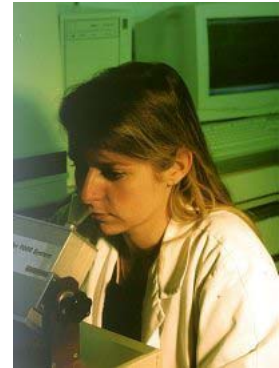


# Sniffer 9000



- **GC-O system**
- **Leading GC-O system on the market**
- **Maximum comfort, enhanced features**

## GC - Olfactometry: Method for Fragrances and Flavor Industry

In the past decades, many detection techniques have been hyphenated to gas chromatography. Less attention has been paid to GC-olfactometry (GC-O) in which the human nose plays the role of the detector. However, the human nose is often more sensitive than any physical detector, and GC-O exhibits powerful capabilities that can be applied to flavors and perfumes, as well as to any odoriferous products (e.g. pollutants).

Olfactometry (or "sniffing") techniques allow the determination of impact odorants in food. They can be classified into two categories: dilution methods, which are based on successive dilutions of an aroma extract until no odor is perceived at the sniffing port of the chromatograph; and intensity methods, in which the aroma extract is only injected once but the sniffer records the odor intensity as a function of time by moving the cursor of a variable resistor.

The Sniffer 9000 System is designed to be a dedicated Sniffing-port as a stand alone unit to be connected



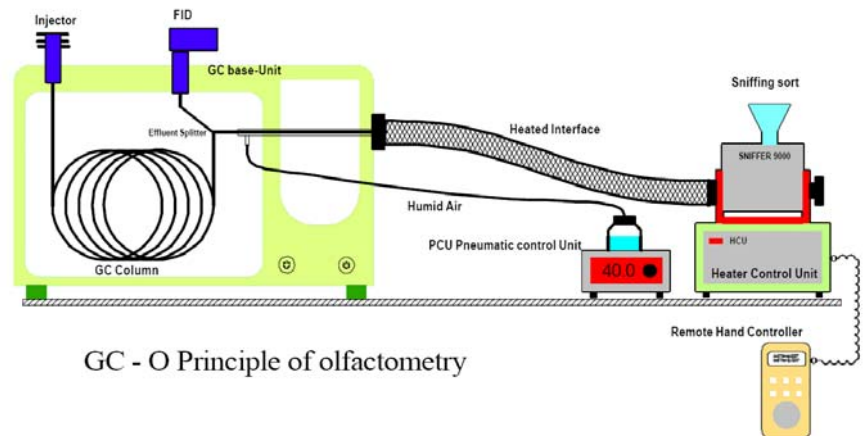
to any GC available on the market. It is also available as a complete system.

The new Electronic- and Pneumatic design, based on a new industry standard (LON) provides maximum flexibility for future needs those protecting your investments in the Laboratory.



## GC - Olfactometry - Principle of operation - Technical description

The GC-Olfactometry theory is simple to understand. By installing at the end of a chromatographic column a split the sample is splitted (e.g. 1:50) FID Detector /nose. The peak/odor impression correlation will then be performed by specialised fragrancery chemists. At the heart of the Sniffer 9000 GC-O system is the dedicated GC/Olfactometer heated Interface. Brechbühler has over 25 years experience in implementing hyphenated techniques by using special designed interfaces.

