

Installation and Operations Manual

SICRIT® Jet Desorber



Release March 2025

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

In addition to this manual, Plasmion GmbH provides further installation documentation e.g.:

- *Installation Manual for SICRIT® Interface TX 2/3*
- *Hardware and Operations Manual for SICRIT® SC-30X Ionization Set*

Please check for further and updated versions of this manual on www.plasmion.de/manuals



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 considered to be reliable. However, Plasmion GmbH does not take any responsibility for damages of foreign or own products, persons and instruments resulting from improper use. 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.

Declaration of conformity

The products outlined in this manual are engineered and built according to the requirements of electrical safety and health protection as outlined in the EC low voltage directive and electromagnetical compliance (EMC) directive. Any change or modification of any of the referred products, not verified by Plasmion GmbH, voids this declaration.

Plasmion GmbH certifies that the

SICRIT® Jet Desorber

is designed and build to meet the EU Regulation No. 2014/35/EU (low voltage directive) and the Guideline 2014/30/EU (EMC Directive). The product fulfills the following safety requirements and safety standards for electrical measurement, control, and laboratory use:

IEC 61010-1:2010

ICE 61010-1:2010/AMD1:2016

EN 61010-1:2010/A1:2019

IEC 61010-2-010:2019

EN IEC 61010-2-010:2020

The product fulfills the following directives for electromagnetic compliance of electrical measurement, control and laboratory use:

IEC/EN 61326-1:2012, Class A

CISPR 11/EN 55011:2009

The product is compliant with RoHS-Guideline 2015/863.



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>

Table of Content

Declaration of conformity	iii
Safety Instructions.....	iv
1. Intended Use of the SICRIT® Jet Desorber.....	1
1.1 The SICRIT® Technology	1
1.2 The SICRIT® Jet Desorber	1
2. Technical Data.....	2
3. Setup and Operation Modes of the SICRIT® Jet Desorber	3
4. Installation and Operation of the SICRIT® Jet Desorber.....	5
4.1 Installation prerequisites	5
4.2 Initial operation of the Jet Desorber.....	6
4.3 Mounting the Jet Desorber in horizontal position for direct analysis	6
4.4 Direct Analysis.....	9
4.5 Mounting the Jet Desorber in angular configuration.....	11
4.6 Angular desorption measurements	13
4.7 Changing the Nozzle Diameter	14
5 Service and Maintenance.....	14
5.1 Cleaning and decontamination.....	14
5.2 Maintenance and service of the SICRIT® Jet Desorber.....	15
6 Risk Avoidance or Residual Safety Risks.....	15
7 Operation with Potentially Harmful Substances.....	15
8 Troubleshooting the SICRIT® Jet Desorber.....	17
8.1 Problem: Error Message: THERMOFUSE TRIPPED.....	17
9 Spare Parts.....	18

1. Intended Use of the SICRIT® Jet Desorber

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.

1.1 The SICRIT® Technology

Soft Ionization by Chemical Reaction In Transfer (SICRIT®) is a flow through ionization technique to be coupled with LC mass spectrometers featuring an API. Inside the ion source a cold plasma is used for ionization of the analytes passing through. In combination with the jet desorber, this allows for direct analysis of solid or liquid samples as well as larger objects

1.2 The SICRIT® Jet Desorber

The Jet Desorber is designed to thermally desorb and volatilize molecules from surfaces for direct analysis. Therefore, the desorber is used in conjunction with the SICRIT® Ion source, which is mounted onto the mass spectrometer (MS) inlet. Further details regarding the installation of the ion source and mounting of the SICRIT® MS Interfaces are provided in the respective manuals. The Jet Desorber is empowered and controlled via the SICRIT® Control unit.

The desorber features a gas inlet and internal heating to generate a hot gas jet, that can be directed onto surfaces to thermally desorb chemicals. The desorber can be used with any kind of non-corrosive or non-toxic gas. Typically, N₂ or Air are used. The user may be advised that the quality of supplied gases (e.g. VOC contaminants) will directly influence the background/blank signal of the measurement.

