GB

Operating instructions

Discharging power pack EN 9 Sine

Ident number: 01.7872.XXX (230 V), 01.7873.XXX (115 V)

Keep for future use!

Static Line

Table of contents

1 Operator instructions

Before installation and commissioning read these operating instruction in full. Always observe the safety instructions.
These operating instruction is a part of the product; make sure you retain them for later use or subsequent owners.

The discharging power pack is maintenance free and operationally safe when used as intended.

The term “high voltage” is abbreviated HV in these operating instructions (e.g. HV terminal).

The illustrations in this document are a simplified representation of the product. They render only the technical facts and provide support for the text. Departures from the actual product may be noticeable. However, these deviations neither reduce the proper function nor mitigate the specifications of the product.

1.1 Symbols used in operating instructions

⚠ WARNING

Always observe this safety instruction to avoid critical or fatal injuries.

NOTICE

Always observe this safety instruction to avoid damage to property.

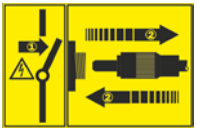
NOTE:
Important notes and additional information.

Never dispose of with household garbage.

Caution, danger spot warning!

1.2 Symbols on the discharging power pack

WARNING!
High voltage



ATTENTION!
Only plug in/unplug the ionizing unit at the HV terminal when the discharging power pack is switched off.

2 Safety

Only the persons authorized by the operator may carry out tasks on the discharging power pack.

The installer must be a trained and qualified electrician and read the operating instructions in full.
The operator must read the operating instructions in full.

When working on the discharging power pack, switch off the voltage supply and secure against inadvertent switching on.

Hazards caused by manipulated or faulty discharging power pack
Unauthorized modifications, moisture or damage to the discharging power pack may result in electric shocks or fire hazards due to sparking.

- For reasons of safety, never open or modify the discharging power pack.
- In the event of visible damage or suspected electrical defects, take the discharging power pack out of operation immediately and secure against inadvertent reuse.
- Protect the discharging power pack from moisture.
- Never carry out any unauthorized repairs to the discharging power pack.
- Always switch off the discharging power pack after use.
- Do not keep any inflammable materials in the vicinity of the discharging power pack or its components.

Damage to device and risk of fire
Short circuits can occur as a result of soiling in the high-voltage (HV) connection point. This can lead to faults with the discharging power pack and cause a fire.

- The high-voltage connections and plugs must be clean, dry and free of grease.
- Use blind plugs to protect the unused HV connection points against environmental influences. Ensure that the blind plugs are clean, dry and free of grease.

2.1 Intended use

WARNING

Risk of explosion!

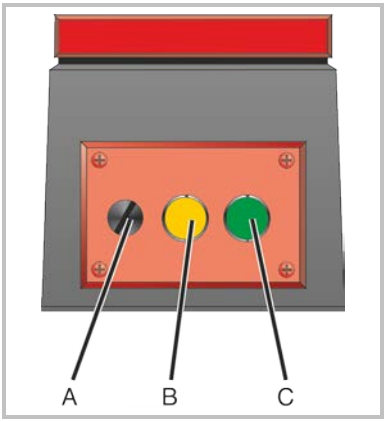
The discharging power pack may generate sparks which ignite gases, dust or similar substances.

- Never install or use the discharging power pack in areas with potentially explosive atmospheres.

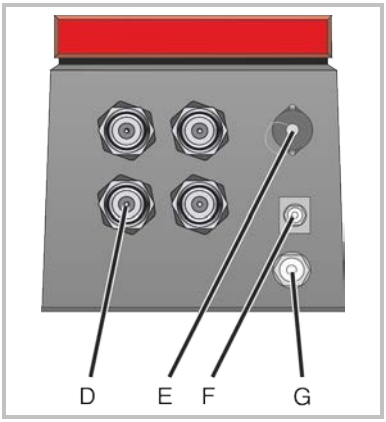
The discharging power pack is intended exclusively for the supply of alternating high voltage to HAUG ionizing units with X-2000 connector. In combination with an ionizing unit, electrostatic charges are neutralized in a production process.
Always observe the installation and operating conditions indicated in these operating instructions.
Warranty only covers products, accessories or spare parts of HAUG GmbH & Co. KG.

