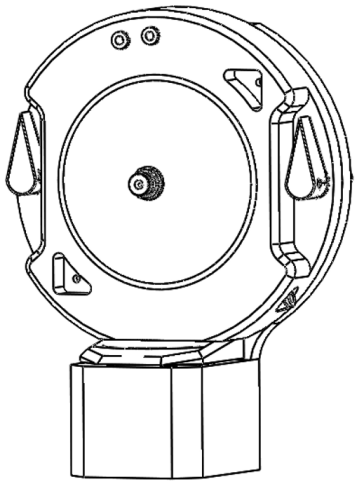
Plasmion
simple smart sensitive

Installation Manual

SICRIT® Interface SX1

for SCIEX LC-MS instruments



Release January 2020

Plasmion GmbH – Am Mittleren Moos 48 – 86167 Augsburg – Germany

This manual has to be to be stored carefully and must be at hand to any user of the described system. In addition to this guide, Plasmion GmbH provides the following installation manuals:

Hardware and Operations Manual for SICRIT® SC-30X Ionization Set

Installation and Operations Manual for SICRIT® GC/SPME-Module

Please check for an updated version of this manual on plasmion.de.

	Attention! Please read and understand this manual before operating the described system. In case you discover obvious errors or contradictions for your product, contact the manufacturer before operating the system.

The content of this document has been checked thoroughly and is believed to be reliable. However, Plasmion GmbH does not assume any responsibility for damages of foreign or own products and instruments resulting from improper use or any combination of the product with other instruments. Plasmion GmbH is not liable for consecutive damages resulting from integration and/or operation of its products in/with other systems. If the system is used in any manner not specified by Plasmion GmbH, the protection of the system could be impaired. Plasmion GmbH is not responsible for ignoring the outlined safety guidelines or the misuse of this system.

The technology and application of the system described in this manual is covered by patents and patent applications and is used under license.
All trademarks are property of their respective owners.

Safety Instructions

The following safety labels on the product and within this manual indicate safety risks and necessary precautions that arise during installation or from operating the products.

	[Attention!], marks possible dangers to your safety and health.
	[Dangerous Voltage!], indicates parts and situations where there is the risk of exposure to dangerous electrical voltages.
	[Attention Hot Surface!], indicates potentially hot surfaces that might cause burning injuries if touched without protective gear.
	[Note], marks important information or advice, not related to safety issues.

Table of Content

1. Intended Use of the SICRIT® MS Interfaces

The system described is intended for use only in laboratory and/or R&D environment. If the system is used in a way not specified by the manufacturer, misused or modified causing an infringement of the safety measures, Plasmion GmbH refuses any liability for consecutive damages in any form.

2.1 The SICRIT® Technology

Soft **I**onization by **C**hemical **R**eaction **I**n **T**ransfer (SICRIT®) is a flow through ionization technique to be coupled with mass or ion mobility spectrometers. Inside the ion source a cold plasma is used for ionization of the analytes passing through. This enables direct gas phase measurements as well as coupling with chromatographic systems as GC or HPLC. The latter requires additional coupling modules.

2.2 The SICRIT® Interface SX1 for SCIEX MS-Instruments

The SICRIT® Interface SX1 replaces the standard Ion Source housing of the SCIEX *API Source* and enables the coupling of the SICRIT® Ion source to the MS (Figure 1). The interface consists of:

- An interlock (a) that enables the MS to detect the SICRIT® Ion source (as Turbo Ion Spray)
- A high-temperature sealing ring (b) to enable gastight connection.
- An ion source adaptor with spacer discs (c)
- An external shut off valve (d) for the integrated venture system.

The interface also enables the mechanical connection of additional SICRIT modules for coupling methods e.g. SPME-SICRIT®-MS, GC-SICRIT®-MS (please check for available products at plasmion.de).

