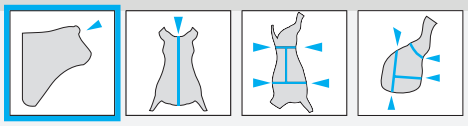
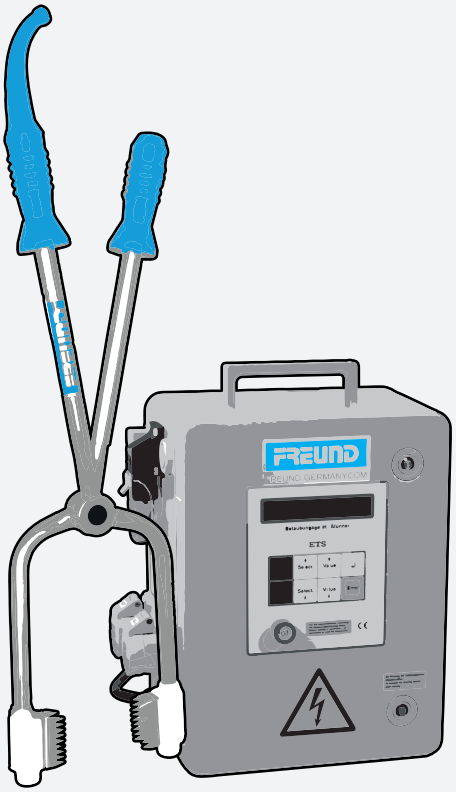
FREUND
GERMAN QUALITY SLAUGHTER-TOOLS

OPERATING MANUAL STUNNING-DEVICES

OPERATING MANUAL

Translation of original manual





ELECTRIC STUNNER

- STUN-E512
- STUN-E513
- STUN-E514

STUN TONGS

- STUN-TONG-EP Steel
- STUN-TONG-EP LS
- STUN-TONG-EA Steel
- STUN-TONG-EP Titan
- STUN-TONG-EF
- STUN-TONG-EPP2

OPTIONAL ACCESSORIES

- STUN-EMEM01
- RS-485
- STUN-Check
- STIM-E512

Imprint

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This operating manual was compiled with the greatest care. However if you notice incompleteness and/or mistakes, please inform us.

Contents

1 About this Manual

The electric stunner, stun tongs and accessory devices are all designated as machinery in these operating instructions.

These operating instructions have been prepared so that you can work quickly and safely with the machinery.

The operating instructions are part of the machinery and contain important recommendations, notes and information

- on safe and correct machinery installation.
- on safe operation of the machinery.
- on how to remedy simple faults yourself.
- on maintenance and cleaning

Read these operating instructions carefully and in full before beginning to operate the machine. Be sure to comply with all of the safety and warning notices provided.

1.1 Target group

These operating instructions are aimed towards operators of slaughtering equipment and personnel employed at slaughtering facilities, as well as butchers and small businesses and their apprentices.

The operating instructions are aimed, in particular, towards specialist personnel involved in assembly, installation, maintenance and repair, and towards cleaning staff.

The target group must have basic knowledge of the machinery described here in order to handle it.

1.2 Liability and warranty

All information and instructions regarding machinery operation and maintenance contained in this manual are provided to the best of our knowledge, taking into account our experience and know-how.

We accept no liability for claims that extend beyond the scope of the warranty agreed in the main contract.

The original version of these operating instructions was written in German. The translation has been prepared to the best of our knowledge; however, we cannot accept any liability for translation errors. In case of doubt, the original German version shall prevail.

Disclaimer

We are not liable for any warranty or liability claim

- for wear parts.
- for damage that may occur during slaughter.

We also state expressly that we are not liable for damage resulting from the following:

- failure to observe, or insufficient observance, of the information provided in these operating instructions
- improper use of the machinery
- inappropriate or improper handling
- use of spare parts or components that are not approved by FREUND Maschinenfabrik GmbH & Co. KG
- unauthorised alterations to machinery functions or materials
- incorrect operation or operation by unqualified personnel
- removal or manipulation of safety equipment
- improper or incorrect cleaning
- chemical or mechanical overload
- inadequate maintenance and repair works or non-compliance with maintenance intervals

Modifications and/or adjustments to the machine may be made in certain circumstances. In such cases, prior written approval must be obtained from FREUND Maschinenfabrik GmbH & Co. KG – subsequently referred to as FREUND Maschinenfabrik.

1.3 Storing the operating instructions

These operating instructions are part of the machinery and must be accessible to operating, maintenance and cleaning personnel at all times during the entire service life of the machinery.

Always keep these operating instructions to hand at the machinery's usage site.

1.4 Symbols and layout elements

1.4.1 Layout elements

- Enumerations

➢ Individual, independent instruction step
Result arising from the instruction step

1. Step-by-step sequences in a specific order
2. The numbers indicate that the instruction steps follow each other
3. *Result arising from the instruction steps*

→ References to another chapter

Important additional information or special details regarding the use of the machine

Embedded warning note - shows type and source of the danger and the measure to avoid the danger

1.4.2 Safety signs

Warning signs

Warning of a danger point

Caution! At this point there is an increased danger to your safety.

Warning of dangerous electrical voltage

Danger to life from electric shocks to the body.

Warning of sharp-edged machine parts

Danger to the fingers and hands from cutting and striking.

Danger to limbs from cutting or severing and injuries to the body.

Warning of hand injuries

Danger to the hands and fingers from crushing due to the sinking or downward movements of machine parts.

Warning of substances harmful to health and irritants

The information on the packaging and containers must be observed.
Keep separate from food.

Prohibition signs

General prohibition signs

This sign is only used in connection with an additional sign or text, which describes the prohibition in greater detail.

High-pressure cleaners forbidden

Do not use high-pressure cleaners to clean the machine.

Parts of the machine could be damaged.

Mandatory signs

Wear protective gloves

protect the hands against friction, abrasions, and cuts:

- during the changing of sharp or cutting tools,
- during cleaning,
- while touching hot surfaces.

Wear safety spectacles

protect the eyes against flying parts, fragments and squirting liquids:

- during operation,
- while the machine is cleaned.

Wear safety shoes or rubber boots

protect the feet against crushing, falling objects and guarantee secure support:

- during operation,
- while the machine is cleaned.

Wear a protective apron
protects the body against humidity, blood and other fluids.

Pull out the power plug
disconnect the machine from the mains power supply before all servicing, maintenance and cleaning work.

Observe the assembly manual or spare parts lists
Further information can be found in the assembly manuals and spare parts lists.

1.4.3 Symbols

Pigs

Pig (heavy)

Sows

Sheep

Head stunning

Heart stunning

Comply with the operating manual
Be sure to observe the information and notes in the operating manual.

Separate spare **parts list available**
There is a separate spare parts list for this spare part.

Assembly manual available There is an extra assembly manual for this spare part. In the assembly manual, work steps and required tools are shown.

2 The order of the work steps is marked with numbers in the grey field.

Available as a set
The symbol indicates an article in a set. In a set, multiple related spare parts are available together. A plate clarifies which parts are included.

Part of a spare parts kit
This spare part is part of a spare parts kit, in which parts identified through experience as requiring replacement or being subject to wear are combined.

Tool set available

To install this spare part, a special tool is required which can be ordered from us.

2 For your Safety

This chapter describes the safety measures and safety devices. It serves for your orientation regarding safety questions about the use of the machine.

Safety instructions are intended to provide occupational safety and prevent accidents. Observe all the safety instructions provided here and at the beginning of each chapter.

Be sure to read the following chapter on safety and the safety instructions contained within carefully before commissioning and using the machine.

2.1 Warning notes

While you are using the machine, dangers may occur in certain situations or as a result of certain behaviours.

In this operating manual, warning information is given at the start of the respective chapter or life phase that involves danger of personal injury or property damage. It relates to all following actions of the chapter or life phase.

The precautions described must be observed to avoid the danger.

Structure of a warning note

Signal word!

Type and source of the imminent danger.

Possible consequences of the danger.

➢ Measures to avoid the danger.

Signal word	Meaning
DANGER	indicates an imminently hazardous situation which, if not avoided, will result in danger to life or death.
WARNING	indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
Caution	indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

Attention	indicates a potentially hazardous situation which, if not avoided, could result in damage to machine or environment.

2.2 Site operator's responsibilities

In accordance with the rules and regulations of the German DGUV Regel 110-008, the site operator may only allow insured persons who are over 18 years old and are familiar with the equipment and the handling of the equipment to operate slaughter equipment.

Young people over 16 years may be employed only if this is required as part of their vocational training and if they have read and understood the safety information. Their safety must be ensured by a supervisor.

Operating staff	The site operator, as a higher level legal person, is responsible that the machine is used in accordance with its intended use and is responsible for training and for assigning authorized and qualified operating, maintenance and cleaning staff. The site operator is obliged to ensure that each employee is properly trained in the operation of the machine. Staff undergoing training may only work at the machine under the supervision of properly qualified staff.
Competent personnel	Only persons possessing the necessary knowledge and skills (expertise) may look after, restrain, stun, slaughter or kill animals. The site operator ensures that the activities within the framework of slaughtering are only carried out by persons possessing a relevant certificate of expertise.
Back-up equipment	The site operator shall ensure that during stunning operations appropriate back-up equipment is immediately available on the slaughtering point and is used in the case of failure of the stunning equipment initially used. The back-up method may differ from that first used.
Instruction of staff	The operator is obliged to instruct employees regularly and in light of certain events (e.g. if an accident has occurred) in safe work procedures and occupational safety and health. We recommend that the instruction and the content covered should be documented by the employee's signature.
Workplace	The workplace must comply with the national and regional hygiene and workplace regulations.
Risk assessment	The site operator must inform operators of possible dangers, symptoms and preventative measures. Relevant occupational safety conditions have to be complied with. Ensure eye and ear protection is worn at all times when operating the machine.
Cleaning	The operator must ensure that machine and working equipment can be cleaned easily and without any risk. The operator must provide suitable detergents and define suitable cleaning procedures.
Safety of the machine	The site operator must ensure that the machine is only operated and used in perfect and functional condition. The site operator must ensure that safety devices are regularly serviced and checked for proper function.
Escape routes	The operator must ensure that sufficient escape routes are available for the staff and that these are clearly marked. The operator must ensure that escape routes are not obstructed and that their function is not impaired (e.g. that doors open towards the escape route).

2.3 Employee responsibilities

Operating staff

The operating staff must be properly instructed and trained by the operator. Staff who have read and understood the safety information and have been properly familiarised themselves with the operation of the machine can be regarded as instructed.

Operating staff must be familiar with the operating manual and the applicable OHS and accident prevention regulations.

Qualified personnel

A technical expert is a person who, due to technical training and experience, possesses sufficient skills and knowledge.

The technical expert must be familiar with the operating manual and the applicable OHS and accident prevention regulations, as well as the applicable animal welfare laws.

Competent personnel

Competent personnel are such persons who, due to technical training and experience, possess sufficient skills and knowledge.

The technical expert must be familiar with the operating manual and the applicable OHS and accident prevention regulations as well as with the latest regulations of the protection of animals.

Machine safety

Before starting any work, carefully check the machine for proper function in accordance with the intended use.

Do not set the machine into operation if it does not work correctly.

Switch off the machine immediately if it no longer works correctly and have it checked.

Have defective safety devices, switches or other defective machine parts repaired.

Notify the operator or his authorised representative of any changes to the machine which may affect your safety.

Safety at the workplace

Maintain a stable upright position and keep your balance. Avoid awkward postures.

Keep your workplace clean and tidy. Untidy workplaces can cause accidents.

Always wear the personal protective equipment provided.

Keep children, young persons and untrained staff away from the machine.

Emergency procedures

In the case of an accident, administer first aid and call a doctor and emergency medical services.

Notify the operator or his authorised representative of every accident.

2.4 Personal protective equipment

The staff must carry the customary personal protective equipment. The personal protective equipment is dependent on the respective field of work.

The personal protective equipment must be provided by the operator. For hygienic reasons, each employee gets his/her own personal protective equipment.

2.5 Inspection in accordance with the German Animal Protection Slaughter Regulation (TierSchIV)

For all FREUND electric stunners, all relevant stunning and work safety parameters are inspected prior to the first use in accordance with the applicable Animal Protection Slaughter Regulation and the EC Regulation 1099/2009, the operational safety regulation and the accident prevention regulation. An inspection sticker is attached to the machine, which indicates the next repeat test.

The inspection interval is one year.

2.6 Electrical safety in accordance with EN60204-1

All our electrical machinery and equipment is tested for electrical safety prior to commissioning and following modification or repair in our factory by an electrically skilled person in accordance with the electrical engineering rules as per DIN VDE 0701-0702 / EN60204-1. The inspection interval for machinery and equipment that is used in slaughtering and cutting plants is every six months.

2.7 Residual risks

The machine has been built according to the scientific and technological state of the art and complies with the basic occupational health and safety requirements of the European Union.

The machine is operationally safe, assuming compliance with the operating manual, the company-specific instructions and the accident prevention regulations.

However, there are still dangers involved which cannot be eliminated by design measures. These include:

- danger to life from live machine parts in electrical machinery
- danger of injury to fingers and hands.
- risk of injury from negligent handling of personal safety equipment while operating the machine, during maintenance and repair work and during cleaning and disinfection

It should also be noted that, despite all precautionary measures, residual risks may remain which are not evident.

You can minimise these residual risks by observing the safety instructions given at the beginning of the individual chapters and observing the instructions in the entire operating manual.

2.8 Intended use

The FREUND-Electric-Stunners

- are used for stunning and killing of pigs, sheep and goats in killing stalls, restrainer and single traps.
- may be operated only with the provided safety devices, which must be fully functional.

FREUND stun tongs

- are intended for stunning and killing pigs, sheep and goats in killing stalls, restrainers and single traps.
- are operated together with FREUND electric stunners.
- must be equipped with a weight compensation system. For safety reasons, the stun tongs may only be operated with a spring balancer for weight compensation.

Proper use applies to the following stun tongs:

STUNG-TONG-EP steel	for stunning pigs
STUNG-TONG-EP LS	for stunning pigs
STUNG-TONG-EA steel	for stunning sheep, goats and lambs
STUNG-TONG-EP titanium	for stunning pigs and sows
STUNG-TONG-EPP2	for stunning pigs (with pneumatic actuator for opening and closing the stun tongs)
STUNG-TONG-EF	stun fork for stunning pigs

The interface control box

- is intended for time-delayed control of heart electrodes during stunning in restrainers and single traps.
- is operated together with the STUN-E514 electric stunner.
- may be operated by one operator only at any given time.

The STIM-E512 electronic stimulator

- is intended for immobilisation of large animals (cattle) after stunning and before shackling.
- is intended to improve meat quality after sticking.

The FREUND STUN-Check testing device for electric stunners

- is intended for automatic testing of electric stunning devices (in accordance with the German Animal Protection Slaughter Regulation and with Council Regulation (EC) No. 1099/2009.).

The STUN-EMEM01 data memory

- is intended for recording of stun data (in accordance with recording requirements under the German Animal Protection Slaughter Regulation and Council Regulation (EC) No. 1099/2009).
- is operated together with FREUND electric stunners.

The RS485 data cable for direct connection

- is intended for transmission of stun data to a PC (in accordance with recording requirements under the German Animal Protection Slaughter Regulation and Council Regulation (EC) No. 1099/2009).
- is operated together with FREUND electric stunners.

The STUN-DATA program

- is intended for transmission of stun data to a PC and for sorting, analysis and management of such data.
- is used together with the STUN-EMEM01 data memory or with the RS485 data cable for direct connection.

Operating the machine within the limits of its intended use also involves:

- observing the safety instructions.
- proper execution of repair and maintenance work.
- regular cleaning of the machine.

Any other use is considered as contrary to the intended use and poses risks to the safety of operating staff.

Disclaimer of liability

FREUND Maschinenfabrik does not accept liability for any damage resulting from improper use of the machine.

2.9 Improper use

Every use other than those described as → chapter *Intended use* is deemed to be non-intended and is thus inadmissible.

The operator is solely responsible for risks in the case of improper use. Consult the manufacturer in case of doubt.

The following are also deemed as improper use:

- the use of the machine to human beings.
- the use to tranquilize the animals prior to slaughter.
- the use of the machine without functional safety devices.
- the extension of the cables and connecting lines attached to the machine.

3 Technical Description

3.1 Minimum electric current and stunning times

In all FREUND-electric-stunners the minimum electric currents for each animal species is preconfigured in accordance with the valid Regulation (EC) No. 1099/2009.

