Arcotec GmbH
Rotweg 24
71297 Mönsheim, Germany

Information for use

English version V11, date: 07 October 2025

Important!
Read carefully before use.
Keep this information for use clearly visible at the device.

Plasma Generator ARCOJET® PG 051 M

Project:

Generator PG 051 M **SN:**

Company:

EC Declaration of Conformity

In accordance with Machinery Directive 2006/42/EC, Annex II Part 1, Section A

The manufacturer: **Arcotec GmbH**
Rotweg 24
71297 Mönsheim, Germany

hereby declares that the following product

Product designation:	HF Plasma Generator with manual electrode head
Type:	PG 051 M
Serial numbers:	HF Plasma Generator PG 051 M SN:
Year of manufacture:	CW xx/2025
Function:	Surface pre-treatment to improve adhesion

complies with all the relevant provisions of the Machinery Directive 2006/42/EC.
Additionally the product complies with the following EU directives:

2014/30/EU	EMC Directive
2014/35/EU	Low Voltage Directive

The following harmonized standards have been applied:

EN 12100:2011-03/ B1:2013-08	Safety of machinery – general principles for design – Risk assessment and risk reduction
EN 60204-1:2007-06/ A1:2009-10/B1:2010-05	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 60204-11:2001-05/ B1:2010-05	Safety of machinery – Electrical equipment of machines – Part 11: Requirements for HV equipment for voltages above 1000 V

Name and address of the person who is authorized to compile the technical documents:
Jens Peter Schmidt, Arcotec GmbH, Rotweg 24, 71297 Mönsheim, Germany

This declaration is made for and on behalf of the manufacturer by

Mönsheim, 07 October 2025

Sebastian Bloss
CEO of Arcotec GmbH

Table of contents

Arcotec GmbH, Rotweg 24, 71297 Mönsheim; Germany
Phone: +49 7044 9212-0, e-mail: info@arcotec.com

1 General information

In this information for use, the following symbols are used:

 **WARNING**	Indicates a risk that may result in death or serious injury if not avoided.
 **CAUTION**	Indicates a risk that may result in minor injury if not avoided.
	Warning of hazardous voltage
	Warning of hot surfaces
NOTICE	Indicates a warning of material damage that may occur if the information is not complied.
Important!	Indicates important information.
• Instructions that have to be carried out in the specified order.	
→Result of an instruction	
■ List of instructions in safety and warning information	

Arcotec GmbH, Rotweg 24, 71297 Mönsheim; Germany
Phone: +49 7044 9212-0, e-mail: info@arcotec.com

2 Safety instructions

2.1 Requirements for operators and operating personnel

- Only allow qualified and instructed personnel to operate the device.
- Make sure that the device is only operated in a safe and functional condition.
- Comply with all safety and hazard warnings on the device and in the information for use.
- Comply with all relevant national safety regulations for operating the device.

2.2 Electrical hazards

During operation, the electrode head is supplied with high voltage. The high-voltage discharge has a voltage of approximately 7 kV. Risk of life-threatening electric shocks.

- Do not touch the high voltage discharge.
- Do not touch the electrodes.
- Do not direct the high voltage discharge at body parts or persons.
- Connect the plasma generator to protective earth.
- Before operating the device, check if the grounding strap is connected to the ground connection of the generator.
- When treating the sample on a table that has a conductive plate (metal plate), ground this plate.
- Hold the hand switch in one hand to activate the high voltage discharge and hold the handgrip in the other hand to move the electrode head across the material.
- In case of faults from the electrical power supply, switch off the device immediately and disconnect the device from the power supply.

When treating conductive or partially conductive material, the material is under high voltage.

- Do not touch the treated material during the treatment.
- In case of doubts, connect the material to earth safely.

The device has a built-in ground fault detection circuit. The ground fault detection circuit must not be used as a safety device (ground fault detection) for personal protection, as it only serves to protect the device.

