User Guide

HT2800T

All-in-ones GC Autosampler:

Headspace, Liquid and SPME

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Summary

1 Introduction

1.1 Intended Use and Restrictions

HT2800T is an all-in-ones GC autosampler for static Headspace analysis, liquid sample injection and SPME.

The autosampler must be used in a professional environment, and only by properly trained users. The autosampler must be used according to the regulations in force regarding the safety in testing laboratories.

A list (not exhaustive) of typical applications of the autosampler is reported below:

- Environmental analysis
- Quality control in the chemical and pharmaceutical industry
- Studies related to pharmaceuticals
- Drug discovery

Other techniques or areas of application are possible.

The safety measures and precautions regarding use, maintenance and repair, are not intended for applications that require the use of toxic or infectious substances.

Every possible mixture or omission of a component cannot be recognized or previously prevented. The operator that will use the autosampler must be trained about the used substances, their hazards, their use and their proper disposal. For the correct use of the used substances, refer to chemicals safety data sheets (MSDS) and to the regulations, laws, directives and safety decrees currently in force that regulate the behaviour inside the testing laboratories.

The insertion and positioning of the sample (vial), the insertion of syringes and all the other preparation activities are under the sole responsibility of the user. The user must operate in accordance with the law, in particular the ones concerning the safety of testing laboratories and accident prevention.

The operator must be trained to operate the equipment in accordance with the safety standards for the laboratories. The autosampler does not have specific protection mechanisms against

substances that are corrosive, potentially infectious, toxic and radioactive or against other substances that can be hazardous to health. However, when the autosampler is used, because of the handled substances, the user could need to use individual protection measures such as gloves, masks and goggles; the use of such devices must comply with the regulations currently in force regarding the safety of testing laboratories.

The use of the autosampler for any technique invasive for humans or animals is explicitly prohibited. The autosampler must be used only in the manner described in the usage instructions. Any other use may affect the autosampler and operator safety.

HTA s.r.l. is not responsible for damage caused, even only in part, by improper use of the autosampler, by unauthorized modification of it, by different or missing execution of the procedures described in this manual, or by the use of the autosampler violating the applicable laws and regulations.

The autosampler has been designed and tested in accordance with current safety standards.

1.2 Symbol Table

Please carefully read this table before using your autosampler. These symbols are used in this manual.

	Do not touch: action forbidden
	Warning: check the manual
	High voltage
	Warning: indicates pinch, crush and cut hazard
	Warning: indicates the possible presence of biological or hazardous substances
	Hot surface

1.3 Warning

Read the following warnings before unpacking or using the unit.

⚠	See paragraph 1.1 "Intended Use and Restrictions " and be sure you understand it.
⚠	Read Declaration of CE Compliance enclosed with the autosampler.
⚠	Before removing the autosampler from the box, please carefully read paragraphs 3.1 "Unpacking and Preliminary Operations" and 3.2 "Autosampler Assembly".
⚡	Before switching the autosampler ON check the correct voltage.
⚡	Electrical Hazards. Every analytical instrument has specific hazards, so ensure you read and comply with the following precautions.
⚡	Use only the power supply provided with the autosampler. The use of a different system could cause damage to the equipment and/or compromise safety. There are no operator-serviceable or replaceable parts inside the power supply. In case of failure, contact the Technical Assistance Centre. Violations of these directives imply the immediate invalidation of the warranty and service contract.
⚡	The supplied power cord must be inserted into a power outlet with a protective earth contact (ground). When using an extension cord, make sure that the cord also has an earth contact.
⚡	Do not change the external or internal grounding connections. Tampering with or disconnecting these connections could endanger you and/or damage the autosampler.
⚠	The product is designed and tested in accordance with international safety standards.
⚡	You do not need to make any changes to the electrical connections or to the chassis of the autosampler in order to ensure safe operation.
⚡	Do not turn the autosampler on if you suspect that it has incurred any kind of electrical damage or if it shows visible signs of damage. If, for any reason, the safety protections were compromised or the autosampler shows visible signs of damage, disconnect the power cord and contact a HTA representative. The power cord connector is considered the disconnecting device of the product. Electrical damage may have occurred if the autosampler shows visible signs of damage, or has been transported under severe stress.

	The operator is responsible for adequate decontamination in case of dangerous spills over or inside the autosampler. The operator is also responsible for the proper use of cleaning or decontamination agents. The agents shall not cause hazards due to a reaction with the autosampler or other materials contained inside. If there is any doubt about the method for proper use of cleaning or decontamination agents contact a HTA representative.
	With regards to autosampler recycling and disposal the following operations mus be performed in the proper order: 1) remove syringe, samples and reagents; 2) switch off the autosampler; 3) remove any contamination of the instrument in accordance with national and international safety regulations.
	Damage can also result if the autosampler is stored for prolonged periods under unfavourable conditions (e.g. subjected to heat, water, etc.).
	Do not place the autosampler in a position which makes it difficult to handle the disconnecting device of the autosampler.
	Always disconnect the power cord before attempting any type of maintenance.
	Capacitors inside the autosampler may still be charged even if the autosampler is turned off.
	The autosampler includes a number of integrated circuits. These circuits may be damaged if exposed to excessive line voltage fluctuations and/or power surges.
	If, for technical reasons, it is necessary to work on autosampler parts which are only accessible using a tool, contact the Technical Assistance Centre. Violation of this automatically invalidates the warranty and service contract. These restrictions do not affect normal operations such as syringe installation and removal.
	Do not make contact with the autosampler while it is running.
	Do not try to open or close the sample tray manually, unless it is strictly necessary. In this case, follow the instructions of paragraph 8.17.1 "Tray opening by hand"
	To avoid accidents, observe the rules of good laboratory practice while handling solvents, reagents and consumables. Observe the safety regulations regarding the use of chemicals being used, as indicated in their specific Material Safety Data Sheets (MSDS). Carefully check the physical and chemical properties of all substances before use.
	Do not use vials without sealing caps. Vapors from volatile solvents may be hazardous and flammable. Acidic vapors may be corrosive when they come in contact with mechanical parts.

⚠	If, during the start up process or while the running the machine, you notice unusual noises or vibrations, stop the operating process and contact the Technical Assistance Centre.
⚠	The warning signals presented on the turret and on the oven cover indicate the presence of moving parts, including the syringe and the fan. Be careful to avoid bumps or cuts.
☣	The biohazard warnings presented on the turret and on the oven cover indicate the possible presence of biological or hazardous substances, depending on the types of substances used with the autosampler.
⚠	The autosampler can heat the vials in the oven and the sample in the syringe up to 170℃. For this reason, the oven and the syringe holder are labelled as hot surfaces. Be careful to avoid burns. Allow the heated syringe adapter to cool down before attempting to change or inspect the syringe. Do not touch the vials, without adequately protected hands, for at least 30 minutes after the vial is removed from the oven.
⚠	The autosampler can heat the vials in the oven and the sample in the syringe up to 170℃. The autosampler is not intended to be used with a large quantity of flammable substances. Verify, according to an analysis of the laboratory's safety standards and safety cards of chemical substances, that substances can be used at this temperature without any risk to the operator and/or the environment.
⚠	The oven is equipped with a fan, which is used to assist temperature stabilization and the cooling down of the oven. This fan must not be obstructed. Any obstruction may affect the operation of the unit.
⚠	The autosampler must be located in a well ventilated environment, Environmental temperature must be from 15℃ to 35℃ and relative humidity must be between 5-80% (no condensation). If these environmental conditions are not met, it may affect the performance or damage the unit.
⚠	Do not obstruct the air outlet opening of the instrument. Keep an appropriate distance between the rear and the side of the machine and any other items.

⚠	During Headspace/SPME operation the syringe is cleaned after each injection with inert, clean gas (e.g. N$_2$ or He). Therefore a gas supply line must be available close to the autosampler. Do not use flammable purging gases. Do not use hydrogen as a purging gas. Hydrogen creates a potential explosion hazard due to the venting of gases.
⚠	Only if the Bar code Reader option has been purchase and it is enabled: do not view directly the led light with optical instruments such as magnifiers, eye loupes or microscopes within a distance of 100mm. This could cause serious eye injury. The Bar code Reader installed is a Class 1 LED Product with Class 1 internal radiation. Maximum LED Output: 141,2 uW.
⚡⚠	Be careful while handling the syringe holder of the SyringeID system (see 1.7.2 Options" and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

1.4 Standards Compliance

The applicable rules for this autosampler are the following:

- 2014/35/EU Low-Voltage Equipment Directive.

- 2014/30/EU Electromagnetic Compatibility Directive.

- 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) Directive.
- 2006/42/EC Machinery Directive.

1.5 General Specification

This is an autosampler for **gas chromatography**.

The HT2800T combines the functions of an autosampler for liquid, static Headspace and SPME into a single unit.

The autosampler is compatible with most Gas Chromatographs (GC).

It can be installed on GCs with either one or two injectors.In the case of GCs with two injectors, your autosampler can be configured to inject automatically into one or the other injector.

The autosampler can be programmed by using the touch screen display or by a PC using an Ethernet or RS232C connection (optional).

1.6 Functions available only through HTA Autosampler Manager

1.6.1 Vial Leakage Check (Headspace Mode)

HTA Autosampler Manager allows the user to enable the Vial Leakage Check (ACCESS SEQUENCE: Setup-Options).

If this option is enabled, the pressure inside vials is monitored by an heuristic procedure in order to check against anomalous values that are indicative of a vial leakage problem.

The Vial leakage test can discriminate for samples which are correctly sealed vs. bad crimping or missing septa. Each sample is marked with PASS or FAIL information in HTA Autosampler Manager Windows.

1.6.2 Method development option (Headspace Mode)

During method development it can be useful to test methods characterized by a progressive increment of a specific parameter in order to define which are the best settings for this parameter.

The parameters that can be increased in this way are the syringe/oven temperature and the incubation time.

This option is only available with "HTA Autosampler Manager", using the "Method development" tab. For the detailed explanation of this option, please refer to "HTA Autosampler Manager" online help.

1.7 Versions

1.7.1 Description
The autosampler is available in the following versions:

HT2800T

This version is equipped with a touch screen interface.

It includes Headspace and Liquid kit (SPME can be sourced separately, also at a later time).

HT2850T

This version is equipped with a touch screen interface.

It includes Headspace and Liquid kit (SPME can be sourced separately, also at a later time). It also includes SPME cleaning device.

1.7.2 Options

Available for all versions:

1.91.716 – SPME Kit for HT28XXT

1.90.501 - HTA Autosampler Manager (Standard Version)

PC software. This may be sold as an option. Please check with your service representative.

1.90.502 - HTA Autosampler Manager (CFR 21 Part 11)

PC software compliant with CFR 21 Part 11 regulation. This may be sold as an option. Please check with your service representative.

1.91.740 – GLP Pack for HT2800T/HT2850T

It includes:

System integrity kit (for Headspace Mode)

The System integrity test is used to verify the syringe integrity. This test can easily be executed at the beginning of each batch in a very convenient way. This functionality is made in a heuristic approach (for detailed description of this function see paragraph 11 "Appendix A – Glossary"). To see how to install this tool see paragraph 3.6.3 "System integrity tool installation (only for Headspace mode)".

SyringeID system (for Liquid Mode)

SyringeID is an automatic syringe recognition system. This system is based on RFID tags and it is able to identify syringes in an unambiguos way. For detailed description of this function see paragraph 11 "Appendix A – Glossary".

1.91.734 - Bar Code Reader Module HT2800T (Factory installation)

This may be sold as an option. This is not compatible with RS232C interface option.

The following accessories can be supplied upon request:

HTA Part Number	Description
3.23.000	External Pressure Regulator. For installation see 3.6.1
1.93.822	Swagelok adapter for HT2x00x series. For installation see 3.6.2
1.93.820	Spacers kit for 10ml vial (6pc/pk)
1.93.828	Spacers kit for 6ml vial (6pc/pk)

1.91.280	Syringe kit 1ml for Headspace autosampler
C00028	Manual Crimper for 20mm Caps
C00029	Manual De-Crimper for 20mm Caps

1.8 Technical Specifications

DIMENSIONS

HT2800T/HT2850T

Height	**640mm**
Width (closed oven cover)	**330mm**
Width (open oven cover)	**350mm**
Depth (closed tray)	**320mm**
Depth (open tray)	**520mm**

WEIGHT

HT2800T	**10kg**
HT2850T	**10kg**

ELECTRICAL SPECIFICATIONS

Power supply:

Voltage	**100-240 ±10%Vac**
Frequency	**47-63Hz**
Max Current	**1.6 A**

Autosampler HT2800T/HT2850T:

Voltage	**24Vdc**
Power	**120W**

INTERFACE SPECIFICATIONS

To GC	**TTL**
To PC	**Ethernet 10/100**
Optional:	**RS232C** (available on a limited number of models)

Ethernet cable should be Category 5 (or higher)

RS232 cable: max distance PC – autosampler: 1.80m (opt. 3.50m)

ENVIRONMENT CONDITIONS

Room temperature limits   **15℃ - 35℃**

Ambient humidity limits   **5% - 80% (not-condensable)**

Maximum altitude   **2000m**

SOUND PRESSURE LEVEL

Maximum measured level   **60dBA** (below the limits of 85dBA defined by the regulations in force)

SAFETY INFORMATION

The autosampler is classified as shown below: Pollution degree   **2**

Overvoltage category   **II**

Devices for use indoors

ANALYTICAL PARAMETERS

HEADSPACE MODE

Tray capacity   **42 vials (20ml); optional: 6 and 10ml**

Syringe volume   **2.5ml (standard); optional:1ml**

Maximum pressure in the injector **2.5bar**
(2.5ml syringe)

Conditioning

Oven positions   **6**

Oven Temperature   **off, from 40℃ to 170℃**

Incubation time   **from 0 to 999min step 1min**

Shaking method   **orbital**

Shaker speed   **from very low to very high**

Shaking cycles   **on/off, from 0 to 9.9min**

Sampling

Syringe Temperature   **off, from 40℃ to 150℃**

Sample volume   **0.01ml stepwise**

Pull Up Strokes   **up to 15 strokes**

Sample speed   **from 0.5 to 100ml/min**   (40ml/min for 1ml syringe)

Injection

Injection speed	**from 0.5 to 100ml/min** (40ml/min for 1ml syringe)
Pre/Post injection dwell time	**from 0 to 99secs**
Enrichment cycles	**up to 15**
Dwell time between enrichment cycle	**from 0 to 100min**

Syringe purge

Flush time	**from 0 to 99min**
Purge temperature	**off, from 40℃ to 150℃**

LIQUID MODE
General

Tray capacity	**121 vials (2ml)**
Volume Increment/Decrement	**According to syringe type**

Pre&Post wash

Number of washes	**up to 15**
Wash mode	**each injection, each sample or step**

Wash with sample

Sample wash	**up to 15**
Bubble elimination	**up to 15 strokes**

Sampling withdrawal

Sample Volume	**According to syringe type**
Air Volume	**According to syringe type**
Aspiration speed	**According to syringe type**
Viscosity time	**from 0 to 15secs**

Injection

Injection speed	**According to syringe type**
Waiting time before and after injection	**from 0 to 99secs**

Internal Standard Techniques

Mode	**no, post or double**

SPME MODE

Tray capacity	**42 vials (20ml); optional: 6 and 10ml**
Extraction Mode	**liquid phase/Headspace vapors**
Fiber type	**10mm, 20mm**
Fiber Cleaning Station	**only for HT2850T** (see dedicated appendix)

Conditioning

Oven positions	**6**
Oven Temperature	**off, from 40°C to 170°C**
Incubation time	**from 0 to 999min step 1min**
Shaking method	**orbital**
Shaker speed	**from very low to very high**
Shaking cycles	**on/off, from 0 to 9.9min**

1.9 PC Software Requirements (HTA Autosampler Manager)

See HTA Autosampler Manager Online Help for the related PC specifications.

Warning

The virtual screen is available only with LAN connection. It is not available with RS232 connection.

2 Equipment Description

2.1 Parts Definition

2.1.1 HT2800T/HT2850T Overview
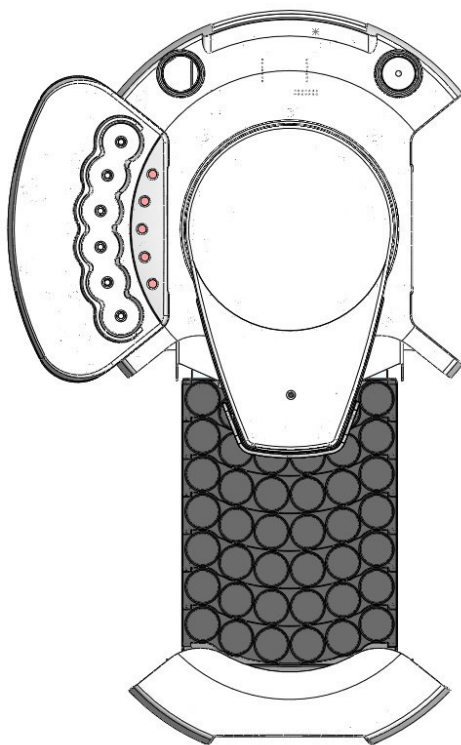
Figure 1: Top view (tray open)
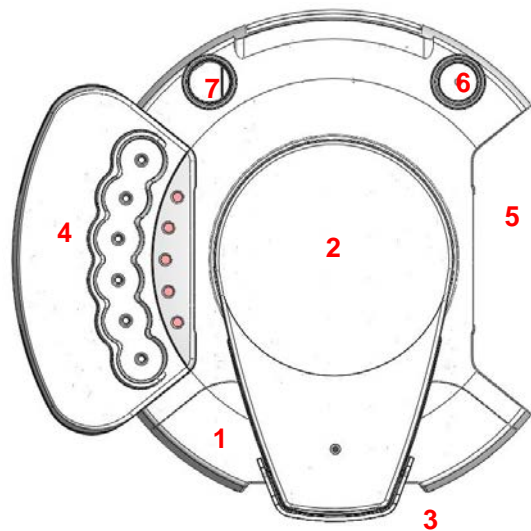
Figure 2: Top view (tray closed)

1. **MOVING TRAY** (1 rack with 42 sample positions in the Headspace Mode or 1 rack with 121 sample positions in Liquid Mode)

2. **TURRET:** holds the syringe

3. **TOUCH SCREEN DISPLAY**

4. According to the instrument mode it can be:

- HEADSPACE AND SPME MODE:

   INCUBATION OVEN/SHAKER, where samples are heated.

- LIQUID MODE:

  LOCATION FOR SOLVENT VIALS

The incubation oven/Location for solvent vials may be located on the left or right side of the autosampler, depending on how the autosampler is configured. Left/Right side configuration is factory set.

5. **INJECTION AREA**: region where an injection can be made. The injection area may also be located on the left or right side of the autosampler.

6. **SPME CLEANING DEVICE LOCATION** (only for HT2850T)

7. According to the instrument mode it can be:

- HEADSPACE MODE:

  SYSTEM INTEGRITY TOOL AREA only if the GLP kit has been supplied (see paragraph 1.7.2 "Options**");**

- LIQUID MODE:

  WASTE VIAL;

- SPME MODE:

  FIBER WASHING VIAL.

2.1.1.1 HT2800T/HT2850T Sample rack

In Headspace mode and SPME mode HT2800T mounts a 42-position rack (20,10 or 6ml vials).
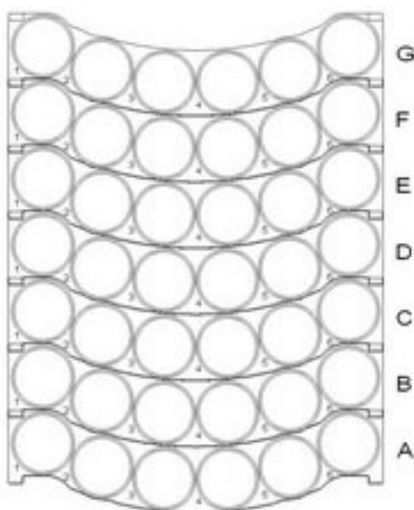
Figure 3: 42 position rack (Headspace and SPME)

Each vial is identified with two digits (a letter and a number):

A.	6
Letter (row)	Number (column)

The letters (from A to G) indicate the rows, while the numbers indicate the columns (from 1 to 6). In Liquid Mode HT2800T mounts a 121-position rack (2ml vials).
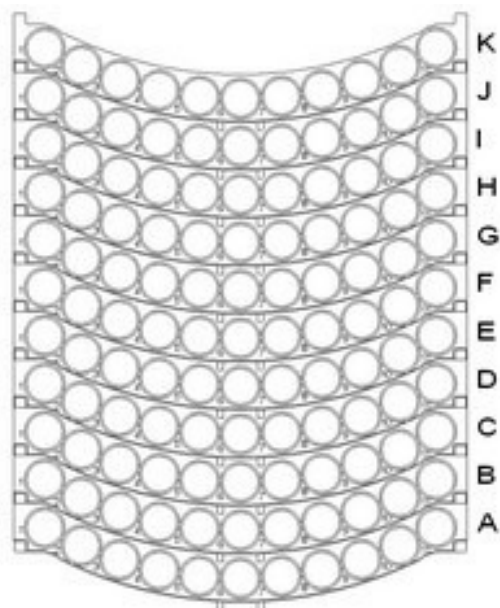
Figure 4: 121 position rack (liquid mode)

Each vial is identified with two digits (a letter and a number):

A.	6
Letter (row)	Number (column)

The letters (from A to K) indicate the rows, while the numbers indicate the columns (from 1 to 11).

2.1.1.2 HT2800T/HT2850T Incubation Oven (Headspace and SPME mode)/ Location for solvent vials (Liquid Mode)

On the side of the autosampler there is an incubation oven with 6 heated vial positions (Headspace and SPME mode). The oven is equipped with a fan, which is used to to assist temperature stabilization and the cooling down of the oven. The oven positions are labelled A-F.

When configured for SPME the "A" position is used for the derivatizing agent. If 10 or 6ml sample vials are used instead of 20ml sample vials the proper spacers must be installed in the oven positions.

In the liquid mode this oven represents the location for solvent vials. The solvent vial positions are labelled A-F. Better position for solvent placing are from B to E . For A and F positions, the lack of the solvent vial can not be detected as an error (see paragraph 8.8 "Lack of a Vial (waste or solvent vial for liquid mode, washing vial for SPME mode)". In these positions it is necessary to place the supplied black spacers before installing the 10ml solvent vials. For solvent vials specifications see paragraph 12.2.3 "Solvent and waste vials ".

Left configuration
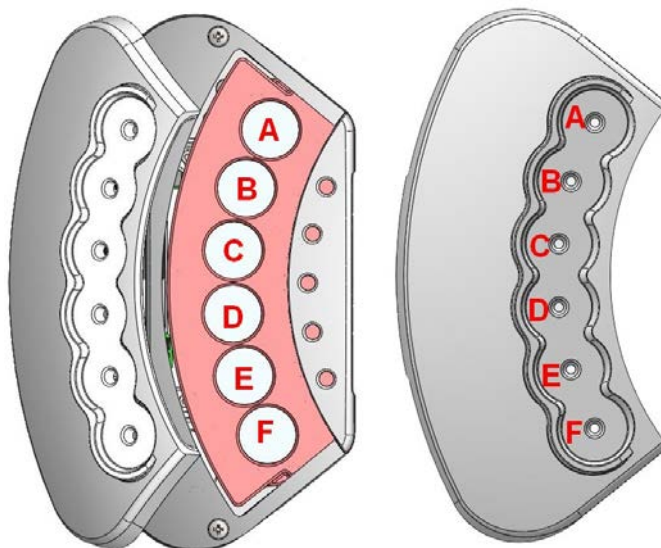
Right configuration
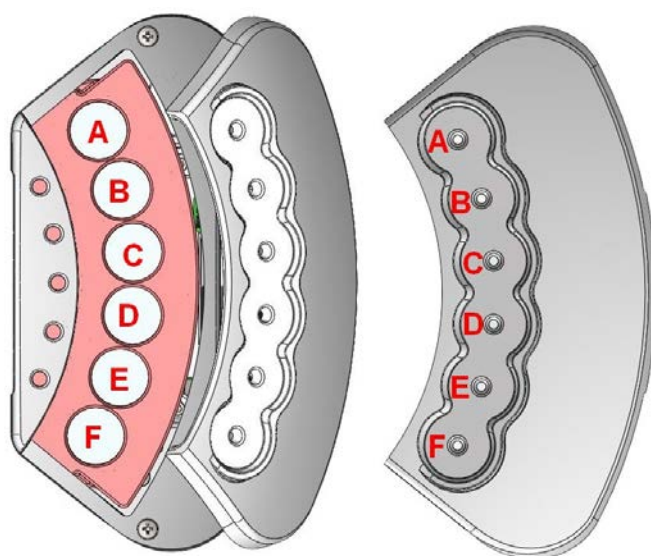
Figure 5: HT2800T/HT2850T Incubation oven/ Location for solvent vial

In the left figure, the oven is shown open, while in the right figure it is shown closed.

2.1.1.3 HT2800T/HT2850T Autosampler base
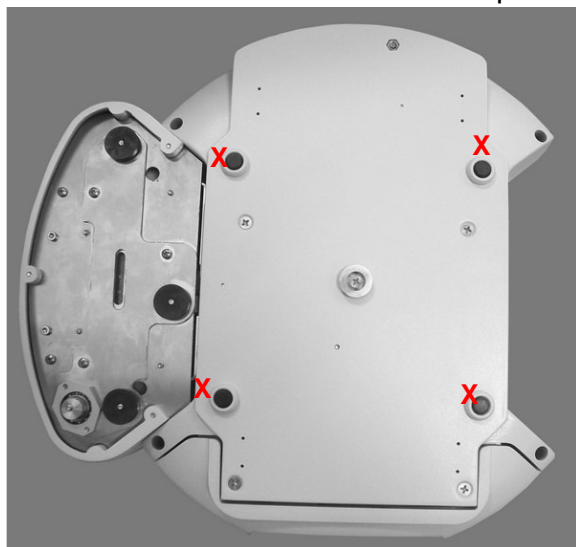
Figure 6: Left location for incubation oven/location for solvent vials (bottom view)
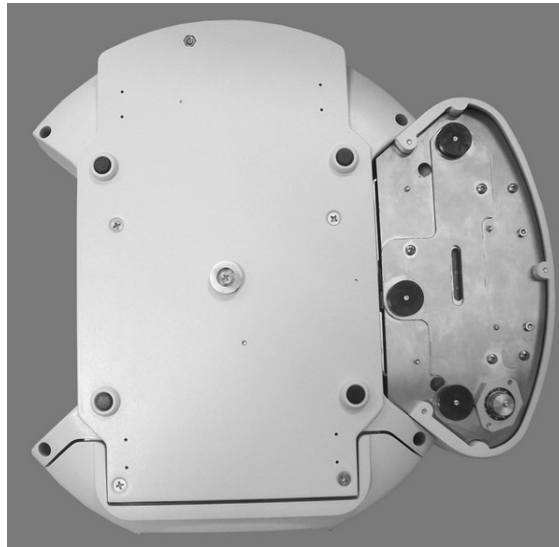
Figure 7: Right location for incubation oven/location for solvent vials (bottom view)

"X" marks the rubber feet, these are important for the installation procedure (see paragraph 3.3.1 "Autosampler installation on the mounting plate").

2.1.1.4 HT2800T/HT2850T Control panel: touch screen display
The touch screen display is on the front of the unit.
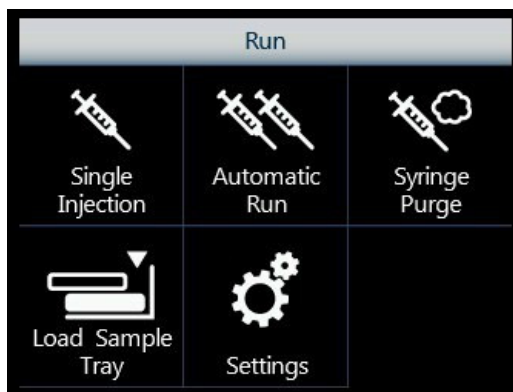
Figure 8: Touch screen display

The HT2800T/HT2850T has a colour LCD display with touch control. The touch screen display can be used to edit the method, sample list or set up as well as running the samples.

For further information on the HT2800T touch screen display please refer to paragraph 2.4 "Touch screen display description".

2.1.2 Syringe location

The syringe is located in the turret. To access the syringe, push up the sliding lid (red arrow in the figure below).

Figure 9: Sliding lid down

Figure 10: Sliding lid up

2.1.2.1 Syringe location for Headspace mode

The syringe location contains the following parts:
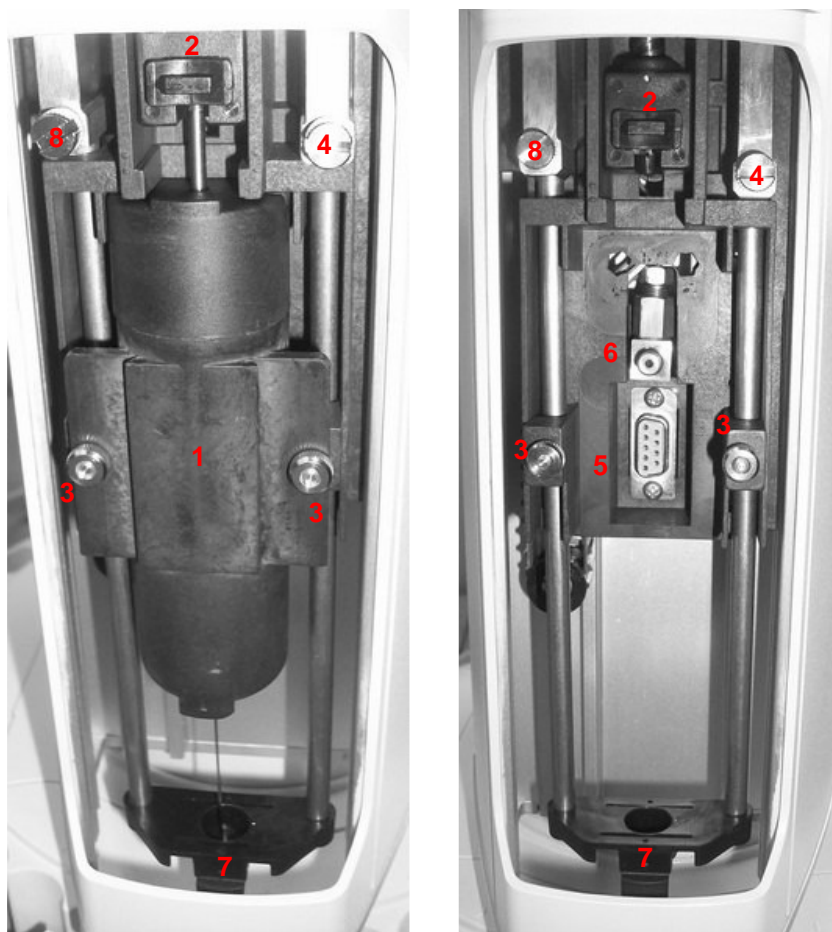
Figure 11: Syringe location (Headspace mode)

1   Syringe warmer assembly: installed (left), not installed (right)

2   Plunger holder with plunger locker

3   Retaining nuts

4   Needle height regulator (right block)

5   Syringe connection socket

6   Flushing gas inlet

7   Vial locator

8   Safety lock (left block)

The **syringe warmer assembly** and the **vial locator** are shown in detail in the figures below:

Figure 12: Syringe warmer assembly (Headspace mode)
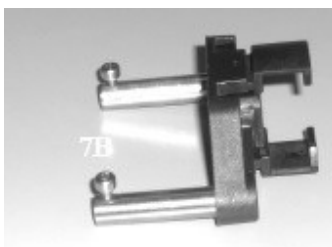
Figure 13: Vial locator (Headspace ans SPME mode)

The **plunger locker** has two different faces in order to locate different kinds of syringe pistons. These faces are indicated as "S side" and "B side". When "S side" is required, please have "S side" facing down; when "B side" is required, please have "B side" facing down.

In the Headspace mode side B must be faced downward.
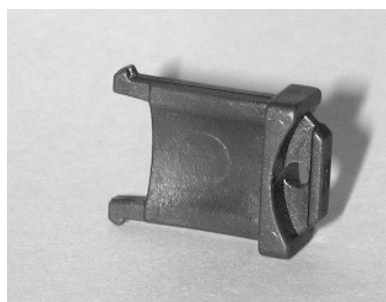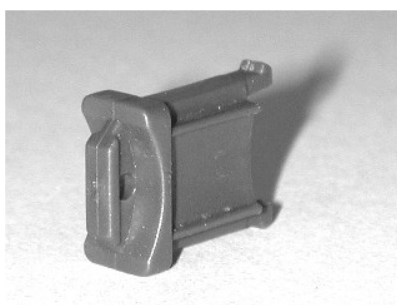
Figure 14: "S" side of the plunger locker *Figure 15: "B" side of the syringe locker*

2.1.2.2 Syringe location for Liquid Mode
The syringe location contains the following parts:
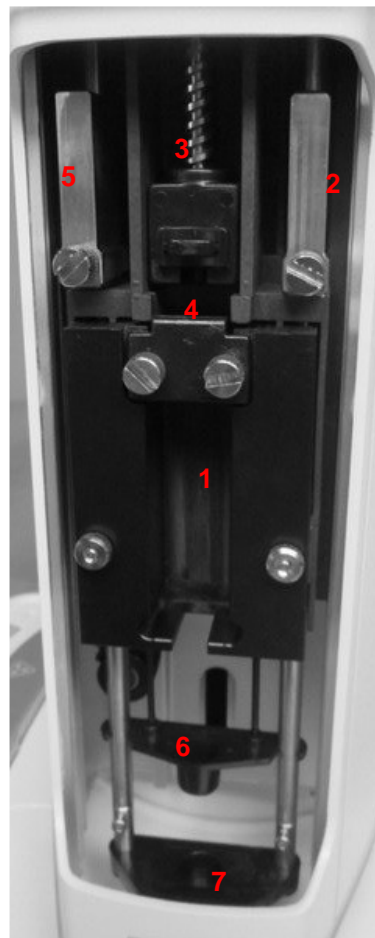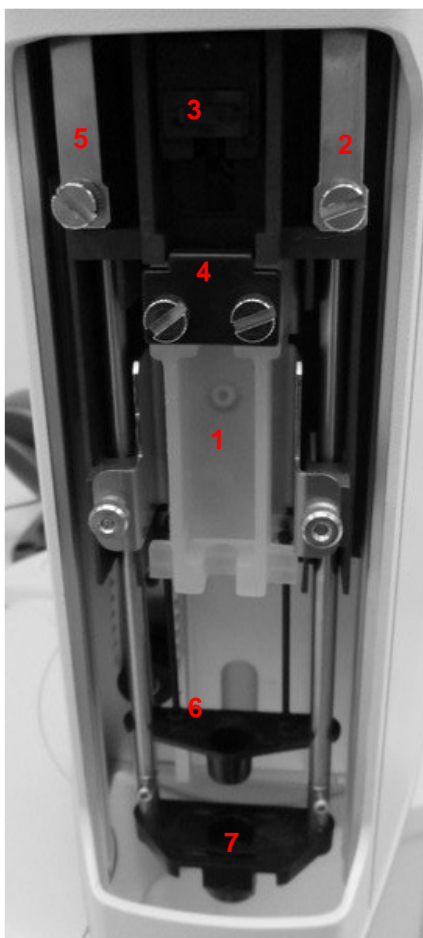
Figure 16: Syringe location (liquid mode)

Figure 17: Syringe location (liquid mode with syringeID system installed)

The syringe location contains the following parts:

1. Syringe holder

2. Needle height regulator (right block)

3. Plunger holder with plunger locker

4. Syringe locker

5. Safety lock (left block)

6. Intermediate needle guide

7. Vial locator

The **syringe holder** is shown in detail in the following figure:
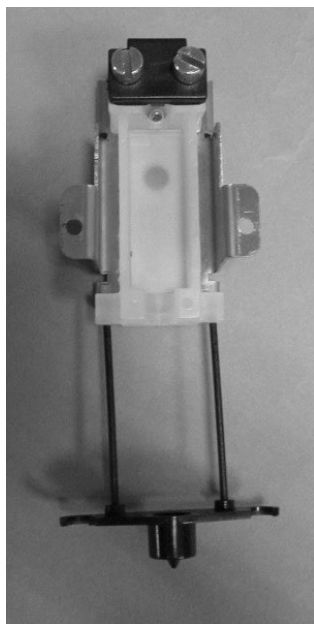
Figure 18: Syringe holder (liquid mode)
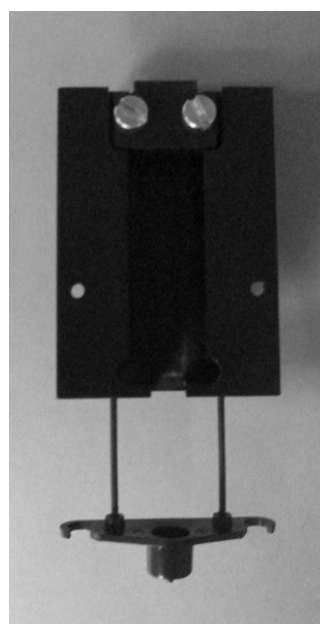
Figure 19: Syringe holder (liquid mode with syringeID system installed)

The **syringe locker** and its finger screws are shown in detail in the following figure:
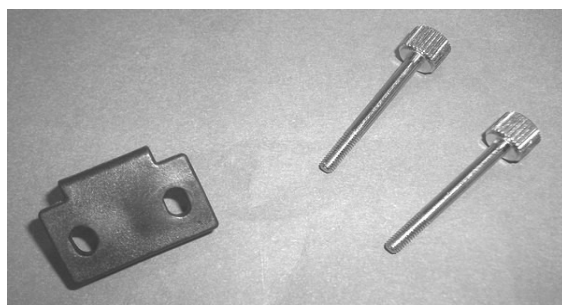
Figure 20: Syringe locker (liquid mode)

The **plunger locker** has two different faces to locate different kinds of syringe pistons. These faces are indicated as "S side" and "B side". When "S side" is required, please have "S side" facing down; when "B side" is required, please have "B side" facing down.
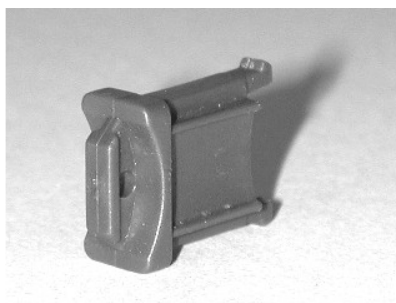
Figure 21: "S" side of the plunger locker
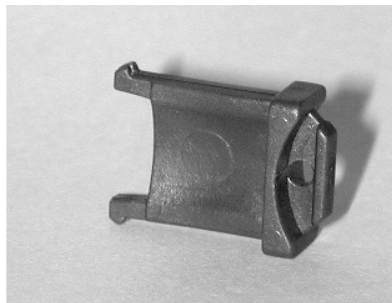
Figure 22: "B" side of the syringe locker

The **standard vial locator** for liquid mode is shown in the following picture:

Figure 23: Standard vial locator (liquid mode)

This vial locator can be removed and replaced with the **vial locator with gripper** shown in the picture below:

Figure 24: Vial locator with gripper

This vial locator must be installed in case that you want to enable Bar code reader option (0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

Setup configuration: BCR").

2.1.2.3 Fiber holder location for SPME Mode
The Fiber holder location contains the following parts:

Figure 25: Fiber holder location (SPME mode)

1   Fiber holder

2   Needle height regulator (right block)

3   Safety lock (left block)

4   Vial locator

5   Plunger locker

The **vial locator** are shown in detail in the figures below:
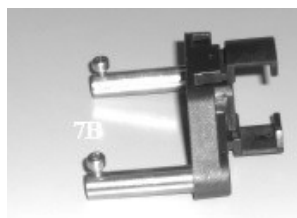
Figure 26: Vial locator (Headspace and SPME mode)

The **plunger locker** has two different faces in order to locate different kinds of syringe pistons. These faces are indicated as "S side" and "B side". When "S side" is required, please have "S side" facing down; when "B side" is required, please have "B side" facing down.

In the SPME mode side B must be faced downward.
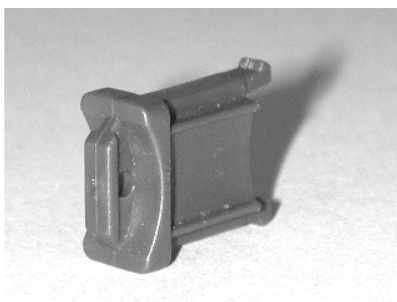
Figure 27: "S" side of the plunger locker   Figure 28: "B" side of the syringe locker
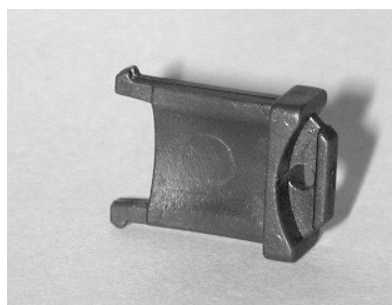
2.1.3 Connection panel

On the rear of the autosampler there is the connection panel:
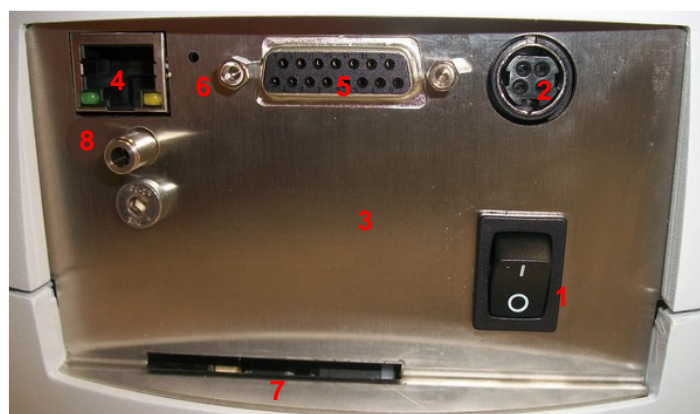
Figure 29: Connection panel

1	**I/O**:	ON/OFF Power switch
2	**Power cable socket:**	low voltage power connection (external power supply)
3	**RS232C connector:**	for remote control (serial connection, optional, not present in this picture)
4	**RJ45 10/100 auto-sensing connector:**	for remote control (Ethernet connection, standard)
5	**GC connector:**	for other devices (GC, analyzer....)

6	**Service Ethernet reset:**	reserved for Service Representative
7	**Service Emergency release:**	reserved for Service Representative
8	**Gas connection for syringe purge:**	inlet 1/8"

N.B.: For further information on this purge line connection please refer to paragraph 3.3.4 "Purge line connections (for Headspace and Fiber Cleaning Device)".

⚠ ⚡

Warning

Use only the power supply system supplied with the autosampler. The use of different system could cause damage to the equipment and/or compromise safety.

The autosampler is powered by an external power supply, as shown in the figure below:
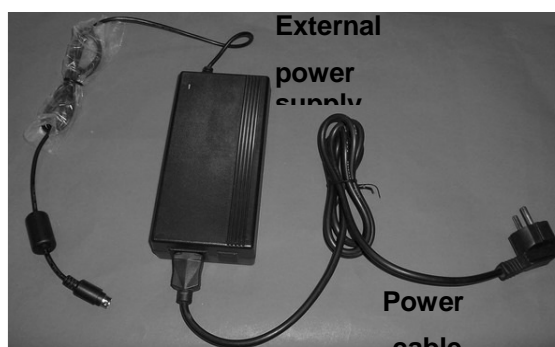
Figure 30: External power supply

This external power supply has to be connected to socket number 2 in *Figure 29*.

2.2 Moving parts

These are the moving parts of the autosampler:

- The **turret** can rotate 320°.

- The **needle** location can move vertically by a maximum of 303mm.

- The **plunger** can move by a maximum of 65mm inside the syringe.

- The moving sample **tray** can be opened/closed (220mm of movement).

- The oven **cover** can rotate 35°(open/close position);

- The orbital **shaker** allows vial(s) agitation with a programmable speed.

- The **fan** is used to assist temperature stabilization and the cooling down of the oven.

The movements are made with DC motors, with position control made by encoders.

Warning

If necessary, it is possible to move the turret and needle motors by hand, very carefully, but **only when the autosampler is switched off**. Rapid movements or movements with the autosampler switched on can damage the autosampler.

Warning

Do not try to open or close the sample tray manually, unless it is strictly necessary. In this case, follow the instructions of paragraph 8.17.1 "Tray opening by hand").

2.3 Tool kit

The autosampler is provided with a tool kit containing:

1. Syringe pointer that can be used for locking/unlocking the autosampler from the mounting kit (see paragraphs 3.3.1 "Autosampler installation on the mounting plate" and 3.3.1.1 "Unlock the autosampler from the mounting kit").
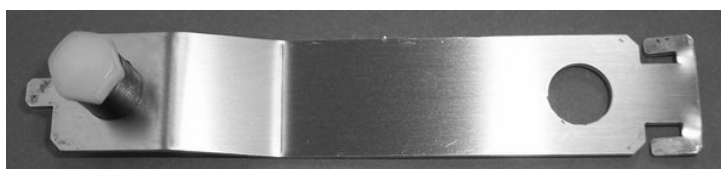
Figure 31: Syringe pointer

2. Allen key (2.5mm) that it is used for syringe replacement (see paragraph 9.1.5 "Syringe replacement in the syringe warmer assembly (Headspace mode)":
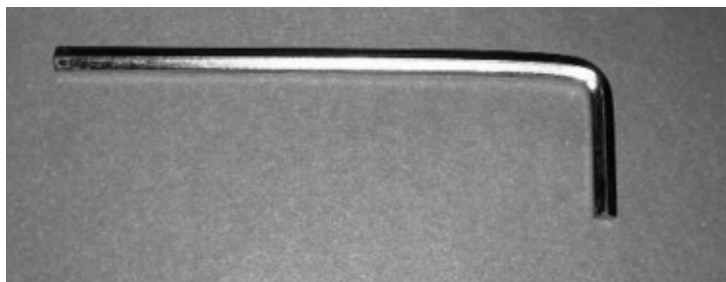
Figure 32: Allen key

3. Tweezers to extract the spacers from the oven (spacers for 6/10ml sample vials in Headspace mode and spacers for solvent vial in Liquid mode):
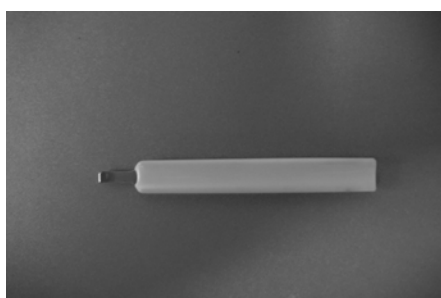
Figure 33: Tweezer_type 2

2.4 Touch screen display description

2.4.1 Touchscreen use

HT2800T/HT2850T use touchscreen displays. These can be controlled using your finger tip or with a dedicated stylus.

Only use a stylus approved by HTA as using any other stylus (or a pen or pencil), may scratch and damage the touchscreen.

The touch screen recognizes the following actions:

- **single tap:** gently press the area of interest to select a menu option or press any button area.
- **prolonged tap:** gently keep the area of interest pressed for short time. It is used with the increase/decrease buttons to increase/decrease the selected value faster.

In all the screens:

- ➢ the areas that can be tapped have a black background (tapping the other areas of the screen will have no effect);

- the enabled buttons use a white font and the disabled buttons use grey font; a button could be disabled because the associated action is not allowed or because other actions must be completed first;
- when a button has been tapped, the background becomes blue for a while.

2.4.2 Screen templates

The screens can be grouped according to type. These are:

2.4.1.1 Screen type 1: Screen saver

Screen type 1:

Figure 34: Screen type 1

See paragraph 3.4 "Start-Up ".

2.4.1.2 Screen type 2: Menu

Screen type 2:
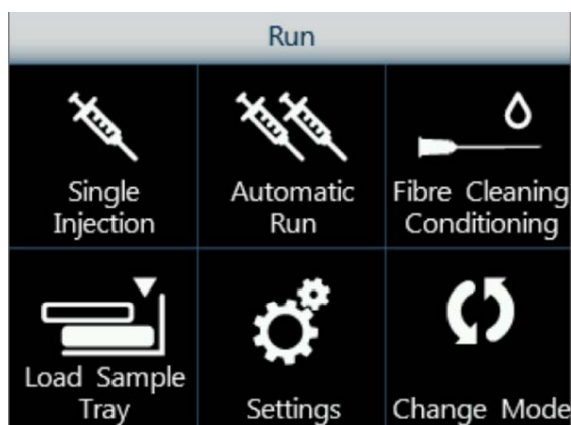
Figure 35: Screen type 1_example A
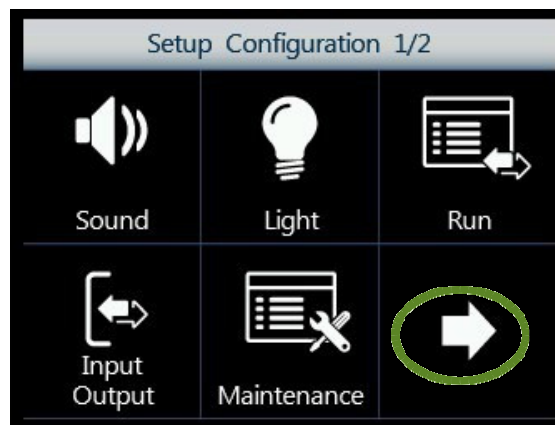
Figure 36: Screen type 1_example B

In this menu, there are up to 6 buttons available. Tap one of the buttons to enter the respective menu/sub menu/function.

Special icons:

- ARROW (see example B, green circle). If more than 6 buttons are available, an ARROW icon is displayed, press this to access the additional buttons..
- EXIT: exits from the current menu.

2.4.1.3 Screen type 3: Parameter display and selection

Screen type 3:
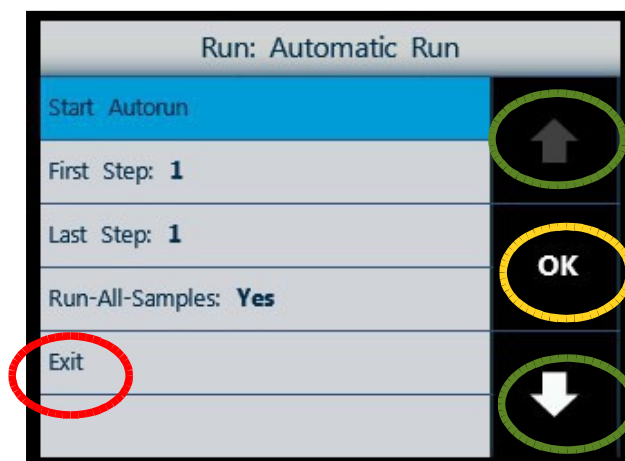
Figure 37: Screen type 3_example A

Use the arrows on the right (green circles) to move between the different option/parameters.

Tap "OK" (yellow circle) to access the selected option/parameter for editing. The selected parameter/option is highlighted with a blue background.

Select "EXIT" (red circle) to exit from this screen. "EXIT" is always the last option on the list; if the list includes a large number of items you may be required to press the "DOWN arrow" several times to reach the "EXIT" option.

2.4.1.4 Screen type 4: Parameter editing

Screen type 4:
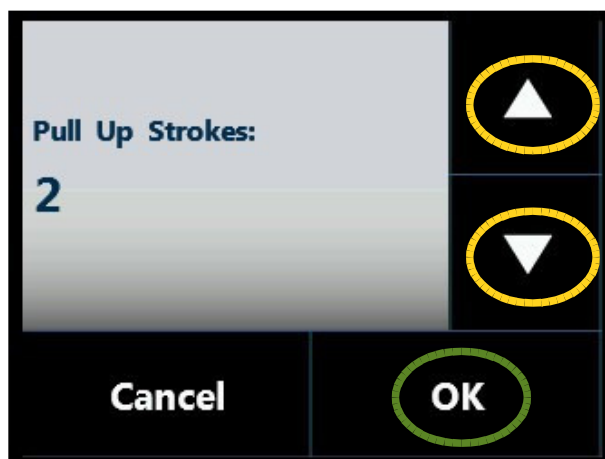
Figure 38: Screen type 4

This screen type is used for parameter editing. Use the arrows on the right (yellow circles) to change the value of the parameter.

Tap "OK" or "SAVE" (not present in this particular example) to confirm the modification, otherwise "CANCEL" .