3 Product overview

A Fuse holder with fuse (Replacing fuse, refer page 19)
B Reset pushbutton (flashes yellow in the event of a defect)
C Mains switch (lights up green when discharging power pack is switched on)



G 4 x HV connection
E K1 Signal socket (external reset and cycle as well as monitoring)
F Earth connection (terminal)
G Network supply line (01.7872.200, 01.7873.200) or Harting connector (01.7872.300, 01.7873.300)



4 Install

WARNING

Risk of explosion!

The discharging power pack may generate sparks which ignite gases, dust or similar substances.

- Never install or use the discharging power pack in areas with potentially explosive atmospheres.

WARNING

Electric shock hazard!

An electric shock hazard results from a faulty connection of the discharging power pack to the power supply.

- The discharging power pack must only be installed by a trained and qualified electrician.

NOTICE

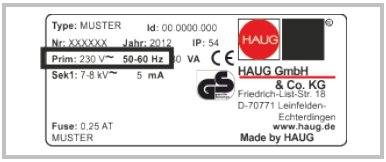
Damage to equipment!

Continuous overloading of the discharging power pack may result in failures.

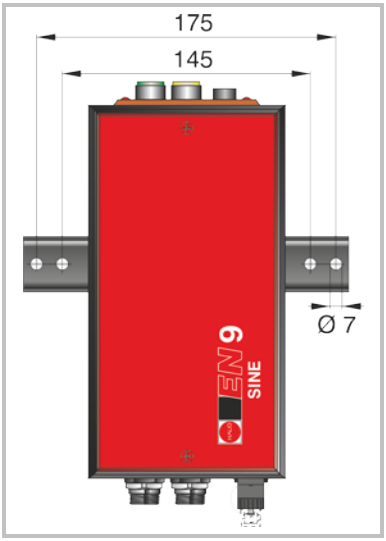
- Never exceed the permissible connected length.
- Never install the discharging power pack on a surface generating or radiating heat.
- Never install at a location subject to direct solar irradiation.

1. Check the model plate of the discharging power pack against the ordering data. In the event of damage to the discharging power pack, contact HAUG GmbH & Co. KG.

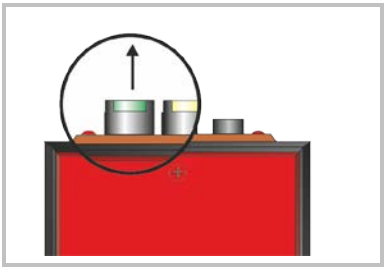
2. Before connecting, make sure that the correct supply voltage is available for the discharging power pack.
   - The model plate attached to the housing indicates the voltage.
   - If the supply voltage is incorrect, the discharging power pack may be damaged.



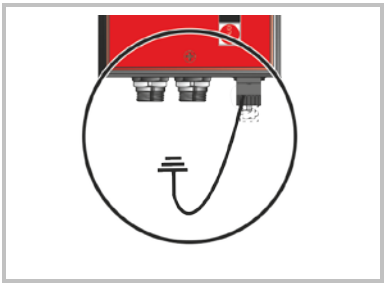
3. Place the discharging power pack at the desired location and attach with the enclosed retaining plate, if appropriate.
   - The operation of the discharging power pack is not affected by the position in which it is installed.
   - We recommend installing the discharging power pack with the HV terminals pointing downwards (to protect them from moisture, oil and dirt).