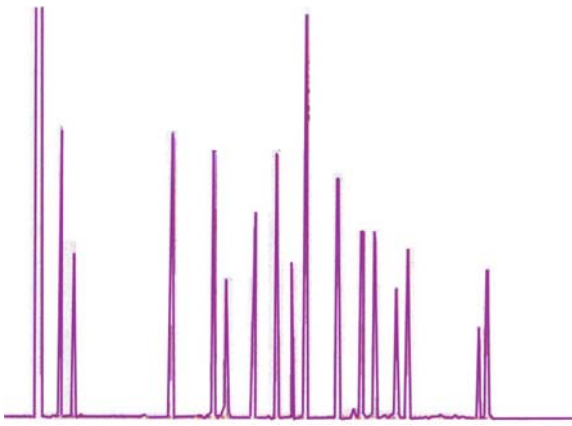


GC - O Principle of olfactometry

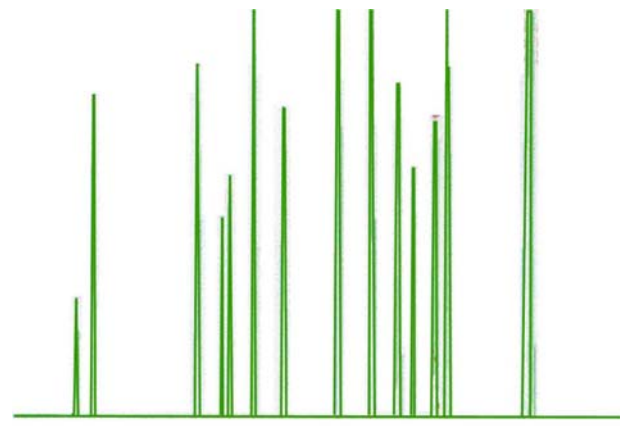
The Sniffer 9000 interface is engineered to transfer the effluents to the Sniffing Port without losing the high resolution available on capillary columns and influence of oxidation or turbulence.

Built as part of the current Sniffer 9000 System, the interface is manufactured from a single Stainless steel tube which is heated by direct current, thus giving the best temperature profile possible. The interface consists of a standard fused silica line resulting in an inert olfactometer interface. The column effluents are combined with laminar streams of inert Make-Up gas generated by the Sniffer 9000 System and additional humidified air to deliver distinct odorants to human subjects with minimum discomfort and maximum separation. Integrated into any GC System available on the market, Brechbühler's Sniffing 9000 System is one of the most flexible GC/Olfactometer Systems available on the market.

An analog output allows the Sniffer 9000 to be connected to an additional Channel on an existing data system, or any integrator available in the lab, to record odor intensity generated by the panelist. The signal is generated using the cursor wheel on the Hand control unit.



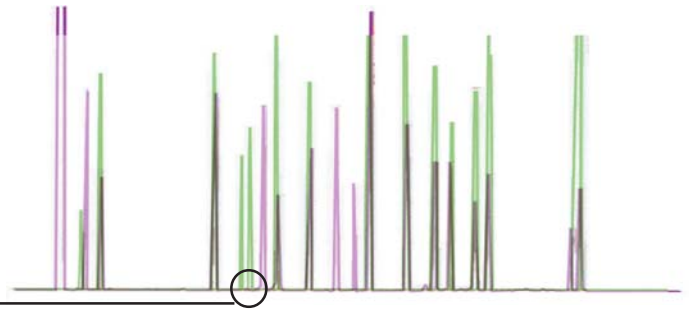
**Chromatogram (fig. 1)**



**Odor intensity (fig. 2)**

The Chromatograms show the FID trace (fig 1) the Odor intensity (fig 2) and the overlay of the two traces (fig 3)

As the human nose is much more sensitive to certain compounds. The overlay clearly shows it. when comparing the FID trace and the odorogram. result of the odor intensity is shown in fig. 3, where we can see that the odor intensity peak is much more intense than the FID peak.

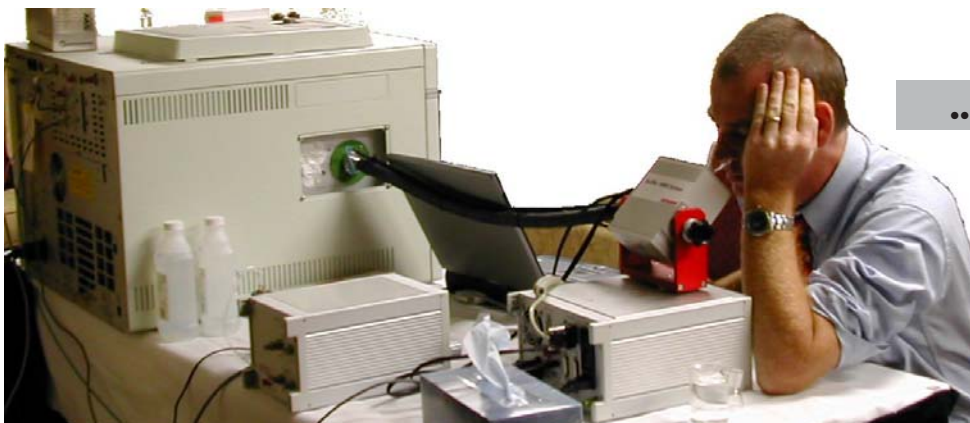


**Chromatogram and Odor intensity overlay (fig. 3)**

## GC - Olfactometry - It's all about...

### ...Focus

One of the challenge in GC-O is the identification of odors eluting. The main detector in GC-O is the human nose. To get accurate results, the panelist must remain focused.