2.4.1.5 Screen type 5: Pop-up Message

Screen type 5:

Figure 39: Screen type 5_example A
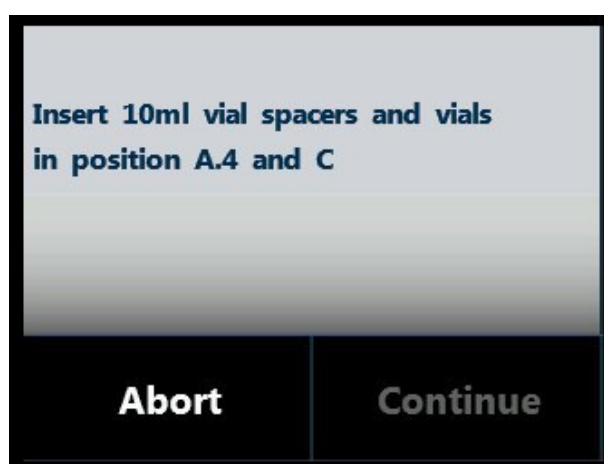
Figure 40: Screen type 5_example B

The grey area shows a notification/confirmation message. The lower part of the screen shows the action buttons.

These include:

- "SAVE" to store the editing,
- "CANCEL" to exit without saving,
- "CONTINUE" to confirm,
- "STOP" or "ABORT" to interrupt the procedure
- etc...

Tap the relevant command to perform the task.

2.4.1.6 Screen type 6: Status Information

Screen type 6

Figure 41: Screen type 6_example A   **Figure 42: Screen type 6_example B**

This screen type describes the status of the autosampler when it is running (injection or wash). The buttons in the lower part of the screen can show:

- "STOP" to stop the running operation;
- "MENU" to access additional options.

2.4.2 Limited Warranty

Due to technology constrains, the touch screen display may have a minor defect. A minor defect refers to a defect which is not considered to be able to substantially degrade the product application or a defect that deviates from existing standards almost unrelated to the effective use of the product or its operation, such as black spot, white

spot, bright spot, pinhole, black line, white line, contrast variation, glass defect, polarizer defect, etc.. The minor defects do not give right to repair or part substitution under warranty, unless the number of minor defects substantially degrades the product application.

3 Installation

Warning

The autosampler must be located in a place that provides good ventilation.

The HT2800T/HT2850T oven is equipped with a fan, which is used to assist temperature stabilization and the cooling down of the oven.

This fan must not be obstructed as it may affect the operation of the unit.

3.1 Unpacking and Preliminary Operations

Take care when unpacking the unit.

Check the integrity of the box before opening it to ensure it is not damaged. If it is, please inform your local dealer before unpacking the autosampler from the box.

When the autosampler has been unpacked, check the autosampler itself and the accessories provided (*compare these with the packing list enclosed*).

Ensure that everything listed in the packing list is in the box. If not, please advise your dealer.

Warning

Do not switch the autosampler on before it is correctly mounted on the bracket (see paragraph 3.3.1 "Autosampler installation on the mounting plate" to avoid the risk of overturning.

3.2 Autosampler Assembly

1. Open the box.

Figure 43: Open the box

2. Remove the protective cushions.
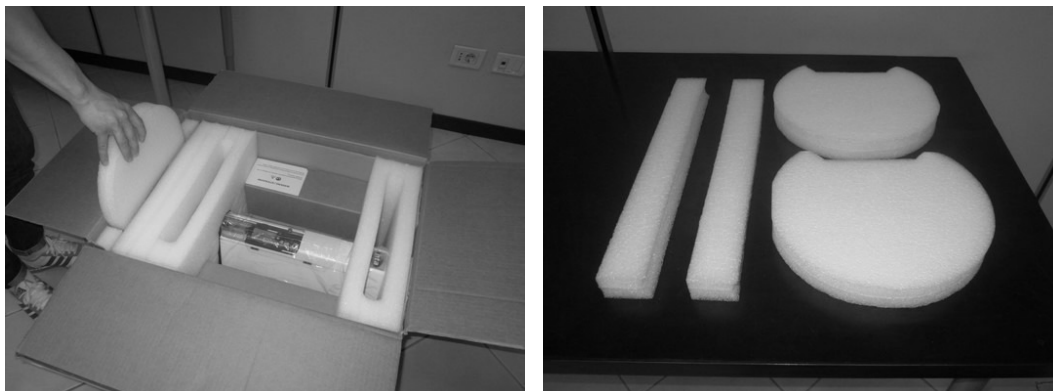
Figure 44: Remove the cushions

3. Extract the autosampler from the box and place it on a flat surface in a vertical position.
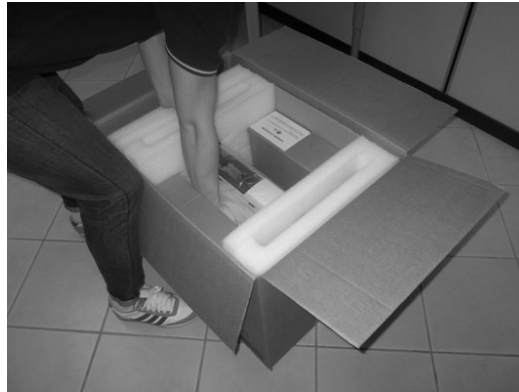
Figure 45: Extract the autosampler from the box

Figure 46: Place the autosampler on a flat surface

4. Cut the adhesive tape to open the packaging.
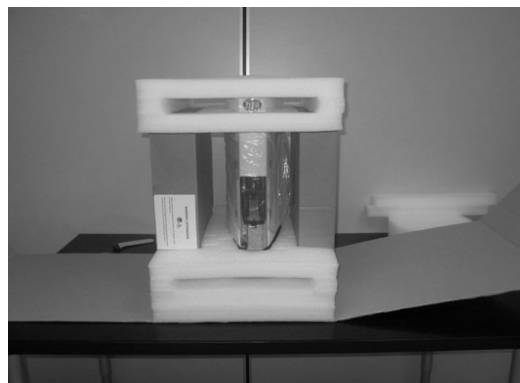
Figure 47: Cut the adhesive tape

5. Remove the upper protective cushions.

Figure 48: Remove the upper cushions

6. Remove the accessory boxes and extract the included accessories.
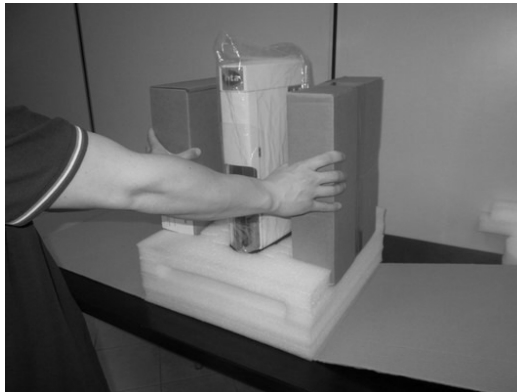
Figure 49: Remove the accessory boxes

7. Remove the lower protective cushions.
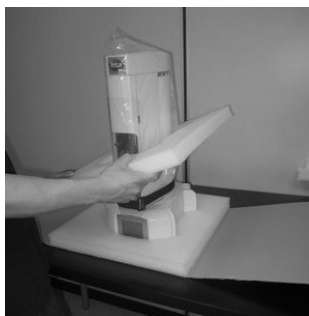
Figure 50: Remove the cushions

8. Check the product sheet to verify that the autosampler configuration (left or right) is consistent with your GC (see paragraphs 2.1.1.4 "HT2800T/HT2850T Control panel: touch screen display"). If the configuration of the autosampler is not correct with respect to your GC specification, please contact your local supplier.

9. Remove the protection belt and polythene bag from the tower.
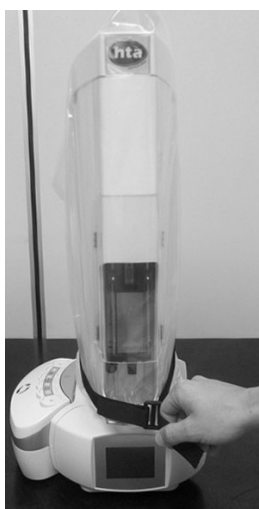
Figure 51: Remove the protection belt

Figure 52: Remove the polythene bag

10. Remove the tower protection.
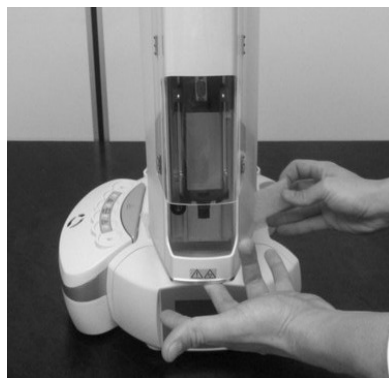
Figure 53: Remove the tower protection

3.2.1 How to lift and carry the autosampler

> ⚠️
>
> # Warning
>
> Before lifting and moving the autosampler it is necessary to remove all of the removable elements: vials and rack.

The autosampler must be lifted and carried by hand as shown in the following figure:

Figure 54: How to lift and carry the autosampler

3.3 Installation

Please read this chapter before using the autosampler .

To install the autosampler follow the instructions below.

Installation operations should be performed using the touch screen display.

1. Install the autosampler on the mounting plate (see paragraph 3.3.1 "Autosampler installation on the mounting plate").

2. Move the safety lock from the shipping position to the operating position (see paragraph 3.3.2 "Safety Lock setting").

3. Connect cables (see paragraph 3.3.3 "Electrical connections").

4. Connect purge line to be used only in Headspace and for Fiber Cleaning Device (see paragraph 3.3.4 "Purge line connections (for Headspace and Fiber Cleaning Device)").

5. Switch on the autosampler (see paragraph 3.4 "Start-Up ").

6. Install PC software (see paragraph 3.5 "PC connection and software installation") (only if it has been purchased).

7. Install the Headspace syringe. See paragraph 4.2.2 "Setup: Syringewarmer assembly installation/ replacement (Headspace mode)".

8. Select the analyzer (see paragraph 4.2.1.1 "Alignment: Analyzer Default") .

9. Align the autosampler on the GC Injector(s) (see paragraph 4.2.1.2 "Alignment: Front Injector" and **Errore. L'origine riferimento non è stata trovata.** "**Errore. L'origine riferimento non è stata trovata.**".)

10. Install the sample rack for 6/10/20ml vials (see paragraph 2.1.1.1 "HT2800T/HT2850T Sample rack, paragraph 7.7 "Load and Unload Sample Vial" to open the tray and paragraph 7.9.1.1 "Rack mounting" to correctly mount the rack).

Perform the touch and plunger zero procedure (see paragraph 0 "4.2.1 "Setup: Alignment").

11. Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)".

12. If SPME kit (see paragraph 1.7.2 "Options ") has been purchased go to point 13), if SPME has not been purchased go to point 15.

13. Change from headspace to SPME mode (see paragraph 7.10.5 "Change from Headspace to SPME mode "). At the end of the change mode procedure, it is always necessary to adjust the injector alignment (see point below).

14. Align the autosampler on the GC Injector(s) (see paragraphs 4.2.1.2 "Alignment: Front Injector" and **Errore. L'origine riferimento non è stata trovata.** "**Errore. L'origine riferimento non è stata trovata.**").

15. Change to liquid mode (see paragraph 7.10.2 "Change from SPME to Liquid mode " or

7.10.1 "Change from Headspace to Liquid mode" At the end of the change mode procedure, it is always necessary to adjust the injector alignment (see point below).

16. Align the autosampler on the GC Injector(s) (see paragraphs 4.2.1.2 "Alignment: Front Injector" and **Errore. L'origine riferimento non è stata trovata.** "**Errore. L'origine riferimento non è stata trovata.**").

17. Modify the needle draw depth inside the sample vial see paragraph 4.2.1.5 "Alignment: Tray Install".

18. Finish the installation (see paragraph 3.8 "Final installation operations").

3.3.1 Autosampler installation on the mounting plate

Warning

Follow the instructions **with the autosampler switched off.** Moving the unit with the autosampler switched ON can cause serious damage to the autosampler.

Please follow these instructions in the following order:

1. Ensure that the autosampler mounting plate is correctly installed on the analyzer and that it allows the correct centering of the autosampler over the injector. The instructions for mounting plate installation are not available in this manual (for this information see the service documentation). The mounting plate is specific for the GC brand and model. The following figure shows an example:

A   A

Figure 55: Example of a mounting plate correctly mounted on a GC

3. Open the mounting plate locker, pulling it out using the syringe pointer shown in the Figure 31. The opening procedure is shown in the figures below.
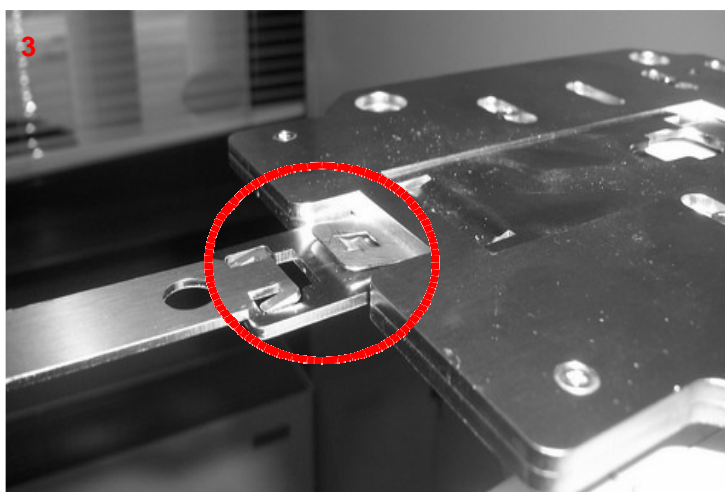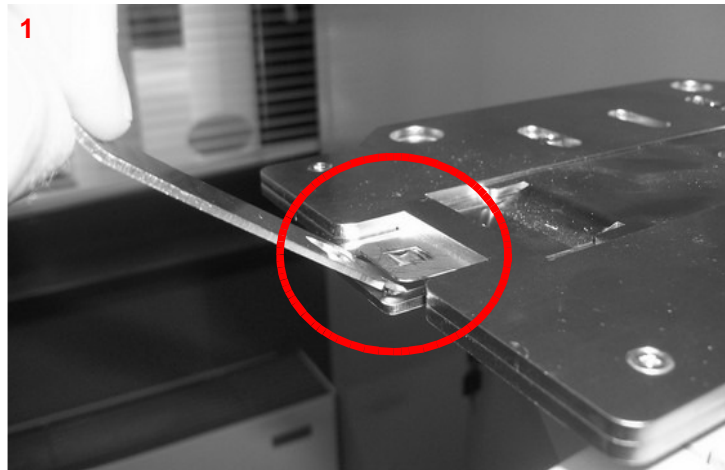
Figure 56: Mounting plate locker opening (example)

4. Place the autosampler over the mounting plate, ensuring that the four rubber feet of the autosampler (indicated with "X" in *Figure 6*) fit the four plate holes in *Figure 55*:
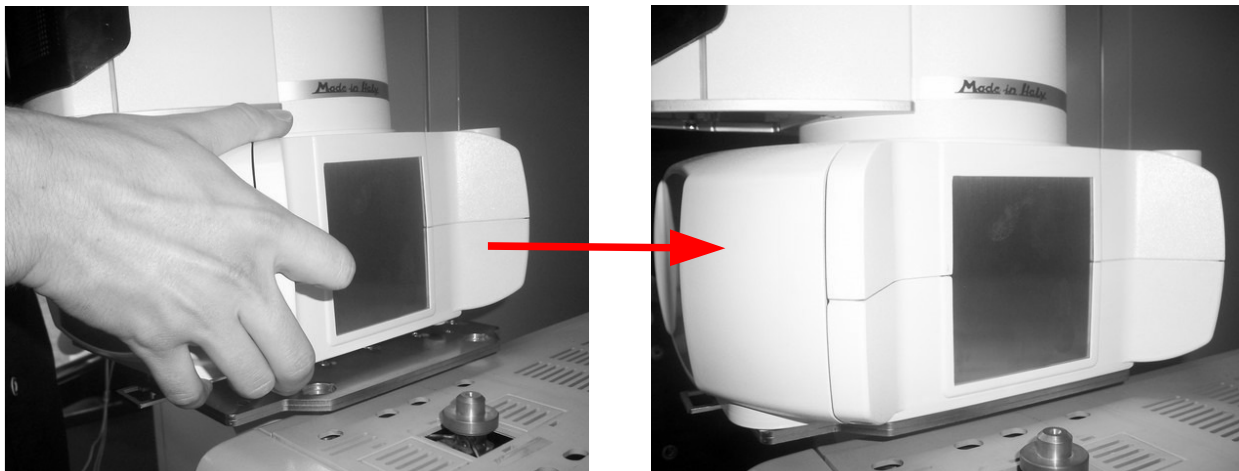
Figure 57: Autosampler mounting over the mounting plate

5. Fix the autosampler on the plate, closing the locker and pulling it in.
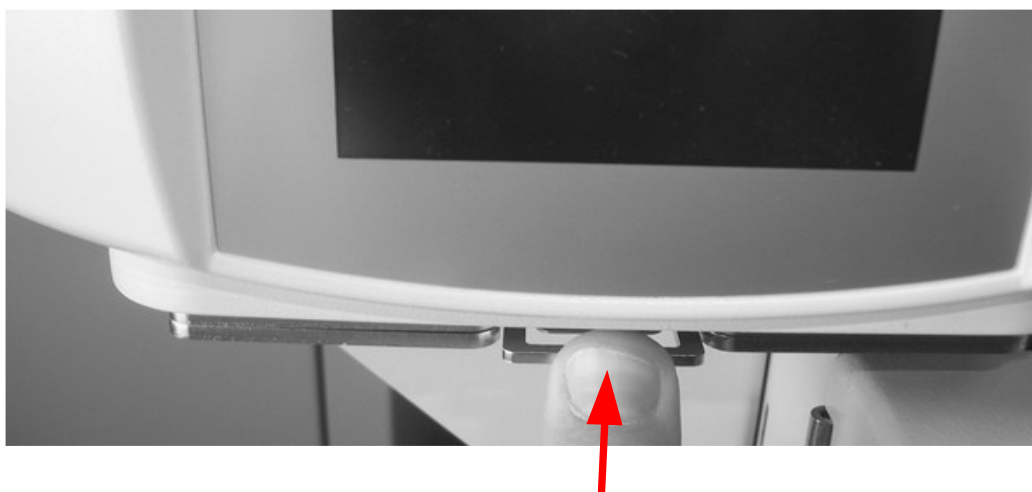
Figure 58: Mounting plate locker closing

3.3.1.1 Unlock the autosampler from the mounting kit

1. Open the mounting plate locker, pulling it out using the syringe pointer shown in Figure 31. The opening procedure is shown in the figure below.
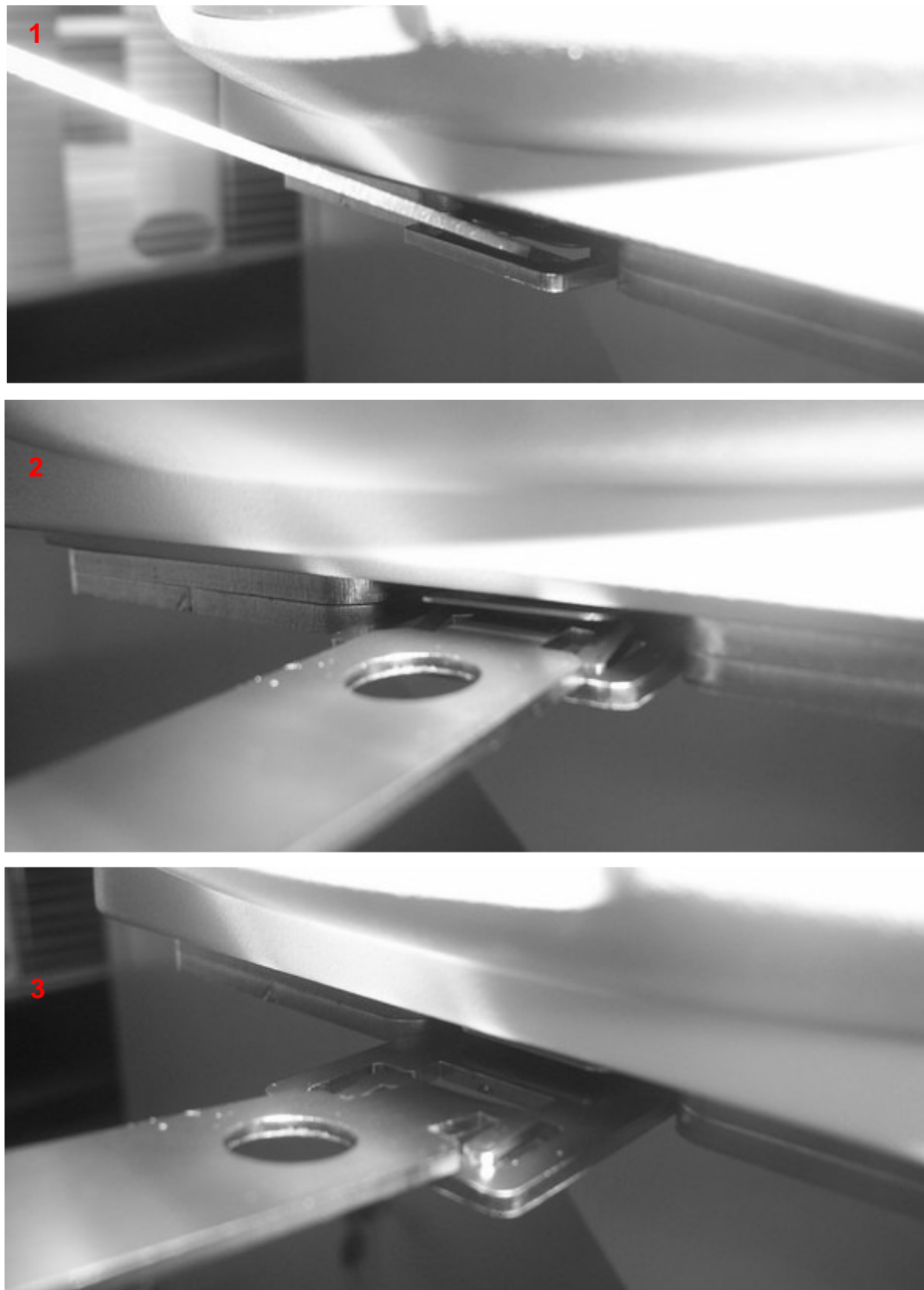
Figure 59: Mounting plate locker opening

2. Lift and remove the autosampler.

3. Close the mounting plate locker, by pushing it in. The plate returns as shown in Figure 55.

3.3.2 Safety Lock setting

When shipped the autosampler has the safety lock as shown in the first of the following pictures; to work correctly it should be set as shown in *Figure 61:*

Figure 60: Shipping position

Figure 61: Moving from shipping to operating position Figure 62: Operating position

1 **Needle Guide regulator (right block)**

2 **Safety lock (left block)**

3 **Vial locator**

Warning

If you don't adjust the safety lock, after start up the autosampler will display an error message (see paragraph 8 Troubleshooting8 "Troubleshooting"). For an accurate first installation, do not release the needle guide regulator – right block (see paragraph 4.2.2 "Setup: Syringe warmer assembly installation/ replacement (Headspace mode)".

In order to set the regulating lock, please proceed as follows:

1. Open the syringe location by pushing up the sliding lid (see *Figure 10*).
2. Lower the sledge manually to have free access to the left block (safety lock) as shown in Figure 61 (from a to c).
3. Loosen the left block (safety lock) using the supplied syringe pointer (see *Figure 31*) as shown in Figure 60.
4. Let the right block move down until it rests on the sledge.
5. Lift the left block about 2-3mm above the right block level and lock it.
6. Verify that the vial locator can be lifted freely by hand. If not, verify that the right and left block are locked parallel.
6. Close the sliding lid.

3.3.3 Electrical connections

Warning

Check that the autosampler is switched OFF. Do not use a power supply system different from the one supplied with this unit. This could cause damage to the autosampler or to the person using it.

Proceed as follows:

1. Connect the analyzer to its connector (number 5 in **Figure 29**) (15 pin port) using the interface cable provided with the mounting kit.

2. Insert the power cable inside the socket (number 2 in **Figure 29**). This cable is connected to an external power supply (low voltage) (see paragraph 2.1.3 "Connection panel").

3. Connect the external power supply to the mains power.

4. If PC connection is needed (optional):

    -   in case of an Ethernet connected autosampler: insert the Ethernet cable provided with the autosampler in the port indicated with the number 4 in **Figure 29**, then plug it into any Ethernet port available.
    -   in case of an RS232 connected autosampler: insert the serial cable provided with the autosampler in the port indicated with the number 4 in **Figure 29**, then on the PC side to any RS232C port available.

3.3.4 Purge line connections (for Headspace and Fiber Cleaning Device)

Warning

During Headspace and SPME operation, the syringe is cleaned after each injection with inert, clean gas (e.g. N_2 or He). Therefore a gas supply line must be available close to the

To flush the syringe between injections, a suitable gas source (e.g. Nitrogen) must be connected to the gas inlet 1/8" located on the rear of the autosampler (number 8 in **Figure 29**) The inlet gas has to be regulated by using a pressure regulator (only provided as an optional accessory, see paragraph 3.6.1 "External pressure regulator installation (only for Headspace and SPME mode)") at 1 bar maximum (15psi or 100kPa). The inlet gas should be at room temperature.

Purge gas must be 99.9995% pure. See the table below for the acceptable purge gas. It is recommended that high quality traps are used in order to remove hydrocarbons, water and oxygen.

Purge gas requirements	Purity	Notes
Helium	99.9995%	Hydrocarbon free
Nitrogen	99.9995%	

3.3.5 Preparing the solvent and waste vials (liquid mode)/ Preparing the washing vial (SPME mode)

Warning

These operations must be completed by competent personnel, properly trained about the procedures described in this manual: any missing or different execution of the described procedures can cause damages to the autosampler or to the person.

For the sample and reagents handling see paragraph 1.1 "Intended Use and Restrictions" and 1.5 "General Specification ". To install, remove, replace, fill, empty or clean the solvent vials and/or the waste vial (see *Figure 23*) perform the following operations in sequence:

3.3.5.1 Mounting
- Fill the solvent vial or the washing vial (waste vial should stay empty)
- Fit the septum in the cap. The septum should be positioned so that its red (PTFE) side is facing downwards and the blue side upwards.
- Fit the cap with the septum on the vial.
- The solvent vials (liquid mode) must be placed in the oven, after the positioning of the dedicated spacers. Press LOAD SAMPLE/SOLVENT to open the oven cover (see paragraph 7.8 "Load and Unload Solvent Vials" and (see *Figure 1* and *Figure 5*);
- The waste vial (liquid mode) must be placed in position 7 of *Figure 1*.
- The washing vial (SPME mode) must be placed in position 7 of *Figure 1.*

3.3.5.2 Removing
To remove the waste vial (liquid mode) or the washing vial (SPME mode), raise and extract it with care.

To remove the solvent vials (liquid mode) from the oven press LOAD SAMPLE/SOLVENT (7.8 "Load and Unload Solvent Vials ").

3.3.5.3 Cleaning
- Remove the vials (see above).

- Carefully remove the plastic caps and septa.

- Empty and wash the glass vials and the plastic caps.

- If necessary, change the septa.

- Refit the caps and septa on the vials as described in the "Mounting" (see above).

- Replace in their original place (see *Figure 1* and *Figure 5*);

3.3.5.4 Filling the Solvent Vials
- Remove the vials (see above).

- Carefully remove the plastic caps and septa.

- Empty and wash the glass vials and the plastic caps.

- If necessary, change the septa.

- Fill the vials with the solvent.

- Refit the caps and septa on the vials as described in the "Mounting" (see above).

- Put back the vials in their original place (see *Figure 1* and *Figure 5*).

3.4 Start-Up

The main power switch is on the back of the autosampler (see *Figure 30*, switch 1), switch it ON ("I" position).

When the autosampler is switched on a program loading screen appears (see paragraph 2.4.2"Limited Warranty"). Then the displays shows the autosampler firmware release.

After the program has loaded the display shows the "HOME SCREEN" (see paragraph 7.1 "Home screen").

During the start up process, in Headspace and SPME mode, the autosampler will proceed to check the incubation oven. If the oven is not empty, a screen appears asking if the oven has to be unloaded. If so, a following screen asks where to move the vial(s).

Warning

The virtual screen is available only with LAN connection. It is not available with RS232

3.5 PC connection and software installation

"HTA Autosampler Manager" software is optional. See paragraph 1.6 "Functions   available   only throughHTA Autosampler Manager".

Warning

HTA Autosampler Manager comes in two versions: Standard version and CFR 21 Part 11 version. In the document in which is reported the Activation key you will find information about the version for which you have been granted a license.

An activation key is required to enable communication with the autosampler. Every autosampler has its own key which is associated with its serial number. Without the activation key, the software can only be used in "DEMO" mode.

In the Demo mode you can not:

- run a sample list, a single injection or washes;
- read from/download to the autosampler methods, sequences and set up settings;
- see the virtual screen.

3.5.1 Autosampler controlled by LAN-connected PC

3.5.1.1 Default IP address
The factory Ethernet configuration of the autosampler is as shown below (it may be subject to change):

- IP Address:192.168.0.207
- Subnet Mask: 255.255.0.0

- Gateway: 192.168.0.1

- Ports: 20101 (TCP), 20102 (TCP), 20201 (UDP)

The IT/ network administrator must verify that any software firewall installed on the PC is:

- disabled;

- or enabled, but is not blocking the "HTA Autosampler Manager" application and the ports 20101 (TCP), 20102 (TCP) and 20201 (UDP);

The IT/ network administrator must also be informed about the IP address, because it could be in conflict with the adresses of other devices connected to the LAN or be outside the subnet

segment of the LAN. If necessary, you can change the IP configuration (see paragraph 3.5.1.3 "IP address/Subnet mask modification") .

3.5.1.2 Operations
To control the autosampler by PC, proceed as follows:

1) Connect the autosampler to your lab LAN (see paragraph 3.3.3 "Electrical connections");

2) The IT/ network administrator must verify that the firewall protection does not prevent communication between the software application "HTA Autosampler Manager" and the autosampler (see paragraph 3.5.1.1 "Default IP address ").

3) Install "HTA Autosampler Manager" on the PC. "HTA Autosampler Manager" is provided on the CD supplied with the instrument. Follow the wizard to install the software (self- explaining). Make sure to select proper version (Standard version or CFR 21 Part 11 version).
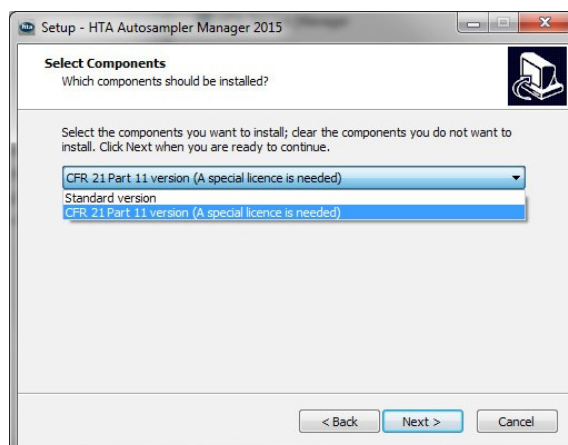
Figure 63: Software versione selection

4) Run the software.

5) (For HTA Autosampler Manager CFR 21 Part 11 version only). At the first access of the software the activation licence is required (click on "Add" from figure "a", tab "Licences" enabled). Then Administrator creation is required (click on "Add" from figure "b", tab "Users" enabled). The screen "c" appears to add the administrator, then it will be possible to create the other users.
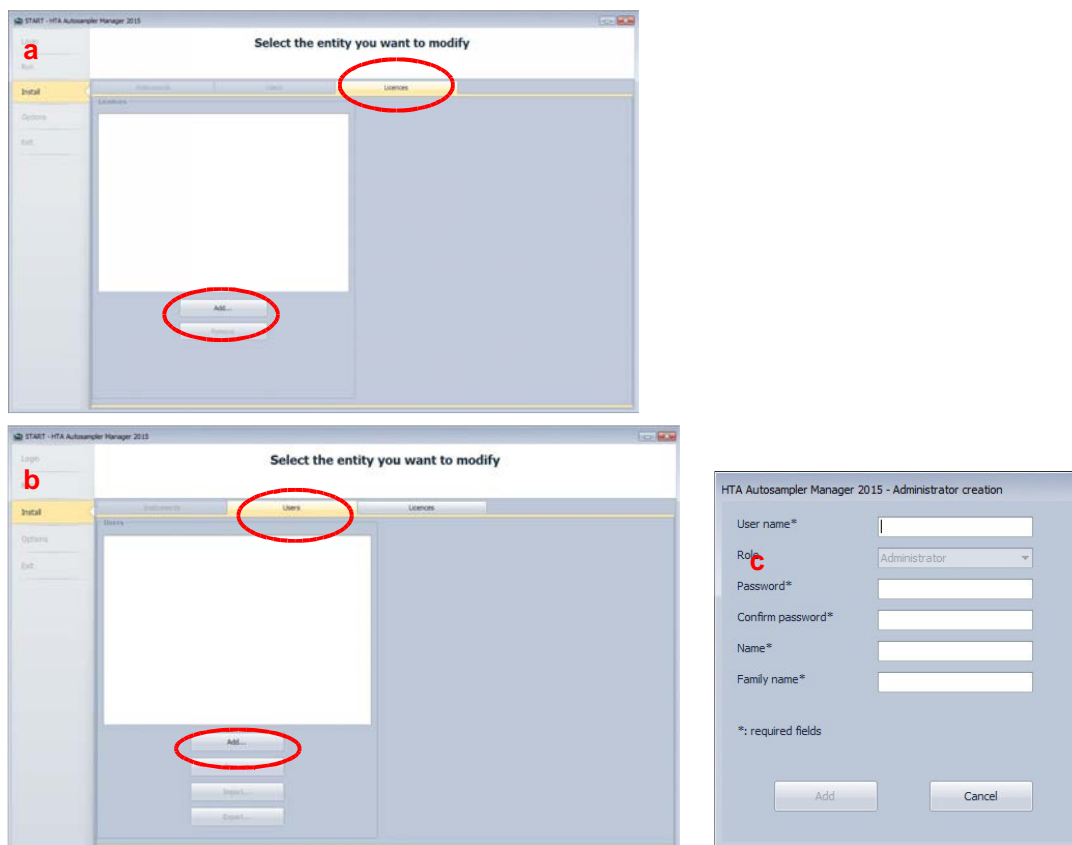
Figure 64: HTA Autosampler Manager CFR 21 Part 11

6) From the following screen (tab "Instruments" enabled) click on "**Add new**":
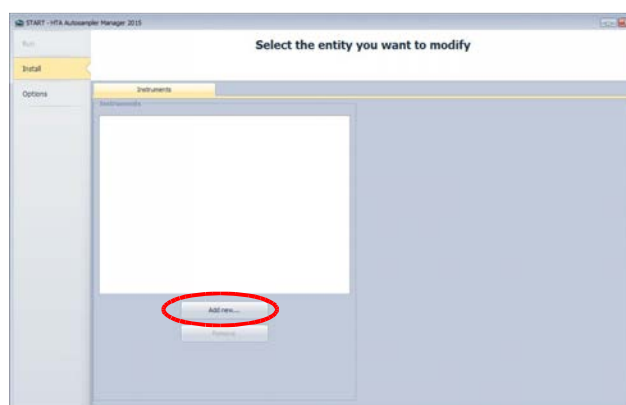
Figure 65: HTA Autosampler Manager screenshot 1

7) From the following screen, click on "**Next**":
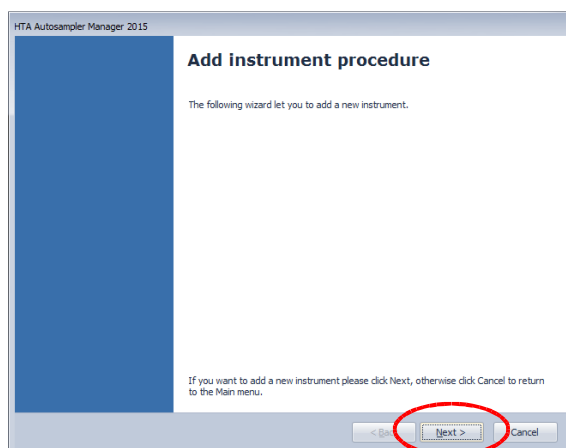
Figure 66: HTA Autosampler Manager screenshot 2

8) Give a "**Name**" to the instrument in order to identify it more easily, and then click on "Next":
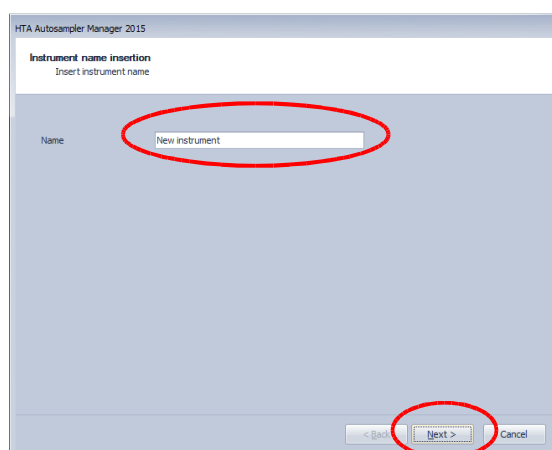
Figure 67: HTA Autosampler Manager screenshot 3

9) Confirm the instrument is connected by "TCP/IP port" (Default) by pressing on "Next":
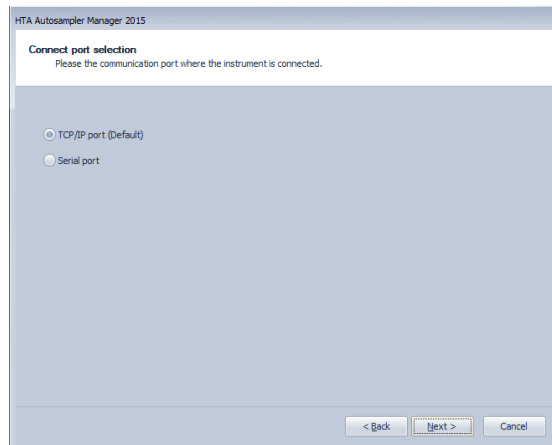
Figure 68: HTA Autosampler manager screenshot 5

10) All the instruments currently connected by Ethernet (LAN) are shown in the following screen. Click on one instrument and then on **"Next"**. If your instrument is not found you can re-try pressing "Refresh".
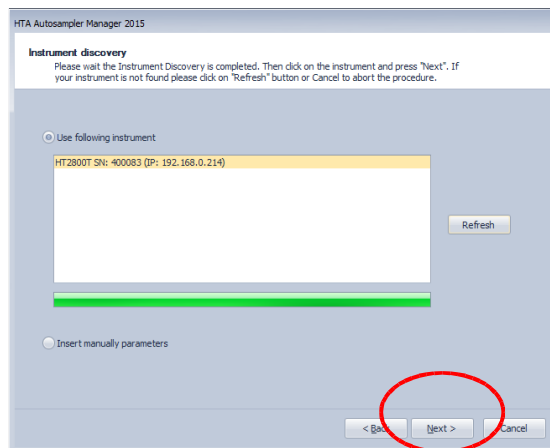
Figure 69: HTA Autosampler manager screenshot 5

11) Fill in the form with your data. Click on "**Next**":

Figure 70: HTA Autosampler manager screenshot 5

12) Fill in the form with the analyzer data. Click on "**Next**":

Figure 71: HTA Autosampler Manager screenshot 11

13) Insert the Activation key supplied with the instrument:
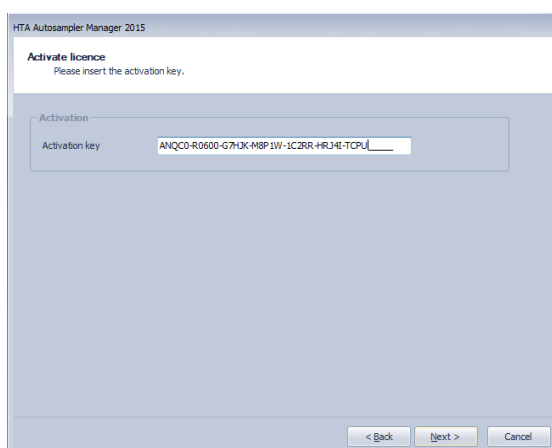
Figure 72: HTA Autosampler Manager screenshot 12

14) The ending of the activation procedure depends on your type of Internet connection:

    a) If you have an <u>Internet connection</u> (not via Proxy server) an automatic activation starts.

    b) If you <u>do not have an internet connection</u> available on the PC you are working with, click on "**Activate offline**".
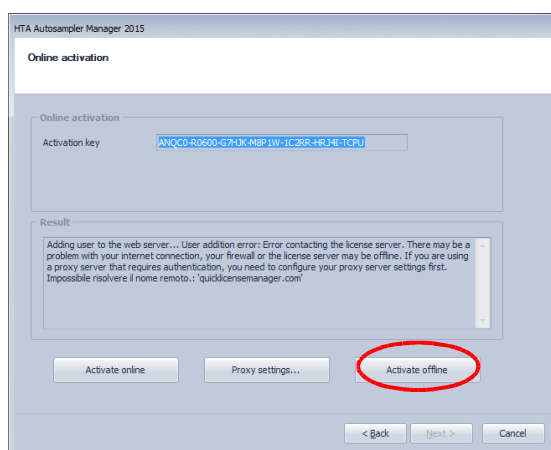
Figure 73: HTA Autosampler Manager screenshot 12

c) The following window appears:
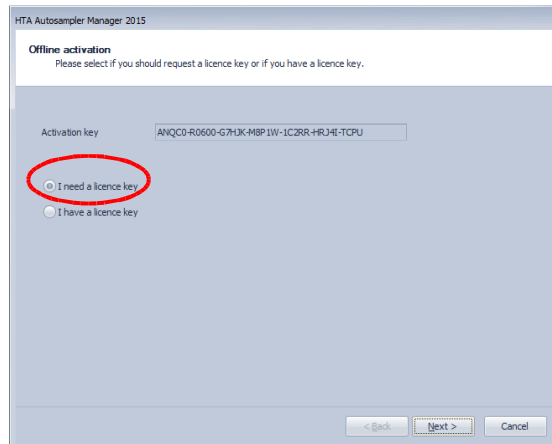
Figure 74: HTA Autosampler Manager screenshot 12

-If you already have a "**licence key**": select "**I have a licence key**" and then insert it in the dedicated field.

-If you do not have a "**licence key**" select "**I need a licence key**" and then "**Request licence key**". You will then obtain all the data required to apply for the "Licence key" from another PC via e-mail.

15) In any case, end the activation procedure by clicking on "**Finish**":

16) Finally, click on "**Run**" button, select the instrument name on the left part of the window and then click on "**Open**":
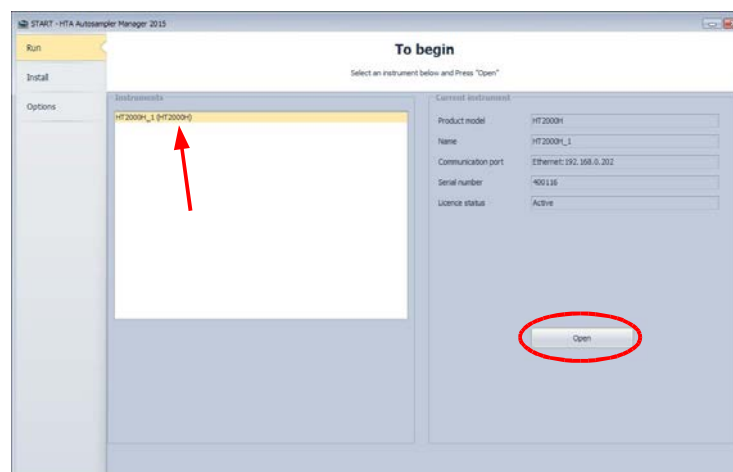
Figure 75: HTA Autosampler Manager screenshot 17

17) The following screen appears. The "Help online" section can help you with the autosampler handling by the software.
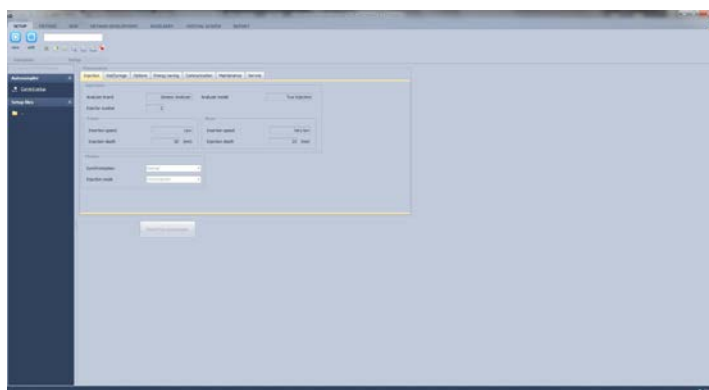
Figure 76: HTA Autosampler Manager screenshot 18

3.5.1.3 IP address/Subnet mask modification

If it necessary to modify the IP address/Subnet mask proceed as follows:

1) Connect the autosampler directly to the PC, inserting the Ethernet cable provided with the autosampler in the port indicated with the number 4 in **Figure 29** and then into the Ethernet port of the PC (see paragraph 3.3.3 "Electrical connections");

2) The IT/ network administrator must verify that the PC you are working with has a static IP address (do not work with DHCP);

3) Run "HTA Autosampler Manager";

4) "Open" your autosampler window (see paragraph 3.5.1.2 "Operations", point 16) and 17)) and from the Set up-Communication window change the IP address or the Subnet mask as shown in the figure below (press "Edit" button to enable the modification and then "Download the autosampler" to make the change effective) In order to get information about a valid IP address/Subnet mask and other related information, please ask your IT/ network administrator.
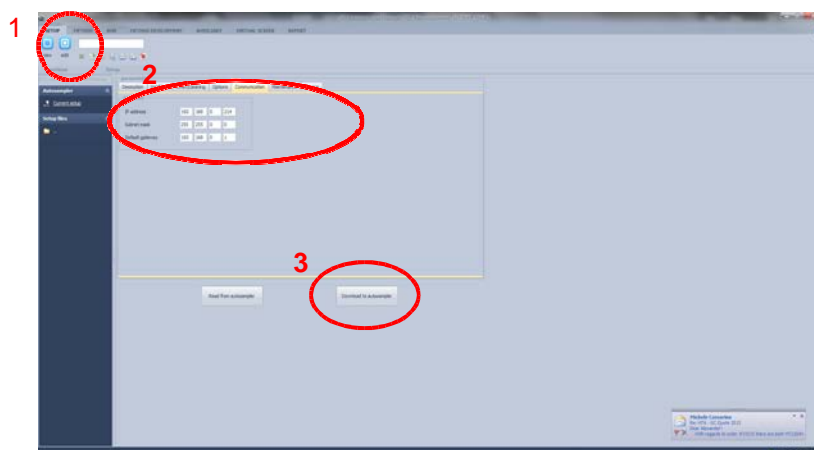
Figure 77: P address/Subnet mask modification

5) Follow the wizard to end the procedure (the instrument has to be switched off/on). If a communication problem occurs, close the software and run it again.

3.5.2 Autosampler connected directly to the PC

3.5.2.1 Autosampler connected directly to the PC by the Ethernet port

1) Connect the autosampler directly to the PC, inserting the Ethernet cable provided with the autosampler in the port indicated with the number 4 in *Figure 29*) and then into the Ethernet port of the PC (see paragraph 3.3.3 "Electrical connections");

2) The IT/ network administrator must verify that the PC you are working with has a static IP address (do not work with DHCP);

3) Then operate as described in paragraph 3.5.1.2 "Operations" start from point 3).

3.5.2.2 Autosampler connected directly to the PC by a RS232 port

1) Connect the autosampler directly to the PC, inserting the serial cable provided with the autosampler in the port indicated with the number 4 in *Figure 29*) and then onto the PC in any RS232C port available. (see paragraph 3.3.3 "Electrical connections");

2) Then operate as described in paragraph 3.5.1.2 "Operations" start from point 3). The only difference is that, instead of selecting "TCP/IP port" (see point 9), you have to select "**Serial Port**" and then select the product model and the correct communication port from the combo boxes.
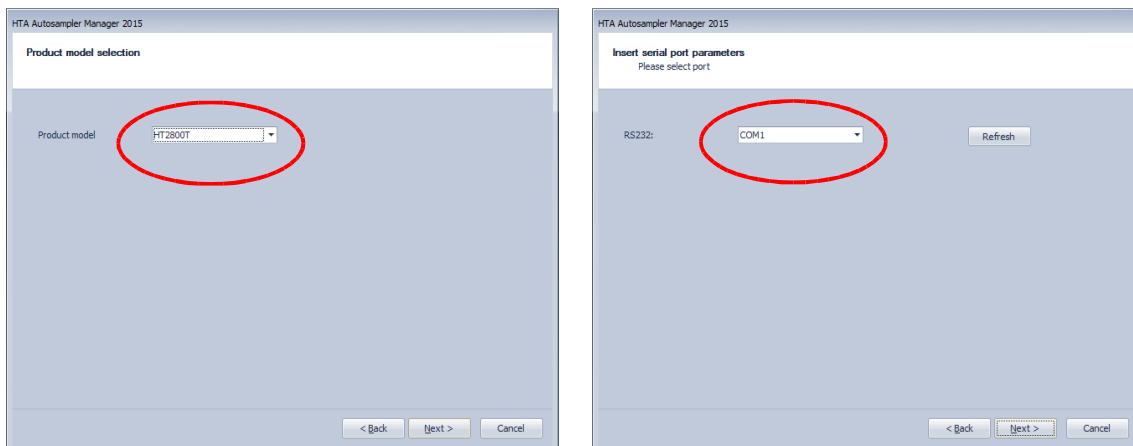
Figure 78: PC connection by RS232 port

3.6 Accessories installation

Warning

During Headspace and SPME operation the syringe is cleaned after each injection with inert,

3.6.1 External pressure regulator installation (only for Headspace and SPME mode)

This optional accessory is used to regulate the pressure of the gas used for the syringe flushing (e.g. Nitrogen). The pressure regulator output must be set at 1 bar maximum (15psi or 100kPa). The external pressure regulator is shown in the figure below:
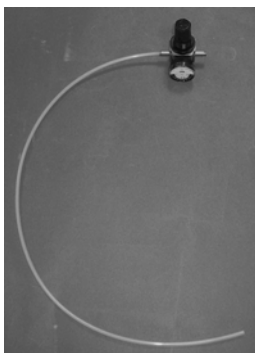
Figure 79: External pressure regulator

The pressure regulator must be inserted between the gas source and the gas inlet of the autosampler in order to regulate the inlet pressure. In detail, the 1/8" tube coming out from the regulator (number 1 in the following figure) must be connected to the gas inlet 1/8" located on the rear of the autosampler (number 8 in *Figure 29*). The other end of the regulator (number 2 in the figure above) must be connected to the gas source.
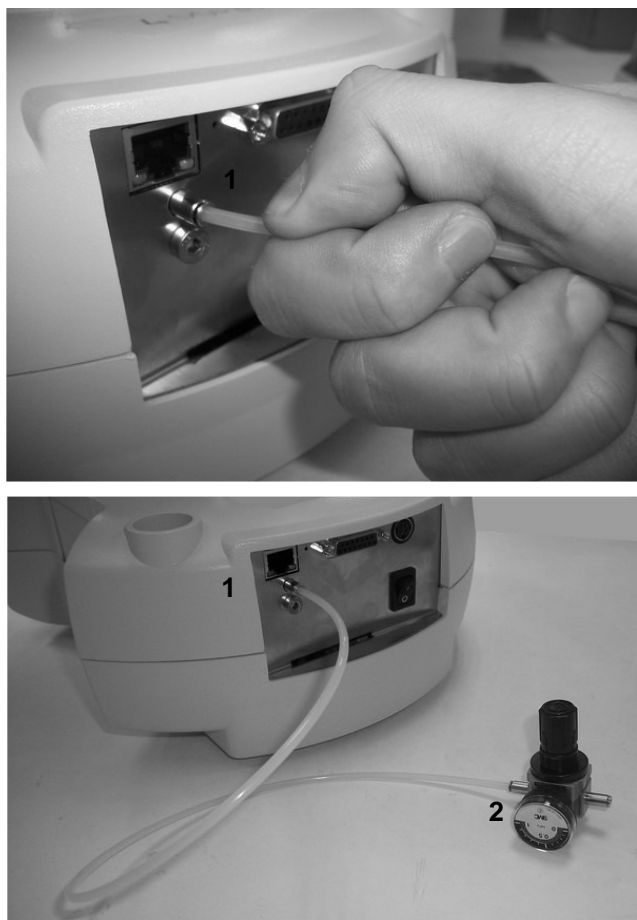
Figure 80: External pressure regulator connection

3.6.2 Swagelok Adapter installation (only forHeadspace and SPME mode)

1) Use a Hexagon key (2mm) to unscrew the Rapid fitting terminal (indicated with the letter A in the figure below):
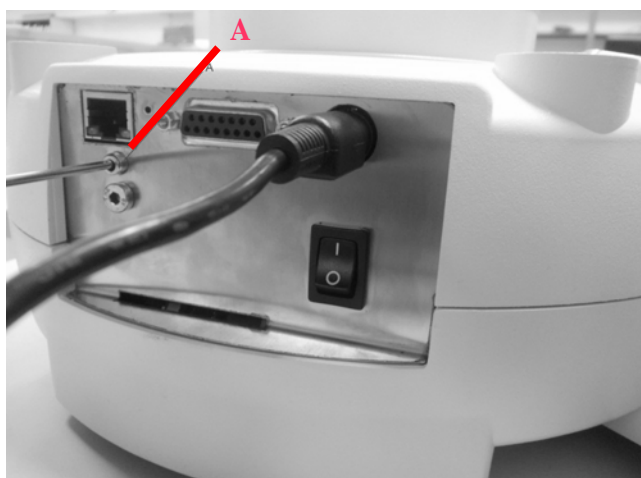
Figure 81: Swagelok adapter installation_1

2) Put the O.R. (indicated with the letter B in the figure below) on the new fitting (indicated with the letter C in the figure below):
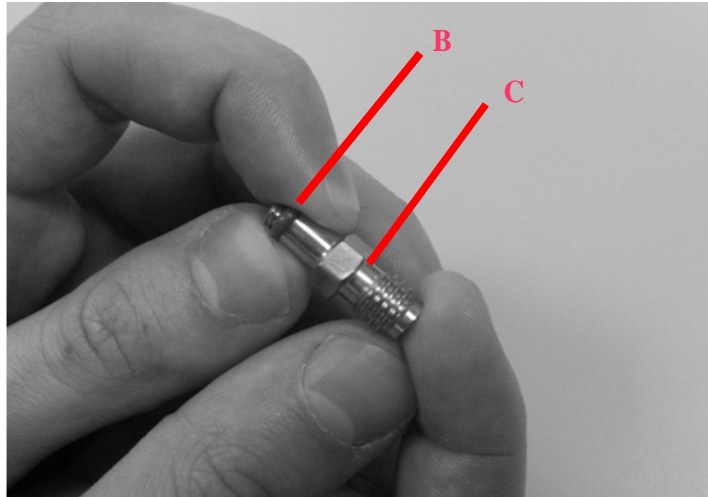
Figure 82: Swagelok adapter installation_2

3) Use an open-end wrench (8mm) to screw the fitting and the washer on the female adapter (indicated with the letter D in the figure below):

Figure 83: Swagelok adapter installation_3

3.6.3 System integrity tool installation (only for Headspace mode)
This tool is included in the GLP Pack for HT2800T/HT2850T (see paragraph 1.7.2 "Options").