4. Ensure that the discharging power pack is switched off.



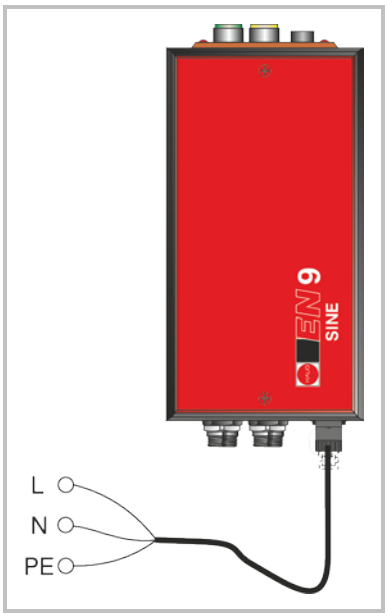
5. The ground socket of the discharging power pack must be connected to ground potential in line with applicable standards.
   - Grounding cables of at least 1,5 mm^2 must be used.



6. Connect the discharging power pack to the supply voltage.

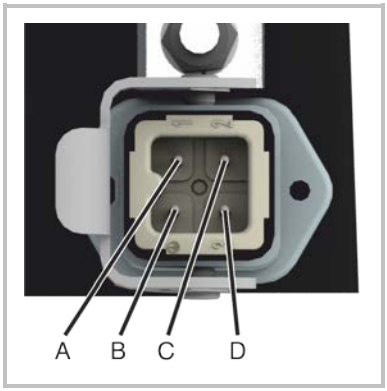
Connect the discharging power pack (01.7872.200, 01.7873.200) to the supply voltage. It is essential to connect the protective conductor (green/yellow) to a working protective earth of the mains.

- The connection of the protective conductor to only some parts of a machine's structure is not sufficient.
- L = brown Litz wire
- N = blue Litz wire
- PE = green/yellow Litz wire



Connect the discharging power pack (01.7872.300, 01.7873.300) to the supply voltage. Follow the configuration of the connection cable of the pin assignment below.

A Pin 1 = L
B Pin PE = protective earth
C Pin 2 = N
D Pin 3 = not assigned

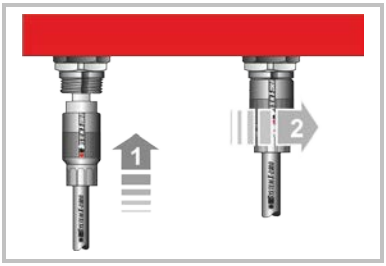


NOTICE Contact and separation spark-overs!

When the ionizing unit is plugged in or unplugged while the discharging power pack is switched on, spark-overs will occur at the HV connection. This may result in defects in the discharging power pack.

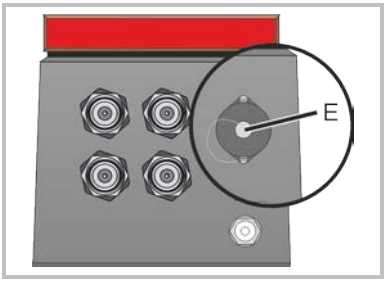
- Switch off discharging power pack before plugging in/unplugging ionizing unit.

7. Connect the ionizing unit to the HV terminal of the discharging power pack.
   - Insert the ionizing unit's HV plug in the HV terminal of the discharging power pack and press the HV cable until it reaches the stop.
   - Screw the screw cap onto the HV terminal and tighten by hand.



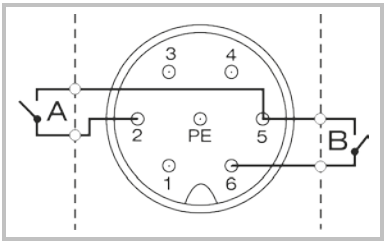
NOTE:
Also note the maximum connected length.
Protect unused HV terminals against the ingress of environmental substances using the blind plugs.

8. If required, the signalling line K1 can be connected to the K1 signalling socket (E).
   - The signalling socket allows the discharging power pack to be reset externally.
   - The signalling socket allows to be pulse externally the discharging power pack.
   - The discharging power pack can be monitored by means of the output monitoring voltage of the signalling socket.



NOTE:
Leave the unused signal socket closed or secure it with the sealing cap to prevent the ingress of environmental influences. The sealing cap must be clean, dry and free of grease.

