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I. Installation procedure description

I.1. Description of the manual

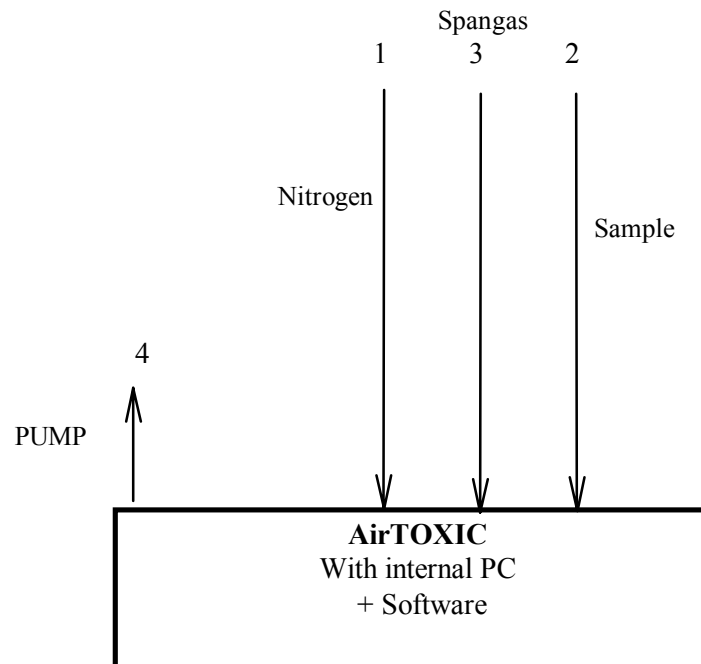
- The grey writing is related to the operations to be performed
- The black and red writing are related to :
 - ⇒ Details of the various events that occur when the operator makes one of the described actions
 - ⇒ The characteristics that have to fulfil the used material (especially if this material is not provided by Chromato-Sud / airmotec).
 - ⇒ The functional diagram of the whole system
 - ⇒ The safety conditions (especially for gas supplies)
 - ⇒ To environmental conditions of the working system

I.2. Installation procedure

- Installation of the software and of the analyser configuration : a procedure is available on the CD Rom and in the folder delivered with the instrument. See the "**SMQ 0008-00 Installation of Vistachrom_UK**" manual.
- Installation of the analyser :
 - ⇒ Environmental conditions
 - ⇒ Connection of the gas supplies
 - ⇒ Electrical supply
 - ⇒ Signal and data cabling
- Starting of the analyser
- Starting of VistaChrom software : checking whether the static conditions of the system are correct
- Start of an analysis