2. Technical Data

SICRIT® Jet Desorber



Dimensions	120 x 50 x 50 mm
Weight	0.5 kg
Supply Voltage	Supply by SICRIT® Control unit SC-30: 24 VDC, 80 W
Electrical Connectors	1.4 m cable with plug for SC-30 Control unit
IP-Code	IP20
Protective Class	III
Operation Conditions	5 °C to 65 °C surface temperature 0 bis 80% RH (non condensating)
Maximum Operation Temperature (set Value)	500°C
Storage Conditions	5 °C to 50 °C
Operation Humidity	up to 31°C: < 80% RH (non condensating) at 40°C: < 50% RH
Maximum Operating Altitude	2,000 m
Possible Carrier Gases	Air, N ₂ , CO ₂ , Dopants* Flow 1 L/min up to 20 L/min or 3 to 30 PSI *contact the manufacturer for further information

3. Setup and Operation Modes of the SICRIT® Jet Desorber

The SICRIT® Jet Desorber is intended for direct analysis or surface desorption measurements (Figure 1). The construction allows for mounting in different orientations, depending on one's requirements.

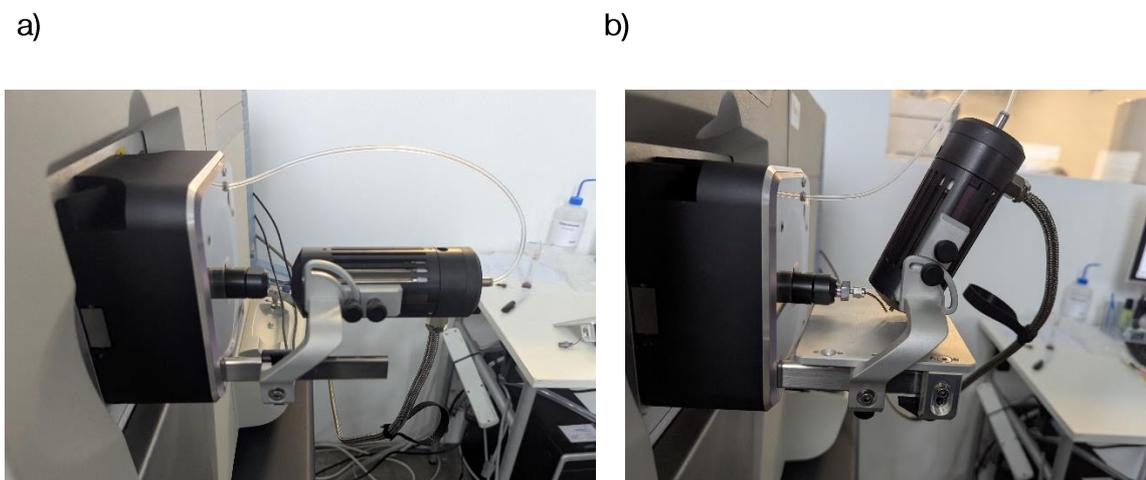


Figure 1: Installation of the Jet Desorber in horizontal (a) for direct or in angular (b) orientation for surface (e.g. TLC) desorption.

For direct analysis the Jet Desorber (Art.-Nr. 15-011) is mounted horizontally, and the sample can be introduced into the hot desorption gas stream facing the source.

In the angular orientation, a Sulfinert coated transfer tube as additional sampling extension (Art.-Nr. 16-030) is mounted onto the SICRIT® Ion source, so the desorption gas stream can be focused on larger objects. Optionally, a support table (Art.Nr 16-030) for analyzing flat objects e.g. TLC plates can be mounted.