Configuration of K1 signalling socket:
A External pulse
B External reset



NOTE:
The discharging power pack can also be reset by pressing the reset pushbutton or switching off/on (mains switch or mains voltage).

More information in chapter "Operate over the signalling socket K1" on page 15.

9. The discharging power pack is ready for operation.

5 Operate

Preconditions:
The discharging power pack and the ionizing unit are connected and installed as specified in the operator instructions.

NOTE:
After a fault, the reset pushbutton will start to flash with a delay of 3 seconds. The discharging power pack switches off the high voltage. This can be triggered by:
- *a drop of the high voltage at the HV output to below 4.2 kV~.*
- *a sparkover in the ionization system.*
- *a short circuit in the ionization system.*
- *overheating of the discharging power pack.*

The discharging power pack can be reset by pressing the reset pushbutton, external reset or switching off/on (mains switch or mains voltage). If the error is caused by overheating (thermal circuit breaker), the unit must be allowed to cool down for approx. 15 minutes. If the defect persists, refer to the following chapter "Troubleshooting". Refer page 18.

5.1 Normal operation

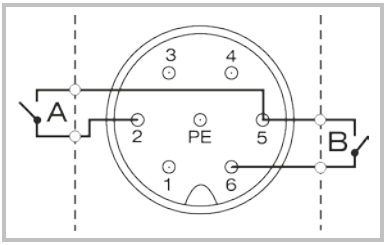
Operation of the discharging power pack without signalling line K1.

1. Switch on the discharging power pack using the mains switch (A).
   - The reset pushbutton will light up briefly to confirm.
   - The mains switch will illuminate green to confirm.
   - The discharging power pack is in operating mode.

NOTE:
Flashing of the reset button indicates an error. The discharging power pack can be reset by pressing the reset pushbutton or switching off/on (mains switch or mains voltage). If the error is caused by overheating (thermal circuit breaker), the unit must be allowed to cool down for approx. 15 minutes. If the defect persists, refer to the following chapter "Troubleshooting". Refer page 18.

5.2 Operate over the signalling socket K1

K1 signalling socket pin assignment



A External pulse
B External reset

Pin 1 Not assigned
Pin 2 Pulse input:
For external pulsing, connect a potential-free normally open contact to Pin 2 and 5.
An internal resistor of 5 kOhm to 12 V_{DC} is built in.
Pin 3 Monitor voltage 0 – 10 V_{DC}:
Connect monitoring of high voltage to Pin 3 and 5. Internal resistance 5 kOhm.
Pin 4 Signal output thermal protection (open collector output):
Connect monitoring of thermal protection cut-off to Pin 4 and 5. Internal resistance 500 Ohm.
Pin 5 Ground (GND)
Pin 6 Reset signal input:
For external resetting, connect a potential-free normally open contact to Pin 5 and 6. Internally a resistor of 5 kOhm and a diode to 12 V_{DC} are built in.
Pin PE Ground

5.2.1 Pulsing high voltage

Precondition:
Connection of a potential-free normally open contact via signalling line K1 to Pin 2 and 5 of signalling socket K1.

During pulsing, the HV is switched off by closing the potential-free normally open contact, and switched on by opening it. The maximum pulse frequency for the HV is 2 Hz.

NOTE:
The external normally open contact must be a potential-free normally open contact.
The reset button will flash when the HV is switched off.

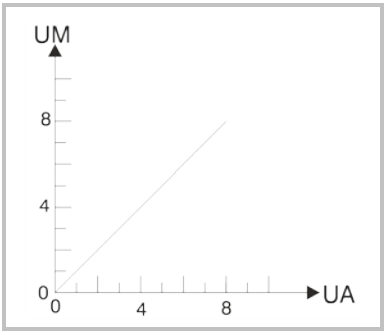
5.2.2 Monitoring the HV

A minimum of 4.2 kV is required for proper ionisation. The threshold set in the discharging power pack is 4.2 V. If the value is less, the “Reset” light flashes.