Minimum electric current

Animal species	Minimum electric current
Pigs	1.3 A*
Sheep / goats	1.0 A*
* in accordance to Regulation (EC) Nr. 1099/2009	

Country-specific legal regulations

The respective national regulations on the protection of animals apply at the time of slaughter or killing. If necessary adapt the stunning parameters (e.g. minimum current levels and stunning times) to the regulations in your country.

3.2 Working method of electric-stunning

A stunning plant consists of an electric-stunner and a stun tong.

At the electric stunning or killing the brain of the animal must be flowed through first or at least simultaneously with the body.

Necessary parameters for stunning:
Refer to national regulations of your country

Body resistance animal

The electric-stunner works according to the constant current measurement process.

The body resistance of the animal (pig, sheep or goat) is thus continuously measured at short intervals and analysed based on the resistance measurement principle. If the measured value is within the pre-set range of up to 1400 ohms, the stun voltage is automatically switched on.

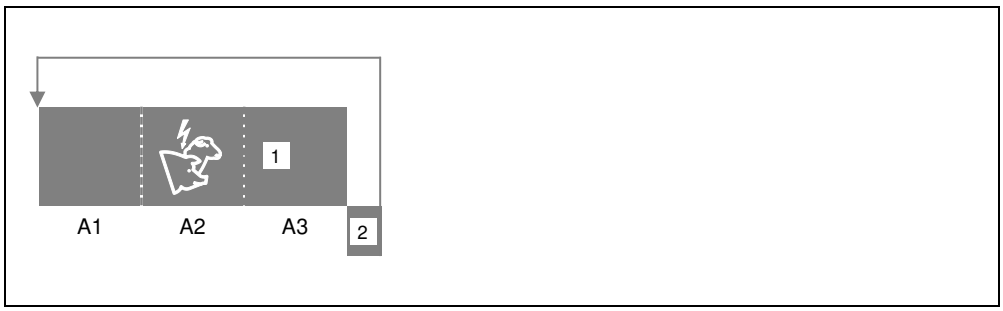
Body resistance humans

The body resistance of humans is significantly higher than the body resistance of the animals being slaughtered. If the pre-set resistance of 1400 ohms is exceeded, the electric stunner switches off the stun voltage to protect the operating personnel. Danger to persons is averted due to the large difference in switch-on value.

Uncontrolled conditions and defects in the stun circuit are indicated to the user by a malfunction lamp.

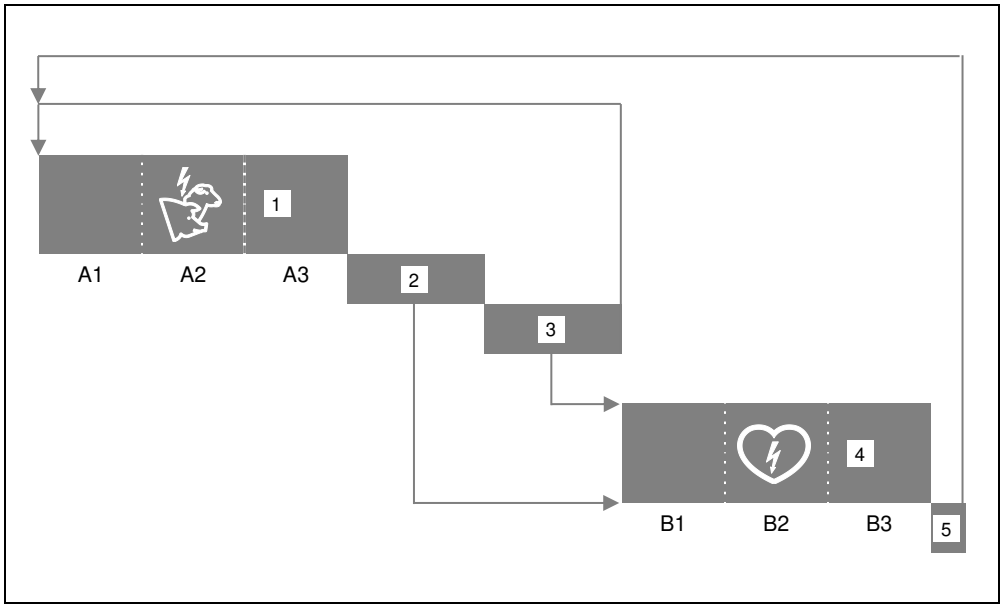
3.3 Stun phases

3.3.1 Head stunning



No.	Phase	Parameter	
1	Head stunning (phases A1, A2, A3)	Head ramp value	
		A1	Head current time 1
			Head current 1
			Head frequency 1
		A2	Head current time 2
			Head current 2
			Head frequency 2
		A3	Head current time 3
			Head current 3
			Head frequency 3
		Head minimum current	
		Head minimum time	
		Head max. voltage	
2	Break between stuns	Break time	

3.3.2 Head and heart stunning



No.	Phase	Parameter	
1	Head stunning (phases A1, A2, A3)	Head ramp value	
		A1	Head current time 1
			Head current 1
			Head frequency 1
		A2	Head current time 2
			Head current 2
			Head frequency 2
		A3	Head current time 3
			Head current 3
			Head frequency 3
		Head minimum current	
		Head minimum time	
		Head max. voltage	
2	Switch	Switching time	
3	Reset	Reset time	
4	Heart stunning (phases B1, B2, B3)	Heart ramp value	
		B1	Heart current time 1
			Heart current 1
			Heart frequency 1
		B2	Heart current time 2
			Heart current 2

No.	Phase	Parameter	
			Heart frequency 2
		B3	Heart current time 3
			Heart current 3
			Heart frequency 3
		Heart minimum time	
		Heart max. voltage	
5	Break between stuns	Break time	

3.4 Pre-set stun programs

The pre-set programs are pre-set for the respective animal species in accordance with the German Animal Protection Slaughter Regulation (TierSchlV). In other countries, the respective national regulations on the protection of animals apply at the time of slaughter or killing.

The electric stunners have 7 preset stun programs.

Stun program		Minimum amperage [A]
P1	Head & heart stunning for pigs ^{N}	1.3
P2	Head & heart stunning for pigs ^{H}	1.3
P3	Head & heart stunning for sows	1.3
P4	Head stunning for sows	1.3
P5	Head stunning for pigs ^{N}	1.3
P6	Head stunning for pigs ^{H}	1.3
P7	Head stunning for sheep	1.0
* N = normal; S = heavy		

3.5 Stunning parameters

30 stunning parameters can be configured individually in the STUN-E512 and STUN-E513 electric stunners' stun programs.

41 stunning parameters and 9 additional options can be configured individually in the STUN-E514 electric stunner's stun programs.

3.5.1 STUN-E512, STUN-E513, STUN-E514 stunning parameters

No. 1-25

No.	Parameter	Description
1	Head ramp value	Current strength ramping behaviour
2	Head current time 1 [s]	Duration of 1st phase of head stunning (in conjunction with parameters 13 + 16)

No. 1-25

No.	Parameter	Description
3	Head current time 2 [s]	Duration of 2nd phase of head stunning (in conjunction with parameters 14 + 17)
4	Head current time 3 [s]	Duration of 3rd phase of head stunning (in conjunction with parameters 15 + 18)
5	Switch period [s] [2]	Period in which the stun tong can be switched from head to heart stunning
6	Heart ramp value	Current strength ramping behaviour
7	Heart current time 1 [s]	Duration of 1st phase of heart stunning (in conjunction with parameters 20 + 23)
8	Heart current time 2 [s]	Duration of 2nd phase of heart stunning (in conjunction with parameters 21 + 24)
9	Heart current time 3 [s]	Duration of 3rd phase of heart stunning (in conjunction with parameters 22 + 25)
10	Break time [s]	Time between stuns
11	Reset period [s] [2]	Period in which the stun tong can be switched from head to heart stunning after switch period has lapsed Start of reset period: • The stun tong was **not** switched from head to heart stunning during the switch period During reset period: • The stun tong was switched and the stun procedure continued with heart stunning End of reset period: • The current stun procedure was cancelled and the settings were reset to the settings for head stunning
12	Head max. voltage [V]	Max. possible head stunning voltage
13	Head current 1 [A]	Constant current strength during the 1st phase of head stunning (in conjunction with parameters 2 + 16)
14	Head current 2 [A]	Constant current strength during the 2nd phase of head stunning (in conjunction with parameters 3 + 17)
15	Head current 3 [A]	Constant current strength during the 3rd phase of head stunning (in conjunction with parameters 4 + 18)
16	Head frequency 1 [s]	Constant frequency during the 1st phase of head stunning (in conjunction with parameters 2 + 13)

No. 1-25

No.	Parameter	Description
17	Head frequency 2 [s]	Constant frequency during the 2nd phase of head stunning (in conjunction with parameters 3 + 14)
18	Head frequency 3 [s]	Constant frequency during the 3rd phase of head stunning (in conjunction with parameters 4 + 15)
19	Heart max. voltage [V]	Max. possible heart stunning voltage
20	Heart current 1 [A]	Constant current strength during the 1st phase of heart stunning (in conjunction with parameters 7 + 23)
21	Heart current 2 [A]	Constant current strength during the 2nd phase of heart stunning (in conjunction with parameters 8 + 24)
22	Heart current 3 [A]	Constant current strength during the 3rd phase of heart stunning (in conjunction with parameters 9 + 25)
23	Heart frequency 1 [s]	Constant frequency during the 1st phase of heart stunning (in conjunction with parameters 7 + 20)
24	Heart frequency 2 [s]	Constant frequency during the 2nd phase of heart stunning (in conjunction with parameters 8 + 21)
25	Heart frequency 3 [s]	Constant frequency during the 3rd phase of heart stunning (in conjunction with parameters 9 + 22)

3.5.2 STUN-E512, STUN-E513 stunning parameters

No. 26-30

No.	Parameter	Description
26	Head minimum current [A]	Head stunning minimum current strength[1]
27	Head minimum time [s]	Head stunning minimum stun time[1]
28	Heart minimum time [s]	Heart stunning minimum stun time[1]
29	Buzzer duration (s)	Duration of acoustic signal The acoustic signal is emitted • after the stun time has lapsed. • if an error occurs during the stun procedure.
30	Number of programs	Number of preset stun programs

* [1] provisions of the German Animal Protection Slaughter Regulation (TierSchlV)

3.5.3 STUN-E514 stunning parameters

No. 26-41

No.	Parameter	Description
26	Change password	Changes the numeric password
27	Head minimum current [A]	Head stunning minimum current strength[1]
28	Head minimum time [s]	Head stunning minimum stun time[1]
29	Heart minimum time [s]	Heart stunning minimum stun time[1]
30	Buzzer duration (s)	Duration of acoustic signal The acoustic signal is emitted • after the stun time has lapsed. • if an error occurs during the stun procedure.
31	Number of programs	Number of preset stun programs
32	Language selection	Language setting
33	Time: minutes	Sets the time (minutes)
34	Time: hours	Sets the time (hours)
35	Date: day	Sets the date (day)
36	Time: month	Sets the date (day)
37	Date: year	Sets the date (year)
38	20V calibration	Calibration Calibration is performed by FREUND Maschinenfabrik service technicians.
39	200V calibration	
40	Start-up calibration	
41	Shutdown calibration	

* [1] provisions of the German Animal Protection Slaughter Regulation (TierSchlV)

Selection 1-9

No.	Parameter	Description
1	Restrainer/single trap (y/n)	Activation/deactivation of stunning in a restrainer/in a single trap
2	External, without measurement (y/n)	Activation/deactivation of resistance measurement before stunning
3	External, with measurement (y/n)	Activation/deactivation of resistance measurement before stunning
4	With heart electrode (y/n)	Activation/deactivation of connection socket for heart stunning
5	With heart current (y/n)	Switch from stun tong to heart electrode
6	List printing on (y/n)	Activation/deactivation of stun data recording
7	Service mode (y/n)	Settings are configured by FREUND Maschinenfabrik service technicians

Selection 1-9

No.	Parameter	Description
8	Emergency Stop function (y/n)	Activation/deactivation of an external Emergency-Stop mechanism
9	Display stun errors (y/n)	Activation/deactivation of stun error display

Setting ranges and setting steps

The following table illustrates setting ranges and setting steps for stunning parameters.

	Parameter	Setting range	Setting step
Head stunning phase	Head ramp value [3]	1-10	1
	Head current time 1 [s]	0-19.9	0.1
	Head current time 2 [s]	0-19.9	0.1
	Head current time 3 [s]	0-19.9	0.1
	Head current 1 [A]	0.1-2.5	0.1
	Head current 2 [A]	0.1-2.5	0.1
	Head current 3 [A]	0.1-2.5	0.1
	Head frequency 1 [Hz] (STUN-E512, STUN-E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Head frequency 1 [Hz] (STUN-E514)	50-730	10
	Head frequency 2 [Hz] (STUN-E512, -E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Head frequency 2 [Hz] (STUN-E514)	50-730	10
	Head frequency 3 [Hz] (STUN-E512, STUN-E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Head frequency 3 [Hz] (STUN-E514)	50-730	10
	Head minimum current [A] [1]	0.1–2.5	0.1
	Head minimum time [s] [1]	0.1–9.9	0.1
	Head max. voltage [V]	50-400	2
Switch phase	Switch period [s] [2]	0-19.9	0.1
	Reset period [s] [2]	0.1-25	0.1
Heart stunning	Heart ramp value [3]	1-10	1

	Parameter	Setting range	Setting step
phase	Heart current time 1 [s]	0-19.9	0.1
	Heart current time 2 [s]	0-19.9	0.1
	Heart current time 3 [s]	0-19.9	0.1
	Heart current 1 [A]	0.1-2.5	0.1
	Heart current 2 [A]	0.1-2.5	0.1
	Heart current 3 [A]	0.1-2.5	0.1
	Heart frequency 1 [Hz] (STUN-E512, STUN-E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Heart frequency 1 [Hz] (STUN-E514)	50-730	10
	Heart frequency 2 [Hz] (STUN-E512, STUN-E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Heart frequency 2 [Hz] (STUN-E514)	50-730	10
	Heart frequency 3 [Hz] (STUN-E512, STUN-E513)	16–730 with fixed setting steps	16, 50, 80, 100, 200, 300, 400, 500, 730
	Heart frequency 3 [Hz] (STUN-E514)	50-730	10
	Heart minimum time [s] [1]	0.1–9.9	0.1
	Heart max. voltage [V]	50-400	2
Break phase	Break time [s]	0.1–9.9	0.1
General parameters	Buzzer duration [s]	0.1-2	0.1
	No. programs	1-7	1
Additional parameters STUN-E514	Change password	1-9999	1
	Time: minutes	0-59	1
	Time: hours	0-24	1
	Date: day	1-31	1
	Time: month	1-12	1
	Date: year	1901 -	1
	Restrainer/single trap	yes/no query	
	External, without measurement	yes/no query	

	Parameter	Setting range	Setting step
	External, with measurement	yes/no query	
	With heart electrode	yes/no query	
	With heart current	yes/no query	
	List printing on	yes/no query	
	Service mode	yes/no query	
	Emergency Stop function	yes/no query	
	Stun error	yes/no query	
STUN-E514 log	Heart time error counter	0-99999	1
	Head time error counter	0-99999	1
	Head current error counter	0-99999	1
	Total stuns counter	0-99999	1

* [1] provisions of the German Animal Protection Slaughter Regulation (TierSchlV)

* [2] only in conjunction with head and heart stunning

* [3] Recommendation: Ramp value ‚10' (factory setting)

3.6 STUN-E512, STUN-E513 and STUN-E514 electric stunners

FREUND STUN-E512, STUN-E513 and STUN-E514 electric stunners are compliant with the provisions of the applicable German Animal Protection Slaughter Regulation of 1 January 2013 and of Council Regulation (EC) No. 1099/2009.

