

Operating Instructions



Hand cutting unit HC35-4 with generator SL35





Disclaimer

The information in this brochure corresponds to our current state of knowledge. However, it is not to be understood as a warranty for certain characteristics or for suitability of the products for certain applications.

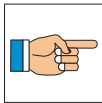
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Notes



Read and precisely follow the information in this operating manual before unpacking the unit and putting it into operation!

The unit may only be used, maintained and repaired by people, who are familiar with the operating manual and the applicable regulations on work safety and accident prevention.

Details about this machine



Representative



Content

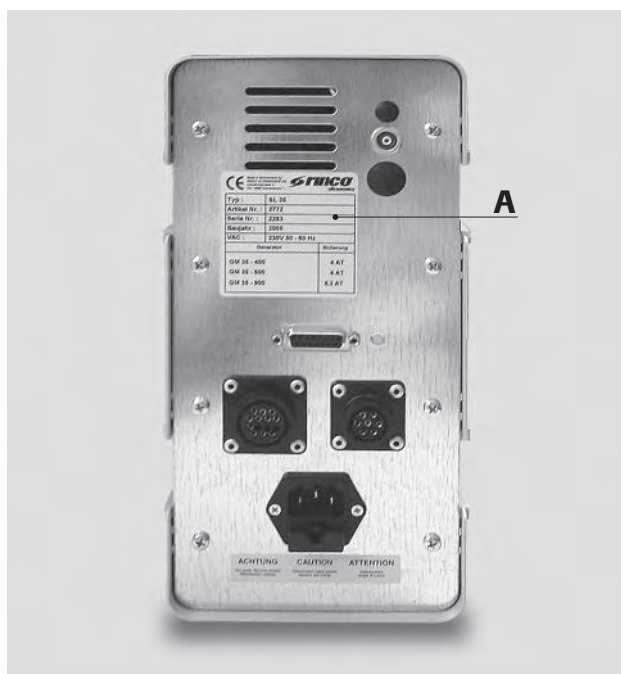
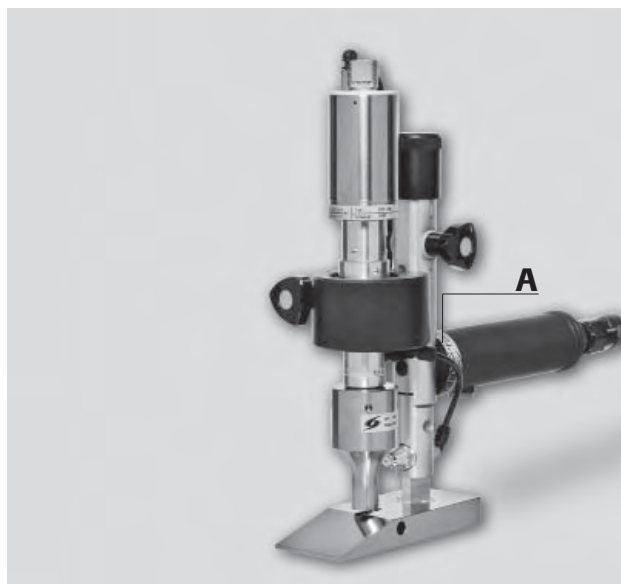
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Important!

When you make enquiries about your machine we ask you to state the exact type of designation and serial number of the unit.

You will find these details on the type plate **(A)** on the back of the gun as well as on the inside cover of these operating instructions.

The construction and electric installation of these devices are subject of continuous development and improvement and represents the latest state of technology.



Preface

We are very pleased that you chose to buy a RINCO product. We are convinced that you will achieve a maximum degree of economy of operation and product quality when using this unit.

The purpose of this manual is to give the purchaser and the user all the information they need in terms of the handling, assembly, operation and care of the welding press.

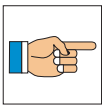
To ensure that your system is always in an operational state, you should take note of and follow all the tips and instructions contained within this manual.

1 Explanation of symbols and signs

A system of symbols indicates dangerous behaviour as well as correct behaviour. The symbols are used in the operating manual. All danger and note symbols describe conditions, during which people, things or the environment could be put at risk, if these symbols are ignored.

Danger symbols in the operating manual are structured according to a unified schema.

Structure of the danger warnings



Note!

Especially important information or operating notes for problem-free operation.



Caution!

Denotes a danger warning. Ignoring this warning can lead to severe injury or damage to parts of the unit.



Danger!

Denotes a severe danger warning. Ignoring this warning can lead to death or severe injury.

2 Safety Information

2.1 General

The construction of this unit represents the latest state of technology and is safe in operation. The individual components as well as the complete unit have been checked by our quality control department prior to delivery.

2.2 Intended purpose



This unit has been designed exclusively for the cutting of materials suited to this purpose. Any other use of the machine is considered «not as intended».

Different use or use beyond that, does not count as intended use. The producer does not accept any liability for damage caused by unintended use. The user bears the sole responsibility. This system is intended for industrial use!

2.3 Unintended use

- Using the cutting unit with insufficient knowledge of how to operate, maintain or care for the system.
- Altering the cutting unit and the generator with, for example, attachments or conversions that could influence the safety, without the approval of RINCO ULTRASONICS.
- Making modification in the control software!
- Using unsuitable working materials.
- Opening the generator housing during operation.
- Handling the converter while energised.

2.4 Important note

Before putting the machine into operation, carefully read the operating manual in hand. The operating manual is to be kept near the welding system, where it can be accessed!

2.5 Choosing stuff

Only trained and instructed personnel should perform work with the cutting unit.

The responsibility of the personnel to operate, set up, maintain and repair the equipment is to be clearly defined by the operating company! The operating company must make sure that only authorised personnel use

the cutting unit. Work on the electrical equipment of the cutting unit may only be carried out by trained electricians according to electrical regulations.

Work on the pneumatic equipment may only be carried out by trained personnel who are qualified and experience in the field of pneumatics!

2.6 Installation



Do not attempt to hook up the equipment when it is plugged in! The electrical connection is to be earthed in all cases! Country-specific, statutory safety measures must be followed during installation! If these regulations are not respected, the producer refuses to accept any liability for personal and property damages!

The equipment must be put in a closed and secure state each time before it is put into operation. Only use dry compressed air for operation. If necessary, an air service unit can be added.

