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CM Medium



Hoogspanningsgenerator DC
DC High-Voltage Generator
Hochspannungsgenerator DC
Generateur DC Haute Tension

CE

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1. Introduction

This manual applies to the Simco-Ion CM Medium high-voltage generator.
Read through the whole manual before you install and put the generator into use.
Follow the instructions set out in this manual to ensure proper operation of the product and to retain your entitlement under the guarantee.
Where the word generator is used in this manual, it refers in all cases to the CM Medium high-voltage generator.
The terms of the guarantee are set out in the General Conditions for the Sale and Delivery of Products and/or Performance of Activities by SIMCO (Nederland) B.V.

2. Safety

- The CM Medium high-voltage generator is intended to generate high voltages for charging bars and electrodes.
- Work on the equipment must be carried out by a skilled and qualified electrical engineer.
- When carrying out work on the equipment: de-energise the equipment.
- Do not touch any live points, you will get an unpleasant electrical shock.
- Make sure that the equipment is properly earthed, this is necessary for correct and safe operation.
  If changes, adjustments, etc. have been made without prior consent in writing, or if original parts have not been used for repairs, CE approval for the equipment will be withdrawn and the equipment will no longer be under guarantee.
- High voltages are hazardous for people who have a pacemaker.

3. Use and operation

The CM Medium high-voltage generator feeds Simco-Ion charging bars/electrodes. This combination is called the Simco-Ion “Chargemaster” electrostatic charging system.
It allows you to temporarily bond certain materials.
The CM Medium high-voltage generator is a switched-mode power supply.
The generator output current is electronically restricted. The output voltage can be set between 0 kV and maximum.
The generator incorporates functions for remote switching on and off, and for remote setting of the output voltage (not wireless).

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4. Technical specifications

Mains voltage:	90 – 130 VAC or 207 - 253 VAC
Frequency:	47 - 63 Hz.
	CM Medium
Max. power input:	73 W
Fuse (rear):	630 mAT
Output voltage:	0 - 30 kV DC
Max. output current:	1,5 mA
Maximum power output:	45 W
Cooling:	convection
Polarity:	N = negative/P = positive
Short-circuit protection:	output electronically protected at max. output current
Mains connection:	Euro connector IEC-320
Accuracy of display:	1 % of max. value ± 2 digits
Voltage stabilisation:	2 % of max. output voltage with a mains voltage of 90 – 130 VAC / 207 - 253 VAC
Load stabilisation:	2 % of maximum output voltage at load fluctuations between 0 and max.
Output voltage:	can be set between 0 kV and max. output voltage
Ripple, peak-peak:	10 % of maximum output voltage at maximum load
Remote on/off:	0V = off, 12 V = on (typical) Control voltage specifications: 10 VDC, 10 mA min. 30 VDC, 25mA max.
Internal power supply:	12 VDC (+/- 20%), 20mA (U_{ripple} = 0.5V_{tt} max.) for remote on/off and external overload signalling, if necessary
Ambient temperature:	0 - 40 °C
Operating environment:	vibration-free installation
Input/output connectors:	4x HV output 1x I/O Sub-D 25-pin
Options:	Remote control functions: - switching high voltage on/off - output voltage regulation - overload indication (maximum load 50 V DC, 50 mA)

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5. Installation

5.1. Checks

- Check that the generator is undamaged and that you have received the correct model.
- Check that the details on the packing slip correspond with the details shown on the product received.

If you have any problems and/or if in doubt:
Please contact Simco-Ion or your regional agent.

5.2. Earthing the generator

Warning:
For personal protection and to ensure proper functioning, the following earth connections must <u>both</u> be made:
- **the fitted (yellow/green) earth wire to an earthed part of the machine.**
- **the mains connection (IEC connector).**

5.3. Mounting

Warning:
- **Do not install the generator in a dirty or damp environment or an environment where chemicals or other corrosive agents are handled.**
- **The generator must be installed in a vibration-free environment.**

1. Position the generator in a clearly visible and easily accessible location on or close to the machine, as close as possible to the charging bar or electrode.
2. If required, the front panel can be rotated by 180° to make operation easier (see 5.4).
3. If you wish, secure the generator using the mounting materials supplied with the generator.
4. Connect the earth wire to an earthing point.
5. Connect the high voltage cables of the charging bars/electrodes.
6. Put the [0 / I] switch in the [0] position.
7. Plug the power cable into the Euro connector at the rear of the generator.
8. Plug the power cable into an earthed wall socket or connect the power cable via the machine.

