HAUG GB®

Operating instructions

Power Pack
Multistat Plus

Static Line

Keep in a safe place for future reference!

Table of contents

Types

Multistat Plus 115 V	01.7863.100
Multistat Plus 230 V	01.7862.100

1 Notes on operating instructions

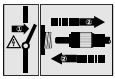
The power pack “Multistat Plus“ is also referred to as “unit” in these operating instructions.

1.1 Pictorial markings used

➢ In these operating instructions

WARNING!
Not for use by persons with pacemaker!

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!

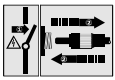


WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

ATTENTION!
Important instructions!

➢ On the unit

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!



WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

2 Safety

WARNING!
Persons wearing heart pacemakers must maintain a safety distance of more than 50 cm from the ionizing unit!
Make sure that you read and observe the operating instructions of the connected ionizing units!

The unit is operationally safe, provided that it is operated in accordance with its intended use.
Operating errors, misuse or defects will result in dangers:
- For life and limb of the operator.
- For the unit and other assets.

Also note Chapter 4.1 (refer to page 10 "Important installation notes").

2.1 Intended use

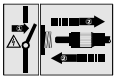
ATTENTION!
Do not install or use the unit in areas subject to explosion hazards!

The unit is intended exclusively for the high-voltage supply of HAUG ionizing units. It generates an alternating high tension of approx. 6 – 8 kV.
It is intended, in connection with an ionizing unit, for the removal of electrostatic charges from, for example, glass, paper, plastics etc.

For reasons of safety, unauthorized conversions and modifications of the unit are not permitted.
The installation and operating conditions indicated in these Operating Instructions must be adhered to.

2.2 Danger sources

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!



WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

Defective high-voltage terminals and cables may lead to danger of electric shocks. Shut down the unit immediately in case of visible damage and suspected electrical defects.

2.3 Installer qualifications

The unit may be installed by trained electricians only. The above mentioned person must have read the operating instructions and must follow the instructions, notes and safety advice.

2.4 Operator qualifications

This unit must only be maintained and put into operation by authorized persons who are instructed in the potential dangers. The above mentioned person must have read the operating instructions and must follow the instructions, notes and safety advice.

3 Description of unit

Figure 1

1. Display (current/voltage)
2. Reset pushbutton
3. LED overload
4. Selector switch (current display/voltage display)
5. Mains switch: Switch lights up green when the unit is switched on.

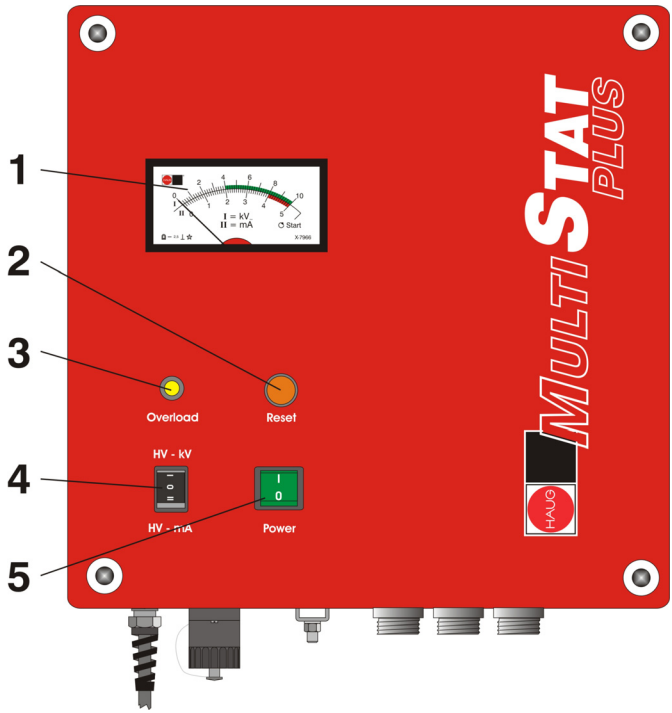
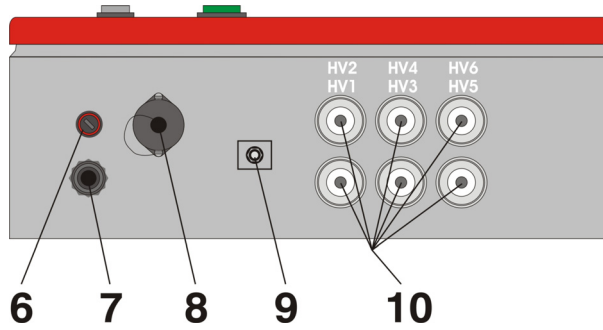