2.7 Operation

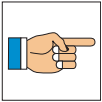


Never open the generator or the converter housing during operation.



High voltage prevails inside the device – risk of injury!

- Refrain from any and all possible methods of work which may put safety at risk!
- Only operate with the cutting unit when all protection and safety equipment, e.g. detachable protection equipment, noise insulation, are present and functional.
- Before turning on the cutting unit, make sure that no one can be harmed by the system starting up.



If the machine is operated with competence and is handled with care during operation including all tools

- the machine's readiness for service will be maintained
- the service life of the machine will be increased and
- downtimes will be reduced to a minimum

2.8 Noise emission



Limit values: according to current understanding, ultrasonic causes no damage when the maximum level remains below 140 dB and the mean level, referring to 8 hrs/day, remains under a linear 110 dB.

Pay attention to the sub-harmonic, i.e. audible pulsations, that, depending on use, fluctuate greatly and has an annoying and harmful effect. Here, the standard measure is the equivalent sound level L_{eq} over a representative working period (at least 8 hrs/day, max. 2000 hrs/year), with a maximum level of 85-87 dB(A).



When cutting special materials, the 70 dB (A) sound level may be exceeded.

Counter measures:

- Wear ear protection
- Install a sound hood (optional)

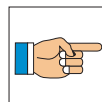
(Information according to SUVA, the Swiss Accident Insurance Fund, no. 86048 d 4.94)

2.9 Guarantee

RINCO ULTRASONICS delivers the system with a guarantee that corresponds to VSM (Swiss Association of Machinery Manufacturers).

The conditions for RINCO ULTRASONICS fulfilling its guarantee are, among other things, the following:

- The user possesses knowledge of the contents of this operating manual
- The instructions and warnings in this operating manual are followed
- The operating company is not permitted to undertake any changes or conversions of the individual parts of the press, the oscillator system or the generator of its own accord



RINCO ULTRASONICS is happy to explain any possible ambiguities or to provide instructions by our qualified staff via telephone.

3 Transport



The transportation notes on the packaging must be observed.

3.1 Receiving the delivery

The transport container for machines and equipment can withstand normal wear and tear resulting from road, rail and air transport.

Upon receipt of the delivery you should check for completeness of all parts listed on the packing list and that there is no visible damage. If there is any damage you should immediately contact your transport company and retain the packaging as evidence.

3.2 Transport damage

Any damage that has been caused during transport is the responsibility of the haulier. In order to substantiate the claim, a complete report with an accurate description of the damage must be submitted to the haulier as a basis for the claim.

Any damage or loss of goods provided by ourselves is to be reported to us immediately, sending a copy of the above report as confirmation.

If the delivery from RINCO ULTRASONICS AG was «free house» or CIF, the damaged delivery will be replaced and the appropriate claim made under the relevant transport insurance, provided the respective conditions are met.

3.3 Placing the unit

It is important to select a suitable place for the unit. In order to guarantee a long service life, the machine should be operated in a clean environment. It is important to ensure that the electronic components are kept free from vibrations.

The factory-provided settings are carried out by 20° C. The ambient temperature during operation may range from 10° to 50° C.

4 Product information

4.1 Product overview / technical data

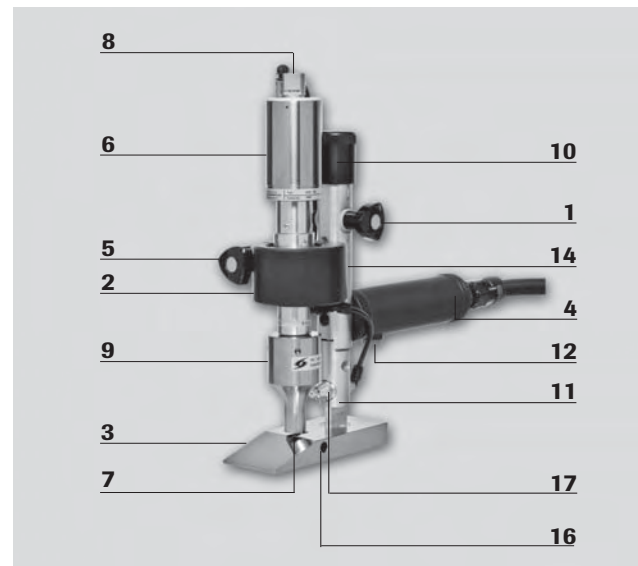
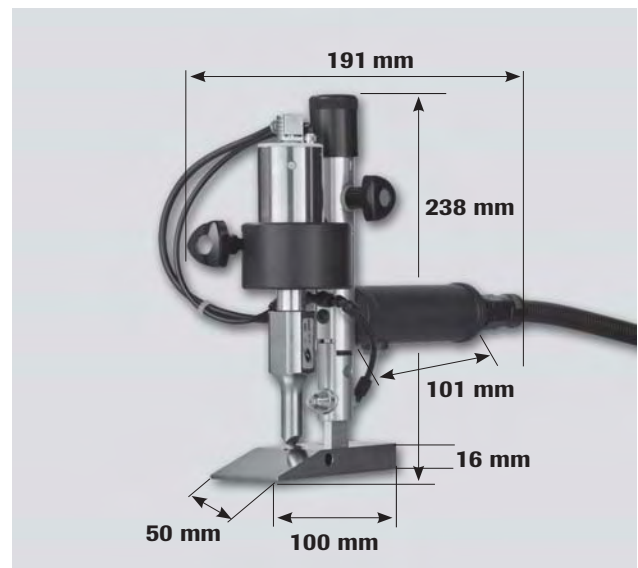
4.1.1 Hand cutting unit

HC35-4 without booster

- 1 Adjustment lever
- 2 Converter holder
- 3 Cutting base
- 4 Handle
- 5 Clamping screw
- 6 Converter
- 7 Cutting wheel
- 8 HF-cable
- 9 Horn
- 10 Force adjusting screw
- 11 Connecting stay
- 12 Trigger switch
- 13 Booster
- 14 Allen head screw
- 15 Adjustment caliber
- 16 Clamping screw cutting-wheel
- 17 Cooling air nozzle

Weight

- 1.6 kg (without Horn)



