OPERATING INSTRUCTIONS

High Voltage Generator

SIJET 351

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1. Explanation of signs and symbols

	**Indicates a hazardous situation that, if not avoided, will result in death or serious injury.**
	**Indicates a hazardous situation that, if not avoided, could result in death or serious injury.**
	**Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.**
	**Indicates information considered important but not hazard related.**

2. Safety instructions

	**Electrical discharge of the high voltage generator.** Before operation it has to be made sure that the electrical discharge cannot be touched by the operating personnel. Especially in case of manual operation the protection against accidental contact has to be paid attention to. We recommend the use of plastic covers in the area of the electrode head. If only an operation without cover is possible, the use of a two-hand tripping device is recommended (mounting option).

	**The high voltage discharge of around 12 - 15kV is of high frequency (25-30 kHz).** By this means the risk of injury due to a jumpy movement as a result of an electric shock is much bigger than the risk emanating from the discharge itself. The electrical discharge must not be touched during operation.

	**Creation of toxic substances.** Due to the high voltage discharge Ozone and nitrogen oxides are created in minimum concentrations during operation, a sucking off of the air might therefore be recommended.

	**Repair works on line electric respectively the line control must only be carried out by a qualified technician.**

NOTICE	**Disregard of the safety instructions!** Expiration of guarantee as well as responsibility for damage to persons. The operation instructions must be taken in consideration in all functions.

NOTICE	**Disposal** This product has to be disposed as industrial waste.

3. Unit description

Unit description

The high voltage generator SIJET 351 is designed for the pre-treatment of plastic surfaces, to improve the adhesion of printing inks, paints or glues.

A symmetric high voltage discharge, which is blown out of the electrode by an air stream, is used for a successful treatment of very different plastic surfaces.

It is applied in plastic industries for the pre-treatment of all kind of profiles after the extrusion process and moulded parts. A further field of application is the cup and tube printing process, if an inner treatment with Corona is unrequested.
The unit also provides a powerful pre-treatment for all kind of pad printing applications.

The present unit is applicable for all pre-treatment processes in which, depending on the material, a max. treatment speed of 10m/min could be reached.

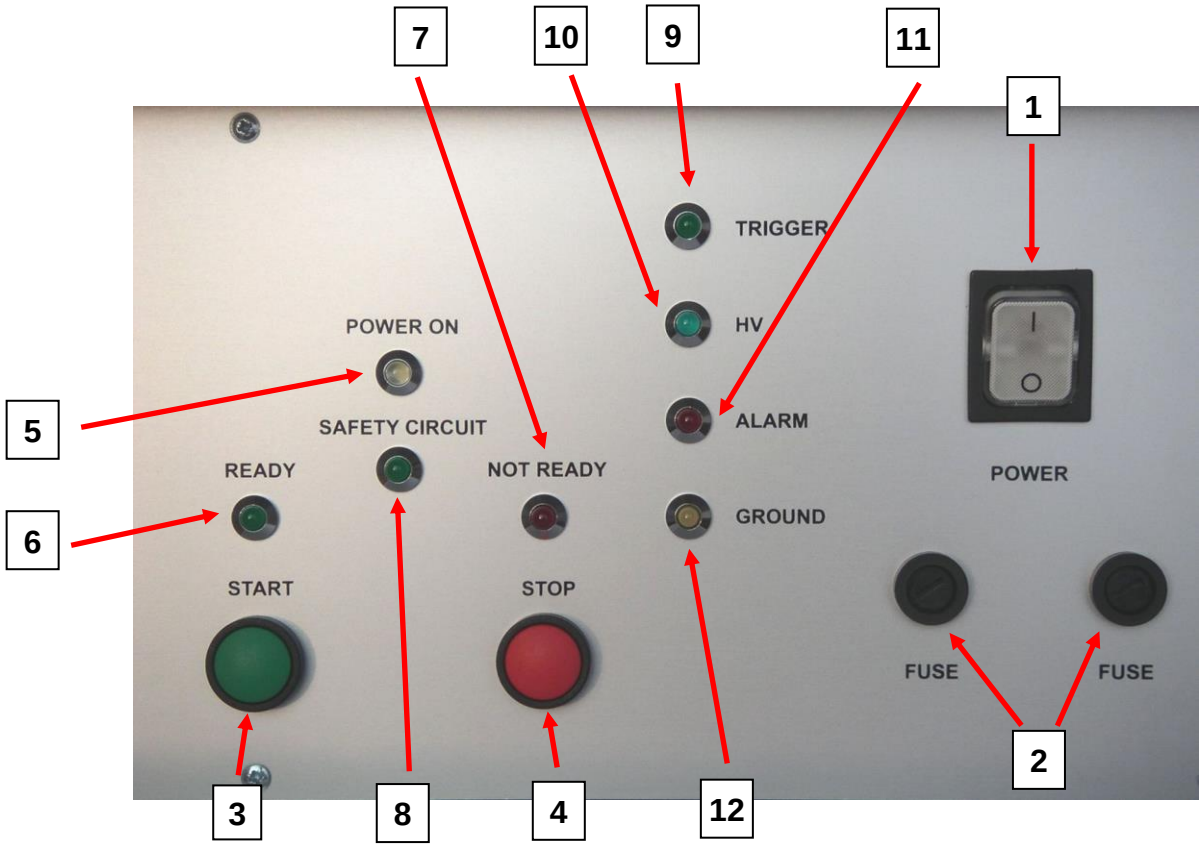
The unit can be used in production processes in manually or automatically controlled operation.