4) Remove the upper part of the Syringe integrity tool (as indicated in the figure below):

Figure 84: System integrity tool installation_1

5) Insert the septum (indicated with the letter A in the figure below) in the lower part of the Syringe integrity tool:
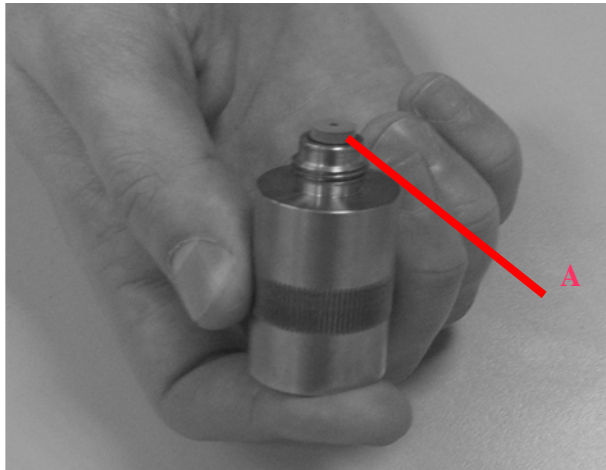
Figure 85: System integrity tool installation_2

6) Screw by hands the upper part (indicated with the letter B in the figure below) of the Syringe integrity tool to the lower part (indicated with the letter C in the figure below):
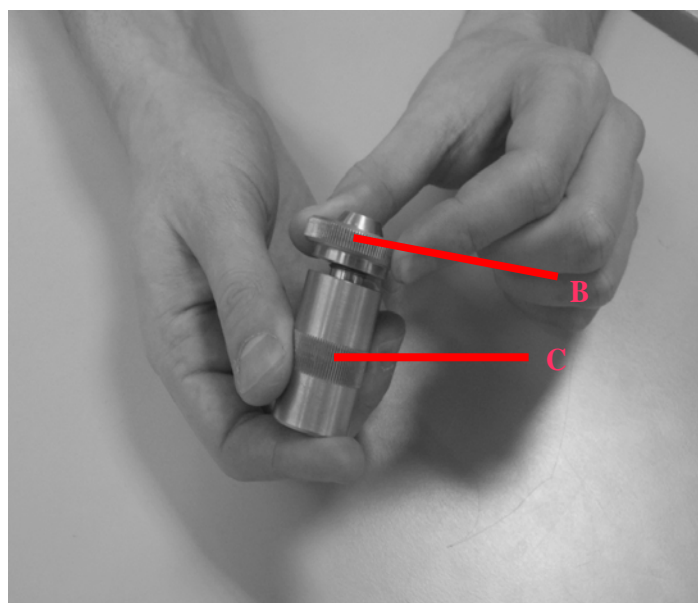
Figure 86: System integrity tool installation_3

7) Place the System integrity tools in position number 6 of *Figure 1*.

Figure 87: System integrity tool installation_4

3.6.4 Vial Locator: Installing and removing (Liquid mode)

You may need to change the vial locator when enabling/disabling Barcode Reader option (see paragraph 0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

Setup configuration: BCR")

The vial locator with gripper (see paragraph 2.1.2.2 "Syringe location for Liquid Mode" to be used in case of Barcode Reader option enabled, is included inside the Barcode Reader Module HT2800T (see 1.7.2 "Options").

The standard vial locator without gripper (see paragraph 2.1.2.2 "Syringe location for Liquid Mode"), can be used when Barcode Reader option is disabled.

The autosampler has the possibility to change the vial locator in a quick way:

Figure 88: Vial locator positioning

8) Enter the Manual Operations menu (see paragraph 4.2.5 "Setup: Manual operations"); Move turret and needle to a position that assures easy access to the vial locator. For example move the vial locator over the injection area as shown in the picture below:

9) Use the dedicated allen key (supplied with the Bar code Reader Module HT2800T) to remove the vial locator as shown in the pictures below:
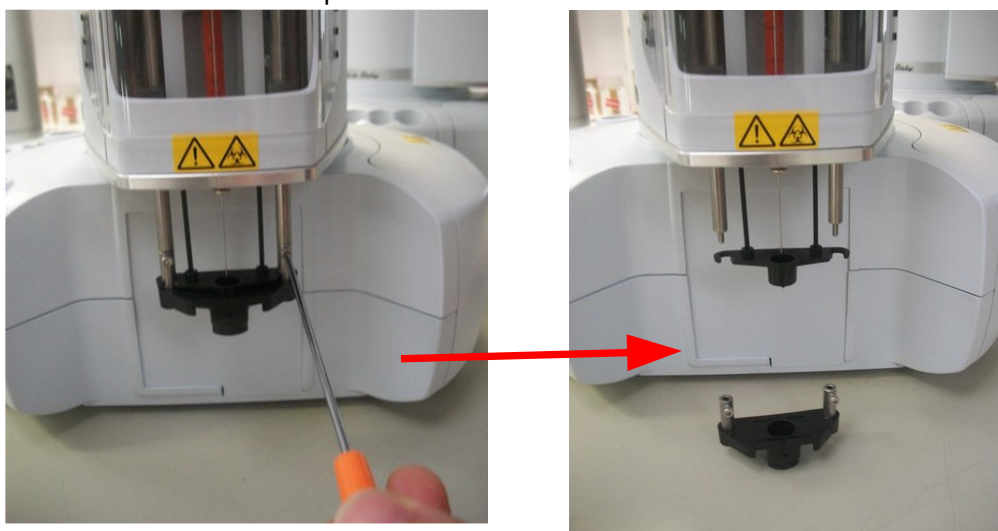
Figure 89: Vial locator removing

10) Place the new vial locator. Puts the rods of the vial locator into the holes of the needle guide (indicated with the red arrows in the picture below):
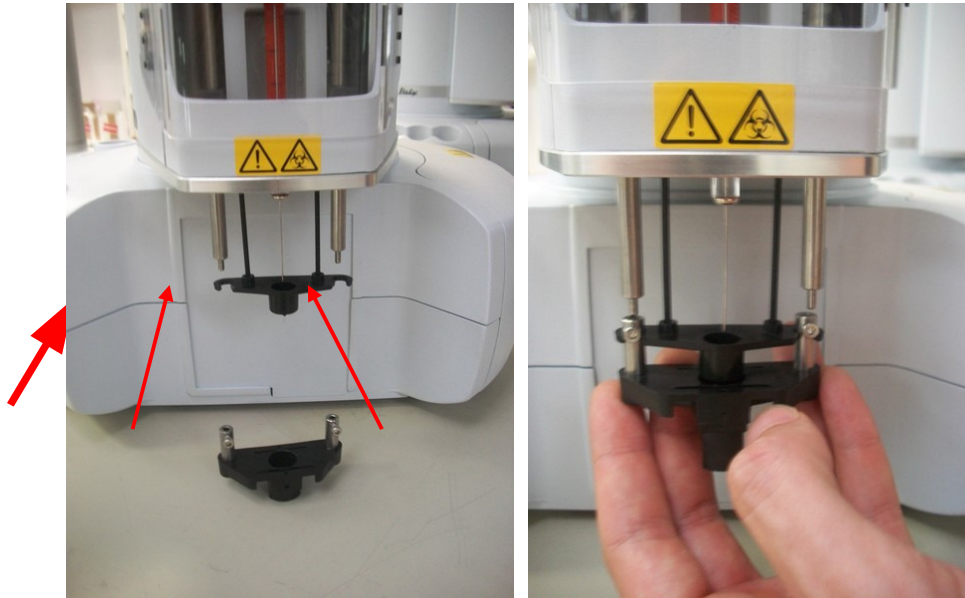
Figure 90: Vial locator replacing step 1

11) Then fit and fix the rods of the vial locator using the allen key as shown in the picture below:
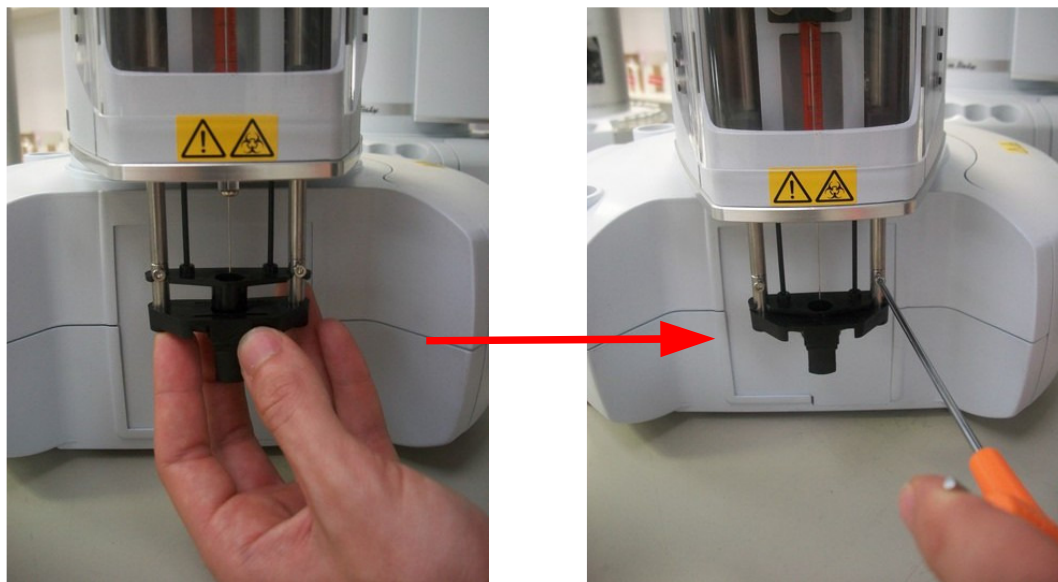
Figure 91: Vial locator replacing step 2

12) Check that the vial locator was correctly aligned with needle tip as shown in the picture below. If the alignment is not correct contact the Technical Assistance Service.
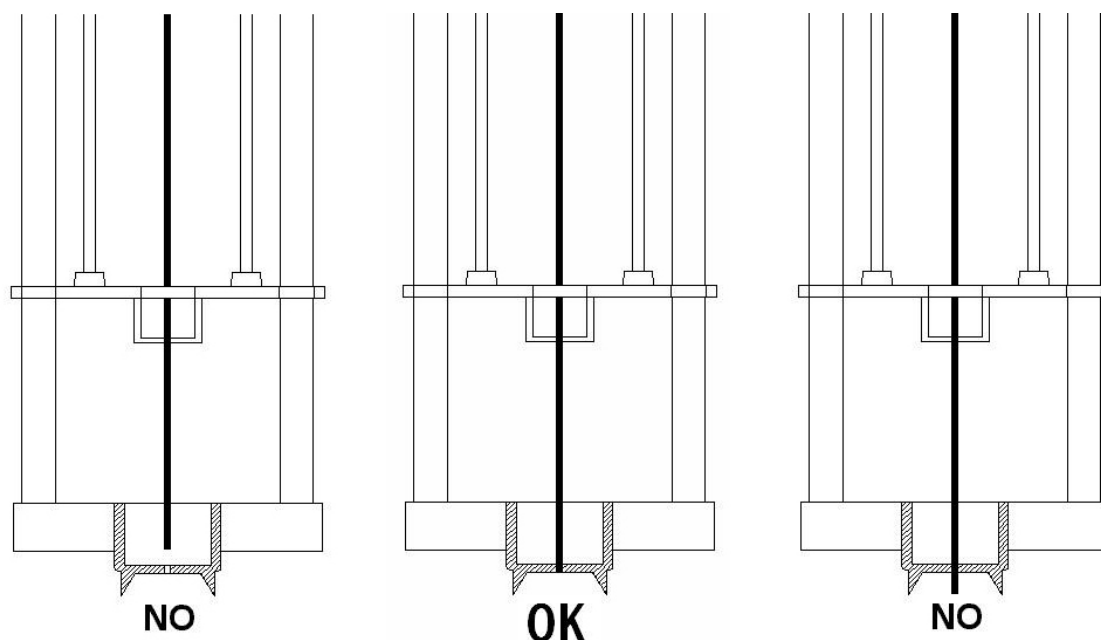
Figure 92: Needle tip-vial locator alignment

Exit from the Manual Operations menu and perform the Touch Plunger Zero procedure (see paragraph 0 "4.2.1 "Setup: Alignment").

Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)".

3.7 Preparing sample vial

⚠️

Warning

These operations must be completed by competent personnel, properly trained regarding the procedures described in this manual: any missing or different execution of the described procedures can cause damage to the autosampler or to the person working on the equipment.

- Follow the instruction for sample loading 7.7 "Load and Unload Sample Vial";

- Prepare the sample vial according to the instructions given in the paragraphs below;

- Put the vial in the rack.

3.7.1 Vial filling in liquid mode

This paragraph contains suggestions about the vial filling in liquid mode.

The recommended fill volume is up to a maximum 50% of the vial nominal volume (e.g.: 1ml for 2ml vial; 50ul for 100ul vial). The air space in the vial is necessary to avoid vacuum formation during sample aspiration as this could affect reproducibility.

1ml   50□l

2ml vial   100ul vial
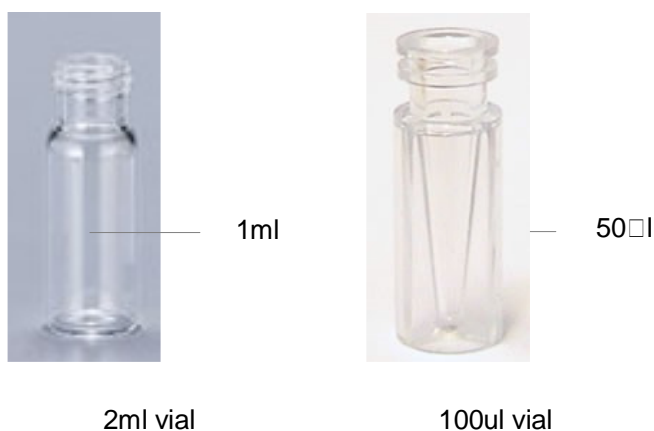
Figure 93: Recommended fill volumes for sample vials

When preparing sample vials remember that:

- If you want to test a large sample over repeated injections, divide the sample in different vials to obtain more reliable data;
- If the sample volume in the vial is low, contaminants from the previous sample or solvent washes could have a bigger impact on the sample.

If you change vial supplier, you may need to recheck your method. Differing manufacturing practices for vial cause sometimes variances in analytical data.

3.7.2 Vial capping (Screw Cap)

If using a sample vial with a screw cap top, firmly tighten the cap ensuring that the septum is flat and not twisted.

3.7.3 Vial capping (Crimping Cap)
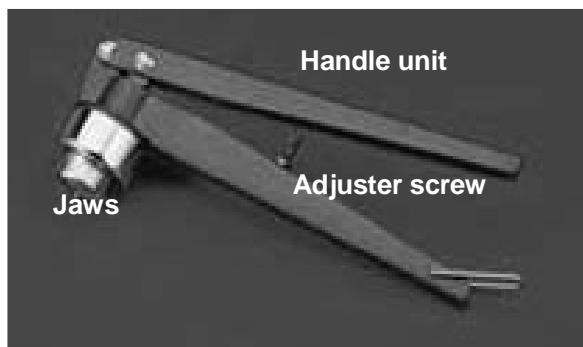
Figure 94: Crimper

You must have a crimper available. Fit the
septum on the cap, then:

- Clean the inside surfaces of the crimper jaws.
- Place the crimp cap over the top of the vial.
- Hold the vial and place the crimper on top of it. Squeeze the handle until it touches the adjuster screw.
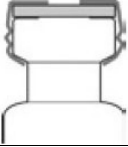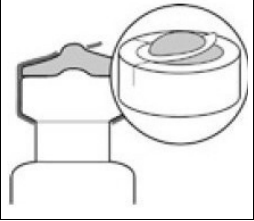
Check each vial for proper crimping. <u>Correct</u>
<u>crimp features:</u>

- flat cap surface;
- flat septa surface;
- tight fitting of the cap edge;
- plain and undeformed cap sides.
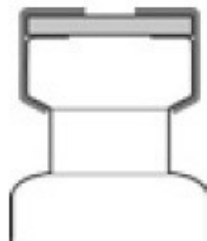
Figure 95: Correct crimp

In the next table, some examples of incorrect crimp are shown:

Untight cap edge	Upward bulge of the crimp cap (overcrimped)	Deformation of the crimp cap sides (overcrimped)	Convex looking liner (overcrimped)	Rounded edges/ Upward bulge of the cap/Liner (overcrimped)

Adjust crimping pressure and adjust crimping height	Adjust crimping pressure and adjust crimping height	Adjust crimping height	Adjust crimping pressure	If the cap is stretched too much under the crimp neck, the bridges of the scorelines suffer too much stress and can break open at even low pressure (below 3 bars) or, in the worst cases can even tear apart beside the scorelines

3.8 Final installation operations

Omissis.

3.9 Basic training

At the end of the installation procedure, the Service engineer must instruct the user about the basic operations of the autosampler. After this basic training, the user should be able to perform the following operations:

- Single injection
- Automatic run
- Syringe purge
- Method and sequence creation and editing
- Syringe replacement (or Fiber replacement in case of SPME mode)
- Front and rear injector alignment
- Switch between modalities.

4 Set Up operations

Warning

Set-up must be completed by competent personnel, properly trained regarding the procedures described in this manual: any missing or different execution of the described procedures can cause damage to the autosampler or to the person operating it.

However, in particular, you should pay attention to the moving parts such as the sledge, syringe , needle, the cover of the oven etc...Some parts of the autosampler (oven, syringe, needle or vials) can work at high temperatures. Be careful to avoid burns. Allow these parts to cool down before handling them.

4.1 View Parameters

Access sequence: RUN>SETTINGS>VIEW PARAMETERS

This information is organized on multiple pages: press NEXT to change the page.

View parameters shows the following information:

- **Syringe Volume:** nominal volume of the installed syringe**;**
- **Tray Type**: the tray type installed. This shows the number of vial positions, dimension of sample vials and needle draw depth inside the vial;
- **Analyzer Brand**: shows the analyzer brand (see paragraph 4.2.1.1 "Alignment: Analyzer Default");
- **Analyzer Model**: shows the analyzer model (see paragraph 4.2.1.1 "Alignment: Analyzer Default");
- **Front Injector Depth**: shows the needle insertion depth into the front injection port;
- **Front Injector Insertion Speed**: shows the needle insertion speed into the injector;
- **Rear Injector Depth**: shows the needle insertion depth into the rear injector. This parameter is shown only if the autosampler is set to work with the rear injector;

- **Rear Injector Insertion Speed:** shows the needle insertion speed into the injector. This parameter is shown only if the autosampler is set to work with the rear injector;

- **IP Address, Subnet Mask, Gateway:** shows the LAN connection data (see paragraph 3.5.1.1 "Default IP address").

Select "**Exit**" to exit from the "VIEW PARAMETERS" screen.

4.2 Setup

Access sequence: RUN>SETTINGS>SETUP

In the "SETUP" screen the following menus are available:

- **Alignment**: aligns injectors and edit rack settings (see paragraph 4.2.1 "Setup: Alignment");

- **Syringe Installation:** used to install the syringe (see paragraph 4.2.2 "Setup: Syringe warmer assembly installation/ replacement (Headspace mode)" for Headspace mode and paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)") for liquid mode;

- **Fiber installation**: used to install the Fiber (see paragraph 4.2.4 "SPME Fiber holder installation/ replacement"). Only in SPME mode;

- **Manual Operation**: moves the autosampler motors for diagnostic or emergency needs (see paragraph 4.2.5 "Setup: Manual operations");

- **Configuration**: edits autosampler settings (see paragraph 4.2.6 "Setup: Configuration");

- **Service**: maintenance operation on the autosampler (see paragraph 0 "Select "Exit" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

- Setup: Service").

Select "Exit" to exit from the "SETUP" screen.

4.2.1 Setup: Alignment

This is used to align the sample tray and GC injection port.

Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT

From this screen access the following sub menu:

- **Analyzer Default**: selects the correct analyzer on which the autosampler is mounted (see paragraph (see paragraph 4.2.1.1 "Alignment: Analyzer Default"). If no analyzer has been selected, the front and rear injector buttons will not be available;

- **Front injector**: aligns the front injector (see paragraph 4.2.1.2 "Alignment: Front Injector");
- **Rear injector**: aligns the rear injector (see paragraph 4.2.1.3 "Alignment: Rear Injector");

Touch Plunger Zero/Touch Fiber Zero: to re-execute alignment procedure (see paragraph 0 "4.2.1 "Setup: Alignment").

- Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)");
- **Tray Install**: to install and edit rack settings (see paragraph 4.2.1.5 "Alignment: Tray Install ").

Select "Exit" to exit from this screen and return to the "Setup" screen (see paragraph 4.24.2 "Setup").

4.2.1.1 Alignment: Analyzer Default
Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>ANALYZER DEFAULT

The first screen ("Setup: Analyzer Brand") shows a list of analyzer brands. Each brand is associated with a list of models (second screen: "Set up: Analyzer Model").

Verify that the selected analyzer (marked blue) matches your analyzer.

If not, select the brand of your analyzer and then the model. If your analyzer is not present in the list select "Generic" and then set the number of injection ports.

Once complete, any previous data relating to the installation will be erased.

Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph 4.2.1 "Setup: Alignment"). Perform the alignment on the front injector (see paragraph 4.2.1.2 "Alignment: Front Injector") and rear injector if present (see paragraph 4.2.1.3 "Alignment: Rear Injector").

4.2.1.2 Alignment: Front Injector
Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>FRONT INJECTOR

When "Front injector" is selected, the screen shows "Wait: Front Injector Alignment in progress"" (Tap "STOP", if you want to end this procedure). The autosampler will go directly to the last position stored in memory or to the default position for the selected analyzer (4.2.1.1 "Alignment: Analyzer Default").

-If the vial locator finds the injector, the following message appears: "Confirm Front injector Alignment?"

- Tap "CONFIRM" if the autosampler is correctly aligned over the injector. Set the Front

Injector injection depth and the Front Injector needle insertion speed (Very Low, Low, Medium, High or Very high). Tap "SAVE" to save these settings, otherwise tap "ABORT".

• Tap "DO MANUAL" to modify the alignment (if needed). A screen appears to manually move the turret and needle. Move the turret and needle by pressing the arrows to center the injector. Tap "STORE" to save the alignment (this button is enabled only if the touch sensor is "ON", so the vial locator must be touching the injector), otherwise tap "ABORT". Set the Front Injector injection depth and the Front Injector needle insertion speed (Low, Medium, High or Very high). Tap "SAVE" to save these settings, otherwise tap "ABORT".

-If the vial locator does not find the injector, the following message appears: "Injector not found". In this case, only the "DO MANUAL" or "ABORT" buttons are enabled.

Warning
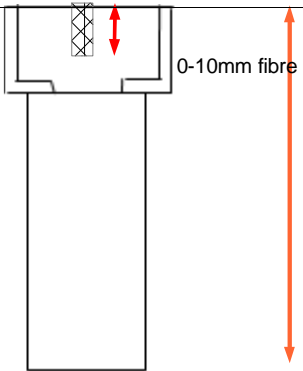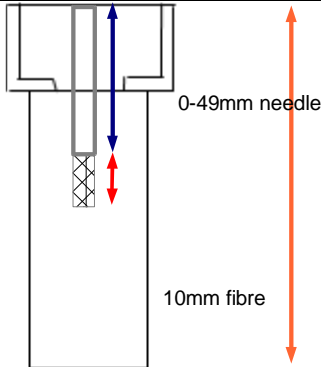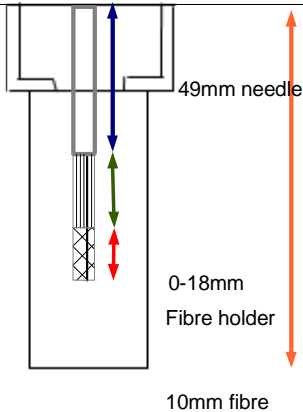
Ensure that:
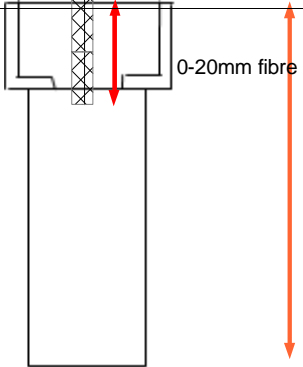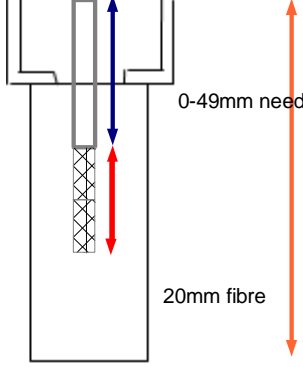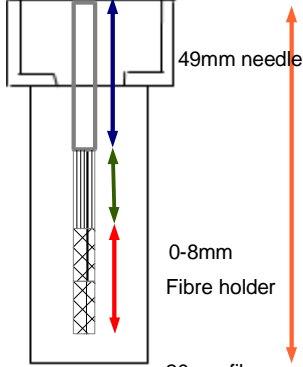
- • The needle is aligned over the centre of the vial locator on the injector;
- • The vial locator fits properly on the injector;
- • The needle has to enter the injector without trouble and penetrate the septum without any excessive bending: If it does not, check the injector septum, type of syringe used and needle tip type;
- • when the needle is in the port, ensure that it has a little further room to go down (about 1-2 millimetres).

Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph 4.2.1 "Setup: Alignment".

Injection depth setting in SPME mode

Injection Depth is the distance from vial locator and the Fiber tip. For different depths set, autosampler exposes only Fiber; Fiber and needle; Fiber, needle and Fiber holder.

Fiber lenght	Injection depth (mm)		
	<10	The instrument moves the needle 1 mm under the vial locator, then expose Fiber moving only the plunger.	0-10mm fibre
	10<depth<59	The instrument moves the needle 10 mm over the final position, then moves the plunger to expose 10 mm of Fiber.	0-49mm needle 10mm fibre
10mm	59<depth<77	The instrument moves the needle until 49 mm, moves the plunger to expose 10 mm of Fiber and then from 0 mm to 18 mm of Fiber-holder to reach the right depth.	49mm needle 0-18mm Fibre holder 10mm fibre

Fiber lenght	Injection depth (mm)		
	<20	The instrument moves the needle 1 mm under the vial locator, then expose Fiber moving only the plunger.	0-20mm fibre
	20<depth<69	The instrument moves the needle 20 mm over the final position, then moves the plunger to expose 20 mm of Fiber.	0-49mm needle 20mm fibre
20mm	69<depth<77	The instrument moves the needle until 49 mm, moves the plunger to expose 20 mm of Fiber and then from 0 mm to 8 mm of Fiber-holder to reach the right depth.	49mm needle 0-8mm Fibre holder 20mm fibre

4.2.1.3 Alignment: Rear Injector
Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>REAR INJECTOR

Tap "Rear Injector" from the "Setup: Alignment" screen to set the alignment of the rear injection (see paragraph 4.2.1 "Setup: Alignment").

The procedure for rear injector alignment is the same as for the front injector (see paragraph above).

Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (4.2.1 "Setup: Alignment").

4.2.1.4 Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)

Headspace mode

Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>TOUCH PLUNGER ZERO

Follow the instructions of the wizard. Place a capped sample vial in the indicated position. If the System integrity kit has been provided (see paragraph 1.7.2 "Options"), also place the System integrity tool in the position indicated with 6 in *Figure 1*. Tap "Continue" to start, (or "ABORT" to quit). The plunger touch procedure is then run automatically. The vial locator touches the indicated position of the oven cover, the indicated vial in the oven, the indicated vial in the tray, the injector/s and on the System integrity area. Then the syringe zero procedure is performed. This procedure can be stopped or skipped by tapping the appropriate button. Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph 4.2.1 "Setup: Alignment").

Liquid mode

Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>TOUCH PLUNGER ZERO

Follow the instructions of the wizard. Place a capped sample vial in the indicated position and ensure the capped waste vial is in the position indicated with 7 in Figure 1. Tap "Continue" to start, (or "ABORT" to quit). The plunger touch procedure is then run automatically. The vial locator touches the waste vial, the indicated sample vial and the injector/s. Then the syringe zero procedure is performed. This procedure can be stopped or skipped by tapping the appropriate button. Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph 4.2.1 "Setup: Alignment").

SPME mode

Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>TOUCH Fiber ZERO

Follow the instructions of the wizard. Place a capped sample vial in the indicated position and ensure the capped wash vial is in position indicated with 7 in *Figure 1*. Tap "Continue" to start, (or "ABORT" to quit). The plunger touch procedure is then run automatically. The vial locator touches the indicated position of the oven cover, the indicated vial in the oven, the indicated vial in the tray, the injector/s, the wash vial and the SPME Cleaning Device location (only in HT2850T). Then the syringe zero procedure is performed. This procedure can be stopped or

skipped by tapping the appropriate button. Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph (see paragraph 4.2.1 "Setup: Alignment").

4.2.1.5 Alignment: Tray Install

Access sequence: RUN>SETTINGS>SETUP>ALIGNMENT>TRAY INSTALL

This screen shows a list of trays/racks stored in memory.

The following options are available:

- **Add new**: adds a new tray/rack;
- **Remove:** removes a tray/rack;

Select a tray to view or edit its details. The number of vial positions, dimension of the sample vials and the needle draw depth inside the sample vial can be modified if your sampler allows it. If you modify a parameter, a screen displays: "Modifying tray". Tap "SAVE" to confirm, otherwise tap "CANCEL". A confirmation screen appears "Tray parameters has been modified". Tap "CONTINUE".

Select "ADD NEW", to set the number of vial positions, the dimension of the sample vials and the needle draw depth inside the sample vial of the new tray/rack (e.g.: 121-2ml-30mm).

To remove a rack, select "REMOVE" then select the tray/rack that you want to remove. A confirmation screen appears "The selected tray has been removed". Tap "CONTINUE".

Warning

The suggested needle draw depth inside the sample vial for Liquid mode is 30mm if 12x32mm (2ml) vial without micro-inserts are used (12.2.2 "Sample vials"). 32mm is the maximum depth.

Select "**Exit**" to exit from this screen and return to the "ALIGNMENT" screen (see paragraph 4.2.1 "Setup: Alignment").

4.2.2 Setup: Syringe warmer assembly installation/ replacement (Headspace mode)

The syringe is installed inside the syringe warmer assembly provided with unit.

Access sequence: RUN>SETTINGS>SETUP>SYRINGE INSTALLATION

1. From the Setup menu, tap "Syringe installation" to start the procedure:

Figure 96: Syringe installation screen

2. The following screen appears, while the autosampler automatically moves the syringe location to an accessible position.
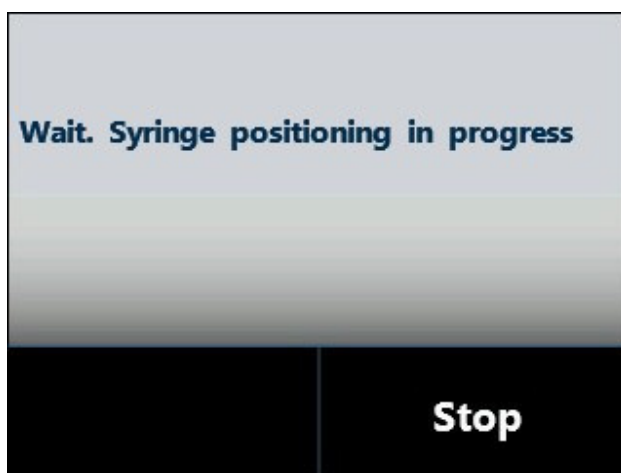
Figure 97: Syringe positioning screen

3. When the autosampler is ready, the following screen appears:

Figure 98: Syringe remove and installation screen

The autosampler should be automatically positioned in a convenient position to allow the syringe warmer assembly installation. If this position is OK, proceed to step 5..

4. If the position is not convenient, tap "MANUAL" to display the following screen. From here, it is possible to move the plunger, turret and needle in order to reposition the autosampler to your desired position.

Figure 99: Syringe Install Manual Move screen

5. Follow this procedure:

   a) Open the syringe location by pushing up the sliding lid.

Figure 100: Sliding lid opening

   b) Remove the plunger locker by pulling it out using the syringe pointer.
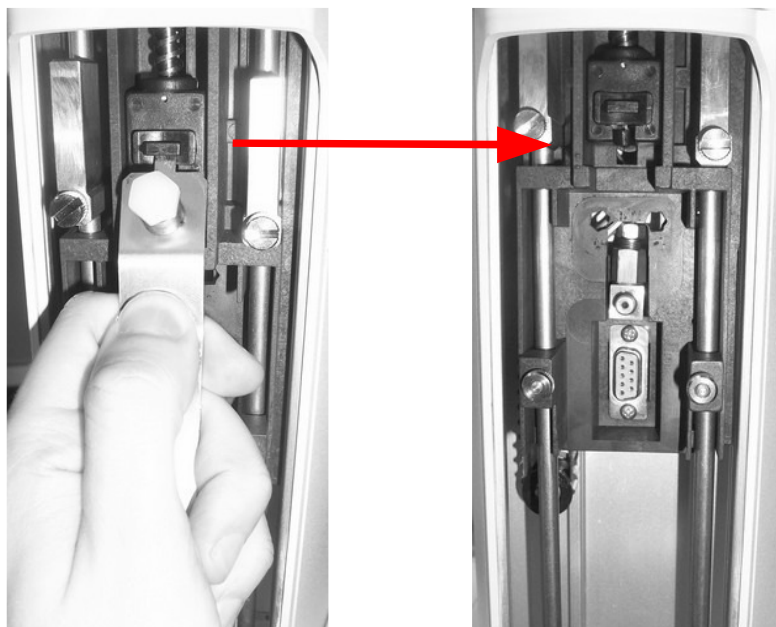
Figure 101: Plunger locker removing

c) Remove the retaining nuts as shown in the figure below.
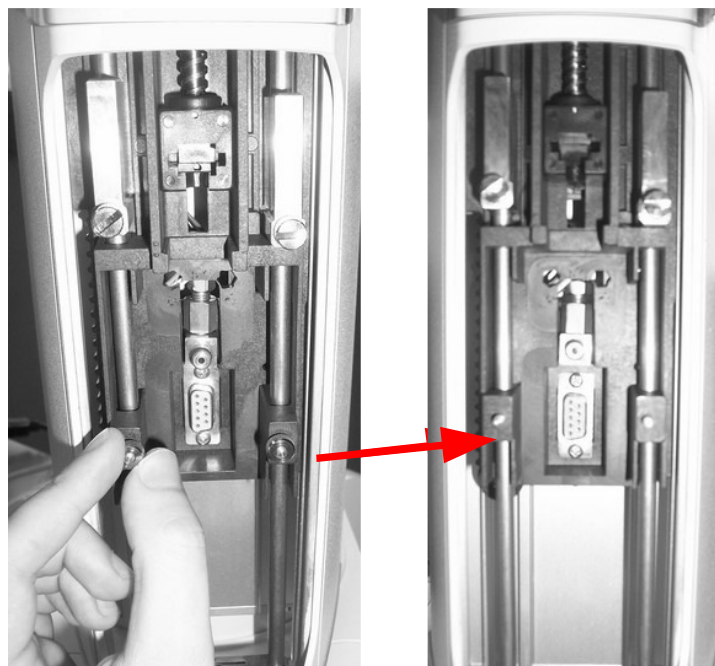
Figure 102: Retaining nuts removing

d) If this is the first installation, proceed directly to point "f)".

e) If this is a syringe replacement, remove the pre-existent syringe warmer assembly with care, as shown in the figure below:
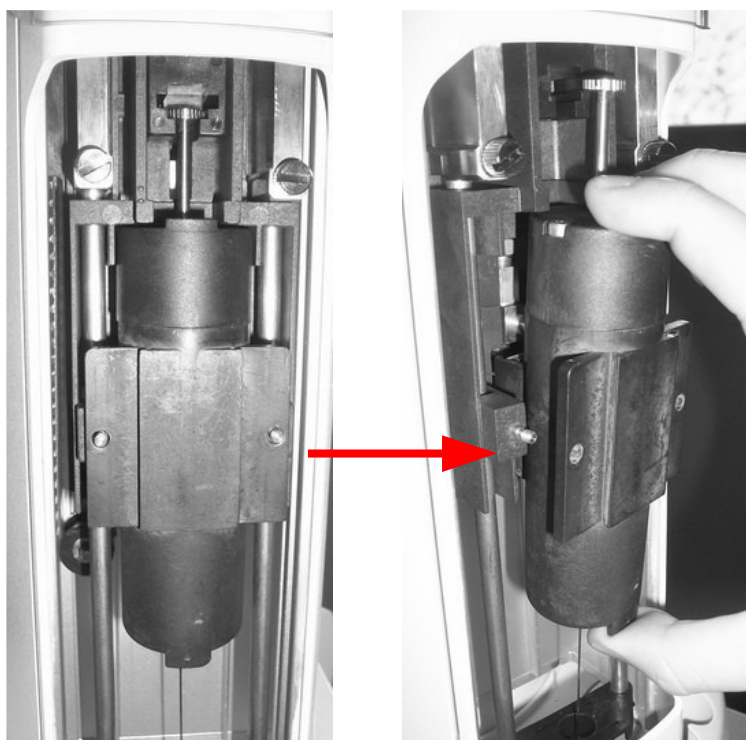
Figure 103: Syringe warmer assembly removal

Then proceed with the syringe replacement as described in paragraph 9.1.5 "Syringe replacement in the syringe warmer assembly (Headspace mode)" and proceed to point "f)".

f) Mount the syringe warmer assembly with the new syringe installed in the syringe location. Take care to insert the needle inside the vial locator and then plug the syringe warmer assembly into the D-shape connector (number 5 in *Figure 11*). Insert the plunger in the plunger holder (number 2 in *Figure 11*).
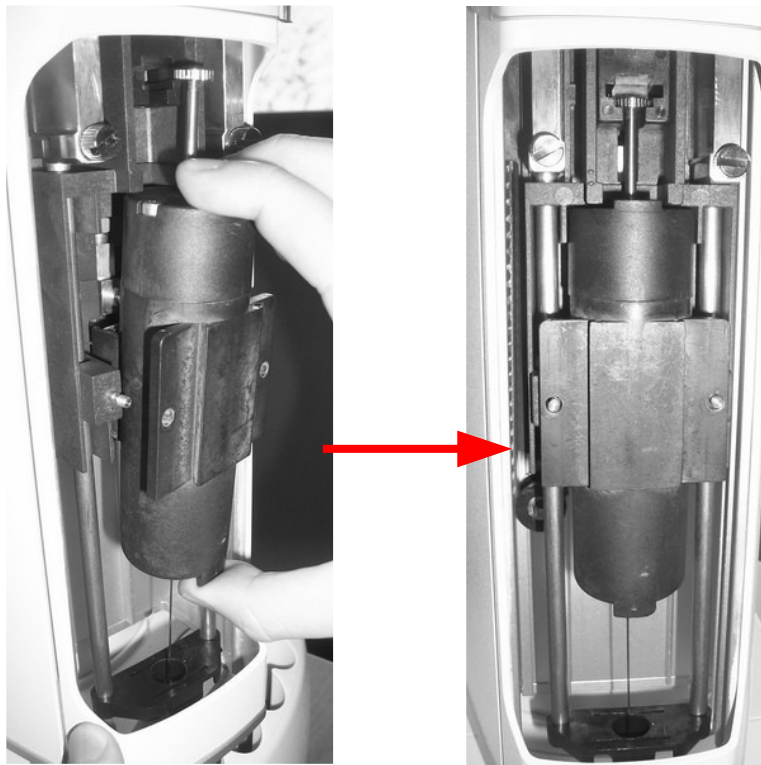
Figure 104: Syringe warmer assembly positioning

g) Reposition the retaining nuts and tighten them:
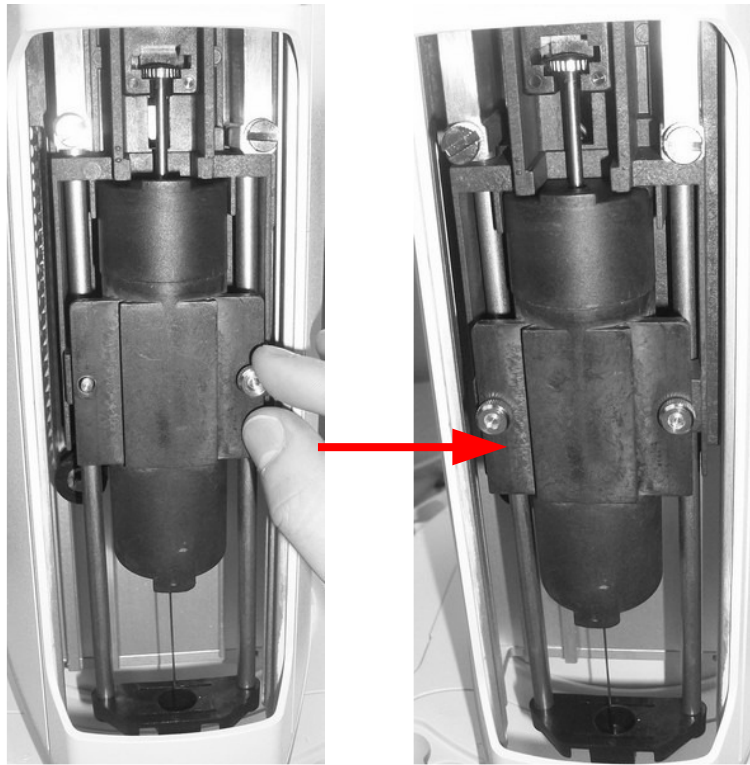
Figure 105: Retaining nuts repositioning

h) Reinsert the piston locker ensuring that the B side (see *Figure 14*) is faced downward.
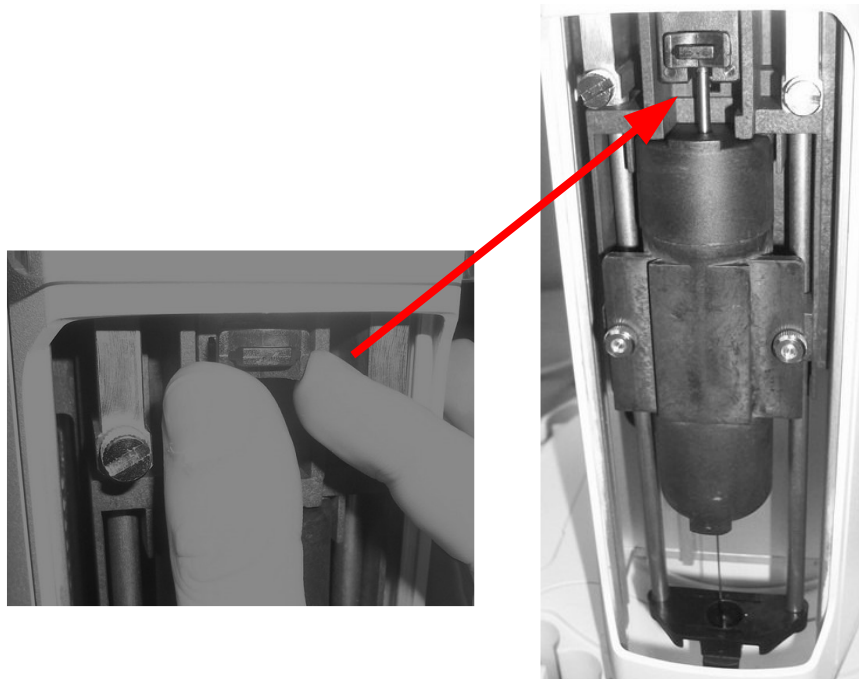
Figure 106: Plunger locker positioning

i) Close the Syringe location by pulling the lid down.

Figure 107: Sliding lid closing

6. From the screen reported in Figure 98 or Figure 99 tap "CONTINUE": the following screen will appear:
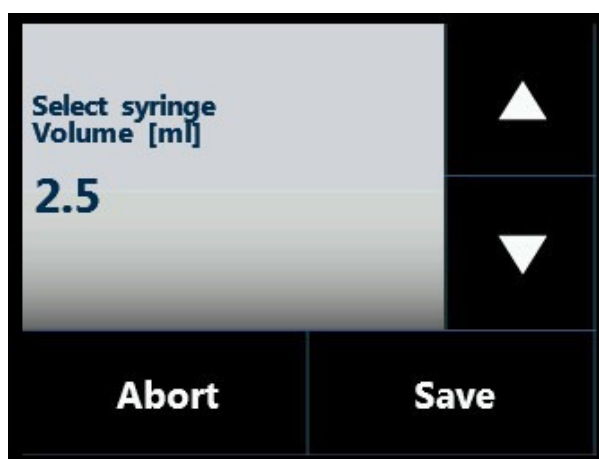
Figure 108: Syringe volume setting screen

7. Set the syringe volume and tap "SAVE" to store the information.

8. The autosampler will start "Plunger zero" to automatically complete syringe installation.

9. The autosampler will also automatically start the syringe conditioning. This procedure should take about 90 minutes.

Warning

The syringe conditioning procedure can be skipped during the autosampler installation because the syringe has been already conditioned by the manufacturer. This procedure can also be skipped in case of the same syringe re-installation. If the syringe barrel or the syringe plunger or both the parts are new, the procedure must be carried out.

4.2.2.1 Syringe warmer assembly removal

Warning

Plunger, syringe and needle are heated up to 150℃. We recommend taking care to prevent injury.

To remove the syringe warmer assembly follow the instructions given in paragraph 4.2.2 "Setup: Syringewarmerassembly installation/ replacement (Headspace mode)" excluding points "d)"-"f)". Instead of executing these points simply remove the syringe warmer assembly.

4.2.3 Syringe installation/ replacement (liquid mode)

Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

Warning

If syringeID system is used, the syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 "Liquid mode"). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Access sequence: RUN>SETTINGS>SETUP>SYRINGE INSTALLATION

Figure 109: Syringe installation screen

1. Tap "Syringe installation" to start the procedure.

2. The following screen appears while the autosampler automatically moves the syringe to an accessible position.

Figure 110: Syringe positioning screen

3. When the autosampler is ready, the following screen appears:

Figure 111: Syringe remove and installation screen

The autosampler should be automatically positioned in a convenient position to allow the old syringe to be removed. If this is OK proceed to step 5.

4. If the syringe location is not convenient tap "MANUAL" to display following screen. From here, it is possible to move the plunger, tower (turret) and needle in order to reposition autosampler to your desired position.

Figure 112: Syringe Install Manual Move screen

5. Follow this procedure:

   a) Open the syringe location pushing up the sliding lid.

   b) Remove the plunger locker pulling it out using the syringe pointer.
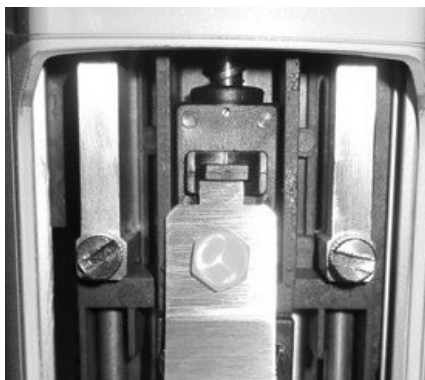
Figure 113: Plunger locker removing

c) Remove the syringe locker loosening the finger screws:
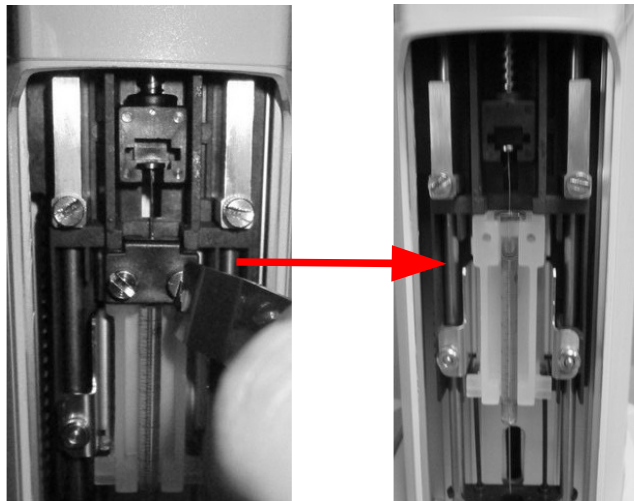
Figure 114: Syringe locker removing
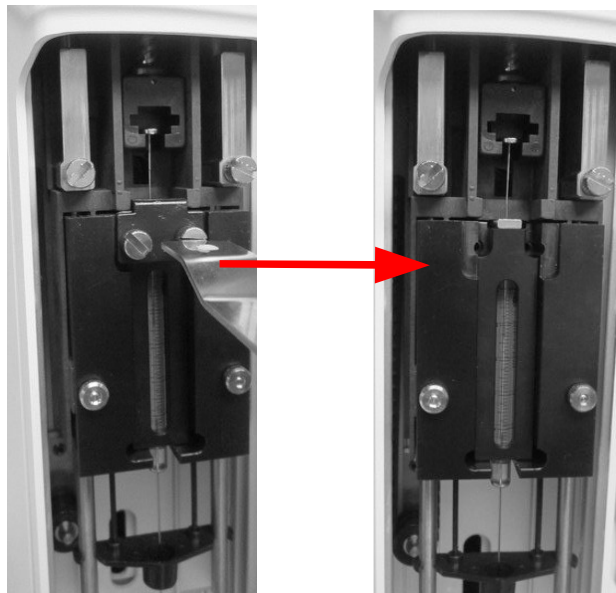
Figure 115: Syringe locker removing (syringeID system purchased and installed)

d) Remove the old syringe with care.
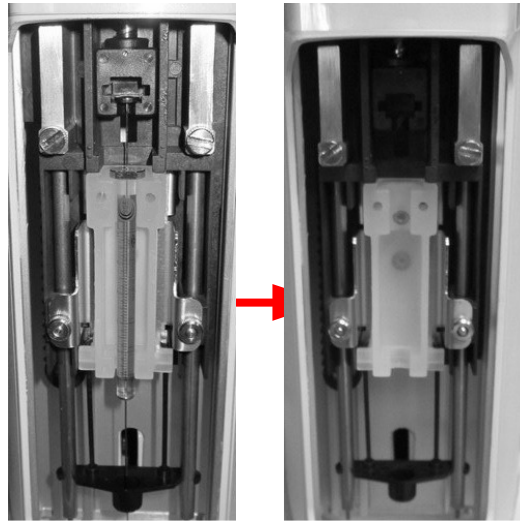
Figure 116: Old Syringe removal
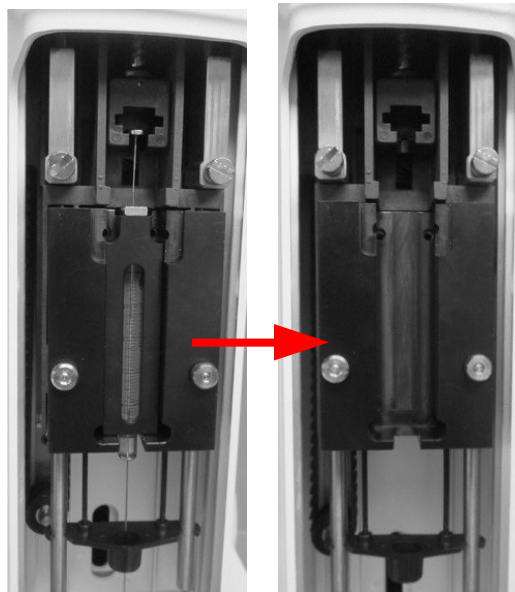
Figure 117: Old Syringe removal (syringe with syringeID)

e) Place the new syringe into its holder: insert the needle through the intermediate needle guide and then into the vial locator; insert the syringe body into the holder and lastly position the plunger into its lodging as shown in the figure below. If the syringe mount the RFID tag of SyringeID, pay attention to orientate correctly it (see paragraph 11 "Appendix A – Glossary). For special syringe installation (for example: syringe with O-ring and

syringe with reinforcement) see paragraph 4.2.3.1 "Special syringe installation" before proceeding.