Features

- 7 stun programs available for selection; must be configured individually for various applications
- Selectable head and heart stun programs
- Acoustic signal for minimum stun time
- Visual and acoustic stun error display
- Fewer blood spots and bone fractures, resulting in better meat quality and greater yield
- Integrated interface for data recording
- LED display (STUN-E512, STUN-E513)
  LCD display (STUN-E514)
- Connection for separate heart electrode (STUN-E514)
- Connection for pneumatic stun tong controller (STUN-E514)

3.6.1 STUN-E512, STUN-E513: function and control elements

Function elements

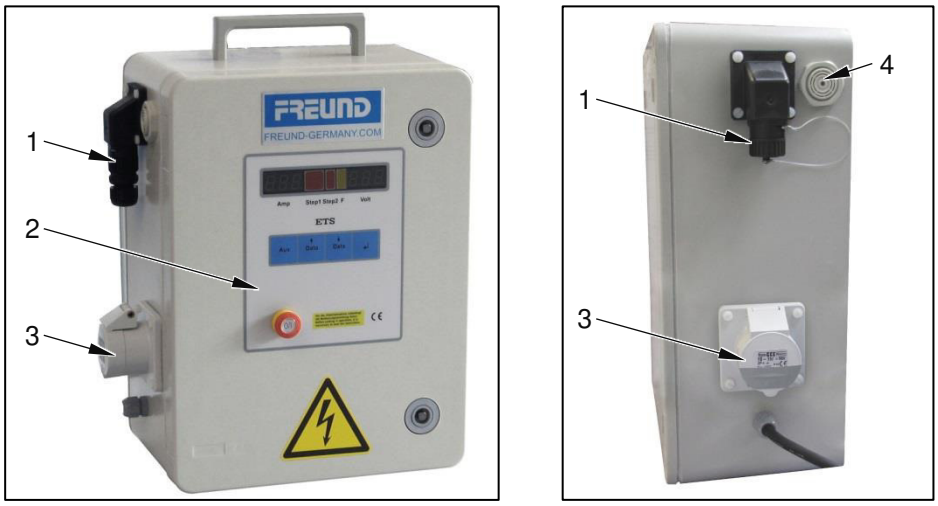


Fig. 3-1 Function elements

Item	Description
1	Connection for • data memory → section ***STUN-EMEM01 data memory*** on page 39 • direct connection → section ***Data cable for direct RS-485 connection*** on page 40
2	Control and display panel
3	Stunner connection: power cable to stun tong (head stunning)
4	Summer

Control and display elements

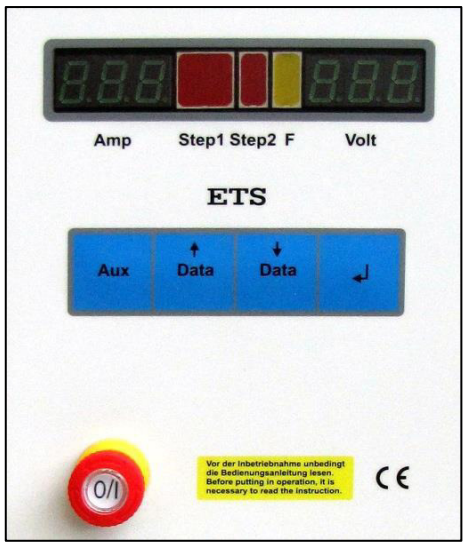


Fig. 3-2 Control and display panel

Control elements

Button	Description

Control elements

Button	Description
Aux	Button for saving data to the data memory
↓ Data	Selection of programs 1 to 7 Selection of parameters in the subprograms (after consultation with the manufacturer only)
↵	Selection and modification of subprograms (after consultation with the manufacturer only)
0/I	0/I rotary switch for switching on and off; can also be used as an EMERGENCY STOP button

Display elements

Display		Description
Amp		LED display: • program display (P..) • display of current strength during stunning
Step1		Signal light for head stunning
Step2		Signal light for heart stunning
F		Signal light for stun error
Volt		LED display: display of voltage during stunning
		Additional acoustic stun error alert

3.6.2 STUN-E514: function and control elements

Function elements

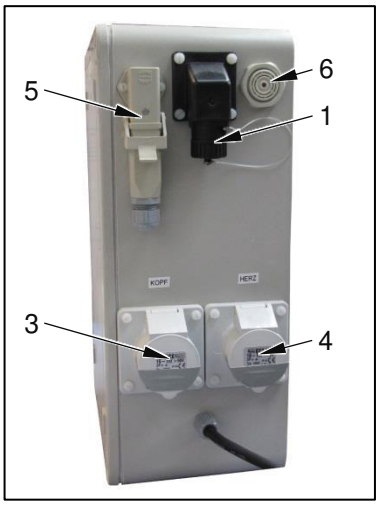


Fig. 3-3 Function elements

Item	Description
1	Connection for • data memory → section ***STUN-EMEM01 data memory*** on page 39 • direct connection → section ***Data cable for direct RS-485 connection*** on page 40
2	Control and display panel
3	Stunner connection: power cable to stun tong (head stunning)
4	Stunner connection: power cable to heart electrode (heart stunning)
5	• Connection to controller for a pneumatic stun tong with an electric trigger device • Interface control box
6	Summer

Control and display elements

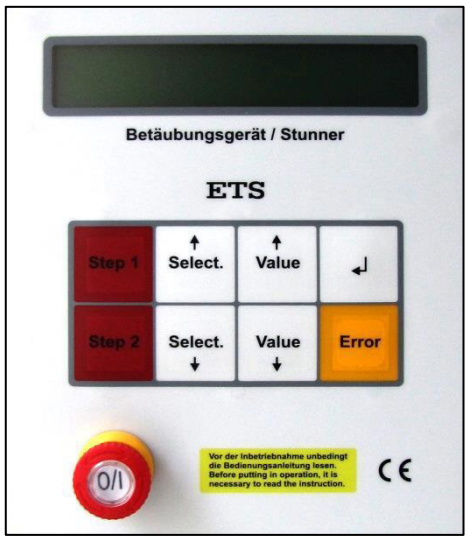


Fig. 3-4 Control and display panel

Control elements

Button	Description
Select. Select.	Button for program selection Button for modifications in subprograms
Value Value	Button for parameter changes in subprograms
↵	Confirmation button
0/I	0/I rotary switch for switching on and off; can also be used as an EMERGENCY STOP button

Display elements

Display	Description

Display elements

Display	Description
	LCD display
	Signal light for head stunning
	Signal light for heart stunning
	Button for saving data to the data memory Signal light for stun and device errors

3.6.3 STUN-E512, STUN-E513, STUN-E514: rating plate

The rating plate is attached to the side of the housing on the outside, and to the door of the control cabinet on the inside. The following illustration shows an example of a rating plate:

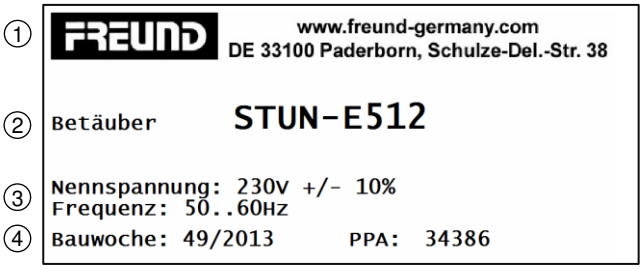


Fig. 3-5 Example of rating plate

Element	Explanation
1	Company address
2	Machine type and designation
3	Performance data
4	Year and week of manufacture and production order no.

3.7 Stun tongs

FREUND electric stun tongs

- have been designed in accordance with DIN EN 60335-2-87 and tested according to quality standards.
- are compliant with the provisions of the applicable German Animal Protection Slaughter Regulation of 1 January 2013 and of Council Regulation (EC) No. 1099/2009.

Features

- Combined spike and central spine electrodes (excludes STUN-TONG-EF electric stun fork)
- Quick-change electrode system
- Ergonomically angled handle
  (STUN-TONG-EP titanium electric stun tong)
- Robust stainless steel design ** INOX/rustproof **
- Robust titanium design
  (STUN-TONG-EP titanium electric stun tong)
- Wear-resistant coiled cable
  (excludes STUN-TONG-EF electric stun fork and STUN-TONG-EPP2 pneumatic stun tong)

The following table provides an overview of stun tong applications according to animal and stunning type.

Stun tong	Animal type			Stunning type	
STUN-TONG-					
EP steel	●	-	-	●	-
EP LS	●	-	-	●	-
EA steel	-	-	●	●	-
EP titanium	●	●	-	●	●
EPP2 (pneumatic)	●	-	-	●	●*
EF	●	-	-	●	-
*	Stunning in restrainers and in single traps				

3.7.1 STUN-TONG-EP steel, STUN-TONG-EA steel, -EP LS: function elements

Function elements

Fig. 3-6 STUN-TONG-EP steel/ -EP LS, STUN-TONG-EA steel

Item	Description
1	Electrodes for pigs (STUN-TONG-EP steel/ -EP LS)
2	Electrodes for sheep (STUN-TONG-EA steel)

3.7.2 STUN-TONG-EP titanium: function elements

Function elements

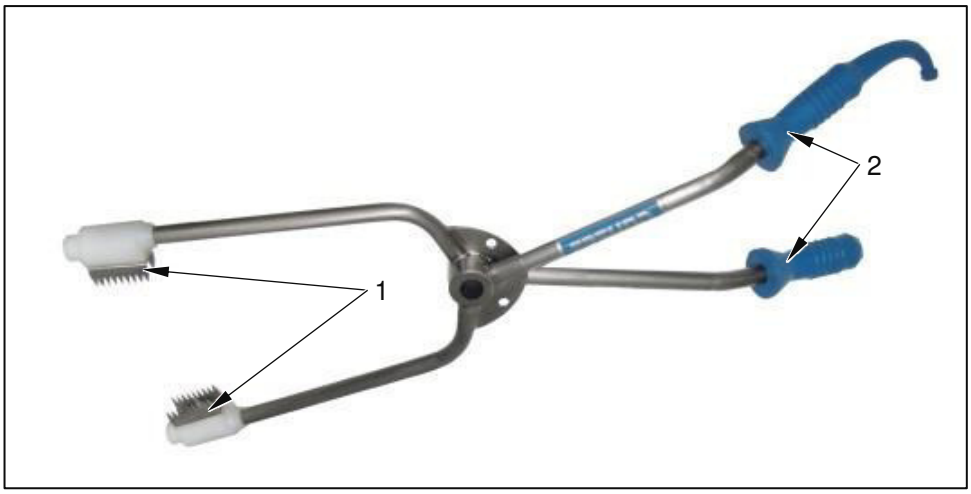


Fig. 3-7 STUN-TONG-EP titanium

Item	Description
1	Electrodes for pigs
2	Ergonomically angled handle

3.7.3 STUN-TONG-EPP2: function elements

Function elements

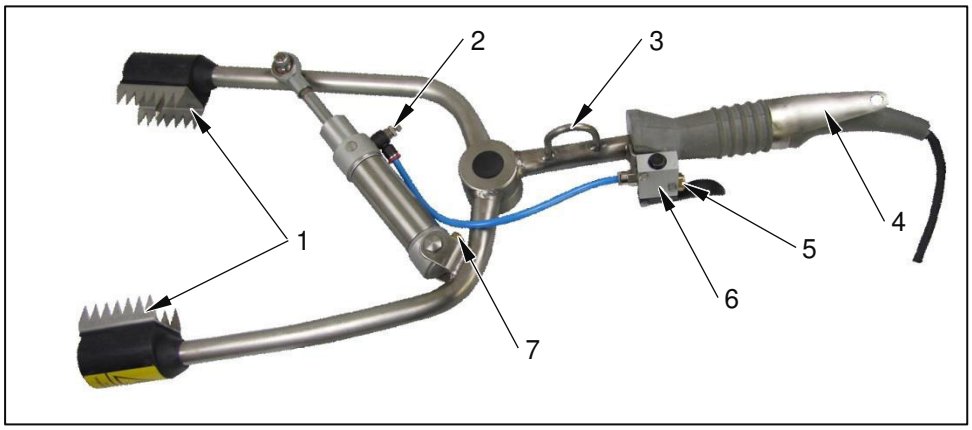


Fig. 3-8 STUN-TONG-EPP2

Item	Description
1	Electrodes for pigs
2	Adjusting screw for closing speed
3	Attachment for horizontal hanging
4	Attachment for vertical hanging
5	Compressed air connection
6	Mechanical trigger for closing process
7	Silencer

3.7.4 STUN-TONG-EF: function elements

Function elements

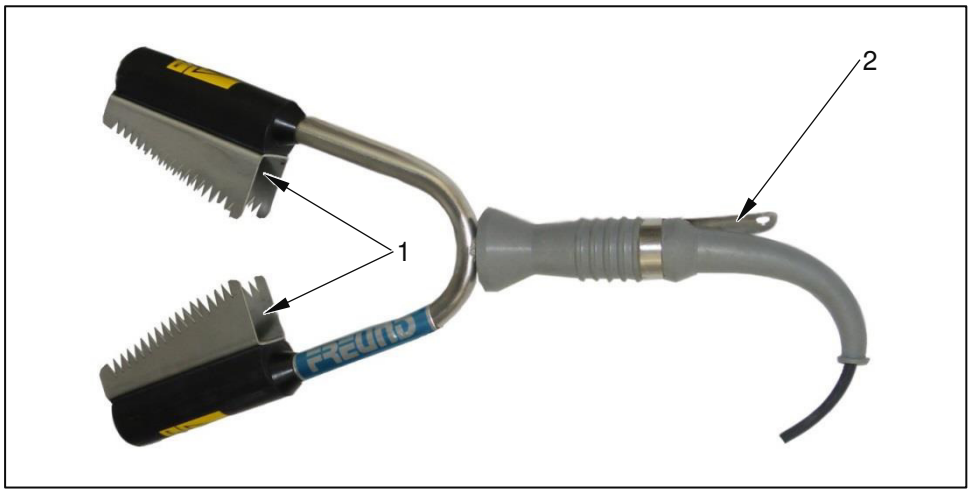


Fig. 3-9 STUN-TONG-EF

Item	Description
1	Electrodes for pigs
2	Attachment for vertical hanging

3.8 Interface control box

The interface control box

- is used for time-delayed control of head-to-heart stunning.
- Head stunning is performed by means of a pneumatically driven stun tong with controlled tong motion activation.
- Heart stunning is performed in a restrainer or single trap by means of a pneumatically driven heart electrode, with controlled activation of heart electrode motion.

Features

- Single cylinder interface control box:
  Compressed air supply to the heart electrode's pneumatic drive (heart electrode motion activated upon contact with the animal's body)
  Dual cylinder interface control box:
  Compressed air supply to the heart electrode's pneumatic drive (contact with the animal's body and lateral motion of heart electrodes)
- Adjustable reduction of heart electrode's inward and outward speed
- Adjustable delay time for control of head-to-heart stunning

Connections and control elements are shown in the following illustrations, using the example of the single cylinder interface control box.

