

Installation Manual

SICRIT® MS Interface AX1 / AX2

for Agilent LC-MS instruments



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This manual must be stored carefully and must be at hand to any user of the described system.

In addition to this guide, Plasmion GmbH provides manuals for installation and operation of the SICRIT® Ion Source and additional modules for coupling with chromatography etc.

Please check for updated versions of manuals on www.plasmion.com.



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.

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The technology and application of the system described in this manual is covered by patents and patent applications and is used under license.

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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.





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

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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 damage in any form.

1.1 The SICRIT® Technology

Soft Ionization by Chemical Reaction In Transfer (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 such as GC or HPLC. The latter requires additional coupling modules.

1.2 The SICRIT® MS Interface AX1 / AX2 for Agilent LC-MS instruments

The SICRIT® Interface AX1/2 replaces the standard ion source housing of the Agilent MS and enables the coupling of the SICRIT® Ion source to the MS (Fig. 1). The AX1/2 MS Interface set consists of:

- a source housing (a) with a plastic safety cover that enables the MS to recognize the SICRIT® Ion source and protects the user during MS operation (Art.-Nr. 26-003),
- an ion source adaptor assembly including a ceramic extension (b, Art.-Nr. 06-0024 or 06-0025), an inlet adapter (c, Art.-Nr.06-0024), and a source adapter with fixing nut (d, Art.-Nr. 16-008) to connect the ion injector capillary to the SICRIT® Ion source

AX1 and AX2 are identical except for the ceramic spacer. The AX2 spacer (Art.-Nr. 06-0025) has 3 small boreholes for adaptation to the higher inlet flow of hexabore resistive capillaries.

To achieve recognition by the Agilent software, the source housing features the original Agilent iButton for ESI sources.

Note: Recognition usually takes up to 15 seconds and might need several tries opening and closing the housing's locking catch.

The interface enables the general connection of the SICRIT® Ion source to your Agilent MS. It also enables the mechanical connection of additional SICRIT® modules for coupling methods e.g. LC-SICRIT®-MS or GC-SICRIT®-MS (please check for available products at plasmion.com)

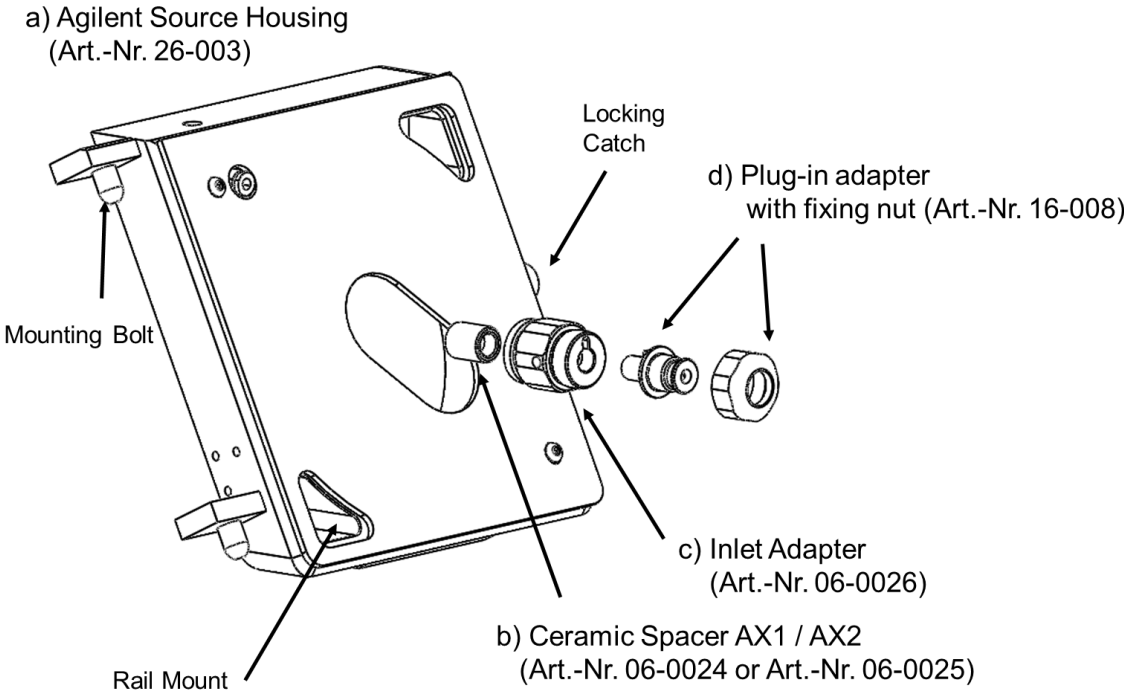




Figure 1: Components of the SICRIT® MS Interface AX1 / AX2.