HC35- with booster

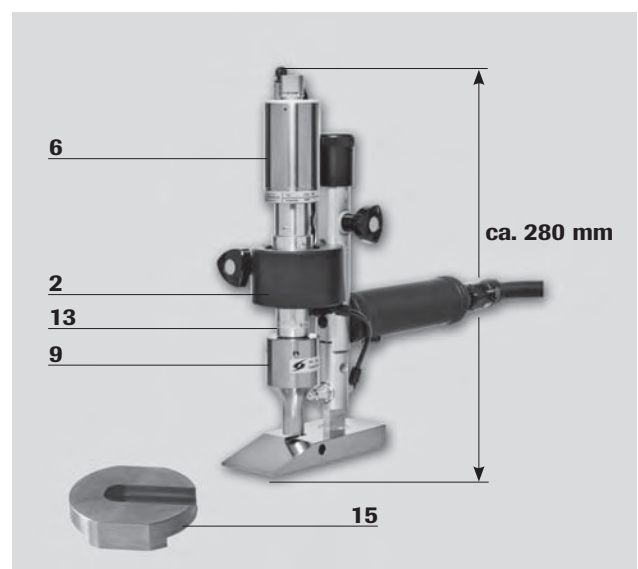
For certain applications, RINCO ULTRASONICS inserts a booster (**13**) between the converter (**6**) and the Horn (**9**). Therefor only converters without amplification are used. In these cases the booster is fitted at location (**2**).

The configuration is carried out by specialized RINCO ULTRASONICS personnel.

Weight

- 1.8 kg (without Horn)

There can only be used booster types 'without flange'.



4.1.2 Ultrasonic generator SL35

- 1 Housing
- 2 Generator module
- 3 Type designation

Dimensions in mm

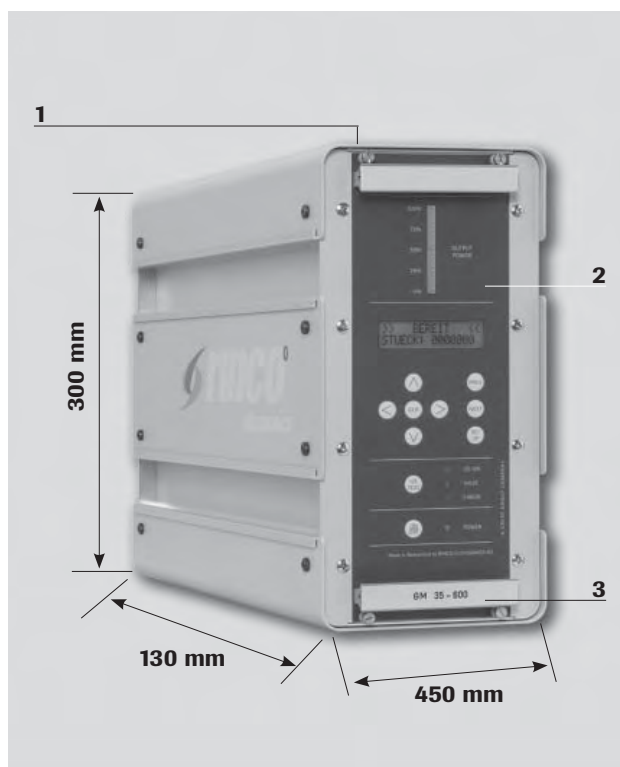
Weight: 7 kg

4.1.3 Available generator modules

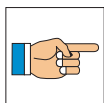
Type maxial	output
GM 35-400	400 W
GM 35-600	600 W

4.1.4 Connection details

- 230 V 50 - 60 Hz
- Optional 110 V
- Maximum power input 5 A



4.1.5 Cooling (optional)

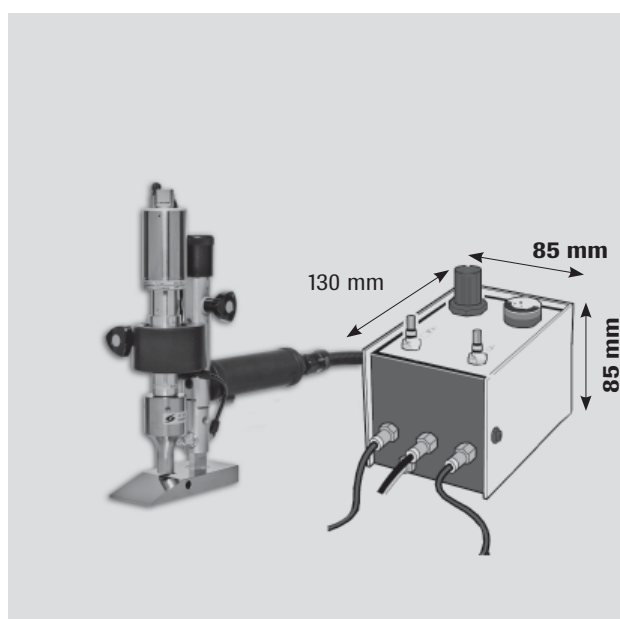


In heavy duty applications it is necessary to provide cooling for the horn and the converter. In this case a closed converter must be used.

The cooling system illustrated can be fitted as an upgrade.

Valve box for precise handling of the cooling air

To be used with dry and filtered compressed air of max. 7 bar or 105 psi.



5 Operating and display elements

5.1 Hand cutting unit

12 Trigger switch

Button to activate the ultrasonics.

Do not touch the horn when activated!

10 Force adjusting screw

The initial tension force is set with this screw.

9 Horn (customer-specific)



Do not modify mechanically the calibrated horns. This can lead to subsequent damage to the oscillator system and generator!

5 Clamping screw for converter holder

5.2 Valve box (optional)



The temperature at the converter and horn must not exceed 50°C during operation. If higher temperature occurs, compressed air cooling needs to be fitted.

18 Pressure controller

The pressure controller of the system is used for adjusting the air pressure. To adjust to the required setting, pull the adjuster knob out, turn to the required setting and push back to arrest.

Maximum pressure: 7 bar.

19 Pressure gauge

The pressure gauge indicates the adjusted maximum cooling air-pressure.