### ...Comfort

The sniffer 9000 has been designed to offer maximum comfort. It offers a comfortable working position away from any source of heat.

### ...instrumentation and features

For over 25 years, Brechbühler has helped food, flavor and fragrances companies with GC-O issues.

The sniffer 9000 GC-O system is the result of this experience.

With all its features, it is the best tool to get he job done.

# Sniffer 9000 - Features

## Olfactive measurement system.



Connection to the GC via flexible heated transfer line of 80 cm (length) x 25 mm (diameter).  
Optional 140 cm length available.  
Temperature of the transfer line programmable from 50°C to 350°C with regulation  
Easy installation left or right of the GC  
Adaptable to any GC

Outlet with glass nozzle cone, set at about 30 cm (12") above the table

Adjustable angle for optimum comfort

Changing of the glass cone takes a few seconds



Make-up (Optional) gas supply (Nitrogen) with pressure control from 0 to 300kPa  
Flow rate : 0 to 50 ml/min.  
Connection of the make-up in the oven on Y PressFitt and mixing at release gas outlet  
Humidified air supply (standard outfit) from humidifier bottle (sparging) control from 0 to 300kPa.  
Flow rate of 0 to 50 ml/min.  
Connection in the oven at the transfer line inlet  
Preheated humid mixture going around the capillary inside the transfer line  
Fitting the outlet split by choosing different lengths and diameters of fused silica capillary.  
Maximum capillary diameter : 0.32 mm  
Hand-Held control unit for control of the sniffer functions.

Set the interface temperature from 50°C to 350°C  
Analog signal generation (for odor intensity) using cursor wheel  
Adjustable maximum output signal (1V, 5V and 10V)  
Adjustable number of turn to reach 100%  
Beeping at the end of range

Power 115/220 V. 50/60 Hz max. 10 Amp



# Sniffer 9000 - Options

## Software option - expand the possibilities



The software option adds several unique features to the hand controller:

Temperature programming of the heated interface

To prevent the degradation of thermolabile compounds, the interface temperature can be ramped

Dynamic adjustment of the intensity potentiometer

For support of the fingerspan

Full scale marker using F2 button.

When all you need is an on/off odor signal

Additional analog output range

## Finger span - Improve odor intensity measurements

The Fingerspan option is designed to improve the odor intensity the intensity generation. The intensity generated is proportional to the distance between the thumb and another finger

This option is installed directly to the remote hand controller of the SNIFFER 9000 and requires the Software option to be able to use the dynamic adjustment of intensity. The dynamic adjustment of intensity allows the user to adjust the fullscale of the intensity marker to his personal distance between thumb and major or index finger. This way, even with different panelists, the intensity range remains constant.



## Training and Test kit - Get the best of your system



The SNIFFER 9000 training and test kit allows the user to train himself using a well known test mixture with reference chromatograms and descriptions of the odors.

The kit includes a 30 meter column, a standard mixture with 17 components, Pressfit, pre columns ferrules and a user manual with different flow descriptions.

This training or test kit has been developed to give to the GC Olfactive users a powerful tool to train them self and to learn how to work with the SNIFFER 9000.

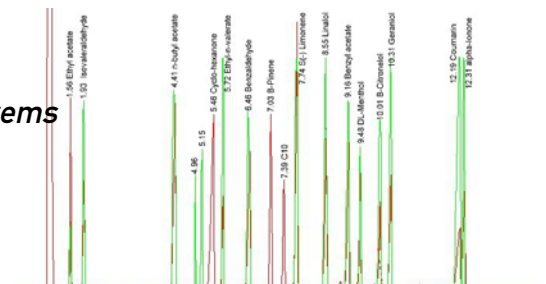
### Features

*New users can be easily trained on how to use GC-Olfactive systems*

*Includes known and described components mixture*

*Includes column*

*Includes description of method parameters, odour description of components and reference chromatograms*