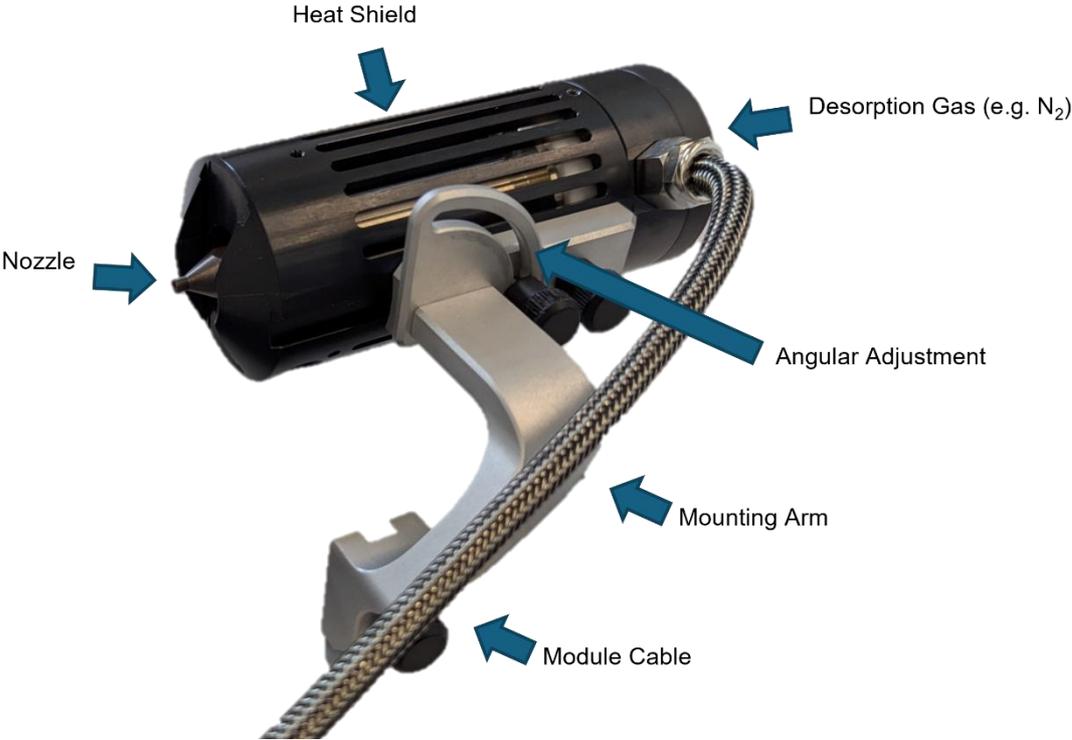


Figure 2: Components of the SICRIT® Jet Desorber.

4. Installation and Operation of the SICRIT® Jet Desorber

The SICRIT® Jet Desorber is installed by mounting it on the respective SICRIT® MS-Interface, using the mounting kit. Each interface features two mounting positions the lower position is used for the Jet Desorber (see Figure 3).

The following installation procedure is described exemplarily for a Thermo LC-MS system and the corresponding SICRIT® MS Interface TX2. However, it applies similarly for other systems and interfaces

4.1 Installation prerequisites

Before mounting the SICRIT® Jet Desorber to your MS, install your specific SICRIT® MS-Interface and the SICRIT Ion source following the steps in the provided manuals:

- *Installation Manual for SICRIT® MS Interface*
- *Hardware and Operations Manual for SICRIT® SC-30X Ionization Set*

a) Thermo IonMax Retrofit housing
(Art.-Nr. 26-001)