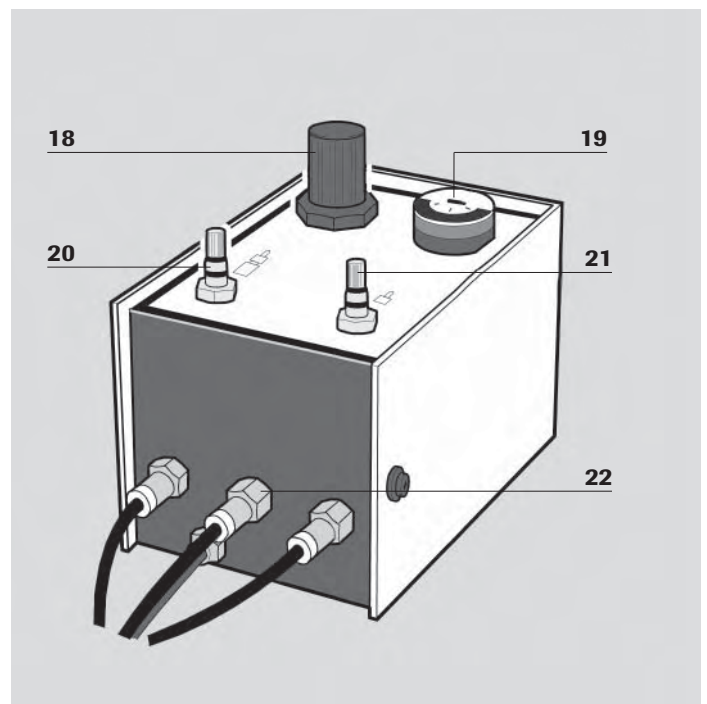
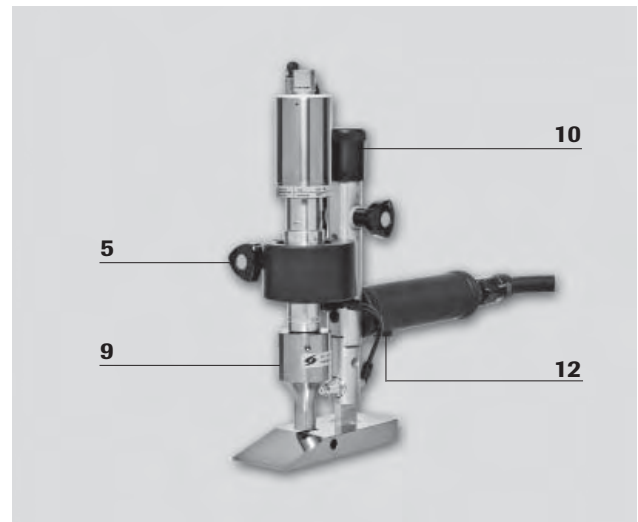
20 Cooling air regulator (Transducer)

Using this regulator, the cooling air quantity of the transducer can be adjusted. The cooling air, coming from the transducer, can be led to the horn with a suitable tube. The second quantity regulator is used for units with separate cooling air-duct.

21 Cooling air regulator (Converter)

22 Compressed air supply

Use dry, filtered compressed air of max. 7 bar or 105 psi.



5.3 Ultrasonic generator SL35

26 Handle for generator module

This handle is used to withdraw the generator module when required. The fixing screws **(34)** for opening the generator module are located above and below the bar of the handle.



Never attempt to withdraw or insert the generator module while it is connected to the mains network! (High voltage)! Do not touch the printed circuit board – the capacitor carries high voltage!

27 LED bars

This display indicates the output provided during the cutting process.

With no load on the horn (free oscillation in the air), the display should not indicate more than 25%.

If the 100% mark is exceeded, an error message appears.

After the cutting process, a flashing LED indicates the maximum output (peak).

28 2-line LCD display

The LCD display indicates:

- welding parameters
- error messages and
- operating states

29 Keyboard

These keyboard can be used to

- activate the generator functions
- change welding parameters

a change the programme / welding operation

b move to the next programme line

c move to the previous programme line

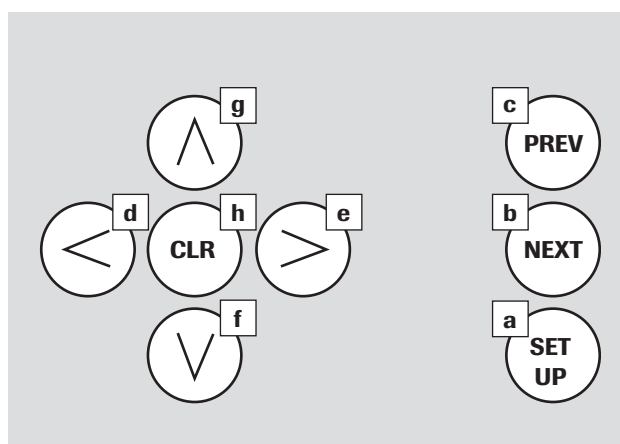
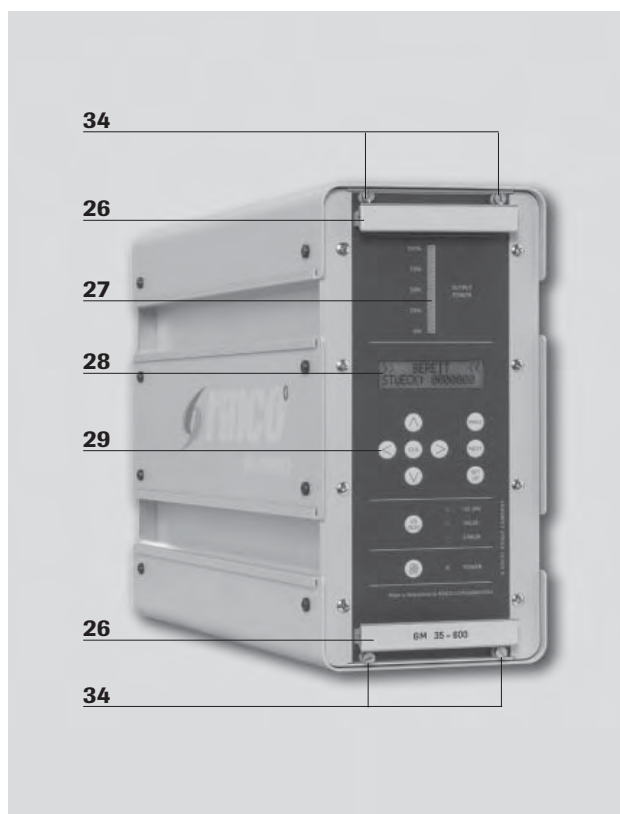
d move the digit selection to the left

e move the digit selection to the right

f reduce numeric value

g increase numeric value

h set value to zero



30 «US-TEST» key

Key for activating the ultrasonic test. The display will indicate the current horn frequency. If the key is activated for more than 5 seconds, an error message appears. Do not touch the horn!