Connections

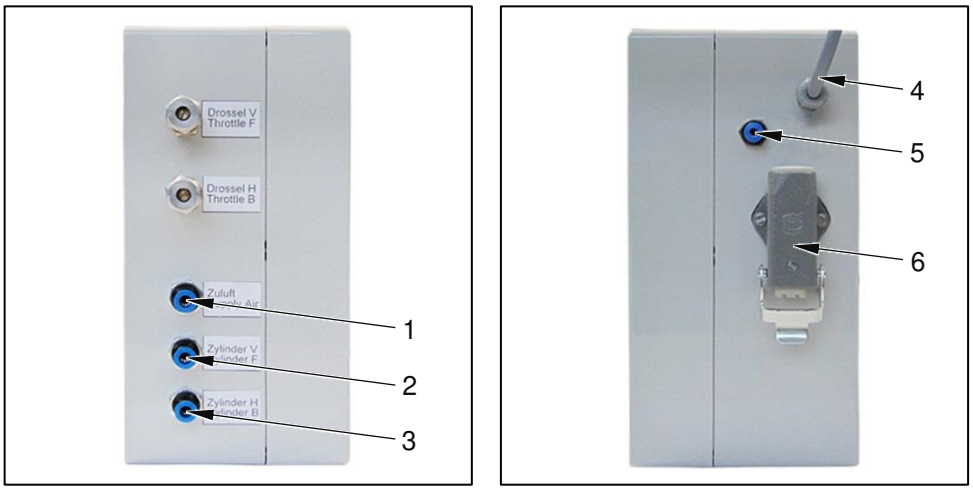


Fig. 3-10 Connections (interface control box: single cylinder version)

Item	Description
1	Compressed air supply connection ► installation site Compressed-air hose, diameter = 6 mm
2	Compressed air connection ► heart electrode The pneumatic drive moves the heart electrode into the stun position (contact with the animal's body) Compressed-air hose, diameter = 6 mm
3	Compressed air connection ► heart electrode The pneumatic drive moves the heart electrode into the starting position Compressed-air hose, diameter = 6 mm
4	Controller connection ► STUN-E514 electric stunner
5	Compressed air connection ► pneumatic stun tong Compressed-air hose, diameter = 4 mm
6	Controller connection ► pneumatic stun tong Pneumatic stun tong control

Control elements

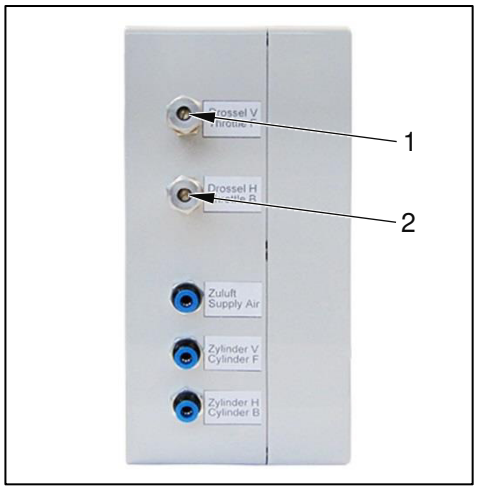


Fig. 3-11 Throttle valve

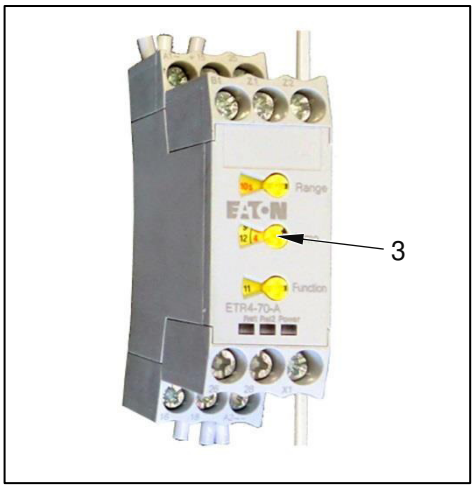


Fig. 3-12 Time-lag relay

Item	Description
1	Headless screw for adjustment of heart electrode's traversing speed in the stun position The headless screw can be rotated max. 270°
2	Headless screw for adjustment of heart electrode's traversing speed in the starting position (The headless screw can be rotated max. 270°.)
3	Time-lag relay* with “time” adjusting screw for setting delay time (control of head-to-heart stunning) Standard time delay setting: 0.5 s

* The time-lag relay is located underneath the interface control box.

3.9 STUN-EMEM01 data memory

The STUN-EMEM01 data memory

- is used to record stun data from STUN-E512, STUN-E513 and STUN-E514 electric stunners.
- enables management and analysis of stun data in conjunction with the STUN-DATA program.

Features

- Mobile data memory with 2 MB memory capacity
- Data interfaces for transmission of data to the PC:
  - RS-232 serial interface, connection cable with RS-232 socket
  - USB port, adapter cable with USB connector (serial–USB)
- Management and analysis of stun data

Data memory
Connection cable
Adapter cable

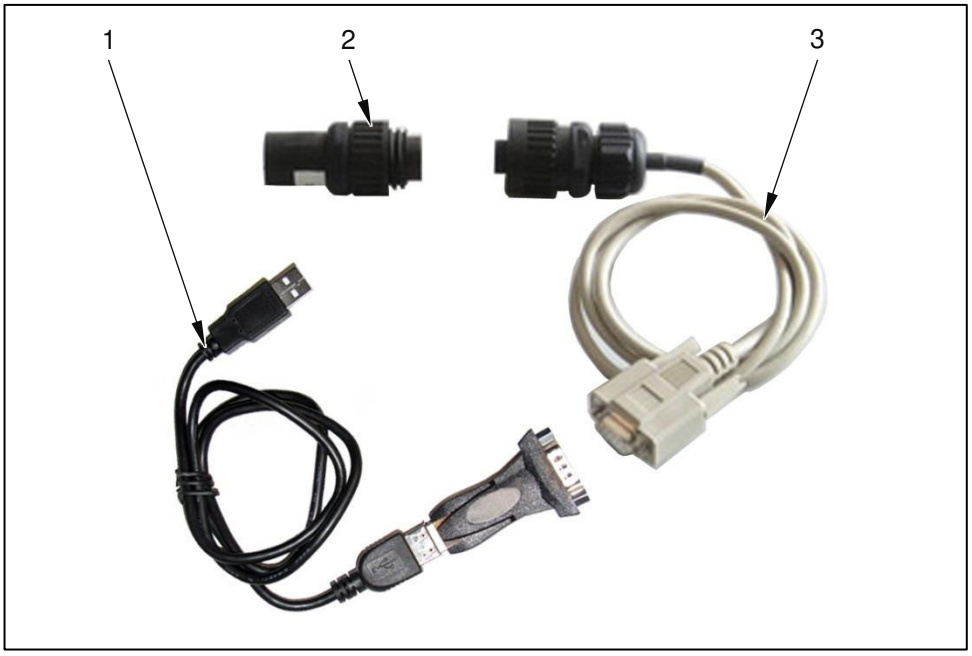


Fig. 3-13 Data memory, connection cable and adapter cable

Item	Description
1	Adapter cable[1] with RS-232 connector and USB connector
2	Data memory[2] (connection to electric stunner)
3	Connection cable with RS-232 socket and screwable connector for data memory

[1] Driver for adapter cable:
If you lose the driver CD, please contact FREUND Maschinenfabrik's Service department.

[2] STUN-DATA program:
https://www.freund.eu/produkte/downloads.html

3.10 Data cable for direct RS-485 connection

The data cable for direct RS-485 connection

- is used for online recording of stun data from STUN-E512, STUN-E513 and STUN-E514 electric stunners.
- enables management and analysis of stun data in conjunction with the STUN-DATA program.

Features

- Online recording of stun data during stunning
- Data interfaces for transmission of data to the PC
  - RS-422/485 serial interface, converter (9-pin) with RS-422/485 socket
  - USB port, adapter cable with USB connector (serial–USB)
- Management and analysis of stun data

Data cable
Converter
Adapter cable

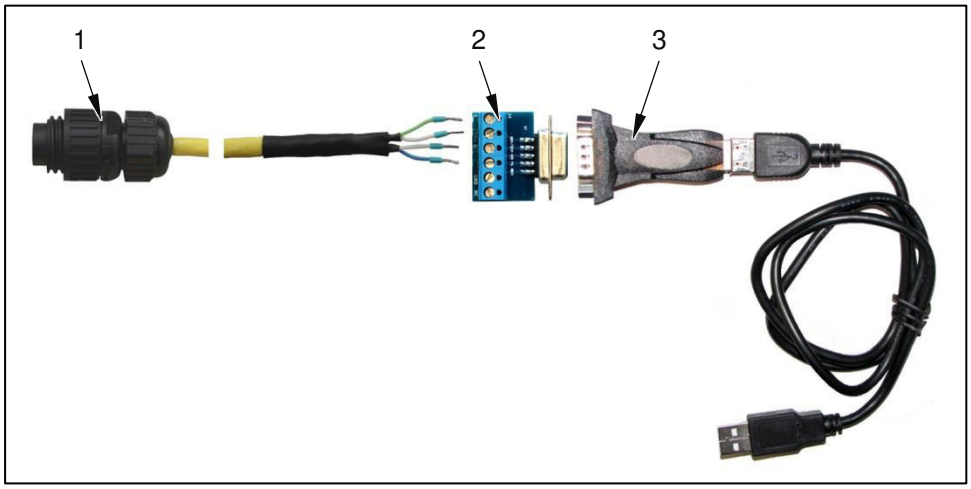


Fig. 3-14 Data cable, converter and adapter cable

Item	Description
1	50 m data cable with connector (connection to electronic stunner)
2	Converter (9-pin to serial RS-422/485 connector)
3	Adapter cable[1+2] with RS-422/485 connector and USB connector

[1] Driver for adapter cable:
If you lose the driver CD, please contact FREUND Maschinenfabrik's Service department.

[2] STUN-DATA program:
https://www.freund.eu/produkte/downloads.html

3.11 “STUN-Check” testing device for electric stunners

The STUN-Check testing device tests electric stunner functionality. Individual functions (safety and stun functions) are tested in an automated sequence.

Test results for the individual functions are displayed by LEDs. The stunning current strength can be read from a display.

Features

- 6 selectable programs (0.1–2.5 A)
- 4-digit stunning current display
- 2 pairs of green and red LEDs for displaying test results (switch-on threshold, ramping, stop time)
- Power supply via 6 accumulators or 6 batteries (AA cell)
  Charging indicator light for monitoring power supply
  Integrated charger with external 12V power adapter
- Overheating protection

Function elements

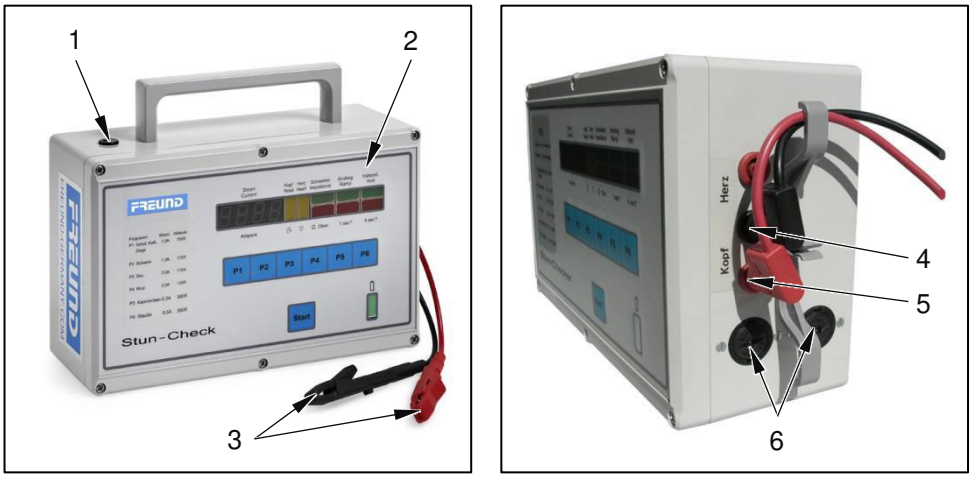


Fig. 3-15 Function elements

Item	Description
1	Connection socket for charging the device
2	Control and display panel
3	Testing line connection terminals
4	Connection socket (ground line)
5	Connection socket (phase line)
6	Accumulator/battery compartment

Control and display elements

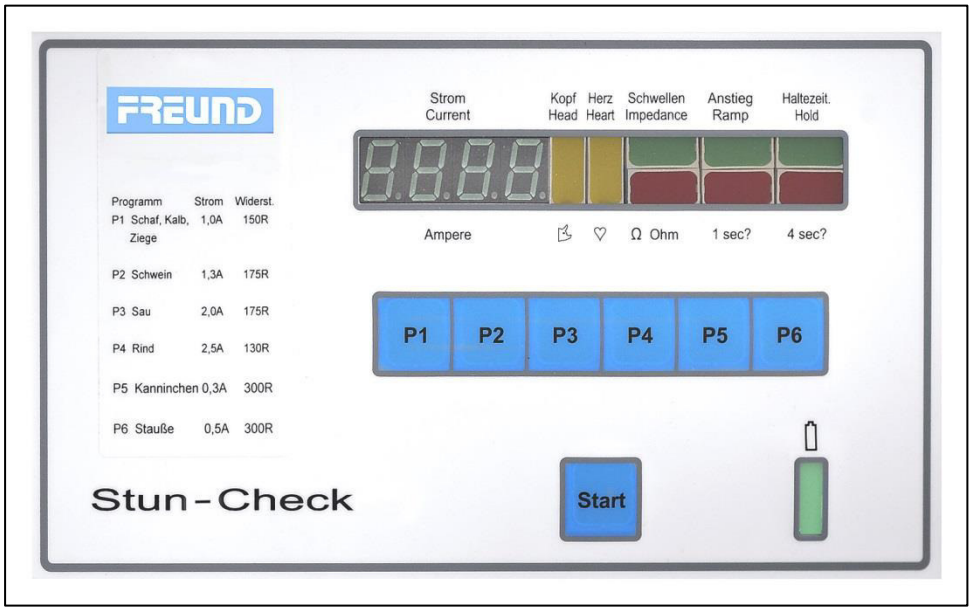


Fig. 3-16 Control and display panel

Control elements

Button	Description
	Test program selection button (P1-P6)
	“Start” button starts the device test

Display elements

Display	Description
	LED display for display • of stunning current strength • of heat accumulator temperature
	LED lighting yellow: Stunning test phase active
	LED lighting green: “Threshold”, “ramping”, “stop time” tests passed
	LED lighting red: “Threshold”, “ramping”, “stop time” tests not passed
	LED charging indicator light for monitoring power supply

3.12 STIM-E512 stimulator

Use of the STIM-E512 electronic stimulator for electronic stimulation in cattle and calves

- prevents reflex movements after stunning.
- accelerates draining of blood after sticking.
- prevents cold shortening of muscles due to accelerated breakdown of energy-rich phosphates.

Features

- 5 selectable stimulation programs (0.6 A)
- LED display
- Acoustic signal when the stimulation period has lapsed
- 10 m connection cable with nose clamp and tube-rail connection

Stimulation programs

The stimulation device has 5 preset stimulation programs.

Stimulation program	P1	P2	P3	P4	P5
Stimulation time [s]	20	30	20	30	40
Voltage [V]	42	42	42	42	42
Amperage [A]	0.6	0.6	0.6	0.6	0.6
Frequency [Hz]	16	16	50	50	50

Function elements

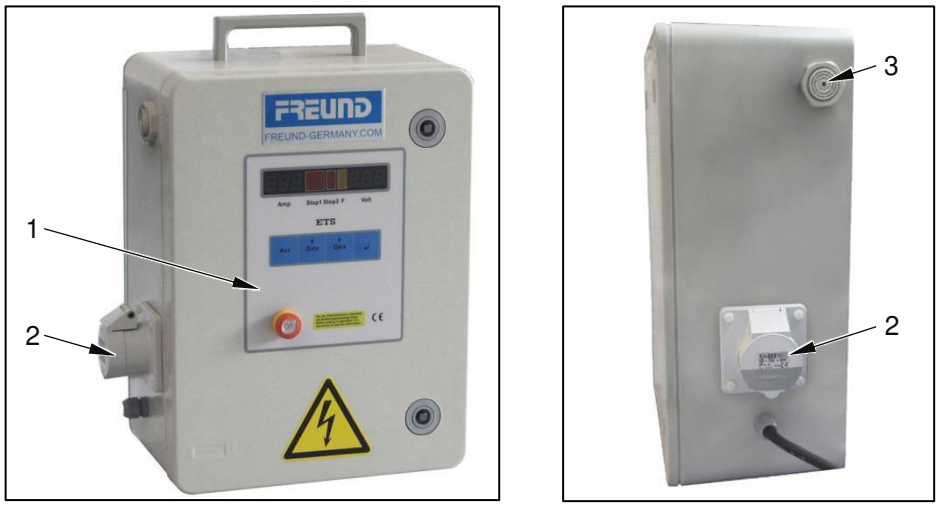


Fig. 3-17 Function elements

Item	Description
1	Control and display panel
2	Stimulation connection: Power cable with nose clamp (muzzle) and tube-rail connection (ground connection)

Item	Description
3	Summer

Control and display elements

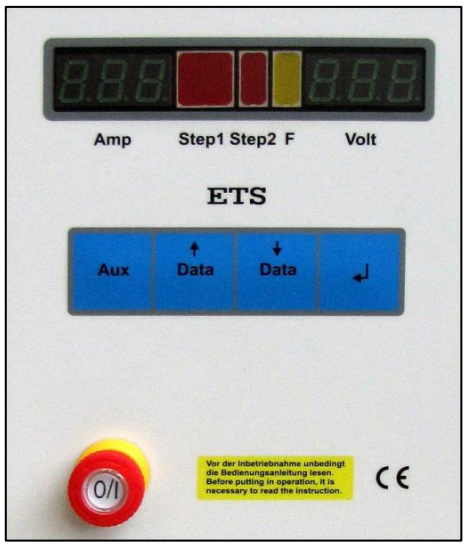


Fig. 3-18 Control and display panel

Control elements

Button	Description
Aux	Button for reading data (function is deactivated)
↑ Data ↓ Data	Selection of programs 1 to 5 Selection of parameters in the subprograms (after consultation with the manufacturer only)
↵	Selection and modification of subprograms (after consultation with the manufacturer only)
0/I	0/I rotary switch for switching on and off; can also be used as an EMERGENCY STOP button

Display elements

Display		Description
Amp		LED display: • Program display (P..) • Display of current strength during stimulation
Step1		Signal light for stimulation
Step2		Signal light with no function
F		Signal light for stimulation errors

Display elements

Display		Description
Volt		LED display: Display of voltage during stimulation
		Additional acoustic error display

4 Transport und Storage

FREUND-machines are intended for shipment via motor truck, train, aircraft, or ship. The secure shipment will be separately or in multiple packages.