# Sniffer 9000 - Nose to Text

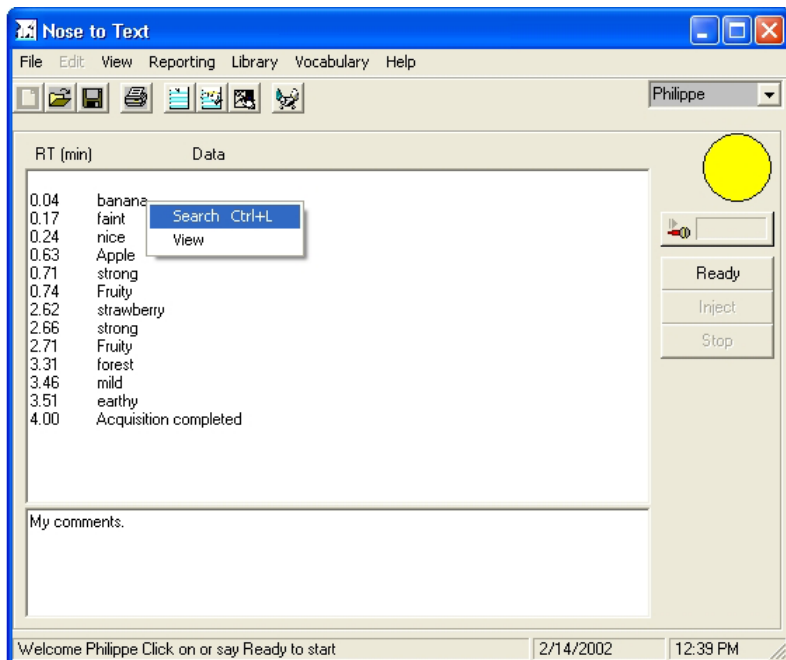
## Your personal assistant for GC-O experiment

### Nose to text

The perfect solution for your GC-Olfactometry experiments.

Speak your mind...

...Nose to Text will put it down on paper when on paper. ...



Nose to Text is based on leading voice recognition software. It has been designed to make your GC-O more productive and allow you to concentrate on the sniffing not on writing down your impressions. As the compounds elute from the gas chromatogram, the user describes the flavor and speaks into a headset microphone. The software inputs time stamps next to the comments dictated.

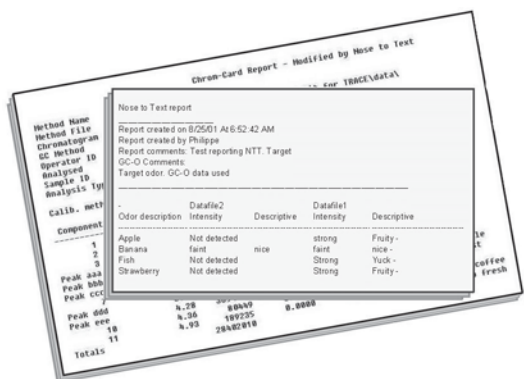
At the end of the run, the comments can be merged to the GC report from ThermoFinnigan's Chrom-Card or from the Agilent's Chemstation or searched against the custom library.

Nose to Text also creates flexible reports for non GC specialists, listing the odors and any other comments. The Target Odor option lets you report only the odors of interest, and allows for a quick sample comparison.

The software responds to voice command. It will initiate the run, start the recognition process upon injection and stop the run at your command.

Nose to Text is available in English, French, German, Italian, Spanish...

## Nose to Text - Reporting



Nose to Text gives you lots of flexibility for reporting the GC-O data.

Merging the GC-O data to the GC report or reporting the on the odors and associated comments, Nose to Text does both.