2. Installation of the SICRIT® MS Interface AX1 / AX2 to the MS Instrument

2.1 Steps before the installation of SICRIT® MS Interface AX1 / AX2

Before the interface can be installed, the standard Agilent ion source has to be removed. Please follow the specific descriptions of the manufacturer of your MS.

	<p>Attention!</p> <p>Plasmion GmbH does not hold responsibility for potential damage that result from non-compliance to the manuals of the MS-manufacturer when removing the housing or other parts of the MS.</p>
	<p>Attention!</p> <p>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.</p>

- Put your MS instrument in standby mode and let the system cool down.
- Open the spray chamber and remove it from the LC-MS.
- Remove the spray shield, so the capillary end cap is exposed.
- Remove the capillary cap from the end of the capillary.

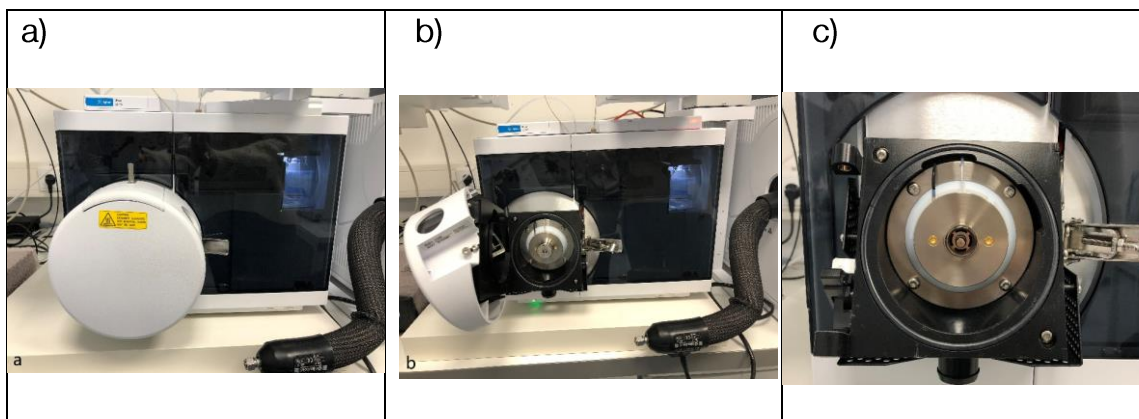


Figure 2: Closed electro spray spray chamber (a), opened electro spray spray chamber (b), Inlet with capillary cap (c).

2.2 Installation of the SICRIT® AX1 or AX2 Ion source adapter

For the operation of the SICRIT® Ion source the resistive capillary must be connected directly with the SICRIT® Ion source adapter by the following steps:

- Place the ceramic spacer on the resistive glass capillary (see Fig. 3). In case of AX2 make sure that the spacer is in correct orientation, having the side with the less deep bore facing towards you (see Fig 3 b).