Figure 118: Syringe positioning
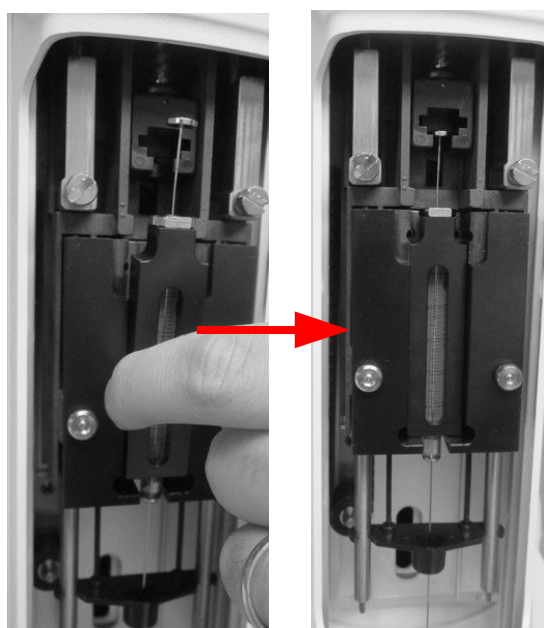
Figure 119: Syringe with syringeID positioning

f)   Reposition the syringe locker tightening the two screws carefully (during the screwing, hold the syringe locker pressed down).

Figure 120: Syringe locker positioning

Figure 121: Syringe locker positioning (syringeID)

g) Reinsert the piston locker ensuring that the appropriate face is used (if in doubt see 12 "Appendix B – Consumables").
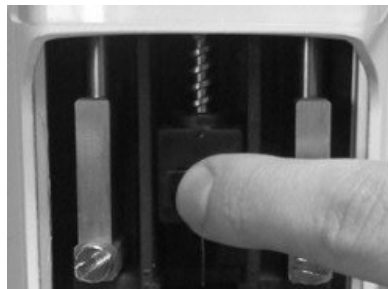
Figure 122: Plunger locker positioning

h) Close the Syringe location by pulling the lid down.

Figure 123: Sliding lid closing

6. From the screen reported in *Figure 111* o r *Figure 112* tap "CONTINUE": the following screen will appear:

Figure 124: Syringe volume setting screen

7. Set the syringe volume and then tap "SAVE" to store the information. The syringe volume is automatically detected if syringeID system has been purchased and enabled (see 1.7.2 "Options" and 4.2.6.8 "Setup configuration: SyringeID").

8. The autosampler will start "Plunger zero" automatically to complete syringe installation.

4.2.3.1 Special syringe installation

Special syringes may be used for some applications or in conjunction with special analyzers. Usage of such syringes require to take care of the instructions detailed below.

4.2.3.1.1 Syringe supplied with o-ring

This paragraph must be followed in case that the syringe is supplied with an o-ring.

The syringe installation must be executed following the instructions given in paragraph 4 . 2 . 3 " Syringe installation/ replacement (liquid mode)" but before mounting the syringe, it is necessary to apply the o-ring on the syringe. The o-ring must be inserted in the syringe before proceeding with the syringe installation. The o-ring must be inserted from the needle side and it must slide along the syringe barrel as shown in figure below. Then proceed with the syringe installation in the syringe location as shown in the figure below. Go ahead with the syringe installation as shown in paragraph 4 . 2 . 3 " Syringe installation/ replacement (liquid mode).
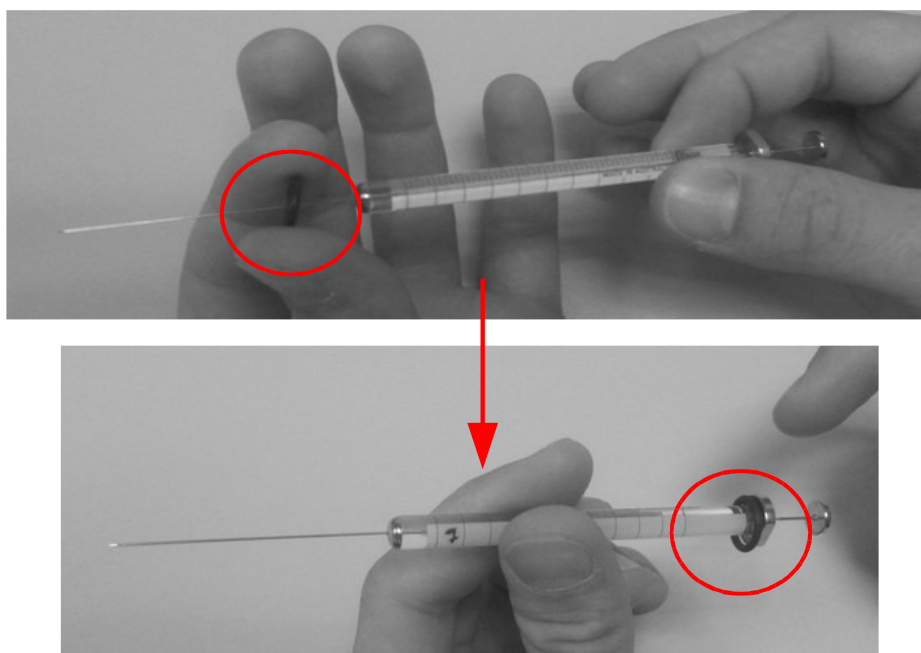
Figure 125: O-ring installation on the syringe
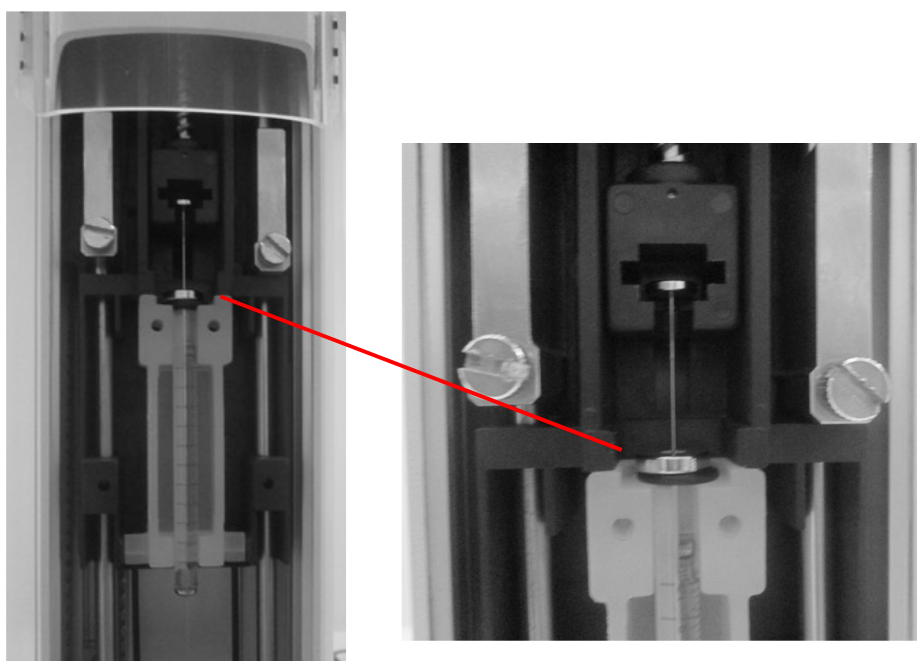
Figure 125: Syringe supplied with o-ring installation in the syringe location

4.2.3.1.2 Reinforced syringe

This paragraph must be followed in case that the syringe is supplied with a reinforcement.

The reinforcement must be inserted in the syringe before proceeding with the syringe installation. The syringe installation must be executed following the instructions given in paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)", but before mounting the syringe, it is necessary to apply the reinforcement on the syringe. The reinforcement must be inserted from the needle side and it must slide along the syringe needle as shown in figure below. Then proceed with the syringe installation in the syringe location and go ahead with the syringe installation as shown in paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)".
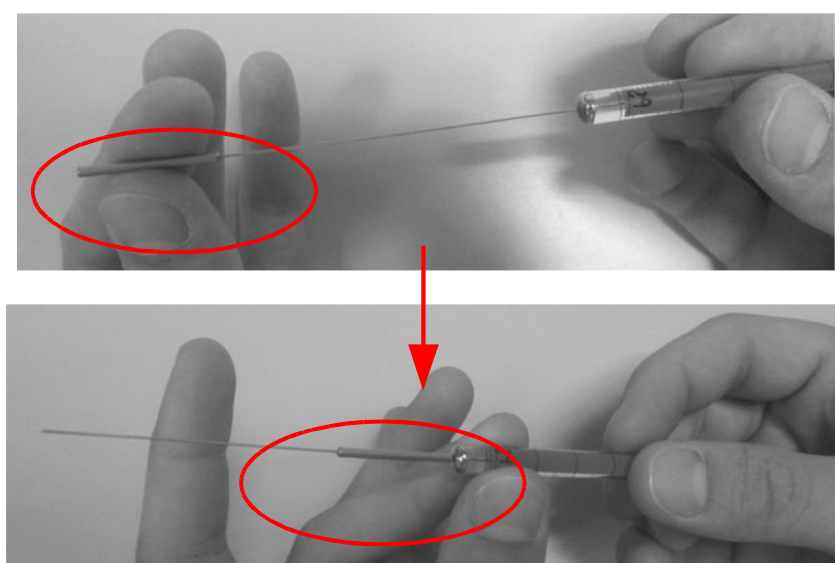
Figure 126: Reinforcement application on the syringe
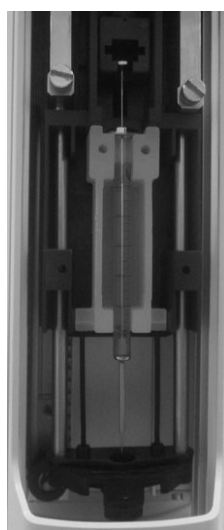
Figure 127: Syringe with Reinforcement installation in the syringe location

4.2.3.2 Syringe removal

To remove the syringe follow the instructions given in paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)" excluding point e).

4.2.3.3 Priming of a new syringe

This operating procedure is always advisable before using a new syringe with low capacity (like a 5 or 0.5ul) or a new syringe with PTFE tip plunger. To prime the syringe perform 15 syringe wash cycle.

4.2.4 SPME Fiber holder installation/ replacement

Access sequence: RUN>SETTINGS>SETUP>FiberINSTALLATION

Figure 128: Fiber Holder installation screen

1. Tap "Fiber installation" to start the procedure.

2. The following screen appears while the autosampler automatically moves the Fiber holder to an accessible position.

Figure 129: Fiber holder positioning screen

3. When the autosampler is ready, the following screen appears:

Figure 130: Fiber Holder removal and installation screen

The autosampler should be automatically positioned in a convenient position to allow the old Fiber holder to be removed. If this is OK proceed to step 5.

4. If the positioning is not convenient tap "MANUAL" to display following screen. From here, it is possible to move the plunger, tower (turret) and needle in order to reposition autosampler to your desired position.
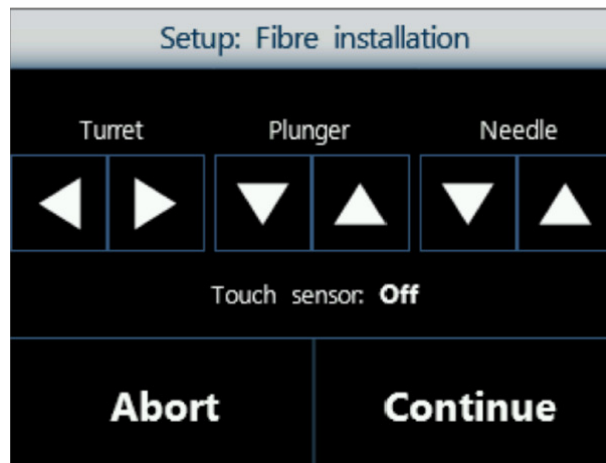
Figure 131: Fibre Installation screen

5. Follow this procedure:

    a) Open the syringe location by pushing the sliding lid up.

    b) Remove the plunger locker pulling it out using the syringe pointer shown in the *Figure 31*.

Figure 132: Plunger locker removing

c) Remove the retaining nuts as shown in the figure below.
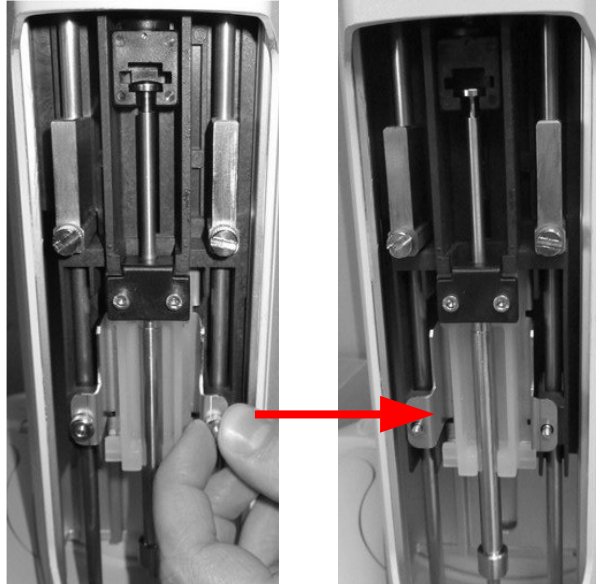
Figure 133: Retaining nuts removing

d) Remove the pre-existent Fiber holder assembly with care, as shown in the figure below:
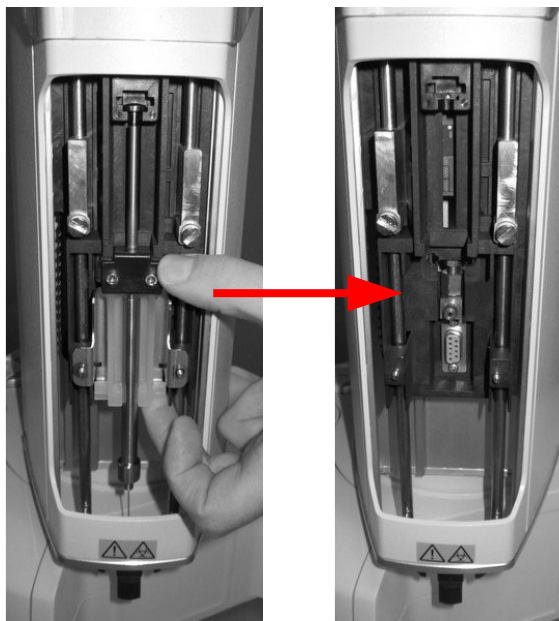
Figure 134: Fiber holder removal

Then proceed with the Fiber replacement as described in paragraph 9.1.6 "Fiber replacement in the Fiber holder (SPME mode)" and proceed to point "f)".

e) Fix the SPME syringe-holder (following figure - a) by placing the plunger inside its location and aligning the holes of syringe holder to the fixing screws (as indicated by the X symbol in following figure - b and c) and then fix with the retaining nuts.
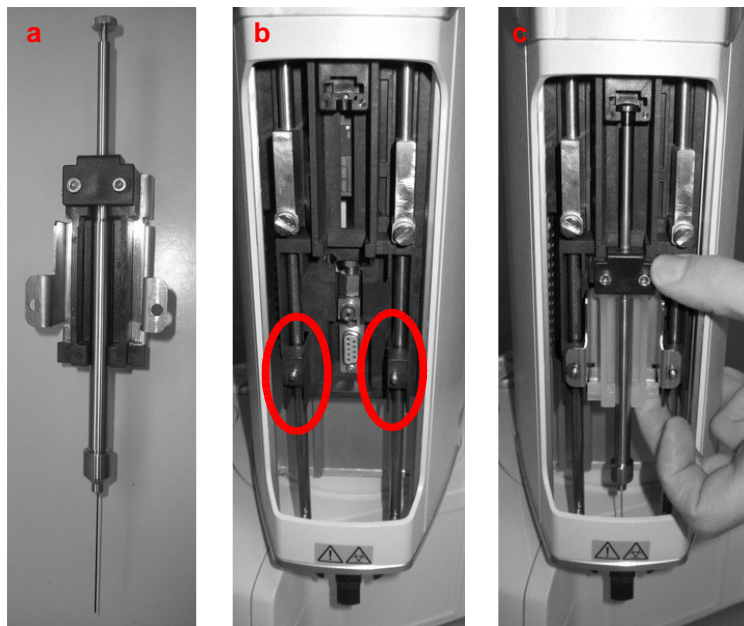
Figure 135: Fiber holder positioning
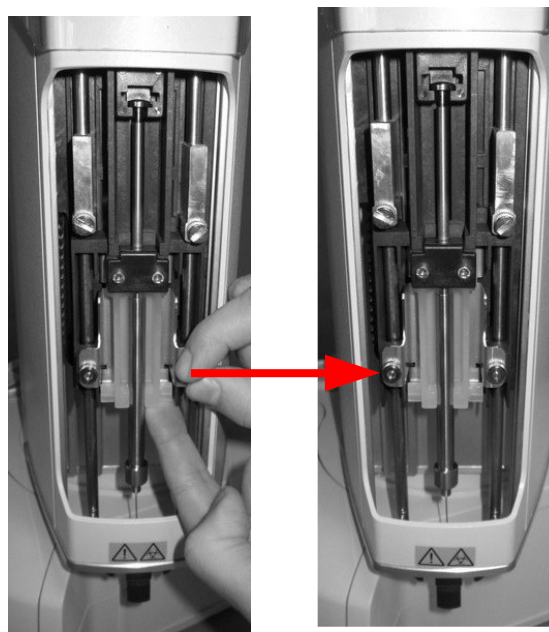
Figure 136: Retaining nuts repositioning

f) Reinsert the piston locker ensuring that the B side is faced downward.
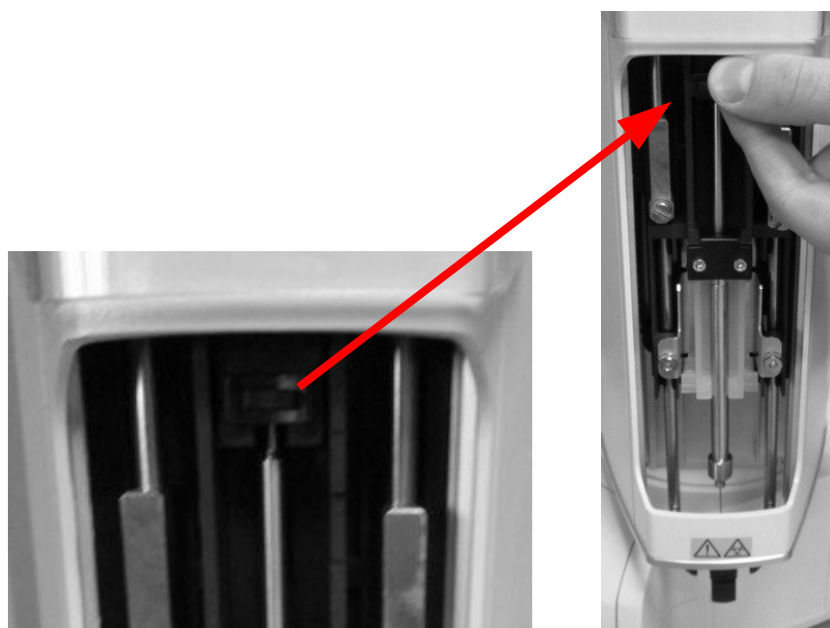
Figure 137: Plunger locker positioning

g) Close the Syringe location by pulling the lid down.

Figure 138: Sliding lid closing

6. From the screen reported in **Figure 130** and **Figure 131** tap "CONTINUE": the following screen will appear:
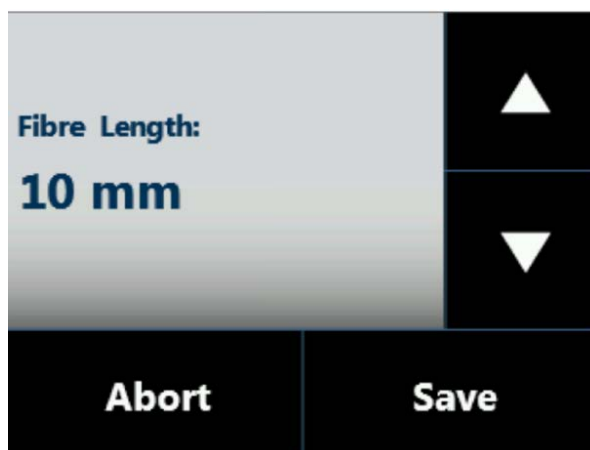
Figure 139: Fiber lenght setting screen

7. Set the Fiber lenght and then tap "SAVE" to store the information. If the Fiber length has been modified, please check compatibility with injector depth values (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector").

8. The autosampler will start "Plunger zero" automatically to complete Fiber holder installation.

4.2.4.1 Fiber holder removal

Warning

Fiber is heated up to 150℃. We recommend taking care to prevent injury.

To remove the Fiber holder follow the instructions given in paragraph 4.2.4 "SPME Fiber holder installation/ replacement" excluding points e).

4.2.5 Setup: Manual operations

This function allows manual movement of the autosampler motors.

Access sequence: RUN>SETTINGS>SETUP>MANUAL OPERATION

This screen displays a list of the autosampler motors.
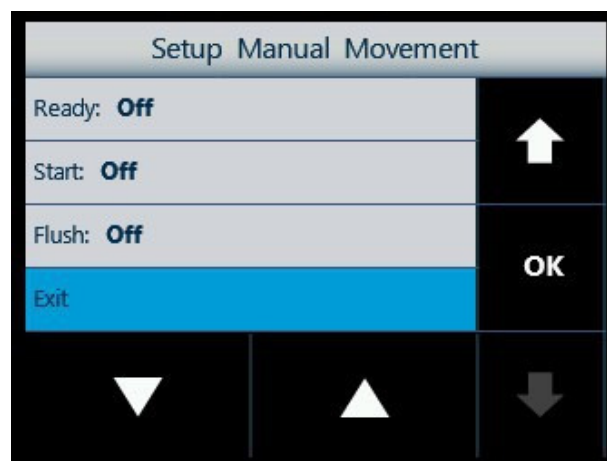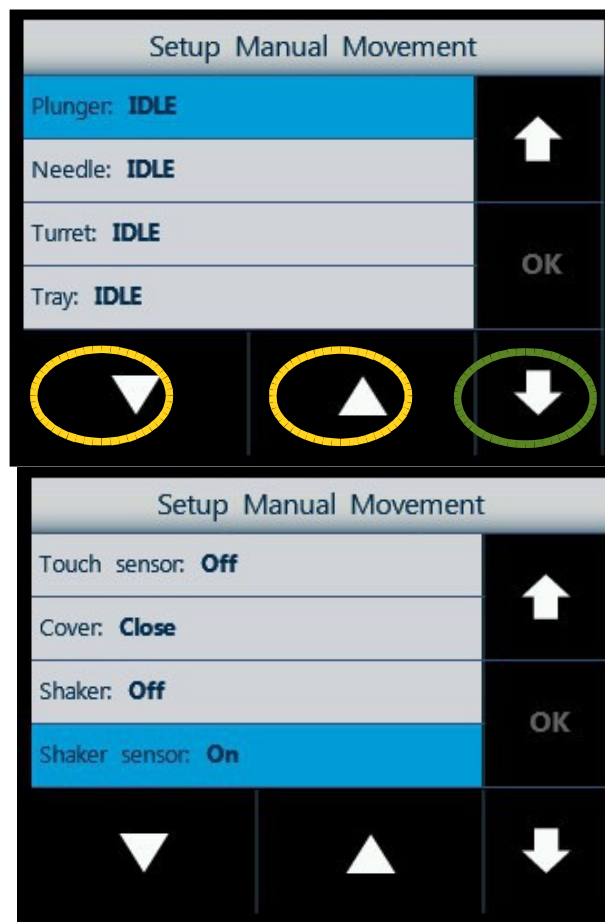
Figure 140: Screen type 7

Select a motor using the arrows on the right (green circle), and use the ▲▼ (yellow circle) arrows to:

- raise (▲) or lower (▼) the plunger;
- raise (▲) or lower (▼) the syringe holder (needle motor);

- rotate the turret to the right hand side (▲) or to the left hand side (▼);

- move the tray towards the open (▼) or towards the closed position (▲);

- open (▲) or close (▼) the oven cover;

- increase (▲) or decrease (▼) the shaker;

- increase and start (▲) or decrease and stop (▼) the fan.

Besides the plunger, needle, turret and tray motor, it is written its status:

Run	When the motor is moving
Idle	When the motor is not moving
Error	An error occurred in the movement

The status of the oven cover can be:

Open	The oven cover is open (not suitable for conditioning)
Moving	The oven cover is moving
Close	The oven cover is closed (suitable for conditioning)

The status of the shaker can be:

Off	The shaker is not active
Very Low clockwise	The shaker is active (very low speed). Clockwise rotation.
Low clockwise	The shaker is active (low speed). Clockwise rotation.
Medium clockwise	The shaker is active (medium speed). Clockwise rotation.
High clockwise	The shaker is active (high speed). Clockwise rotation.
Very High clockwise	The shaker is active (very high speed). Clockwise rotation.
Very Low anti clockwise	The shaker is active (very low speed). Anticlockwise rotation.
Low anticlockwise	The shaker is active (low speed). Anticlockwise rotation.
Medium anticlockwise	The shaker is active (medium speed). Anticlockwise rotation.

High anticlockwise	The shaker is active (high speed). Anticlockwise rotation.
Very High anticlockwise	The shaker is active (very high speed). Anticlockwise rotation.

Press "OK" to move the shaker at the set speed. The

status of the fan can be:

Off	The fan is not active
Low	The fan is active (low speed)
Medium	The fan is active (medium speed)
High	The fan is active (high speed)
Very High	The fan is active (very high speed)

Press "OK" to move the fan at the set speed.

This screen also shows:

- **Touch sensor**: it is "ON" if the vial locator has detected the presence on an object, or "OFF" if it is not touching.
- **Shaker sensor**: it is "ON" when the shaker is in the position suitable for vial loading and unloading, it is "OFF" in all the other positions.

Ready: shows the "Ready" signal status (see paragraph 0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

- Setup configuration: Input Output ").

Start: shows the "Start" signal status (see paragraph 0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

- Setup configuration: Input Output "). By pressing "OK", this signal is activated for about 1 second.
- **Sync-out**: shows the "Sync-out" signal status. Pressing "OK" this signal is activated.
- **Sync-in**: show the "Sync-in" signal status.
- **Flush:** shows the status of the flushing valve. It is "ON" when the valve is open and the gas can flush the syringe, it is "OFF" when the valve is closed. Press "OK" to change the valve status.

Select "**Exit**" to exit from the "Setup Manual Operation" screen and return to the "Setup" screen (see paragraph 4 "Set Up operations ").

4.2.6 Setup: Configuration
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION

This is used to define some general settings of the autosampler. The information is shown on multiple pages.

Use this screen to access the following sub menus:

- **Sound**: changes the sound effects of the autosampler (see paragraph 4.2.6.1 "Setup configuration: Sound") ; "
- **Light**: changes the target illumination settings (see paragraph 4.2.6.2 "Setup configuration: Light");
- **Run**: changes the settings for the injection sequence (see paragraph 4.2.6.3 "Setup configuration: Run");
- **Input Output**: changes the input/output parameters to/from the analyzer (see paragraph

0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

Setup configuration: Input Output");

- **Maintenance**: displays information and changes settings about preventive maintenance counters (see paragraph 4.2.6.5 "Setup configuration: Maintenance");

Advanced: edits the advanced parameters of the autosampler (see paragraph 0 "Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

- Setup configuration: Advanced");
- **Activation:** enables the optional features of the autosampler (see paragraph 4.2.6.7 "Setup   configuration: Activation").

4.2.6.1 Setup configuration: Sound
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>SOUND

* Select "**2**" to emit a sound when the touch screen is tapped;

* Select "**1**" to emit a sound after the end of each single injection, every sample during an automatic run, when "save" or "store" is tapped, or if the autosampler memory is erased;

* Select "**0**" to disable the sound emission.

Tap "SAVE" to store the modification, otherwise "CANCEL".

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.6.2 Setup configuration: Light
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>LIGHT

This is used to change the light setting

* Select "**On**" to switch on the target illumination;

* Select "**Off**" to switch off the target illumination;

* Select: "**Injection**" to switch on the target illumination during injection only; Tap "SAVE" to store the modification, or "CANCEL".

Select "**Exit**" to exit from this screen and return to the "Setup Configuration" screen (see paragraph 4.2.6 "Setup: Configuration").

4.2.6.3 Setup configuration: Run
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>RUN

Use this to change the following operational parameter:

* **Tray Behaviour**: to set tray position during automatic run;

Tray	**Closed**: the tray remains closed during run
Behaviour	**Open**: the tray remains open during run

* **Power-on Restart**: sets autosampler restart after a power failure. It should be set to "ON" only if your GC/analyzer and your data acquisition system are also able to restart automatically;

Power on-Restart	**On**: If the power is lost during a run, when the power comes back on, the autosampler will restart the injection that it was carrying out at the moment of the power failure
	Off: If the power is lost during a run, when the power comes back on, the autosampler will return to the home screen (see paragraph 7.1 "Home screen"), without completing the run.

- **Injection mode**: only for liquid and Headspace mode. It sets the predefined injection mode. This parameter is editable only if the system is configured for two injectors. This setting is always used for single injection runs, while during an automatic run it is only used if the injection mode in the injection sequence is set to "Default" (otherwise it will take the mode specified in the injection sequence). See paragraph 6.1.2" Setting sequence step parameters ".

Injection Mode	**Front**: the autosampler injects only in the first injector
	Rear: the autosampler injects only in the second injector
	Confirmation: the autosampler injects the same sample in both injectors (see "Confirmation mode" explanation in paragraph 11" Appendix A – Glossary").
	High Throughput: It injects different sampler alternatively in front and rear injector (see paragraph 6.2.2.1" High throughput mode"). This modality is available only in liquid mode.

- **Desorption mode**: only for SPME mode. It sets the predefined desorption mode. This parameter is editable only if the system is configured for two injectors. This setting is always used for single injection runs, while during an automatic run it is only used if the desorption mode in the injection sequence is set to "Default" (otherwise it will take the mode specified in the injection sequence). See paragraph 6.1.2" Setting sequence step parameters ".

Desorption Mode	**Front**: the desorption is performed in the first injector
	Rear: the desorption is performed in the second injector

- **Injection Synchro**: only for liquid and Headspace mode. It sets the synchronization mode between the autosampler and the analyzer or other instruments during the execution of one or more injections.

Injection Synchro	The autosampler starts sample preparation	The autosampler injects the sample in the injector	The autosampler gives the "Start" signal to the analyzer
Normal	At the reception of the "Ready" signal from the analyzer	After ending sample preparation the autosampler checks again the presence of the "Ready" signal from the analyzer and then starts the injection	At the beginning of the syringe plunger movement
Trigger	In liquid mode: At the reception of the "Ready" signal from the analyzer. After ending sample preparation it emits a "SYNC-OUT" signal	In liquid mode: When it receives an external synchronism (SYNC-IN) it starts the injection and stop the "SYNC-OUT" signal emission when the "Start" signal is activated	In liquid mode: At the beginning of the syringe plunger movement
	In Headspace and SPME mode: As Normal	In Headspace and SPME mode: As Normal	In Headspace and SPME mode: As Normal
A-Start	At the reception of the "Ready" signal from the analyzer	After ending the sample preparation the autosampler checks again for the presence of the "Ready" signal from the analyzer and then starts the injection	When the autosampler touches the injector
D-Start	At the reception of the "Ready" signal from the analyzer	After ending the sample preparation the autosampler checks again for the presence of the "Ready" signal from the analyzer and then starts the injection	At the end of the syringe plunger movement

Injection Synchro	The autosampler starts sample preparation	The autosampler injects the sample in the injector	The autosampler gives the "Start" signal to the analyzer
EA	In liquid mode: At the contemporaneous reception of the "Ready" signal from the analyzer and of the "SYNC-IN" signal	In liquid mode: After ending sample preparation the autosampler checks again the presence of the "Ready" signal from the analyzer and then starts the injection	In liquid mode: At the beginning of the syringe plunger movement
	In Headspace and SPME mode:	In Headspace and SPME mode:	In Headspace and SPME mode:
Normal w/o Rdy	At the end of the analysis time set in the autosampler method	After the ending sample preparation	At the beginning of the syringe plunger movement

- **Desorption Synchro**: only for SPME. It sets the synchronization mode between the autosampler and the analyzer or other instruments during the execution of one or more injections.

Desorption Synchro	The autosampler starts sample preparation	The autosampler starts the desoprtion	The autosampler gives the "Start" signal to the analyzer
Normal	At the reception of the "Ready" signal from the analyzer	After ending sample preparation the autosampler checks again the presence of the "Ready" signal from the analyzer and then starts the desorption	At the beginning of the syringe plunger movement

Desorption Synchro	The autosampler starts sample preparation	The autosampler starts the desoprtion	The autosampler gives the "Start" signal to the analyzer
A-Start	At the reception of the "Ready" signal from the analyzer	After ending the sample preparation the autosampler checks again for the presence of the "Ready" signal from the analyzer and then starts the desorption	When the autosampler touches the injector
D-Start	At the reception of the "Ready" signal from the analyzer	After ending the sample preparation the autosampler checks again for the presence of the "Ready" signal from the analyzer and then starts the desorption	At the end of the syringe plunger movement
Normal w/o Rdy	At the end of the analysis time set in the autosampler method	After the ending sample preparation	At the beginning of the syringe plunger movement

- **Clean mode:** only for SPME mode. It sets the predefined clean mode. In HT2800T this parameter is editable only if the system is configured for two injectors. This setting is used for single injection runs and automatic run.

Clean Mode	**Front**: the Fiber cleaning is performed in the first injector
	Rear: the Fiber cleaning is performed in the second injector
	Cleaning Device: the Fiber cleaning is performed in the SPME Fiber Cleaning Devive location (indicated with number 7 in Figure 1). This option is available only in HT2850T.

- **Shaker speed**. It sets the speed of the shaking (only in Headspace and SPME mode).
- **Empty Position Synchro**. It sets the autosampler behaviour when a vial is missing (only in Liquid mode). It may have the following values:

Empty Position Synchro	**Yes**: If a vial is missing, the autosampler emits the "Start" signal to the analyzer "as if the vial were present".
	No: If a vial is missing, the autosampler does not emit the "Start" signal to the analyzer and skips directly to the next vial.

- **Maintenance Warnings**. It sets when the Maintenance Warning messages (see paragraph 4.2.6.5 "Setup configuration: Maintenance ") can be displayed.

Maintenance Warning	**Normal**: the Maintenance Warning messages will be displayed at the end of each run, if the set limit is reached (see 4.2.6.5).
	Only at Start up: the Maintenance Warning messages will be displayed only at Start up, if the set limit is reached (see 4.2.6.5).

- **User Interface**. It set the modality of the Home screen.

User Interface	**Standard**: The Home screen will be in the Standard modality (to see the functions accessible from this screen see paragraph 7.1.1).
	Quick Start: The Home screen will be in the Quick modality. Quick modality is a simplified modality in which you can start working by simply tapping "Start" (to see the functions accessible from this screen see paragraph 7.1.2).

- **Prep-Ahead Waiting position**. It sets the position of the autosampler while it is waiting the signal for injection. This setting is used only in Liquid mode, in case that the Injection Synchro is set to "Trigger". In this case it indicates the position of the autosampler between the sample preparation and the injection.

Prep-Ahead Waiting position:	**In vial**: the autosampler waits with the needle inside the vial.
	On Injector: the autosampler waits with the turret over the injector.

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.6.4 Setup configuration: Input Output
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>INPUT OUTPUT

From here, it is possible to change the input / output parameters to/from the analyzer:

- **Ready on**: sets the "ON" state of the "Ready" signal. This signal is used to start the sampler and must match the signal given by the analyzer.

Ready on	**Low**: the autosampler starts the injection when the analyzer provides a low logical level of voltage for the "Ready" signal;
	High: the autosampler starts the injection when the analyzer provides a high logical level of voltage (+5V) for the "Ready" signal.

- **Start on**: to set the "ON" state of the "Start" signal from the autosampler to the analyzer during the injection. This parameter has to be set according to the analyzer.

Start on	**Open**: during the injection (for about 1 second) the pins 3 (SAMPINS-NO) and 6 (SAMPINS COM) are open, while before and after the injection they are closed (see paragraph 13 "Appendix C – Analyzer connector").
	Close: during the injection (for about 1 second) the pins 3 (SAMPINS-NO) and 6 (SAMPINS COM) are closed (short-circuit), while before and after the injection they are open (see paragraph 13 "Appendix C – Analyzer connector").

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration").

4.2.6.5 Setup configuration: Maintenance
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>MAINTENANCE

This is used to display information and settings of the preventive maintenance counters:

- **Plunger Strokes Counter**: only in liquid mode. It is the number of plunger strokes performed since the last reset. Select "Plunger Strokes Counter", if you want to reset the number of Plunger Strokes. Tap "ERASE" to reset, otherwise tap "CANCEL". If reset the unit says: "Plunger Stroke Counter has been reset".

- **Plunger Strokes Limit**: only in liquid mode. It is the limit of plunger strokes, at which point a Maintenance Warning message is displayed. Select "Plunger Strokes Limit", if you want to edit it (if you set it to "Off", there is no limit and the warning message never appears);

- **Injection Counter**: is the number of injections performed since the last reset. Select "Injection Counter", if you want to reset the number of injections. Tap "ERASE" to reset, otherwise tap "CANCEL". If you reset this, a notification screen appears: "Injections Counter has been reset";

- **Injection Limit**: is the limit of injection number, at which point a Maintenance Warning message is displayed. Select "Injection Limit", if you want to edit it (if you set it to "Off", there is no limit and the warning message never appears).

- **System integrity test**: if available, it enables or disables the System integrity test execution at the beginning of each automatic run (only in Headspace mode). See paragraph 11 "Appendix A – Glossary".

The Plunger Stroke Counter/Limit are to monitor the syringe "wear and tear".

The Injection Counter/Limit are used to monitor the GC and predict when the GC septa or injection liner should be replaced.

Please note:

- The counters are automatically reset when the warning message is cleared;
- The Plunger Stroke Counter is automatically reset after a new syringe installation.
- If SyringeID system is enabled (Liquid mode), Plunger Strokes Counter reset is not allowed (see paragraph 4.2.6.8 "Setup configuration: SyringeID").

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.6.6 Setup configuration: Advanced
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>ADVANCED

This menu is password protected and is only accessible to service representatives.

4.2.6.7 Setup configuration: Activation
Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>Activation

This screen contains a list of 9 optional features (from 1 to 9). Select a feature to enable it (to know if there feature available for activation, contact your sales representative).

A screen showing the following message: "**You are activating the feature X**" ("X" is the feature number) appears.

- Tap **CANCEL** to return to the previous screen.
- Tap **TEMPORARY** to temporarily enable the selected feature (see below how to proceed)**.**
- Tap **FULL**, to definitively enable the selected feature. A password is required for the activation. Please contact your sales representative to get the password.

If you have tapped "TEMPORARY" a screen showing the following message: **"Random number: X"** appears. If this is your first activation attempt, send this random number to your sales representative to obtain the password for the temporary activation. Then tap "CONTINUE" to access the screen for the password entry and temporarily enable the feature. If you haven't received the password yet, from the screen for the password entry you can tap "CANCEL" and retry the activation later. You have only to re-execute the described operations. The unit will re-show you the same random number (because you have already tried the activation, but you haven't complete it). Directly tap "ACTIVATE" to access the screen for the password entry and temporarily enable the feature.

4.2.6.8 Setup configuration: SyringeID

Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options" and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

This menu is available only for liquid mode, in case that GLP pack has been purchased (see pa 1.7.2).

Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>SyringeID   The following parameters can be viewed/edited:

- **Enable**: enables or disables the SyringeID system (see paragraph 11 "Appendix A – Glossary").
- **Reading**: starts the syringeID parameter (see below) reading test. If the reading test is successful, a screen showing the SyringeID parameters appears, otherwise an error message is displayed (see paragraph 8.12 "SyringeID timeout").

The SyringeID parameters are: the syringe serial number and part number, the syringe volume and the "Plunger stroke Counter" (number of plunger strokes performed that represents a syringe "wear and tear" indicator).

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.6.9 Setup configuration: BCR

This menu is available only in case that Bar Code Reader Module has been purchased (see paragraph 1.7.2 "Options").

Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>BCR

Warning

In liquid mode the Bar Code reader option can be enabled only if the proper vial locator with gripper is mounted (see paragraph 2.1.2.2 "Syringe location for Liquid Mode").

To see how to mount the vial locator with gripper in liquid mode see paragraph (see

paragraph 3.6.4 "Vial Locator: Installing and removing (Liquid mode)") .

The following parameters can be viewed/edited:

- **Enable**: enables or disables the Bar Code reading from the vials;

- **On reading error**: sets the autosampler behaviour if the BCR cannot read the Bar Code of a vial;

Skip	The vial, whose Bar Code has not been read, is not processed and it is repositioned on the tray. The "Start" signal emission to the analyzer depends on the "Empty Position Synchro" setting (4.2.6.3 "Setup configuration: Run").
Process	The vial is processed, even if the Bar Code has not been read.

- **Test**: starts the Bar Code reading test. This procedure checks the reading of the Bar Code applied on the indicated vial position. After the test execution, a screen shows the read Bar Code and the reliability of the reading expressed as a percentage. When the tray is open, it is possible to verify that the read Bar Code is correct. If the reading fails, "None" appears instead of the Bar Code. Tap "CONTINUE" to end the test procedure.

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.6.10   Setup configuration: Cleaning Device
Available only for HT2850T in SPME mode.

Access sequence: RUN>SETTINGS>SETUP>CONFIGURATION>NEXT>CLEANING DEVICE

This menu is available only for HT2850T. The following parameters can be viewed/edited:

- **Enable**: enables or disables the Fiber Cleaning Device (see paragraph 11 "Appendix A – Glossary").
- **Cleaning device Temperature**: sets the Fiber Cleaning Device temperature. This value can be between 210°C and 300°C (active conditioning) or off (inactive conditioning);

Select "**Exit**" to exit from this screen and return to the "Setup Configuration"" screen (see paragraph 4.2.6 "Setup: Configuration"):

4.2.7 Setup: Service
Access sequence: RUN>SETTINGS>SETUP>SERVICE

This menu is password protected and is only accessible to service representatives.

5 Programming Method

5.1 Method (Headspace mode)

5.1.1 Method Menu

This function is used to edit or view the injection method parameters.

Access sequence: RUN>SETTINGS>METHODS

The "RUN: METHODS" screen contains a list of the 10 methods (from 0 to 9) stored in the unit memory.

The methods can be identified by the number or by a name.

The name can only be created or edited using a PC (using the "HTA Autosampler Manager" software). Once the names have been created, they will be visible on the touch screen.

Select a method number/name to enter in the "METHOD X" screen (X is a number from 0 to 9 that can be followed by the method name) and to view or edit its parameters. See paragraph 5.1.2 "Method X: Setting method parameters ".

Select "**Tools**" to access the "METHOD TOOLS" screen (see paragraph 5.1.3 "Method tools ") Tap "**Exit**" to exit from the "RUN: METHODS" screen.

5.1.2 Method X: Setting method parameters

Each method contains a set of analytical parameters. Use this screen to view or edit these parameters.

Access sequence: RUN>SETTINGS>METHODS>METHOD X

In the "METHOD X" screen the following sub menus are available:

- **General:** see paragraph 5.1.2.1;
- **Advanced:** see paragraph 5.1.2.2;
- **Preparation:** see paragraph 5.1.2.3;
- **Sample:** see paragraph 5.1.2.4;
- **Injection**: see paragraph 5.1.2.5.

Tap "**Exit**" to exit from the "METHOD X" screen.

If one of these parameters has been changed a confirmation screen appears "Modifying Method X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving. The display will return to the "RUN: METHODS" screen.

5.1.2.1 General parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>GENERAL

The following parameters can be viewed/edited:

- **Syringe Volume**: volume of the syringe. The syringe volume affects the limits of other parameters such as speed and volume;
- **Analysis Time**: time of the sample analysis (for details see below). This parameter is only taken into consideration by the autosampler if "Normal w/o Rdy" is set as "Injection Synchro" parameter (see paragraph 4.2.6.3 "Setup configuration: Run");
- **Method Type**: parameter not editable;
- **Preparation Time**: displays how long the autosampler needs to perform a cycle. It is calculated from the instrument and is not editable *(Time needed to transfer the vial from the tray to the incubator, filling time, injection time, etc.)*.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.1.2 "Method X: Setting method parameters").

Analysis time

The Analysis time is the GC run time plus any additional time needed for the GC to execute any post-run program and then return to a Ready state.

Please consider that the autosampler uses the analysis time (GC cycle time) to calculate throughput and timing. An accurate analysis time is crucial to optimizing throughput and for correctly processing samples.

If the analysis time is too long, this can cause lowered throughput because vials wait longer than needed before processing. If the analysis time is too short, this can cause sequence faults because the vial may sit too long while waiting for the GC to become Ready. It is better to enter a longer time than needed than to enter too short a time and possibly reduce sample quality.

To determine the analysis time, program the GC to perform a sequence of two or three blank (no injection) runs. If you are using a Data system, you can determine the cycle time from the Data system sequence log and compare the start times for the runs. A good analysis time is the average difference between the start times, plus 0.2 to 0.5 minutes. If you are not using a Data

system, watch the GC. Count the time between the start of the first run and when the GC becomes Ready for the second run, then add 1 minute.

You can also estimate the analysis time without making a run. By adding the GC oven program duration and the duration of any post-run programs, you can get close to the true cycle time.

Also consider time for data processing. While in most cases data processing is not a problem, a very busy Data system may need extra time between samples.

To validate the analysis time, look at the GC run time. The analysis time cannot be less than the total run time. Then look at the GC post run program duration. The analysis time cannot be less than the total run time plus the post run program duration.

Finally, consider that the GC cooling time may vary according to room temperature: the higher the room temperature is the more time is needed for the GC cooling time; typically it implies a shorter time during winter seasons and a longer time during summer seasons. Therefore, the analysis time should be set according to the worst scenario (summer season).

5.1.2.2 Advanced parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>ADVANCED

The following parameters can be viewed/edited:

- **Enrichment Cycle(s)**: the number of enrichments in the injection cycle. The enrichment allows the user to inject a higher quantity of sample.
  NOTE. It is only possible to enrich the sample by multiple injections if the gas chromatograph can support this feature by a proper trapping system.

- **Dwell Between Injections**: delay time between any enrichment, to allow the Headspace vial to equilibrate.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.1.2 "Method X: Setting method parameters""").

5.1.2.3 Preparation parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>PREPARATION

The following parameters can be viewed/edited:

- **Syringe Temperature:** temperature of conditioning of the syringe. This value can be between 40°C and 150°C (active conditioning) or off (inactive conditioning);
- **Oven Temperature:** temperature of conditioning of the oven. This value can be between 40°C and 170°C or off (inactive conditioning);
- **Incubation:** sample incubation time inside the oven;

- **Shaker On:** interval time during incubation time in which the sample is shaken;

- **Shaker Off:** interval time during incubation time in which the sample is not shaken.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.1.2 "Method X: Setting method parameters"").

5.1.2.4 Sample parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>SAMPLE

The following parameters can be viewed/edited:

- **Sample Volume**: volume of sample to be injected;
- **Fill Volume:** the volume that the syringe dispenses inside the vial if the "Syringe Prefill" has been selected as "Y*ES",* or the volume that the syringe aspirates and dispenses from the vial during the Pull Up Strokes (if the Pull Up Strokes number set is different from zero);
- **Pull Up Strokes**: the number of pre-aspirate strokes (during each stroke the "Fill Volume" is aspirated and ejected). *This procedure assures a good mix of the sample.*

- **Equilibration Delay:** delay time between sample pick up and the syringe moving from the sample;
- **Sample speed:** speed of the plunger during the syringe filling operation;
- **Syringe Prefill:** syringe-filling mode. You can choose if, when the needle comes in the vial, the syringe plunger has to be pulled up (**YES**) or pushed down (**NO**), before the septum has been pierced.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.1.2 "Method X: Setting method parameters"").

5.1.2.5 Injection parameters
Access sequence: RUN>SETTINGS >METHODS>METHOD X>INJECTION

The following parameters can be viewed/edited:

- **Injection speed**: the syringe dispensation speed used during injection;
- **Pre Injection Dwell**: the waiting time of the syringe needle inside the injection port before making the injection;
- **Post Injection Dwell**: is the waiting time of the syringe needle inside the injector after the injection;
- **Flush Time:** syringe flush time after the injection.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.1.2 "Method X: Setting method parameters"").

5.1.3 Method tools

Access sequence: RUN>SETTINGS>METHODS>TOOLS

In the "METHOD TOOLS" screen (see paragraph 5.1 "Method (Headspace mode)") the following options are available:

- **Restore Default**: used to load the default settings for a method;
- **Copy Methods**: used to copy the parameters from one method to another.

If you select "RESTORE DEFAULT", you have to select the method to reset. A confirmation screen appears "Loading default parameter for method X". Tap "LOAD" to restore the default parameters and "CANCEL" not to make the restore operation. If you select "COPY METHODS", you have to select the source method and the destination method. Tap "CONTINUE" to confirm and "ABORT" not to make the method copy.

Select "Exit" to exit from this screen and return to the "RUN: METHODS" screen (see paragraph 5.1.2 "Method X: Setting method parameters").

5.1.4 Example

Below there is an example method, and you can use this to create your own method.

Please keep in mind that the example method should be adapted depending on your analysis technique, analyzer model, inlet type, etc. and therefore this may not be suitable for your application.

5.1.4.1 Typical GC Method (headpsace mode)

General	**Syringe Volume**	2.5ml
	Analysis Time	1[1]
Advanced	**Enrichment Cycle(s)**	1
	Dwell Between Injections	0min
	Syringe Temperature	40 to 150℃[2]
	Oven Temperature	40 to 150℃-170℃[3]
	Incubation	[4]

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[1] **GC Cycle Time: GC run time plus any additional time needed for the GC to execute any post-run program, then return to a Ready state.**

[2] **Value depends on application. Typically: Oven Temperature plus 10°C (in any case not higher than the 150°C).**

[3] **Value depends on application. Consider boiling point of solvent. 170°C is the maximum temperature that can be set.**

[4] **The incubation time has to be established with method development 1.6 "Functions available only through HTA Autosampler Manager".**

Preparation	**Shaker On**	0.2
	Shaker Off	0.1
Sample	**Sample Volume**	0.5
	Fill Volume	1ml
	Pull Up Strokes	2
	Equilibration Delay	1s
	Sample speed	6ml/min
	Syringe Prefill	No
Injection	**Injection Speed**	15-30ml/min
	Pre Injection Dwell	1
	Post Injection Dwell	3
	Flush TIme	3min (1 bar)

5.2 Method (Liquid mode)

5.2.1 Method Menu

This function is used to edit or view the injection method parameters.