31 LED

- «US-ON» ultrasonic active
- «VALVE» electrovalve active
- «ERROR» error exit active

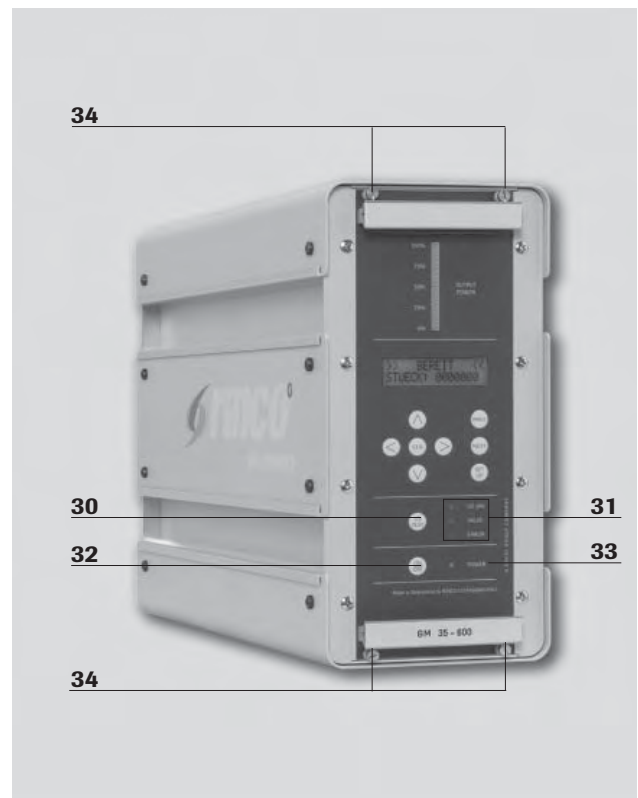
32 «ON/OFF» key

33 «POWER» LED

Operating mode display

34 Fixing screws

During operation the fixing screws must be fitted properly!



6 First initial operation

6.1 Choice of location

Select the location for the unit in accordance with the following criteria:

- Clean environment
- Support for electronic equipment has to be free from vibrations
- Ambient temperature during operation: 10° C – 50° C, for settings: 20°C

6.2 Power supply and connections

Take the following steps to put the equipment into operating conditions:

1. Connect the cables between the hand cutting unit and the generator.



Only use an earthed electrical connection!

2. Insert the plugs into the sockets on the generator:

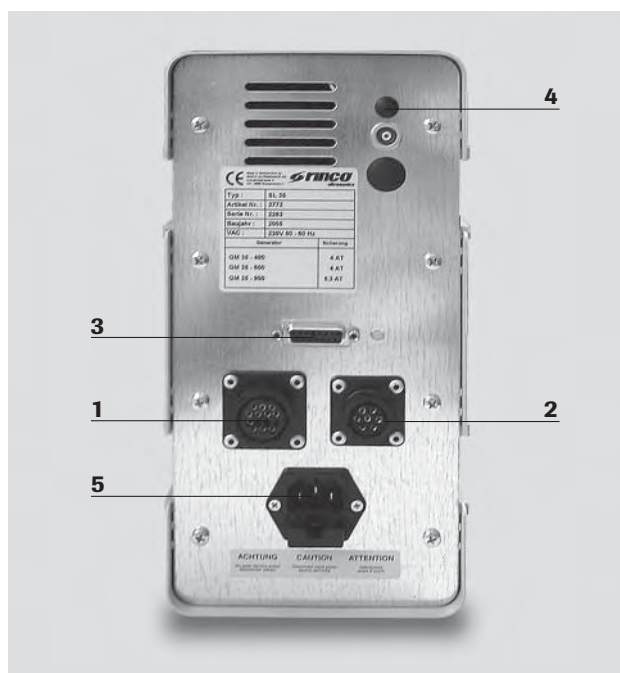
- 1 STO1 not used for hand units
- 2 STO2 trigger connection
- 3 STO3 not used for hand units
- 4 STO4 HF cable connection
- 5 STO5 mains connection

3. Cutting tool (horn)

On a new item the horn is normally already mounted by the supplier. If this is not the case, please observe the fitting instructions in chapter 7, «Retooling».

6.3 Initial operation

Normally, the generator has been preset by the supplier for the respective cutting unit. However, if any adjustments are necessary, please refer to chapter 7, «Retooling».



7 Retooling

7.1 Basic setting of generator for hand cutting units

While starting up (the LED bar starts building up) keep the «SET UP» key depressed in order to open the code dialogue box.

Use the cursor keys **d** to **g** to enter the code 472 and then press again the «SET UP» key.

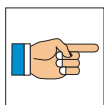
A dialogue box for initialisation will appear; enter the following settings:

Start:	Automatic
Trigger:	Off
Welding:	External / timer*)
Valve:	Off
Afterpulse:	Off
Soft start:	7
Amplitude:	Internal
SDF:	Off
Output limit:	Off

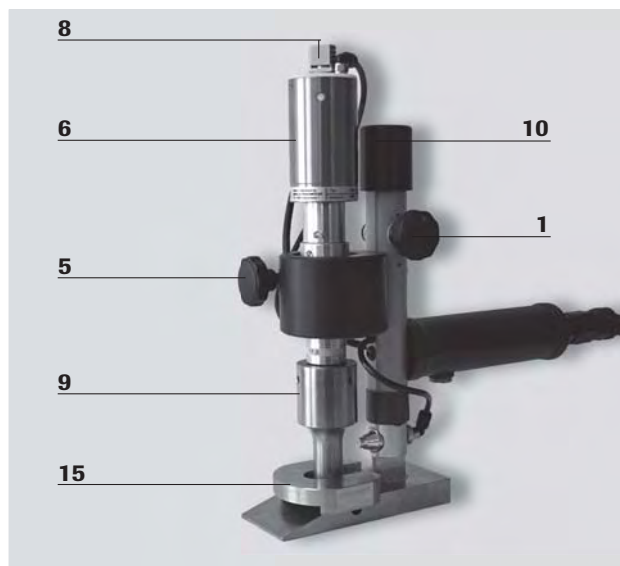
*) Timer: for continuously adjustable welding time