2.3 Risk of burns and fire hazard

The high voltage discharge has temperatures of higher than 100°C.

- Do not touch the high voltage discharge.
- Do not direct the high voltage discharge at body parts or persons.
- Hold the hand switch in one hand to activate the high voltage discharge and hold the handgrip in the other hand to move the electrode head across the material.
- Do not direct the high voltage discharge at easily flammable material.

2.4 Harmful corrosive gases

The plasma treatment produces hazardous corrosive gases such as nitrogen oxides and ozone, which can lead to respiratory diseases.

In order to avoid the formation of larger concentrations of these corrosive gases, an air extraction from the working space is recommended. The respective workplace exposure limits apply.

2.5 Installation, maintenance and repair

- Only allow qualified electricians to maintain and repair the device.
- Before maintaining and repairing the device, switch off the device with the main switch, check for no voltage and secure the device against unintentional restart.
- Do not remove or disable any safety devices. If it is necessary to remove or disable safety devices for maintenance or repair, reinstall the safety devices immediately after completing this work.
- After repair, make a test run to check the operational safety of the device.
- Modifications to the device are only allowed after written consultation with Arcotec.
- Never shorten, lengthen or kink the hoses to the electrode head, especially the high voltage cable contained therein. Changing the cable lengths can cause malfunction of the device.
- Only use original spare parts.

2.6 Explosion hazard in the presence of flammable gases

In the presence of flammable gases in the ambient air there is an explosion hazard due to the high voltage discharge. **The device must not be used in potentially explosive areas.**

- Keep the ambient air free of flammable gases or provide adequate ventilation.

3 Intended use and technical specifications

3.1 Intended use

The device is only intended for physical pre-treatment of plastic surfaces to improve the adhesion of printing inks, lacquers, glues, foams, etc.

It consists of the semiconductor generator in 19″ construction with a built-in high voltage transformer and a discharge electrode head. The electrodes are located in the Teflon inserts of a metal housing, which is firmly connected to the generator by a flexible hose for the working air and a second flexible hose containing high voltage cables.

The handgrip with ARCOJET® electrode head is intended for manual use of the electric head with the optimum distance of 10 mm to the surface to be treated. The hand switch is used to activate the high voltage discharge with the other hand.

The speed at which the electrode head is moved over the surface should not exceed 25 cm/s (15 m/min).

The treatment effect can be verified by means of dyne level test inks (surface energy measurement based on the wettability of the surface). It is to examine in each individual case, which surface energy is sufficient for optimal adhesion.

3.2 Improper use

The device may not be used for inappropriate purposes. Any modifications and changes to the system are not authorized without written permission by Arcotec. The manufacturer assumes no liability for damage resulting from improper use.

3.3 Technical specifications

Power	230 V, 50 / 60 Hz, single phase
Power input	max. 460 VA
Current consumption	max. 2 A
Number of electrode heads	1
Type of electrode head	ARCOJET® type C with handgrip with guide rollers
Width of treated area	max. approx. 55 mm
Standard hose length	1.80 m (optionally a length of 3.00 m)
Dimensions (width × height × depth)	470 x 213 x 530 mm
Weight of the generator	20 kg

Subject to change.

