separately into the exhaust system and must not be connected.**

The exhaust system must **not generate any negative pressure.**

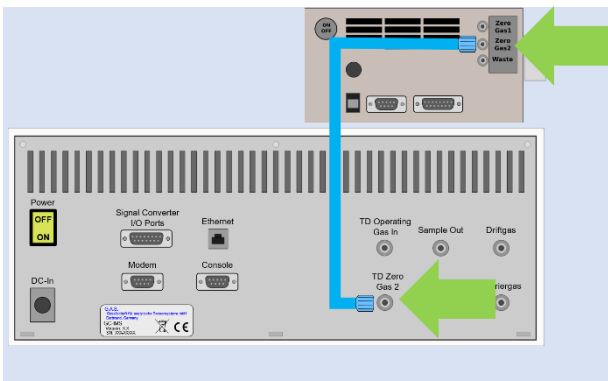


11



Connect TD operating gas in socket to **Driftgas- / Carriergas-Adapter** using a 3 mm Swagelok PFA tube.

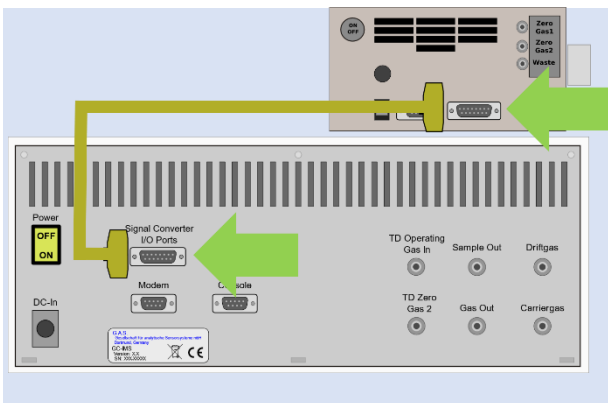
12



Also connect Outlet **ZeroGas 2** and **TDZero Gas 2** using a 3 mm Swagelok PFA tube.

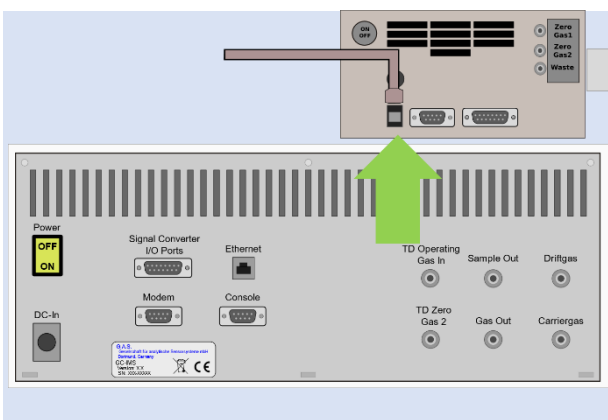
**For further Information see: Airsense  $\mu$ TD manual**

13



Connect GC-IMS **Signal Converter I/O-Port** to  **$\mu$ TD Digital Port** with appropriate Connection-Cable.

14

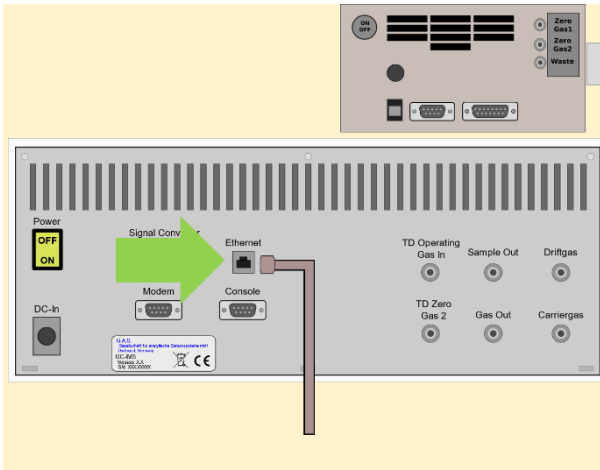


Connect the  $\mu$ TD with a computer via USB cable.