Especially in case of manual operation the protection against contact has to be paid attention to.

Before operation the safety instructions, the connection diagram and the operation instructions have to be taken into consideration.

3.1. Front view

3.2. Operating elements



1 Mains switch	2 Fuses	3 Pressure switch Readiness „Start“
4 Pressure switch Readiness „Stop“	5 Control lamp „Power ON“	6 Control lamp „Readiness ON“
7 Control lamp „Readiness OFF“	8 Control lamp „Safety ciruit closed“	9 Control lamp „Trigger signal“
10 Control lamp „High voltage ON“	11 Control lamp „Alarm“	12 Control lamp „Ground connection“

4. Technical details

Mains voltage	230 VAC 50/60 Hz
Fuse mm	2 x 3,15A delay action 6,3x30
Current consumption	2,3A
Power input	600 VA
Electrode power output of each electrode	550VA
Treatment surface	max. 25 x 60 mm, depending on surface shape
Treatment speed	max. 10m/min depending on material
Distance of electrode head	4 - 12mm
Length of electrode hose	2,0 m; Special design 3,0 m
Housing dimensions	width 350 mm, depth 450 mm, height 213 mm
Weight total	16 kg

5. Operation of the high voltage generator SIJET 351

NOTICE	**Switch on the mains switch „Power“!** Internal PLC of the high voltage SIJET 351 is ready within 2 or 3 seconds.

Before switching on the high voltage generator SIJET 351, the external safety circuit has to be closed.

Instead of an external safety circuit a connection at the safety input of the high voltage generator SIJET 351 can be mounted. For this purpose connect pin 8 (STV 2) to +24V(DC) from pin 12.

The **green LED„Safety Circuit“** lights up.

Switching the high voltage generator SIJET 351 into readiness.

Press the **„Start-button“.**

The **green LED „READY“** lights up.

Generate the high voltage discharge.

The high voltage discharge can be switched on
1. with a manual control switch.
or
2. with an external machine control device.

For further reference see connection diagram.

The **blue lamp „HV“** lights up.

NOTICE	**Safety switch off of the high voltage for safety reasons in case of discharge directed onto grounded parts!** Factory-made this function is switched off, because it is an unrequested function in case of many applications.

Activating ground sensor signal
Only to be carried out by instructed personnel!
Delivery status is ground sensor off.