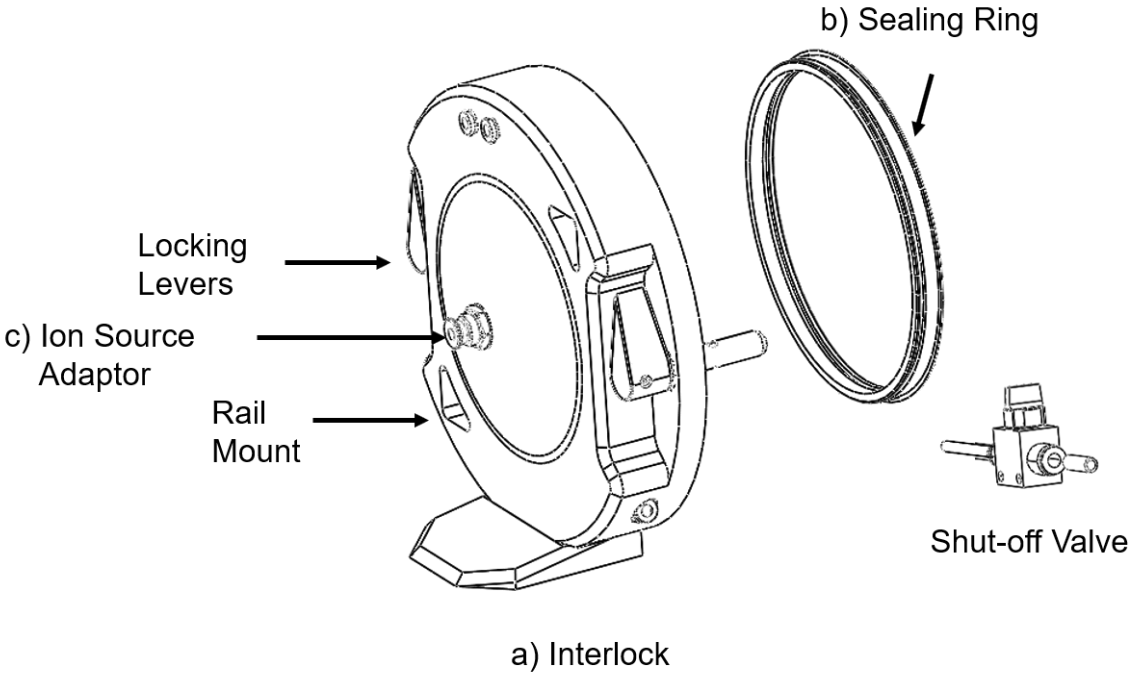


Figure 1: Components of the SICRIT® Interface SX1.

2. Installation of the SICRIT® Interface SX1 to the MS-instrument

2.1 Steps before the installation of SICRIT® Interface SX1

Before the interface can be installed to the mount of a SCIEX MS, the standard housing of the *API source* has to be removed. Please follow the specific descriptions of the manufacturer of your MS.

	Attention! Plasmion GmbH does not hold responsibility for potential damages that result from non-compliance to the manuals of the MS-manufacturer when removing the housing or other parts of the MS.
	Attention! Some parts of the MS interface can be very hot and cause burnings or injuries. Before performing the installation, let the system cool down, wear protective gear and refer to the instructions given in the respective MS manual.

- Put your MS instrument in standby mode.
- Rotate the two levers on the ion source housing and take it off. After successful removal, the MS interface should look as shown in Figure 2.

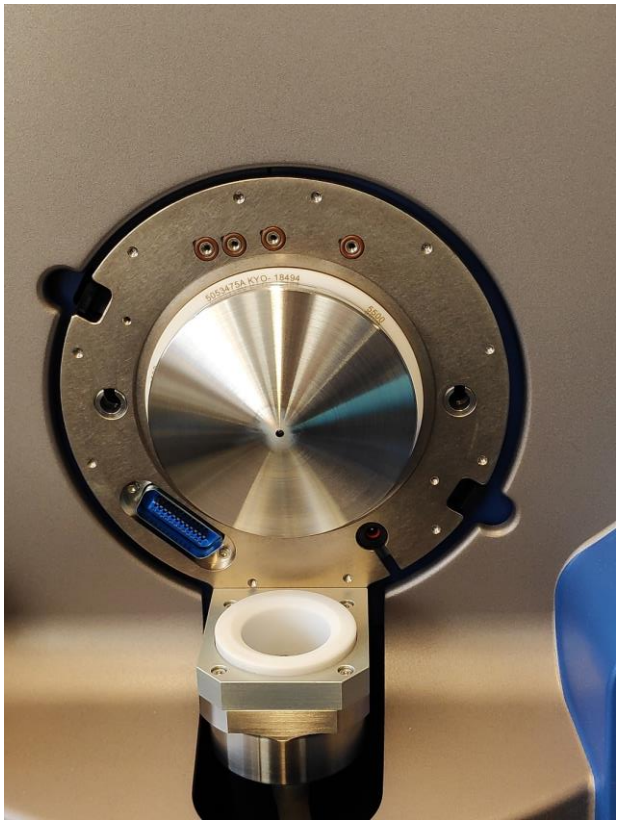


Figure 2: SCIEX API interface with ion source housing removed and ready for SICRIT® Interface installation.