Figure 2

6. Fuse (for replacement refer to page 21, Section 7.1)
7. Mains supply
8. Signalling terminal
9. Ground connection
10. High-voltage terminals (HV1 – HV6)

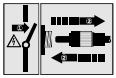


4 Installation

The unit may be installed by trained electricians only. The above mentioned person must have read the operating instructions and must follow the instructions, notes and safety advice.

4.1 Important installation instructions

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!



WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

ATTENTION!
Make sure that the permitted connected length on the power pack is not exceeded!
If the connected length is exceeded, the power pack will overheat during operation and may get damaged as a result. In addition, proper operation of the connected ionizing units is no longer ensured. If the connected length is exceeded, the unit may switch off due to fluctuating load conditions or in the case of increasing contamination of the ionizing units.
You will find the maximum connected length in Section “Technical Data“.

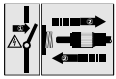
ATTENTION!
Do not connect the ionizing units to the power pack until the installation has been completed!
Push the high-voltage plugs of the ionizing units into one of the high-voltage sockets up to the stop, and firmly tighten the nut by hand. Cover (or keep covered) any unused high-voltage terminals using the red caps to protect them from moisture and contamination.

The operation of the unit is not affected by the position in which it is installed. However, we recommend installing the unit so that the high-voltage terminals points downwards (to protect it from humidity, oil and dirt).

Do not place the unit on a surface generating or radiating heat. Avoid installation positions exposed to direct sunlight.

4.2 Setting up, connecting

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!



WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

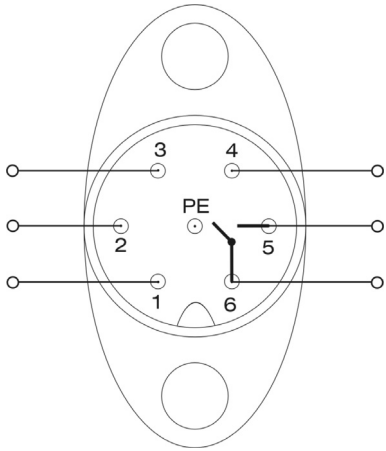
ATTENTION!
Make sure that the permitted connected length on the power pack is not exceeded!
If the connected length is exceeded, the power pack will overheat during operation and may get damaged as a result. In addition, proper operation of the connected ionizing units is no longer ensured. If the connected length is exceeded, the unit may switch off due to fluctuating load conditions or in the case of increasing contamination of the ionizing units (see page 14, section 5.1.1, paragraph 4).
You will find the maximum connected length in Section “Technical Data“.

1. Before connecting always check that the unit is suitable for the local mains voltage (the voltage is indicated on the name plate). Incorrect mains voltage may result in damage to the unit.
2. Attach the unit at the required location.
3. Ensure that the unit is switched off (for mains switch, refer to page 8, Fig. 1, item 5).
4. Connect the ionizing units to high-voltage terminals. Do not exceed the permitted connected length on the power pack.
5. Connect ground terminal with the machine ground.
6. Connect the unit to the supply voltage. The supply voltage is indicated on the name plate. Connect the PE conductor (green-yellow) with the protective earth of the mains. Connecting the PE conductor via parts of a machine body is insufficient.
7. If required, connect the signalling line K1 to the signalling terminal (see page 9, Fig. 2, item 8).
8. The unit is ready for operation.