5.4. Rotating the front panel by 180°

The front panel can be rotated by 180° as follows:

1. De-energise the generator (remove power cable).
2. Remove the cover.
3. Disconnect the 2 connectors of the front panel.
4. Unscrew both hexagon nuts on the front panel.
5. The front panel can now be taken off the generator and turned round.
6. Refasten the front panel with the 2 hexagon nuts, the plastic nut on the switch side and the metal nut on the other side.
7. Re-connect the 2 connectors of the front panel. The 20-way cable with Pin 1 (marked wire) on the side of the transparent 6-way flat cable, and the 12-way cable with the grey and red/bleu wire on the side of the transparent 6-way flat cable.

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8. Fit the cover earthing.
9. Position the cover carefully on the generator. Make sure the transparent flat cable is pressed down and, therefore, does not get stuck.



☞**Attention:**

- **Use only the supplied fasteners to fix the bracket (fastening screws M4x8) to the CM Medium.**
- **Do not route high voltage cables next to any sharp metal components and take care to avoid sharp bends and kinks in the cable.**
- **Keep high-voltage cables separated from low-voltage wiring.**
- **Keep high-voltage cables as short as possible.**

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6. Putting into use

Warning:
- **High voltages are hazardous for people who have a pacemaker.**
- **Ensure that the generator is properly earthed.**
- **Touching live parts of the charging bar/electrode will cause an unpleasant electrical shock.**



6.1. Switching on and off

- Switching on = [0 / I] switch in [I] position.
- Switching off = [0 / I] switch in [0] position.
  When the equipment is switching off, the overload LED lights briefly.

6.2. Setting the output voltage

☞Attention:
- **Avoid unnecessarily high output voltages, otherwise spark-over can occur on the charging bars or electrodes. This will impair the reliability and proper functioning of the charging process.**
- The maximum output voltage can be internally restricted. For this purpose, contact Simco-Ion or your regional agent.

With the [▲] / [▼] keys) or remote (0-10V), the output voltage can be adjusted. The selection can be made with a solder connection (external Setpoint Enable) on the SubD connector at the rear of the unit.

6.2.1. Using the keys:

The output voltage is set using the [▲] / [▼] keys. Briefly pressing the [▲] key increases the output voltage by 1 increment, briefly pressing the [▼] key decreases the output voltage by 1 increment. 1 step is 1 % of the maximum value (200 V). If the keys are pressed for a longer time, the output voltage will rise/fall in steps automaticaly.

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Setting procedure:

1. Put the [0/I] switch to position [I].
2. Use the [▲] / [▼] keys to set the output voltage to about 25% of the maximum voltage.
3. Increase the output voltage in steps, until the correct bonding strength is reached.
4. Set the output voltage about 10 % higher to accommodate for process fluctuations.

6.2.2. With Remote Voltage Programming:

The output value can be set using an external analog voltage (see par. 8.3 and the appended connector pinout). The supplied external voltage must be between: 0-10 VDC.
This voltage can be used to adjust the output voltage between 0 and 100% of the maximum value.

Setting procedure:

1. Put the [0 / I] switch in the [I] position.
2. Supply an external voltage to set the output voltage to about 25% of the maximum voltage.
3. Increase the output voltage until the correct bonding strength is reached.
4. Set the output voltage about 10 % higher to accommodate for process fluctuations.

6.3. Display readings

The CM Medium display gives the actual output voltage.

Hint:
- **Note the required voltage. This information makes it easier to reset the system and provides information on any wear on the points of the charging bar/electrode.**
- **Switch off the system when it is not in use. This prevents unnecessary wear.**

7. Functional check

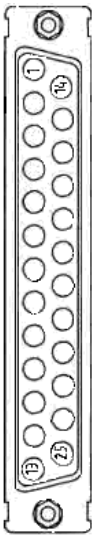
The [OVERLOAD] LED will light up:
- in case of spark-over
- when the generator is overloaded (maximum current is reached). With an overload, the output voltage is decreased until the maximum current is supplied.

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8. Options

8.1. Summary

Switching on/off (remote on/off) and setting the output voltage are functions that can be remotely controlled. A 25-pin Sub-D-connector has been fitted at the rear of the unit for this purpose.
The options can be installed using low voltage / datacable.