2.2 Installation of the SICRIT® Interlock

For the installation of the SICRIT® Ion source to SCIEX MS-systems the SICRIT® Interlock is used on the ion source mount instead of the Turbo V ion source housing.

- Press the interlock gently onto the mount, ensure that the sealing ring and interface slides in place using the two holes and the guiding pins of the interlock (Figure 4, step 1).
- Lock the two levers on the interlock by turning them 180 degrees (Figure 4, step 2).
- Check the correct installation by the green status message in the *Analyst* control software.

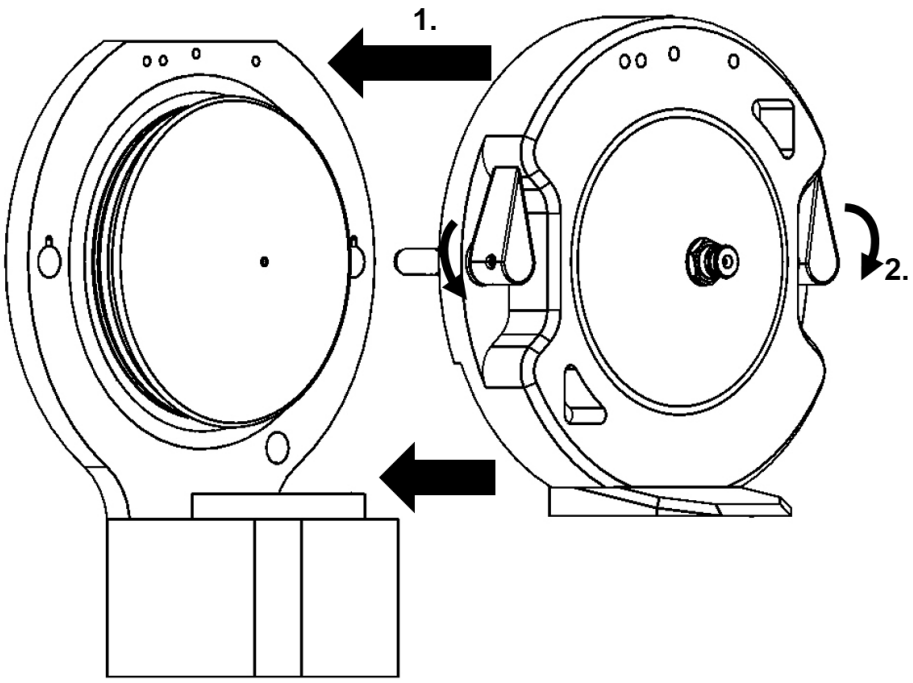


Figure 4: Installation of the SICRIT® Interlock to the mount of the SCIEX MS-instrument.

After installation of the interlock the SICRIT® Ion source should be detected as Turbo ionspray source by the MS-instrument.

2.3 Installation of the Venturi Pumping

To ensure proper operation of the SICRIT® Ion source the internal venturi pump of the SICRIT® Interface must be connected.

After installation of the SICRIT® SX1 Interface to the MS connect a pressurized air supply (2 bar) to the delivered shut-off valve by use of the delivered 4 mm OD PFA tubing. Make sure to set the valve to closed position while mounting. Adjust the pressure to 2 bar using the delivered pressure regulator. Connect the interlock venturi port to the shut-off valve using the one-touch fitting. See figure 5 for details.