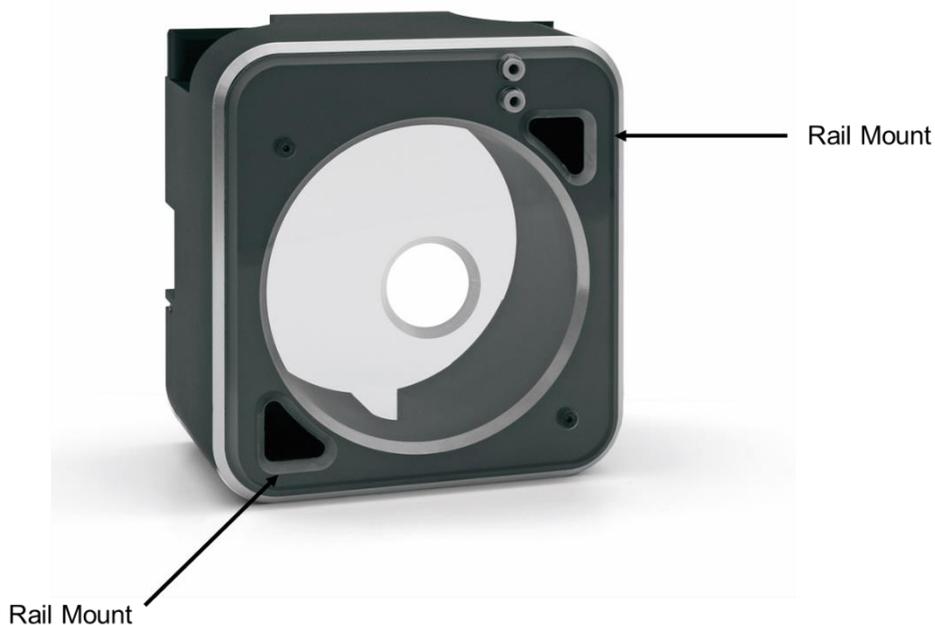


Figure 3: SICRIT® MS Interface TX2 with rail mounts for module installation

4.2 Initial operation of the Jet Desorber

The Jet Desorber consists of a stainless-steel heating chamber surrounded by an aluminum heat shield housing. The carrier gas passes a ceramic heater inside the heating chamber. To remove contaminations due to the manufacturing process, the heating chamber is thermal pre-treated by the manufacturer. This process can result in blooming patterns on the chamber surface.

Before using the Jet Desorber in analytical experiments, the assembly should be heated for 45 minutes with an active gas flow to remove deposited residues.

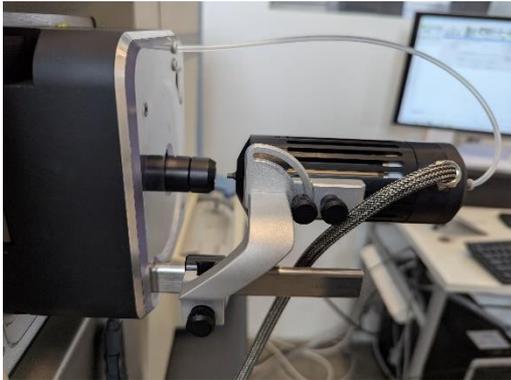
4.3 Mounting the Jet Desorber in horizontal position for direct analysis

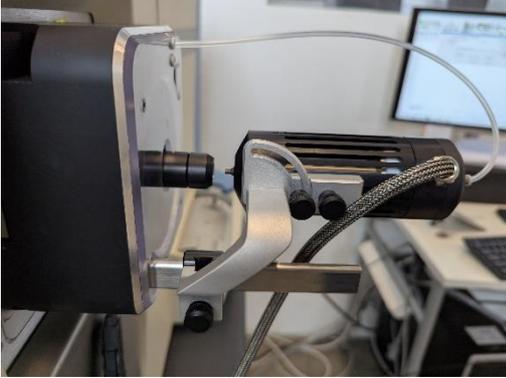
Generally, the mounting rail system allows for easy and flexible alignment of add-on modules for use with the SICRIT® Ionization technology. A lock screw system enables fine adjustment of the modules in x, y, and z-direction.

During the first installation of the system, some adjustments must be performed to meet the individual space and orientation requirements. These pre-settings can then be used for future installations.