In order to monitor the HV, the signal line K1 must be connected to pin 3 and 5 of the K1 signal socket.
The monitor voltage (UM) is analogous to the output HV (UA).

Schematic:
A monitor voltage of 7 V indicates a HV of 7 kV.
UM = Monitor voltage ±20 %
UA = Output HV

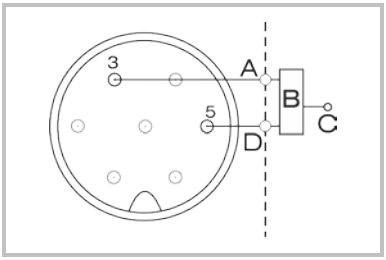
Internal resistance = 5 kΩ



If using a PLC system, implement signal “HV OK”:
The signal from pin 3 (pin 5 = GND) is read into the PLC via an analogue card and converted according to the application.

Alternatively, an adjustable threshold switch can be used. Set the threshold to 4.2 V and connect the output to a digital input of the PLC.

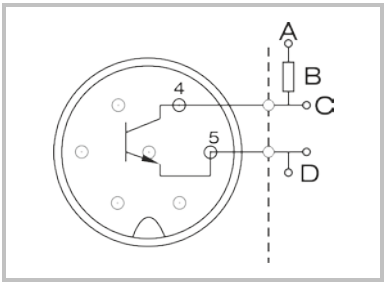
A Monitor voltage 0 to 10 V_{DC}
B Threshold switch
C Potential-free NO (normally open) contact
D GND



5.2.3 Monitoring the thermal protection

Requirement:
Connect the monitoring of the thermal protection switch via the signal line K1 to pin 4 and 5 of the K1 signal socket.

Pin 4 is an open collector output.
A +12 to +24 V_{DC}
B 1 to 10 kΩ
C PLC connection
D GND



If the device functions properly, a signal (low level) is applied to pin 4. The internal resistance is 500 Ω and the reference ground (GND) is applied to pin 5. Depending on the voltage input, a signal between +12 to +24 V_{DC} is applied when the thermal protection is switched off. The HV is switched off and the “Reset” button flashes. Before activating the “Reset” button, the discharging power pack must be cooled down (approx. 15 minutes). After the reset, the HV is switched on again and the signal (low level) is again applied.

5.2.4 External reset

Precondition:
Connection of a potential-free normally open contact via signalling line K1 to Pin 5 and 6 of signalling socket K1.

After the high voltage has been switched off as a result of an error, it can be switched back on again by means of the potential-free normally open contact. For an external reset, the potential-free normally open contact must be closed for approx. 1 second.

NOTE:
The external normally open contact must be a potential-free normally open contact.
For a reset, the potential-free normally open contact must be closed for approx. 1 second.

6 Troubleshooting

⚠ WARNING

Electric shock hazard!

The discharging power pack is operated electrically and generates a high electric voltage. In the event of any faults, there is a risk of an electric shock.

- Faults may only be eliminated by a trained and qualified electrician.

NOTE:

If the error cannot be removed in this way, return the discharging power pack and ionizing unit for checking to HAUG GmbH & Co. KG (the address is provided on the back of the envelope).

Fault	Cause	Troubleshooting
Ionisation not available	Power failure	Inspect the power fuse
	HV not available	Check the fuse of the discharging power pack.
		Inspect the connections on the discharging power pack.
		Use the Combicheck überprüfen (Accessories/spare parts, refer page 21) to verify the HV output of the discharging power pack.
Reset button flashes	The discharging power pack is damaged	Shut down the discharging power pack immediately and secure it to prevent unintentional restart.
	Ionisation unit is dirty	Clean ionisation unit
	Short circuit	Proceed with the work steps according to the flow diagram shown below. Refer page 20.
	Flashover	Proceed with the reset function
	Excessive heat	Allow the device to cool for 15 minutes and proceed with the reset function.