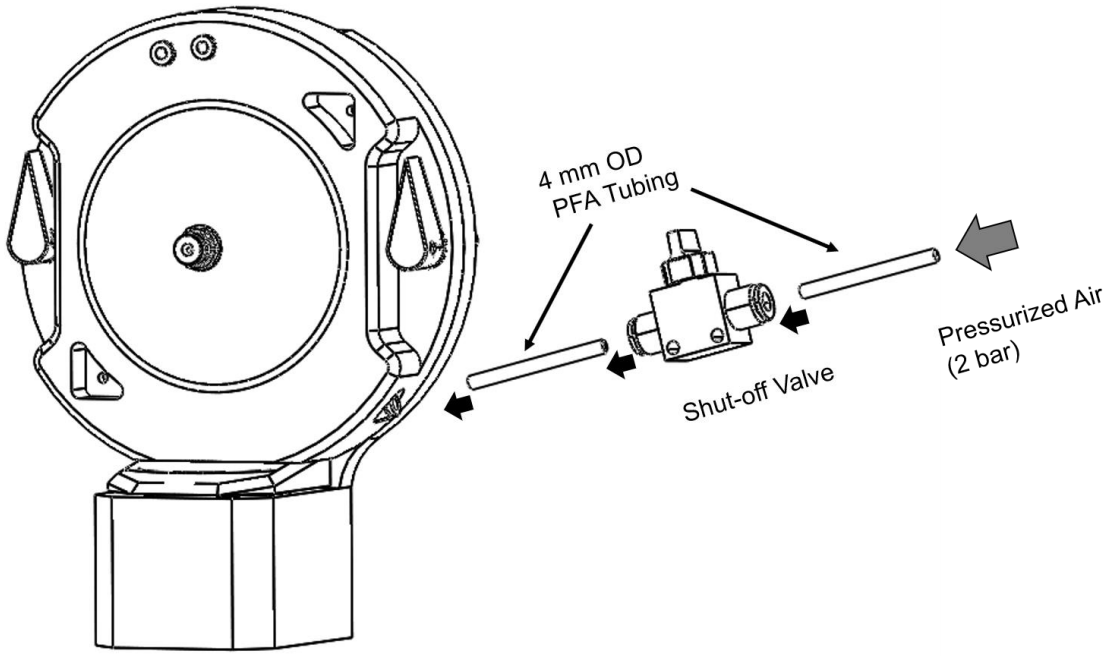


Figure 5: Installation of the venturi pump and gas connection to the SX1 Interlock.

	You can utilize the pressurized air supply for "Exhaust gas" to your SCIEX Instrument for connection of the SICRIT Interface by inserting a T-piece and he supplied pressure regulator.
	Make sure to wear proper protective gear and take all necessary precautions (e.g. turn of the pressure) when manipulating pressurized gas supplies!

2.4 Installation of the SICRIT® Ion Source

After installation of the SICRIT® Interlock and venturi system, you can now mount the SICRIT® Ion source by means of the quick lock mount (Figure 6).

- Press the ion source onto the adapter.
- Firmly hold the source and rotate the lock about ¼ turns clockwise, until you hear a "click" sound. This signalizes that the lock is engaged and mounting is finished.

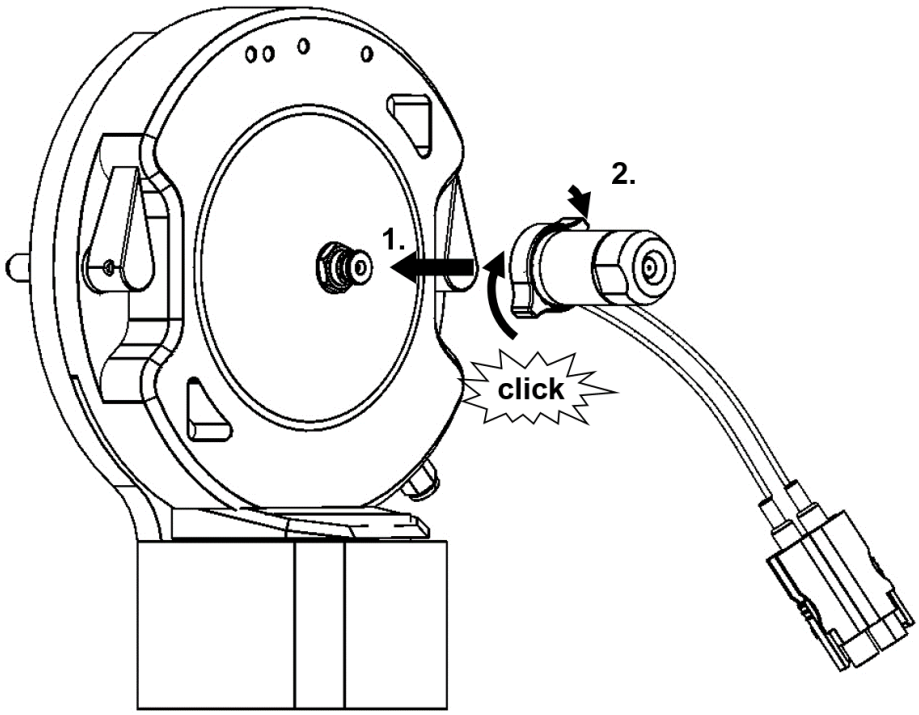


Figure 6: Installation of the SICRIT® Ion source to the SX1 Interlock.