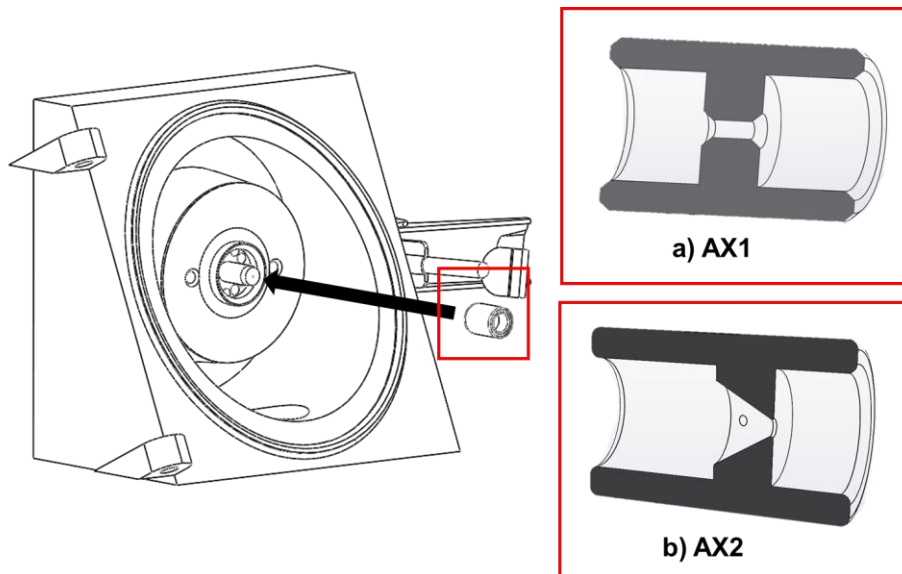


Figure 3: Installation of the ceramic spacer with orientation of a) AX1 and b) AX2 variant.

- Install the inlet adapter over the ceramic spacer by screwing it clockwise into the spray shield thread (see Fig. 4). Do not tighten the adapter yet.
- Mount the source adapter onto the inlet adapter. Make sure to guide the pin into the notch (see Fig. 5).
- Complete by installing the nut over the source adapter by screwing it clockwise onto the inlet adapter thread (see Fig. 5) and tighten the inlet adapter. Do NOT use tools e.g., pliers to tighten the nut and tighten it only hand tight!

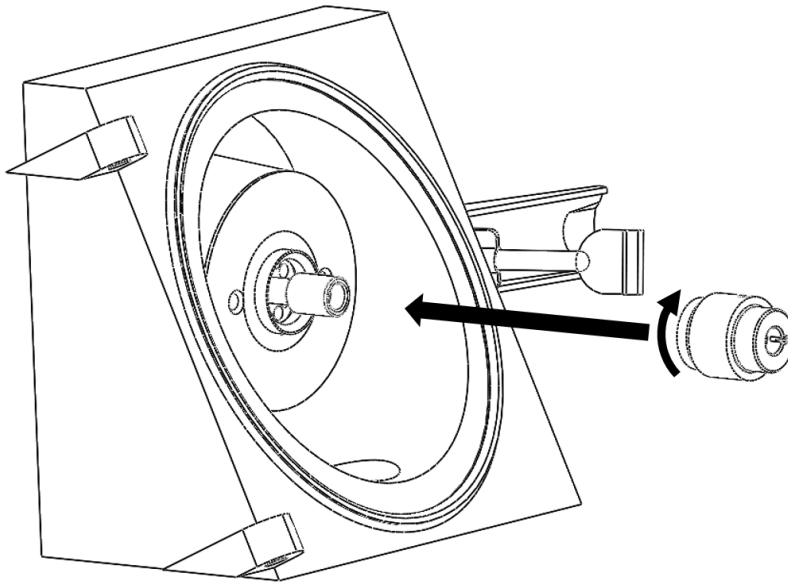


Figure 4: Installation of the inlet adapter.

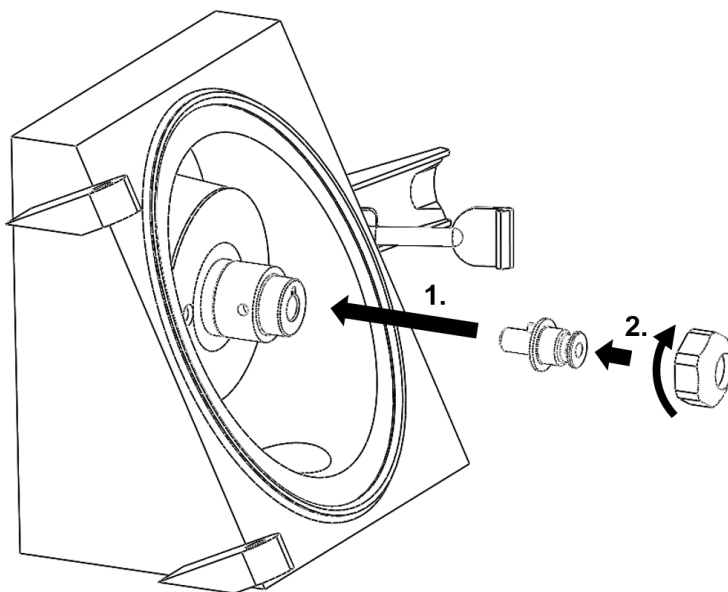


Figure 5: Installation of the plug-in source adapter.