Pin	Function	Pin	Function
1	Remote on/off +12V	14	Remote on/off 0V
2	n.c.	15	n.c.
3	External set point	16	GND
4	n.c.	17	GND
5	n.c.	18	Extern set point enable
6	n.c.	19	n.c.
7	+12V internal	20	0V internal
8	n.c.	21	n.c.
9	Open collector overload	22	Open emitter overload
10	n.c.	23	n.c.
11	n.c.	24	GND
12	n.c.	25	Remote on/off enable
13	n.c.		

n.c. not connected

Sub-D connector layout (rear panel view).

Warning:
- **When carrying out work on the equipment: de-energise the equipment.**
- **Work on the equipment must be carried out by a skilled electrical engineer.**
- **Only connect the specified voltages to the control circuits.**
- **Use only shielded cables and shielded Sub-D connectors for the connections.**

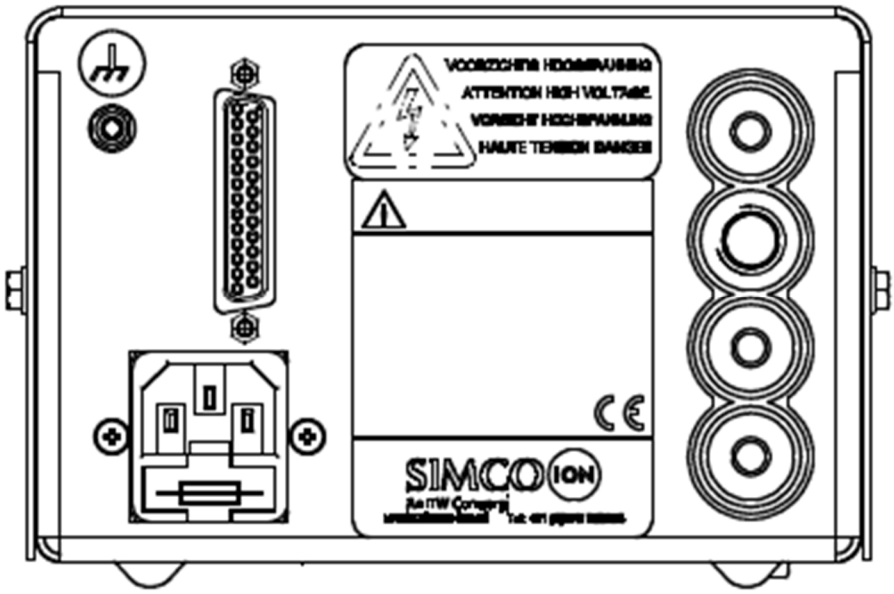
8.2. Switching on/off (remote on/off)

8.2.1. Summary

This function switches the output voltage, not the mains voltage. A voltage of 12V (10mA) is required to switch. This voltage is present on the Sub-D connector, but can also be supplied externally. Mind the switching speed; the unit needs 60 ms to reach the maximum output voltage from 0 kV. The time needed to reach 0 kV from the maximum output voltage depends largely on the connected load.
When the remote on/off is used, a solder connection must be made on the SubD25 connector. If remote on/off is used, the [RUN] key can be used to activate the output voltage manually for testing purposes.

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8.2.2. Installation



To activate the remote on/off function, pins 24 and 25 of the Sub-D connector must first be connected together. To be able to activate the output voltage, a voltage must be connected between pins 1 and 14 of the Sub-D connector. This can be done in two ways:

1: By means of the internal power supply.
- Connect pin 1 to pin 7 of the Sub-D connector.
- The contact can now be connected between pins 14 and 20 of the Sub-D connector. An open collector on pin 14 and open emitter on pin 20 can also be used (e.g. by using an optocoupler)

2: By means of an external power supply:
- Connect pin 1 of the Sub-D to +12V of an external power supply.
- The contact can now be connected between pin 14 of the Sub-D connector and 0V of the external power supply. An open collector on pin 14 and open emitter on the 0V of the external power supply can also be used (e.g. by using an optocoupler)

(See also the diagrams in the appendix)

☞Attention:
- **When the remote on/off function is not (no longer) required:**
  Remove the connection between pins 24 and 25 on the Sub-D connector or remove the Sub-D connector.

8.3. Setting the output voltage (remote voltage programming)

8.3.1. Summary

The output voltage set point can be set remotely (Remote Voltage Programming). This option is connected using the Sub-D connector on the rear of the unit.

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8.3.2. Installation

To activate the Remote Voltage Program function, pins 17 and 18 of the Sub-D connector must first be connected together. Next, a power supply can be connected between pin 3 (+) and pin 16 (GND). The output voltage can now be externally regulated from 0 kV to maximum with 0 to 10 V.