Access sequence: RUN>SETTINGS>METHODS

The "RUN: METHODS" screen contains a list of the 10 methods (from 0 to 9) stored in the unit memory.

The methods can be identified by the number or by a name.

The name can be created or edited only using a PC (using the "HTA Autosampler Manager" software). Once the names have been created, they will be visible on the touch screen.

Select a method number/name to enter in the "METHOD X" screen (X is a number from 0 to 9 that can be followed by the method name) and to view or edit its parameters. See paragraph 5.1.2 "Method X: Setting method parameters ".

Select "**Tools**" to access to the "METHOD TOOLS" screen (see paragraph 5.1.3 "Method tools"). Tap "**Exit**" to exit from the "RUN: METHODS" screen.

5.2.2 Method X: Setting method parameters

Each method contains a set of analytical parameters. Use this screen to view or edit these parameters.

Access sequence: RUN>SETTINGS>METHODS>METHOD X

In the "METHOD X" screen the following sub menus are available:

- **General:** see paragraph 5.2.2.1;

- **Solvent Wash:** see paragraph 5.2.2.2;

- **Internal Standard** see paragraph 5.2.2.3;

- **Sample:** see paragraph 5.2.2.4;

- **Injection**: see paragraph 5.2.2.5.

Tap "**Exit**" to exit from the "METHOD X" screen.

If one of these parameters has been changed a confirmation screen appears "Modifying Method X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving. The display will return to the "RUN: METHODS" screen.

5.2.2.1 General parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>GENERAL

The following parameters can be viewed/edited:

- **Syringe Volume**: volume of the syringe. The syringe volume affects the limits of other parameters such as speed and volume;
- **Analysis Time**: time of the sample analysis (time from the injection to the moment in which GC will be ready again). This parameter is taken into consideration by the autosampler only if "Normal w/o Rdy" is set as "Injection Synchro" parameter (see paragraph 4.2.6.3 "Setup configuration: Run");
- **Fill Speed**: syringe aspiration speed;
- **Viscosity Delay**: time the syringe remains in the sample vial after the plunger has been raised. It allows viscous samples time to fill the syringe.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.2.2 "Method X: Setting method parameters".

5.2.2.2 Solvent wash parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>SOLVENT WASH

The following parameters can be viewed/edited:

- **Pre Wash Cycle (s)**: the number of pre washes (washes before injection)

- **Pre Wash Volume**: the quantity (volume) of solvent to use for each pre-washing operation;

- **Pre Wash Mode**: how often the pre washing occurs (see below);

- **Post Wash Cycle (s)**: the number of post washes (washes after injection)

- **Post Wash Volume**: the quantity (volume) of solvent to use for each post-washing operation;

- **Post Wash Mode**: how often the post washing occurs (see below);

Pre and Post wash mode can have the following values:

Inject	Wash is made every injection
Sample	Wash is made on each new vial: it is not made between injections of the same sample from the same vial.
Step	Wash is made for each new step of the sequence.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.2.2 "Method X: Setting method parameters").

5.2.2.3 Internal standard parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>INTERNAL STANDARD
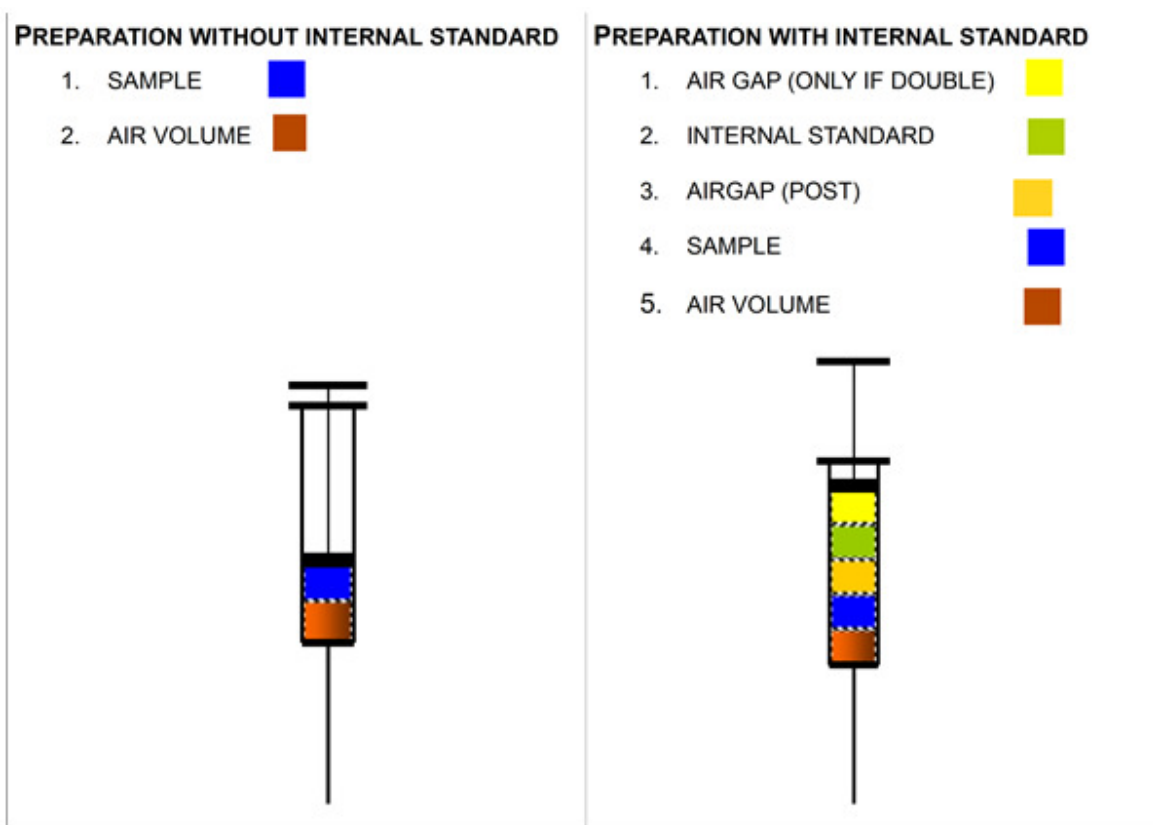
Figure 141: Internal Standard Injection

The following parameters can be viewed/edited:

- **Enable**: enables or disables internal standard;

- **Volume**: internal standard volume;

- **Air Gap Mode**: can have the following values:

Post	There is one air gap, that is interposed between the Internal Standard and the Sample
Double	There are two air gaps, the first one before the sample, the second one after the internal standard.

- **Air Gap Volume**: volume of the air gap (see explanation below).

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.2.2 "Method X: Setting method parameters").

5.2.2.4 Sample parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>SAMPLE

The following parameters can be viewed/edited:

- **Sample Volume**: volume of sample to be injected;
- **Fill Volume**: volume of sample to aspire for sample wash and for the Pull up Strokes (see below).
- **Air Volume**: the quantity (volume) of air to aspire after the sample has been drawn; this prevents volatile samples evaporating from the needle;
- **Sample Washes**: number of washes to make with the sample;
- **Pull Up Strokes**: the rapid up and down movements of the plunger to eliminate air bubbles from the syringe.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.2.2 "Method X: Setting method parameters").

5.2.2.5 Injection parameters
Access sequence: RUN>SETTINGS >METHODS>METHOD X>INJECTION

The following parameters can be viewed/edited:

- **Injection speed**: the syringe dispensation speed used during injection;
- **Pre Injection Dwell**: the waiting time of the syringe needle inside the injection port before making the injection (this allows the temperature of the syringe to equilibrate with the temperature of the GC inlet).
- **Post Injection Dwell**: is the waiting time of the syringe needle inside the injector after the injection (this allows the complete evaporation of the sample).

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.2.2 "Method X: Setting method parameters").

5.2.3 Method tools

Access sequence: RUN>SETTINGS>METHODS>TOOLS

In the "METHOD TOOLS" screen the following options are available:

- **Restore Default**: used to load the default settings for a method;
- **Copy Methods**: used to copy the parameters from one method to another.

If you select "RESTORE DEFAULT", you have to select the method to reset. A confirmation screen appears "Loading default parameter for method X". Tap "LOAD" to restore the default parameters and "CANCEL" not to make the restore operation. If you select "COPY METHODS", you have to select the source method and the destination method. Tap "CONTINUE" to confirm and "ABORT" not to make the method copy.

Select "Exit" to exit from this screen and return to the "RUN: METHODS" screen (see paragraph 5.2.2 "Method X: Setting method parameters").

5.2.4 Example

Below are some method examples, use these to create your own method.

Please keep in mind example methods should be adapted depending on your analysis technique, analyzer model, inlet type, etc. and therefore these may not be suitable for your application.

5.2.4.1 Typical GC Method (Liquid mode)

General parameters	**Syringe Volume**	10 ul
	Analysis Time	[5]
	Fill Speed	1ul/sec
	Viscosity Delay	5sec
Solvent wash parameters	**Pre Wash Cycle (s)**	3
	Pre Wash Volume	10ul
	Pre Wash Mode	Inject
	Post Wash Cycle (s)	3
	Post Wash Volume	10ul
	Post Wash Mode	Inject
Internal standard	**Enable**	No
	Volume	/
	Air Gap Mode	/

---

[5] **Set it according to the elution time of your analyte(s) in your GC condition**

parameters	Air Gap Volume	/
	Volume	1ul
	Fill Volume	5ul
	Air volume	1ul
Sample parameters	Sample Washes	2
	Pull Up Strokes	5
	Injection Speed	100ul/sec
Injection parameters	Pre Injection Dwell	1sec
	Post Injection Dwell	3sec

5.3 Method: SPME mode

5.3.1 Method Menu

This function is used to edit or view the injection method parameters.

Access sequence: RUN>SETTINGS>METHODS

The "RUN: METHODS" screen contains a list of the 10 methods (from 0 to 9) stored in the unit memory.

The methods can be identified by the number or by a name.

The name can only be created or edited using a PC (using the "HTA Autosampler Manager" software). Once the names have been created, they will be visible on the touch screen.

Select a method number/name to enter in the "METHOD X" screen (X is a number from 0 to 9 that can be followed by the method name) and to view or edit its parameters. See paragraph 5.3.2 "Method X: Setting method parameters").

Select "**Tools**" to access the "METHOD TOOLS" screen (see paragraph 5.3.3 "Method tools ") Tap "**Exit**" to exit from the "RUN: METHODS" screen.

5.3.2 Method X: Setting method parameters

Each method contains a set of analytical parameters. Use this screen to view or edit these parameters.

Access sequence: RUN>SETTINGS>METHODS>METHOD X

In the "METHOD X" screen the following sub menus are available:

- **General:** see paragraph 5.3.2.1;

- **Conditioning**: see paragraph 5.3.2.2;

- **Wash &Clean:** see paragraph 5.3.2.3;

- **Extraction:** see paragraph 5.3.2.4;

- **Desorption:** see paragraph 5.3.2.5.

Tap "**Exit**" to exit from the "METHOD X" screen.

If one of these parameters has been changed a confirmation screen appears "Modifying Method X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving. The display will return to the "RUN: METHODS" screen.

5.3.2.1 General parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>GENERAL

The following parameters can be viewed/edited:

- **Vial type**: volume of the used vials. The vial type affects the limits of other parameters such as depths;
- **Analysis Time**: time of the sample analysis (for details see below). This parameter is only taken into consideration by the autosampler if "Normal w/o Rdy" is set as "Desorption Synchro" parameter (see paragraph 4.2.6.3 "Setup configuration: Run");
- **Preparation Time**: displays how long the autosampler needs to perform a cycle. It is calculated from the instrument and is not editable *(Time needed to transfer the vial from the tray to the incubator, filling time, injection time, etc.)*.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.3.2 "Method X: Setting method parameters").

Analysis time

The analysis time is the GC run time plus any additional time needed for the GC to execute any post-run program and then return to a Ready state.

Please consider that the autosampler uses the analysis time (GC cycle time) to calculate throughput and timing. An accurate analysis time is crucial to optimizing throughput and for correctly processing samples.

If the analysis time is too long, this can cause lowered throughput because vials wait longer than needed before processing. If the Analysis time is too short, this can cause sequence faults

because the vial may sit too long while waiting for the GC to become Ready. It is better to enter a longer time than needed than to enter too short a time and possibly reduce sample quality.

To determine the analysis time, program the GC to perform a sequence of two or three blank (no injection) runs. If you are using a Data system, you can determine the cycle time from the data system sequence log and compare the start times for the runs. A good analysis time is the average difference between the start times, plus 0.2 to 0.5 minutes. If you are not using a Data system, watch the GC. Count the time between the start of the first run and when the GC becomes Ready for the second run, then add 1 minute.

You can also estimate the analysis time without making a run. By adding the GC oven program duration and the duration of any post-run programs, you can get close to the true cycle time.

Also consider time for data processing. While in most cases data processing is not a problem, a very busy Data system may need extra time between samples.

To validate the analysis time, look at the GC run time. The analysis time cannot be less than the total run time. Then look at the GC post run program duration. The analysis time cannot be less than the total run time plus the post run program duration.

Finally, consider that the GC cooling time may vary according to room temperature: the higher the room temperature is the more time is needed for the GC cooling time; typically it implies a shorter time during winter seasons and a longer time during summer seasons. Therefore, the analysis time should be set according to the worst scenario (summer season).

5.3.2.2 Conditioning parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>CONDITIONING

The following parameters can be viewed/edited:

- **Oven Temperature:** temperature of conditioning of the oven. This value can be between 40°C and 170°C or off (inactive conditioning);
- **Incubation:** sample incubation time inside the oven;
- **Shaker On:** interval time during incubation time in which the sample is shaken;
- **Shaker Off:** interval time during incubation time in which the sample is not shaken.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.3.2 "Method X: Setting method parameters").

5.3.2.3 Wash & Clean parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>WASH & CLEAN

The following parameters can be viewed/edited:

- **Pre-washing:** enables/disables the pre-washing operation. The Fiber pre-washing is performed after the extraction (before the desorption) by immersion inside a proper solution (wash vial in position 7 of Figure 1);
- **Pre-Washing Time:** sets the time of the pre-washing operation (see above)
- **Post-Cleaning**: enables/disables the post-cleaning operation. The Fiber post-cleaning is the Fiber cleaning after the desorption operation. The cleaning is performed in the location specified as "Clean mode" in the Setup Configuration: Run (see paragraph 4.2.6.3).
- **Post-Cleaning Time**: sets the time of the post-cleaning operation (see above).

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.3.2 "Method X: Setting method parameters").

5.3.2.4 Extraction parameters
Access sequence: RUN>SETTINGS>METHODS>METHOD X>EXTRACTION

The following parameters can be viewed/edited:

- **Extraction Time:** time the Fiber is exposed inside the vial to absorbe the analytes;
- **Extraction Depth:** the depth of the Fiber inside the vial during the extraction phase (see tables below for setting the depth correctly);
- **Derivatization**: see 11 "Appendix A – Glossary". It can have the following values:

Pre	Derivatization before the extraction
Post	Derivatization after the extraction
None	No derivatization

- **Derivatization Time:** time the Fiber is exposed to the derivatization agent;
- **Derivatization Depth:** depth of the Fiber inside the vial during the derivatization (see tables below for setting the depth correctly).

For Extraction Depth and Derivatization depth, the position "Under septum" (depth =0) is between 5 and 7mm under vial septum. This spread depends on the vials height and the mechanical tolerance of the oven loading.

Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.3.2 "Method X: Setting method parameters").

Fiber lenght	Extraction/ Derivatization depth (mm)		
	<10	The instrument moves the needle to have the needle tip just under the septum, then expose the fiber moving only the plunger.	
0mm	10<depth<28	The instrument moves the needle 28mm over the final position, then moves the plunger to expose 10 mm of fiber and if necessary, up to 18mm of fiber holder.	
	10<depth<47	The instrument moves the needle 28mm over the final position, then moves the plunger to expose 10 mm of fiber and 18mm of fiber holder and, if necessary, it moves the needle down up to 19mm further.	

Fiber lenght	Extraction/ Derivatization depth (mm)		
	<20	The instrument moves the needle to have the needle tip just under the septum, then expose the fiber moving only the plunger.	Cover — 33mm / 47mm / 0-20mm Fiber / Under septum, depth 0
	20<depth<28	The instrument moves the needle 28mm over the final position, then moves the plunger to expose 20 mm of fiber and if necessary, up to 8mm of fiber holder.	33mm / 47mm / 0-8mm Fiber holder / Under septum,
20mm	28<depth<47	The instrument moves the needle 28mm over the final position, then moves the plunger to expose 20 mm of fiber and 8mm of fiber holder and, if necessary, it moves the needle down up to 19mm further.	33mm / Cover / 47mm / 0-19mm Needle / 8mm / Under septum,

5.3.2.5 Desorption parameters
Access sequence: RUN>SETTINGS >METHODS>METHOD X>DESORPTION

The following parameter can be viewed/edited:

- **Desorption:** the time the Fiber remains in the injection port to desorpt the analytes. Select "**Exit**" to exit from this screen and return to the "RUN: METHOD X" screen (see paragraph 5.3.2 "Method X: Setting method parameters").

5.3.3 Method tools
Access sequence: RUN>SETTINGS>METHODS>TOOLS

In the "METHOD TOOLS" screen (see paragraph 5.1 "Method (Headspace mode)"), the following options are available:

- **Restore Default**: used to load the default settings for a method;
- **Copy Methods**: used to copy the parameters from one method to another.

If you select "RESTORE DEFAULT", you have to select the method to reset. A confirmation screen appears "Loading default parameter for method X". Tap "LOAD" to restore the default parameters and "CANCEL" not to make the restore operation. If you select "COPY METHODS", you have to select the source method and the destination method. Tap "CONTINUE" to confirm and "ABORT" not to make the method copy.

Select "Exit" to exit from this screen and return to the "RUN: METHODS" screen (see paragraph

5.1.1 "Method Menu").

5.3.4 Example
Below there is an example method, and you can use this to create your own method.

Please keep in mind that the example method should be adapted depending on your analysis technique, analyzer model, inlet type, etc. and therefore this may not be suitable for your application.

5.3.4.1 Typical GC Method (SPME mode)

General	**Vial Type**	2.5ml
	Analysis Time	[6]
Conditioning	**Oven Temperature**	40 to 170℃ [7]
	Incubation Time	[8]
	Shaker On	0.2
	Shaker Off	0.1
Wash&Clean	**Pre-Washing**	No
	Pre-Washing Time	0
	Post-Cleaning	No
	Post-Cleaning Time	0
Extraction	**Extraction Time**	[9]
	Extraction Depth	[10]
	Derivatization	None
	Derivatization Time	0
	Derivatization Depth	0
Desorption	**Desorption**	5 [11]

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[6] **GC Cycle Time: GC run time plus any additional time needed for the GC to execute any post-run program, then return to a Ready state.**

[7] **Value depends on application**

[8] **The incubation time has to be established with method development 1.6 "Functions available only through HTA Autosampler Manager".**

[9] **Value depends on application**

[10] **Value depends on application**

[11] **Value depends on application**

6 Programming Sequence

6.1 Sequence: Headspace mode

6.1.1 Sequence Menu

This function is used to edit a sample list (later refered to as Sequence).

Access sequence: RUN>SETTINGS>SEQUENCES

The sequence is a program (a list of instructions) that defines a series of injections also know as an Automatic Run (see paragraph 7.3 "Automatic run"). The program has 16 steps (1 to 16). Each step defines different parameters involved in the injection cycle (tray type, method, first sample, last samples, cycles etc..). Each step can work alone or with other steps (see para 7.3 "Automatic run").

The "RUN: SEQUENCES" screen displays the sequence steps stored in the autosampler memory. The steps can be identified by the number or by a name.

The name can only be created or edited using a PC. Once the names have been created, they will be visible on the touch screen.

Select a step number/name to enter the "STEP X" screen (X is a number from 0 to 16, that can be followed by the step name) to view or edit the parameters. See paragraph 6.1.2 "Setting sequence step parameters ").

Select "**Tools**" to access to the "SEQUENCE TOOLS" screen (see paragraph 6.1.3 "Sequence tools").

Tap "**Exit**" to exit from the "RUN: SEQUENCES" screen.

6.1.2 Setting sequence step parameters

This screen is used to display or edit a sequence step. Access

sequence: RUN>SETTINGS>SEQUENCES>STEP X

In the "STEP X" screen, the following parameters are available:

- **Tray type: specifies the type of tray to use;**

- **Method:** specifies the method to be used;

- **First Sample**: specifies the number of the first vial to run;

- **Last Sample:** specifies the number of the last vial to run; all the vials from the first sample to the last sample position will be run. Therefore, the last sample must be equal to or higher than the first sample;

- **Injection Mode:** can have one of the following values:

Default	Uses the injection port defined in the Setup (see paragraph 4.2.6.3 "Setup configuration: Run ")
Front	Injects only in the first injector
Rear	Injects only in the second injector
Confirmation	It injects the same sample in both front and rear injectors *(see paragraph 1 1 "Appendix A – Glossary".*

- **Name**: shows the name of the sequence

step. Tap "**Exit**" to exit from the "STEP X" screen.

If any parameters have been changed, a confirmation screen appears stating "Modifying sequence step X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving.

The display return to the "RUN: SEQUENCES" screen.

6.1.3 Sequence tools
Access sequence: RUN>SETTINGS>SEQUENCES >TOOLS

In the "SEQUENCE TOOLS" screen the following options are available:

- **Add New**: adds a new sequence step;

- **Copy as New**: creates a new sequence step by copying parameters from an existing one;

- **Reorder:** changes the order of the sequence steps;

- **Remove**: removes a sequence step.

If you select "ADD NEW" the following message appears: "A new step has been added at position X". Tap "CONTINUE" to confirm.

If you select "COPY AS NEW", first select the source step to copy, then the following message appears "A new step has been copied at position X". Tap "CONTINUE" to confirm.

If you select "REORDER", you have to select the new step position (target position) and tap "MOVE". A screen appears: "Step X has been moved to position Y". "Y" will be the new step position.

If you select "REMOVE", you have to select the step to remove, and then a screen appears: "Step X has been removed". Tap "CONTINUE" to confirm.

Select "Exit" to exit from this screen and return to the "RUN: SEQUENCES" screen (see paragraph 6.1.1 "Sequence Menu").

6.2 Sequence: Liquid mode

6.2.1 Sequence Menu

This function is used to edit a sample list (later refereed as Sequence).

Access sequence: RUN>SETTINGS>SEQUENCES

The sequence is a program (a list of instructions) that defines a series of injections also know as an Automatic Run (see paragraph 7.3 "Automatic run"). The program has 16 steps (1 to 16). Each step defines different parameters involved in the injection cycle (tray type, method, first sample, last samples, cycles etc..). Each step can work alone or with other steps (see para 7.3 "Automatic run").

The "RUN: SEQUENCES" screen displays the sequence steps stored in the autosampler memory. The steps can be identified by the number or by a name.

The name can be created or edited only using a PC. Once the names have been created, they will be visible on the touch screen.

Select a step number/name to enter the "STEP X" screen (X is a number from 0 to 16, that can be followed by the step name) to view or edit the parameters. See paragraph 6.2.2 "Setting sequence step parameters").

Select "**Tools**" to access to the "SEQUENCE TOOLS" screen (see paragraph 6.2.3 "Sequence tools").

Tap "**Exit**" to exit from the "RUN: SEQUENCES" screen.

6.2.2 Setting sequence step parameters

This screen is used to display or edit a sequence step.

Access sequence: RUN>SETTINGS>SEQUENCES>STEP X

In the "STEP X" screen the following parameters are available:

- **Tray type:** specifies the type of tray to use;

- **Method:** specifies the method to be used;

- **First Sample**: specifies the number of the first vial to run;

- **Last Sample:** specifies the number of the last vial to run; all the vials from first sample to the last sample position will be run. Therefore the last sample must be equal or higher than the first sample;

- **Cycle(s)**: the number of times that the same sample has to be injected;

- **Internal Standard**: the sample vial (or solvent vial) to use as the Internal Standard.

- **Pre Wash Solvent:** the solvent to use for the pre-washing operations. This can be a single solvent vial (e.g.: "A") or a combination of 2 solvents (e.g.: "A+B"). If 2 solvents are used it will wash with the first solvent and then wash with the second solvent;

- **Post Wash Solvent:** the solvent to use for the post-washing operations. This can be a single solvent vial (e.g.: "A") or a combination of 2 solvents (e.g.: "A+B"). If 2 solvents are used it will wash with the first solvent and then wash with the second solvent;

- **Injection Mode:** can have one of the following values:

Default	Uses the injection port defined in the Setup (see paragraph 4.2.6.3 "Setup configuration: Run")
Front	Injects only in the first injector
Rear	Injects only in the second injector
Confirmation	It injects the same sample in both front and rear injectors (see paragraph 11Appendix A – Glossary")
High throughput	It injects different sampler alternatively in front and rear injector (see paragraph 6.2.2.1 "High throughput mode")

- **Name**: shows the name of the sequence

step. Tap "**Exit**" to exit from the "STEP X" screen.

If any parameters have been changed a confirmation screen appears "Modifying sequence step X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving.

The display return to the "RUN: SEQUENCES" screen.

6.2.2.1 High throughput mode

In this mode the injections are performed alternately in the two injectors start from the front injector. So it will inject the first vial of the step in the front injector, the second vial of the

step in the rear injector (then it waits for the GC to run the samples), the third vial of the step in the front injector, the fourth vial of the step in the rear injector and so on...

High Throughput Mode will only work on GCs that have two injection ports.

High Throughput Mode is only supported during automatic run (not single injection)

6.2.3 Sequence tools

Access sequence: RUN>SETTINGS>SEQUENCES >TOOLS

In the "SEQUENCE TOOLS" screen, the following options are available:

- **Add New**: adds a new sequence step;
- **Copy as New**: creates a new sequence step by copying parameters from an existing one's;
- **Reorder:** changes the order of the sequence steps;
- **Remove**: removes a sequence step.

If you select "ADD NEW" the following message appears: "A new step has been added at position X". Tap "CONTINUE" to confirm.

If you select "COPY AS NEW", select first the source step to copy, then the following message appears "A new step has been copied at position X". Tap "CONTINUE" to confirm.

If you select "REORDER" you have to select the new step position (target position) and tap "MOVE". A screen appears "Step X has been moved to position Y". "Y" will be the new step position.

If you select "REMOVE", you have to select the step to remove, then a screen appears "Step X has been removed". Tap "CONTINUE" to confirm.

Select "Exit" to exit from this screen and return to the "RUN: SEQUENCES" screen (see paragraph 6.2.1 "Sequence Menu").

6.3 Sequence: SPME mode

6.3.1 Sequence Menu

This function is used to edit a sample list (later refered to as Sequence). Access sequence: RUN>SETTINGS>SEQUENCES

The sequence is a program (a list of instructions) that defines a series of injections also know as an Automatic Run (see paragraph 7.3 "Automatic run"). The program has 16 steps (1 to 16). Each step defines different parameters involved in the injection cycle (tray type, method, first sample, last samples, cycles etc..). Each step can work alone or with other steps (see para 7.3 "Automatic run").

The "RUN: SEQUENCES" screen displays the sequence steps stored in the autosampler memory. The steps can be identified by the number or by a name.

The name can only be created or edited using a PC. Once the names have been created, they will be visible on the touch screen.

Select a step number/name to enter the "STEP X" screen (X is a number from 0 to 16, that can be followed by the step name) to view or edit the parameters. See paragraph 6.3.2 "Setting sequence step parameters ").

Select "Tools" to access to the "SEQUENCE TOOLS" screen (see paragraph 6.3.3Sequence tools6.3.3 "Sequence tools").

Tap "Exit" to exit from the "RUN: SEQUENCES" screen.

6.3.2 Setting sequence step parameters

This screen is used to display or edit a sequence step.

Access sequence: RUN>SETTINGS>SEQUENCES>STEP X

In the "STEP X" screen, the following parameters are available:

- **Tray type:** specifies the type of tray to use;
- **Method:** specifies the method to be used;
- **First Sample**: specifies the number of the first vial to run;
- **Last Sample:** specifies the number of the last vial to run; all the vials from the first sample to the last sample position will be run. Therefore, the last sample must be equal to or higher than the first sample;
- **Derivatizer:** specifies the derivatizer position (see derivatization in paragraph 11 "Appendix A – Glossary").

- **Desorption Mode:** can have one of the following values:

Default	Uses the desorption mode defined in the Setup (see paragraph 4.2.6.3 "Setup configuration: Run ")
Front	Desorption in the first injector

Rear	Desorption in the second injector

- **Name**: shows the name of the sequence

step. Tap "**Exit**" to exit from the "STEP X" screen.

If any parameters have been changed, a confirmation screen appears stating "Modifying sequence step X". Tap "SAVE" to save the modifications or "CANCEL" to exit without saving.

The display return to the "RUN: SEQUENCES" screen.

6.3.3 Sequence tools

Access sequence: RUN>SETTINGS>SEQUENCES >TOOLS

In the "SEQUENCE TOOLS" screen, the following options are available:

- **Add New**: adds a new sequence step;
- **Copy as New**: creates a new sequence step by copying parameters from an existing one;
- **Reorder:** changes the order of the sequence steps;
- **Remove**: removes a sequence step.

If you select "ADD NEW" the following message appears: "A new step has been added at position X". Tap "CONTINUE" to confirm.

If you select "COPY AS NEW", first select the source step to copy, then the following message appears "A new step has been copied at position X". Tap "CONTINUE" to confirm.

If you select "REORDER", you have to select the new step position (target position) and tap "MOVE". A screen appears: "Step X has been moved to position Y". "Y" will be the new step position.

If you select "REMOVE", you have to select the step to remove, and then a screen appears: "Step X has been removed". Tap "CONTINUE" to confirm. Select "Exit" to exit from this screen and return to the "RUN: SEQUENCES" screen (see paragraph 6.3.1 "Sequence Menu").Operations

7 Operations

7.1 Home screen

After the START UP procedure, the autosampler will move the turret to the central position, and the touch screen shows the Home screen.

The Home screen is available in two modalities: Standard (see paragraph 7.1.1) and Quick Start (see paragraph 7.1.2). The Quick Start modality is a simplified modality in which you can start working by simply tapping "Start" (for details see paragraph 7.1.2). To modify the Home screen modality, set the User Interface (see paragraph 4.2.6.3 "Setup configuration: Run ").

7.1.1 Home screen: Standard User Interface

Figure 142: Home screen: Standard User Interface

From here, it is possible to access the following functions:

Headspace mode:

- **Single Injection:** performs an injection from a specific sample vial (see paragraph 7.2);

- **Automatic Run:** performs an automatic cycle of injections from different sample vials (see paragraph 7.3);

- **Syringe Purge:** flushes the syringe with gas (see paragraph 7.4);

- **Load Sample Tray:** opens the tray to load/unload the samples (see paragraph 7.7);

- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).

- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).

Liquid mode:

- **Single Injection:** performs an injection from a specific sample vial (see paragraph 7.2);

- **Automatic Run:** performs an automatic cycle of injections from different sample vials (see paragraph 7.3);

- **Syringe Wash:** washes the syringe with solvent (see paragraph 7.5);

- **Load Sample/Solvent:** opens the tray to load/unload the samples and open the oven cover to load/unload the solvent vials (see paragraph 7.7 and 7.8);

- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).

- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).

SPME mode:

- **Single Injection:** performs an injection from a specific sample vial (see paragraph 7.2);

- **Automatic Run:** performs an automatic cycle of injections from different sample vials (see paragraph 7.3);

- **Fiber Cleaning Conditioning:** conditions or cleans the Fiber (see paragraph 7.6);

- **Load Sample Tray:** opens the tray to load/unload the samples (see paragraph 7.7);

- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).

- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).
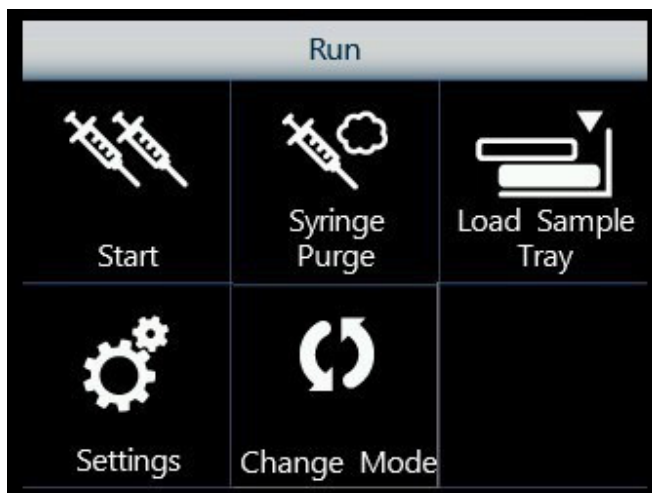
Tap one of these options to enter the respective sub menu.

To move to the Quick Start User Interface, see paragraph 4.2.6.3 "Setup configuration: Run".

7.1.2 Home screen: Quick Start User Interface

Figure 143: Home screen: Quick User Interface

From here, it is possible to access the following functions:

Headspace mode:

- **Start:** the autosampler will run all the stored sequence steps (see paragraph 6) processing all the vials set in each sequence step (note that after detecting two empty positions it will automatically stop).
- **Syringe Purge:** flushes the syringe with gas (see paragraph 7.4);
- **Load Sample Tray:** opens the tray to load/unload the samples (see paragraph 7.7);
- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).
- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).

Liquid mode:

- **Start:** the autosampler will run all the stored sequence steps (see paragraph 6) processing all the vials set in each sequence step (note that after detecting two empty positions it will automatically stop).
- **Syringe Wash:** washes the syringe with solvent (see paragraph 7.5);
- **Load Sample/Solvent:** opens the tray to load/unload the samples and open the oven cover to load/unload the solvent vials (see paragraph 7.7 and 7.8);
- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).
- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).

SPME mode:

- **Start:** the autosampler will run all the stored sequence steps (see paragraph 7.6) processing all the vials set in each sequence step (note that after detecting two empty positions it will automatically stop).
- **Fiber Cleaning Conditioning:** conditions or cleans the Fiber (see paragraph 7.6);
- **Load Sample Tray:** opens the tray to load/unload the samples (see paragraph 7.7);
- **Settings:** accesses other autosampler functionalities and menus (see paragraph 7.9).
- **Change mode**: to change the current autosampler mode (Headspace, Liquid, SPME) (see paragraph 7.10).

Tap one of these options to enter the respective sub menu.

To move to the standard User Interface, see paragraph 4.2.6.3 "Setup configuration: Run".

7.2 Single injection

This function is used to carry out one or more injections from a single vial.

Access sequence: RUN>SINGLE INJECTION.

In the "Single Injection" screen you need to define the injection parameters:

- **Method**: (from 0 to 9);
- **Sample**: the vial position of the sample to be injected (e.g.: A.2).

In Liquid mode there are also some optional parameters to be set if required by the selected method:

- **Internal Standard**: the vial position of the internal standard (e.g.: B.5);
- **Pre Wash Solvent**: the solvent to use for the pre-washing operations. This can be a single solvent vial (e.g.: "A") or a combination of 2 solvents (e.g.: "A+B"). If two solvents are used it will wash with the first solvent and then wash again with the second solvent; **Post Wash Solvent**: the solvent to use for the post-washing operations. This can be a single solvent vial (e.g.: "A") or a combination of 2 solvents (e.g.: "A+B"). If two solvents are used it will wash with the first solvent and then wash again with the second solvent.

In SPME mode there are also some optional parameters to be set if required by the selected method:

- **Derivatizer**: specifies the derivatizer position (see derivatization in paragraph 11 "Appendix A – Glossary".

Select "**Start Injection/Single Run**" to perform the single injection. During the single injection, the status information is displayed. Tap "STOP" to stop the procedure and then "ABORT" to confirm or "RESUME" to continue the single injection procedure.

Select "**Exit**" to exit from the "Single Injection" screen and return to the home screen.

7.3 Automatic run

This function is used to carry out a sequence of injections from different sample vials. Access sequence: RUN>AUTO RUN.

In the "Automatic Run" screen you need to define the following parameters:

- **First step**: sets the first step of the sequence;

- **Last step**: sets the last step of the sequence;

  It is only possible to select existing steps: numbers corresponding to non-existent steps will not be displayed. To set-up or modify a sequence please refer to paragraph 6 "Programming Sequence". The Last Step must be equal to or greater than the First Step: for example if you set the "First step" as "5", the last step must be "5" or higher (6-7-8-9 etc...).

- **Run-All-Samples**: select one of the following values:

Yes	"Run-All-Samples" function is active: after two empty positions on the rack, the autosampler will stop and will not continue with the other vials set in the sequence
No	"Run-All-Samples" function is not active: after two empty positions on the rack, the autosampler will not stop and will continue looking for the other vials in the sequence

The "Run-All-Samples" function can be used to run a lower set of samples than normal without having to program a separate sequence. In the sequence step, set the "Last vial" to the last vial position in the rack (see paragraph 2.1.1.1 "HT2800T/HT2850T Sample rack"), even if there are fewer samples. If the "Run-All-Samples" function is active (select "Yes") and the run is started, then the autosampler will process all the samples available, and after detecting two empty positions it will automatically stop. This option allows the operator to always use the same sequence of steps (without needing to change the first and last vials every time), even if the number of samples to process changes from time to time.

Select "**Start Automatic run**" to start the automatic run.

During the automatic run, a screen ("AUTOMATIC RUN EXECUTION") displays status information. Select:

- "MENU" to display method or sequence information; to inject the sample immediately (see paragraph 7.3.2 "Immediate Injection" and 7.3.4 "Priority injection"), to skip the sample injection (paragraph 7.3.3 "Skip Next Vial option"), or to add or remove samples in the tray/s;

- "STOP" to end the automatic run (see paragraph 7.3.1 "Interrupting an automatic run").

Select "**Exit**" to exit from the "Automatic Run" screen and return to the home screen.

7.3.1 Interrupting an automatic run

During the automatic run, from the "AUTOMATIC EXECUTION SCREEN" (see paragraph 7.3 "Automatic run"), tap "**STOP**" to stop the procedure, then:

- tap "**ABORT**" to stop the unit immediately;
- tap "**TERMINATE OVEN**" to continue the execution of the samples present in the oven;

- tap "**RESUME**" to continue operations as before.

7.3.2 Immediate Injection

Only for Headspace mode.

During the automatic run, the "AUTOMATIC EXECUTION SCREEN" is displayed (see paragraph

7.3 "Automatic run"). Then follow the access sequence: AUTOMATIC EXECUTION SCREEN>MENU>IMMEDIATE INJECTION

This function can only be activated during the sample conditioning. When this option is activated the autosampler stops the current sample conditioning and immediately injects it.

Once the immediate injection has been made, the autosampler will re-start the automatic injection procedure from the point of interruption.

7.3.3 Skip Next Vial option

Only for Headspace mode.

During the automatic run, the "AUTOMATIC EXECUTION SCREEN" is displayed (see paragraph

7.3 "Automatic run").

Then follow the access sequence: AUTOMATIC EXECUTION SCREEN>MENU>SKIP NEXT VIAL

This function can only be activated during the sample conditioning. When this option is activated, the autosampler stops the current sample conditioning and replaces the sample to its original position of the tray without injecting it.

The autosampler will re-start the automatic injection procedure from the point of interruption.

7.3.4 Priority injection

Only for Liquid mode.

While an automatic run is in progress, an unscheduled sample may need to be processed immediately – this can be performed using the Priority injection function. This function can be used to make an injection from any vial position and using any available injection method.

During the automatic run, the "AUTOMATIC EXECUTION SCREEN" is displayed (see paragraph

"Automatic run"). Then follow the access sequence: AUTOMATIC EXECUTION SCREEN>MENU>PRIORITY INJECTION

Depending on the autosampler status (whether the next sample injection is already in progress or not) you may be required to wait up to few minutes before programming a priority injection. This ensures the integrity of the analytical data.

Use the wizard to insert the vial for the priority injection when the tray is in the open position. Then tap "OK" to allow tray to close. A screen will appear to allow the priority injection parameters to be set, as follow:

- Mandatory:
    - **Method**: (from 0 to 9);
    - **Sample**: the vial position of the sample to be injected (e.g.: A.2);
- Optional (if required by the selected method):
    - **Internal Standard**: vial position of the internal standard (e.g.: B.5) -
    - **Pre Wash Solvent**: solvent to use for the pre injection wash
    - **Post Wash Solvent**: solvent to use for the post injection wash

Then select "**Start Priority**" to run the priority injection. During the priority injection, a screen will show status information. Tap "STOP" to stop the procedure. Tap "ABORT" to confirm and "RESUME" to continue operation as before.

Select "**Exit**" to exit from the screen for priority injection without running it.

Once the priority injection has been made the autosampler will re-start automatic injection procedure from the point of interruption.

7.4 Syringe purge

Only for Headspace mode.

This function is used to purge the syringe with gas.
Access sequence: RUN>SYRINGE PURGE.

In the "Syringe Purge" screen you can set:

- **Flush Time**: sets how long the syringe purge must take;

- **Purge Temperature**: sets the syringe purging temperature. This value can be between 40°C and 150°C (active conditioning) or off (inactive conditioning);

Select "**Start Purge**" to run the syringe purge. Whilst the syringe is being purged the unit will display the status information. Tap "STOP" to stop the procedure.

Select "**Exit**" to exit from the "Start Purge" screen and return to the home screen.

7.5 Syringe wash

Only for Liquid mode.

This function is used to wash the syringe. Syringe wash is normally performed automatically during an injection sequence. However extra washing may be recommended before the autosampler is first used or after a new syringe installed etc...

Access sequence: RUN>SYRINGE WASH. In
the "Syringe Wash" screen you can set:

- **Solvent Vial**: the vial position of the solvent (example: D);
- **Wash Volume**: amount of solvent to be used for each wash cycle;
- **Cycle(s)**: the number of washing cycles (repetition of wash function).

Select "**Start Wash**" to run the syringe wash. Whilst the syringe is being washed the unit will display the status information. Tap "STOP" to stop the procedure.

Select "**Exit**" to exit from the "Start Wash" screen and return to the home screen.

7.6 Fiber Cleaning/Conditioning

Only for SPME mode.

This function is used to clean the Fiber

Access sequence: RUN>Fiber CLEANING CONDITIONING In
the "Fiber Cleaning Conditioning" screen you can set:

- **Position:** sets the location of the Fiber cleaning (see below);
- **Remaining Time**: sets how long the Fiber cleaning must take;

Select one of the following values:

Front	The Cleaning operation is performed inside the Front injector.
Rear	The Cleaning operation is performed inside the Rear injector.
Wash vial	The Cleaning operation is performed inside the wash vial (see position 7 in *Figure 1*).
Cleaning Device	The Cleaning operation is performed inside the SPME Cleaning Device (see position 6 in *Figure 1*). Available only for HT2850T.

This cleaning positions can be used only if enabled (see paragraph 4.2.6.10 " Setup configuration: Cleaning Device) and aligned 4.2.1.4 "Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode) ").

Select "**Start Cleaning/Conditioning**" to clean the Fiber. Whilst the Fiber is being cleaned the unit will display the status information. Tap "STOP" to stop the procedure.

Select "**Exit**" to exit from the "Fiber Cleaning Conditioning " screen and return to the home screen.

7.7 Load and Unload Sample Vial

Access sequence (Headspace and SPME mode): RUN>LOAD SAMPLE TRAY
Access sequence (Liquid mode): RUN>LOAD SAMPLE/SOLVENT

The unit will open the tray (In Liquid mode it opens also the oven cover for the solvent loading/unloading, see paragraph 7.8).

When the tray is open, samples can be loaded or removed.
Tap "CLOSE" to close the tray after sample loading/unloading.

7.8 Load and Unload Solvent Vials

Only for Liquid Mode

Access sequence: RUN>LOAD SAMPLE/SOLVENT

The unit will open the oven cover (The unit opens also the tray for the sample vial loading/unloading, see paragraph 7.7).

When the oven cover is open, solvent vials can be loaded or removed.
Tap "CLOSE" to close the oven cover after solvent vial loading/unloading.

7.9 Settings Menu

Access sequence: RUN>SETTINGS

In this screen the following sub menus are available:

- **Methods:** see paragraph 5 "Programming Method";

- **Sequences:** see paragraph 6 "Programming Sequence";

- **Tray Type:** see paragraph 7.9.1 "Change tray/rack type";

- **View Parameters:** see paragraph 4.1 "View Parameters";

- **Setup:** see paragraph 4.2 "Setup";

- **Eco Savings**: used to set the stand by parameters (see paragraph 7.9.2 only for Headspace and SPME mode).

Tap "**Exit**" to exit from the "RUN: SETTINGS" screen and return to the home screen.

7.9.1 Change tray/rack type
This function is used to change the rack type to be used during the run.

This operation has to be performed when the autosampler is installed on a GC.
Access sequence: RUN>SETTINGS>TRAY TYPE

In the "TRAY TYPE" screen you will see a list of the racks stored in the unit memory.

The racks are described by the number of vial positions, dimension of sample vials and needle draw depth inside the sample vial (example: 42-10ml-20mm). Select the rack type to install. If the rack is not shown in the tray list it has to be created (see paragraph 4.2.1.5 "Alignment: Tray Install ").

A wizard for mounting the new rack/s starts. Follow it:

- if necessary, remove the old rack (do not do this during autosampler installation);
- install the new rack (see paragraph 7.9.1.1 "Rack mounting");
- Place a vial in the indicated position. Tap "Continue" to go on, otherwise "ABORT";
- The unit will ask to run the touch procedure. This can be run (recommended) or skipped.

Warning

If the dimension of the sample vials has been modified (6ml-10ml-20ml) or if there is a modality change (from Headspace/SPME to liquid mode and viceversa), the user has to install or remove (if present) the spacers in the oven using the suitable tweezers (Spacers kits are sold as options, see paragraph 1.7.2 "Options "). Select "**Exit**" to exit from the "TRAY TYPE" screen.

7.9.1.1 Rack mounting

Place the rack in the tray paying attention that the letter A has to face toward the operator (see figure below as example).
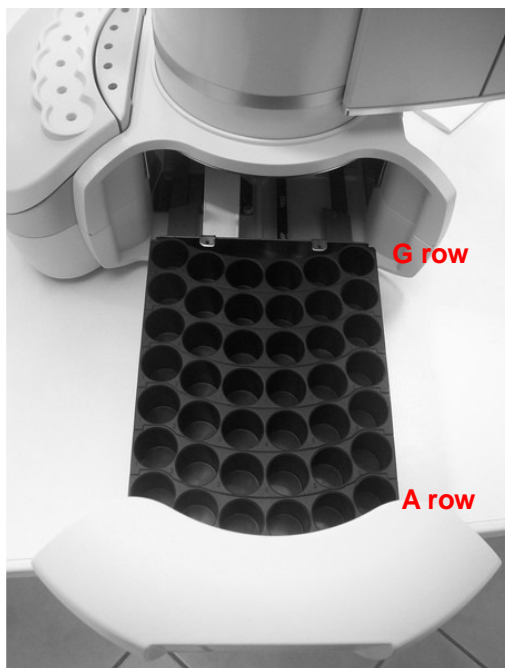
Figure 144: Rack placing

7.9.2 Eco Savings

Only for Headspace and SPME mode.

This function is used to set the stand by temperatures.

Access sequence: RUN>SETTINGS>ECO SAVINGS In

the "Eco Savings" screen you can set:

- **St by syringe**: only for Headspace mode. It sets the syringe stand by temperature. This value can be between 40℃ and 150℃ (active conditioning) or off (inactive conditioning);

- **St by oven**: sets the oven stand by temperature. This value can be between 40℃ and 170℃ (active conditioning) or off (inactive conditioning);

- **St by flush**: only for Headspace mode. It allows the user to open or close the valve that controls the purging gas flow inside the syringe. Select one of the following values:

On	The valve is open and the gas is flushing inside the syringe

Off	The valve is closed.

Select "**Exit**" to exit from the "Eco Savings" screen and return to the home screen.

7.10 Change Mode

This function is used to change the autosampler mode.

Access sequence: RUN>CHANGE MODE

In this screen you can switch the mode:

- **Headspace:** switches to the Headspace mode;.

- **Liquid:** switches to the liquid mode;

- **SPME:** switches to the SPME mode;

In this screen you can see the current mode (Last Used Configuration). At the first autosampler switch on, the default mode is "Headspace".

Tap the button corresponding to the current mode to exit from the "Change Mode" screen and return to the home screen.

Each switching operation is followed by a dedicated wizard. In the following paragraphs you can find a description of the operations to be performed for each switch:

- Change from Headspace to Liquid mode (7.10.1)
- Change from SPME to Liquid mode (7.10.2)

- Change from Liquid to Headspace mode (7.10.3)

- Change from Liquid to SPME mode (7.10.4)

- Change from Headspace to SPME mode (7.10.5)

- Change from SPME to Headspace mode (0).

7.10.1   Change from Headspace to Liquid mode

Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options" and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

Warning

If syringeID system is used, the syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 "Liquid mode"). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Follow this procedure to move from Headspace   to Liquid mode
Access sequence: RUN>CHANGE MODE>LIQUID

The screen "You are moving to Liquid mode" confirms the start of the changing procedure. Tap "CONTINUE"" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing up the sliding lid and follow the wizard:

1) "Remove vial locator" screen: remove the vial locator for Headspace/SPME using the supplied allen key to loose the fixing screws (see paragraph 2.3 " Tool kit") and tap "CONTINUE".