4.3 Signalling terminal

Figure 3

Pin 1: Signal output overload:
In the event of an overload on one of the HV sockets, a signal (> 9 V) is output. The internal resistance is 15 kΩ. The reference ground GND is located on Pin 4.
Pin 2: Signal output current monitoring (see page 17, Fig. 5)
Pin 3: Reset signal input:
When the unit switches off due to overload, this input can be used to restart the unit. For a reset, Pins 3 and 4 must be closed for a short period using a floating NO contact.
Pin 4: Signal ground GND
Pin 5: Floating contact
Pin 6: Floating contact
Pin PE: Ground



Output states:

	Operating conditions		**Contacts closed**
Normal operation	Mains voltage present	High-voltage present	5 and 6
			Contacts open
Malfunction	Mains voltage present	High voltage failure	5 and 6
Malfunction	Mains failure	Not defined	5 and 6

Contact rating: max. 24 VAC / 35 VDC, max. 50 mA

5 Application

This unit must only be put into operation by authorized persons who are instructed in the potential dangers. The above mentioned person must have read the operating instructions and must follow the instructions, notes and safety advice.

The unit is intended exclusively for the high-voltage supply of HAUG ionizing units. It generates an alternating high tension of approx. 6 – 8 kV.
It is intended, in connection with an ionizing unit, for the removal of electrostatic charges from, for example, glass, paper, plastics etc.

5.1 Putting into operation

Preconditions:
The power pack and the ionizing unit must be connected correctly.

5.1.1 Normal operation

1. Switch on the unit at the mains switch (see page 8, Figure 1). The high voltage will be switched on automatically with a delay (approx. 5 s).
2. Set the selector switch (current display/voltage display) to the desired position (see page 8, Fig. 1). The display (current/voltage) either displays the current or the voltage.
3. In the current setting, the current at the time is shown cyclically for each high-voltage socket according to the following pattern (see page 16, section 5.2).
4. If the current increases to above 4 mA at any of the high-voltage sockets, the overload LED will illuminate. Either the maximum connected length has been exceeded, or the ionizing unit is heavily contaminated. The unit will switch off when the current reaches more than 5 mA.
5. In the event of a failure, the power pack will switch off, and the reset button will flash. Before pressing the reset button, wait for 10 s to ensure proper operation of the unit. Once the defect has been removed (see page 19 “Troubleshooting“), the power pack can be switched on again by pressing the reset button.

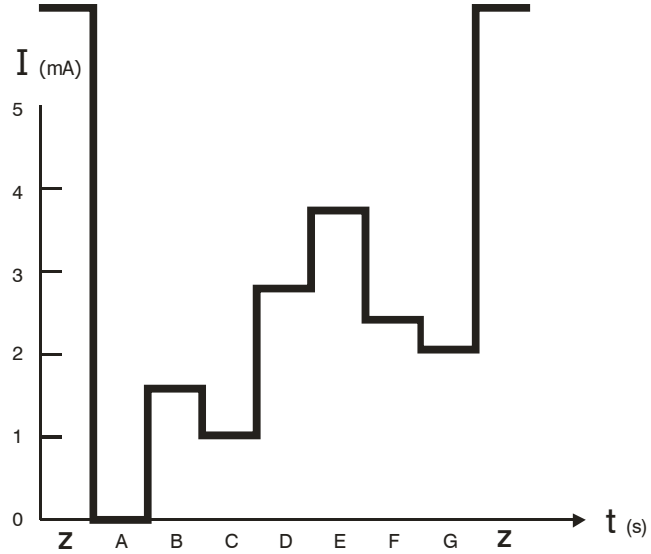
5.1.2 Normal operation with connected signalling line K1