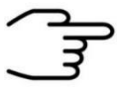
<p>15</p>		<p>Connect the <b>μTD detector transfer line</b> to <b>sample in socket</b> of GC-IMS.</p>
<p>16</p>		<p>Connect <b>the μTD sampling transfer line</b> to μTD.</p>
<p>17</p>		<p>Connect a sample gas source to <b>sampling transferline</b> with the delivered <b>bypass adapter</b>.</p>
<p>18</p>		<p>Switch on both devices.</p>

## 19

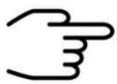
## Option



For file transfer via LAN:  
Connect the **Ethernet**  
socket with an  
appropriate Ethernet  
cable to a LAN.

**INFORMATION!**

For detailed information about the installation and operation of the  $\mu$ TD please refer the  **[\$\mu\$ TD-GC-IMS Quickstart Manual](#)** and the **[Airsense  \$\mu\$ TD Manual](#)**.

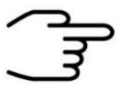
**INFORMATION!**

When the  $\mu$ TD unit is connected to GC-IMS, the current loop data output cannot be used.

## 5.5 Prepare the device for operation

Before using the device for the first time or after being disconnected from the nitrogen source for some time it must be cleaned to ensure proper operating conditions. In this case start the **cleaning mode**.

An appropriate cleaning period duration must be chosen depending on how long the device was switched off and on the extent of contamination. It is recommended to clean the device for at least **15 hours** before operating it for the first time. If the Spectrum is not clean repeat the process. A **reference spectrum** for the evaluation can be found in the supplied **Analytical Approval**.

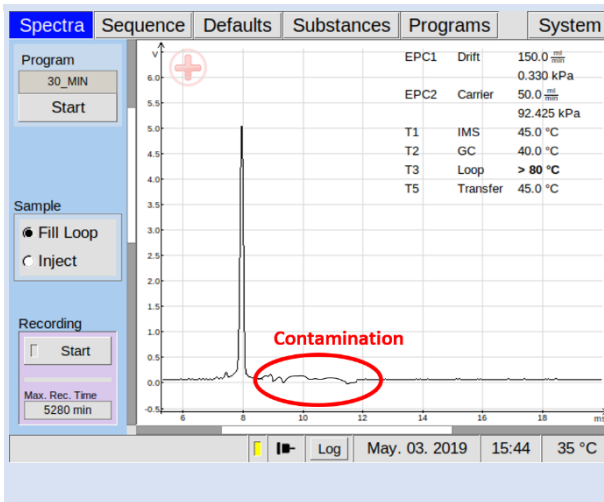


### INFORMATION!

After the cleaning process the device needs at least **2 hours** to cool down the internal components to their required temperatures.

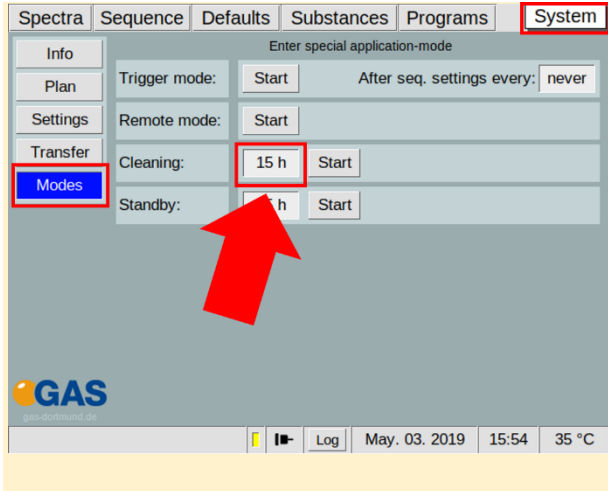
The duration of the cool down process is depending on the temperature default settings.

1



Inspect spectrum for contamination. Control the baseline. Start cleaning when contaminated. Contamination is indicated by peaks or the disappearing of the RIP.