	On new sources the locking might require some force. The locking mechanism becomes easier after a few installations.
	The MS instrument software recognizes the SICRIT® Interface as Turbospray source. Make sure that spray voltage is set to 0!

Further steps about the intended use of the SICRIT® Ion source and the implementation of SICRIT®-MS-measurements or measurements with coupling of GC or SPME can be found in the corresponding manuals of Plasmion GmbH available free of charge plasmion.de.

3. Launching the MS instrument with SICRIT® Ionization Technology

	If the system is used in a way not specified by the manufacturer, the warranty of the manufacturer can be impaired.

3.2 Software-Settings for the operation of the MS instrument with SICRIT® Ionization technology

The SICRIT® Ion source replaces the standard *API ion sources* like ESI or APCI. Before assembling and launching the SICRIT ion source the following parameters must be set in the *Hardware profile* of the MS:

- Create a new MS Hardware Profile called "SICRIT" in analyst software.
- Go to manual Tuning.
- Set the default values for *spray voltage* as well as the streams for *all gases* to zero, except curtain gas, which is set to minimum value (usually 10 l/min).
- Turn on the SICRIT-Venturi by opening the shut off valve.
- Start a Q1 Scan from 50-300 m/z
- Turn on the voltage at the SICRIT® Control unit (usually 1.5kV) -> you should see a background spectrum of room air.
- The intensity may be optimized now by tuning the declustering or entrance potential.
- *First time tuning:* for the first installation tune the ion intensity by adjusting the pressure/pumping of the venturi system. Once an optimal venturi pressure is adjusted, lock the pressure regulator to this value. Do not exceed 2.5 bar at the supply pressure!

	Whilst tuning the venturi pressure make sure to monitor the vacuum status of the system. Only make slight adjustments and monitor the vacuum afterwards. Usually the pressure in Q1 should decrease or stay constant with increasing venturi pressure. On some systems and at pressures above 2.5 bar (maximum recommended value!) you might monitor an increase in Q1 pressure. If you see the pressure rising, turn off the venturi pressure immediately! Else the pressure increase (which is not fully understood yet) might cause the system to initiate an emergency vent!