Trial run at manufacturer

The machine has been thoroughly checked before shipping and has already undergone a trial run in the factory. This check ensures that the machine corresponds to the data specified and works correctly.

Despite all the care taken the machine can be damaged in transit.

4.1 Unpacking the machine

After unpacking, the machine is ready for use.

Recycling and disposal

The original packaging of the machine is made of recyclable material and can be given to the system for collecting recyclables.

For details about recycling and disposal of the package refer to the → chapter *Disposal and Recycling* on page 99.

- Remove all packing materials and dispose of it properly and in an environmentally sound manner.
- Remove any accumulated condensate.
- Check the machine for transport damage.
- Watch the machine during the first hours of operation to check whether any malfunctions occur.

4.2 Storing the machine

To store the machine safely, be sure to observe the following notes:

- Only store the machine in dry and frost-free rooms.
- When storing the machine for a longer period, make sure it is dry.
- Store the machine so that damage to the machine is excluded.
- Protect the machine against corrosion.

5 Installation and Commissioning

The electric stunner, stun tong and accessory devices are installed and connected by the operator.

FREUND Maschinenfabrik accepts no liability for damage resulting from incorrect connection or improper handling.

5.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before beginning any installation, maintenance or repair work, place the stun tong on a non-conductive surface.
- Before beginning any installation, maintenance or repair work, disconnect the electric stunner from the mains.
- Secure the electric stunner against being switched on accidentally.
- Before beginning any installation, maintenance or repair work, disconnect the stun tong from the electric stunner.

WARNING!

Risk of accident caused by insufficiently qualified personnel

Danger to Life and most severe injuries are possible.

- The machine may only be installed and commissioned by instructed and authorized personnel.
- All works to live components may only be performed by approved electricians.

WARNING!

Sharp-edged electrodes.

Risk of cutting on sharp-edged electrodes.

- Wear protective gloves when performing any installation, maintenance or repair work.

5.2 Personal protective equipment

5.3 Installation and connection of the electric stunner

Do not extend the power cable provided. Longer power cables may cause loose connections during stunning.

We recommend installation of a power outlet or a permanent connection.

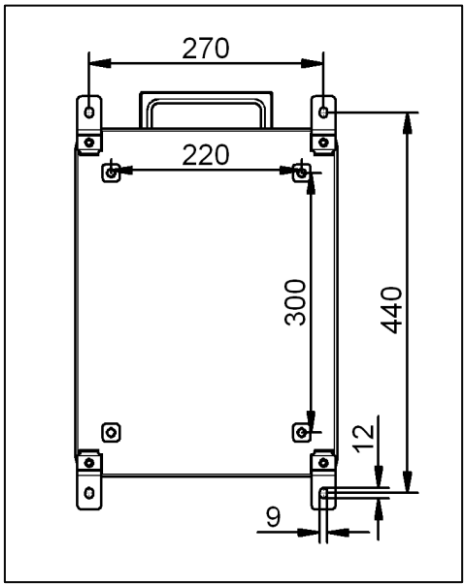


Fig. 5-1 Drilling pattern dimensions

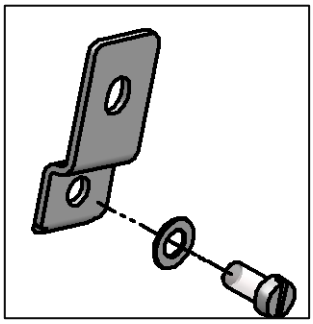


Fig. 5-2 Wall mounting set

The electric stunner's signal and display elements must be clearly visible to the user so that faults can be identified immediately.

- Mount the electric stunner with our wall mounting set* (Fig. 5-2) at a height of at least 1.6 m.

  Use the 4 mounting holes fitted on the back of the electric stunner for mounting.
- Store the stun tong in a suitable holding device at the same height when not in use.
- Connect the electric stunner to an effective equipotential bonding system (grounding).
- Install an EMERGENCY STOP mechanism in the power supply circuit.
- Route electrical connection cables so that they cannot be reached by slaughter animals.

* The wall mounting set (part no. 100-022-069)) is available from our Sales department. The address and telephone number can be found on the copyright page.

5.4 Connecting the stun tong

The connection cables are 5 m long so that the electric stunner and stun tong can be positioned at a safe distance from the work area.

Do **not** extend the power cable provided. Longer power cables may cause loose connections during stunning.

5.4.1 Installing a spring balancer (optional)

The spring balancer is used to balance the stun tong when suspended (weight compensation). FREUND spring balancers are preset to the weight of the corresponding stun tong.

Recommendation

FREUND Maschinenfabrik recommends spring balancer F 4-2.5 (Art.-Nr. 920-414-001) for the STUN-EPP2 pneumatic stun tong.

Please refer to the spring balancer's operating instructions for technical data and details on spring balancer assembly.

1. Mount the spring balancer in accordance with the manufacturer's operating instructions.
2. Using a mounting rail system, attach the spring balancer to a mounting rail at a higher elevation above the work area or on the ceiling.

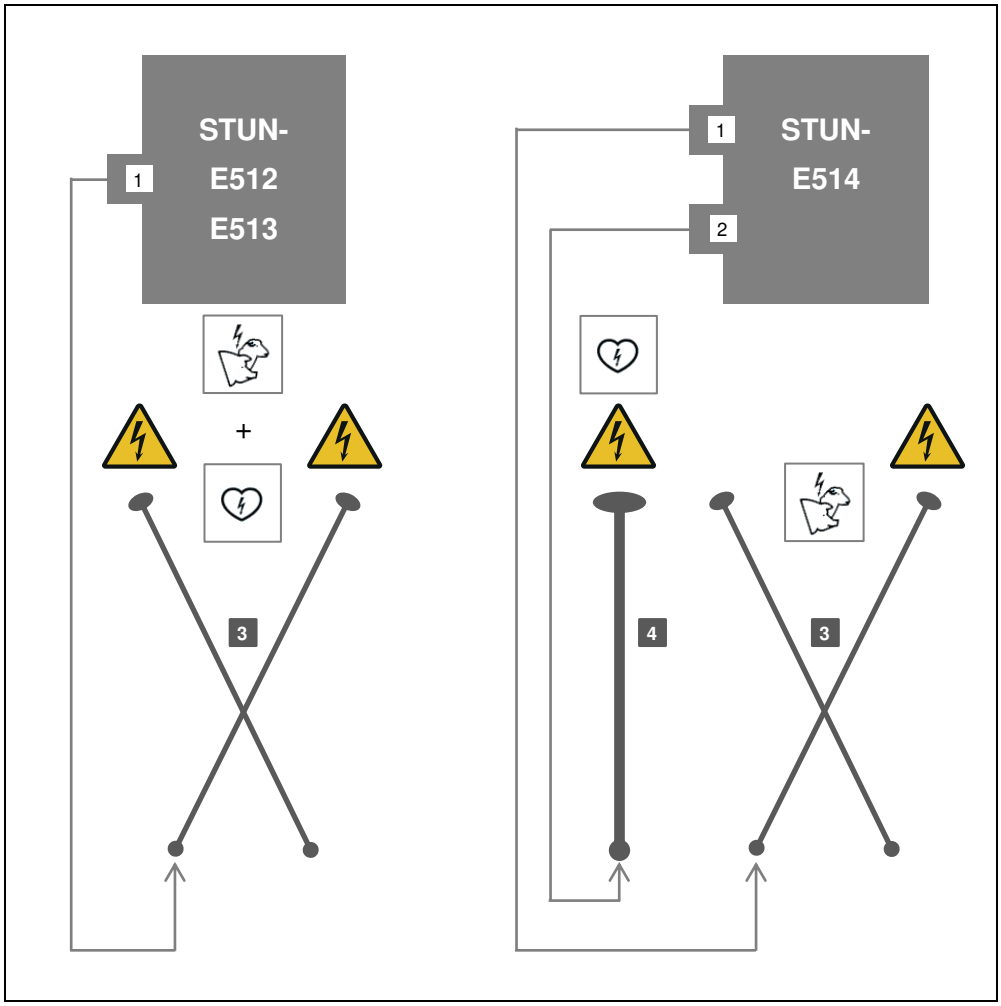
When using a tube rail, there must be a distance of between 350 and 400 mm between the centre of the tube rail or the carcass suspension point and the spring balancer suspension.

3. Mount the machine in the spring balancer. Insert the machine's coiled cable into the holder of the spring balancer.
4. Correct the spring balancer’s settings if necessary. Follow the instructions provided in the spring balancer's operating instructions in order to do so.

5.4.2 Connecting STUN-TONG-EP/STUN-TONG-EA/ STUN-TONG–EF

Stunning Connection diagram

The following illustration shows connection for stun tongs **without** pneumatic drives.



Item	Description
1	Connection to stun tong
2	Connection[1] to heart electrode
3	Stun tong
4	Heart electrode[2] (provided by the customer)

[1] for electronic stunner STUN-E514 only

[2] in conjunction with STUN-E514 electric stunner

STUN-E512
STUN-E513
STUN-E514

➢ Insert the plug of the stun tong into the connection socket on the electric stunner.

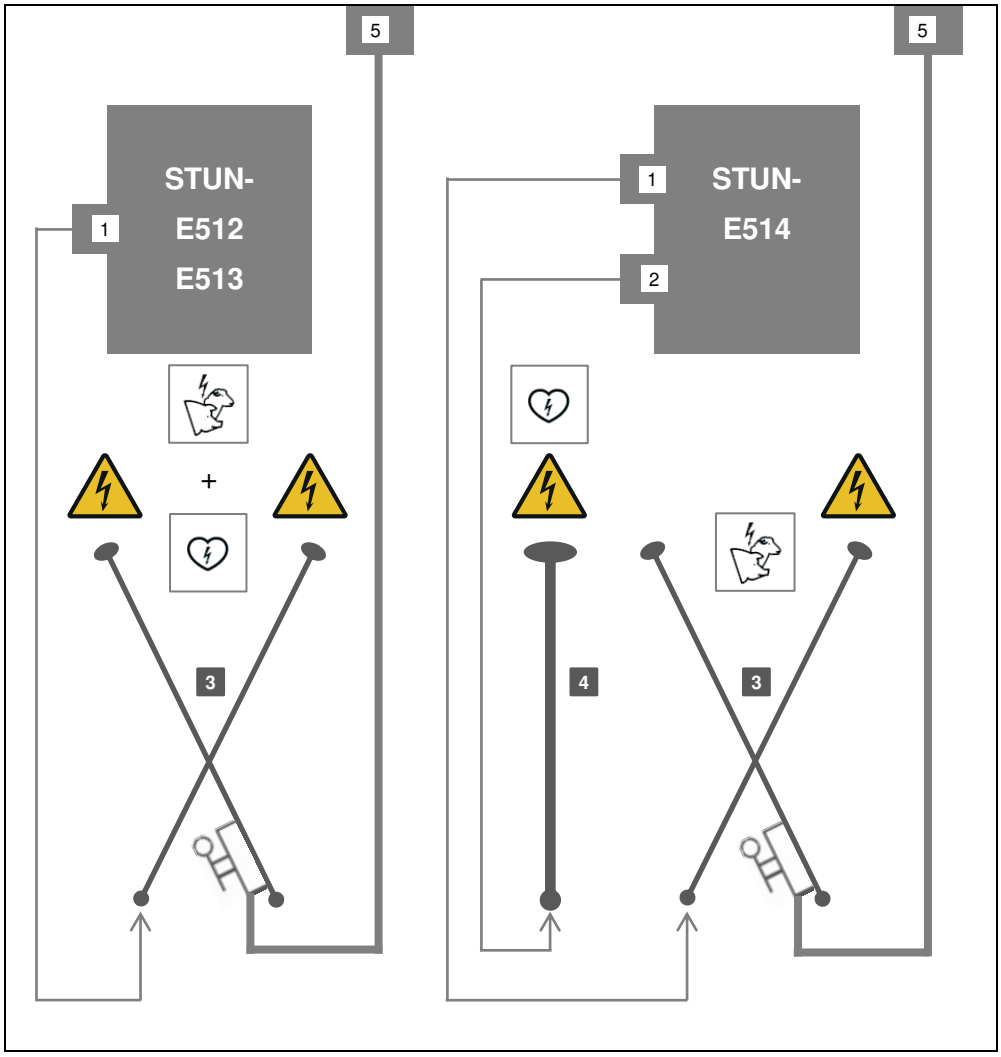
STUN-E514

➢ For heart stunning with a heart electrode:
Insert the plug of the heart electrode into the connection socket on the electric stunner.

5.4.3 Connecting STUN-TONG-EPP2 pneumatic stun tong

Stunning Connection diagram

The following illustration shows connection for the stun tong **with** a pneumatic drive.



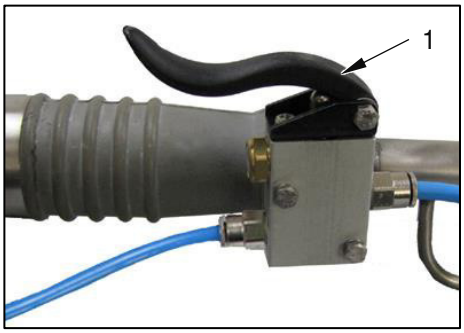
Item	Description
1	Connection to stun tong
2	Connection[1] to heart electrode
3	Pneumatic stun tong
4	Heart electrode[2] (provided by the customer)
5	Compressed air supply connection at installation site

[1] for electronic stunner STUN-E514 only

[2] in conjunction with STUN-E514 electric stunner

1. Connect the pneumatic stun tong to the compressed air supply or to a compressor with a capacity of 5-8 bar.

2. Press the trigger (1) and keep it pressed.



3. Adjust the stun tong's closing speed on the adjusting screw (2).

4. Release the trigger.

STUN-E512
STUN-E513
STUN-E514

5. Insert the plug of the stun tong into the connection socket on the electric stunner.

6. Mount the stun tong to a spring balancer.

STUN-E514

7. For heart stunning with a heart electrode:
   Insert the plug of the heart electrode into the connection socket on the electric stunner.