Please follow the step-by-step instructions below:

1		Insert the rail of the mounting holder system in the designated rail mount at the lower left of the interface and secure it with the provided Torx tool.
---	---	--

<p>2</p>		<p>Place the slider with the mounting arm on the rail.</p>
<p>3</p>		<p>Adjust the angular fixation to a horizontal position</p> <p>Install the Jet desorber and slide it into position.</p>
<p>4</p>		<p>Adjust the position of the Nozzle that it directly faces the Ion source with a distance of 1 cm</p>

<p>5</p>		<p>Connect the desorber cable with the SICRIT® Control unit.</p>
<p>6</p>		<p>When you switch the power on the SICRIT® SC-30 Control unit the next tab is activated. The display shows the actual temperature of the desorber.</p>
<p>7</p>		<p>Connect the carrier gas with the desorber using the tube fitting inlet (Ø 3.2 mm). Gas supply can be provided by the aux gas supply of the MS using the one-touch fitting included in the SICRIT® Interface kit.</p> <p>Activate the Gas flow from the instrument (e.g. Aux Gas setting 10 for Thermo instruments)</p>
<p>8</p>		<p>Choose the desired set temperature in the module tab of the SICRIT® Control unit and activate it to heat up the desorber.</p>

	<p>The Jet Desorber is designed to generate a very hot gas stream (up to 500°C) for desorption. Do not get in contact with the gas stream! It can cause severe burnings and injuries. Always use heat resistant sampling devices (e.g. metal pincers) for introducing a sample.</p>
	<p>Attention! Avoid bending the cables. Do not place the cable over sharp edges or hot surfaces. Avoid strain on the cables and use strain relief measures.</p>

4.4 Direct Analysis

For MS analysis any sample, please insert the sample directly in the gap between Desorber and SICRIT, by use of metal pincers. You can also desorb liquid samples by e.g. dipping a glas tube (e.g. melting point tube) into the sample and introducing the tube into the gas stream. Depending on the set value, the Jet Desorber can deliver temperatures up to 500°C, which can damage the introduced object, if it is not heat resistant. **For sensitive sample/objects use lower heating settings (e.g. 100°C) to avoid burning marks!**

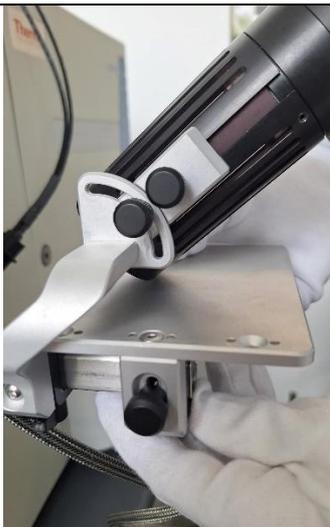
The desorbed analytes in the analysis gap are sucked in by the SICRIT Ion source for analysis. **To avoid contamination and carry over, please make sure not to touch any surface with the sample.**

	<p>The PI heating control of the Jet Desorber is designed for fast desorption ramps. By heating straight to maximum operation temperature (rt to 500 °C) there is the possibility of a short overheating. The system should reach stable temperature within 2 min.</p>
	<p>If you do not operate the Jet Desorber continuously with carrier gas, the assembly should be flushed for 15 minutes with carrier gas at 500 °C before every operation to remove residues and ensure a defined background atmosphere.</p>
	<p>Avoid direct contact to the nozzle surface and the Gas Jet or the Jet Desorber. The nozzle and gas stream may be hot! After operation, let cool down the system before deinstallation of the desorber assembly. Take special care when touching the nozzle which is extremely hot (up to 500°C)</p>

	<p>during and short after operation. Make sure to wear suitable protective gear (e.g. woolen gloves) when disassembling the desorber assembly..</p>
--	---

4.5 Mounting the Jet Desorber in angular configuration

For angular mounting please follow the step-by-step instructions for horizontal mounting (Section 4.3) and then continue with the Steps below

1		Loosen the angular positioning screw and tilt the desorber to the desired angle (e.g. 45°) and tighten the screw again.
2		Loosen the fixation screw and move it upwards, so that there is space to insert the Plate holder.
		Slide the Plate holder on the Linear rail and fix it.