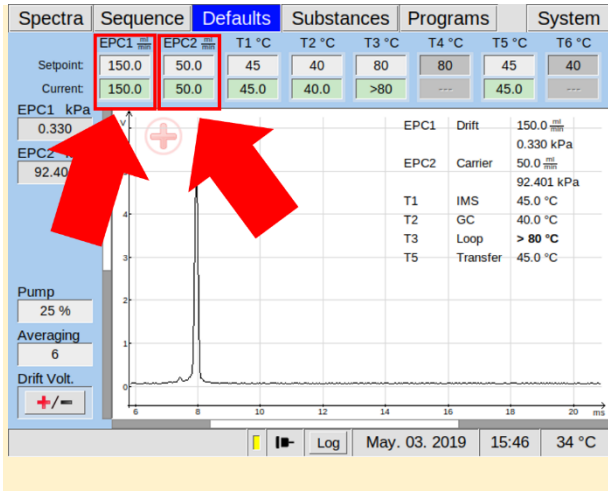
**2**  
Option



Select duration in hours:

**System** > **Modes** >  
**Cleaning Mode** > **x h**

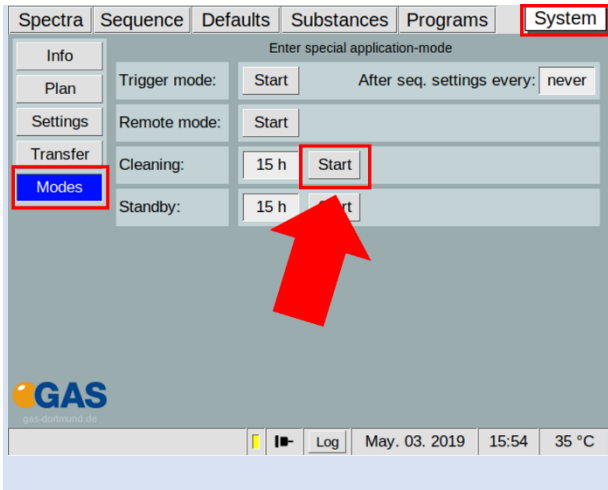
**3**  
Option



To speed up this process, increase flow rate of EPC1 and EPC2 to their maximum values (e.g 500/150 ml/min):

**Defaults** > **EPC1** > **EPC2**

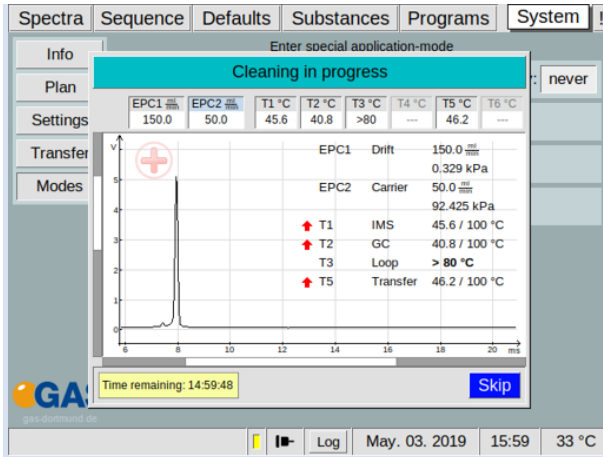
**4**



Start cleaning:

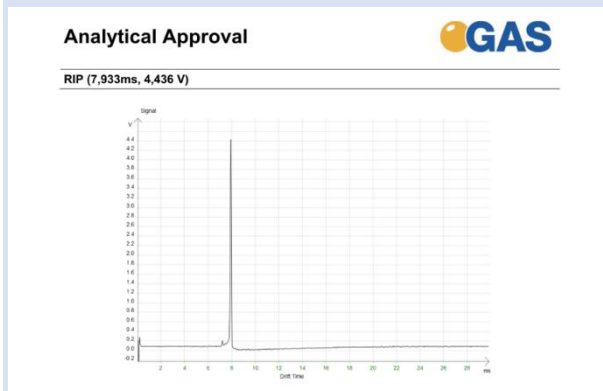
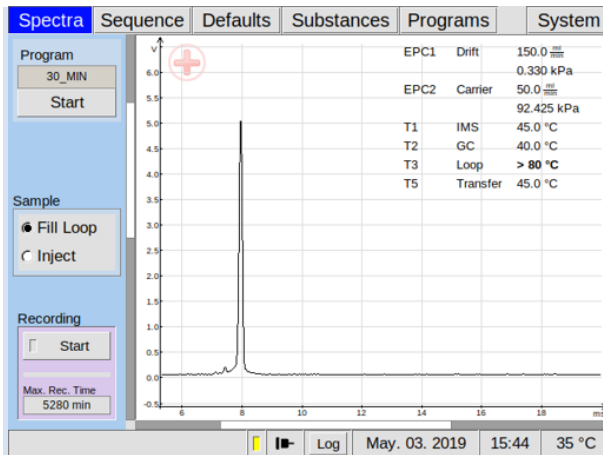
**System** > **Modes** >  
**Cleaning Mode** > **Start**

5



Wait until cleaning process is completed. The process can be stopped with **Skip**.

6



After all temperatures reached the default values inspect visually the current spectrum and compare it with the reference spectrum of the analytical approval. **The RIP should reach ~80% of the RIP height displayed in the delivered Analytical Approval of the device under same measurement conditions of G.A.S.**

If not check the gas quality and/or install additional purification cartridges and start the cleaning procedure again.



**INFORMATION!**

The device is delivered with an acceptance snapshot. This snapshot defines the system performance during device acceptance and is used to assess the readiness for measurement. Any deviations from this are displayed in the Error Information Window. **The default values can be adjusted by the customer.**

## 6 Measurement

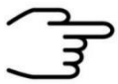
### 6.1 Measurement Requirements

**INFORMATION!**

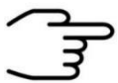
Only use the original accessories supplied with the device.

**INFORMATION!**

Make sure that the gas quality is 5.0 (99,999%) or better.

**INFORMATION!**

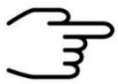
Only use stainless steel pressure reducer.

**INFORMATION!**

Make sure that the spectrum is clean a without contamination.

**WARNING!**

Do not introduce any liquids. This can destroy the device.

**INFORMATION!**

Make sure that that all temperature-, flow- and pressure values have reached their default value and are stabilized.

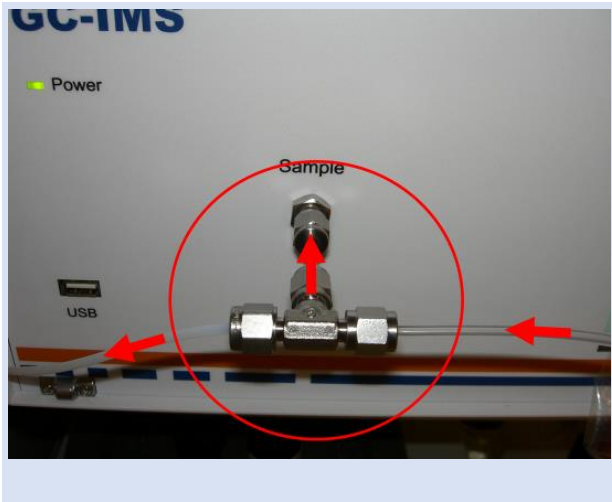
### 6.2 Running a measurement

**INFORMATION!**

The following workflow shows the exemplary measurement procedure.