WARNING

A safety switch-off of the high voltage for safety reasons in case of discharges directed onto grounded parts requires the following steps (activating ground sensor signal):

1.
After switching off the unit, the generator housing can be opened. The ground cable and the HV-cable have to be changed in such a way, that the HV-cable is connected to the ground line

2.
In case of discharge directed onto grounded parts the **yellow LED „Ground“** lights up and the unit switches to alarm mode.

In case of an operation default the high voltage generator SIJET 351 is switched off.

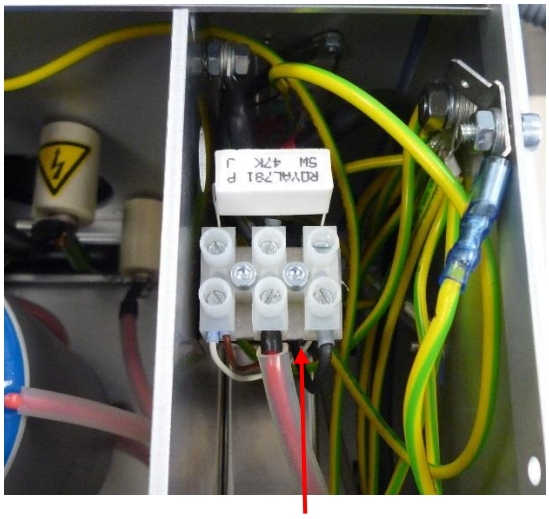
Referring to the corresponding measures see item **fault description**.

The **red LED „Alarm“** lights up and the ready for operation mode of the high voltage generator SIJET 351 is switched off. The **red LED„Not Ready“** lights up.

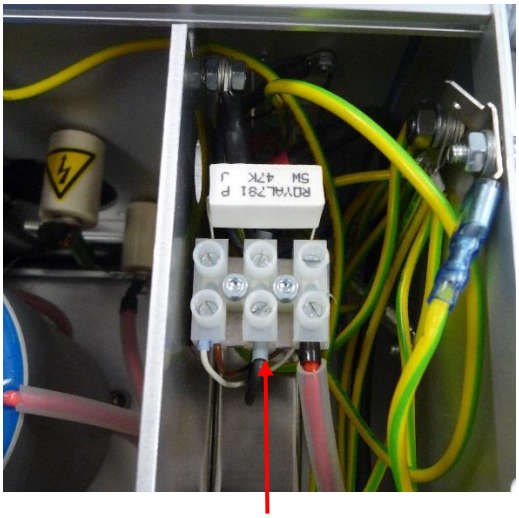
Reset „Alarm signal“.

1. Press the „Stop button“.

By pressing the green „Start button“, the generator is again ready for operation.



Ground sensor OFF (factory made)



Ground sensor ON

6. Connection diagram SIJET 351

STV 1	**Connector 1:**		**Power supply**
	Pin 1	L1	
	Pin 4	N	
STV 2	**Connector 2:**		**Unit control**
	Pin 1	not used	
	Pin 2	In +24V **„Trigger“**	HV–start channel 1 right
	Pin 3	Out +24V **„HV“**	On channel 1 right
	Pin 4	Out 0 V **„Alarm“**	failure signal inverted
	Pin 5	In +24V **„Not Ready“**, **„Stop“**	of the ready for operation mode by opening the contacts. **If not used bridge on Pin 6 required**
	Pin 6	Out	+24V signal supply
	Pin 7	In +24V **„Ready“**, external **„Start“**	of ready for operation mode
	Pin 8	In +24V **„Safety Circuit“-Ready**,	closing of the safety circuit via normally closed contacts on Pin 12 +24V **If not used bridge on Pin 12 required.**
	Pin 9	Ready for operation relay contacts	NC Opening Contact
	Pin 10	COM Base for relay contacts **„Ready“, „HV-On“** and **„Alarm“ Set on +24 V if signals in use**	
	Pin 11	Ready for operation relay contacts	NO Closing contact
	Pin 12	Out	+24V signal supply
	Pin 13	(In +24V **“Trigger”**	HV–start channel 2 left)
	Pin 14	(Out +24V **“HV”**	On channel 2 left)
	Pin 15	(Out +24V **„Alarm“**	relay contact, COM from pin 10)
	Pin 16	0V Ground	

7. Fehlerbeschreibungen

Fault: The ignition of the discharge is non-uniform, the flame becomes smaller and turbulent. The pre-treatment performance will be reduced.