6.1 Replacing fuse

NOTICE

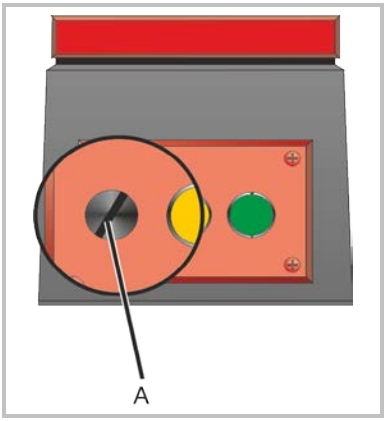
Damage to equipment!

An incorrect fuse in the discharging power pack may cause a defect. This may result in a cable fire.

- Only use fuses of the specified type.
- Never use repaired fuses.
- Never bridge the fuse.

The unit type and the rated voltage are indicated on the nameplate.

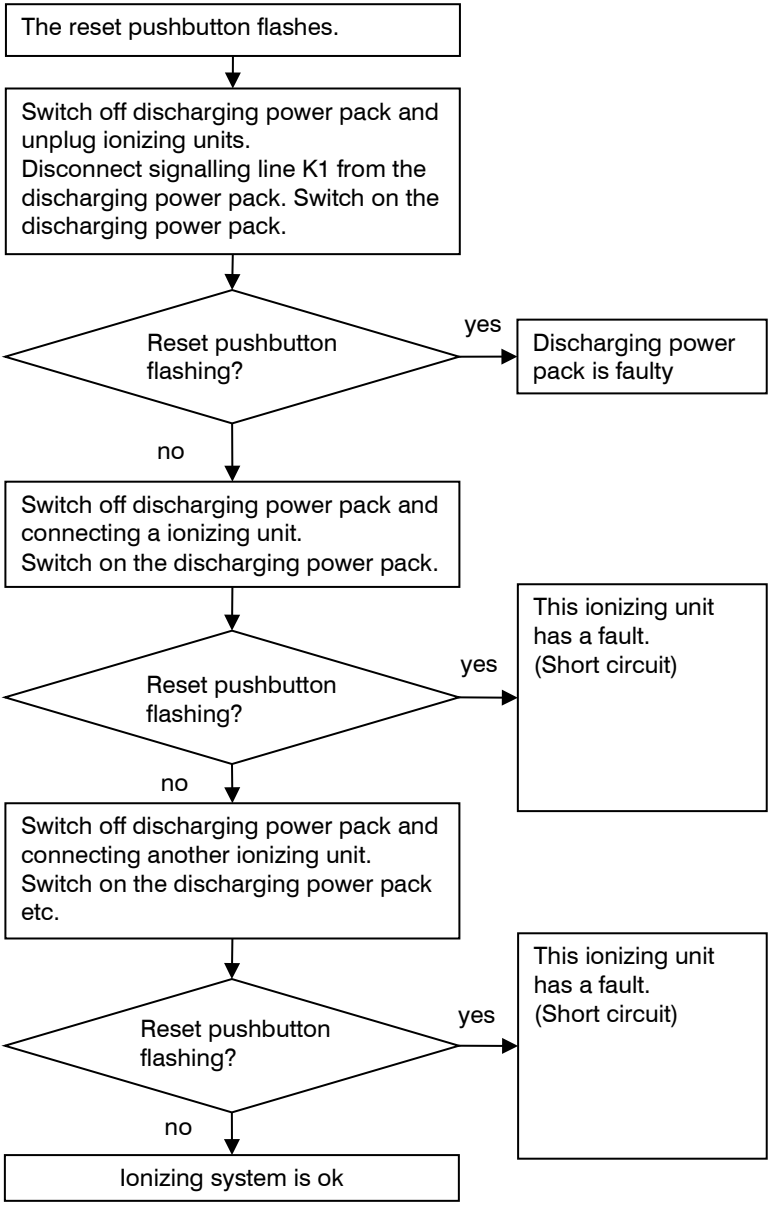
1. Disconnect discharging power pack from supply.
2. Determine and remove the cause for the blown fuse.
3. Detach the fuse holder (A) using a screwdriver and lift out.
4. Replace fuse and reattach fuse holder.