7.2 Adjust

1. Put the adjustment lever **(1)** on position S to setup the hand cutting unit.
2. Place the adjustment caliber **(15)** on the cutting base. Insert the assembled converter / horn device **(6, 9)** in the hand cutting unit and let it rest on the adjustment claiber. Make sure, that at the cutting horn the edge looks in the direction of the connecting stay. Fix the device by turning the clamping screw **(5)**.
3. Plug the HF cable in **(8)**.
4. Bring the oscillator system in operating position by moving the adjustment lever **(1)** to position C.
5. Now set the level of force with the force adjusting screw **(10)**, here the engraved ruler may be helpful. Optimise the results by means of trials.



With this setting a possible build-up of noise can be avoided.



7.3 Retooling

7.3.1 Changing horns



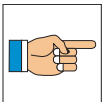
The mains switch on the generator has to be switched off before unplugging the HF cable!

1. Pull out the HF plug (38) and loosen the fixing screw (5).
2. Remove oscillator unit.
3. Separate the horn (9) from the converter (6) with spanners (G, Accessory). Never loosen a horn when it is mounted in the unit!



Never stretch the two parts in a vise or similar devices!

4. Before fitting the horn, clean the contact surface (K1) with a clean rag. If one of the two surfaces is scored, please contact your RINCO ULTRASONICS service centre. Screw on the new oscillator system and tighten it.
5. Screw on the new horn and tighten it

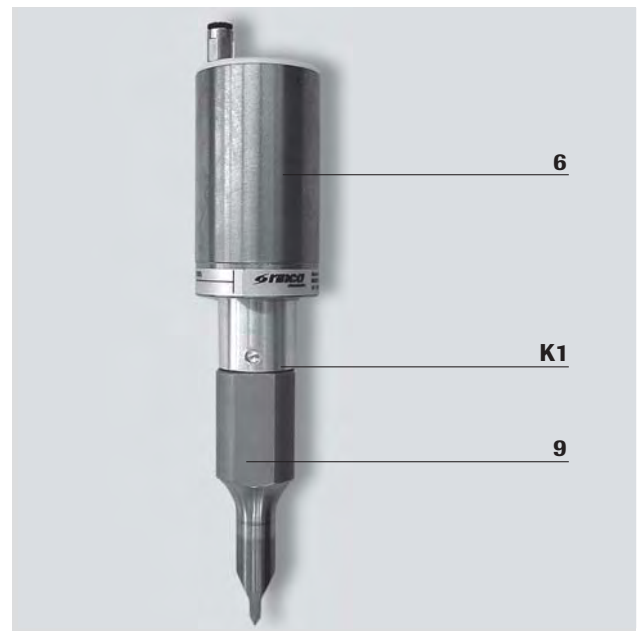
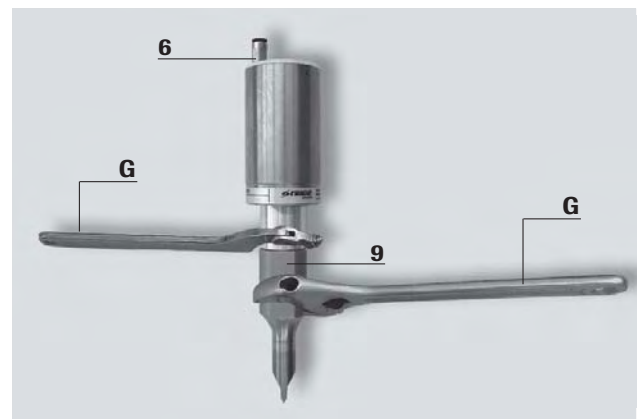
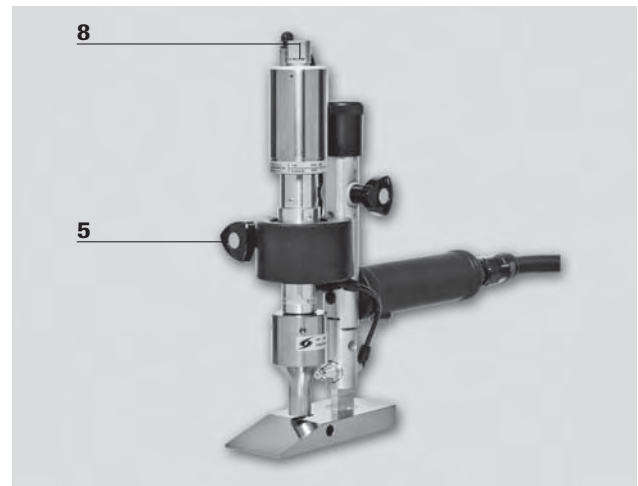


The horn must be tightened with a torque of 30 - 40 Nm.

6. Repeat the process as described in chapter 7.2 «Adjust»



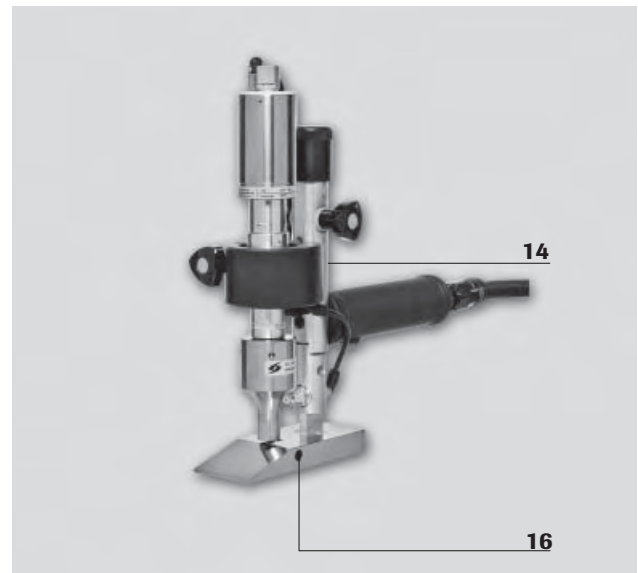
By loosening the two Allen head screws (14) the converter holder can be moved up or down, if required!