(see also the diagrams in the appendix)

☞Attention:

- **When the Remote Voltage Program function is not (no longer) required: Remove the connection between pins 17 and 18 on the Sub-D connector or remove the Sub-D connector.**

8.4. External overload signalling

An overload (Chap. 7) can also be signalled externally. It can be indicated by a external led lighting up or by sending a signal to a PLC, for instance.

8.4.1. Installation

The overload connection on the Sub-D connector is an optocoupler output and is therefore electrically isolated (Pin 22 = open emitter, Pin 9 = open collector). Connect the external overload as shown in the appended diagram.
Maximum load 50VDC, 50mA.

(see also the diagrams in the appendix)

9. Maintenance

- Keep the unit dry and free of dust, dirt and chemicals.
- Regularly check the generator earthing.
- Regularly check the high-voltage connectors and cables for mechanical or electrical damage.
- The generator does not contain any parts that require periodic maintenance.

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10. Faults

Problem	Cause	Remedy
No output voltage Display off	Mains voltage too low or not present	Restore mains voltage
	Fuse at the rear of the unit is defective	Replace fuse
	High-voltage generator defective	Send generator for repair
No output voltage Display on	A set point has not been specified through the [▲] / [▼] keys or in Remote Voltage Programming not via the Sub-D connector)	Specify set point with the [▲] / [▼] keys or with a signal 0-10 V (when Remote Control Programming is used) or disable this option (Sub-D).
	Remote on/off function has been switched on, but signal is not sent to switch the generator on Press the [RUN] key to manually switch the generator on	Give a signal on the Sub-d connector to switch the generator on, or switch off remote on/off function (remove solder connection on Sub-d)
	High-voltage generator defective	Send generator for repair
[OVERLOAD] LED lights up	Sparking or short-circuit in the equipment	Check the equipment
	Generator overloaded	Reduce set point Increase distance between charging bar/electrode and material

Table 1 Faults

11. Repair

Warning:

- **When carrying out work on the equipment: de-energise the equipment.**
- **Repairs must be made by a skilled electrical engineer.**
- **When opening the equipment, you may come into contact with parts connected to dangerous voltages.**

Simco-Ion recommends that you return the generator if repairs are required.
Request an RMA form by sending an e-mail to service@simco-ion.nl.
Pack the bar properly and clearly state the reason for return.

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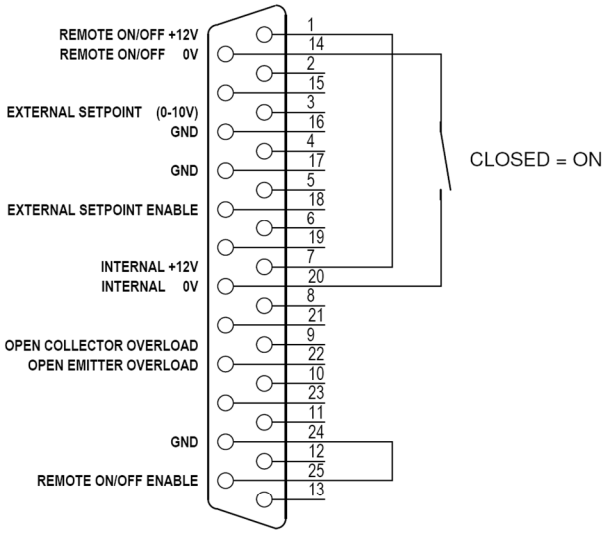
12. Disposal

Comply with locally applicable environmental and other regulations when disposing of the product.

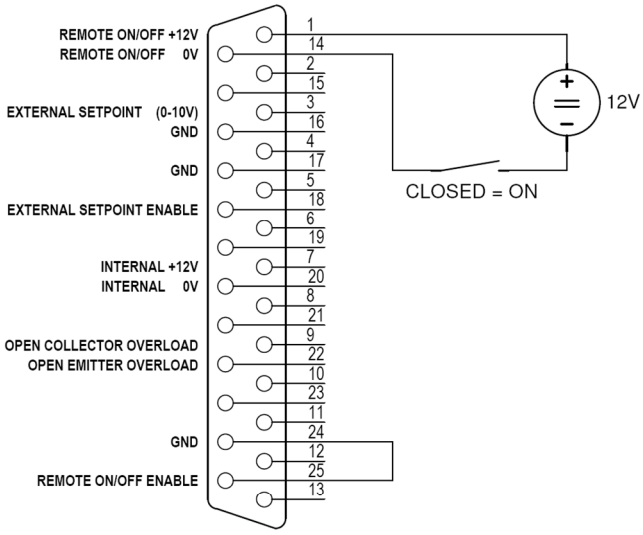
13. Spare parts

Part no.	Description
21.05.10.0000	Spring connector for ChargeMaster
39.70.70.6900	Sub-D solder connector assembly
39.70.70.6910	Sub-D screw connector assembly
93.40.41.0630	Fuse on rear panel 630 mAT