II. Installing the Analyser

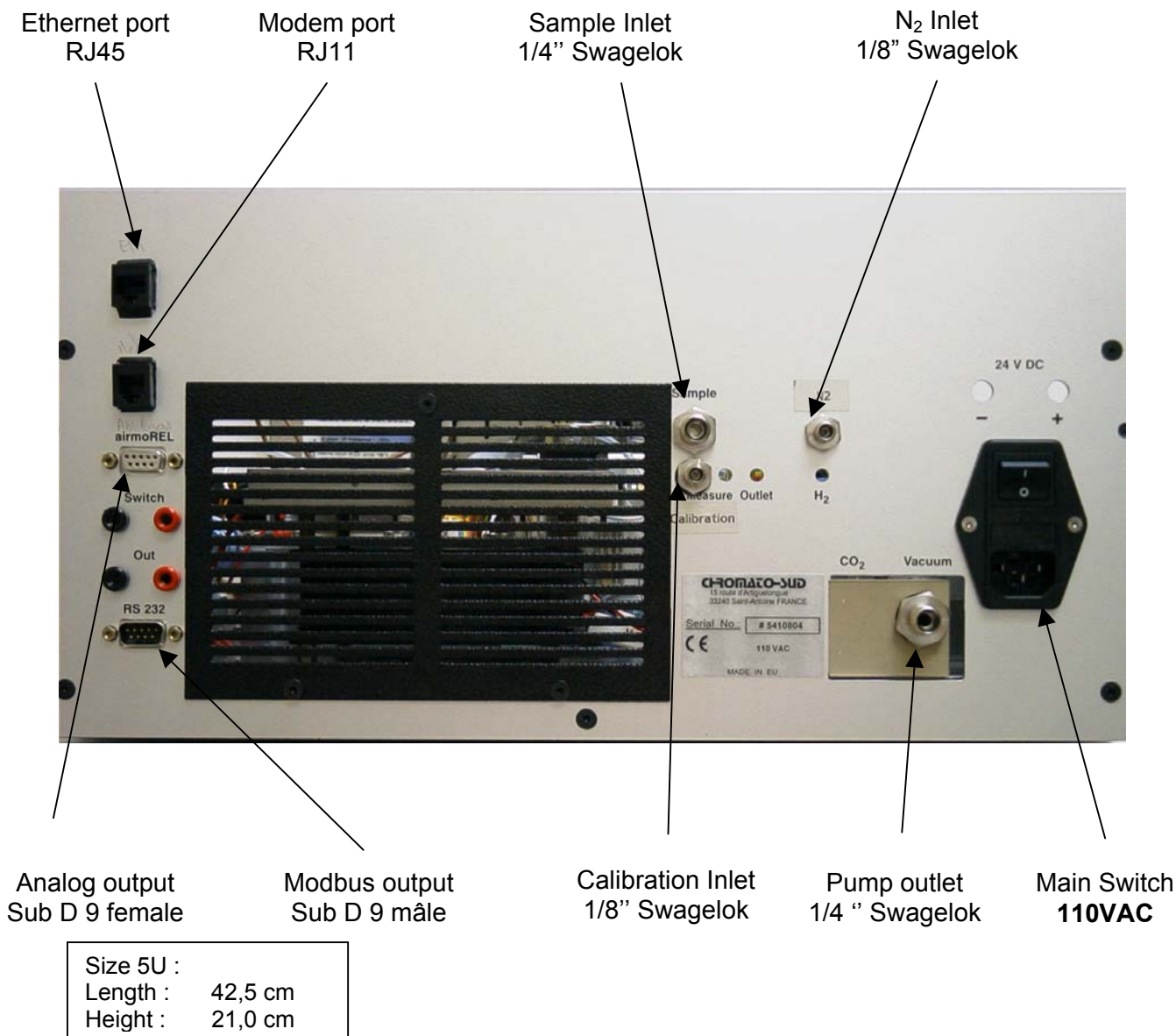
II.1. Functional diagram



Legend :

- 1 Nitrogen cylinder (not included) 1/8" stainless steel, swargelock.
- 2 Sample (ambient air...). 1/4" stainless steel, swargelock
- 3 Standard gas inlet, 1/8" stainless steel, swargelock
- 4 Sampling pump 1/4" , stainless steel, swargelock.

II.2. Rear face scheme : location of the gas tubes, electrical and communication cables connection



II.3. Mechanical installation and operation position

The usual lack of space in instrumentation cabins, vehicles and measurement stations results necessarily in the installation of the various measuring systems in close proximity to each other. Despite this, it is essential to ensure that a sufficient supply of cooling air is available to the instrument at all times. Usually, cooler conditions are found in the lower levels of large systems. Under no circumstances should an instrument with large power consumption be placed directly below the Analyser.

II.4. Environmental conditions

The permitted ambient temperature range for operation of the instrument is **+10 to +35°C**.

Do not forget that the internal temperature of the instrument is 5 to 8 °C higher than ambient. Therefore the lowest permissible oven temperature lies about 5 °C above ambient, an important point when operating at elevated room temperature, expect extended cooling times.

II.5. Electrical supply

This instrument is supplied with 110VAC.

The supply must be able to deliver the following power :

110 VAC (+/- 10 %)

Power : 400W

Fuse : 15A

Power uptake :

- Standby : approximately 80 W
- Normal operation : approximately 140 W
- Short duration peak : approximately 360 W.

These values are for guidance only. The actual power uptake varies with the maximum oven temperature, PID temperature and calibration plug-in unit.

Connect the electrical supply cable to the analyser and to the electrical supply.

II.6. Gas supply and connections

II.6.1. Warning

The gas supply tubing diameters must be sufficiently large so that the required inlet pressure at the instrument is maintained even under worst-case conditions (such as maximum gas flow rate at maximum ambient air).

All tubing used must be clean, debarred, and free of sward and dust. The use of virgin tubing is recommended. Tubing which has previously been in contact with liquids is not suitable. The following materials have proven themselves suitable :

- Nitrogen : stainless steel, **1/8"**, HPLC grade.
- Stainless steel, **1/8"**, HPLC grade (standard gas)
- Sample inlet : glass, 10 mm, or PFA, **1/4"**.
- Standard gas inlet : glass, 5 mm, or PFA, **1/8"**
- Pump : **1/4"** (grade not important).

Before pressurising the tubing for the first time, all connections must be checked for correctness of assembly and leak tightness.

For a better stability of gas flows, it is recommended that double pressure release valves are used with gas bottles. These pressure regulators must be free of plastic (i.e. GC or ultra-high purity gas quality).

All gas supplies are controlled on the airTOXIC. The use of unsuitable pressure-reducing valves would result in the entry of contaminating hydrocarbons into the measuring system, resulting in incorrect measurement values.