1. Switch on the unit at the mains switch (see page 8, Figure 1). The high voltage will be switched on automatically with a delay (approx. 5 s).
2. After switching on, the power pack will not signal readiness for operation via the monitoring contacts until after a few seconds.
3. Set the selector switch (current display/voltage display) to the desired position (see page 8, Fig. 1). The display (current/voltage) either displays the current or the voltage.
4. In the current setting, the current at the time is shown cyclically for each high-voltage socket according to the following pattern (see page 16, section 5.2).
5. If the current increases to above 4 mA at any of the high-voltage sockets, the overload LED will illuminate, and a signal will be output at the signalling socket (Pin 1). Either the maximum connected length has been exceeded, or the ionizing unit is heavily contaminated. The unit will switch off when the current reaches more than 5 mA. Once the overload conditions have been removed, the overload signal will not be reset until after the current monitoring cycle is completed (see page 16, section 5.2).
6. According to the current monitoring pattern, a voltage is output on Pin 2 in analogy with the currents at the HV sockets. 1 mA current at the HV socket corresponds to a voltage of 1 V on Pin 2 (see page 17, Fig. 5).
7. In the event of a failure, the power pack will switch off, and the reset button will flash. Before pressing the reset button, wait for 10 s to ensure proper operation of the unit. Once the defect has been removed (see page 19 “Troubleshooting“), the power pack can be switched on again by pressing the reset button or by means of a signal (ground potential) via the signalling socket (Pin 3).

5.2 Current monitoring cycle

Figure 4

Diagram for current display.

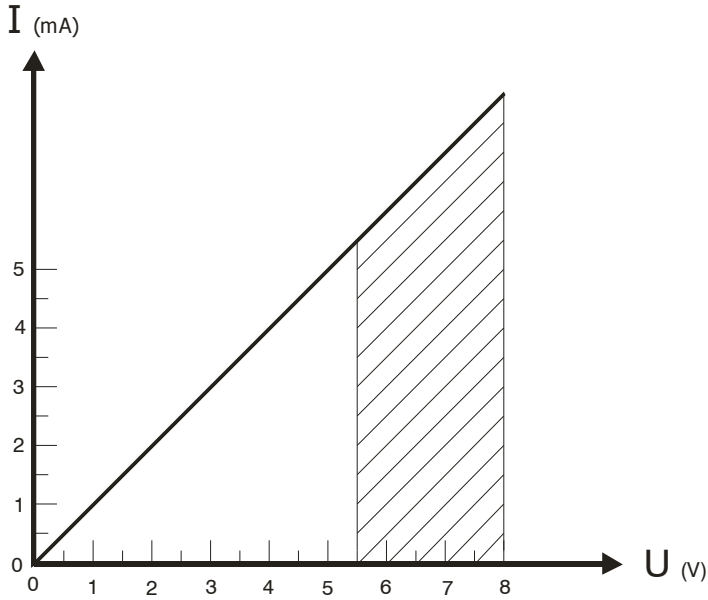


The time for one monitoring cycle is 64 (±4 %) seconds.
Only one current value is displayed for the HV sockets to which ionizing units are connected.

Z: Start signal
A: Signal pause
B: Current value HV socket 1
C: Current value HV socket 2
D: Current value HV socket 3
E: Current value HV socket 4
F: Current value HV socket 5
G: Current value HV socket 6

Figure 5

Diagram for voltage output on Pin 2 of the signalling socket.



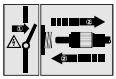
The start signal of the monitoring cycle has a voltage of > 5,5 V.
The subsequent voltages after the signal pause correspond to the relevant current values at the HV sockets 1 - 6.
A current value above 5 mA at the HV sockets is not possible as the unit will switch off.

5.3 Spark detection

The unit has a spark detection facility. In the event of a sparkover at one of the HV sockets or at the ionizing units connected, the unit switches off. Sparkovers can also occur on cables with faulty insulation and defective plug connectors.

6 Remedy of defects

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!



WARNING!
Only plug in/unplug coaxial connector
when the unit is switched off!

Any remedy of defects must be carried out by trained electricians only. The above mentioned person must have read the operating instructions and must follow the instructions, notes and safety advice.