Source of defect: The surface of the electrodes is highly oxidised. The distance between the electrodes exceeds 8,5mm.

Measures: The oxide film of the electrode plates must be eliminated by abrasion. Pay attention to a good contact between the electrode plates and the resistors, if possible press some grease into the holes. The normal distance between the electrode plates is 6,5mm. After a long operation time the distance, caused by abrasion, should not exceed 8,5mm. In case of grave abrasion it is recommended to exchange the electrodes.

FaultI: The control lamp „alarm“ lights up after a short operation time.

Source of defect: The air stream in the electrode has become too low. The distance between electrode head and part to be treated is too small. Intense discharges directed onto grounded parts next to parts to be treated.

Measures: If required, clean or exchange the air filter in the electrode fan housing. Minimum distance of 4-5mm between electrode head and part to be treated must be respected. Please make sure that the treatment area is free of grounded parts.

8. Spare parts list

Item no.:	Designation:	Part number:
1	Teflon block	A-TB 1
2	Electrode resistor	A-EW 1
3	Electrode plates for 6,5mm distance	A-EB 6,5
4	Ceramics blind 2-parts with plastic screws	A-SB 1
5	Air pipe 83mm, 20mm∅ for head A, B, C	A-LR 8
6	Screws M3x12 counter sunk PA (for blind)	SC-PY 3x12S
7	Screws M5x10 stud bolt PA (for teflon block)	SC-PY 5x10M
8	Screw M2,5x30 with nut (for air pipe)	SC-VA 2,5x30SM
9	Electrode plates for nozzle 3,5mm distance	A-EBD 3,5
10	Teflon nozzle 7mm slot	A-DA7
11	Teflon nozzle 7mm slot, conic bore hole	A-DA7K
12	Screws M3x12 PA (for teflon nozzle)	SC-PY 3x12Z
13	HV cable 2x 2,3m	HV GL 71-2,3
14	Electrode metal hose AD21 PUR blue 2,0m	EMS-AD21-PUR
15	Screwing for metal hose US-P 16 unit side	EVM-GP16
16	Screwing for metal hose LI-P 16 electrode side	EVM-EP16
17	Air spiral hose AD21 PG16 PVC-grey 2,0m	EKS-AD21-PVC
18	Screwing for plastic hose LKI-PG16 grey electrode side	EVK-AD21-PVC
19	HV support ceramics 50mm M6	KB50-16-A6
20	JET-electrodes complete with hoses and screwing 2,0m A: straight version, C: angled version	JET-EK2,0-A/-C
21	High voltage ceramic bolt with inside and outside thread M6, 50mm height	KB 50-I6-A6
22	High voltage inductor primary	HVPS 30-30-31
23	High voltage inductor secondary	HVSS 30-30-080
24	Ferrite core	FK93/30
25	Housing fan 60 x 60 mm 24VDC with plain bearings	GHL60-24
26	Housing fan 80 x 80 mm 24VDC with ball bearing	GHL80-24
27	Housing fan 92 x 92 mm 24VDC with ball bearing	GHL92-24
28	Elektrodengebläse Radial 24VDC PWM Gerätausführung e	Ebm-G1G126
29	Dust filter element 30x430mm	LF-84J
30	Pushbutton START green	ST-G 197
31	Pushbutton STOP red	ST-R 157
32	Mains switch enlighted	NSW-1
33	Control card	LP4_03-5
34	Output stage	LP3_01-4 Gelb
35	Power board	LP2_01-5
36	Switch-mode power supply rail version 24 V DC	MDR 60-24
37	Switch-mode power supply screw version 24V DC	RS 50-24

9. Manufacturer

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