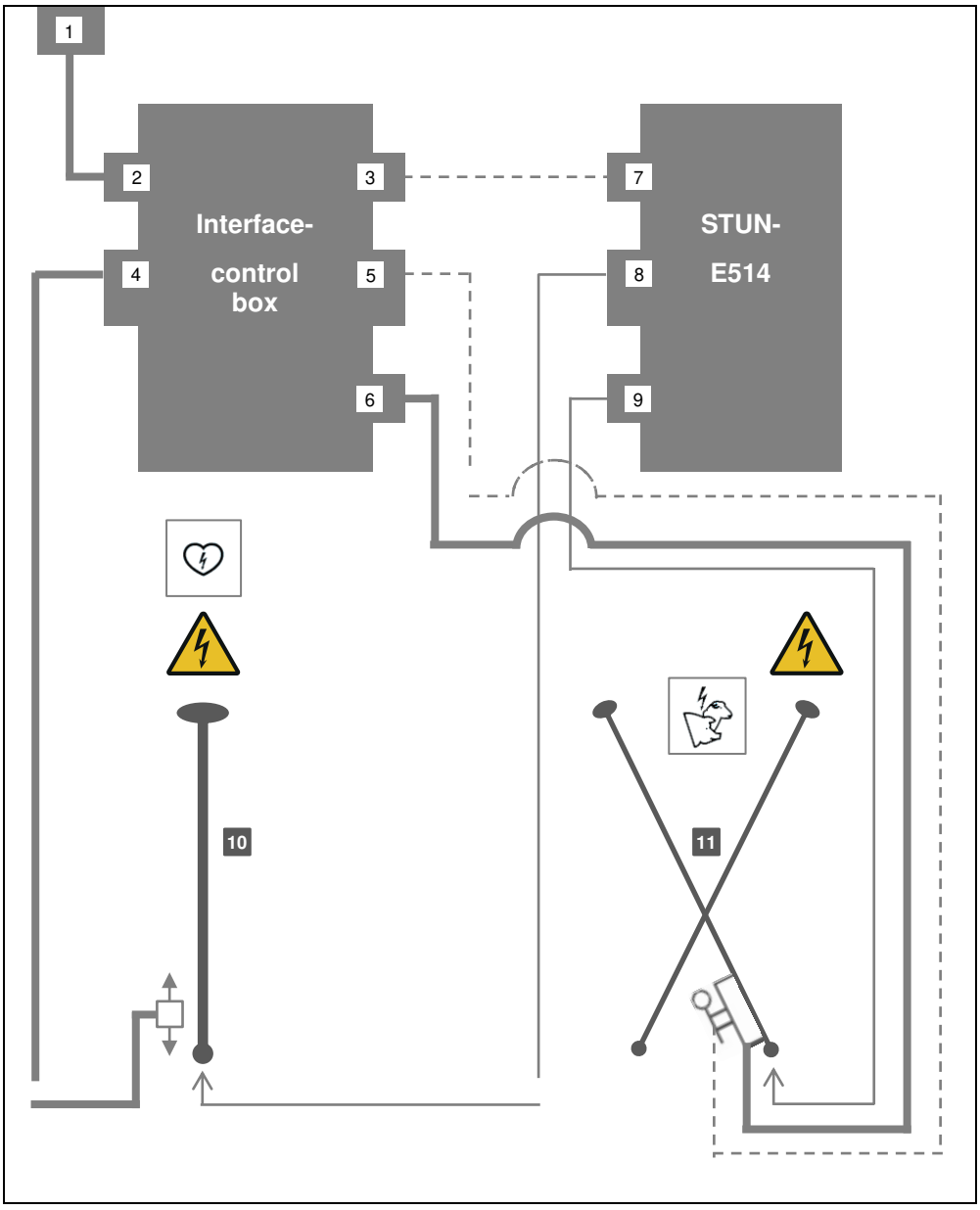
5.5 Installing and connecting the interface control box

- Install the interface control box in the vicinity of the electric stunner.
- Mount the interface control box at a height of at least 1.6 m. Use the 4 mounting holes on the back of the interface control box for mounting.
- Route the control cable and compressed-air hoses so that they cannot be reached by slaughter animals.
- Connect the interface control box → *connection diagram*.

Connection diagram

Single cylinder version

Single motion heart electrode: The following illustration shows a diagram of the interface control box connection.



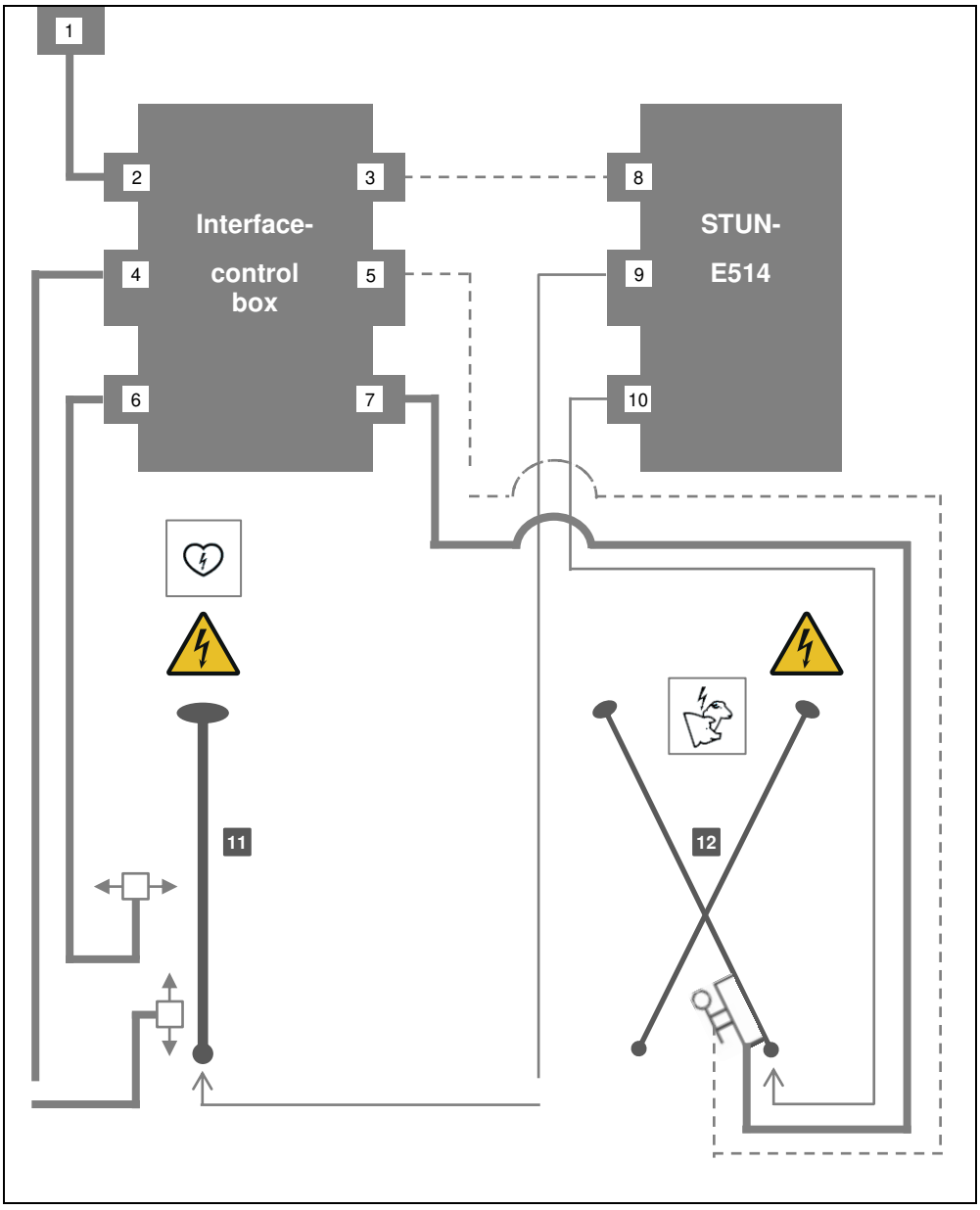
Item	Description
▬	Compressed-air hose
——	Stunning power cable
- - -	Control cable
1	Compressed air supply at installation site
2	Compressed air supply: Interface control box ► installation site

Item	Description
3	Controller: Interface control box ► STUN-E514 electric stunner
4	Compressed air connections (motion towards animal body) Interface control box ► pneumatic cylinder (heart electrode)
5	Controller: Interface control box ► pneumatic stun tong
6	Compressed air supply: Interface control box ► pneumatic stun tong
7	Controller: STUN-E514 ► interface control box
8	Power cable: STUN-E514 ► heart electrode
9	Power cable: STUN-E514 ► pneumatic stun tong
10	Movable heart electrode (pneumatic cylinder)
11	Pneumatic stun tong with controlled activation

Connection diagram

Dual cylinder version

Dual motion heart electrode: The following illustration shows a diagram of the interface control box connection.



Item	Description
▬	Compressed-air hose
——	Stunning power cable
- - -	Control cable
1	Compressed air supply at installation site
2	Compressed air supply: Interface control box ► installation site

Item	Description
3	Controller: Interface control box ► STUN-E514 electric stunner
4	Compressed air connections (motion towards animal body) Interface control box ► pneumatic cylinder 1 (heart electrode)
5	Controller: Interface control box ► pneumatic stun tong
6	Compressed air connections (lateral motion) Interface control box ► pneumatic cylinder 2 (heart electrode)
7	Compressed air supply: Interface control box ► pneumatic stun tong
8	Controller: STUN-E514 ► interface control box
9	Power cable: STUN-E514 ► heart electrode
10	Power cable: STUN-E514 ► pneumatic stun tong
11	Movable heart electrode
12	Pneumatic stun tong with controlled activation

5.6 Setting up data recording

The following implementation work for data recording must be performed before stunning:

Data recording with data cable for direct transmission

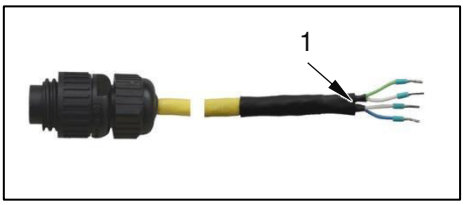
- Connect data cable with converter (→ *Connecting data cable and converter* section on page 57)
- When connecting the converter to a USB port: install driver for serial USB adapter (→ Installing driver for serial USB adapter section on page 57)
- Install and set up STUN-DATA program (→ Installing and setting up the STUN-DATA program section on page 59)
- Connect data cable with electric stunner (→ Connecting the data cable for direct transmission and the electric stunner section on page 58)

Data recording with STUN-EMEM01 data memory

- When connecting the converter to a USB port: install driver for serial USB adapter (→ Installing driver for serial USB adapter section on page 57)
- Install and set up STUN-DATA program (→ Installing and setting up the STUN-DATA program section on page 59)
- Connect data memory to electric stunner (→ *Connecting the STUN-EMEM01 data memory* to the electric stunner section on page 59).

5.6.1 Connecting data cable and converter

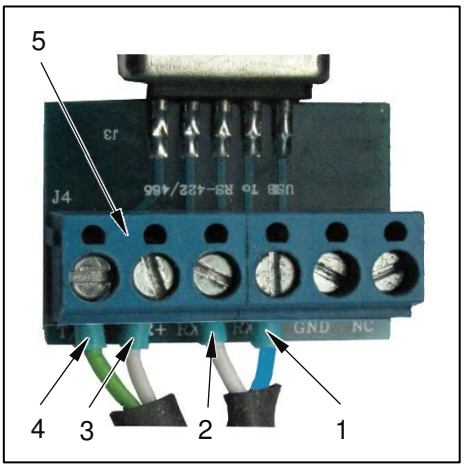
1. Route the open end (1) of the data cable to the PC/notebook's installation site.



2. Connect the ends of the cable to the converter's terminal strip (5) (→ terminal assignment).

   Terminal assignment:

		Converter	Cable*
Blue	R+	RXD+	1
White	R-	RXD-	2
White	T-	T/R+	3
Green	T+	T/R-	4



* The cable numbering corresponds to the terminal assignment on the connector.

5.6.2 Installing driver for serial USB adapter

The driver is on the driver CD. The driver CD is part of the scope of supply of the data cable for direct connection and the STUN-EMEM01 data memory.

If you lose the driver CD, please contact FREUND Maschinenfabrik's Service department.

System requirements

The following system requirements apply for installation of the driver and use of the serial USB adapter:

Hardware

Computer with USB connection and CD/DVD drive

Operating systems (32-bit/64-bit)

Windows XP, Windows Vista, Windows 7, Windows 8/8.1, Windows 10

1. Switch on the computer.
2. Connect the serial USB adapter to an available USB connection.
3. Insert the driver CD into the CD/DVD drive.

   The window for running the Autostart file is displayed.

4. Click on “AUTORUN.EXE“.
   The window for starting driver installation is displayed.

5. Click on “driver installation“ and follow the additional instructions in the window displayed.

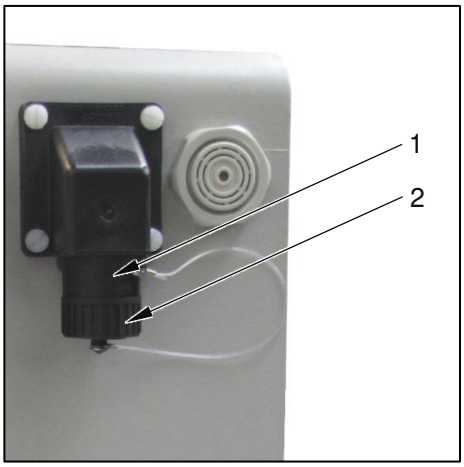
6 Restart the computer after completion of driver installation.

You can use the serial USB adapter after restarting the computer.

5.6.3 Connecting the data cable for direct transmission and the electric stunner

STUN-E512
STUN-E513
STUN-E514

1. Unscrew the cap (2) on the connection socket (1).



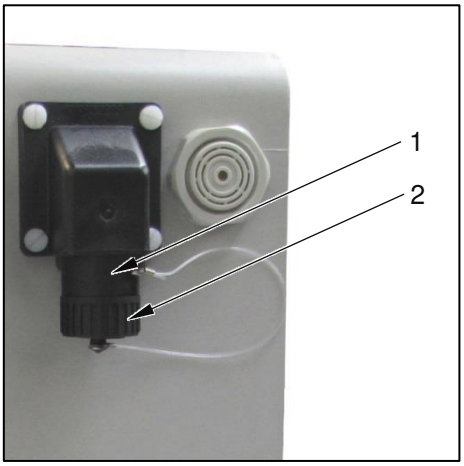
2. Plug the data cable connector (1) into the electric stunner's connection socket.
3. Screw the connector to the connection socket.

5.6.4 Connecting the STUN-EMEM01 data memory to the electric stunner

The electric stunner must be switched off before connecting the data memory.

STUN-E512
STUN-E513
STUN-E514

1. Unscrew the cap (2) on the connection socket (1).



2. Plug the data memory (1) into the electric stunner's connection socket.
3. Screw the data memory to the connection socket.

5.7 Installing and setting up the STUN-DATA program

System requirements

The following system requirements apply for installation and use of the STUN-DATA program:

Operating systems (32-bit/64-bit)

- Windows Vista, Windows 7, Windows 8/8.1, Windows 10
- Installed Microsoft .NET framework (version 2.0 or higher)

  Microsoft download link:
  https://www.microsoft.com/de-de/download/details.aspx?id=17718

The current version of the STUN-DATA program is available in the Download area on our homepage.

FREUND download link:

https://www.freund.eu/produkte/downloads.html

Download program

1. Go to the https://www.freund.eu/produkte/downloads.html page in the web browser.
2. Click on “Download StunData2.x_install.exe“ in the web browser window.
3. Click on “save file” in the window displayed.

The “StunData2.x_install.exe“ installation file is saved in the download index.

5.7.1 Installing the STUN-DATA program

1. Select the download index with the installation file.
2. Double click on the “StunData2.x_install.exe“ installation file and follow the additional instructions in the window displayed.

5.7.2 Setting up the STUN-DATA program:

Preparatory measures

➢ Connection to a serial RS-232 port:
Connect the connection socket with the computer's serial port.

➢ Connection to USB port:
Connect the connection socket with the connector for the serial USB adapter.
Plug the USB connector into an available USB connection on the computer.

Start program

➢ Double click on the program icon on the monitor.
The program interface is displayed (→ Fig. 5-3).
The program icon is displayed in the task bar.

Program interface

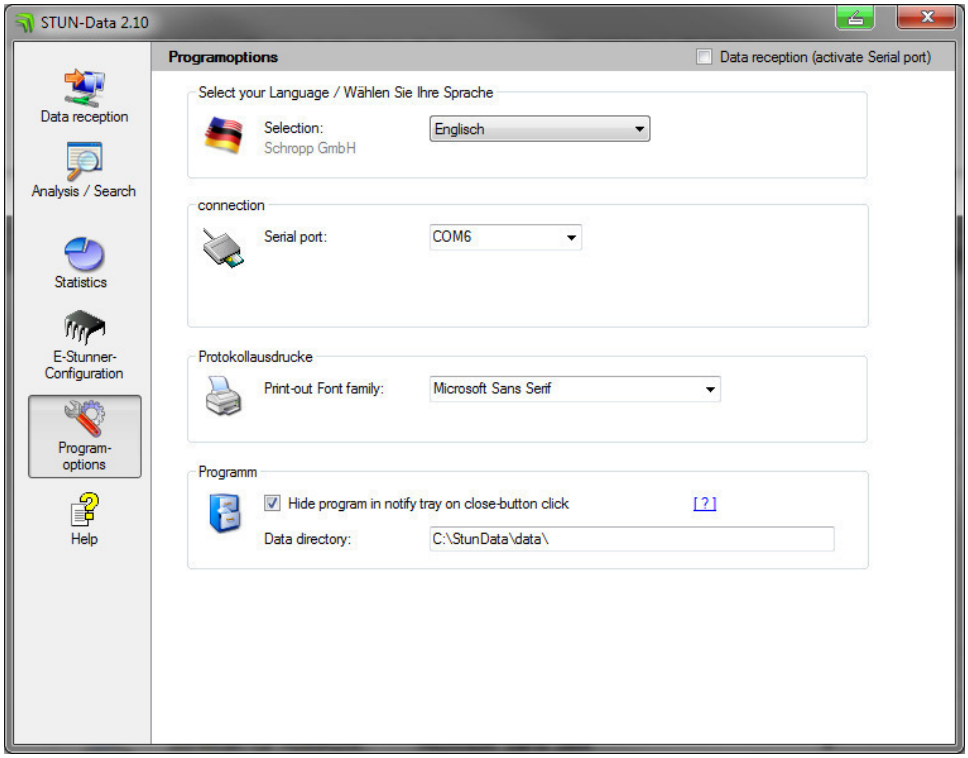
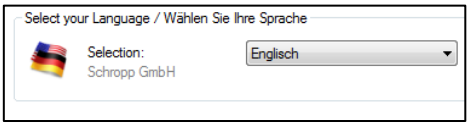


Fig. 5-3 Example: “Program options” menu

Choose language

1. Select the “Program Options“ menu.

2. Select the required language in the “Selection” menu.

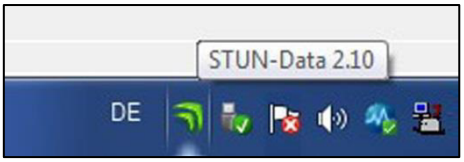


Select serial port

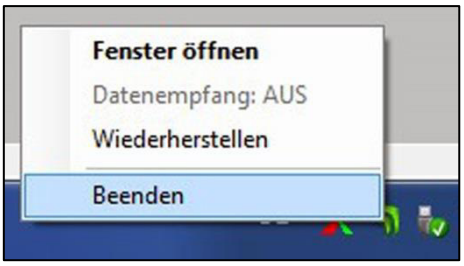
The available ports are listed in the “Serial Port“ selection list (COM 1, COM 3, COM 6, etc.).