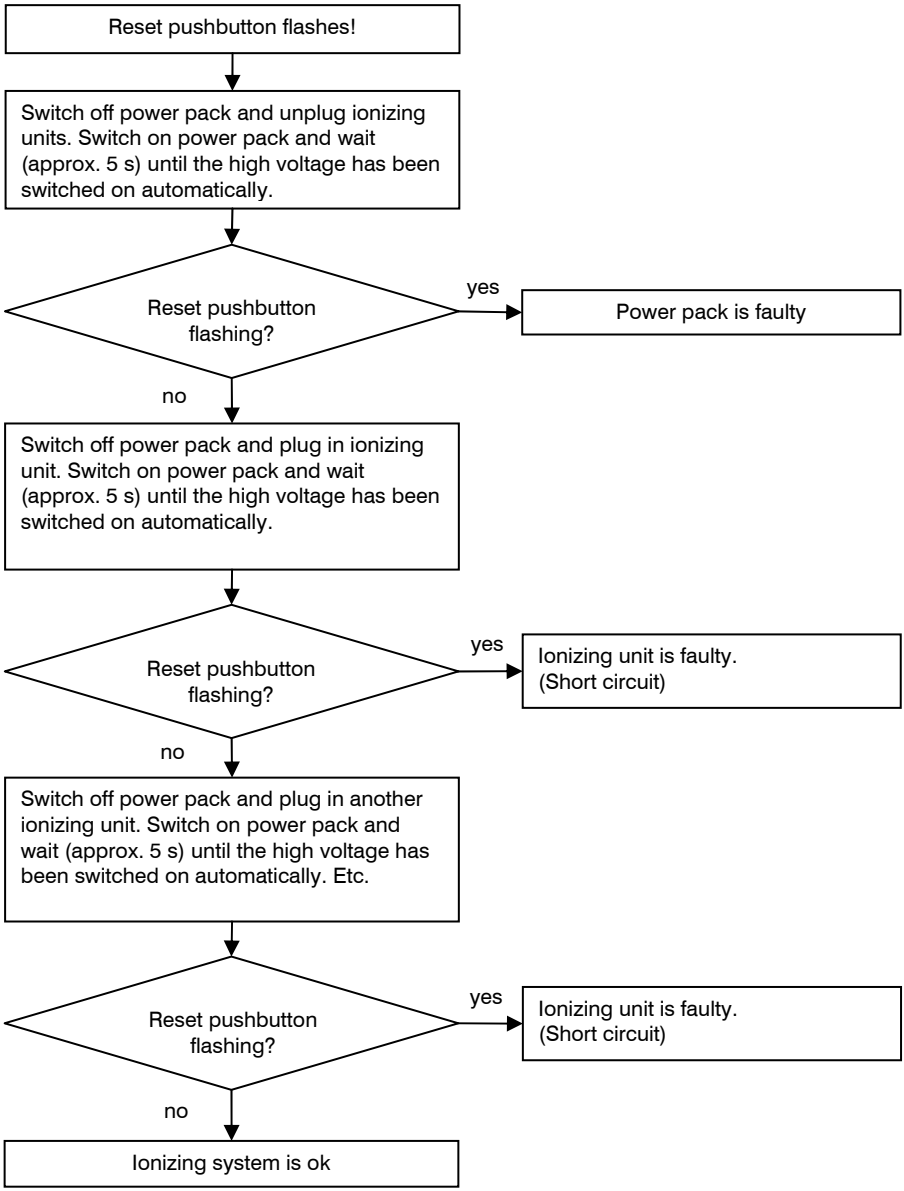
In case of defects regarding the power pack and the ionizing unit, please check for correct installation and fusing first (for replacement, refer to page 21, chapter 7.1).

6.1 Troubleshooting

Faults	Measures
No ionization	Check mains voltage
	Check fuse (for replacement, refer to page 21, chapter 7.1)
	Check connection
	Clean ionizing unit
	Check ionizing unit for damages. If damaged, immediately shut down and secure against restarting.
Overload LED illuminated	Check connected length at the HV sockets.
	Clean ionizing unit
Reset pushbutton flashes	Check high-voltage connections for correct fitting. No sparks must be allowed to form at the contact points.
	Check ionizing units for insulation defects. No sparks must be allowed.
	Check output current at the HV sockets by means of the current monitoring system. The current must not exceed 5 mA.
	Follow work sequence according to the flow chart below.