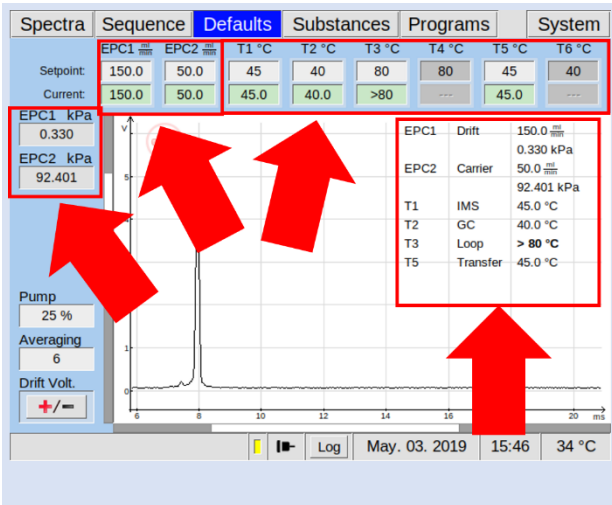
For detailed information about measurement and sampling please refer the [GC-IMS User Manual](#).

1a



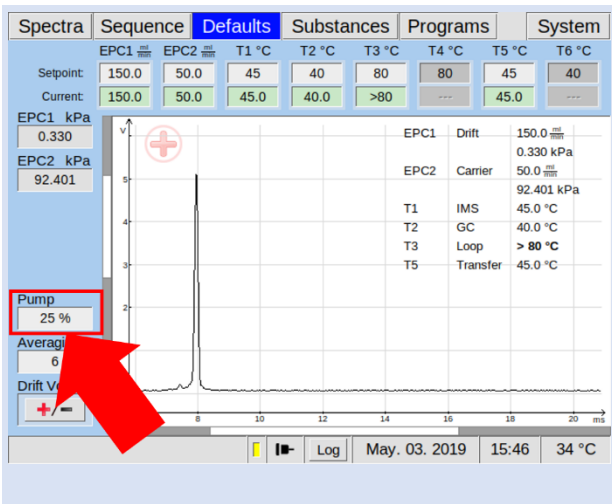
**Standard Sampling method 1 (Bypass sampling):**  
 Connect a **Bypass-Adapter** to Sample-In-Connector at the front of the Device. Connect a Sample-Gas-Supply to Bypass-Adapter.

1b



Check and setup the measurement parameter. Make sure that that all temperature-, flow- and pressure values have reached their default value and are stabilized.

1c

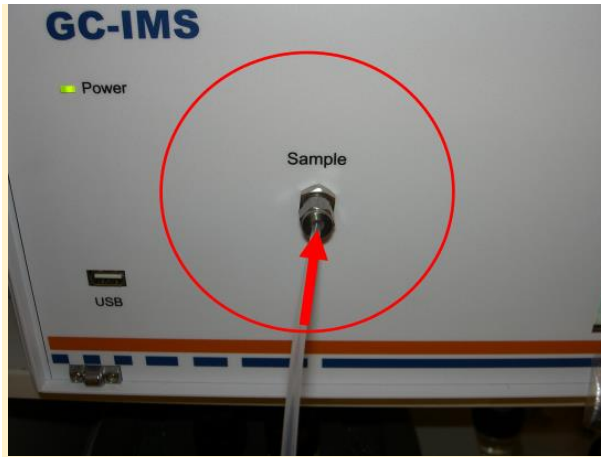


Set pump-power to a sucking flow below the sample-gas flow:  
**Defaults** > **Pump** > **x%**



# 2a

## Option



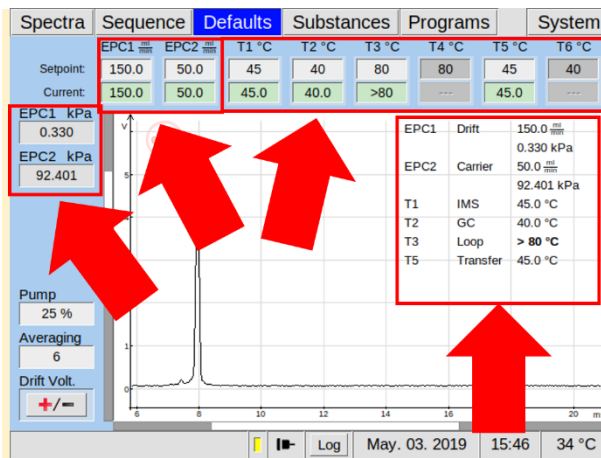
### Sampling method 2 (Direct sampling):

Connect a Sample-Gas-Supply to Sample-In-Connector at the front of the Device.