		<p>Install the Ion Source Sampling extension on the SICRIT® Ion Source and align it with the Jet Desorber</p>
<p>3</p>		<p>Connect the carrier gas with the desorber using the tube fitting inlet (Ø 3.2 mm). Gas supply can be provided by the aux gas supply of the MS using the one-touch fitting</p>

4.6 Angular desorption measurements

The angular setup is used for desorption of larger objects' surfaces and flat objects (For larger objects, please uninstall the sample plate). For analysis, start a measurement and heat up the gas flow. Place the object right underneath the Sample jet and sampling extension and continuously record the spectra. Jet Desorber and sampling extension should be oriented in a V shape right above the sample for proper desorption and analysis. Please see example picture below:

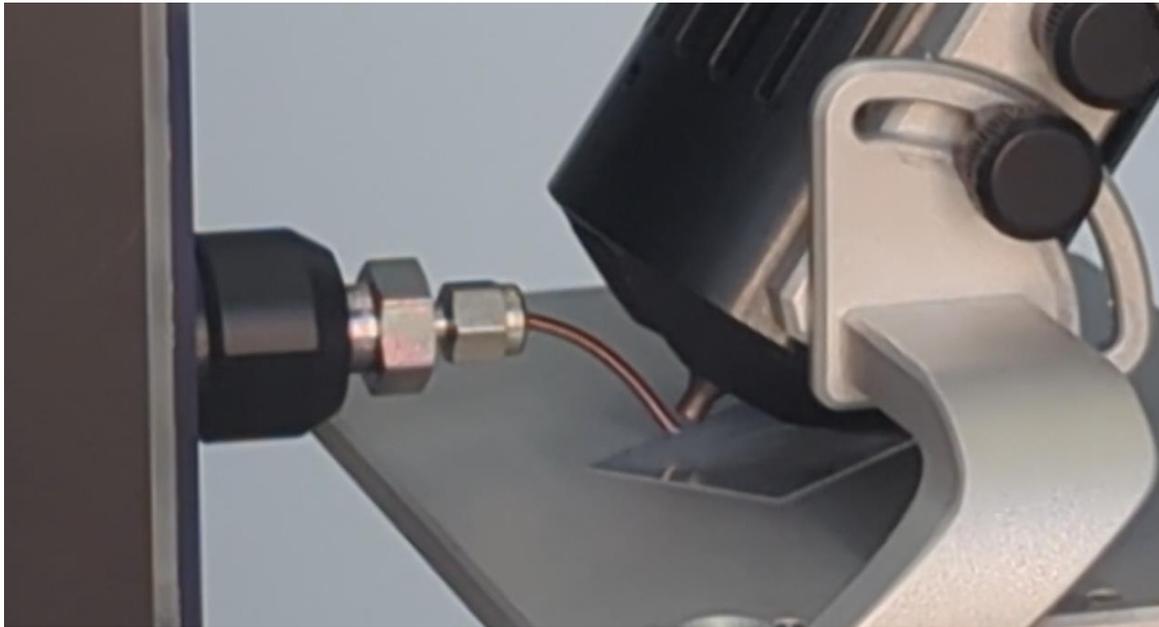
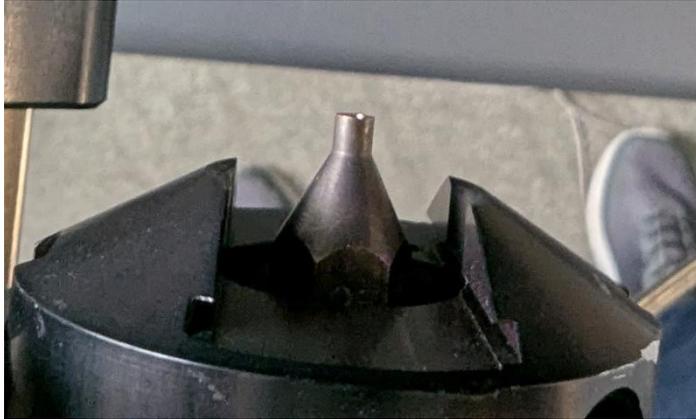


Figure 4: Sampling Setup for direct analysis of solid sample on glass slide.