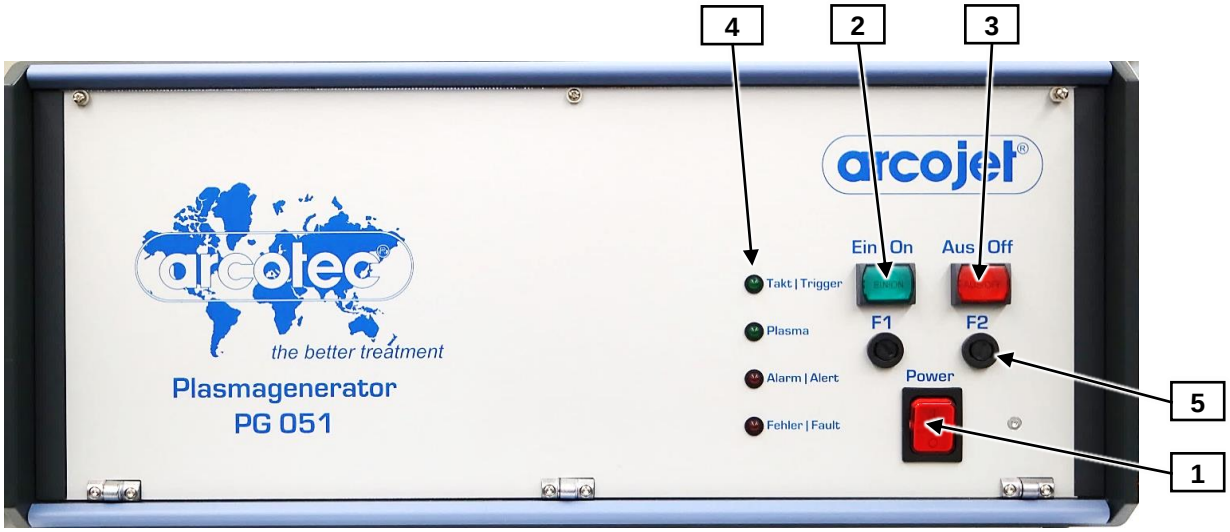
4 How it works

Between two electrodes, a high voltage of 7 kV with a frequency of about 30–50 kHz generates a high voltage discharge that is carried out of the electrode head by means of a compressed air stream. The high voltage discharge can break up molecular chains on the surface of non-polar and poorly soluble plastics. Therefore, oxygen in the airflow of the high voltage discharge can attach to these open molecular breaks. The attached oxygen provides polar bonding for paints, adhesives, paints, etc.

The electrode head is free-radiating, which means, it does not require a grounded counter electrode at the back of the surface to be treated. The treatment area of the electrode head is about 55 × 35 mm. The treated area can be increased by moving the electrode head over the surface. The optimal distance for good pretreatment results is 10 mm using the guide rollers. The speed at which the electrode head is moved over the surface should not exceed 25 cm/s (15 m/min).