Make sure that the sample source gas is **pressure-free**.

# 2b

## Option

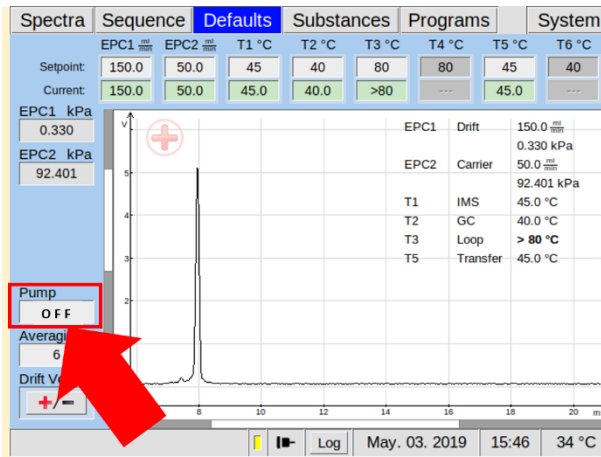


Check and setup the measurement parameter.

Make sure that that all temperature-, flow- and pressure values have reached their default value and are stabilized.

# 2c

## Option



Set pump-power off:

**Defaults** > **Pump** > **OFF**

# 3a

Option

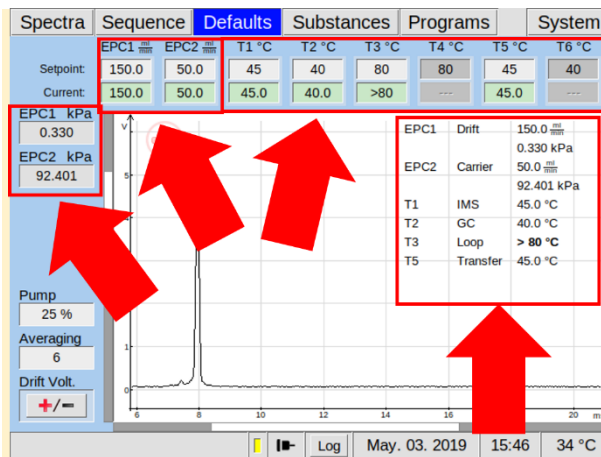


**Sampling method 3  
Sampling with Luer  
Adapter:**

Connect a **Luer-Adapter** to **Sample In** Connection at the front of the Device.

# 3b

Option

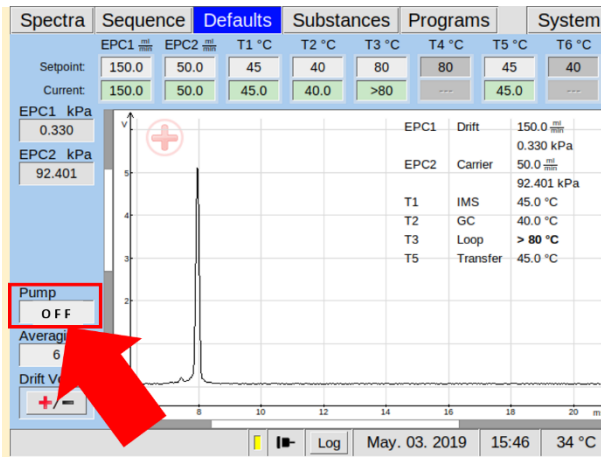


Check and setup the measurement parameter.

Make sure that that all temperature-, flow- and pressure values have reached their default value and are stabilized.