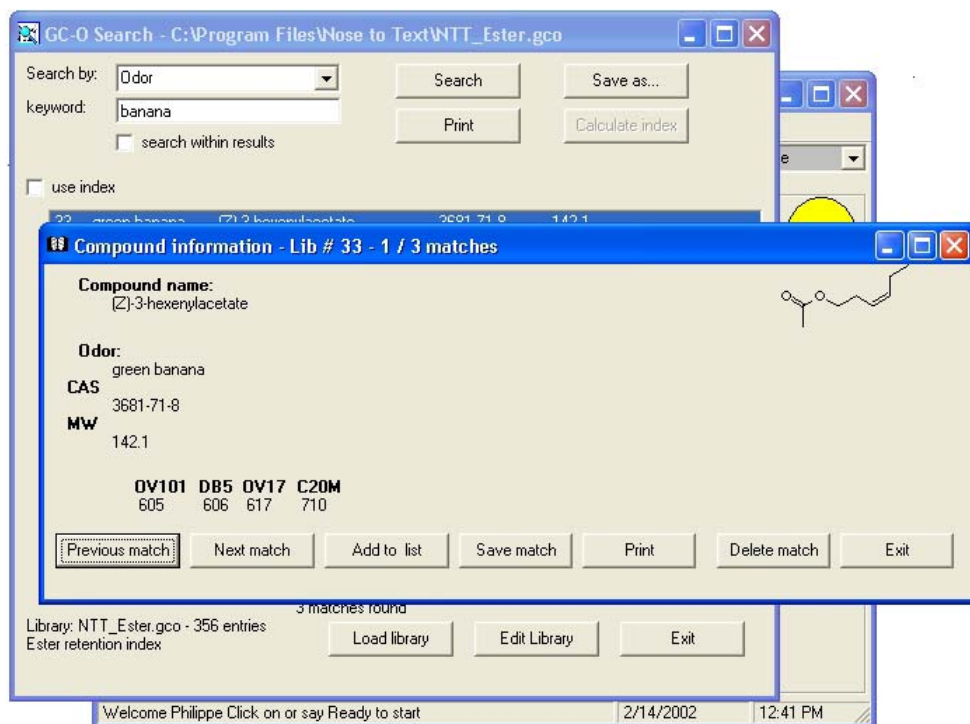
If your GC Data systems can create a TEXT file report of your data, Nose to Text can add your comments to your Report.

The comparison of sample is easy with the multiple file reporting option.

Report only on the odors of interest using the powerful Target odor report.

# Sniffer 9000 - Nose to Text

## Nose to Text - Library search



With its custom odor Library, Nose to text gives an additional tool for GC-O.

The library can be searched by odor, compound name or any other specific entry.

### Specifications:

One field for compound name, One field for odor description

6 custom fields designed for such parameters as:

- Synonym , Formula, Molecular weight, CAS, Natural occurrences,
- Graphic file (one per compound either the Structure or a spectrum)
- Retention Indices for up to 10 columns

## Nose to Text - Requirements

### Computer

**Windows® 2000 (XP recommended, 500 MHz processor minimum, 128 MB RAM (256MB recommended))**

**150 MB free disk space 150 MB CD-ROM for installation**

**Speakers, Noise canceling headset microphone (included)**

**Soundcard from the following list:**

#### Manufacturer

#### Model

Aureal Inc.	Vortex2 SQ2500
Aureal Inc.	Vortex2 SuperQuad Digital PCI
Aureal Inc.	Vortex2 PCI
Aztech Labs Inc.	PCI 168
Conexant	Riptide Modem/Wave Device
Creative Labs Inc.	SoundBlaster AWE 32 PnP (CT 3980)
Creative Labs Inc.	SoundBlaster 16 PnP (CT 2940)
Creative Labs Inc.	SoundBlaster Vibra 16C (CT 4180)
Creative Labs Inc.	SoundBlaster AWE 64 (CT 4380 / CT 4500)
Creative Labs Inc.	SoundBlaster AWE 64 Gold PnP (CT 4390)
Creative Technology	Ltd. Sound Blaster PCI 128
Creative Technology	Ltd. Sound Blaster Live!
Creative Technology	Ltd. Sound Blaster Live! Value
Diamond Multimedia	Sonic Impact s90
Diamond Multimedia	Monster Sound II MX300
Ensoniq Corporation	Audio PCI (32-bit)

#### Manufacturer

#### Model

Ensoniq Corporation	SoundScape VIVO 90
Expert Media	Med 3240 (with OPTi 931 chip)
Hi-Val Inc.	SounTastic 16 PnP
MediaTriX Peripherals	Audiotrix Pro
New Media Corp	Wavjammer (PCMCIA)
TerraTec Electronic	ProMedia Sound System Base 1
TerraTec Electronic	XLerate PCI Audio Card
Turtle Beach Systems	Multisound FIJI
Turtle Beach Systems	Tropez Plus
Turtle Beach Systems	MontegoA3DXstream PCI
Turtle Beach Systems	Montego II
Typhoon Multimedia	Soundcard Gold 3D
Yamaha Corporation	Waveforce 192XG
Yamaha Corporation	DS-XG Quad

## Sniffer 9000 - Available configurations

The Sniffer 9000 comes in different configuration. Depending on your lab setup, your applications, you might want to consider a complete GC-O sunlge or multiport system. The sniffer 9000 is also available as an upgrade to existng GC.