Figure 145: Change from Headspace to liquid mode_Remove vial locator

2) "Remove and install new syringe" screen:

a) <u>Remove the syringe warmer assembly</u>: remove the plunger locker by pulling it out using the syringe pointer (figure below - a and b); remove the retaining nuts as shown in the figure below (figure below - c and d) and finally remove the syringe warmer assembly with care, as shown in the figure below (figure below - e and f).
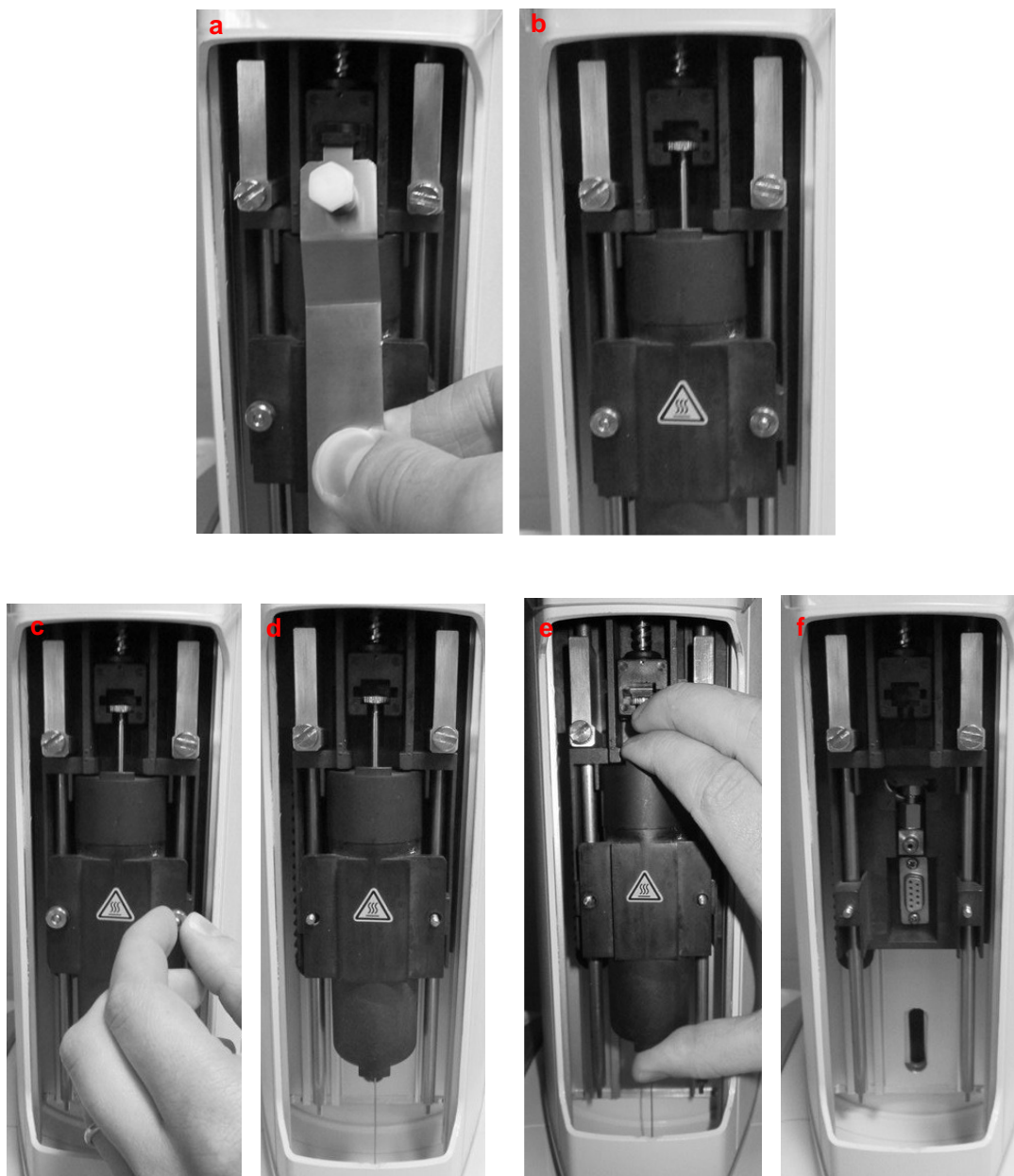
Figure 146: Syringe warmer assembly removal

b) Install the syringe holder for liquid configuration. Mount the liquid syringe-holder by aligning the holes of the syringe holder to the threaded inserts (see figure below - a), and anchoring the intermediate needle guide. Finally fix it with the nuts keeping the holder pressed upwards (see figure below - b):
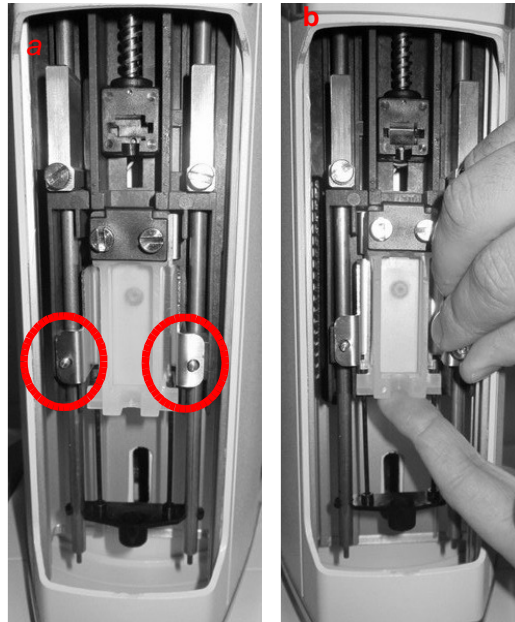
Figure 147: Liquid syringe holder mounting
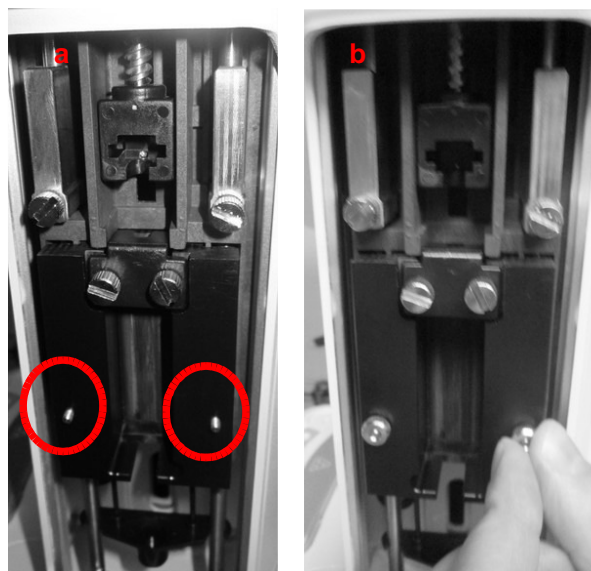
Figure 148: Liquid syringe holder mounting (syringeID system purchased and enabled)

c) Install the syringe for liquid configuration: remove the syringe locker (*Figure 149* or *Figure 150* if the syringeID system is enabled - a and b); place the syringe into its holder: insert the needle through the intermediate needle guide, insert the syringe body into the holder and lastly position the plunger into its lodging (*Figure 149* or *Figure 150* if the syringeID system is enabled - c); reposition the syringe locker tightening the two screws carefully; during the screwing, hold the syringe locker pressed down (*Figure 149* or *Figure 150* if the syringeID system is enabled - d) and finally reinsert the piston locker ensuring that the appropriate face is used (*Figure 149* or *Figure 150* if the syringeID system is enabled - e) (if in doubt see 12 "Appendix B – Consumables").
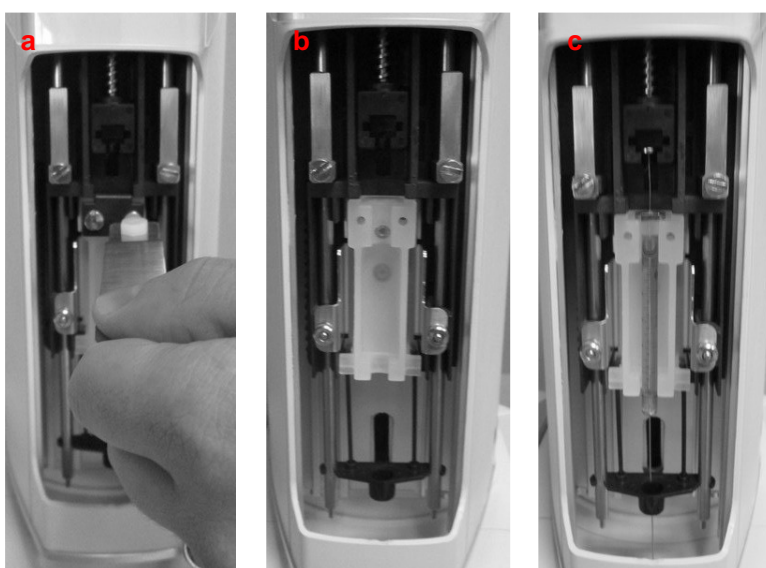
Figure 149: Liquid syringe installation
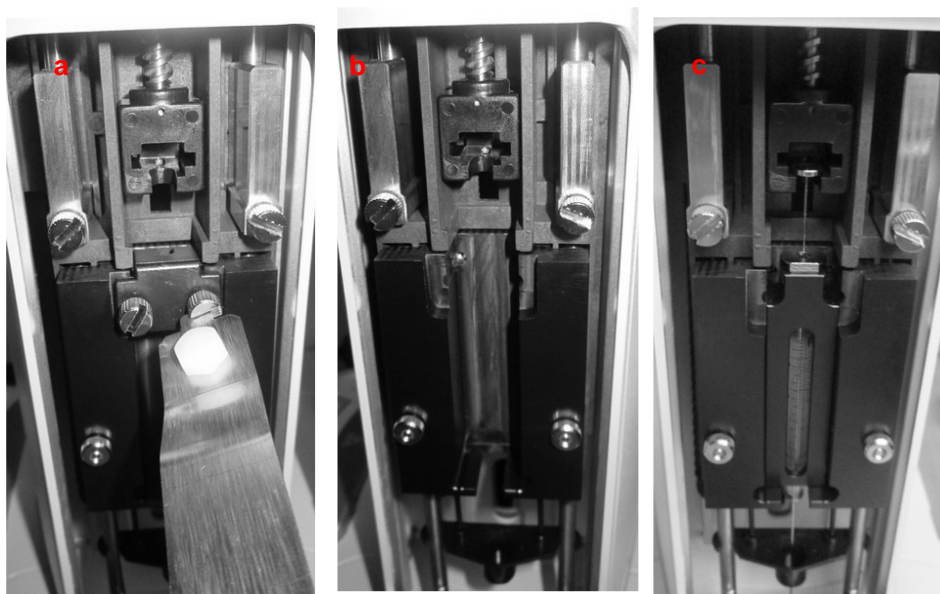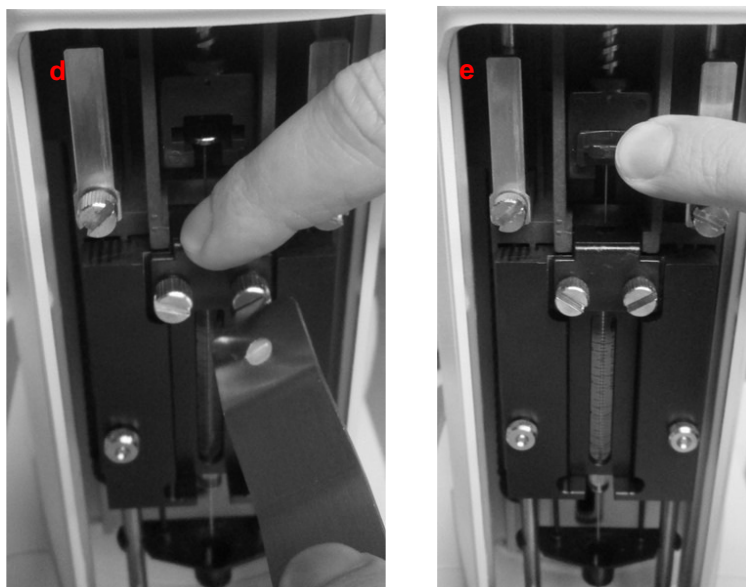
Figure 150: Liquid syringe installation (syringeID system purchased and enabled)

d) Tap "CONTINUE".

3) "Mount vial locator" screen: install the vial locator for liquid configuration using the supplied allen key to fix the fixing screws (see paragraph 2.3"Tool kit") and tap "CONTINUE".
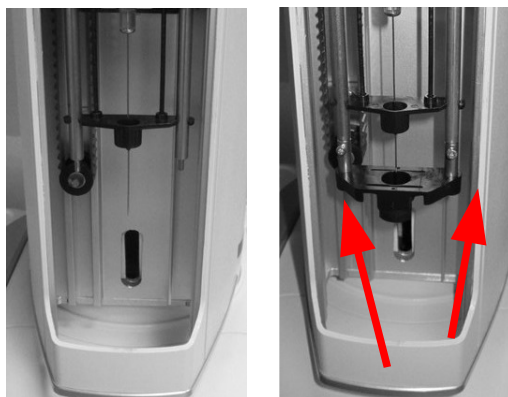
Figure 151: Mount liquid vial locator

4) "Select syringe volume" screen: select the volume of the installed syringe and press "SAVE". The syringe volume is automatically detected if syringeID system has been purchased and enabled (see 1.7.2 "Options" and 4.2.6.8 "Setup configuration: SyringeID").

5) "Insert new rack" screen: remove the rack for 20/10/6ml vial and install the rack for 2ml vials, then press "CONTINUE".

Figure 152: Rack for 2ml vials installation

6) "Insert black spacers and vials in position A6, C and waste vial in proper position" screen: insert the six black spacers for liquid configuration in the oven, a 2ml sample vial in the A.6 position of the rack, a solvent vial in position C of the oven and a waste vial into its the dedicated position on the back of the autosampler (see paragraph 2.1.1.1 "HT2800T/HT2850T Main parts"), then press "CONTINUE".

7) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2 "Alignment: Front Injector"and 4.2.1.3 "Alignment: Rear Injector").

7.10.2   Change from SPME to Liquid mode

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Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

⚠️

Warning

If syringeID system is used, the syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 "Liquid mode "). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Follow this procedure to move from SPME to Liquid mode

Access sequence: RUN>CHANGE MODE>LIQUID

The screen "You are moving to Liquid mode" confirms the start of the changing procedure. Tap "CONTINUE" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing up the sliding lid and follow the wizard:

8) "Remove vial locator" screen: remove the vial locator for Headspace/SPME using the supplied allen key to loose the fixing screws (see paragraph 2.3 "Tool kit" and tap "CONTINUE".
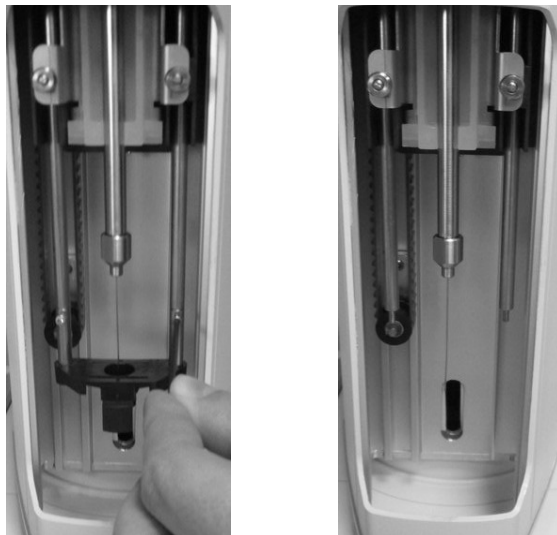
Figure 153: Change from SPME to liquid mode_Remove vial locator

9) "Remove and install new syringe" screen:

a) Remove the Fiber holder: remove the plunger locker by pulling it out using the syringe pointer (figure below - a and b); remove the retaining nuts as shown in the figure below (figure below - c and d) and finally remove the Fiber holder with care (figure below - e).
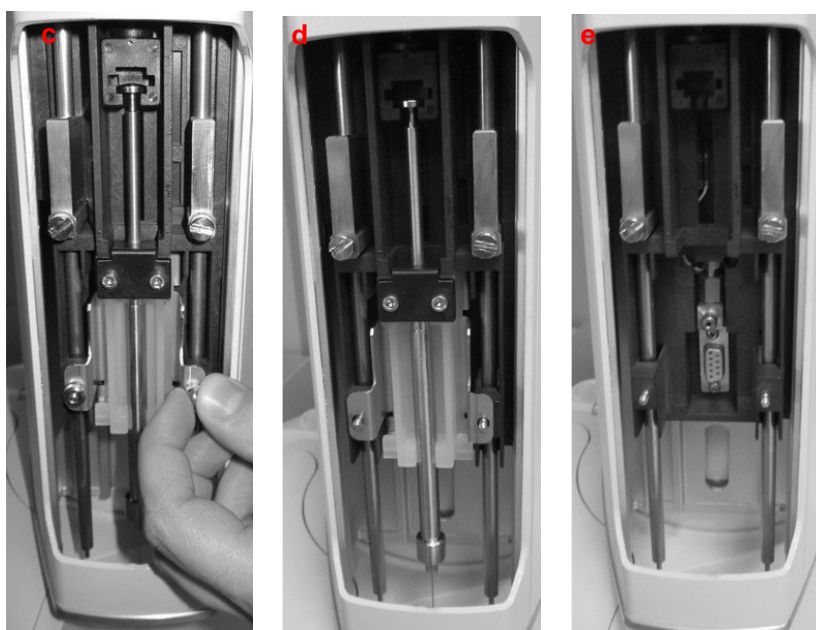
Figure 154: SPME Fiber holder removal

b) Install the syringe holder for liquid configuration. Mount the liquid syringe-holder by aligning the holes of the syringe holder to the threaded inserts (see figure below - a), and anchoring the intermediate needle guide. Finally fix it with the nuts keeping the holder pressed upwards (see figure below - b):
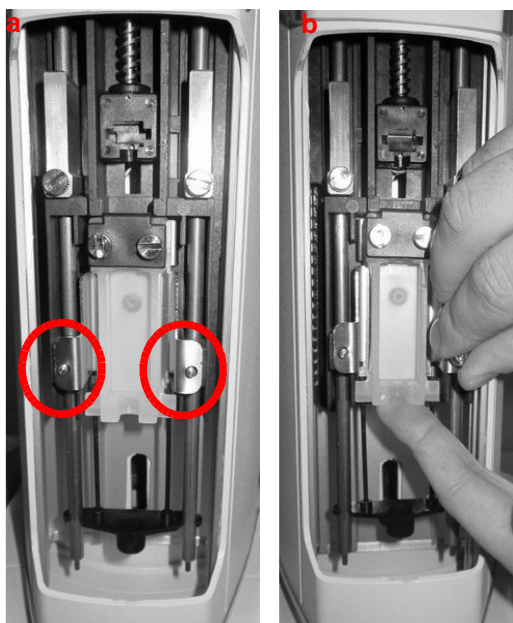
Figure 155: Liquid syringe holder mounting
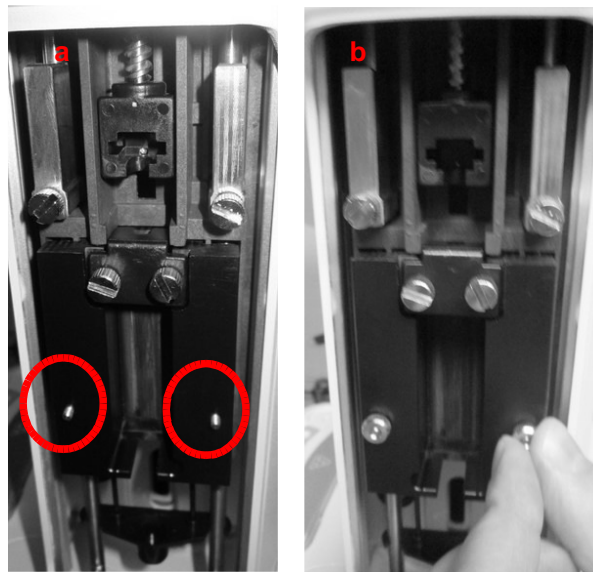
Figure 156: Liquid syringe holder mounting (syringeID system purchased and enabled)

c) Install the syringe for liquid configuration: remove the syringe locker (***Figure 157*** and ***Figure 158*** if the syringeID system is enabled - a and b); place the syringe into its holder: Insert the needle through the intermediate needle guide, insert the syringe body into the holder and lastly position the plunger into its lodging (***Figure 157*** and ***Figure 158*** if the syringeID system is enabled - c); reposition the syringe locker tightening the two screws carefully: during the screwing, hold the syringe locker pressed down (***Figure 157*** and ***Figure 158*** if the syringeID system is enabled - d) and finally reinsert the piston locker ensuring that the appropriate face is used (***Figure 157*** and ***Figure 158*** if the syringeID system is enabled - e) (if in doubt see 12 "Appendix B – Consumables").
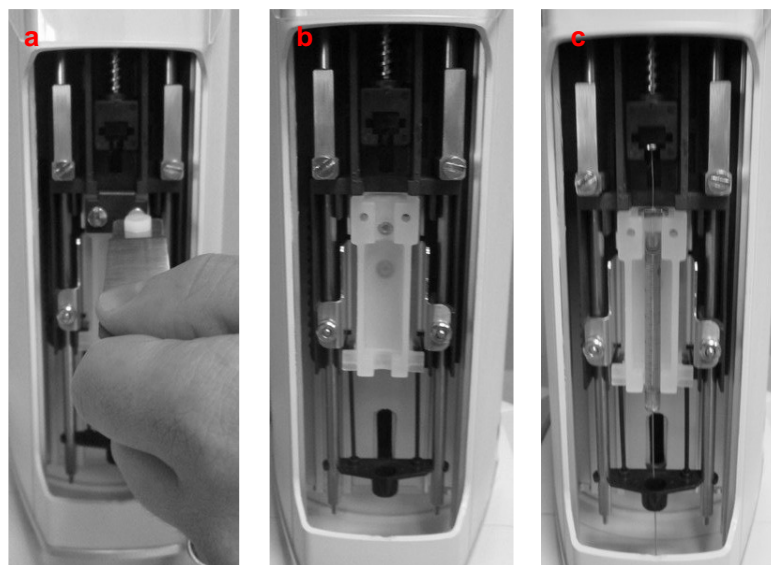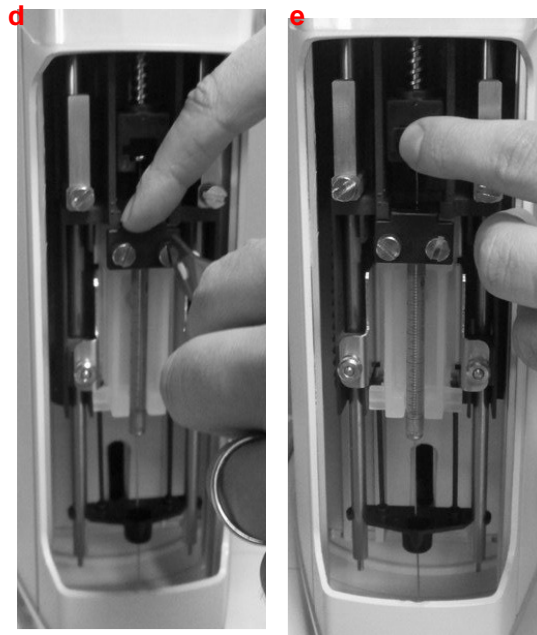
Figure 157: Liquid syringe installation
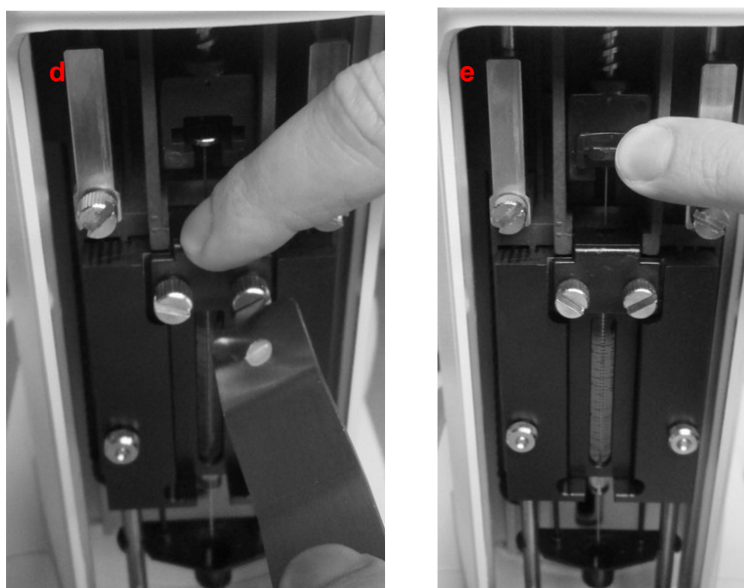
Figure 158: Liquid syringe installation (syringeID system purchased and enabled)

       d) Tap "CONTINUE".

10) "Mount vial locator" screen: install the vial locator for liquid configuration using the supplied allen key to fix the fixing screws (see paragraph 2.3 "Tool kit") and tap "CONTINUE".
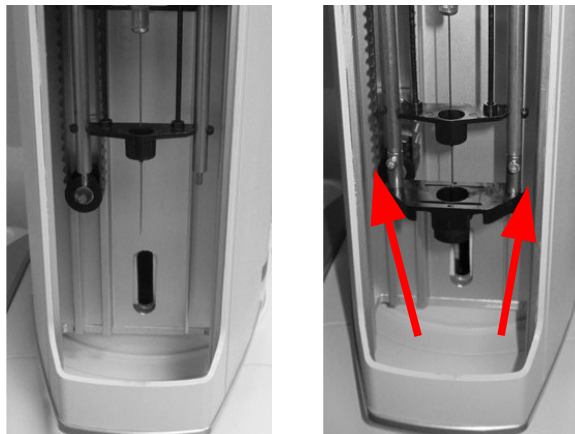
Figure 159: Mount liquid vial locator

11) "Select syringe volume" screen: select the volume of the installed syringe and press "SAVE". The syringe volume is automatically detected if syringeID system has been purchased and enabled (see 1.7.2 "Options" and 4.2.6.8 "Setup configuration: SyringeID ").

12) "Insert new rack" screen: remove the rack for 20/10/6ml vial and install the rack for 2ml vials, then press "CONTINUE".

Figure 160: Rack for 2ml vials installation

13) "Insert black spacers and vials in position A6, C and waste vial in proper position" screen: insert the six black spacers for liquid configuration in the oven, a 2ml sample vial in the A.6 position of the rack, a solvent vial in position C of the oven and a waste vial into its the dedicated position on the back of the autosampler (see paragraph 2.1.1"HT2800T/HT2850T Overview"), then press "CONTINUE".

14) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2"Alignment: Front Injector"and 4.2.1.3"Alignment: Rear Injector").

7.10.3   Change from Liquid to Headspace mode

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Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

Warning

If syringeID system is used, the syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 "Liquid mode"). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Follow this procedure to move from Liquid to Headspace mode Access sequence: RUN>CHANGE MODE>Headspace

The screen "You are moving to Headspace mode" confirms the start of the changing procedure. Tap "CONTINUE" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing up the sliding lid and follow the wizard:

1) "Remove vial locator" screen: remove the liquid vial locator using the supplied allen key to loose the fixing screws (see paragraph 2.3 "Tool kit") and tap "CONTINUE".

Figure 161: Change from liquid to Headspace mode_Remove vial locator

2) "Remove and install new syringe" screen:

a) <u>Remove the syringe for liquid configuration</u>: remove the plunger locker by pulling it out using the syringe pointer (see figures below - a); remove the syringe locker (see figures below - b) and finally remove the syringe (see figures below - c and d)
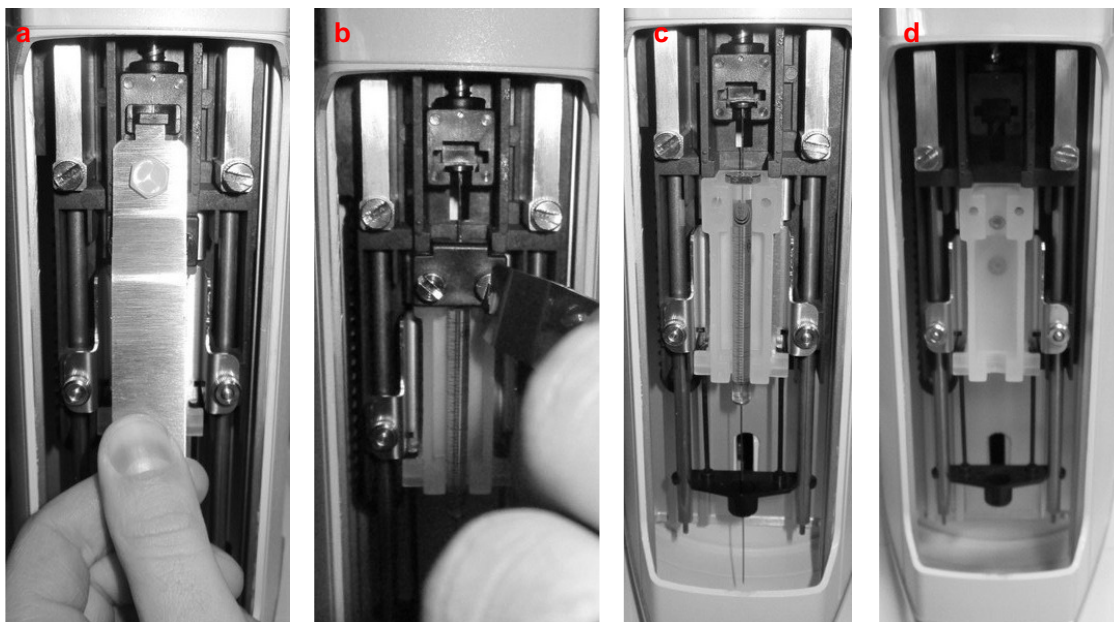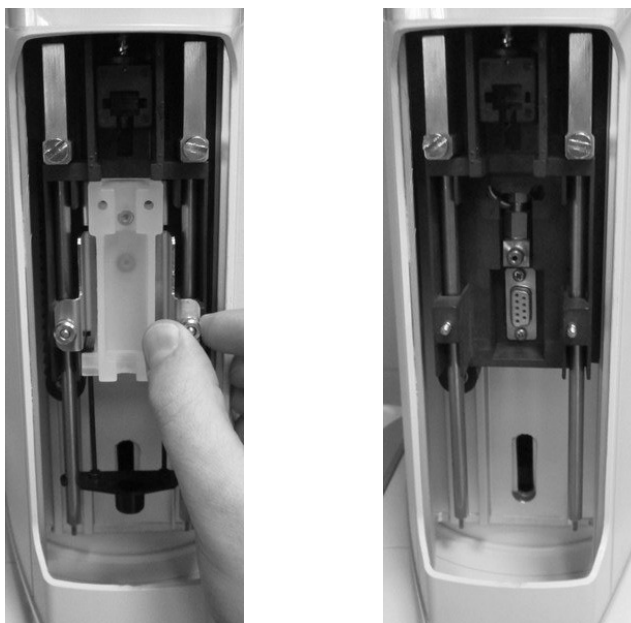

Figure 162: Liquid syringe removal
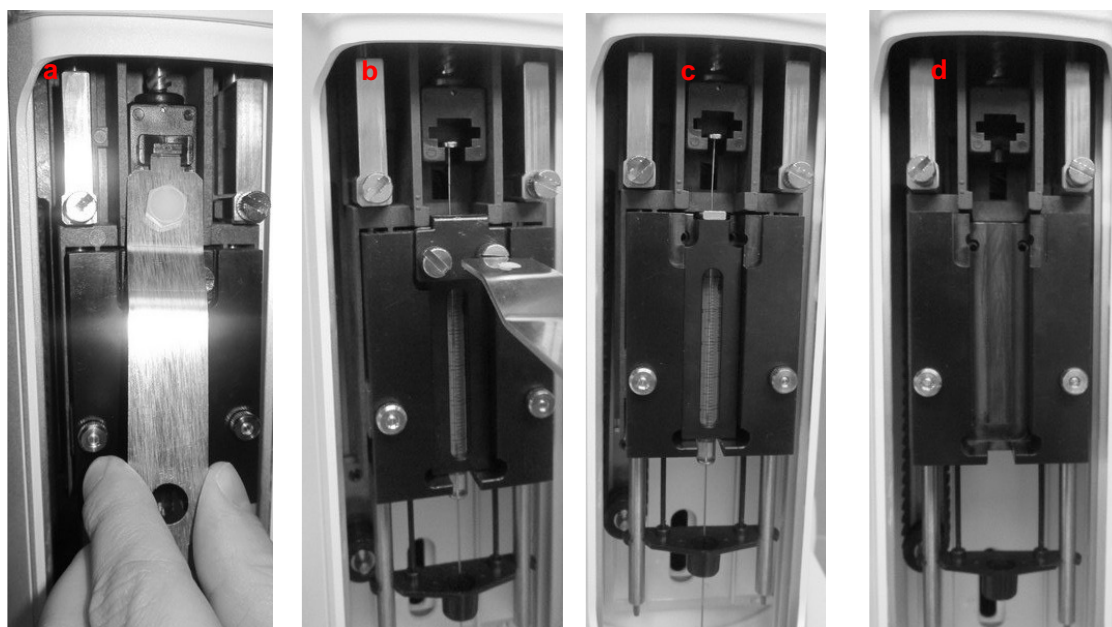
Figure 163: Liquid syringe holder removal (syringeID system purchased and enabled)

b) Remove the syringe holder for liquid configuration, removing the retaining nuts and
disengaging the intermediate needle guide as shown in the figure below.

Figure 164: Liquid syringe holder removal

Figure 165: Liquid syringe removal (syringeID system purchased and enabled)

c) <u>Install the syringe warmer assembly</u>. Fix the syringe warmer assembly by aligning the holes of the syringe warmer assembly to the threaded inserts (figure below - a), then fix it with the nuts keeping the warmer pressed upwards (figure below - b) and finally install the plunger locker (figure below - c) ensuring that the B side (see 2.1.2.1) is faced downward.
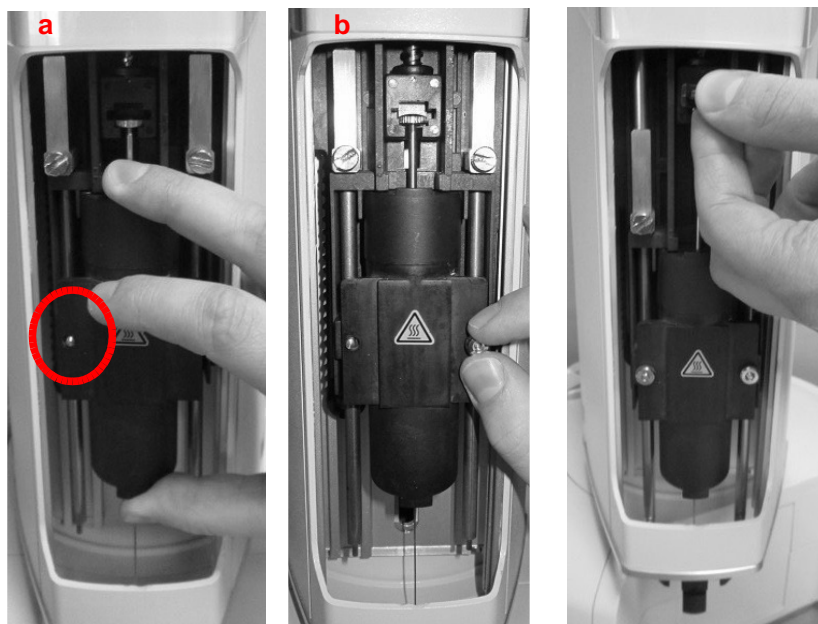
Figure 166: Syringe warmer assembly mounting

d) Tap "CONTINUE".

3) "Mount vial locator" screen: install the vial locator for Headspace/SPME using the supplied allen key to fix the fixing screws (see paragraph 2.3 "Tool kit") and tap "CONTINUE".
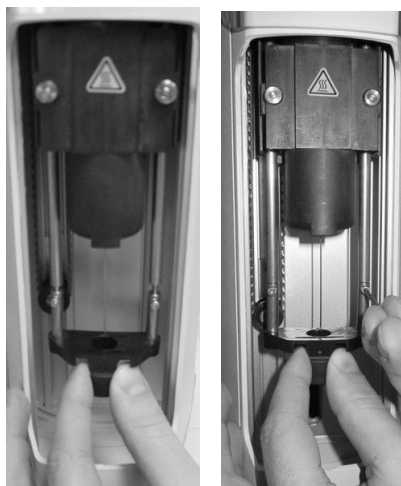
Figure 167: Mount Headspace vial locator

4) "Select syringe volume" screen: select the volume of the installed syringe and press "SAVE".

5) "Insert new rack" screen: remove the rack for 2ml vial and install the rack for 6/10/20ml vials, then press "CONTINUE".

Figure 168: Rack for 6/10720ml vials installation

6) "Remove spacers and insert vials in position A4, C and System Integrity Tool in proper position" screen: remove the six black spacers for liquid configuration in the oven using the supplied tweezers (see paragraph 2.3 "Tool kit"), add a headspace sample vial[12] in A.4 position of the rack and in position C of the oven and a the System Integrity Tool (only if you purchased the GLP pack, see paragraph (1.7.2 "Options"). into the dedicated

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[12] **The headspace vial to be put in the rack must have the same volume of the vial used last time in headspace mode.**

position on the back of the autosampler (see paragraph 2.1.1 "HT2800T/HT2850T Overview "), then press "CONTINUE".

Figure 169: Spacer removal

7) "Remove vial from oven" screen: remove the 20ml vial from C position of the oven.

8) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector").

7.10.4 Change from Liquid to SPME mode

Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (1.7.2 "Options and 11.2 "Liquid mode). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

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Warning

If syringeID system is used, the syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 "Liquid mode"). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Follow this procedure to move from Liquid to SPME mode
Access sequence: RUN>CHANGE MODE>SPME

The screen "You are moving to SPME mode" confirms the start of the changing procedure. Tap "CONTINUE" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing up the sliding lid and follow the wizard:

9) "Remove vial locator" screen: remove the liquid vial locator using the supplied allen key to loosen the fixing screws (see paragraph 2.3 "Tool kit") and tap "CONTINUE".
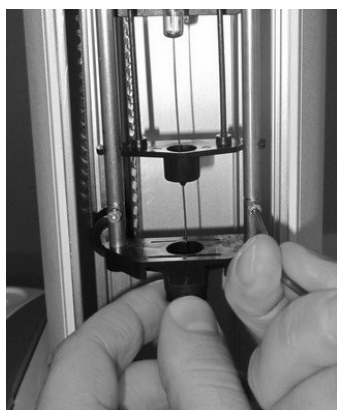
Figure 170: Change from liquid to Headspace mode_Remove vial locator

10) "Remove and install new Fiber holder" screen:

a) <u>Remove the syringe for liquid configuration:</u> remove the plunger locker by pulling it out using the syringe pointer (see figures below - a); remove the syringe locker as shown in the figure below (see figures below - b) and finally remove the syringe (see figures below - c and d).
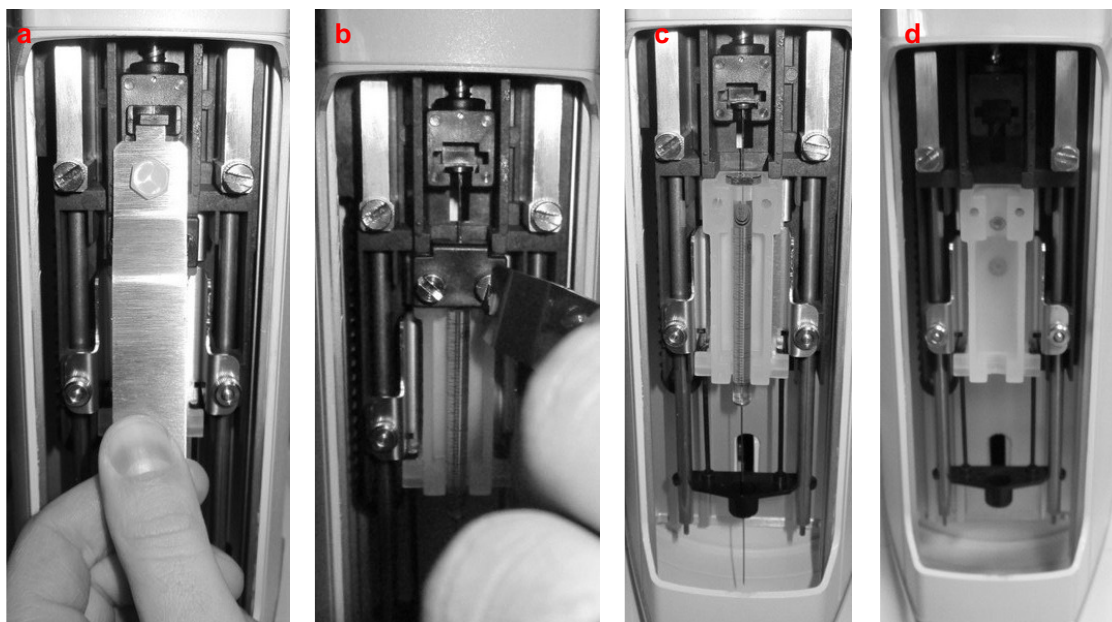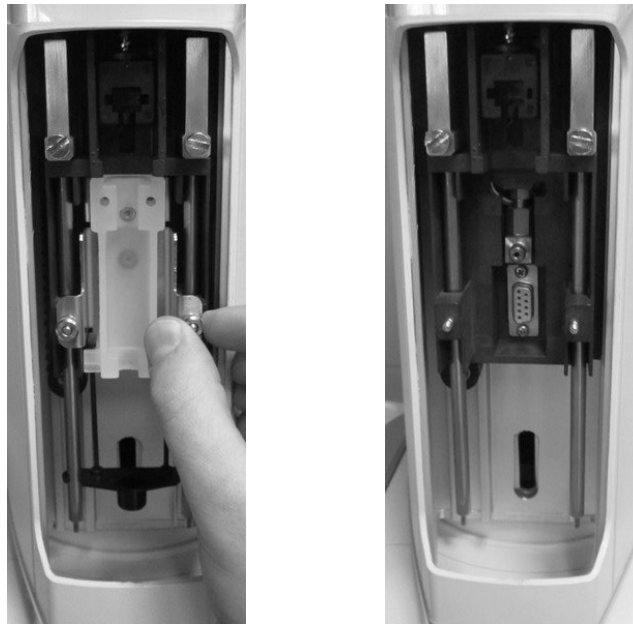

Figure 171: Liquid syringe removal
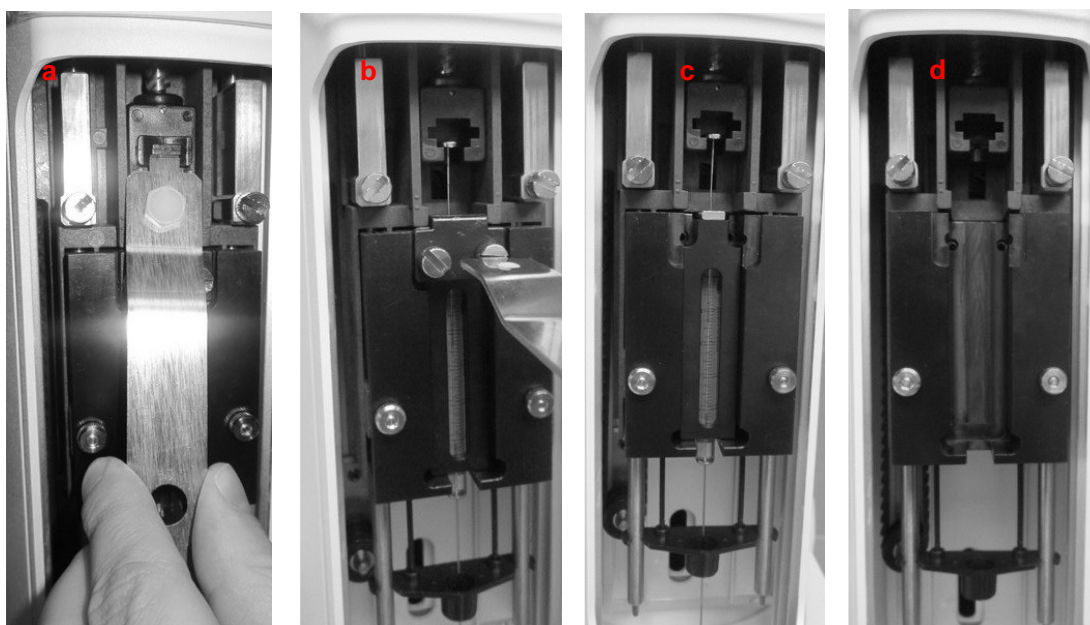
Figure 172: Liquid syringe holder removal (syringeID system purchased and enabled)

b) Remove the syringe holder for liquid configuration, remove the retaining nuts as shown in the figure below.

Figure 173: Liquid syringe holder removal

Figure 174: Liquid syringe removal (syringeID system purchased and enabled)

c) Install the Fiber holder. Fix the Fiber holder by aligning the holes of the Fiber holder to the threaded inserts (figure below - a), then fix it with the nuts keeping the holder pressed upwards (figure below - b and c) and finally install the plunger locker (figure below -d), ensuring that the appropriate face is used (if in doubt see 1 2 " Appendix B – Consumables").
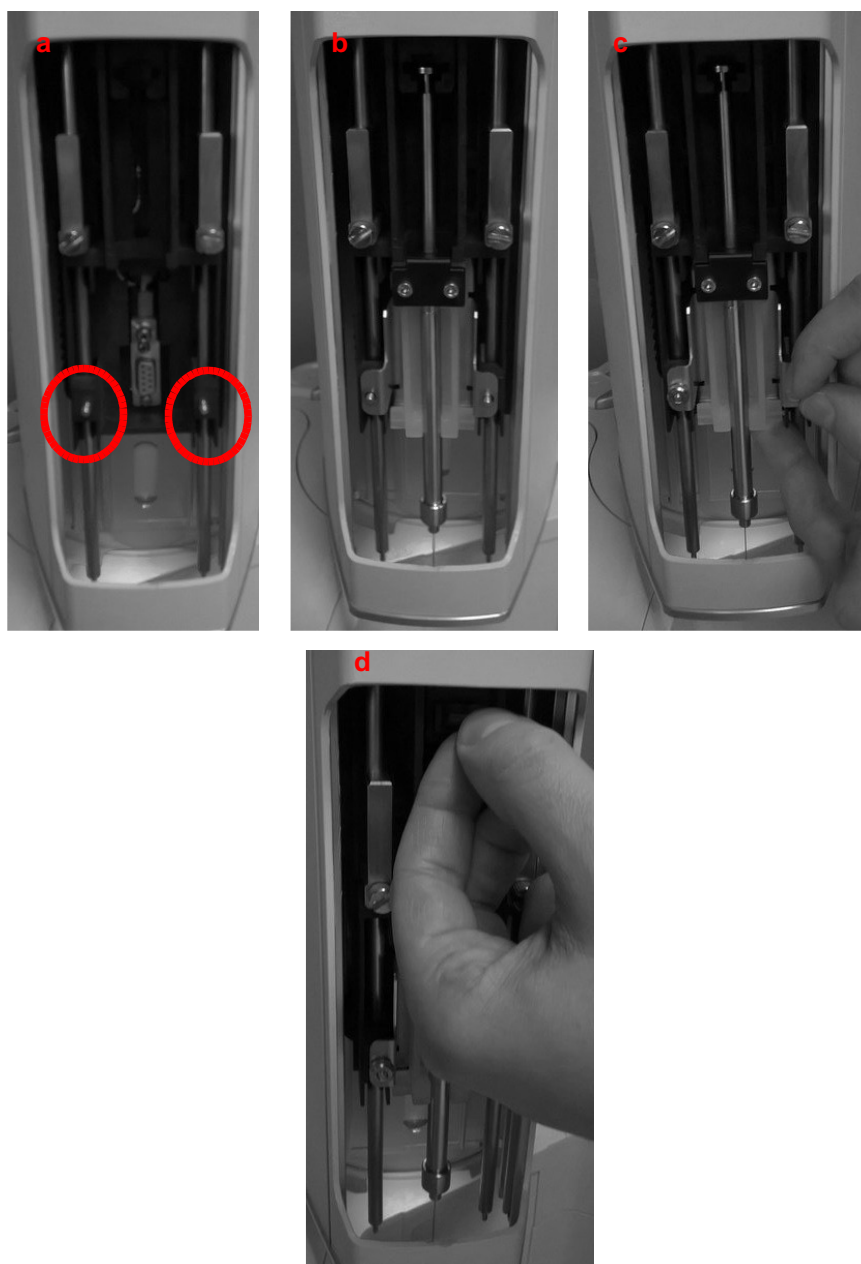
Figure 175: Fiber holder mounting

d) Tap "CONTINUE".

11) "Mount vial locator" screen: install the vial locator for Headspace/SPME using the supplied allen key to fix the fixing screws (see paragraph 2.3 "Tool kit") and tap "CONTINUE".

Figure 176: Mount Headspace vial locator

12) "Fiber lenght" screen: select the lenght of the installed Fiber and press "SAVE". If the Fiber length has been modified, please check compatibility with injector depth values (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector ").

13) "Insert new rack" screen: remove the rack for 2ml vial and install the rack for 6/10/20ml vials, then press "CONTINUE".

Figure 177: Rack for 20ml vials installation

14) "Remove spacers and insert vials in position A4, C and wash vial in proper position" screen: remove the six black spacers for liquid configuration in the oven using the supplide tweezers (see paragraph 2.3 "Tool kit"), a 20ml sample vial in A.4 position of the

rack and in position C of the oven and the wash vial into its the dedicated position on the back of the autosampler (see paragraph 2.1.1 "HT2800T/HT2850T Overview"), then press "CONTINUE".

Figure 178: Spacer removal

15) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector ").

16) "Remove vial from oven" screen: remove the 20ml vial from C position of the oven.

7.10.5 Change from Headspace to SPME mode

Follow this procedure to move from Headspace to SPME mode Access

sequence: RUN>CHANGE MODE>SPME

The screen "You are moving to SPME mode" confirms the start of the changing procedure. Tap "CONTINUE" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing up the sliding lid and follow the wizard:

1) "Remove and install new Fiber holder" screen:
a)Remove the syringe warmer assembly: remove the plunger locker by pulling it out using the syringe pointer (figure below - a and b); remove the retaining nuts as shown in the figure below (figure below - c and finally remove the syringe warmer assembly with care, as shown in the figure below (figure below - d and e).
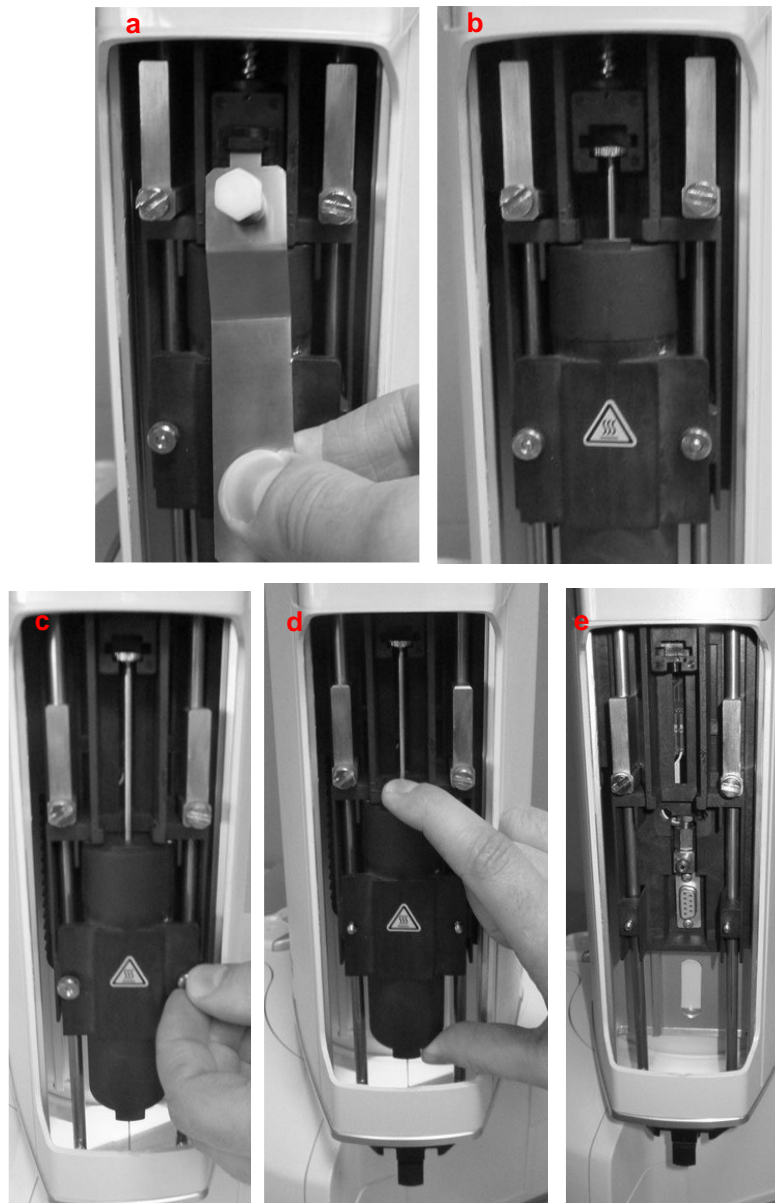
Figure 179: Syringe warmer assembly removal

b) Install the Fiber holder. Fix the Fiber holder by aligning the holes of the Fiber holder to the threaded inserts (figure below - a and b), then fix it with the nuts keeping the holder pressed upwards (Figure 171 - c) and finally install the plunger locker (figure below - d and e) ensuring that the appropriate face is used (if in doubt see 12 "Appendix B – Consumables") .
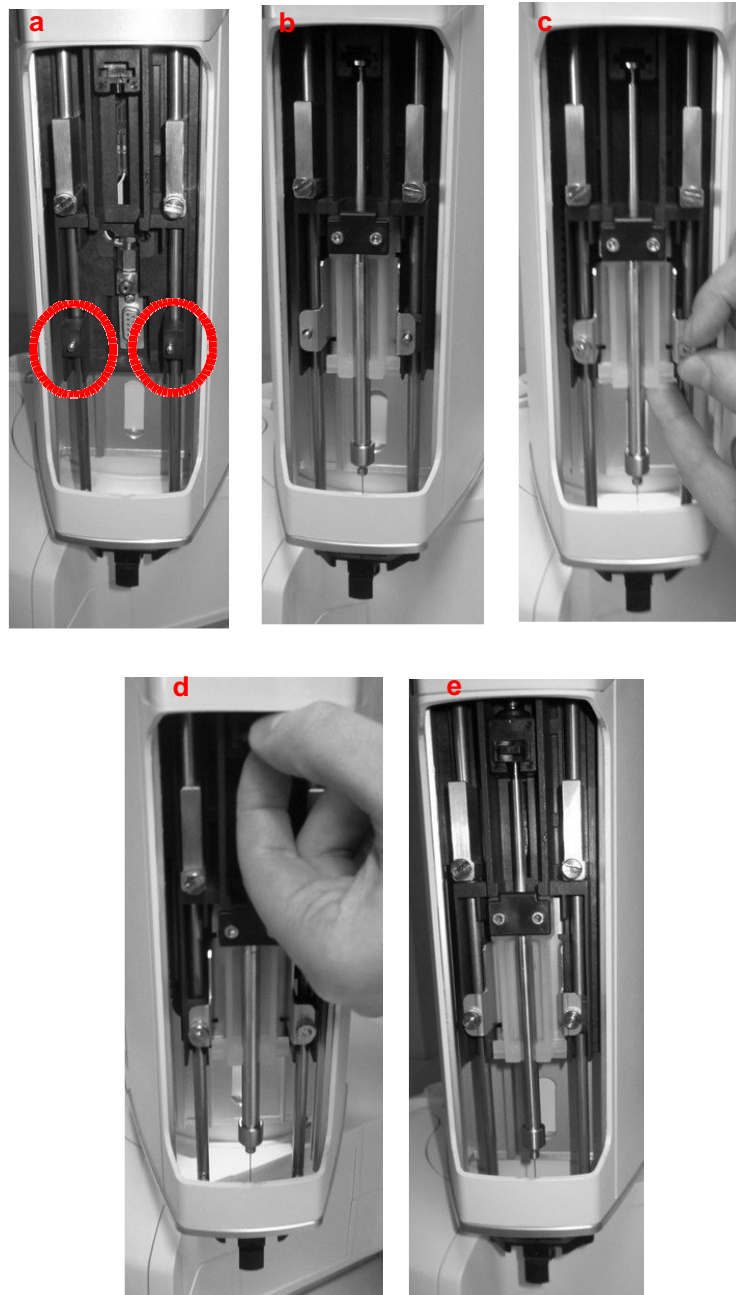
Figure 180: Fiber holder mounting

c)   Tap "CONTINUE".