# 3c

Option

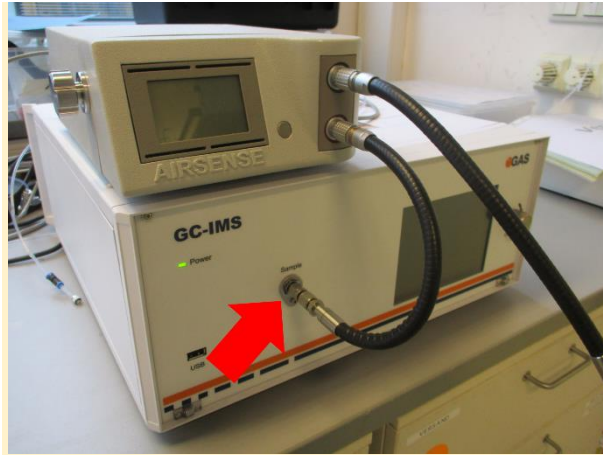


Set pump-power off:

**Defaults** > **Pump** > **OFF**

# 4a

Option

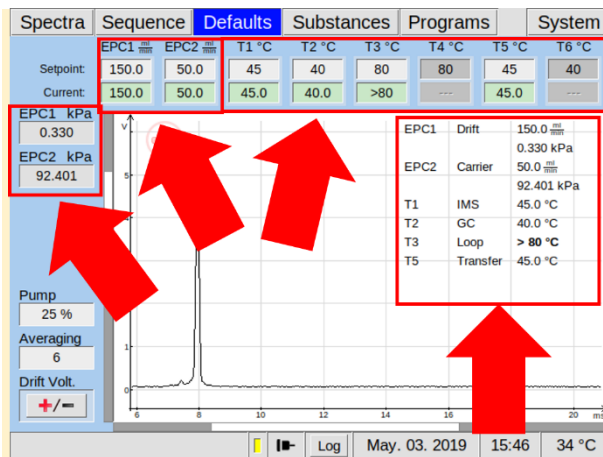


**Sampling method 4  
Sampling with  $\mu$ TD  
device:**

Connect the **Sample-Gas-Out-Tube** of the  $\mu$ TD device to Sample-In-Connector at the front of the Device.

# 4b

Option

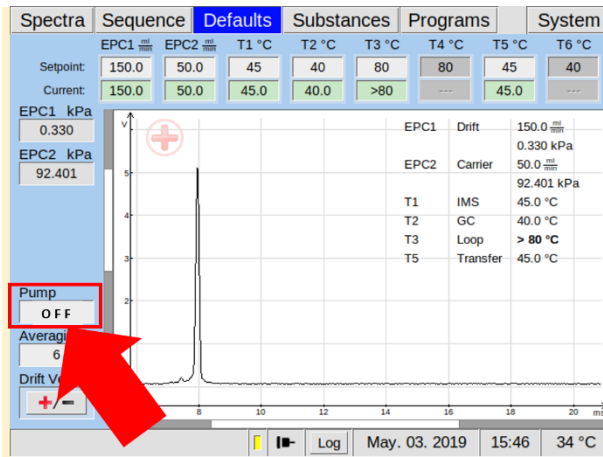


Check and setup the measurement parameter.

Make sure that that all temperature-, flow- and pressure values have reached their default value and are stabilized.

# 4c

Option



Set pump-power off:

**Defaults** > **Pump** > **OFF**

5

Time	R	E1	E2	P1
00:00,000	rec	150.0	50.0	25%
00:02,000	open			
00:05,000	close			
30:00,000	stop	150.0	50.0	
30:00,020				

Select a measurement program:

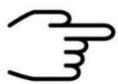
**Programs** > **Select**

6

Parameter	Value
EPC1 Drift	150.0
EPC1 Carrier	0.330 kPa
EPC2 Carrier	50.0
EPC2 Carrier	92.425 kPa
T1 IMS	45.0 °C
T2 GC	40.0 °C
T3 Loop	> 80 °C
T5 Transfer	45.0 °C