7.3.2 Changing the cutting wheel

The changing of the cutting wheel is made by loosening the Allen head screw **(16)** which is marked in yellow. Therefore the yellow Allen key is used. Loosen the screw completely and remove the wheel - mount the desired wheel and retighten the screw.

With the same procedure, by turning the wheel, a worn cutting wheel can be replaced by a new sharp cutting wheel.



7.4 Selecting the amplitude

If required, the amplitude **(A)** (half of the oscillation width) can be changed by pressing «SET UP» and cursor «vertical».

7.5 Amplitude values of the GM generator module series

The different generator outputs result in different amplitudes. The amplitude value listed in the table below refers to the respective generator-, booster- and horn configuration.

For the HG35-4 without booster the amplitude, due to the direct amplification of the converter, can be read in the range «Booster 1:1.5».

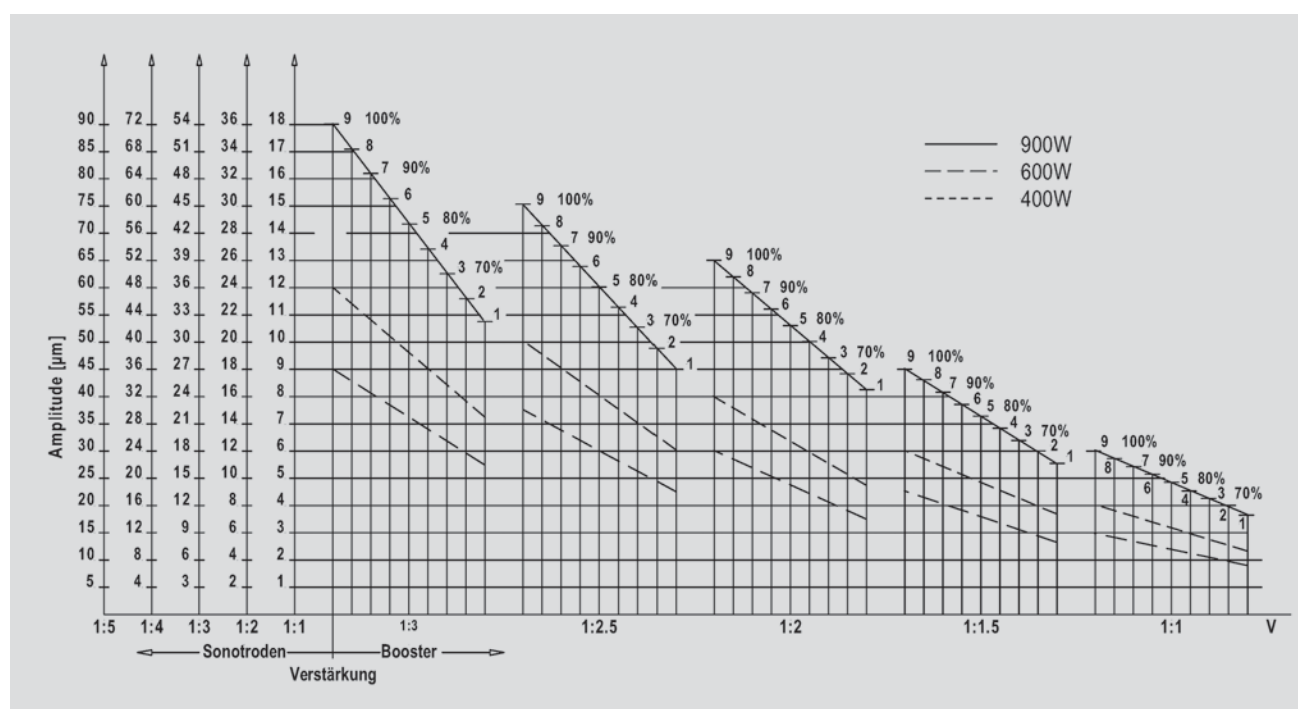
The amplitude will be displayed as a number 1 to 9; the corresponding value in [μm] can be found in the diagram below.



Never put directly on the highest level 9. This could lead to the destruction of the horn.



7.6 Amplitudes of 35 kHz SL generators



8 Cleaning and servicing

8.1 General servicing



Only trained personnel may carry out cleaning and maintenance tasks.

Before carrying out any servicing it is imperative to ensure that all sources of energy, such as the power supply, are disconnected.

Important: Never use any caustic cleanser to clean the keyboard or foil of the generator.

8.2 Hand cutting unit

The horn as a cutting tool as well as the counterplate at the cutting base are subject to a certain abrasion. Appropriate corrections will be carried out by RINCO ULTRASONICS.

Apart from that, the hand cutting unit does not require any special maintenance.

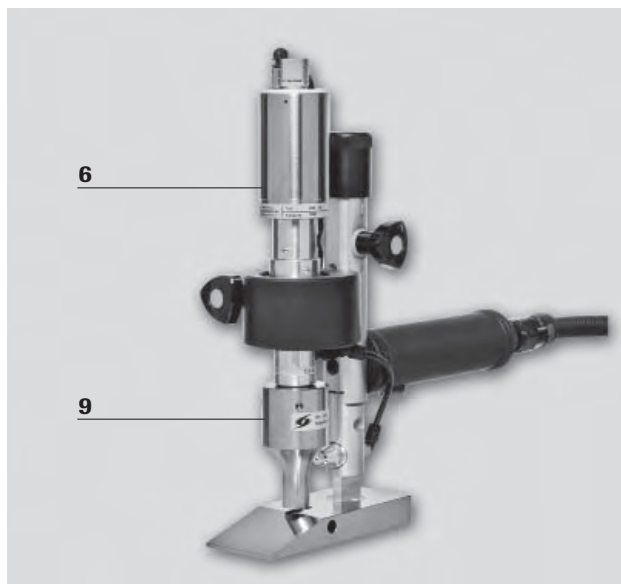
Only regular cleaning of

- Converter and **(6)**,
- Horn **(9)**,

ensure a long and trouble-free operation of the ultrasonic system.