2) "Fiber lenght" screen: select the lenght of the installed Fiber and press "SAVE". If the Fiber length has been modified, please check compatibility with injector depth values (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector ").

3) "Remove spacers and insert vials in position A4, C and wash vial in proper position" screen: remove the spacers for 6/10ml vials in the oven (if present) using the supplied tweezers (see paragraph 2.3 "Tool kit"), a 20ml sample vial in A.4 position of the rack and in position C of the oven and the wash vial into its the dedicated position on the back of the autosampler (see paragraph 2.1.1 "HT2800T/HT2850T Overview "), then press "CONTINUE".

4) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector ").

5) "Remove vial from oven" screen: remove the 20ml vial from C position of the oven.

7.10.6   Change from SPME to Headspace mode
Follow this procedure to move from SPME to Headspace mode Access
sequence: RUN>CHANGE MODE>Headspace

The screen "You are moving to Headspace mode" confirms the start of the changing procedure. Tap "CONTINUE" to start the switching operation or "ABORT" to return to the "CHANGE MODE" screen.

Open the syringe location by pushing the sliding lid up and follow the wizard:

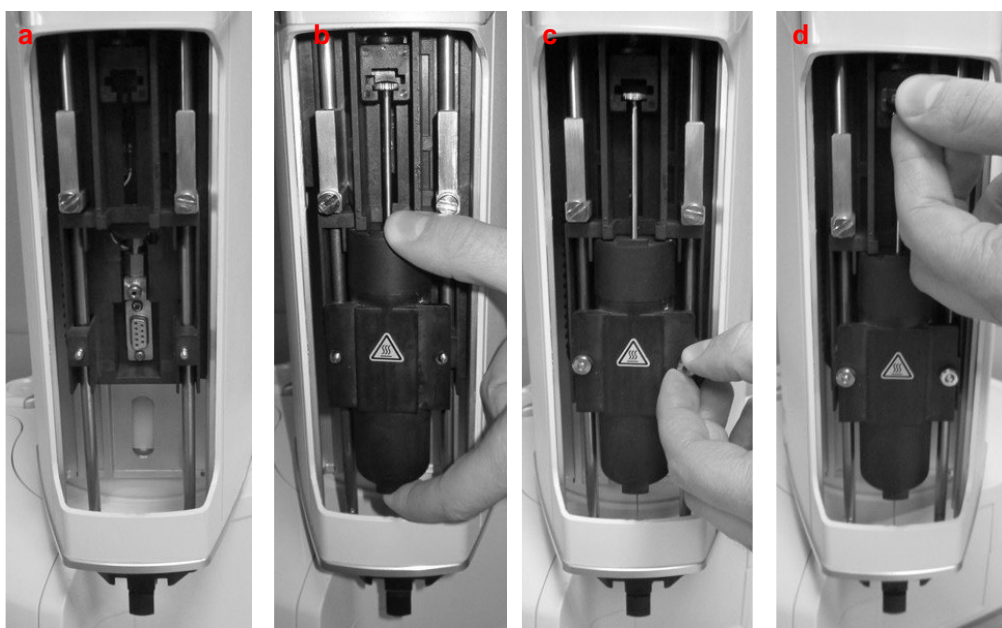1) "Remove and install new syringe" screen:

a) Remove the Fiber holder: remove the plunger locker by pulling it out using the syringe pointer (figure below - a and b); remove the retaining nuts as shown in the figure below (figure below - c and d) and finally remove the Fiber holder with care, as shown in the figure below (figure below - e).
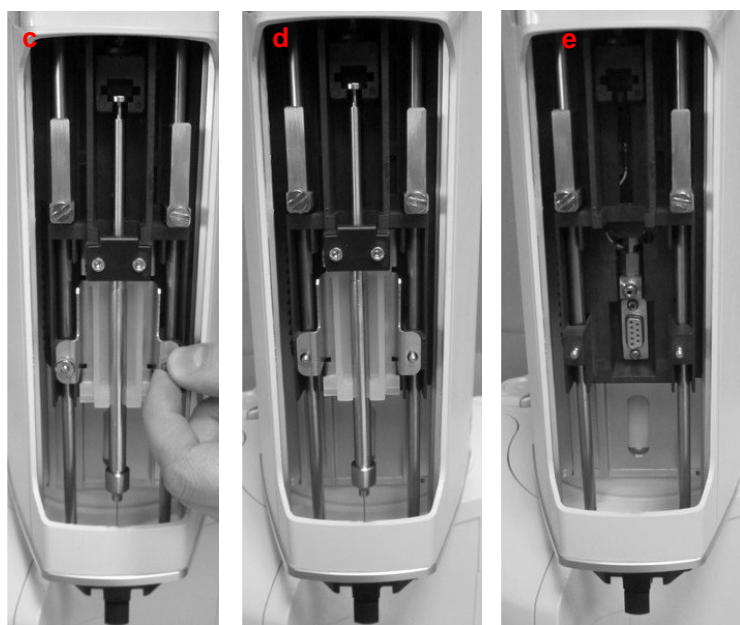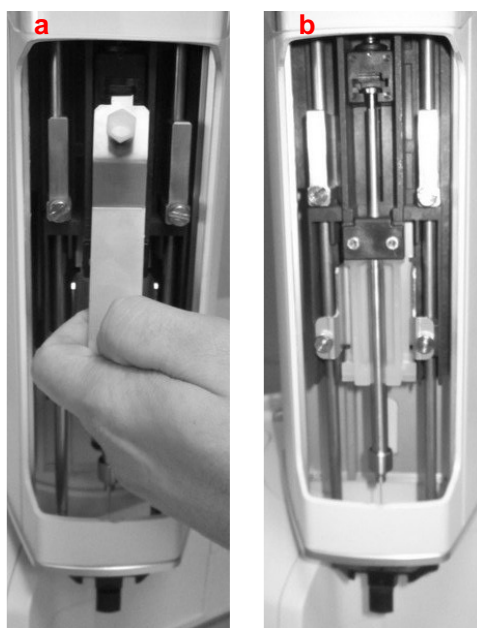
Figure 181: SPME Fiber holder removal

b) <u>Install the syringe warmer assembly</u>. Fix the syringe warmer assembly by aligning the holes of the syringe warmer assembly to the threaded inserts (figure below - a and b), then fix it with the nuts keeping the warmer pressed upwards (figure below - c) and finally install the plunger locker (figure below - d), ensuring that the B side (see 2.1.2.1) is faced downward.

Figure 182: Syringe warmer assembly mounting

    d) Tap "CONTINUE".

9) "Select syringe volume" screen: select the volume of the installed syringe and press "SAVE".

10) "Remove spacers (and insert vials in position A4, C and System Integrity Tool in proper position" screen: remove the spacers for 6/10ml vials in the oven (if present), using the supplied tweezers (see paragraph 2.3 "Tool kit"), an headspace sample vial[13] in A.4 position of the rack and in position C of the oven and a the System Integrity Tool (only if you purchased the GLP pack, see paragraph 1.7.2 "Options") into its the dedicated position on the back of the autosampler (see paragraph 2.1.1 "HT2800T/HT2850T Overview""), then press "CONTINUE".

11) If during the final Zero procedure the alignment on injector is not correct please modify it (see paragraphs 4.2.1.2 "Alignment: Front Injector" and 4.2.1.3 "Alignment: Rear Injector ").

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[13] **The headspace vial to be put in the rack must have the same volume of the vial used last time in headspace mode.**

8 Troubleshooting

8.1 Introduction

Warning

Troubleshooting must be handled by competent personnel, properly trained with the procedures described in this manual: any missing or different execution of the described procedures can cause damage to the autosampler or to the person working on it.

However, in particular, pay attention to the moving parts such as the sledge, syringe, needle

Warning

Some parts of the autosampler (oven, syringe, needle or vials) can work at high temperatures. Be careful to avoid burns. Allow these parts to cool down before handling them.

The list of the possible errors generated by the autosampler are summarized in this chapter.

If the solutions given do not solve the problem, please contact your Supplier or the Technical Assistance Centre.

Before calling the Technical Assistance Centre please check that:

- **all instructions were carefully followed;**

- **all the options listed were tried;**

- **all cables are connected correctly.**

8.2 Start up errors

8.2.1 Safety lock error

Error message:

"Is safety lock in operating position? If NO, switch off and check user manual"

Causes:

- Autosampler has not been moved from the shipping to the operating position, before the autosampler was switched on (see paragraph 3.3.2 "Safety Lock setting").
- Touch sensor is not working correctly.

Solution:

- If the autosampler has not been moved from the shipping to the operating position, as suggested by the error message, switch off the autosampler and set the safety lock as described in paragraph 3.3.2 "Safety Lock setting". Then switch on the autosampler.
- If the safety lock setting has already been performed, there is a mechanical problem. Tap "YES" and see paragraph 8.4 "Touch Sensor problems".

8.2.2 Vial locator error

Error message:

"Attention! Vial locator in critical position! Press Disengage and move the vial locator to a safe position, then press Exit "

Causes:

Autosampler was switched off suddenly, while the vial locator was picking up/replacing a vial.

Solution:

Tap "DISENGAGE" to enter the screen from which it is possible to move the motors (see paragraph 4.2.5 "Setup: Manual operations").

Raise the needle motor. If present, remove the vial from the vial locator and replace it in its original position. Check that all the vials are correctly positioned in the rack.

Finally tap "EXIT".

8.2.3 Memory error

8.2.3.1 BMO reading error
Error message:

"Error during BMO reading!"

Causes:

Autosampler cannot read the Border Mark Out parameters.

Solution:

Tap "CONTINUE". The "Setup: Service" screen appears (see paragraph 4.2.7"Setup: Service") Contact your Supplier or the Technical Assistance Centre to solve the problem.

8.2.3.2 Method reading error
Error message:

"Error during methods reading!"

Causes:

Autosampler cannot read the parameters of the saved methods.

Solution:

Tap "CONTINUE". Try to switch on-off the autosampler. If the error message appears again, contact your Supplier or the Technical Assistance Centre to solve the problem.

8.2.3.3 Sequence reading error
Error message:

"Error during sequences reading!"

Causes:

Autosampler cannot read the parameters of the saved sequences.

Solution:

Tap "CONTINUE". Try to switch on-off the autosampler. If the error message appears again, contact your Supplier or the Technical Assistance Centre to solve the problem.

8.3 Method errors

8.3.1 Fill Volume/Pull Up Strokes setting incompatibility
Only for Headspace or liquid mode

Error message:

"Please add a volume for Fill Volume or set to 0 Pull-up strokes"

Causes:

You have set a "Fill volume" to zero, but you have set "Pull Up Strokes" to a value different to zero. These settings are not compatible.

Solution:

Tap "CONTINUE" to edit the method (set "Fill volume" to a value different from zero or set the "Pull Up Strokes" to zero).

8.3.2 Fill volume/Syringe Pre-Fill setting incompatibility
Only for Headspace mode

Error message:

"Please add a volume for Fill Volume or set to NO Syringe Pre-Fill"

Causes:

You have set a "Fill volume" to zero, but you have set the Syringe Pre-Fill to "YES". These settings are not compatible.

Solution:

Tap "CONTINUE" to edit the method (set "Fill volume" to a value different from zero or set the "Syringe Pre-fill" to NO).

8.3.3 Internal Standard setting error
Only for liquid mode

Error message:

"Please add a volume for Internal Standard or disable Internal Standard"

Causes:

You are saving a method, in which in the Internal Standard parameter screen (5.2.2.3 "Internal standard parameters ") you have set "Enable: YES" but Internal Standard "Volume" to "0".

Solution:

Tap "CONTINUE". The Internal Standard parameter screen automatically appears. From this screen set "Enable: NO" or change the Internal Standard "Volume" to a value different from "0". Then tap "EXIT" and save the current method.

8.3.4 "Sample washes" setting error

Error message:

"Please add a volume for Fill Volume or set to 0 Sample Washes""

Causes:

You are saving a method, in which in the Sample parameter screen (5.2.2.4 "Sample parameters")you have set the number of "Sample washes" to a value different from "0" but the "Fill Volume" to "0".

Solution:

Tap "CONTINUE". The Sample parameter screen automatically appears. From this screen set "Sample Washes" to "0" or set the "Fill Volume" to a value different from "0".

Then tap "EXIT" and save the current method.

8.4 Touch Sensor problems

Error message:

"Warning: Check Touch Sensor!"

Causes:

Touch sensor is not working correctly (normally always on). It is possible that there are mechanical problems.

Solution:

Tap "DISENGAGE" to enter the screen from which it is possible to move the motors to try to unlock the system and solve the problem (see paragraph 4.2.5 "Setup: Manual operations ").

Ensure that the vial locator can move up and down freely and that the left safety lock is higher than the right lock (see paragraph 3.3.2 "Safety Lock setting").

To exit manual operations, tap "EXIT". If the problem is solved, the autosampler will re-start the Automatic run procedure from the point of interruption.

8.5 Falling vials

In most cases if a vial falls during transport the problem is due to an incorrectly crimped cap (see paragraph 3.7.3 "Vial capping (Crimping Cap)" for correct vial capping).

Warning

The autosampler only works properly by using vials with a round bottom. It has been tested with vial types reported in 12.1.2 "Sample vials ".

To reduce this problem, the crimping tool should be regularly checked to ensure that the cap cannot turn once it is crimped, and that the under edge of the cap is flush with the vial lip. Also, check that any obstacles do not hinder the turret and that the vial handlers at the end of the arm are clean.

In that case we recommend to check:

- check the vial handlers are not broken;

- check the vial, septa and the crimp cap;

- check if the turret has had an unexplained collision with some object, and if vial handlers or the vials are dirty.
- check the turret alignment, if not correct, contact your Supplier or the Technical Assistance Centre.

8.6 Obstacle found

Error message:

"Warning: Obstacle found over the X!" "Try to remove the obstacle"

(Where "X" can be a sample vial, a position in the oven or the front or rear Injector)

Causes:

The autosampler has found an obstacle over the indicated position.

Solution:

Remove the obstacle. If necessary, tap "DISENGAGE" to enter the manual operation screen to move the motors and unlock the system (see paragraph 4.2.5 "Setup: Manual operations").To exit manual operations, tap "EXIT".

Tap "RETRY" to re-start the Automatic run procedure from the point of interruption.

If the problem persists, the Touch & Plunger procedure must be repeated 4.2.1.4 "Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)".

8.7 Obstacle found during cover movement

Error message:

"Warning: Obstacle found during cover movement!" "Try to remove the obstacle"

Causes:

The autosampler has found an obstacle during cover movement

Solution:

Remove the obstacle. If necessary, tap "DISENGAGE" to enter the manual operation screen to move the motors and unlock the system (see paragraph 4.2.5 "Setup: Manual operations).To exit manual operations, tap "EXIT".

Tap "RETRY" to re-start the Automatic run procedure from the point of interruption.

8.8 Lack of a Vial (waste or solvent vial for liquid mode, washing vial for SPME mode)

Error message:

"Warning: X missing!"

"Insert the vial, then press Retry"

(Where "X" can be the waste vial or a reagent vial)

Causes:

A vial is missing.

Solution:

If you have access to the position, insert the missing vial and tap "RETRY".

If it is not possible to insert the vial: tap "DISENGAGE" to enter the manual operations screen and move the motors to allow access to the position and insert the missing vial (see paragraph 4.2.5 "Setup: Manual operations); then exit from this screen; the autosampler re-starts automatically from the point of interruption.

Tapping "ABORT" will exit and stop the running operation.

8.9 Mismatch errors

8.9.1 Syringe wash mismatch error

8.9.1.1 Syringe mismatch
This error appears only in Liquid mode, if SyringeID system is enabled (see paragraphs 11 "Appendix A – Glossary" and 4.2.6.8 "Setup configuration: SyringeID").

Error message:

"Syringe mismatch! Execute Syringe Installation"

Causes:

At the beginning of a syringe wash, the syringeID system detects the presence of a syringe different from the one detected during the syringe installation procedure (see paragraph 4.2.3Syringe installation/ replacement (liquid mode).

Solution:

Tap "ABORT" and perform the syringe installation procedure (see paragraph 4.2.3 "Syringe installation/ replacement (liquid mode). Then restart the washing operation.

8.9.2 Single injection mismatch error
If the method parameters conflict with those defined in "setup", the unit will display an error message.

Examples are shown below.

8.9.2.1 Syringe Volume mismatch
Error message:

"Warning: Run Error Parameters" "Method X: Syringe Volume mismatch"

(Where "X" is the method used for the single injection)

Causes:

The syringe volume set during installation is different from the syringe volume set in the method.

Solution:

Tap "EXIT" and/or:

- edit the syringe volume set in the method;

- replace the syringe with one that has the correct capacity;

- change the syringe volume set during installation if this doesn't match the installed syringe.

Restart the single injection.

8.9.2.2 Syringe mismatch

This error appears only in Liquid mode, if SyringeID system is enabled (see paragraphs 11 "Appendix A – Glossary" and 4.2.6.8 "Setup configuration: SyringeID").

Error message:

"Syringe mismatch! Execute Syringe Installation"

Causes:

At the beginning of a single injection, the syringeID system detects the presence of a syringe different from the one detected during the syringe installation procedure (see paragraph 4.2.3Syringe installation/ replacement (liquid mode).

Solution:

Tap "ABORT" and perform the syringe installation procedure (see paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)". Then restart the single injection.

8.9.3 Automatic run mismatch errors

If the method parameters in any part of an automatic run conflict with those defined in "setup", the unit will display an error message. The unit will show where the problem occurs. These include the following:

8.9.3.1 Syringe Volume mismatch

Error message:

"Warning: Run Error Parameters"

"Step X: Syringe Volume mismatch in Method Y"

(Where "X" is the sequence step and "Y" is the method used)

Causes:

The syringe volume set during installation is different from the syringe volume set in the method used.

Solution:

Tap "EXIT" and/or:

edit the syringe volume set in the method;

replace the syringe with one that has the correct capacity;

- change the syringe volume set during installation if this doesn't match the installed syringe.

Then restart the automatic run.

8.9.3.2 Tray Type mismatch
Error message:

"Warning: Run Error parameters" "Step X: Tray Type mismatch" *(Where "X" is the sequence step)*

Causes:

The tray type set in the "TRAY TYPE" screen (see paragraph 7.9.1 "Change tray/rack type") is different from that set in the sequence step (see paragraph 6.1.2 "Setting sequence step parameters").

Solution:

Tap "EXIT" and/or:

change the tray type set in the sequence step to match the installed tray (see paragraph 6 "Programming Sequence");

change the tray type set in the "TRAY TYPE" screen (see paragraph 7.9.1 "Change tray/rack type ") to match the installed tray.

replace installed tray with the correct one (see paragraph 4.2.1.5 "Alignment: Tray Install") and change the tray type set in the "TRAY TYPE" screen (see paragraph 7.9.1 "Change tray/rack type".

Then restart the automatic run.

8.9.3.3 Injection Mode mismatch
Error message:

"Warning: Run Error parameters" "Step X: Injection Mode mismatch"

Causes:

The injection mode in the sequence step (see 6.1.2 "Setting sequence step parameters") is different from the injector type/number in the setup (see paragraph 4.2.1 "Setup: Alignment").

Example: only one injector is defined in setup, but "Rear" or "Confirmation" injection mode is used in the sequence step.

Solution:

Tap "EXIT". Modify the injection mode in the sequence step (see paragraph 6.1.2 "Setting sequence step parameters") or the injector type/number in setup (see paragraph 4.2.1 "Setup: Alignment"). In the latter case run the injector alignment.

Restart the automatic run.

8.9.3.4 Syringe mismatch

This error appears only in Liquid mode, if SyringeID system is enabled (see paragraphs 11 "Appendix A – Glossary" and 4.2.6.8 "Setup configuration: SyringeID").

Error message:

"Syringe mismatch! Execute Syringe Installation"

Causes:

At the beginning of the automatic run, the syringeID system detects the presence of a syringe different from the one detected during the syringe installation procedure (see paragraph paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)".

Solution:

Tap "ABORT" and perform the syringe installation procedure (see paragraph paragraph 4.2.3 "Syringe installation/ replacement (liquid mode)". Then restart the automatic run.

8.10 Missing errors

8.11.1   Missing: front injector alignment

Error message:

"Missing: front injector alignment"

Causes:

Front injector alignment (4.2.1.1 "Alignment: Analyzer Default") has not been performed after the change of Analyzer brand or model (4.2.1.1 "Alignment: Analyzer Default ")

Solution:

Perform the Front injector alignment (4.2.1.2 "Alignment: Front Injector").

8.10.1   Missing: rear injector alignment

Error message:

"Missing: rear injector alignment"

Causes:

Rear injector alignment 4.2.1.3 "Alignment: Rear Injector" has not been performed after the change of Analyzer brand or model (4.2.1.1 "Alignment: Analyzer Default ").

Solution:

Perform the Rear injector alignment (4.2.1.3 "Alignment: Rear Injector").

8.11.3   Missing: touch & plunger zero/Fiber zero

Error message:

"Missing: touch & plunger zero"/ "Missing: Fiber zero".

Causes:

"Touch Plunger Zero" procedure is missing (4.2.1.4 "Alignment: Touch Plunger Zero (Headspace and Liquid mode)/ Touch Fiber Zero (SPME mode)".

Solution:

Execute the "Touch Plunger Zero" procedure/ Fiber zero.

8.11 Timeout error

8.11.1 Peripheral communication timeout

Error message:

"Time-out communication with peripheral: X"

(Where "X" can be Plunger, Needle, Turret, Tray, Shaker etc...).

Causes:

The communication with the a peripheral fails.

Solution:

Tap "RETRY" to retry the communication with the peripheral.

Tap "DISENGAGE" to enter in the screen from which it is possible to move the motors to try to unlock the system and to solve the problem (4.2.5 "Setup: Manual operations).

Tap "ABORT" to stop the operations.

If the problem isn't solved, switch the autosampler OFF, wait 30 seconds and switch it ON again. Retry the operation.

If the problem persists contact the Technical Assistance Centre, supplying the error message.

8.12 SyringeID timeout

This error appears only in Liquid mode, if SyringeID system is enabled (see paragraphs 1 1 " Appendix A – Glossary" 11 a n d 4 . 2 . 6 . 8 " Setup configuration: SyringeID ").

Error message: "SyringeID timeout!"

Causes:

The syringeID parameter reading by the SyringeID system is not successful during the SyringeID parameter reading test (see paragraph 4 . 2 . 6 . 8 " Setup configuration: SyringeID") or at the beginning of a syringe wash, a single injection or an automatic run.

Solution:

Tap "RETRY" to retry the syringeID parameter reading. Tap "ABORT" to abort the running operation.

To perform the syringe wash, single injection, or automatic run it is necessary to disable the SyringeID system because it is not working correctly (see paragraph 4.2.6.8 Setup configuration: SyringeID).

To solve the problem regarding the SyringeID system contact the Technical Assistance Centre.

8.13 Mechanical errors

Error message:

"Name motor error: Code XXX"

(Where "Name motor" can be Plunger, Needle, Turret, Tray, Shaker and "XXX" specifies the error).

The code is useful for technical purposes but does not give a definitive cause.

Causes:

The autosampler can not complete a movement.

Solution:

Check the unit for obstacles and remove if present. You can tap "DISENGAGE" to enter "Manual operations" and move the locked motors and try to solve the problem (see paragraph 4.2.5 "Setup: Manual operations). Tap "EXIT" to return to the main menu

If the problem isn't solved, switch the autosampler OFF, wait 30 seconds and switch it ON again. Retry the operation.

If the problem persists contact the Technical Assistance Centre, supplying the error message and error code.

8.14 Heating errors

Only for Headspace and SPME mode.

Error message:

"Warning"

"Y heater: Code XXX Oven: ZZZ°C (WWW°C) Syringe: KKK°C (JJJ°C)

("Y" can be the Oven or the Syringe according to the heater that has generated the error, "XXX" specifies the error, "ZZZ" is the set temperature for the oven, "WWW is the read temperature for the oven, "KKK" is the set temperature for the syringe, "JJJ" is the set temperature for the syringe).

The code is useful for technical purposes but does not give a definitive cause.

Causes:

The autosampler can not complete an operation.

Solution:

Tap "ABORT" to stop the operations. Retry the operation.

If the problem is not solved, switch the autosampler OFF, wait 30 seconds and switch it ON again. Retry the operation.

If the problem persists contact the Technical Assistance Centre, supplying the error message and error code.

8.15 System integrity test fail

Only for Headspace mode, if the System Integrity tool (see paragraph 1.7.2 "Options") has been purchased

Error message:

"The System Integrity test is failed. Please check the integrity of the syringe"

Causes:

The possible causes are:

Septum of the System integrity tool must be replaced.

Syringe (barrel and plunger) must be replaced.

Solution:

- Press **RETRY** to re-execute the test;
- Press **CONTINUE**, to go on with the run, even if the test has failed.
- Press **ABORT** to stop the run and solve the problem.

To solve the problem, the first operation that must be carried out is the replacement of the septum of the System integrity tool (see paragraph 3.6.3 "System integrity tool installation (only for Headspace mode)" for the septum replacing instructions. After the septum change, re-execute the test.

If the System integrity test fails again, press ABORT one more and replace the syringe. Replace both the syringe barrel and plunger (see paragraph 9.1.5 "Syringe replacement in the syringe warmer assembly (Headspace mode)"). Re-execute the run.

8.16 Damage to syringe needle

Only for Headspace and Liquid mode. Damaged syringe needles are normally caused by using incorrect vials, syringes or injection septum; they can also be caused by the incorrect syringe installation/configuration.

It is recommended to:

1. Try to identify the cause of the damage and the position in which the damage happened. Ensure the alignment on the sample vials and on the injector(s) (see paragraphs 4.2.1 "Setup: Alignment") were made correctly. Check that the septa of the sample vials and injector are correctly pierced in the centre.

2. Check that the syringe was installed correctly, as indicated in paragraph 4.2.2 "Setup: Syringe warmer assembly installation/ replacement (Headspace mode)", and ensure that all instructions and notes were followed. In particular, check that the vial locator was correctly aligned with the needle tip, as indicated in the following figure:
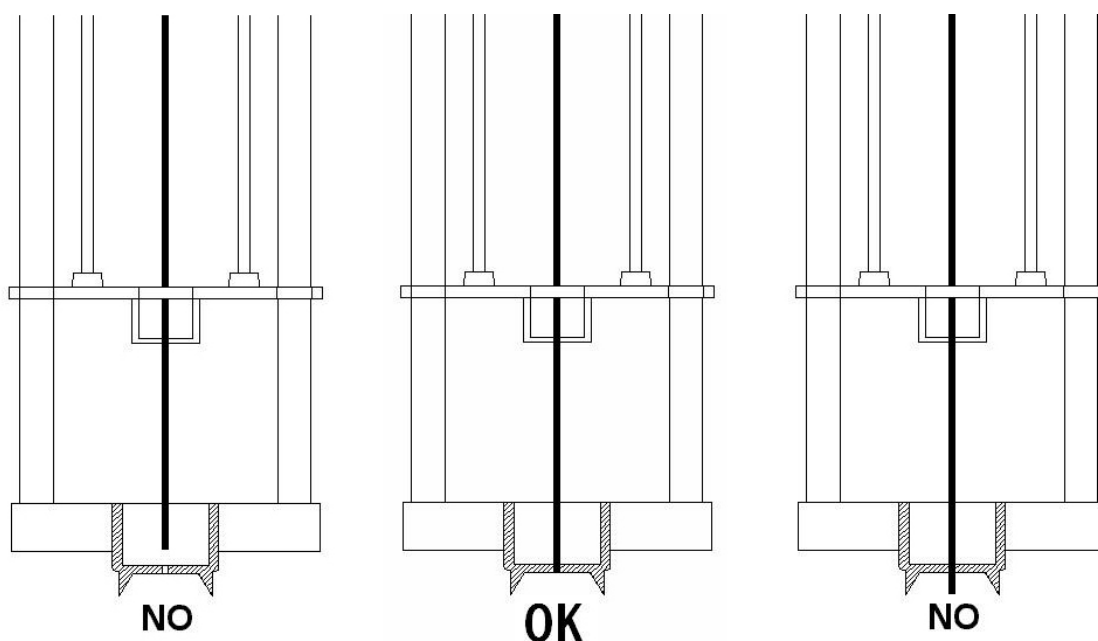
Figure 183: Damage to the syringe needle

3. Verify the specifications of the syringe with that supplied in 12 "Appendix B – Consumables". In particular, check that the needle used has a tip suitable for the septum to pierce.

4. Verify suitable septa were used.

4. Check that there are no obstacles inside the vial(s) (such as an insert).

5. Inspect the syringe to check for abnormalities (see paragraph 8.16.1 "Syringe inspection").

8.16.1   Syringe inspection

Only for Headspace and liquid mode. Before installing a syringe perform the following inspection procedure

- Roll the syringe over a clean flat surface. If the tip of the needle moves in a circle, straighten it by bending it carefully near the connection point to the barrel and check it again (see figure below).

- Check the needle to ensure it is free from burrs and ridges. These can abrade pieces of the septum and leave particles inside the vial. The ridges can be see under 10X magnification. If there are ridges, polish the needle by pulling it through a folded piece of fine emery paper between your finger and thumb until the ridges are gone. Ensure the tip of the syringe is not damaged.

- Check the syringe plunger by sliding it up and down a few times. It should move easily without sticking or binding. If it sticks, remove it and clean it using a suitable solvent.

Bend here if necessary

Figure 184: Syringe inspection

8.17 Tray emergency release

If the tray doesn't open automatically (and samples are inside), please proceed as follows:

- Switch autosampler OFF;

- Wait 30 sec;

- Switch it ON again;

- Try to open the tray by selecting the "Load sample tray" icon in the home screen. If it is not possible to access the home screen, try to access the manual operation screen;

- If this fails, switch autosampler OFF;
- Disconnect it from the mains power;

- Pull the tray gently out by hand (see paragraph 8.17.1 "Tray opening by hand"). Do not pull the tray out with the power switched on.

8.17.1   Tray opening by hand
The tray opening must be performed by hand only if it is strictly necessary.

Do not pull the tray out with the power switched on.

Pull out the tray using both hands, as shown in the *Figure 186* (images 1 and 2). Do not pull the tray with only one hand, as shown in the third image of the figure.
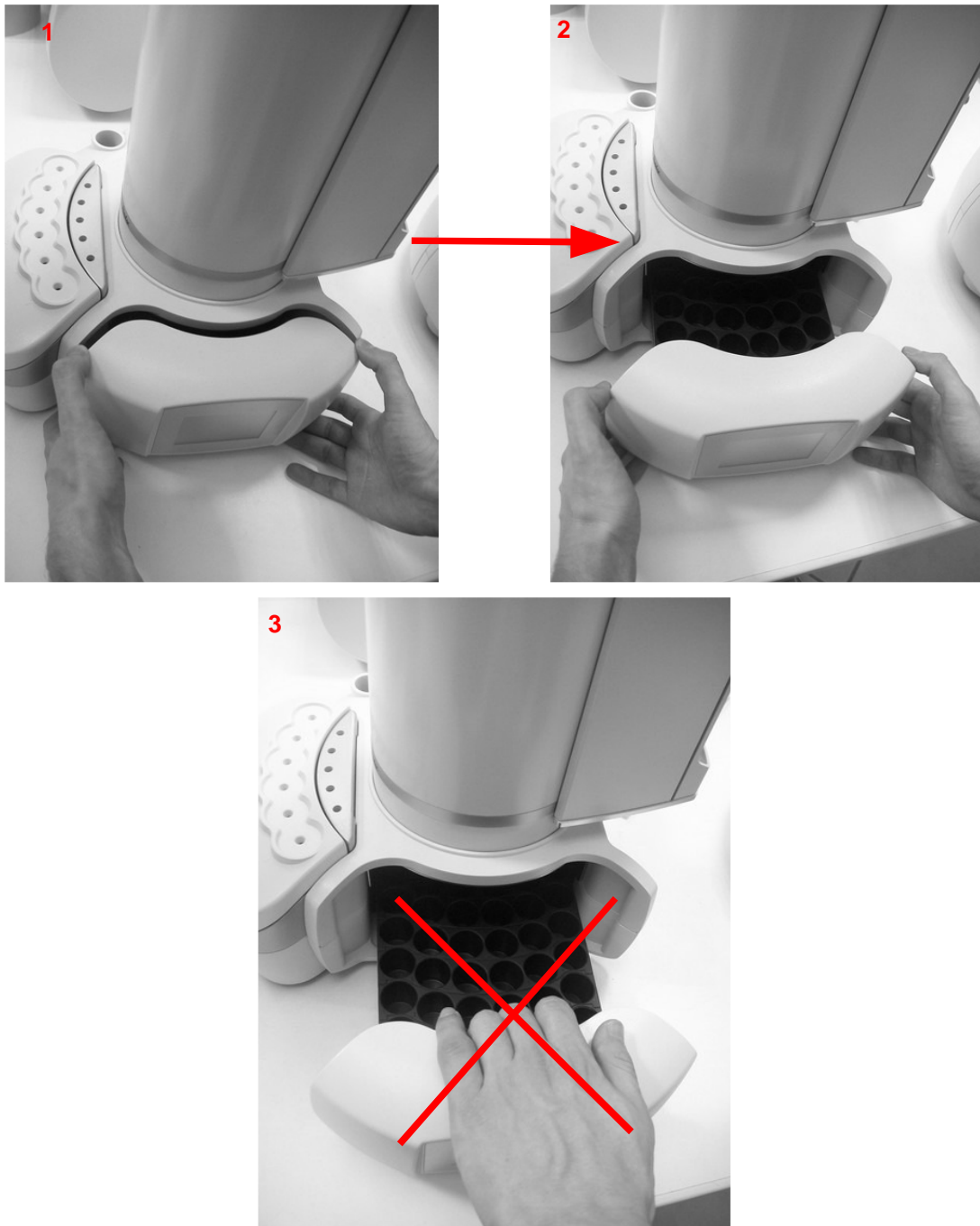
Figure 185: Tray opening by hand

8.18 "HTA Autosampler Manager" troubleshooting

8.18.1 Autosampler and PC do not communicate (connection by LAN)

Error scrreen
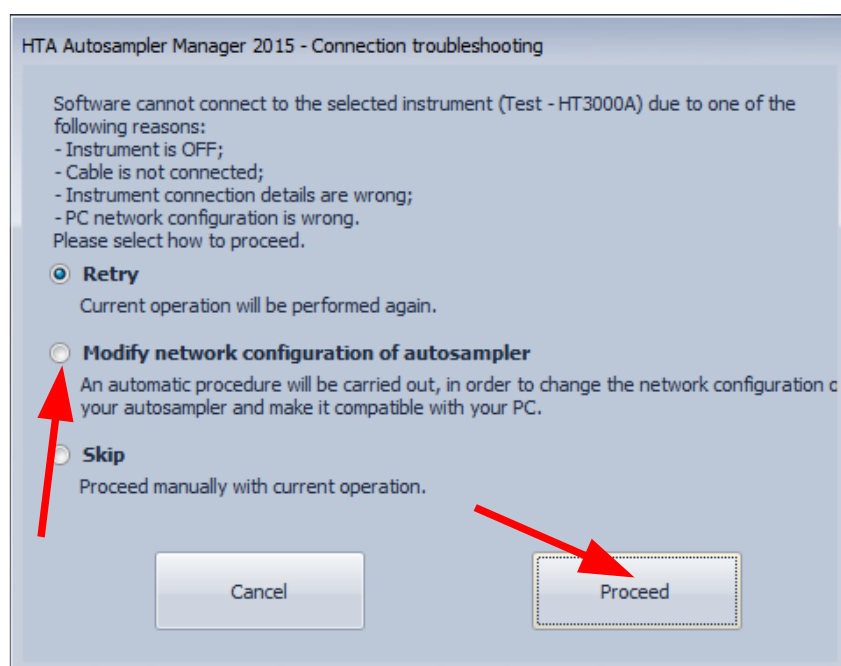
Figure 186: Connection troubleshooting

Causes:

The autosampler can not communicate with the PC.

Solution:

Proceed as follow:

1) Preliminary checks:

- Check that the autosampler is switched on, all the cables are correctly installed, and that all instructions were carefully followed.

- The IT/ network administrator must also verify that any software firewall installed on the PC is: disabled or enabled but it is not blocking the "HTA Autosampler Manager" application and the ports 20101 (TCP), 20102 (TCP) and 20201 (UDP).

- If one of these conditions were missed, fix it and simply click on "Retry", otherwise go ahead with step 2).

2) Click on "Modify network configuration of autosampler" and then on "Proceed". In this way an automatic procedure start to change the network configuration of your autosampler and make it compatible with your PC. The following screen appears:

Figure 187: Connection troubleshooting_2

3) The IT/ network administrator must check that the suggested network parameters (IP address, Subnet mask, gateway) are actually compatible with your network.
4) If the checking passes, click on "Next" to start the automatic assignment of the new network configuration of your autosampler.

8.19 Analytical troubleshooting

The indications given below are for gas chromatography applications and may not be suitable for other analysis techniques for which this autosampler could be used.

When troubleshooting chromatographic symptoms, always remember that the Headspace sampler is only part of the system. Evaluate the whole system in order to isolate the problem. Often, issues that appear in the chromatography can be caused by a problem in one or more of the following, in order:

- The sample;
- The sample preparation (inlcuding the consumable hardware, such as vials, septa, syringe, solvent and so forth);
- The Data system (acquisition setpoints, integration parameters, peak identification settings, quantitation settings and reporting);
- The GC (method or hardware);
- The Headspace autosampler (method or hardware).

To troubleshoot chromatographic symptoms, begin troubleshooting with the sample and sample preparation.

8.19.1　Analytical troubleshooting (Headspace Mode)

8.19.1.1　Reproducibility issue
Sample peaks or responses are not reproducibile.

Possible causes	Solutions
Syringe is dirty	Increase the syringe purge time in the method (see paragraph 5.1.2.5). Set the syringe temperature 10℃ above the oven temperature (see paragraph 5.1.2.3).
Vacuum created in sample vial	Reduce sample volume (see paragraph 5.1.2.4).
Improperly crimped vials	Check vial cap by attempting to rotate manually. Loose caps may cause selective loss of more volatile components from sample. Adjust crimping tool correctly (see paragraph 3.7.3).
None or too low Syringe flush gas pressure	Check pressure at External pressure regulator during the syringe purge. Check gas flow at syringe needle tip.
Method parameters	Check all the method parameters, in particular the sample speed, the pull up strokes (see paragraph 5.1.2.4), the injection speed and the post injection dwell (see paragraph 5.1.2.5).

8.19.1.2   Peak distortion or tailing

Possible causes	Solutions
Method parameters	Check all the method parameters, in particular the sample speed, the pull up strokes (see paragraph 5.1.2.4), the injection speed and the post injection dwell (see paragraph 5.1.2.5).
Needle penetration speed in GC injector	Check the injection parameters (see paragraph 5.1.2.5).
GC injector liner not suitable	Check the liner geometry according to the recommendations of the GC manufacturer.
GC related parameters	Any parameter like injector, oven or detector temperature can contribute to bad peak shape. Check the column type and connections (square cut connections). Check the troubleshooting guide of the GC manufacturer.

8.19.1.3   Carry over issue

Possible causes	Solutions
Syringe is dirty	Increase the syringe purge time in the method (see paragraph 5.1.2.5). Set the syringe temperature 10℃ above the oven temperature (see paragraph 5.1.2.3).
None or too low Syringe flush gas pressure	Check pressure at External pressure regulator during the syringe purge. Check gas flow at syringe needle tip.

8.19.1.4   Unexplained chromatographic peaks

Possible causes	Solutions
Purge gas is dirty	Check purge gas for impurities.

8.19.1.5   Retention times not repeatable

Possible causes	Solutions
Problem in the GC system	Check the GC for leaks in the inlet, including septum. Check the liner type used.

8.19.1.6   Faulty temperature read-out

Possible causes	Solutions
Probe or sensor of the syringe holder temperature are broken	Contact your service representative.
Probe or sensor of the oven temperature is broken	Contact your service representative.

8.19.2   Analytical troubleshooting (Liquid Mode)

8.19.2.1   Reproducibility issue
Peak area or peak retention times are not reproducible.

Possible causes	Solutions
Injection Depth	Ensure the needle is set to the correct depth for the GC. This is particularly important if the unit has just been installed or moved.
Leak in the inlet septum	If there is a leak in the septum, change it. If the septum had experienced less than 100 injections, check the following elements to avoid premature septum problems: the syringe needle is not straight; the septum retainer nut is too tight; the syringe has not been installed correctly.
Syringe is dirty or worn	If there is dirt in the syringe or the plunger is sticking, clean the syringe according to the manufacturer's cleaning instructions.
Sample volume in the vial is not correct.	If the sample vial are not filled correctly, evaporation or contamination can alter the results. The vial should only be filled up too half way (see paragraph 3.7.1).
The vials are not closed properly	Check the caps of the vials. Loose caps may cause volatile solvents to evaporate and change the sample concentration over time (see paragraph 3.7.2).
Sample instability	Check the stability of the samples,and ensure they are not sensitive to light or heat.
Sample size variation	Change the syringe (syringe is probably imprecise or worn) . For example syringe with removable needles can cause dead volume formation or needle to needle variation
Air bubbles inside the needle	Try to modify the following parameters: fill speed, injection speed, viscosity delay etc... (see paragraph 5.2.2). If the samples is viscous you can dilute it in a proper low-viscosity solvent.

8.19.2.2   Contamination or ghost peak issue

Possible causes	Solutions
Vial cap septum dissolution in solvent (small fragments of septum were dissolved in the sample).	Inject several blanks to check for ghost peaks persistence or elimination. Check that: the syringe needle hasn't burrs that can cause septum cutting ; septum resistance to the solvent in use; the septum is flat (see paragraph 3.7.2).
Contamination in sample vials	Try to use new or clean vials. Store new vials in a contaminant-free place
Sample instability	Check the stability of the samples,and ensure they are not sensitive to light or heat. Ensure they are stored correctly.

8.19.2.3   Peak size issue

Possible causes	Solutions
Leak in the GC system	Replace the septum and check the fitting to verify leak presence. If the septum had experienced less than 100 injections, check the following elements to avoid premature septum problems: the syringe needle is not straight; the septum retainer nut is too tight; the syringe has not been installed in the correct way.
Sample instability	Check the stability of the samples, and ensure they are not sensitive to light or heat. Ensure they are stored correctly.
The vials are not closed properly	Check the caps of the vials. Loose caps may cause volatile solvents to evaporate and change the sample concentration over time (see paragraph 3.7.2).

8.19.2.4   Carry over issue

Possible causes	Solutions
Type or number of washes are inappropriate	Check if the washing modalities are suitable for your specific application.
The solvent is almost finished	If the solvent level is too low, the needle cannot reach it. Top up the solvent vial. If the waste vial is almost full, replace or empty it.
Syringe is dirty or worn	If there is dirt in the syringe or the plunger is sticking, clean the syringe according to the manufacturer's cleaning instructions.
Samples are immiscible.	In this case the washes should not rinse properly the syringe. Increase the wash number or use solvent that can rinse different types of samples.

8.19.2.5   Signal/Peak issue
No signal/No peak

Possible causes	Solutions
Syringe plunger is not working properly	Check that the plunger is secured by the plunger locker. See paragraph 4.2.2 "Setup: Syringe warmer assembly installation/ replacement (Headspace mode)".Check if the syringe needle is plugged. If so, replace or clean the syringe.
Sample volume is insufficient	If the sample level in the vial is too low, the needle cannot reach it (see paragraph 3.7.1). Increase the sample volume in the vial or change needle draw depth inside the sample vial (see paragraph 4.2.1.5).
Sample is viscous	Increase the viscosity delay (see paragraph or dilute the sample in a proper low viscosity solvent.
Injection depth too high	Ensure the needle goes deep enough into the GC.

8.20 Bar Code Reader Troubleshooting

Problems	Possible causes/solutions
Bar Code not readable	Check the horizontal orientation of the Bar Code lines.
	Check the Bar Code length.

	Check if the type of the Bar Code you are using matches with the Bar Code type you have enabled by HTA Autosampler Manager software (see paragraph 12.2.2.3 "Bar Code Specifications).
	Check the label quality.
	Check the print quality of the Bar Code lines.
	Check the density of the Bar Code lines.
	Check that the Bar Code label is not overlapped excessively (see paragraph 12.2.2.3 "Bar Code Specifications).
	Check the vial orientation (see paragraph 12.2.2.3 "Bar Code Specifications).
	Check if Bar Code is 1D; 2D bar codes cannot be decoded.
Bar code not identified	Check if Bar Code label is attached.
	Check the horizontal orientation of the Bar Code lines. Check for any shifted angles.
	Check the label quality.
	Check if the white background creates the correct contrast.
	Check if the label is burned (blackened) from elevated temperature (due to agitator for example).
	Check if the surface is wet (moisture) and if there is a reflection.

9 Maintenance

Warning

These operations must be completed by competent personnel, properly trained in the procedures described in this manual: any missing or different execution of the described procedures can cause damage to the autosampler or to the person working on it.

However, in particular, pay attention to the moving parts such as the sledge, syringe, needle, the cover of the oven etc...For the sample handling, see paragraph 1.1 "Intended Use and Restrictions" and 1.3 "Warning ".

Warning

Some parts of the autosampler (oven, syringe, needle or vials) can work at high temperatures. Be careful to avoid burns. Allow these parts to cool down before handling them.

9.1 Ordinary maintenance

The autosampler does not require periodical maintenance other than that described below.

9.1.1 Cleaning of vial rack/tray

- Open the tray (7.7 "Load and Unload Sample Vial");
- Remove the rack from the tray;
- Clean the rack and tray with a non-abrasive detergent solution.

- Dry with a dry cloth.

- Replace the rack inside the tray and close the tray.

9.1.2 External cleaning of cabinet
- Switch OFF the autosampler.
- Remove the power cable from the rear.
- Carefully clean the control panel (touch screen or keypad) and fragile parts using only a damp cloth. They must not be cleaned with solvents or detergents.
- Clean the cabinet using a non-abrasive detergent solution.
- Dry with a dry cloth.

Do NOT use water, solvents, detergents or spray on electrical parts.

9.1.3 Incubation oven cleaning

Warning

Oven surface and spacers (when inserted) are heated at high temperature and can be very hot. We recommend taking care in order to prevent burns.

- Be sure that the autosampler is in stand-by status and that no other operations are in progress.

- Set the oven stand-by temperature to off (see paragraph 7.9.2 "Eco Savings");

- Enter "manual operations" and open the oven cover (see paragraph 4.2.5 "Setup: Manual operations");

- Turn OFF the autosampler and remove the power cable;

- Wait until the incubator oven cools down;

- Remove the spacers (if present) using the suitable tweezers ;

- Clean the incubator and the spacers;

- Reinstall the spacers (if needed);

- Let the oven dry;

- Connect the autosampler to the power supply and switch ON the unit;

- Enter "manual operations" and close the oven cover (see paragraph 4.2.5 "Setup: Manual operations").

9.1.4 Touch screen display cleaning

Wet a soft, lint-free or microFiber cloth with distilled water. Wring out as much water as you can. Make sure the cloth is damp but not wet. Wipe the screen in a gentle motion to remove dust, oil, or fingerprint smudges.

Another option is to use a screen cleaner kit that includes antistatic wipes.

Finish cleaning the touch screen with a dry lint-free cloth to wipe away any excess moisture, then turn it back on.

9.1.5 Syringe replacement in the syringe warmer assembly (Headspace mode)

9.1.5.1 2.5ml to 2.5ml syringe replacement

Syringes should be replaced according to sample throughput and sample dirtiness/matrix.