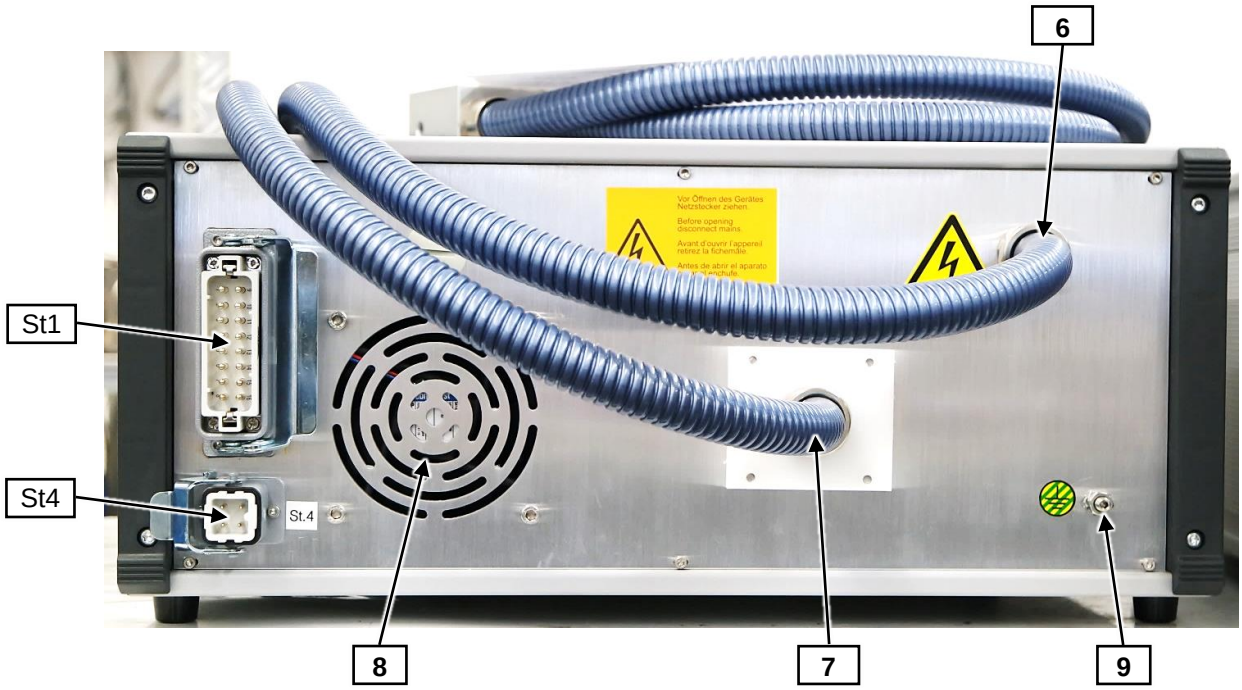
5 Description of the Device

5.1 Controls on the front panel



1 Main switch
2 On button
3 Off button
4 Indicator lights
5 Fuses F1, F2

5.2 Connections on the rear panel

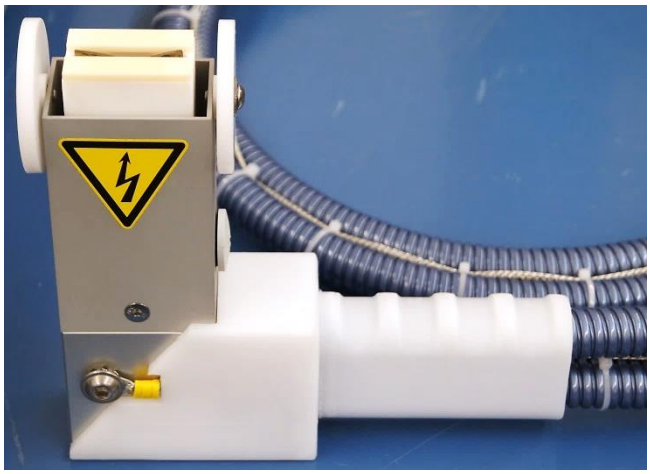


6 High voltage output
7 Working air for electrode head
8 Fan
9 Grounding connection
St1 Interface connector
St4 Power cable plug