8.3 Generator

The generator does not require any servicing.



8.4 Oscillator system



Do not carry out any work on the oscillator system and converter housing unless the mains power has been switched off! High voltage!

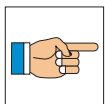
Avoid any contact with the HF connection of the converter.

Do not connect any measuring instruments to the HF connection of the converter!

The converter will retain an electric charge even after the generator has been switched off.

8.5 Stack assembly

After the horn has been in operation for some time, it should be disconnected and checked for soiling, following the instructions in chapter 7 «Retooling».



Fastening torque: 30 – 40 Nm

Black patches on the contact surface can be cleaned as follows:

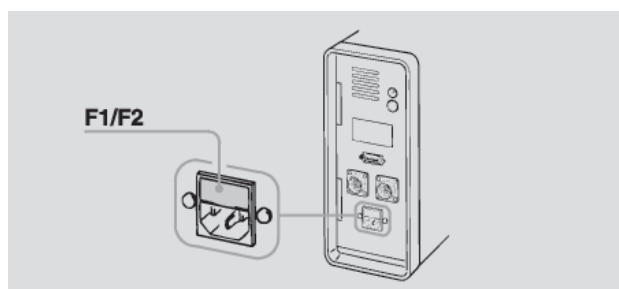
1. Use oil-free cleanser and clean with a woolen rag or paper.
2. For bumps or scratches, please inform your service centre.

9 Internal machine service

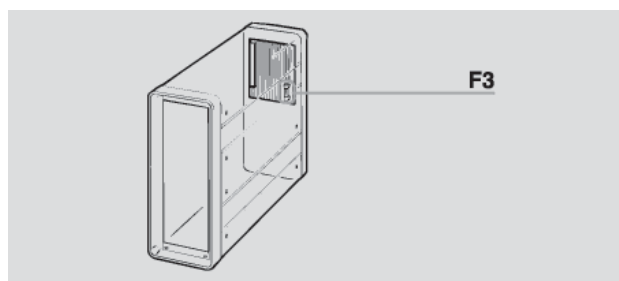
9.1 Fuses of generator SL35

The following components are fitted with fuses:

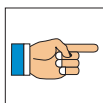
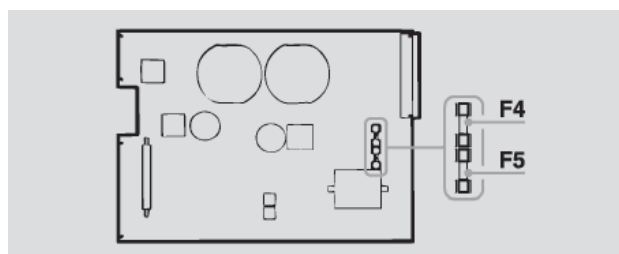
Mains socket



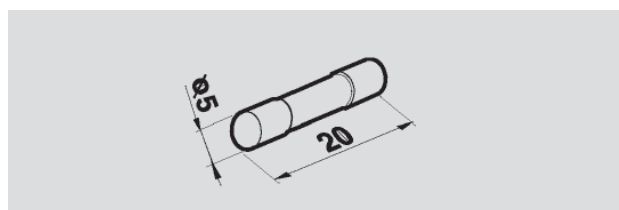
Bus print



Generator module



Dimensions of all fuses: 5 x 20 mm.



9.2 List of fuses for generator SL35

9.2.1 230 volt fuses

Generator	Mains socket		Generator module		
	F1	F2	F3	F4	F5
GM35-400	4A/T	4A/T	400mA/T	4A/T	100mA/T
GM35-600	4A/T	4A/T	400mA/T	4A/T	100mA/T

9.2.2 110 volt fuses

Generator	Mains socket		Generator module		
	F1	F2	F3	F4	F5
GM35-400	8A/T	8A/T	400mA/T	8A/T	160mA/T
GM35-600	8A/T	8A/T	400mA/T	8A/T	160mA/T

10 Error Messages and troubleshooting



Any fault may only be attended by qualified personnel with the appropriate training. In case of doubt, contact the service centre or the manufacturer directly (see appendix).

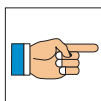
10.1 Error messages and troubleshooting when switching on

Error	Possible causes	Troubleshooting
Generator does not switch on	– No voltage supply – Control cable HC to generator	– Insert plug – Check cable connection
	(STO2) not plugged in	
	– Fuse defective – Module is not in the housing	– Check fuses F1 to F5 – Insert module and screw home
After switching on the displays indicates: FREQUENCY ERROR	– Oscillator system not inserted – HF cable at the oscillator system or generator not connected – Oscillator system fault: a) Not screwed home tightly b) Horn defective or out of frequency c) Booster defective d) Transducer defective	– Check oscillator system – Check HF cable connection – Screw home stronger – Exchange horn – Exchange booster – Send the hand cutting unit to repair

10.2 Error messages from the generator during operation

Error	Possible causes
«OVERLOAD 1» The generator was overloaded to over 100% of the nominal output.	- Contact pressure too high - Generator output not high enough for required duty - Oscillator system defective
«OVERLOAD 2» The generator had to use the reserves of the end stage to the maximum.	- Amplitude too low - Mains voltage below nominal tolerance
«FREQUENCY» The oscillator system is outside the frequency range of the generator.	- Sonotrode defective or needs adjusting - Booster defective - Converter defective - HF cable not plugged in or defective - Generator defective - Change frequency by connecting to the take up
«TIME OUT» The set operating time has been exceeded.	- The US-TEST key was pressed for longer than 5 seconds - In an application with contact switching the control time was exceeded.
«HARDWARE 1»	- Generator defective - Trigger defective
«HARDWARE 2»	- Wrong base settings

Confirm errors by pressing the CLR key.



The error Hardware 1 can only be confirmed by switching off the machine.

11 Service Addresses

The RINCO ULTRASONICS AG technical service agents are happy to answer any questions you may have concerning any technical malfunctions or cutting problems which may occur. For an efficient response our Customer Service requires the following information:

- A precise description of the technical fault or cutting problem.

Our address:

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