The port must be detected in the operating system's device manager in order to select the right port for the connected direct cable or the connected STUN-EMEM01 data memory.

1. Close the program. Right click on the program icon in the task bar.



2. Click on “End”.
   The program is closed.



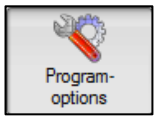
3. Access the device manager: enter “devmgmt.msc“ in the Start menu input field in order do this.

4. Click on the filtered entry “devmgmt.msc“ in the Start menu.
   The device manager is displayed.

5. Click on “Connections (COM & LPT)“.
   The entries for the connections available are displayed.

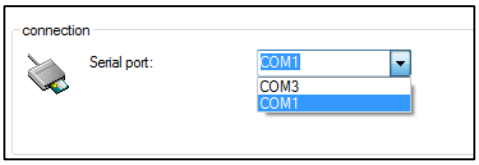
6. Search for the entry with the serial port.
   Example: Proflific USB-to-Serial Comm Port (COM 6).

7. Start the “STUN-DATA” program: Double click on the program icon on the monitor.



8. Select the “Program Options“ menu.

9. Select the port identified in the “Serial port:” selection menu in the device manager.
   Example: COM 1

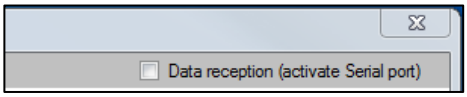


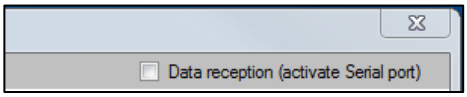
Activate serial port

The serial port can be activated or deactivated in each of the program menus.

➢ Click the checkbox beside the “Data Reception“ entry.

The serial port is activated.





5.8 Connecting the STIM-E512 stimulator

Do not extend the connection cable provided. Longer connection cables may cause loose connections during stunning.
We recommend installation of a power outlet or a permanent connection.

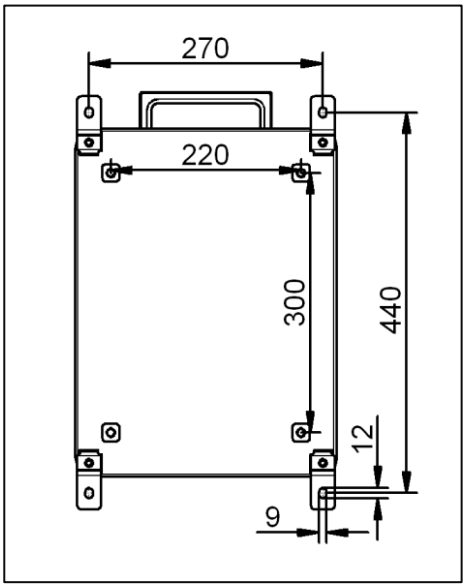


Fig. 5-4 Drilling pattern dimensions

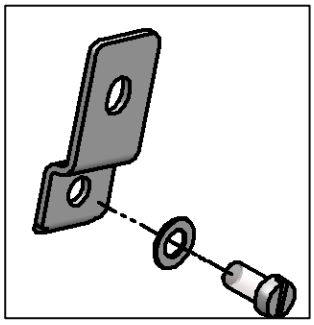


Fig. 5-5 Wall mounting set

The stimulator's signal and display elements must be clearly visible to the user so that faults can be identified immediately.

- Mount the stimulator with our wall mounting set* (Fig. 5-2) at a height of at least 1.6 m.
  Use the 4 mounting holes fitted on the back of the stimulator for mounting.
- Store the nose clamp and the tube-rail connection in a suitable holding device at the same height when not in use.
- Connect the stimulator to an effective equipotential bonding system (grounding).
- Install an EMERGENCY STOP mechanism in the power supply circuit.

* The wall mounting set (part no. 100-022-069)) is available from our Sales department. The address and telephone number can be found on the copyright page.

6 Operation and Stunning

When operating stunning plants the relevant provisions of the trade association are to be observed. Moreover the provisions of the veterinary offices, the EU and the animal welfare apply.

FREUND electric stunners offer the following stunning methods:

- Head stunning
- Head and heart stunning
- Stunning in restrainers
- Killing

6.1 Safety information

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to Life and most severe injuries are possible.

- ➢ The machine may only be operated by instructed and authorized personnel.
- ➢ The machine may only be operated by personnel, who possessing the necessary knowledge and skills (expertise) to look after, restrain, stun, slaughter or kill animals.

6.2 Personal protective equipment


Use special electric rubber gloves according to EN 60903.

Only use foot protection with insulating soles, e.g. rubber boots.

6.3 Animal welfare

The harmonised laws of the EU and the German Animal Protection Slaughter Regulation (TierSchlV) require careful treatment that prevents pain, suffering or injury of the slaughter animals as the top priority.

- ➢ Avoid causing the slaughter animals any excitement, pain or suffering when driving, loading and stalling the animals.

  Do not use electric stunners to herd animals.
- ➢ Avoid causing stress to the slaughter animals prior to stunning so that the level of excitement or injury is kept the absolute minimum.
- ➢ Only use electric animal drover with healthy and uninjured over one year old cattle and over four month old pigs.

- Moisten only the areas on the slaughter animals where the electrodes of the stun tongs are to be applied.
  Use warm water (approx. 40 °C) if possible.
- Avoid pain and suffering by attempting to apply contact pressure in a manner conducive to the well-being of the animal.
- Stun the animals so that they are quickly and painlessly rendered unconscious and insensitive right up to the point of death.

6.4 Daily safety check

Before starting operation, check the stunning device and the stunning system diligently for flawless and intended functioning.

Only use faultless and fully functional machines.

Check the

- machine and all electrical connections and access lines for surface damages.
- functionality of the entire stunning system.
- function of the safety devices.
- water hoses for surface damages and a fixed connection to the hand piece and the solenoid valves.
- electrodes to be properly fixed and rounded and burned tips.
- balancer and the balancer settings.
- Never use a machine with defective safety devices, switches or other defective machine parts.
- Have defective safety devices, switches or other parts repaired, and notify your employer.

6.5 Preparatory measures

- Ensure that the electric stunner is connected to the power supply at the installation site.
- Do **not** switch on the electric stunner yet.
- Ensure that data recording is set up.
  Data recording via direct connection or on STUN-EMEM01 data memory.
  → section **Setting up data recording** on page 56
- Switch on the computer before stunning and start the STUN-DATA program.
  The STUN-DATA program must stay open during stunning; otherwise, data is not recorded.

➢ Ensure that the data connection is **not** interrupted during stunning.

The electric stunner has only limited internal memory. Stunning can no longer be performed when the memory is full.

6.5.1 Stunning with category A stun tongs

The following stun tongs belong to category A:
STUN-TONG-EP steel
STUN-TONG-EP LS
STUN-TONG-EA steel
STUN-TONG-EP titanium
STUN-TONG-EF

➢ Ensure that the stunning tong is connected to the electric stunner (connection diagram: → section **Connecting the stun tong** on page 49).

6.5.2 Stunning with category B stun tongs

The following pneumatic stun tongs belong to category B:
STUN-TONG-EPP2

➢ Ensure that the pneumatic stun tong is connected to the electric stunner and to the compressed air supply at the installation site (connection diagram: → section **Connecting the stun tong** on page 49).

6.5.3 Stunning with category C stun tongs

The following pneumatically driven stun tongs with controlled tong motion activation belong to category C.

➢ Ensure that the interface control box is connected to the STUN-E514 electric stunner (connection diagram: → section **Installing and connecting the interface control** box on page 52).

➢ Ensure that the pneumatic stun tong is connected to the electric stunner and to the interface control box

(Connection diagram: → section **Installing and connecting the interface control** box on page 52).

6.6 Starting stunning

Default stun time

The pre-set stun time is based on the current German Animal Protection Slaughter Regulation from 12th December 2012 (BGBl I p. 2982) and on EC Regulation 1099/2009.

The minimum current strengths and current flow times refer to the stunner's sinusoidal alternating current.

In other countries, the respective national regulations on the protection of animals apply at the time of slaughter or killing. Adapt the stunning time to the regulations in your country.

Necessary parameters for stunning:
Refer to national regulations of your country.

Switch on electric stunner

1. Switch on the electric stunner.

STUN-E512
STUN-E513
STUN-E514

To do this, turn the 0/I switch.

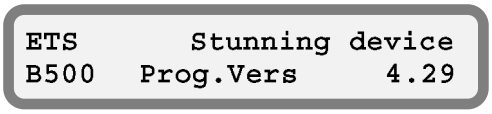
STUN-E512
STUN-E513

The LED display shows the last program set and the value of the measuring voltage:

The electric stunner is activated for stunning.

STUN-E514

The LCD display shows the current program version of the device.



After a self-test, the last set program, current time and measuring voltage are displayed.

The electric stunner is activated for stunning.

Select program

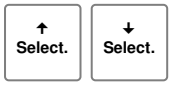
2. Select a different stun program as required (stun programs P1-P7).

STUN-E512
STUN-E513

2a. To do this, press the "Data ↑" button or the "Data ↓" button.

STUN-E514

2b. To do this, press the "Select. ↑" button or the "Select. ↓" button.



6.6.1 Performing head stunning (restrainers and single traps)

The head of the animal is stunned in a single step. The stun effect lasts for around 40-60 seconds.

When the electrodes make contact with the animal's skin, the stunning voltage is activated automatically and is indicated by means of a signal light. The electric stunner's digital display shows the actual flowing current in amperes.

Application position - pigs

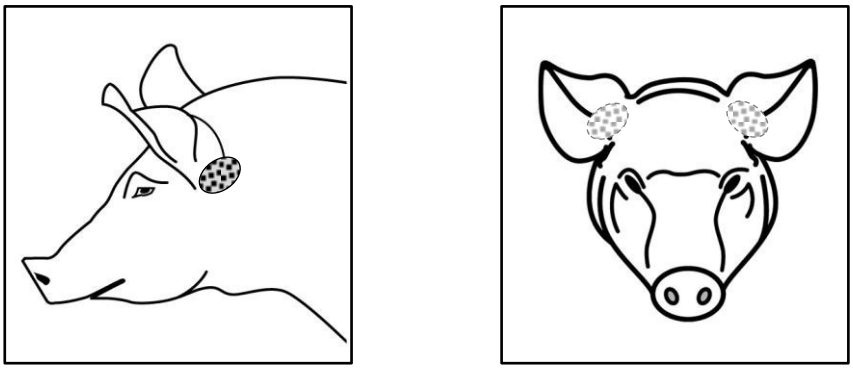


Fig. 6-1 Ideal electrode application position (side and front view)

Application position - sheep

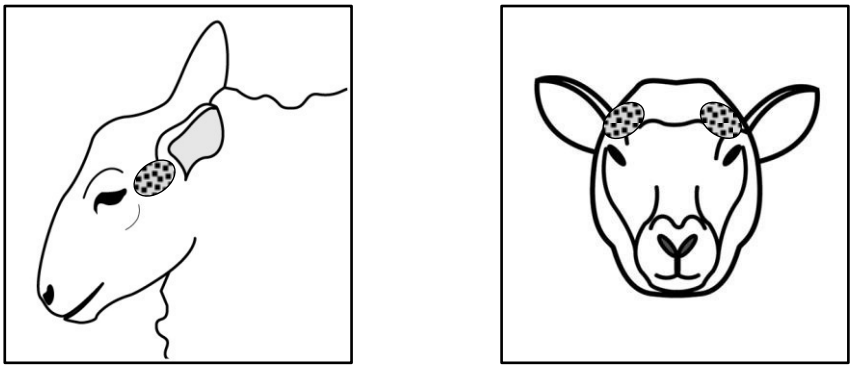


Fig. 6-2 Ideal electrode application position (side and front view)

1. Place the stun tong's electrodes at both sides of the animal's head.
   Pigs:
   preferably at the base of the ear or between the eye and the base of the ear (see markings Fig. 6-1)
   Sheep:
   between the eye and ear (see markings Fig. 6-2)
   This causes the current to flow on the shortest possible path through the brain.
   Avoid bone fractures caused by probing with the stun tong.

2. Close the stun tong:

Stun tong STUN-TONG-EP STUN-TONG-EA

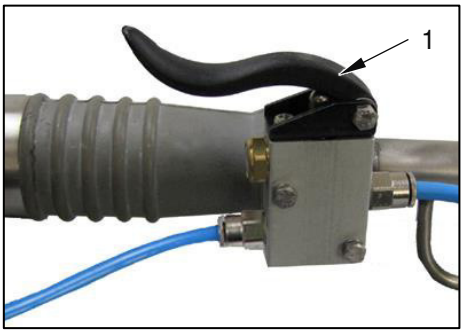
2a. To do this, press the arms of the tong together.

Stun tong STUN-TONG-EF

2b. Apply the stun fork to the head of the sheep.

Pneumatic stun tong STUN-TONG-EPP2

2c. Press the trigger (1) and keep it pressed.
The stun tong closes.



STUN-E512
STUN-E513

A buzzer sound is emitted when the preset stun time has lapsed.
The signal light above "Step1" lights up.
The stun procedure is now finished, and the stunning current is switched off.

STUN-E514

A buzzer sound is emitted when the preset stun time has lapsed.
The "Step1" signal light lights up.
The stun procedure is now finished, and the stunning current is switched off.

3. *Opening the stun tong:*

Stun tong STUN-TONG-EP STUN-TONG-EA

3a. *Open the stun tong.*
The electric stunner switches back to the beginning of the program.

Stun tong STUN-TONG-EF

3b. *Remove the stun fork from the head of the sheep.*
The electric stunner switches back to the beginning of the program.

Pneumatic stun tong STUN-TONG-EPP2

3c. *Release the pneumatic stun tong's switch.*
The electric stunner switches back to the beginning of the program.

4. Ensure that blood is drained quickly after completion of stunning to ensure that the animal loses large quantities of blood immediately and in a manageable way.
   - no later than 10 seconds* (ideally 5 seconds) if blood is drained in a lying position.
   - no later than 20 seconds* (ideally 10–15 seconds) if blood is drained in a hanging position.

   * provisions in accordance with the German Animal Protection Slaughter Regulation (TierSchlV) of 01.01.2013

6.6.2 Carrying out head and heart stunning

Head and heart stunning is carried out in two steps.
Generally, this stunning method results in an optimum stunning effect and a better meat quality.