Use the following fuse only:

- 230 V = 0,25 A slow, 5 x 20 mm
- 115 V = 0,50 A slow, 5 x 20 mm

6.2 Flow chart



7 Accessories/spare parts

Accessories and spare parts can be sourced from your authorized sales partner or directly from HAUG GmbH & Co. KG (the address is provided on the back of the envelope).

Article	Illustrations	Order number
Circular plug (K1)		X – 0616
Right-angle plug (K1)		X – 5718
5 m shielded signalling line K1 with assembled plug		06.8941.000
10 m shielded signalling line K1 with assembled plug		06.8941.001
20 m shielded signalling line K1 with assembled plug		06.8941.002
Combicheck		12.7231.000
Blind plug for HV terminals		X – 3521

8 Technical data

8.1 Characteristics and specification

Reference temperature 23 °C

HV terminals	4
High-voltage	6,7 ±1 kV~
Short-circuit current	I_k approx. 5 mA
Max. pulse frequency	2 Hz

8.2 Supply voltage

Unit type	**Nominal value**	**Frequency range**	**Power input**
01.7872.XXX	230 V~ ±10 %	50 – 60 Hz	P_{max} = 80 VA
01.7873.XXX	115 V~ ±10 %	50 – 60 Hz	P_{max} = 80 VA

8.3 Ambient conditions

Never use in potentially explosive atmospheres.	
Use indoors only.	
Temperature:	
Rated range of use	+5 to 45°C
Limit range for storage and transport	-15 to 60°C
Relative humidity (RH):	
Rated range of use	20% to 65% RH
Limit range for storage and transport	0 % to 85 % RH
Compressed air:	
Rated range of use	810 hPa to 1074 hPa
Vibrations:	
Limit range for storage and transport	max. 1.5 g (10 to 55 Hz), 1 h
Impact	max. 15 g in each direction
Recommended position for operation:	HV connections pointing downwards

8.4 Connected lengths

Unit type	Permissible connected length	Maximum ionizing bar length Type A	Maximum ionizing bar length Type B
Discharging power pack	18 m	18 m	6 m

	Ionizing bar
Type A	EI RN, EI RNE, EI RA, EI RAE, EI RNOF, EI RAOF, EI HRN, EI HRA, EI HRE, EI HRAE, EI PS, EI PRX, EI PRV, EI SL, EIW
Type B	EI VS, EI VSE, EI VSA, EI VSAE, EI VC, EI VCA, EI VCE, EI VCAE, EI VSOF, EI VSAOF

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

8.5 Housing

Protection type 01.7872.XXX, 01.7873.XXX	IP 54
Protection class	I
Network supply line 01.7872.200, 01.7873.200	Approx. 2.6 m, attached to the device
Network supply line 01.7872.300, 01.7873.300	Harting connector
Dimensions:	
Height	245 mm
Width	128 mm
Depth	125 mm
Weight:	5 kg

9 Taking out of operation

WARNING

Electric shock hazard!
The discharging power pack is operated electrically and generates a high electric voltage. Improper decommissioning may result in electric shock.

- Decommissioning may only be carried out by a trained and qualified electrician.

1. Disconnect discharging power pack from supply.
2. Disconnect the mains line from the voltage supply.
3. Disconnect the ionizing unit from the HV terminal.
4. Disconnect the signalling line from the discharging power pack.
5. Remove the discharging power pack from the production process.

9.1 Storing

Always store our products in a dry and cool place.

9.2 Disposing

Never dispose of electrical appliances together with household garbage.
Always collect separately and dispose of in an environmentally responsible way. Always observe national and regional waste disposal regulations for the disposal of electrical appliances.

If proper disposal of our products is not possible, returning the units to us may be an option. We dispose of our products in an environmentally responsible way. The address is provided on the back of the envelope.

made by HAUG®

HAUG GmbH & Co. KG

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