See on § I-6 Gas and power supply connectors on the instrument rear panel.

The following information refers to the values measured at the inlet connectors to the airTOXIC.

II.6.2. Nitrogen

Nitrogen is used as carrier gas and for the pneumatic actuator.

- Nitrogen (5.5 quality recommended).
- Inlet pressure : **3 bars**
- Consumption for carrier gas : **3 to 4 ml/min**
- Connector : **1/8 "**, stainless steel, swagelock.

II.6.3. Air

Ambient air is used as gas for the self cleaning of the lamp and for the internal calibration system.

- Ambient air with dust filter
- Consumption : \approx **30-40 ml/min** (for self cleaning)

II.6.4. Sample

II.6.4.1. Sampling system

An adequate vacuum supply is required to aspirate the sample into the instrument and for the sample volume measurement.

- Vacuum : **800 hPa** (200 hPa maximum at the vacuum outlet).
- Pump flow : **1 to 2 l/min**.
- Connector : **1/4"**, stainless steel, swagelock.

The gas sample must be made available at the instrument inlet ("Sample", 1/4" stainless steel, swagelock) under certain defined conditions. It must not contain any liquids. It is recommended that the sample be brought to the instrument through generously dimensioned glass tubing. Metal tubing should be kept as short as possible.

In order to carry out the sample volume measurement, certain conditions must be fulfilled. The lower the inlet pressure, the less sample gas flows into the instrument. The pressure at the inlet connector must be at least 800 hPa.

II.6.4.2. Sample

The sample gas must contain no liquids or particles.

If gas at high temperature and of high relative humidity is being sampled, there exists the danger that condensation may occur in the instrument. This must be prevented by diluting the sample with dry gas.

If the sample gas contains fine dust this must be removed by using a suitably fine glass wool or glass frit filter in the sample pass. Such a filter must not, however, cause a pressure drop of more than 50 hPa.

The filter must be frequently changed, since the slightest accumulation of dust can lead to the absorption of certain components in the sample.

All methods of sample filtering have some effect on the measurement. It is essential in all cases to check that the compound to be analysed actually passes through the filter. (This can be done by making test measurement with reference samples before and after the filter and comparing the results).

- The flow is fixed by a critical orifice.

- Connector : 1/4", stainless steel, swagelock.

II.6.5. Calibration Gas

The calibration gas will be introduced in the analyser at atmospheric pressure. The instrument measure the sample volume introduced in the analyser with the PA Card. This volume measurement is depending of the critical pressure. This pressure will be always little like ambient pressure.

In any case, you have to use a T at the instrument inlet to have a correct pressure measurement.

Connector : 1/8" swagelock stainless steel

Sampling flow is fixed by the critical orifice. The instrument take the needed volume and the rest of the standard flow will be connected to an EVENT.

II.7. Signal and data cabling

Data cable : RS 232, 9600 Baud. Maximum permissible cable length : 15 meters
Fiche 9 pole submin. Type D, male / female.
Inside the instrument.

Analogue output : 0-1 V, 500 ohms output impedance
Two 4 mm diameter banana plug sockets (black : -; red : +).
Short circuits protection.

Switching output : Isolated relay switch controlled by CPU microprocessor.
Switching capacity 100 mA at 24 V
Two 4 mm diameter banana plug.

II.8. Starting the Analyser



Before turning on the supply gas (Nitrogen), you must verify that the pressure reducing valve is turned off because the pressure regulator inside the instrument is pre-adjusted and a big pressure variation are very dangerous for the pre-adjustments.

Check that all the tubes are connected correctly and gas tight.

- Set the Nitrogen pressure at **3 bars**. Switch on the sample vacuum pump. Connect to the VENT the outlet of the sampling pump and the outlet of the Standard T.
- Switch on the Main Power Supply (Back Face)
- When the airTOXIC is on the green LED "**OK**" and the red LED "**STAND BY**" light. It is possible that errors occurred before the instrument was last switched off, in which case, the error information will have been saved by the system. If this is case, the yellow LED "**WARNING**" or the red LED "**ERROR**" will light immediately after the instrument is switched on again. The error number will be passed to the computer before or by latest the end of the first chromatogram. When the airTOXIC is switch on, the initial parameters are charged in the instrument. These parameters are :