Start current measurement program:

**Spectra** > **Start**

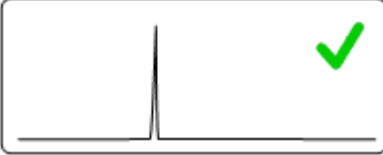
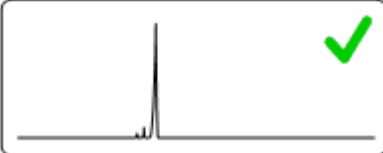

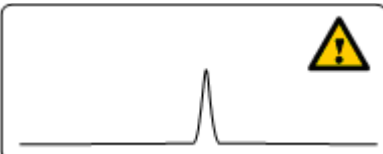

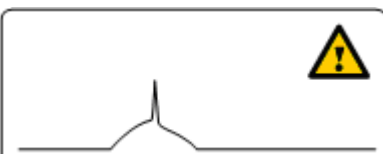
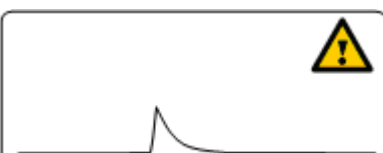


**INFORMATION!**

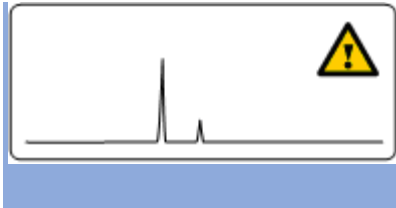
The maximum measuring time is limited to **59 minutes 59 seconds and 980 milliseconds.**

## 7 Appendix

### 7.1 IMS-Spectrum Examples

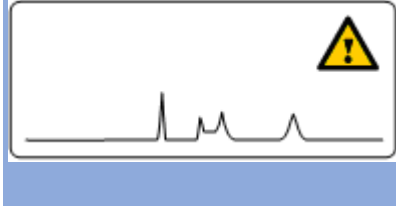
Schematic of IMS spectrum	Spectrum description	reasons / suggestions
	Clean spectrum	Perfect
	Clean spectrum, up to two extra signals left hand side of the RIP	Perfect
	RIP shifted to lower drift times	<ul style="list-style-type: none"> <li>- elevated temperature</li> <li>- reduced pressure</li> </ul>
	RIP shifted to higher drift times	<ul style="list-style-type: none"> <li>- low temperatures</li> <li>- elevated pressure</li> </ul>
	RIP deformed	<ul style="list-style-type: none"> <li>- gas quality out of specifications</li> <li>- device needs to be flushed for some time</li> <li>- flows not in range</li> </ul>
	RIP base deformed yet visible	<ul style="list-style-type: none"> <li>- gas quality out of specifications</li> <li>- device needs to be flushed for some time</li> <li>- flows not in range</li> </ul>
	RIP deformed towards tailing	<ul style="list-style-type: none"> <li>- gas quality out of specifications</li> <li>- device needs to be flushed for some time</li> <li>- flows not in range</li> </ul>

GC-IMS – Quickstart Manual



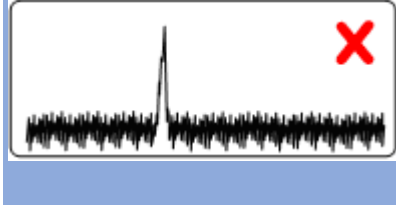
Minor impurities

- gas quality out of specifications  
- device is polluted > run system cleaning



Major impurities

- gas quality out of specifications  
- device is polluted > run system cleaning



Elevated noise

Contact G.A.S. support



No signal

Contact G.A.S. support

## 7.2 Corresponding Documents



### INFORMATION!

- GC-IMS User Manual
- CGFU User Manual (optional)
- $\mu$ TD GC-IMS Additional Information Quickstart (optional)
- Sequence Designer Manual
- IMS Control TFTP-Server Manual
- Tutorials Sequence Designer
- Tutorials VOCal