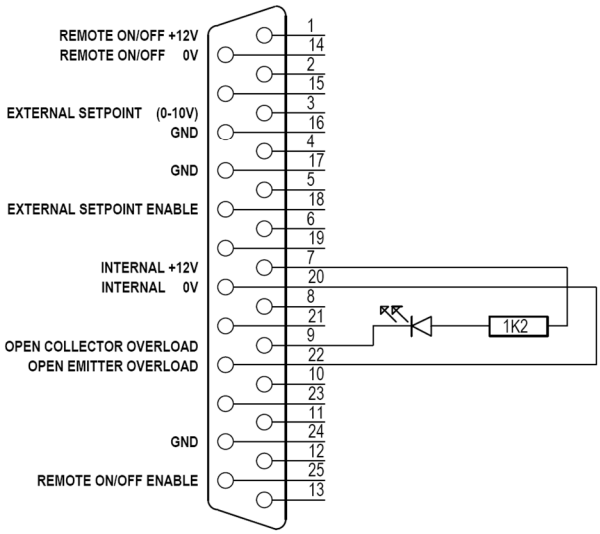
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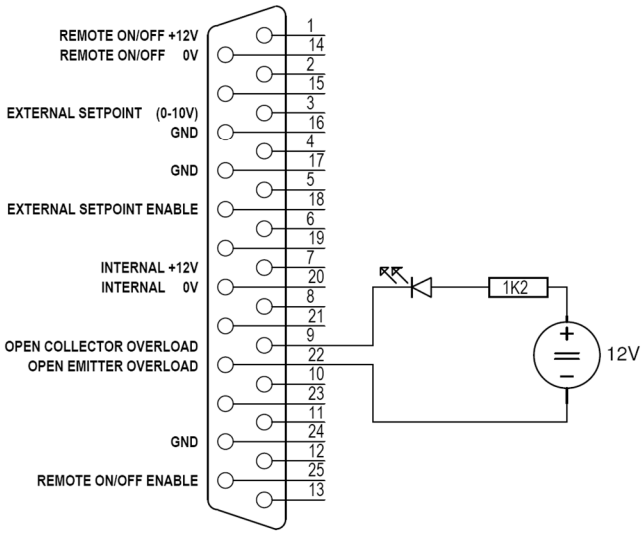
REMOTE ON/OFF WITH INTERNAL POWERSUPPLY



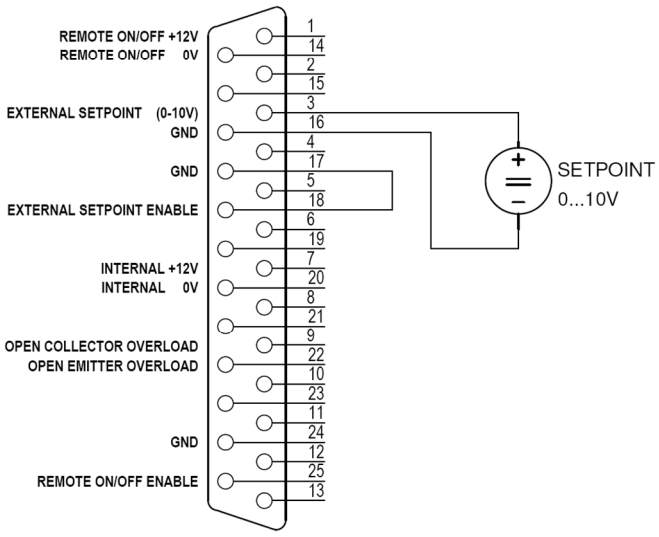
REMOTE ON/OFF WITH EXTERNAL POWERSUPPLY



EXTERNAL OVERLOAD INDICATOR WITH INTERNAL POWERSUPPLY



EXTERNAL OVERLOAD INDICATOR WITH EXTERNAL POWERSUPPLY



REMOTE VOLTAGE PROGRAMMING

Bijlage/ encl.

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