SNIFFER 9000 standalone system



Complete GC-O system with trace GC

The new Focus GC-O system is designed for budget sensitive customers.



Complete GC-O system with Focus GC

Complete GC-O three port system with trace GC



For efficient panel studies the multiport system is the best tool to get the job done quickly. The panelists get the same effluents at the same time so that comparison is simple.

The Sniffer 9000 can easily be upgraded to the Prep 9000 fraction collection system. The Prep 9000 allows for the collection and concentration of Low level compounds for further studies.



Sniffer 9000 with Prep 9000 upgrade



## Ordering information

Part number	Description
	<b>Base Unit</b>
9 1000050	<b>Sniffer 9000</b> (80 cm Interface) GC/Olfactive measurement system includes: Dedicated flexible heated interface 80 cm length Heater control unit Hand held control unit Analog output to record odor intensity Standard outfit, Manual
9 1000051	<b>Sniffer 9000</b> (140 cm Interface) GC/Olfactive measurement system includes: Dedicated flexible heated interface 140 cm length Heater control unit Hand held control unit Special analog output to record odor intensity Standard outfit, Manual
	<b>Options</b>
9 1000080	SNIFFER 9000 <b>Software option</b>
9 1000081	SNIFFER 9000 <b>"Finger Span" option</b>
9 1000085	SNIFFER 9000 <b>Training and test kit</b>
9 1000086	<b>Nose to Text</b> , Standard DNS, English includes: DNS Voice recognition Software Standard Version, english Nose to Text Software CD, Manual
9 1000087-2	<b>Dual-port system includes :</b> Two Sniffer 9000, 140cm interface (P/N 9 100051) Adapter for up to three sniffer
9 1000087-3	<b>Three-port system includes :</b> Three Sniffer 9000, 140cm interface (P/N 9 100051) Adapter for up to three sniffer
	<b>Accessories / Spare parts</b>
9 1000055	Flexible heated interface 80 cm (standard)
9 1000056	Flexible heated interface 140 cm (optional)
9 1000060	Outlet glass nozzle cone
9 1000061	O-Ring for outlet glass nozzle cone
9 1000062	Fused-Silica transfer line
9 1000063	Press-fit with make-up-line

## Ordering information Complete GC-O Systems

Part number	Description
9 100050-TR-S	<b>Trace GC-O Single port system</b> Includes: Trace GC (spl/splless, FID, EFC) Sniffer 9000 80cm (P/N 9 100050) Data system with two acquisition channel Computer
9 100050-TR-2	<b>Trace GC-O Dual port system</b> Includes: Trace GC (spl/splless, FID, EFC) Two Sniffer 9000 140cm (P/N 9 100051) with multiport adapter Data system with three acquisition channels Computer
9 100050-TR-3	<b>Trace GC-O Thee-port system</b> Includes: Trace GC (spl/splless, FID, EFC) Three Sniffer 9000 140cm (P/N 9 100051) with multiport adapter Data system with four acquisition channels Computer
9 100050-FC-S	<b>Focus GC-O single port system</b> Includes: Focus GC (spl/splless, FID, EFC) Sniffer 9000 80cm (P/N 9 100050) Data system with two acquisition channels Computer
9 100050-FC-2	<b>Focus GC-O Dual port system</b> Includes: Focus GC (spl/splless, FID, EFC) Two Sniffer 9000 140cm (P/N 9 100051) Data system with three acquisition channels Computer
9 100050-FC-3	<b>Focus GC-O Thee-port system</b> Includes: Focus GC (spl/splless, FID, EFC) Three Sniffer 9000 140cm (P/N 9 100051) Data system with four acquisition channels Computer

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