Attention!
Make sure that you tighten the nut hand tight! Do NOT use any tools to tighten the nut.
Overtightening might damage the resistive glass capillary!

2.3 Installation of the SICRIT® Ion source

After installation of the SICRIT® Ion source adapter you can now mount the SICRIT® Ion source by means of the quick lock mount (Figure 6).

- Press the ion source gently onto the source adapter.
- Firmly hold the source and rotate the lock about $\frac{1}{4}$ turns clockwise, until you hear a “click” sound. This signals that the lock is secured, and mounting is finished.

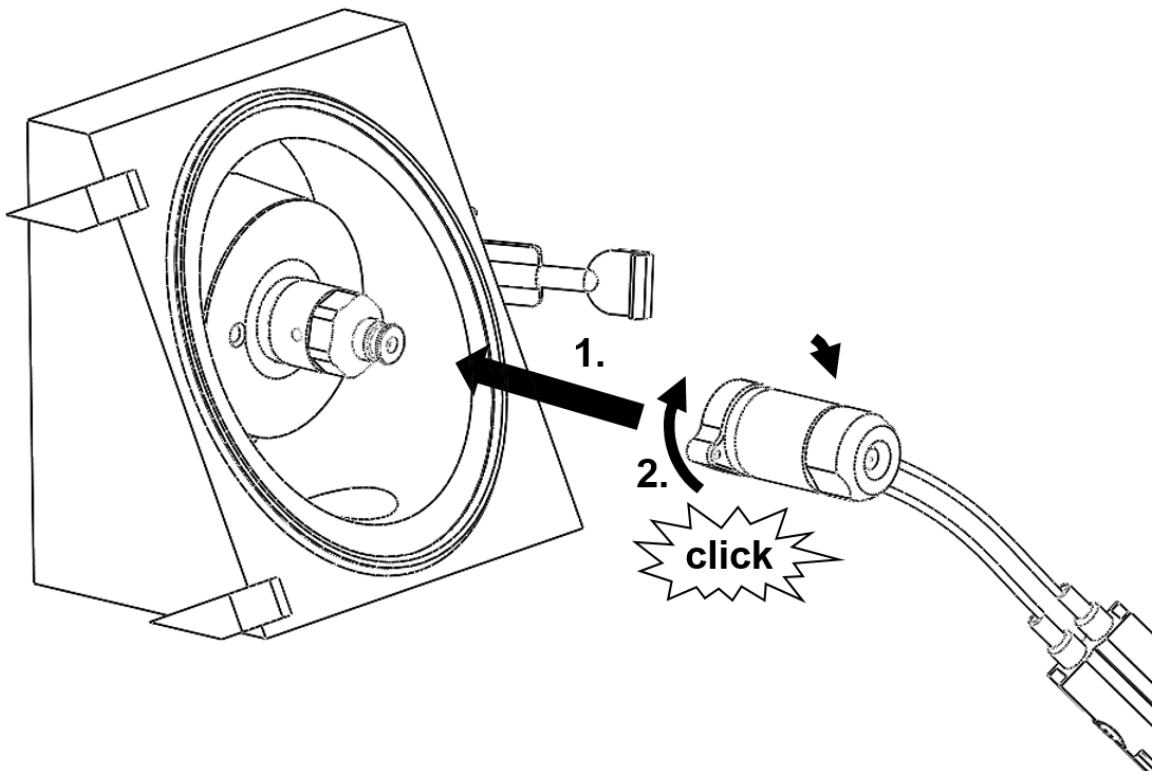


Figure 6: Installation of the SICRIT® Ion source.



On new sources the locking might require some force. The locking mechanism becomes easier after a few installations.

2.4 Installation of the SICRIT® MS Source housing

After mounting of the SICRIT® Ion source, install the provided SICRIT® MS Source housing before operation of the ion source as following:

- Hook on the housing by placing the mounting bolts in the guides of the MS (see Fig. 7).