To replace the syringe, disassemble and reassemble the syringe warmer assembly that contains the syringe. In the following picture, the syringe warmer assembly is shown.
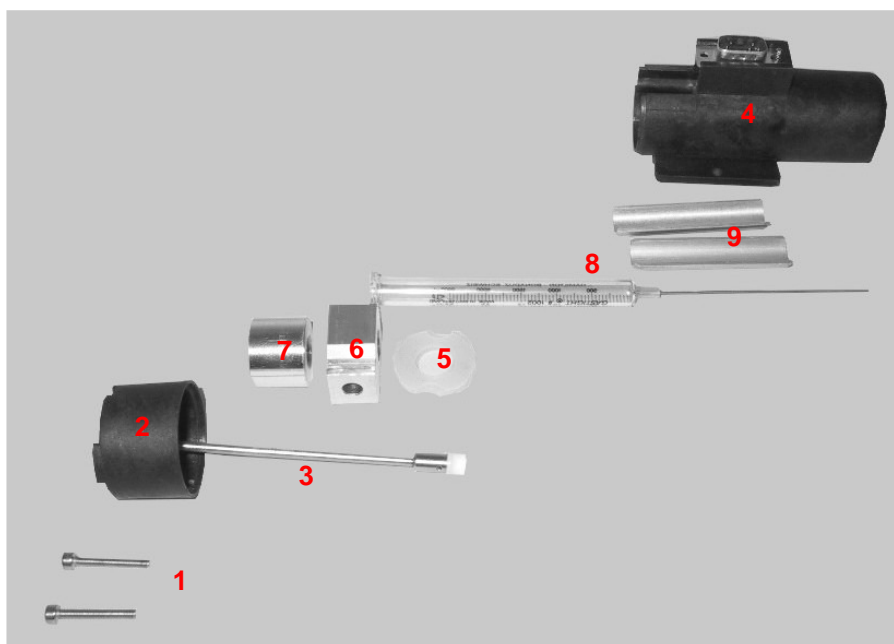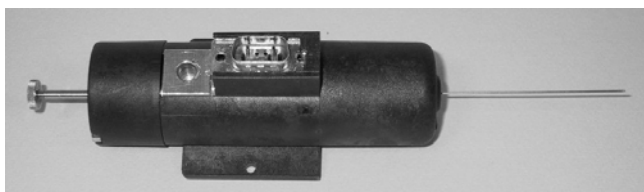
Figure 188: Exploded view of the syringe warmer assembly

1   **Main screws**

2   **Upper cover**

3   **Syringe plunger**

4   **Heating body**

5   **Insulating gasket**

6   **Syringe holder**

7   **Upper spacer**

8   **Syringe barrel**

9   **Lower spacers**

Proceed as described below:

1) Remove the two main screws (number 1 in figure below) that secure the upper cover using the supplied allen key (see paragraph 2.3 "Tool kit").
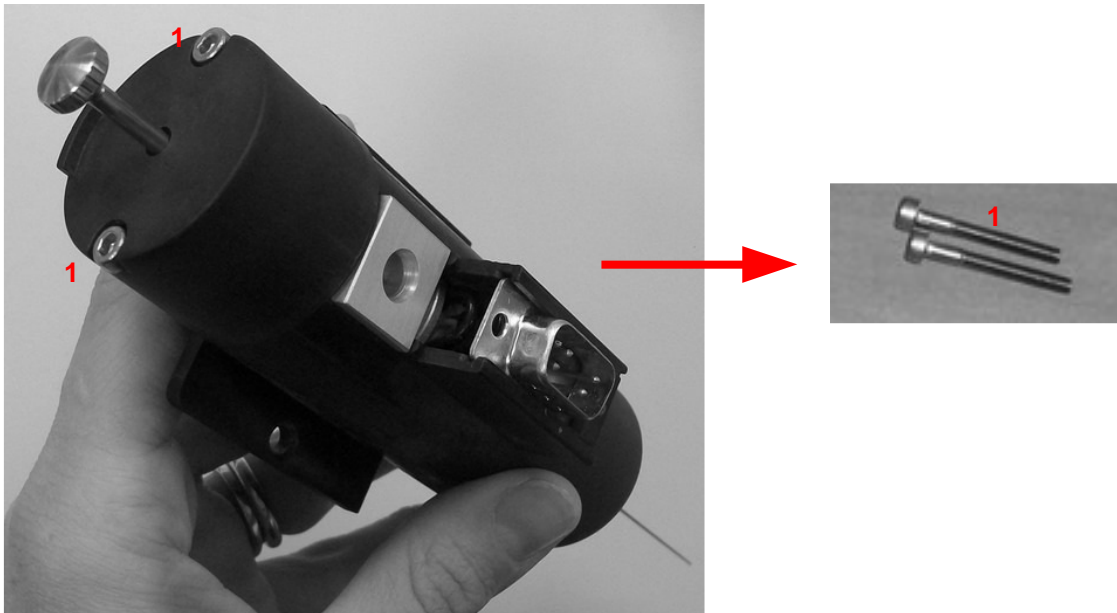
Figure 189: Main screw

2) Gently lift up the upper cover (number 2 in figure below) and the syringe plunger (number 3 in in figure below)to detach them from the heating body (number 4 in figure below).
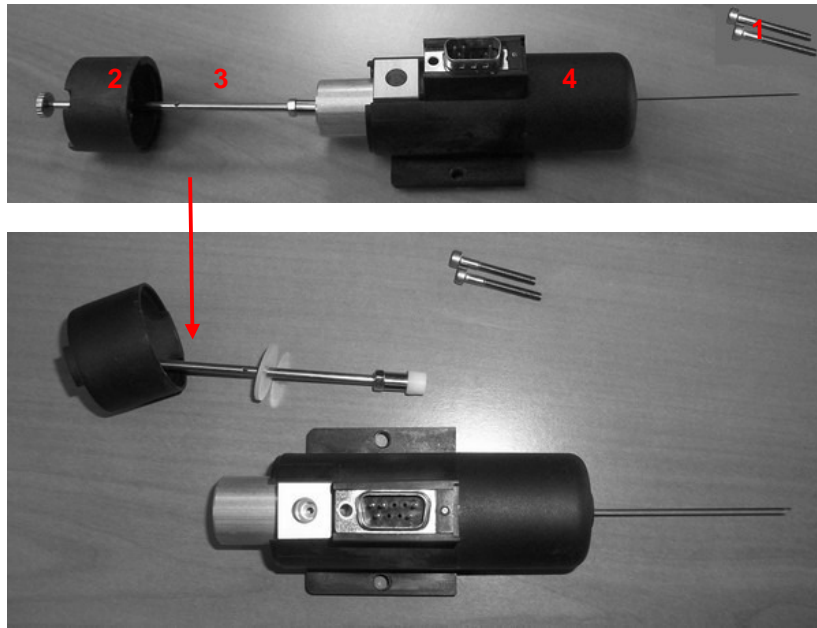
Figure 190: Removing the upper cover and the syringe plunger

3) Extract the syringe barrel (number 8), with the insulating gasket (number 5 in figure below), the syringe holder (number 6 in figure below), the upper spacer (number 7 in figure below) and the lower spacers (number 9 in figure below) from the heating body (number 4 in figure below). This operation is shown below:
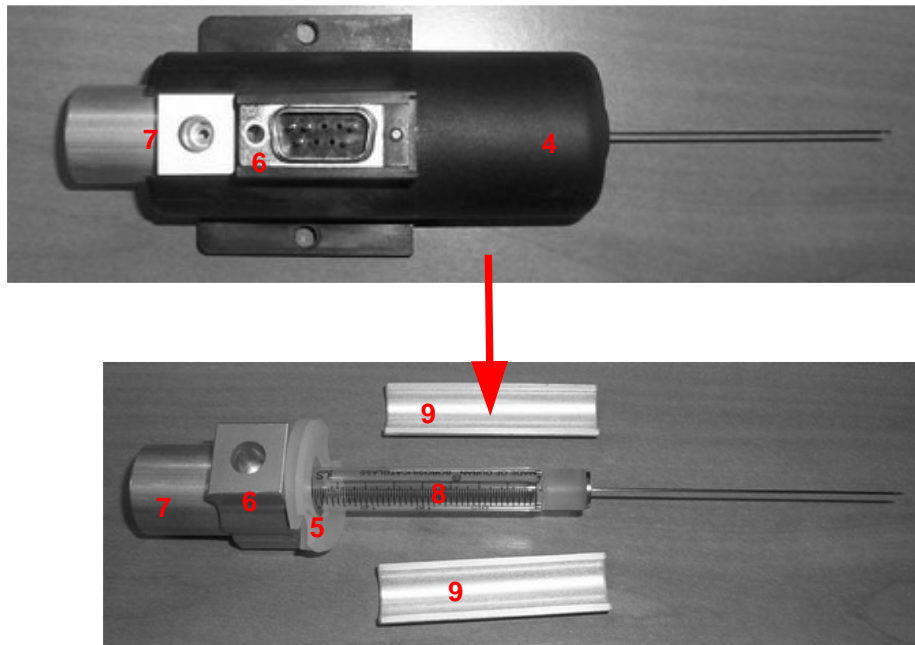
Figure 191: Syringe warmer assembly disassembling_1

4) The insulating gasket (number 5 in figure below), the syringe holder (number 6 in figure below), the upper spacer (number 7 in figure below), lower spacers (number 9 in figure

below), must be extracted from the syringe barrel (number 8 in figure below). Pull them out from the needle side and do it very gently without forcing. Please note that all of the elements should be separated naturally during the syringe barrel extraction from the heating body.
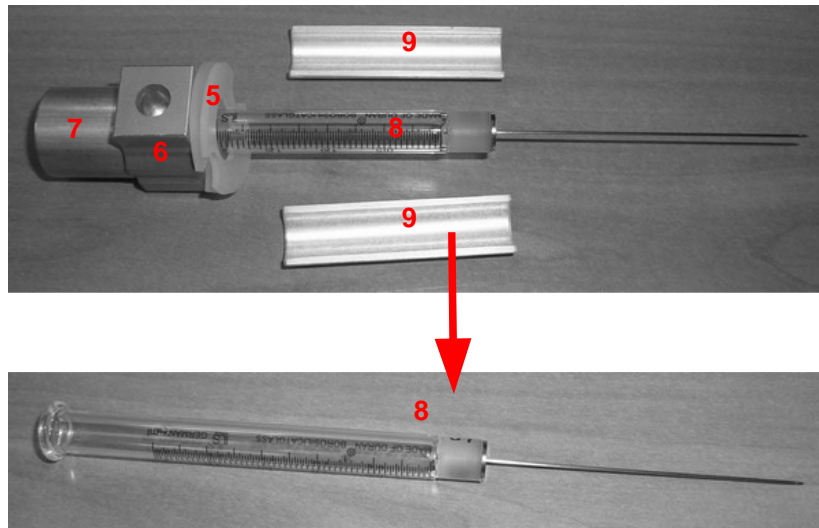
Figure 192: Syringe warmer assembly disassembling_2

5) Replace the syringe barrel with a new one.

6) Re-assemble the syringe warmer assembly. Start by placing the lower spacer (number 9 in figure below) inside the heating body (number 4 in figure below). This operation must not be carried out for 5ml syringe.
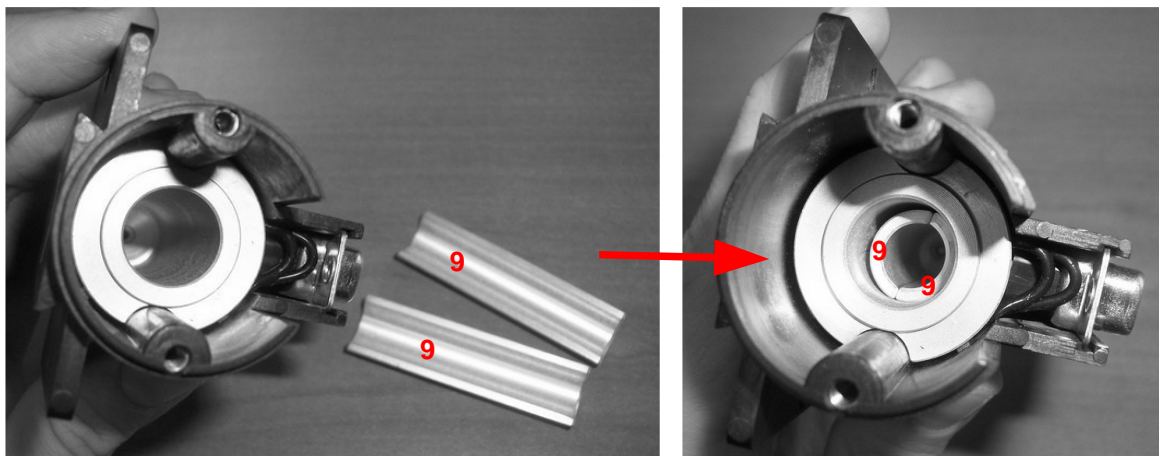
Figure 193: Lower spacers positioning

7) Also place the insulating gasket (number 5 in figure below) inside the heating body (number 4 in figure below).
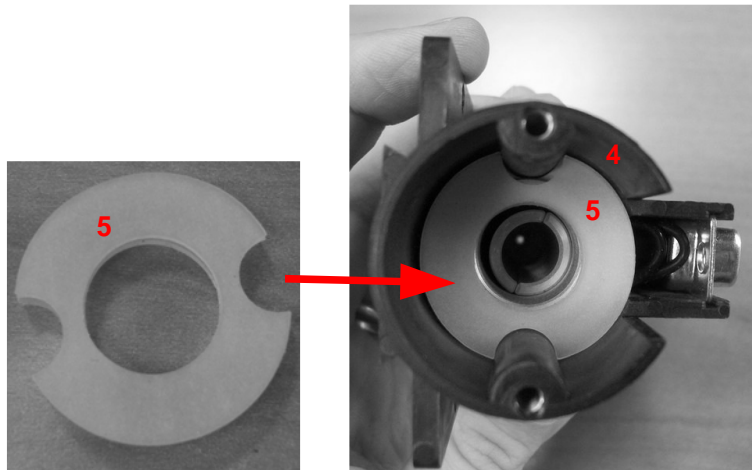
Figure 194: Insulating gasket positioning

8) Slide (from the needle side) the upper spacer (number 7 in figure below) inside the syringe barrel (number 8 in figure below). Be careful to insert it in the correct orientation.
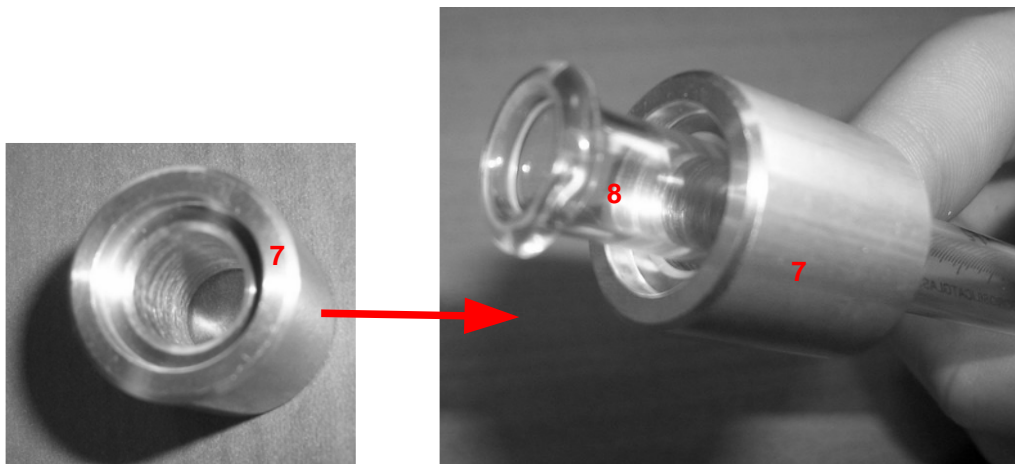
Figure 195: Upper spacer positioning

9) Also insert (sliding from the needle side) the syringe holder (number 6 in figure below). It should offer a little resistance during insertion.
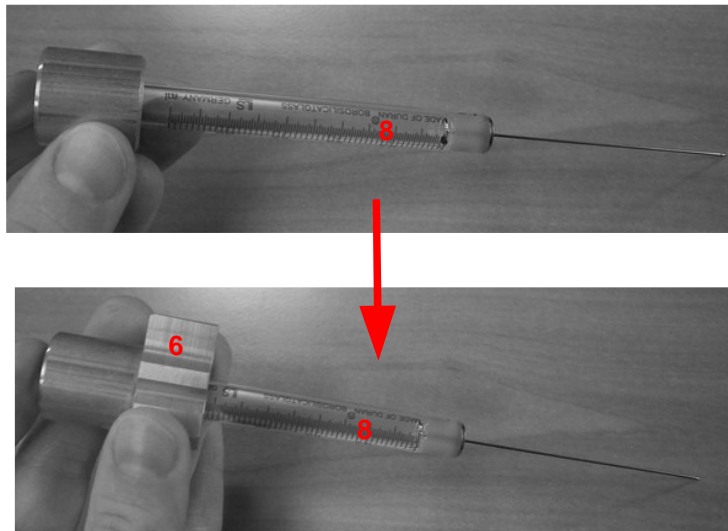
Figure 196: Syringe holder positioning

10) Insert the syringe barrel (number 8 in figure below), with the upper spacer (number 7 in figure below) and the syringe holder (number 6 in figure below) mounted on it, in the heating body. The needle has to be inserted through the hole in the bottom of the body.
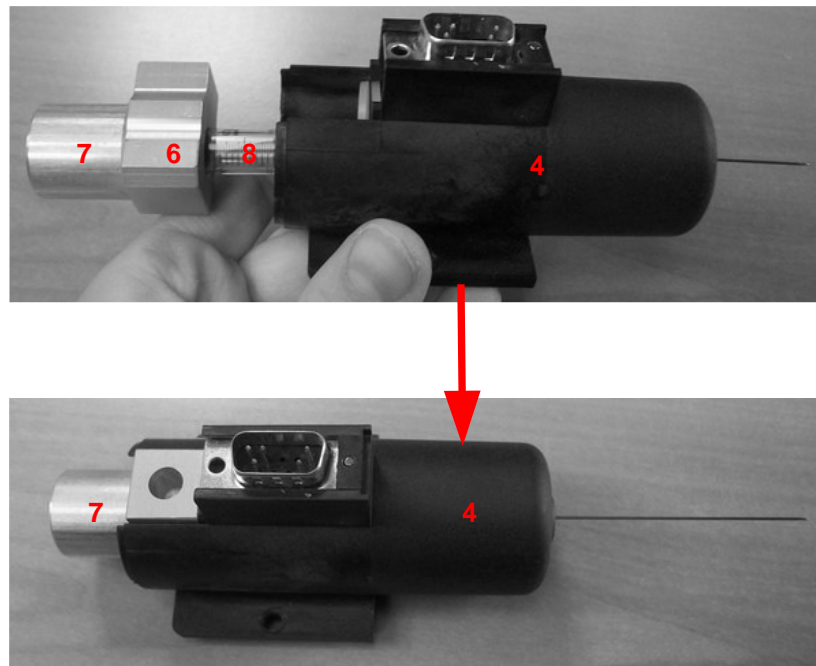
Figure 197: Syringe barrel mounting inside the heating body

11) Only if necessary, also replace the syringe plunger (it is substituted with a lower frequency than the syringe barrel). Remove the plunger (number 3a, 3b and 3c in figure below) from the upper cover (number 2 in figure below). To separate the plunger from

the upper cover unscrew the nut indicated with the number 3a. All the components can be disassembled. After replacing the plunger, re-assemble the plunger and the upper cover.
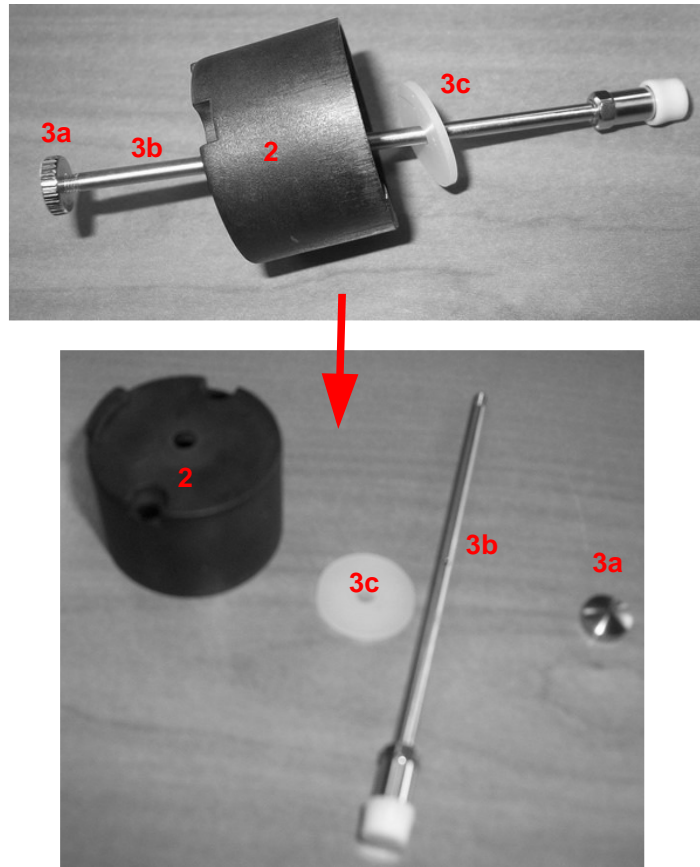
Figure 198: Syringe plunger replacing

12) Insert the upper cover with the syringe plunger in the syringe barrel. Be sure that the cover fits perfectly with the heating body. Screw in the two main screws that hold the two parts.

13) To replace the syringe warmer assembly in the syringe location see paragraph 4.2.2 "Setup: Syringe warmer assembly installation/replacement (Headspace mode)".

9.1.6 Fiber replacement in the Fiber holder (SPME mode)

1) Unscrew the Fiber block from the Fiber holder as shown in the figure below:
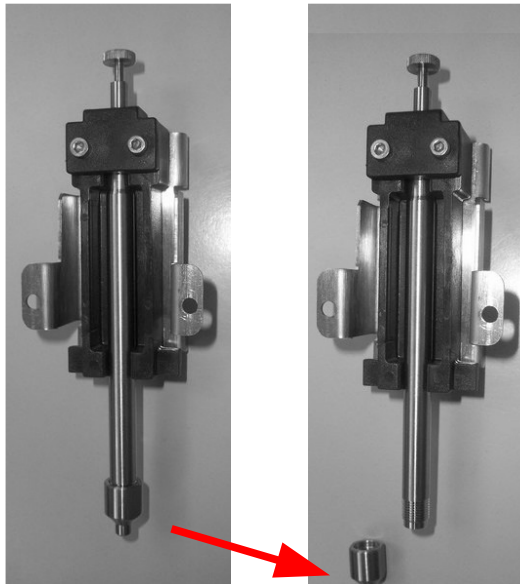
Figure 199: Fiber mounting in the Fiber holder_1

2) If there is an old Fiber to be removed, unscrew and remove it. Insert the new Fiber in the Fiber holder and screw it:

Figure   200:   Fiber   mounting   in   the   Fiber   holder_2

3) Replace the Fiber block in the position indicated in the figure below:
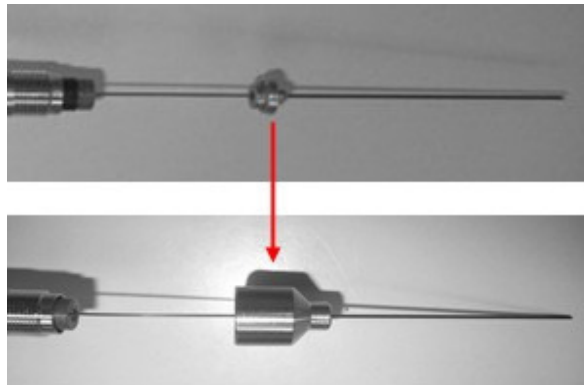
Figure 201: Fiber mounting in the Fiber holder_3

4) Raise the plunger until the Fiber block touches the Fiber holder:

Figure 202: Fiber mounting in the Fiber holder_4

5) At this point, tighten the Fiber block to the Fiber holder.

9.1.7 Septum of the System integrity tool replacement (Headspace mode)

System Integrity tool is sold as an option, included in the GLP pack (1.7.2 "Options ").The septum of the System integrity tool must be replaced every 30 sample sequences.

The Syringe integrity tool location is shown in position 6 of Figure 1. To replace the septum, perform the following operations:

- remove the System integrity tool from its location;
- remove the old septum from the tool (see procedure in paragraph 3.6.3 "System integrity tool installation (only for Headspace mode)" for detailed instructions);
- insert the new septum in the tool and tighten it;
- reposition the System integrity tool inside its location.

9.1.8 Preventive maintenance pack

It is possible to order a preventive maintenance pack (PN 1.93.855).

This kit includes the following parts:

Description	Suggested Replacement Frequency
Antifriction Stickers: Silver + Standard Writing	Every year
Turret Sliding Plate	Every year
20ml Headspace vial for perfomance check	
Septa & Caps for Headspace vial for perfomance check	
Needle Guide Assembly HS/SPME	Every year
Septa for System Integrity Tool (pack)	As needed
Solvent & Waste Vial CAPS	Every 3 months
Solvent & Waste Vial SEPTA	When needed
Needle Guide Assembly Liquid	Every 3 years

Syringes that are NOT included in the preventive maintenance kit should be replaced according to sample throughput and sample dirtiness/matrix.

9.2 Extraordinary maintenance

For any other maintenance operation not indicated in this manual, please contact your Supplier or Technical Assistance Centre. The operator is not authorized to perform any operations outside of the normal working use of the unit.

10 Uninstalling and disposal

Warning

These operations must be completed by competent personnel, properly trained in the procedures described in this manual: any missing or different execution of the described procedures can cause damage to the autosampler or to the person working on it.

However, in particular, pay attention to the moving parts such as the sledge, syringe, needle etc...For the sample handling see paragraph 1.1 "Intended Use and Restrictions" and 1.3 "Warning ".

Warning

Some parts of the autosampler (oven, syringe, needle or vials) can work at high temperatures. Be careful to avoid burns. Allow these parts to cool down before handling them.

10.1 Autosampler uninstalling

To uninstall the autosampler perform the following operations in sequence:

1. Remove the syringe warmer assembly according to the instructions given in paragraph

4.2.2.1 "Syringe warmer assembly removal". Remove any residual substances from the instrument in accordance with the applicable safety regulations;

2. Remove sample vials and dispose of any residual substances from the instrument in accordance with any applicable safety regulations;

3. Remove the rack(s) from the tray (to open the tray follow the instructions in paragraph 7.7 Load and Unload Sample Vial);

4. Raise the syringe location to the top using the needle motor (4.2.5 "Setup: Manual operations");

5. Loosen the left lock;

6. Raise the vial locator;

7. Tighten the left lock;

8. Lift up the sledge manually;

9. Lower the sliding lid;

10. Switch off the autosampler;

11. Unplug the external power supply from the main power and then remove the power cord from the autosampler;

12. Disconnect the interface cable from the autosampler port and from the analyzer;

13. Disconnect the pneumatic connection;

14. Disconnect, if present, the Ethernet cable from the autosampler and from the Ethernet connector of the PC or of the Switch;

15. Disconnect, if present, the RS232C cable from the autosampler port and from the serial port of the PC;

16. Unlock the autosampler from the bracket that fixes it to the analyzer (3.3.1.1 "Unlock the autosampler from the mounting kit).

17. Raise the autosampler from the bracket and place it in a vertical position.

10.2 Autosampler shipping

The autosampler can only be shipped in the original packaging. If the autosampler has already been installed you must perform the following:

1. Perform the uninstalling procedure described in paragraph 10.1.

2. Repack the accessories in the accessory boxes. Seal the accessory boxes with a suitable adhesive tape.
3. Apply the tower protection.
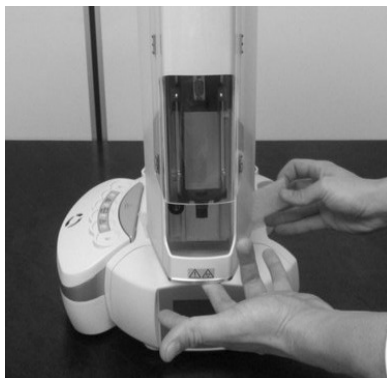
Figure 203: Apply the tower protection

4. Apply the polythene bag and the protection belt to the autosampler tower.

Figure 204: Apply the polythene bag

Figure 205: Apply the protection belt

5. Apply the lower protective cushions.

Figure 206: Position the lower cushions

6. Position the sealed accessory boxes on the autosampler sides.
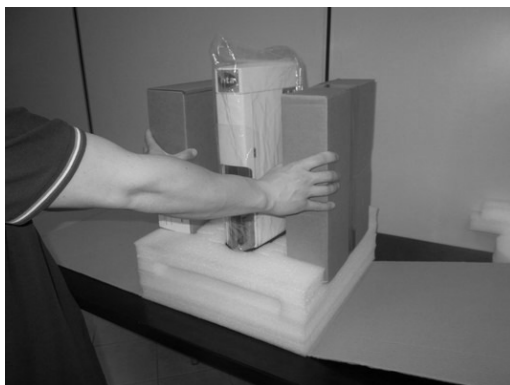
Figure 207: Position the accessory boxes

7. Position the upper protective cushions.

Figure 208: Position the upper cushions

8. Close the packaging using a suitable adhesive tape.
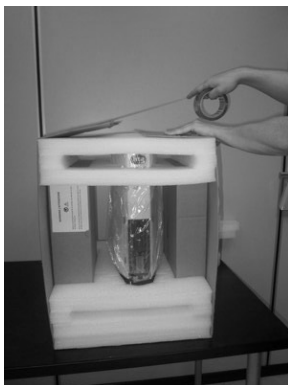
Figure 209: Close the packaging by adhesive tape

9. Put the autosampler in the original box.

Figure 210: Put the autosampler in the box

10. Insert the protective cushions.
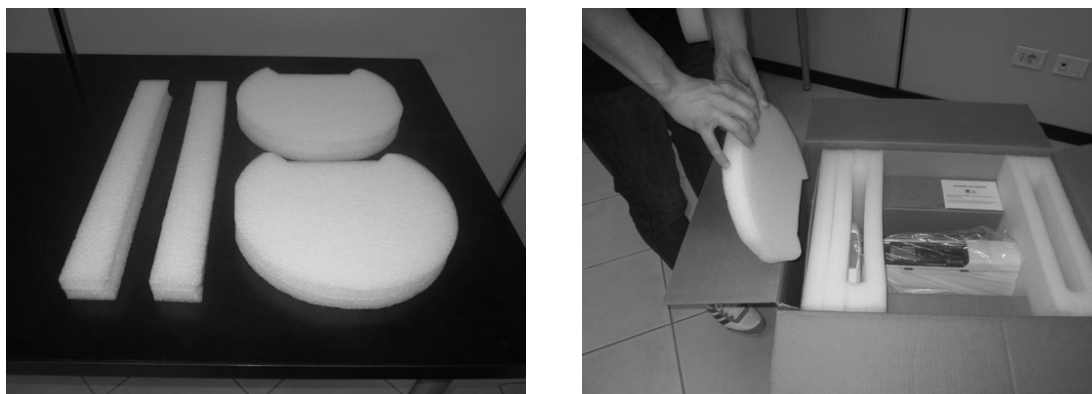
Figure 211: Insert the cushions

11. Close and seal the box using suitable adhesive tape.

10.3 Autosampler disposal

If the autosampler has to be disposed of, perform the following:

1. Execute the uninstalling procedure described in paragraph 10.1.

2. Place the autosampler and its accessory parts in the original packaging or into another type of packaging suitable for transport. If you need further information, contact your dealer or the Technical Assistance Centre.

10.4 Disposal instructions

INFORMATION FOR THE USERS

According to the Directive 2011/65/CE, 2012/19/UE, concerning the restriction of the use of certain hazardous substances in the electrical and electronic equipment and the waste disposal.

The symbol of the crossed bin shown on the equipment or on its packaging indicates that the product is to be collected separately from the other waste. Thereof the user must deliver the equipment to the appropriate collection points for electrical and electronic waste or to his sale representative (if a new similar equipment is bought).The appropriate separated collection allows the recycling, the treatment and the disposal. It can help to avoid possible negative

HTA s.r.l., as electronic devices manufacturer, is engaged in the financing and management of electronic equipment's disposal activities. For updated information about the disposal mode and the collection points:

- contact your sales representative;
- visit www.hta-it.com website and look for the WEEE section;
- send an e-mail to weee@hta-it.com.

11 Appendix A – Glossary

11.1 Headspace mode

Head Space Technique

Head Space technique is an indirect method to inject components with low boiling points from liquid or solid samples. The method is based on the analysis of vapours released from a sample that has been incubated at a constant temperature for a given period of time. Head Space technique has some advantages compared to other techniques: quick preparation time compared to analysis time, possibility to analyse samples that cannot be analysed in liquid or in solid state, less cross contamination problems and higher sensitivity, as this procedure can be considered as a pre-concentration step before injection.

System integrity test

The System integrity kit is sold as an option included in the GLP Pack for HT2800T/HT2850T (see paragraph 1.7.2 "Options "). The System integrity test is used to verify the syringe integrity in Headspace mode.

If this test is enabled, at the beginning of each batch, the system performs a check to verify the system integrity through a heuristic procedure. This test is carried out using the System integrity tool (see Figure 1 and Figure 1).The septum of this tool should be replaced periodically (see paragraph 3.6.3 "System integrity tool installation (only for Headspace mode)").

This check can verify if it is better to replace the syringe (barrel and plunger). Please note that this check does not replace the necessary periodic validations you have to program for the instrument qualification. If the test fails, a warning message appears (see paragraph 8.15 "System integrity test fail").

Vial leakage check

This function can only be enabled by the HTA Autosampler Manager (Setup-Options).

If this option is enabled, the pressure inside vials is monitored by a heuristic procedure in order to check against anomalous values that are indicative of a vial leakage problem.

The Vial leakage test can discriminate samples correctly sealed vs. bad crimping or missing septa. Each sample is marked with PASS or FAIL information in HTA Autosampler Manager Windows.

Confirmation Mode

Confirmation Mode Technique injects the same sample into two injectors to confirm the analysis. The GC is started on the first injection.

11.2 Liquid mode

Air Gap

An air gap is a "cushion" which is sometimes used when using Internal Standards. The gap can be between the Internal Standard and the sample (*"post" mode*), or may be after both the Internal Standard and sample (*mode "double"*).

Dual injection modes (Confirmation Mode, High throughput Mode)

High throughput mode injects different samples into two separate injection ports.

Confirmation Mode Technique injects the same sample into two injectors to confirm the analysis. For both modes the GC is started on the first injection.

Internal Standard

This is an analytical technique that injects a sample and a reference standard at the same time. The reference is drawn first into the syringe and the sample afterwards. They are injected together.

SyringeID

SyringeID is an automatic syringe recognition system, available if GLP pack has been purchased (1.7.2 "Options"). This system is based on RFID tags and it is able to identify syringes in an univocal way.

The RFID tag contains information regarding the syringe serial number and part number, the syringe volume and the number of plunger strokes performed.

Enabling the "SyringeID" system, errors during syringe installation are avoided because the syringe serial number and volume are automatically read. Furthermore the system keeps track of the syringe "wear and tear" by the "Plunger stroke counter" that it is automatically updated after each run.

The syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 12.2.1 "Syringes"). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

Figure 212: Syringe with syringeID adapter containing the RFID tag

11.1 SPME mode

SPME (solid Phase extraction)

SPME is a solvent free technique that integrates sampling, extracting, concentrating and injection of the sample in only one phase. The analytes are directly extracted and concentrated in the extraction Fiber. The Fiber is fused silica with a small polymeric coating. The SPME Fiber is directly immersed in the liquid sample or in the Headspace of the sample. The principal advantage of this technique are the good analytical performance, simplicity and the low cost.

Desorpiton

After the sampling the Fiber is exposed and the analytes are desorbed thermally in the GC injector.

Fiber Pre-Washing

Fiber washing after extraction (before desorption) by the immersion in a proper solution inside the wash vial.

Post-Cleaning

Cleaning process after the desorption: the Fiber is exposed in the injector or inside the Fiber Cleaning Device (available only in HT2850T).

Derivatization

During the derivatization the Fiber is exposed to substances that can modify the adsorbed analytes to obtain better final analytical results.. The derivatization can cause a chemical transformation of analytes in a form that is more suitable for the analysis. By derivatization it is possible, for example, to increase volatility and/or decrease the polarity of some analytes and thus increase the efficiency, selectivity and sensitivity of the analysis. This approach makes possible the identification of substances difficult to be detected, highly reactive or thermally unstable.

The derivatization can be carried out in two stages:

Post-extraction: After the extraction, the extracted compounds in this case are exposed to the derivatizing agent in the vapour phase for a set time.

• Pre-extraction: Before extraction, in this case the Fiber is exposed to the derivatizing agent and then it is exposed to the sample to be analyzed, in this way the analytes are extracted and simultaneously converted into molecules with greater affinity for the Fiber.

12 Appendix B – Consumables

Warning

For the sample and reagents handling, see paragraph 1.1 "Intended Use and Restrictions" and 1.3 "Warning ".

12.1 Consumables for Headspace mode

12.1.1   Syringes

HTA part number	Volume	Description
3.21.400	2,5 ml	Glass Barrel
3.21.300	2,5 ml	Plunger

12.1.2   Sample vials

HTA Part Number	Description	Temperature Range (℃)
1.29.949	6ml transparent vials with round end	
1.29.941	10ml transparent vials with round end	
1.29.942	20ml transparent vials with round end	
1.29.940	Septa and caps for HS vials in SIL/PTFE	from -40 to +200℃.

12.1.2.1   Vial specifications

- Vials must be approved for head space techniques;

- Rounded end;

- Clear or amber glass (amber glass is suitable for light sensitive samples).

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Warning

Correct sample vial dimensions are essential for proper operation. Vials that do not comply with these guidelines should cause autosampler errors. Service calls and repairs found to be due to vials and microvials that do not comply with these guidelines are not covered under warranty or the service contract.

Specifications for 20ml vials
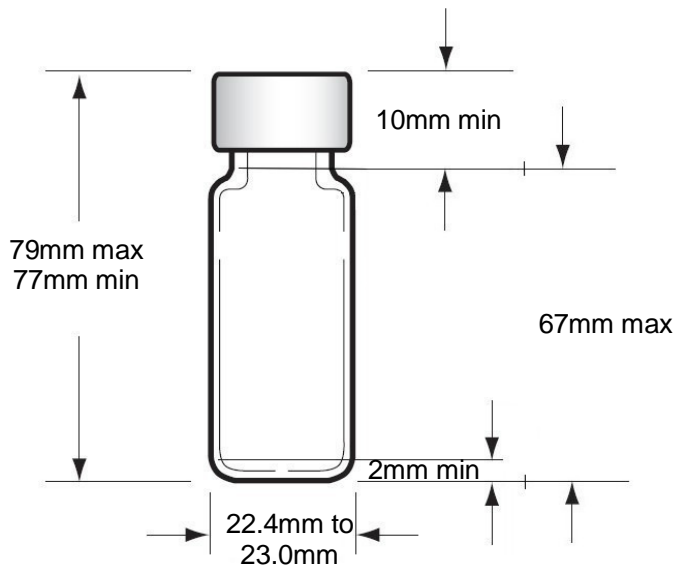
Figure 213: 20ml sample vial dimensions

Specifications for 10ml vials
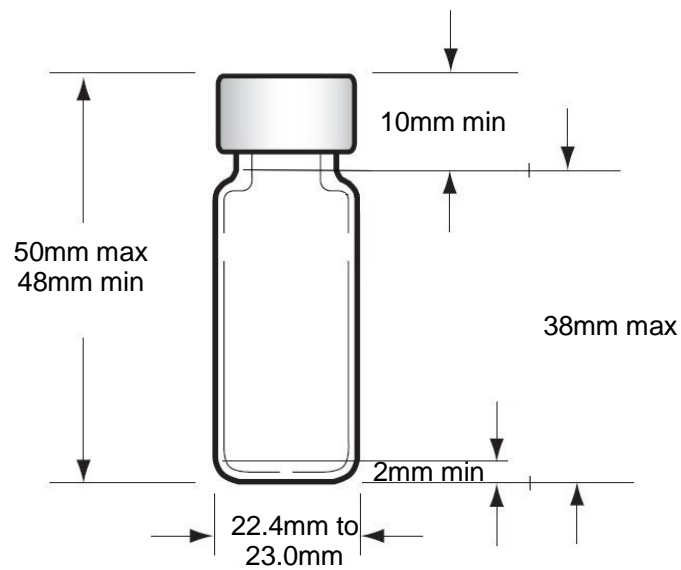
Figure 214: 10ml sample vial dimensions

Specifications for 6ml vials
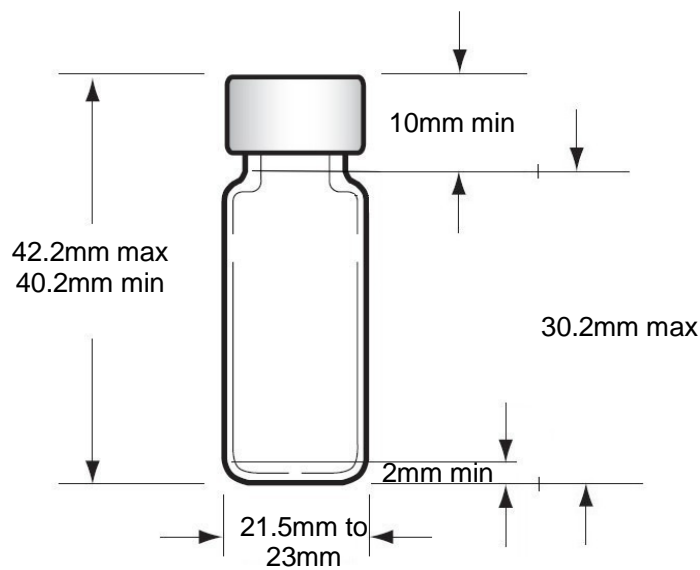
Figure 215: 6ml sample vial dimensions

12.1.2.2　　Vial labeling

- *Printer Specification:*

  - Resolution:

    - 600 dpi Thermal Transfer printer (Advised);

    - 300 dpi Thermal Transfer printer (Minimum).

- *Label Specification:*

  - Label dimensions:

	20ml sample vials	10ml sample vials	6ml sample vials
Advised	36x71mm	26x71mm	20x68mm
Maximum	36x73mm	26x73mm	20x70mm

  - Label material:

    - Opaque blank adhesive label.

  - Printing orientation:

    - Print with Bar Code bar perpendicular to printing way.

12.1.2.3　　Bar Code Specifications

Code type	Maximum characters readable
Code 128	7 alphanumeric characters
Interleaved 2 of 5	7 numeric characters
Code 93	7 numeric characters
UPC-E	7 numeric characters (fixed)
EAN 8	7 numeric characters (fixed)

The code type must be set by HTA Autosampler Manager. It
is advised to:

- Use always code with checksum in order to detect possible reading errors.
- Apply the Bar Code label on the vial, paying attention not to overlap it excessively.

- Position the vial with the Bar Code label oriented toward the Bar Code Reader Module HT2800T. Avoid to position the vial with any eventual label overlap oriented toward Bar Code Reader Module.

- Set the Bar Code Reader Module HT2800T in order to activate only the reading of the Code type used (for example if Code 128 is being used, enable only this code type in order to reduce the possibility of reading error).

- Follow the indication of the Bar Code standards when you create it. In particular leave an appropriate margin on the left and on the right of the Bar Code.

12.1.2.4 Cap specifications

The autosampler uses sample vials with crimp caps.

The Minimum diameter of the pierceable area is 9mm.

In general, do not use crimp caps more than once for Headspace analysis.

12.1.2.5 Septa specifications

Septum material	Compatible with	Incompatible with	Thickness
PTFE/silicone rubber	PTFE resistance until punctured, then septa will have the compatibility of silicone (alcohol, acetone, ether, DMF, DMSO)	ACN, THF, benzene, chloroform, pyridine, toluene, hexane, heptane	2-3mm

For more detailed compatibility data refer to the manufacturer's recommendations.

In general, do not use septa more than once for Headspace analysis.

12.2 Consumables for Liquid mode

12.2.1 Syringes

Note: The autosampler supports a wide range of syringes. Ensure the syringe is compatible with your application and analyzer. If in doubt, contact your Technical Representative.

HTA part number	Syringe size	Needle kind	Plunger with PTFE cover	Needle length (mm)	Syringe holder	Plunger block position (*)	Gauge	Notes
1.23.105	10ul	Fixed, conical tip	No	80	1	S	G22	
1.23.106	10ul	Fixed, conical tip	No	80	1	S	G23	

To use the syringeID system (included in the GLP pack, see 1 . 7 . 2 ” Options”) you have to install the following syringe:

HTA part number	Syringe size	Needle kind	Plunger with PTFE cover	Needle length (mm)	Syringe holder	Plunger block position (*)	Notes
1.91.759	10ul	Removable, conical tip	No	80	Included in the GLP pack	S	With SyringeID

(*) “B” and “S” are the two sides of the plunger block (see chapter 2.1.2)

Spare parts for 1.91.759:

- Needle (80mm): 1.23.116.

Warning

The syringe information are loaded in a RFID tag included in the black adapter mounted on the syringe for the syringeID system (see paragraph 11.2 “Liquid mode“). Every adapter must be associated to a syringe only in order to maintain the info regarding the syringe always correct and updated. Do not remove the syringe from its black adapter.

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Warning

If syringeID system is used, be careful while handling the syringe holder of the SyringeID system (11.7.2 "Options" and 11.2 "Liquid mode"). Do not touch the connector or the electronic circuit placed on the back of the holder. The components may be damaged. If not used, the SyringeID holder must be stored in the antistatic bag supplied with the packaging.

Please note that if Bar Code reader Module has been purchased, the syringe length cannot exceed the one indicated below.

MAX:222mm
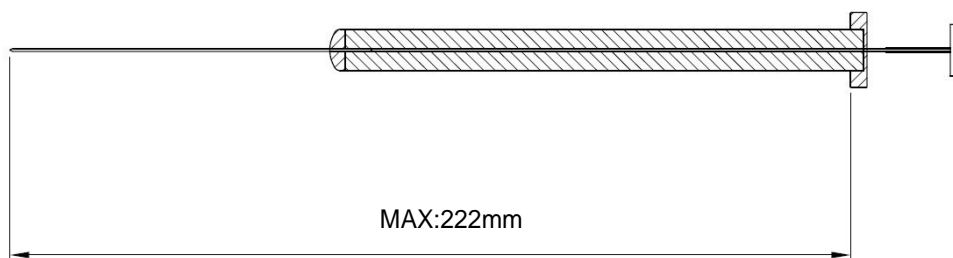
Figure 216: Maximum syringe length with Bar Code Reader Module HT2800T (Liquid mode)

12.2.1.1 How to select correct syringe volume

Look at the following table to check which kind of syringe you need according to the injection volume.

Injection Volume Range	Suggested syringe
0.5-5ul	10ul
0.2-1ul	5l
0.01-0.3ul	0.5l

12.2.2 Sample vials

General specifications:

- Supported caps; screw, snap or crimp caps.

HTA Part Number	Description
1.29.961	12x32 (2ml) vials with snap cap

12.2.2.1 Vial features and dimensions

The autosampler can use clear or amber glass sample vials with snap, crimp or screw cap. Amber glass vials can be used for light-sensitive samples. Snap cap are recommended because they can't be over-screwed (as per screw cap) or incorrectly crimped.

The following figure shows the dimensions of the vials that can be used with the autosampler. These dimensions do not make up a complete set of specifications.

Body Diameter (BD) = 11.7 ± 0.2

Cap Diameter (CD) = BD × 1.03 maximum

(All dimensions in millimeters)
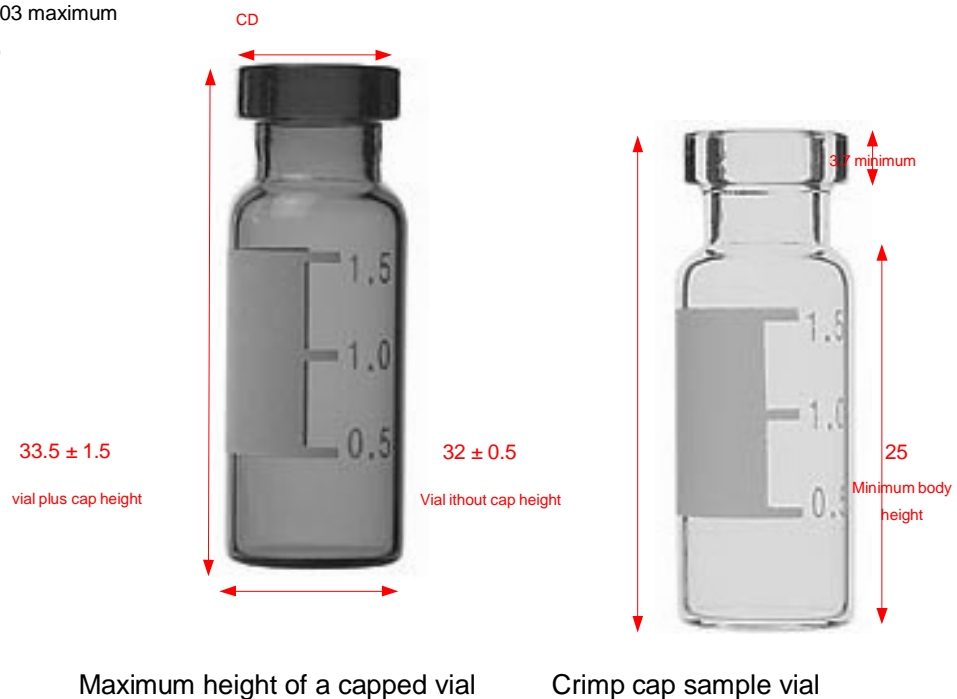
Maximum height of a capped vial   Crimp cap sample vial

Figure 217: Sample vial dimensions

⚠

Warning

Correct sample vial dimensions are essential for proper operation. Vials and labels that do not comply with these guidelines should cause autosampler errors. Service calls and repairs found to be due to vials and microvials that do not comply with these guidelines are not covered under warranty or the service contract.

12.2.2.2 Vial labeling

- *Printer Specification:*
    - Resolution:
        - 600 dpi Thermal Transfer printer (Advised);
        - 300 dpi Thermal Transfer printer (Minimum).

- *Label Specification:*
    - Label dimensions:
        - 20x37 mm (Advised);
        - 20x38 mm (Maximum).
    - Label material:
        - Opaque blank adhesive label.
    - Printing orientation:
        - Print with Bar Code bar perpendicular to printing way.

12.2.2.3 Bar Code Specifications

Code type	Maximum characters readable
Code 128	7 alphanumeric characters
Interleaved 2 of 5	7 numeric characters
Code 93	7 numeric characters
UPC-E	7 numeric characters (fixed)
EAN 8	7 numeric characters (fixed)

The code type must be set by HTA Autosampler Manager. It is advised to:

- Use always code with checksum in order to detect possible reading errors.
- Apply the Bar Code label on the vial, paying attention not to overlap it excessively.

- Position the vial with the Bar Code label oriented toward the Bar code Reader Module HT2800T. Avoid to position the vial with any eventual label overlap oriented toward Bar Code Reader Module.

- Set the Bar Code Reader Module HT2800T in order to activate only the reading of the Code type used (for example if Code 128 is being used, enable only this Code type in order to reduce the possibility of reading error).

- Follow the indication of the Bar Code standards when you create it. In particular leave an appropriate margin on the left and on the right of the Bar Code.

12.2.3   Solvent and waste vials

General specifications:

- Solvent vials and waste vials: 10ml, diameter (22mm), snap cap and 1.5-2mm thick septa.

HTA Part Number	Description
1.29.941	Solvent Vial (100pc/pk) (this type of vial is used also as waste vial)
1.29.965	Solvent & Waste Vial CAPS (20pc)
1.29.936	Solvent & Waste Vial SEPTA (20pc)

12.3 Consumables for SPME mode

12.3.1   Fibers

Refer to the Sigma Aldrich/Supelco local office for the SPME Fibers. Always use Fibers for automatic use. HT2800T can handle SPME Fibers of 1cm or 2cm long.

The metal Fibers are preferred if they suit your specific applications.

12.3.2   Washing vial

General specifications:

- Washing vials: 10ml, diameter (22mm), snap cap and 1.5-2mm thick septa.

HTA Part Number	Description
1.29.941	Solvent Vial (100pc/pk)
1.29.965	Solvent & Waste Vial CAPS (20pc)

13 Appendix C – Analyzer connector

The GC connector is on the connection panel (see paragraph 2.1.3 "Connection panel").

DB15 pin #	Function	Note
1	+5 Volts	Exit = Max. 20 mA
2	FREE3-IN	Signal input (true low); Low-level = 0÷0.5 V Hi-level = 4÷12 V
3	SAMPINS-NO	Exit = Relay contact (open by default)
4	GCRDY	Signal input (true high); Low-Level = 0÷0.5 V Hi-level = 4÷12 V
5	GND	Ground
6	SAMPINSCOM	Relay common contact
7	FREE1-NC	Exit = Relay contact (closed by default)
8	ENDSAMP-NC	Exit = Relay contact (closed by default)
9	GCRDY	Signal input (true low); Low-Level = 0÷0.5 V Hi-level = 4÷12 V
10	FREE1-NO	Exit = Relay contact (open by default)
11	ENDSAMPL-NO	Exit = Relay contact (open by default)
12	FREE2	Signal input (true low); Low-Level = 0÷0.5 V Hi-level = 4÷12 V
13	FREE1-COM	Relay common contact
14	ENDSAMPL-COM	Relay common contact
15	SAMPINS-NC	Exit = Relay contact (closed by default)

Relay specification: V_{max} = 24 V ; I_{max} = 1A
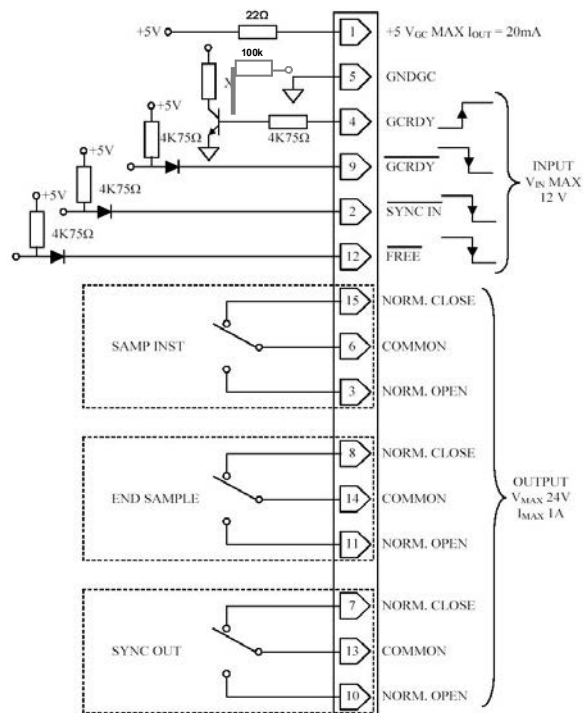
DB15 Connector

Figure 218: GC Connector

Typical GC interface
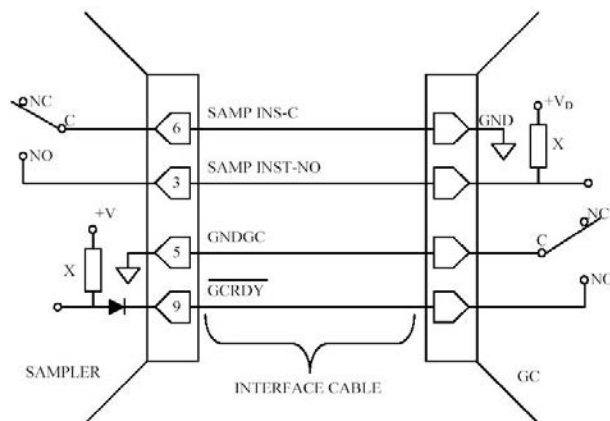
Figure 219: Common interface

13.1 RS232C interface (optional)

RS232C Connector, DB9 Connector

DB9 pin #	Function	Note
1	N.C.	n.c.
2	TX	Transmission
3	RX	Receiving
4	DSR	Internally connected with DSR signal
5	DGND	
6	DTR	Internally connected with DTR signal
7	CTS	
8	RTS	
9	N.C.	

FIGURE INDEX