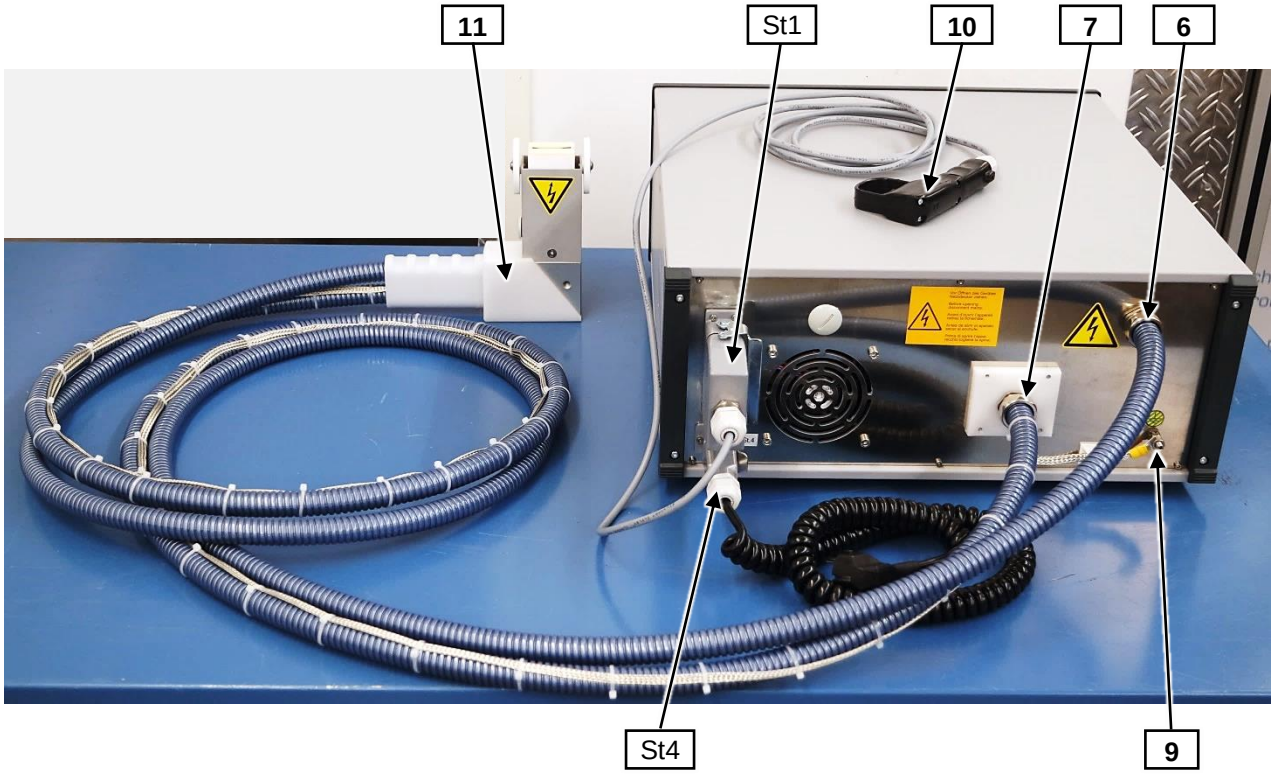
5.3 Hand switch and hand grip

Hand switch

Hand grip ARCOJET with electrode head type C



5.4 Setup and connections



6 High voltage output
7 Working air for electrode head
8 Fan
9 Grounding connection
10 Hand switch
11 Hand grip with electrode head
St1 Interface connector
St4 Power cable plug

5.5 Pin assignment of the 4-pin connector St 4

- Connect the device to the power supply (230 V, 50 / 60 Hz, single-phase) with connector St 4.

PE	**PE**
1	**L**
2	**N**

5.6 Indicator lights

There are four indicator lights on the front panel of the plasma generator:

Takt / Trigger	This LED lights up green when the high-voltage is activated by means of the hand switch via connector St 1.
Plasma	This LED lights up green when the high voltage plasma is activated.
Alarm / Alert	This LED lights up if there is a short circuit between the two electrodes of the electrode head, which can occur if the distance between the electrode head and the surface to be treated is too short, or when the air stream is too weak or missing.
Fehler / Fault	For devices equipped with earth fault detection, this LED lights up if the high voltage discharge is discharged to ground.

In order to reset the fault message, press the green on button again.

6 Packaging, Transport and Scope of Delivery

6.1 Packaging

- Dispose of the used packaging in accordance with the official local regulations.

6.2 Transport

- Only allow instructed personnel to transport the device.
- When transporting the system, make sure not to damage it.
- Comply with the accident prevention regulations.
- Report transport damages immediately.

6.3 Scope of delivery

Pos.	Quantity	Item	Designation
1	1	61729	Plasma generator ARCOJET® PG 051 M, SN: P254350
2	1	62614	Hand grip ARCOJET® including electrode head type C – Hand grip for guiding the type C electrode head – Grounding strap between electrode head and generator – Guide rollers – Hand switch
3	1	64827	Technical documentation in English

7 Installation

7.1 Setting up the device

HINWEIS

Eine mangelnde Luftzufuhr führt zur Abschaltung des Geräts aufgrund einer Überhitzung der Komponenten.