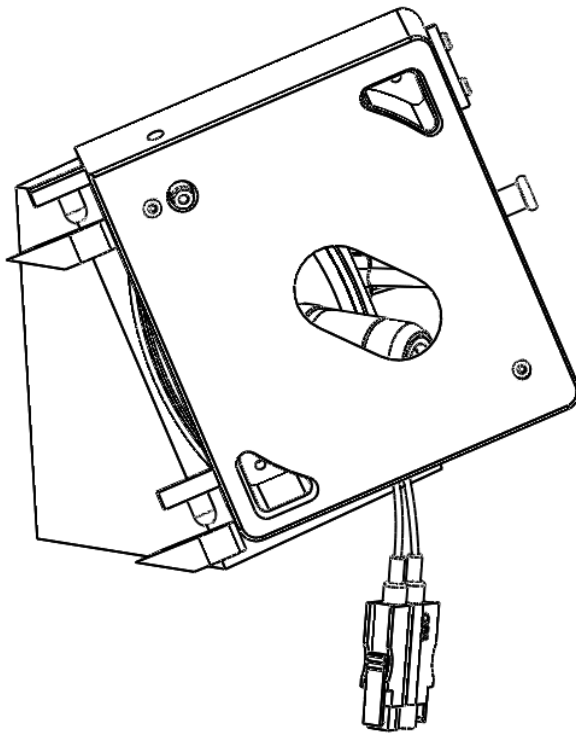


Figure 7: Hooking of SICRIT® MS Source housing.

- Move the HV cables of the ion source through the cutouts while closing the housing. Make sure not to jam the cables!
- Lock the housing by closing the locker over the catch on the interface (see Fig. 8).
- Check the correct installation and recognition by the MS status in the MS software.

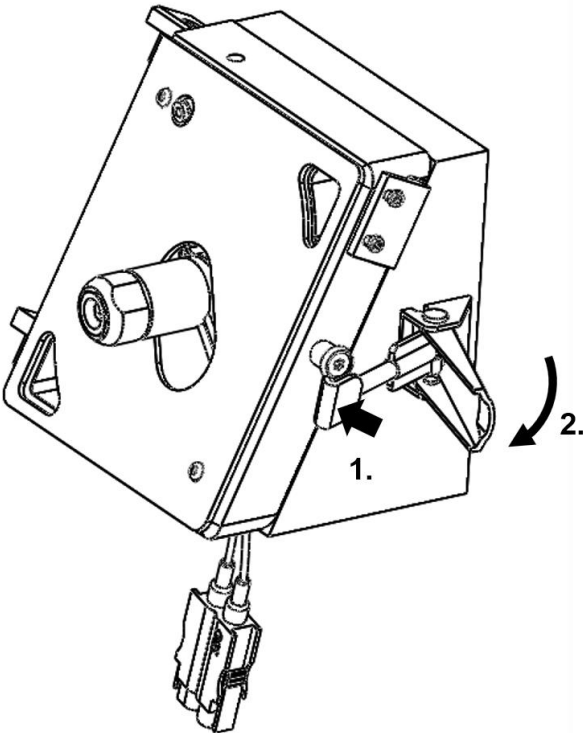


Figure 8: Closing the locking catch.

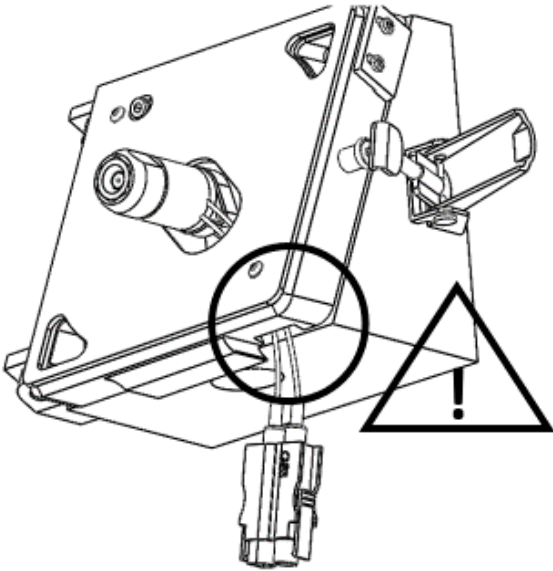


Figure 9: Cutout for ion source cables.