If this does not remedy the defect, please return the unit and the ionizing unit to HAUG GmbH & Co. KG (see address on back page) for examination.

6.2 Flow chart



7 Maintenance and repairs

WARNING!
High voltage!
Danger of fatal accidents!
Do not open unit!

This unit does not include any parts which can be maintained or repaired by the operator. HAUG GmbH & Co. KG only is authorized to repair or calibrate the unit.

Should the unit prove defective or if a defect is suspected, switch off unit immediately and secure against subsequent reuse.

7.1 Replacing fuse

1. Switch off unit.
2. Determine and remove the cause for the blown fuse.
3. Detach the fuse holder using a screwdriver and lift out.
4. Replace fuse and reattach fuse holder.

Use the following fuses only:

Unit type		**Fuse**
01.7863.100	115 V	2,50 A slow, 5 x 20 mm
01.7862.100	230 V	1,25 A slow, 5 x 20 mm

The unit type and the rated voltage are indicated on the nameplate.
Only use fuses of the type indicated.

7.2 Accessories

Article	**Order number**
Circular plug	X – 0616
Right-angle plug	X – 5718
Signalling line K1 (incl. plug, assembled) 5 m shielded	06.8941.000
Signalling line K1 (incl. plug, assembled) 10 m shielded	06.8941.001
Signalling line K1 (incl. plug, assembled) 20 m shielded	06.8941.002

8 Technical data

8.1 Characteristics and specification

Reference temperature 23 °C

High-voltage terminals	6 HAUG High-voltage terminals (HV1 - HV6)
High-voltage	U = approx. 6 - 8 kV
Signalling terminalSignalling terminal	For pin assignment, refer to page 12, section 4.3
Maximum output current at each HV socket	$I_{max.} \leq 5$ mA
Cannot be used in pulsed mode	

8.2 Supply voltage

ATTENTION!
Always connect the PE conductor (green/yellow conductor) to the protective earth of the mains!

Unit type	Nominal value	Operating range	Frequency range	Power input
01.7863.100	115 VAC	±10 %	50 - 60 Hz	$P_{max.}$ = 200 VA
01.7862.100	230 VAC	±10 %	50 - 60 Hz	$P_{max.}$ = 200 VA

8.3 Connected length

ATTENTION!
Make sure that the permitted connected length on the power pack is not exceeded!

The values indicated in the Table refer to each HV socket.

Power Pack	Permissible connected length	Maximum ionizing bar length Type A	Maximum ionizing bar length Type B
01.7862.100, 01.7863.100	10 m	6 m	2.5 m

	Ionizing bar
Type A	RN, RNE, RNOF, RA, RAE, RAOF, HRN, HRA, HRE, HRAE, PS, PRX, PRV, SL, EIW
Type B	VS, VSE, VSA, VSAE

Ionizing bar Type A:
The maximum cable length (KL) is the permissible connected length (AL) minus the maximum ionizing bar length (SL).
KL = AL – SL

Ionizing bar Type B:
The maximum cable length (KL) is the permissible connected length (AL) minus 3 x the maximum ionizing bar length (SL).
KL = AL – (3*SL)

8.4 Ambient conditions

Ambient temperature:	
Rated application range	+5 °C to +45 °C
Extreme range for storage and transport	-15 °C to +60 °C
Humidity:	
Rated application range	20 % to 65 % RF
Extreme range for storage and transport	0 % to 85 % RF
Air pressure:	
Rated application range	800 mbar to 1060 mbar
Vibrations:	
Extreme range for storage and transport	max. 1.5 g (10 to 55 Hz), 1 h
Shock	max. 15 g in each direction
Recommended service position:	vertical, supply cable downwards

8.5 Housing

Protection type	IP 54
Protection class	I
Mains supply	approx. 2,6 m fixed on unit
Dimensions:	
Height	approx. 300 mm
Width	approx. 300 mm
Depth	approx. 120 mm
Weight:	approx. 11 kg

9 Disposal

Observe and maintain national and regional waste disposal regulations for the disposal of the unit!

NOTES:

made by HAUG

Multistat Plus v05gb.doc

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