- Do not cover the air inlet slots at the bottom of the generator.

Changing the cable lengths can cause malfunction of the device.

- Never shorten, lengthen or kink the hoses to the electrode head, especially the high voltage cable contained therein.

If the air supply is not sufficient, the material will not be treated sufficiently and the generator will be switched off with the error message "Alarm". Furthermore, in the worst case, the high-voltage transformer can also be damaged.

- Never kink or squeeze the air conveying hoses of the electrode head.

- Set up the generator so that the hose length is sufficient for the intended working position.
- Leave at least 100 mm free space for plugs cables at the rear of the device.

7.2 Connecting the equipment

- Connect the device to the power supply (230 V, 50 / 60 Hz, single-phase) with connector St 4.
- Connect the hand switch to the connector St 1.
- Connect the grounding strap to the ground connection.

7.3 Air extraction

CAUTION! Harmful corrosive gases.

The high voltage discharge produces nitric oxides and ozone (in lower concentrations).

In order to avoid the formation of larger concentrations of these corrosive gases, it is recommended to use an air extraction from the working space.

The concentration of the harmful gases in the exhaust air is so low, that no filtering is necessary, if the exhaust air is led directly out of the building.

8 Operation

WARNING of high voltage! Risk of life-threatening electric shocks.

During operation, the electrode head is supplied with high voltage. The high voltage discharge has a voltage of around 7 kV.

- Do not touch the high voltage discharge.
- Do not touch the electrodes.
- Do not direct the high voltage discharge at body parts or persons.
- Before operating the device, check if the grounding strap is connected to the ground connection of the generator, otherwise high voltage can dissipate via other objects.
- When treating a sample on a table that has a conductive plate (metal plate), ground this plate.
- Hold the hand switch in one hand to activate the high voltage discharge and hold the hand grip in the other hand to move the electrode head across the material.
- In case of faults from the electrical power supply, immediately switch off the device and disconnect the device from the power supply.

Connect conductive or partially conductive materials to ground, because high voltage discharge can dissipate via the material.

- Make sure that conductive or partially conductive materials are always connected to ground.
- Do not touch the material during the treatment.

WARNING! The high voltage discharge generates temperatures of higher than 100 °C. Risk of burns and fire.

- Do not touch the high voltage discharge.
- Do not direct the high voltage discharge at body parts or persons.
- Hold the hand switch in one hand to activate the high voltage discharge and hold the hand grip in the other hand to move the electrode head across the material.
- Do not direct the high voltage discharge at easily flammable material.

NOTICE

If the air supply is insufficient, the material will not be treated sufficiently and the generator will be switched off with the error message “Alarm”.

- Do not kink or squeeze hoses of the electrode head.

8.1 Operating the device

- Switch on the main switch.
  → The main switch and the off button light up red.
  → The housing fan is running.
- Press the on button to switch the generator to operational readiness.
  → The blower starts running.
  → The green on button lights up and the red off button goes out.
- Hold the hand switch in one hand to activate the high voltage discharge and hold the handgrip in the other hand to move the electrode head across the material.
  → The high voltage discharge remains active as long as the button of the hand switch is pressed.
  → Both indicator lights “Trigger” and “Plasma” light up at the same time.
  → If the high voltage discharge does not start due to a fault, only the indicator light “Trigger” will light up.

8.2 In case of a fault

- If a fault is indicated, press the green on button to switch the device ready for operation again.

8.3 Handling the hand grip electrode head

WARNING of high voltage! Risk of life-threatening electric shocks.

- Handle the electrode head so that you cannot get into contact with the high voltage discharge, since voltages of several kV (~ 7 kV) are applied.

- Hold the hand grip in one hand to move the electrode head across the material.
- Hold the hand switch in the other hand to activate the high voltage discharge.

8.4 Earth fault detection

The devices are delivered with this earth fault detection as standard.