**Attention!**

Make sure not to jam the HV cables while closing the source! Use the provided cutouts (see Fig. 9). Avoid bending the cables (minimal bending radius is 4 cm). Do not place the cables over sharp edges or hot surfaces. Avoid strain on the cables and use strain relief measures.

**Attention!**



Do not remove the surface cover plate of the SICRIT® Source housing.

The cover plate is meant to protect the user for unintended contact with hot and/or electrically live components of the MS instrument or the ion source in the event of operation not according to the instructions given in this manual.

Further information 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.

If you need further assistance or support, please contact Plasmion via support@plasmion.com.

3. Launching the MS instrument with SICRIT® Ionization Technology

	<p>If the system is used in a manner not specified by the manufacturer, the warranty of the manufacturer may be impaired.</p>
	<p>If you do not use/restrict the nebulizer flow (e.g. GC/SPME Module), close of the gas line with a proper fitting, else the instrument might not achieve the required readbacks to get “ready” state.</p>

3.1 Mass Hunter Software-Settings for operating SICRIT® Ion Source

After installation of the SICRIT® Ion source select following set parameters in the MS software:

- Select ESI as ionization source in the “General” tab of the software.
- Switch to “Source” tab and use the recommended settings according to Tab. 1 (see Fig. 10).

Table 1: Recommended source settings for SICRIT® ionization

Setting	Recommended Values
Drying Gas Temperature	250°C- 300°C
Drying Gas Flow	3-12 l/min
Nebulizer	0 psi (except if used for optional modules)
VCap	0-1000 V (usually 0 V)
Nozzle Voltage	0 V
Fragmentor	150-250 V



Plasmion GmbH refuses any liability for damage to persons, its own or foreign products if other than the above-mentioned recommended settings are used during SICRIT® MS operation!

General	Source	Acquisition	Ref Mass	Chromatogram	Advanced Parameters		
Dual AJS ESI (Seg)			MS TOF (Expt)				
Gas Temp	290	°C	0	°C	Fragmentor	175	V
Drying Gas	11	l/min	0.0	l/min	Oct 1 RF Vpp	750	V
Nebulizer	35	psig	-13	psig			
Sheath Gas Temp	350	°C	0	°C			
Sheath Gas Flow	11	l/min	0.0	l/min			
Dual AJS ESI (Expt)							
VCap	3500	V	Capillary	0.000	µA		
Nozzle Voltage (Expt)	1000	V	Chamber	0.00	µA		

Figure 11: Source tab with parameter settings of Agilent Mass Hunter Software.

3.2 ChemStation Software-Settings for operating SICRIT® Ion Source

After installation of the source housing and the SICRIT® Ion source, select ESI as ionization source in the Method editor. Use similar settings (if applicable) as listed in Table 1



Figure 12: Method editor of Agilent ChemStation Software.

4. Service and Maintenance of the SICRIT® MS Interface AX1 / AX2

4.1 Maintenance of the SICRIT® MS Interface AX1 / AX2

We recommend cleaning the adapter periodically to avoid the formation of contaminations in form of deposits and to ensure an optimum performance of the ion source. For disassembly follow the steps described for installation in reverse order:

- Put your MS to standby mode and let the inlet cool down.
- Turn off the SICRIT® SC-30 control unit's HV output.



Attention!

Ensure the MS instrument is in standby and HV is turned off at SICRIT® HV supply before continuing.

- Disconnect the HV cables.
- Unlock the catch of the SICRIT® Source housing and take off the interlock carefully.

**Attention!**

All parts of the adapter including spacer might be very hot!
Let it cool down first and wear appropriate protective gear.

- Dismantle the ion source turning the lock counterclockwise.
- Loosen the nut and take out the source adapter.
- Unscrew the inlet adapter and take of the ceramic spacer.

4.2 Cleaning the SICRIT® Interface parts

Follow the procedure below to clean the SICRIT® Interface parts:

- Use an ultrasonic cleaning bath to clean stainless steel and ceramic adapter parts for 15 min in a 50:50 methanol/water mixture. Use only LC-grade solvents or better.
- If necessary, clean the source housing and protective plastic cover using a moist linen tissue.
- Make sure all parts are dry and clean before reinstallation.