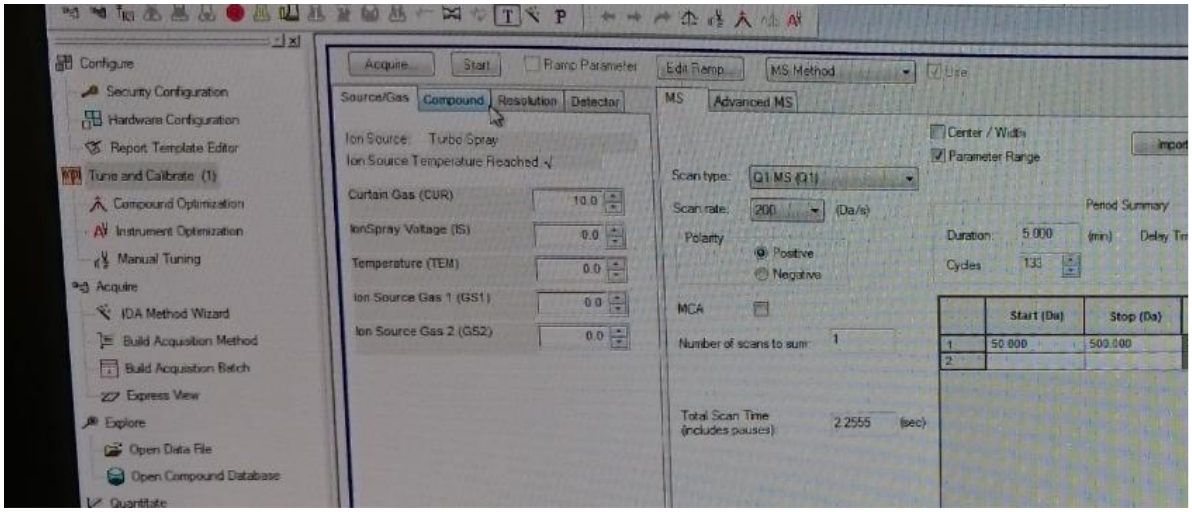
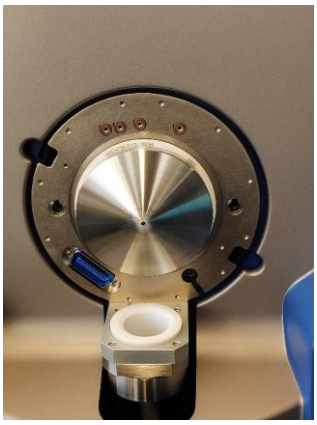
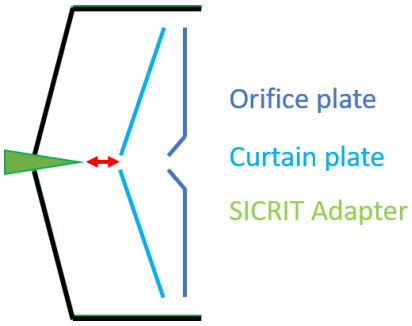
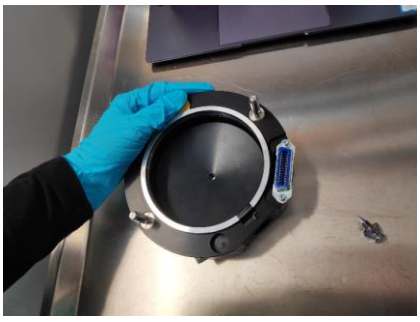


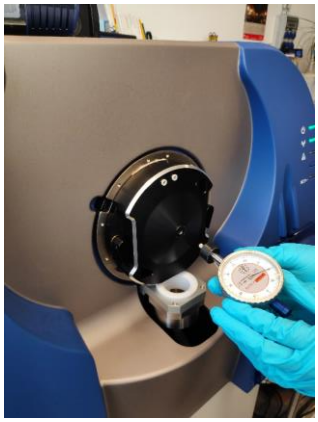
Figure 6: Parameters to be changed in the Analyst software.

3.1 First Installation of the SICRIT® Ion Source (only trained personnel)

For the first time installation of the SICRIT® SX1 interface it is necessary to adapt the interface to the SCIEX MS instrument. In order to avoid any mismatch every SCIEX instrument has to be measured and installed carefully by trained service personnel.

For correct installation, please follow the steps described below:

Prepare SCIEX MS for installation		
1		• Remove ESI Source. • Check the Curtain Plate and clean it if necessary.
Adapt the interface to the individual SCIEX instrument		
2		Measure the distance between *curtain plate* and SICRIT® Ion source adaptor: • Use the provided tool (dial gauge) to measure the distance. • Calculate the correct length of the SICRIT® Ion Source adaptor and place correct number of spacer discs on it. In the following each step is described in detail
3		Prepare the SX1 Interface for installation: • Remove SICRIT® Ion source adaptor • Remove interlock plug

4		Install the bare interface without SICRIT® Ion source adaptor and interlock plug
5		Assemble the dial gauge.
6	 	Use the dial gauge to measure the distance between the tip of the adaptor and the *curtain plate.* Correct use of the Dial Gauge tool: • Marked in red and green is the measured value of approximately 2.36 mm • Your measurement should range between 1.5 mm and 3.0 mm

7		Determine the correct number of spacer discs: • Remove the SICRIT® Interlock. • With the measured distance you need to determine the exact number of spacers needed: *Example 2.5 mm:* *1 x 1.6 mm (PEEK spacer disc)* *5 x 0.2 mm (PTFE spacer disc, white)* ⇒ *2.6 mm (this value is 0.1 mm higher than needed to stay safe)*
8		Place the spacer discs onto the SICRIT® Ion Source adaptor (first PEEK, then PTFE discs) and screw the adaptor onto the interlock.
9		Reinstall the interlock plug. **Make sure not to tighten the screws to hard.** The plug should be mounted loosely.