WARNUNG!

The earth fault detection circuit must not be used as a safety element (earth fault detection), because there are no components available for the shutdown that comply with the relevant regulations for earth fault detection.

The ARCOJET® electrode is equipped with an earth fault detection. It is not possible, to treat conductive parts that are electrically connected to ground.

If the high voltage discharge is conducted to ground via a conductive or semi-conductive material, the device provided with earth fault detection will switch off automatically. The red “Fault” indicator light and the red off button light up.

- Press the green on button again to restart the device and to reset the fault message.

8.5 Switching off

- Release the button of the hand switch to stop the high voltage discharge.
  → The high voltage discharge stops.
  → The air stream stops.
- If the device is not used for some time, press the red off button.
  → The light of the green on button goes off.
  → The red off button lights up.
  → The device is not ready for operation.
- If you want to activate the high voltage discharge again, first press the green on button to switch the device to operational readiness again.
- In order to switch off the device for a longer time (for example for several hours or overnight), additionally switch off the main switch.

9 Maintenance

WARNING of high voltage. Risk of life-threatening electric shocks.

- Always switch off the device before starting any maintenance work.

9.1 Cleaning or replacing the air filter

The housing is provided with a fleece insert as an air filter, which is located in the front area of the device behind the base panel.

Depending on the pollution of the ambient air, regularly check and clean the filter, though in case of heavily polluted ambient air weekly. If the filter is heavily contaminated, you will have a weak airflow and therefore a reduced high voltage discharge.

- To clean or replace the fleece insert, remove the filter grille by loosening the six screws (Torx T9).
- Take out the fleece insert.
- Clean or replace the fleece insert.

9.2 Checking the electrode erosion

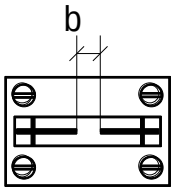
As a result of erosion, the distance between the electrodes in the electrode head increases over time.

- Every 2 years check the electrode gap at the electrode head.

With electrode heads with **flat ceramic shields** the distance (d) should be **6.5 mm**.

With electrode heads with a **nozzle** the distance (d) should be **3.5 mm**.

Every 2 years check the electrode gap at the electrode head.



Otherwise, the device is maintenance-free.

10 Troubleshooting

Troubleshooting may only be carried out by qualified electricians after consultation with the company Arcotec.

WARNING of high voltage. Risk of life-threatening electric shocks.

- Before opening the device, always switch off the main switch and disconnect the device from the mains. (Disconnect connector St 4).
- If it is necessary to switch on the device again for troubleshooting with the open front panel, be very careful.
- Do not touch any live high-voltage parts inside the device.
- Before removing any plug-in cards, be sure to switch off the power.

NOTICE

Changes to the factory-set configuration may only be made by qualified electricians after consultation with the manufacturer Arcotec. The manufacturer assumes no responsibility for damage to the device caused by unauthorized, incorrect settings of the user.

NOTICE

The maximum output power has been adjusted by the manufacturer depending on the used transformer and the electrode system. Transformers for low output powers can be damaged by too high output powers from the generator. Even electrode systems can be damaged by too high powers due to flashovers and burning out.

- Never change the factory-set configuration.

- If any of the fault indicator lights on the front panel lights up, first check all cable connections for proper condition and check plugs for tight fit.
- Press the green on button to achieve operational readiness again.
- Try to reactivate the high voltage discharge.
- Switch the device on and off again.
- In case of malfunction also check the following fuses in the generator:
  Two fuses (F1, F2) on the front panel and one fuse on the NT24 power board.
  The ampere value of the fuses (Amps) may vary depending on the set maximum output power of the generator. The ampere value is written on the fuses.
- Only replace defective fuses with fuses of the same value.
- If it is still not possible to clear the fault message using the instructions above, consult the manufacturer Arcotec for an accurate diagnosis under the guidance of an Arcotec technician.