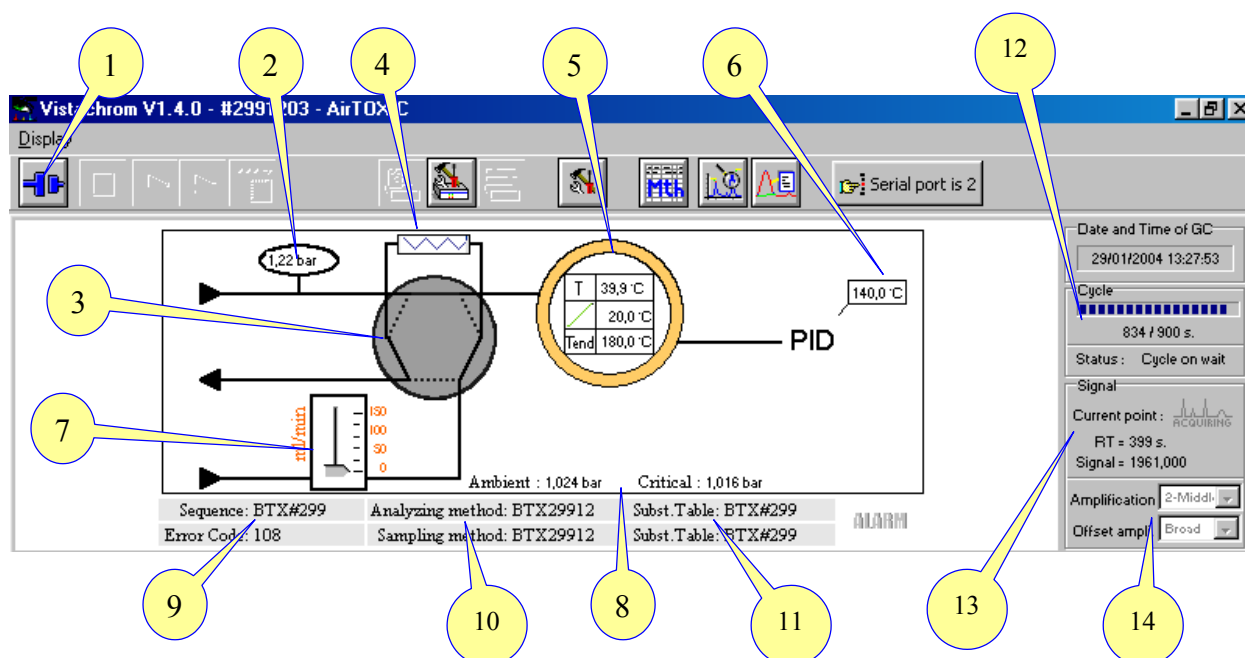
- Oven temperature : 40 °C
- PID temperature : 140 °C
- Column pressure : $\approx 1,26$ B

These parameters are fixed and should not be modified.

- d) In the same time, the PC is switched on. Windows XP starts with **Chromatotec** user “password” : **CETOMRIA** and the PC opens automatically the vistachrom software. You select the “super user” level and you type **1234** as Password.
- e) You log on the instrument with  and the PC. Start the analysis with the touchpad . The first cycle permits to initialize the system.

II.9. Checking of the static working conditions of the analyser




The parameters that have to be checked when getting in to the on-line window are indicated. The values of the parameters when in stand by status are:



- ① : Icon to establish the communication with the PC
- ② : Measure of the pressure on the head of the column. If there is no pressure, check the Nitrogen supply. If the pressure is not stable, check the gas circuit for leaks.
- ③ : State of the injection valve
- ④ : Indication of the trap thermodesorption state :
 ♦ red drawing : active
 ♦ blue or green drawing : inactive
- ⑤ : Oven temperature measure. In a stand by position, the oven is regulated at 40°C.
 Oven temperature programming : in this example :
 ♦ 20 : gradient in °C/min
 ♦ 180 : final temperature of the gradient.
- ⑥ : PID detector temperature (140 °C)
- ⑦ : Indication of the sampling flow
- ⑧ : Measure of ambient and critical pressures

- ⑨ : Name of the sequence
- ⑩ : Name of the methods : sampling method and analysing method
- ⑪ : Name of the substances table
- ⑫ : Cycle and acquisition times
- ⑬ : Signal value and retention times during the acquisition
- ⑭ : Electrometer amplification and Offset amplification

III. Start of an analysis

- Run the Vistachrom software.
- Select the user name and type the corresponding password (see the CDROM).
- Double click on the serial number of the analyser.
- Establish the communication with the analyser by clicking on the  icon. Check the static parameters of the instrument (pressure, temperatures,...)
- Connect the sampling gas and the standard gas (if present)
- Load the sequence by selecting "Load sequence" ( icon).
- Start the measure by selecting "Start measure" ( icon)
 - ⇒ 1st cycle : it is used for the sampling ; no acquisition.
 - ⇒ 2nd cycle : analysis.

NB :

The injection valve is controlled by Relay 8 (POWER board).

The sample selection is piloted by the Relay 7 (POWER board) :

- at rest : the sample swept the sampling path
- active : the standard gas swept the sampling path.