	ATTENTION: Be careful with the hot gas stream. Do not get in contact with the gas stream and wear proper protection gear e.g. cotton gloves
	ATTENTION: To avoid burning/charring of the surface choose a proper desorption temperature

4.7 Changing the Nozzle Diameter

To change the nozzle let cool down the system completely and uninstall the Jet desorber from the linear mounting rail. Disconnect the desorber from the SC-30 Control Unit. Use the supplied tool to unscrew and exchange the nozzle. The standard configuration has a diameter of 1mm.



5 Service and Maintenance

The SICRIT® Jet Desorber does not require any service or maintenance in routine operation. The only replaceable part is the orifice, which may be exchanged with different diameter orifice.



Do not open the desorber assembly! In case of technical question or problems, please contact Plasmion or its respective sales agent.

5.1 Cleaning and decontamination

In an unplugged state, the surface of the desorber unit may be cleaned with a humid cloth. To remove contaminations a 50:50 methanol:water mixture can be used. If you use other solvents check the persistence of the anodized aluminum surfaces against these cleaning agents.

Any contact of the inner cables and components with liquids must be avoided! Before next operation, the desorber assembly must be completely dry.

In case of chemical contaminations visible in your measurements you should clean or replace the orifice or inlet tube. Inlet tubes with passivated Swagelok tube fittings can be purchased as spare parts from the Plasmion (support@plasmion.de) or your respective sales partner.

5.2 Maintenance and service of the SICRIT® Jet Desorber

The operational status of the desorber can be checked using the display of the control unit. After plugging in power supply cable of the and turning on the control unit, the actual temperature of the desorber should be displayed and the temperature should be adjustable by the rotary encoder. If there is no or a lost connection the display will show [--] for set and actual value.

If there is an overheating of the system, the control unit will stop operation and display a warning.

Correct heating of the desorber should show a response of the actual temperature value within 20 seconds in the display of the control unit.

Do not operate the system if the housing shows obvious damages.

In case of unrealistic actual temperature values or fluctuations in the displayed values without heating of the desorber, there is a defect of the desorber power supply or the control unit. Please contact Plasmion or its respective sales agent for further advice.

In case of abnormal heating of the desorber there is a defect of the controller. Please do not further use the desorber and contact Plasmion or its respective sales agent.

6 Risk Avoidance or Residual Safety Risks

Regularly check the casing and cables for damages.

Ensure that access to the system is restricted for any unauthorized or untrained personnel.

Visually check the contact pins of the connectors for changes and damages.

Check if all connections are engaged before operating the system..

7 Operation with Potentially Harmful Substances

The risks of operation and handling of harmful or toxic substances that can be analyzed with the SICRIT® Ion Source fall to the operator. Stick to all safety guidelines and take all necessary precautions. Ensure that the substances introduced do not damage the system. The materials used in the SICRIT® Ion Source are PEEK, stainless steel and ceramics. Consider also the durability at higher temperatures.

The device itself does not contain harmful substances.

For recycling of the system, please contact the manufacturer.

8 Troubleshooting the SICRIT® Jet Desorber

In the following section problems are discussed that might occur during operation of the system. If you do not feel confident to solve the problems after this brief troubleshooting guide, please contact Plasmion or its respective sales agent for further advice.



Please support us in the further development of the devices by sending us a short description of the error, its occurrence and/or the solution via email to support@plasmion.de we appreciate your efforts!

We are further happy to receive feedback on the handling or operation, since we are always eager to improve our customers' experience.

8.1 Problem: Error Message: THERMOFUSE TRIPPED

The Jet Desorber is equipped with a resetting thermofuse to prevent the desorber from unintended overheating in case of hard- or software error. Tripping the fuse will result in switching off the heating and showing the error message in the display.

- Check, if the Jet Desorber is freely positioned and the air can circulate. Don't cover the housing with thermal insulation material.
- If the thermofuse has been tripped, wait >1 hour before heating again for resetting of the fuse.

9 Spare Parts

Description	Part No.
Orifice 1 mm	01-0051
Orifice 2 mm	01-0052
Sampling Platte	16-030
Mounting Holder	16-029
Tubing Kit Jet Desorber	12-004
Ion Source Sampling Extension	16-031