Head stunning phase

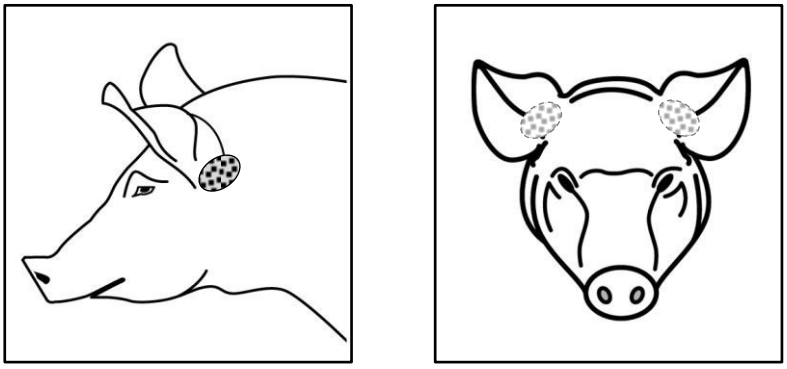


Fig. 6-3 Ideal electrode application position (side and front view)

1. Place the stung tong's electrodes at both sides of the animal's head.
   Pigs: preferably at the base of the ear or between the eye and the base of the ear (see markings Fig. 6-3)
   This causes the current to flow on the shortest possible path through the brain.
   Avoid bone fractures caused by probing with the stun tong on the animal's head.

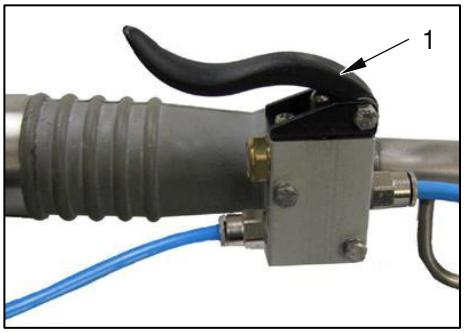
2. Closing the stun tong:

Stun tong
STUN-TONG-EP
STUN-TONG-EA

2a. To do this, press the arms of the tong together.

Pneumatic stun tong
STUN-TONG-EPP2

2c. Press the trigger (1) and keep it pressed.
The stun tong closes.



STUN-E512
STUN-E513

A buzzer sound is emitted when the preset head stunning time has lapsed.

The signal light above “Step1” lights up.

Head stunning is now finished.

The electric stunner automatically switches to heart stunning mode and the signal light above “Step2” lights up.

STUN-E514

A buzzer sound is emitted when the preset head stunning time has lapsed.

The “Step1” signal light lights up.

Head stunning is now finished.

The electric stunner automatically switches to heart stunning mode and the “Step2” signal light lights up.

3. *Opening the stun tong:*

Stun tong STUN-TONG-EP STUN-TONG-EA

3a. *Open the stun tong.*

Pneumatic stun tong STUN-TONG-EPP2

3b. *Release the pneumatic stun tong's switch.*

Switch Phase

The stun tong must be switched within the set switch and reset period; otherwise, the stun procedure is interrupted and must be performed again from the beginning, starting with head stunning.

Heart stunning phase

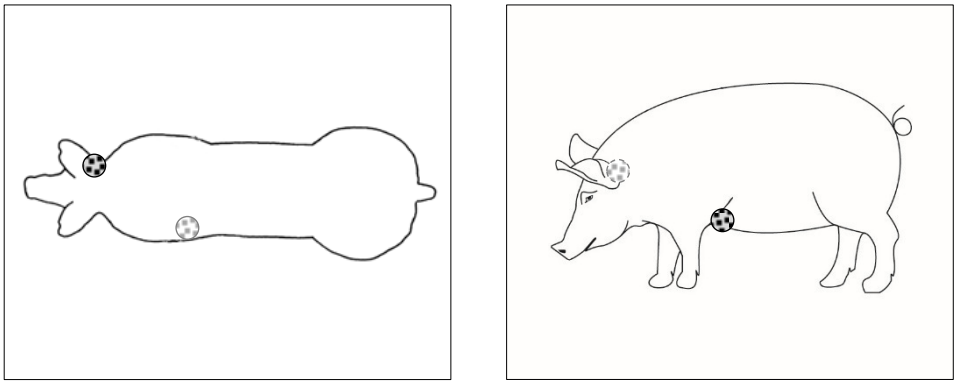


Fig. 6-4 Ideal electrode application position (overhead and side view)

4. Immediately apply the electrodes of the stun tong to the heart and to the base of the ear of the animal lying on the ground (see markings Fig. 6-4):

   1 electrode on the heart,
   1 electrode on the head.

5. Closing the stun tong:

Stun tong STUN-TONG-EP STUN-TONG-EA

5a. To do this, press the arms of the tong together.

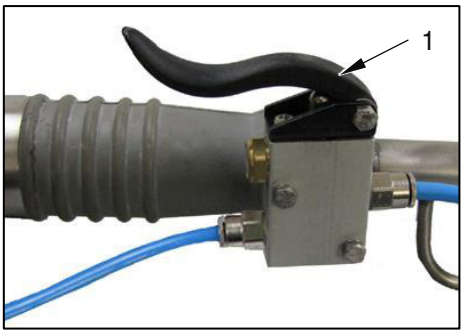
A buzzer sound is emitted when the preset heart stunning time has lapsed.

Pneumatic stun tong STUN-TONG-EPP2

5b. Press the trigger (1) and keep it pressed.

The stun tong closes.

A buzzer sound is emitted when the preset heart stunning time has lapsed.



6. *Opening the stun tong:*

Stun tong
STUN-TONG-EP
STUN-TONG-EA

6a. *Open the stun tong.*

The stun procedure is now finished and the electric stunner switches back to the beginning of the program.

Pneumatic stun tong
STUN-TONG-EPP2

6b. *Release the pneumatic stun tong's switch.*

The stun procedure is now finished and the electric stunner switches back to the beginning of the program.

7. Ensure that blood is drained quickly after completion of stunning to ensure that the animal loses large quantities of blood immediately and in a manageable way.
   - no later than 10 seconds* (ideally 5 seconds) if blood is drained in a lying position.
   - no later than 20 seconds* (ideally 10–15 seconds) if blood is drained in a hanging position.

   * provisions in accordance with the German Animal Protection Slaughter Regulation (TierSchlV) of 01.01.2013

6.6.3 Finishing stunning

Ensure that data is recorded.

➢ Make sure that all stun data has been transmitted after the last stun procedure.

Data recording with direct data cable for direct transmission

➢ Switch off the electric stunner: To do this, press the 0/I switch.

➢ Disconnect the electric stunner from the power supply.

➢ Clean the electric stunner (→ section ***Daily cleaning*** on page 90).

➢ Analyse the stun data on the computer if required (→ Section **Managing stun data** on page 77).

Data recording with STUN-EMEM01 data memory

STUN-E512
STUN-E513

➢ Press the “Aux” button after the final stun procedure.
The stun data is saved to the data memory.
Wait for around 2 minutes for all stun data to be saved to the data memory.

STUN-E514

➢ Press the “Error” button after the last stun procedure.
The stun data is saved to the data memory.
Wait for around 2 minutes for all stun data to be saved to the data memory.

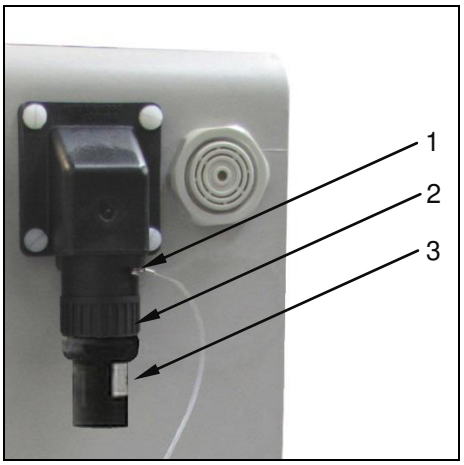
➢ Switch off the electric stunner: To do this, press the 0/I switch.

STUN-E512
STUN-E513
STUN-E514

➢ Transfer the stunning data to the computer if required:

To do this, undo the data memory's (3) screw connection (2):

Pull the data memory out of the connection socket (1) on the electric stunner.



- ➢ Disconnect the electric stunner from the power supply.
- ➢ Clean the electric stunner (→ section ***Daily cleaning*** on page 90).

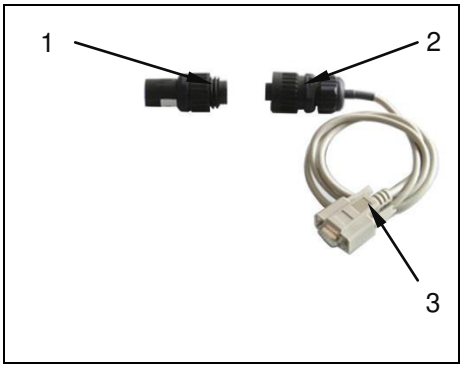
STUN-EMEM01 data memory

- ➢ Connect the data memory to the computer:

Computer with serial port (9-pin plug connector)

Plug the data memory (1) into the connector on the connection cable (2) and screw it to the connector.

Screw the RS-232 socket (3) to the connection on the computer.

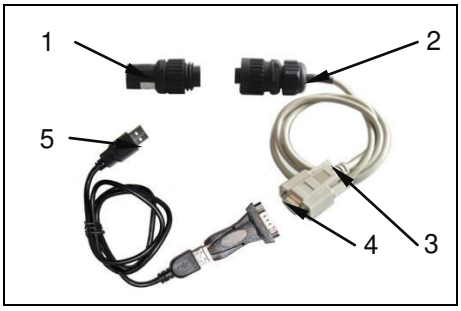


Computer with USB port

Plug the data memory (1) into the connector on the connection cable (2) and screw it to the connector.

Plug the RS-232 connector (3) into the connector on the adapter cable (4).

Plug the USB connector (5) into an available connection on the computer.



- ➢ Analyse the stun data on the computer if required (→ section *Managing stun data* on page 77).

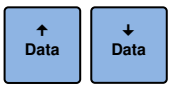
6.7 Setting stun program parameters

Parameters may be set by trained specialists only.

6.7.1 STUN-E512 and STUN-E513 electric stunners

Select program

1. Select the stun program (P1-P7) for which you wish to change the parameters:

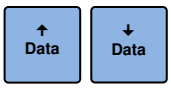


➢ To do this, press the “Data ↑” button or the “Data ↓” button.
The stun program is shown in the left LED-display.

➢ Press the “↵ button.
You will be taken to the settings level for the selected stun program.

Select parameters

2. Select the parameter that you wish to change (parameter coding: → section***Stunning parameters*** on page 23):



➢ To do this, press the “Data ↑” button or the “Data ↓” button.
The parameter code is shown in the left LED-display.
The current parameter value is shown in the right LED-display.

➢ Press the “↵ button.
The current parameter value flashes in the right LED-display.

Change parameter value

3. Change the parameter value:

➢ To do this, press the “Data ↑“ or the “Data ↓“ button several times in succession until the desired parameter value is shown in the right LED-display.

➢ Press the “↵ button.
The set parameter value lights continuously in the right LED-display.
The new parameter value is saved.

4. Repeat steps 2-3 as needed in order to change additional parameters in the selected stun program.

The user is exited from the settings level if there is no entry within 10 seconds.

➢ In this case, repeat steps 1-3 in order to change additional parameters in the stun program selected.

Leave settings level

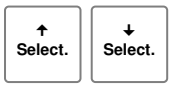
5. Leave the stun program's settings level after setting the parameters:

➢ To do this, wait for about 10 seconds. Do **not** press any buttons during this time.
You have left the settings level when the stun program is shown in the left LED-display (P1 – P7).

6.7.2 STUN-E514 electric stunner

Select program

1. Select the stun program (P1-P7) for which you wish to change the parameters:



➢ To do this, press the “Select. ↑“ button or the “Select. ↓” button.
The stun program is shown on the LCD-display.

Example:

```
B500 ready,    Prog.1
08:24:10   Volt. 20V
```

Enter security code

2. You must enter the 4-digit safety code “0101” in order to set the parameters of a stun program and to enable the settings level:

➢ To do this, press the “↵ button.
“Password entry: 0000” is displayed on the LCD- display.

➢ Press the “Select. ↑” button.
The number “1” is set as the 2nd digit of the security code.
The display for security code “0100” flashes.

➢ Press the “Value ↑” button.
The number “1” is set as the 4th digit of the security code.
The display for security code “0101” flashes.

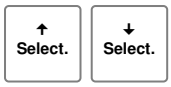
➢ Press the “↵ button.
The settings level is enabled.
The last set parameter is shown on the LCD-display.

Example:

```
Current 1        Head
No.13          1.50A
```

Select parameters

3. Select the parameter that you wish to change (parameter coding: → Section***Stunning parameters*** on page 23):



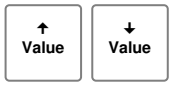
➢ To do this, press the “Select. ↑“ button or the “Select. ↓” button.
The selected parameter is shown with the current parameter value on the LCD-display.

Example:

```
Heart ramp value
No.6        10.0A/sec
```

Change parameter value

4. Change the parameter value:



➢ To do this, press the “Value ↑“ or the “Value ↓“ button several times in succession until the desired parameter value is shown.
The parameter value flashes on the LCD-display.

➢ Press the “↵ button.
The parameter value is shown continuously on the LCD-display.
The new parameter value is saved.

5. Repeat steps 2-3 as needed in order to change additional parameters in the selected stun program.

Leave settings level

6. Leave the stun program's settings level after setting the parameters:

➢ To do this, press the “↵ button and keep it pressed until the settings level is displayed with the stun program on the LCD-display.

Example:

```
B500 ready,    Prog.1
08:24:10   Volt. 20V
```

6.8 Managing stun data

6.8.1 Displaying current stun data

Current stun data can only be displayed in the STUN-DATA program if the electric stunner and the computer are connected to the data cable for direct transmission.

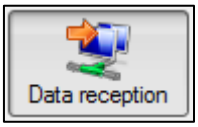
During stunning, stun data is displayed as a data record in the “Data Reception” menu in the STUN-DATA program immediately after completion of a stun procedure.

The list is continuously updated with the data record for the current stun procedure.

➢ Click on “Data reception” on the program interface.

*The current data record is displayed in the **Data reception** menu in the “received data” list (→ Fig. 6-5).*

“Data Reception“ menu



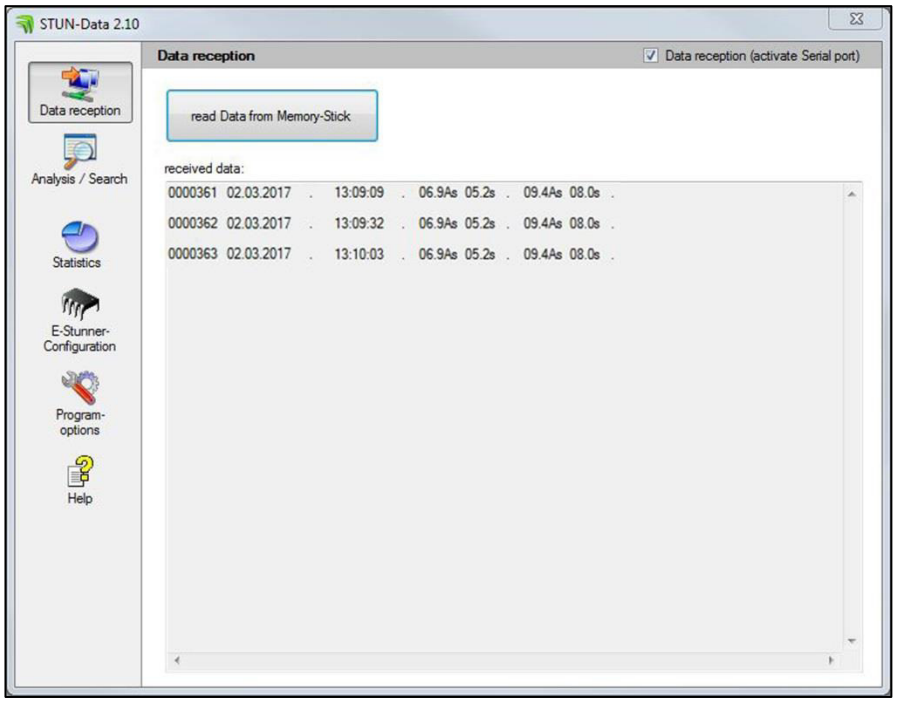


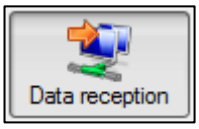
Fig. 6-5 List of incoming data records (data cable with direct transmission)

6.8.2 Reading stun data from data memory

Stun data is saved to the data memory during stunning.

1. Ensure that
   - the stun data is saved to the data memory in full after completion of stunning
     (→ section***Finishing stunning*** on page 72).
   - the data memory is connected to the computer
     (→ section***Finishing stunning*** on page 72).
2. Click on “Data reception” on the program interface.
   The “received data” list is empty (→ Fig. 6-6)

“Data Reception“ menu



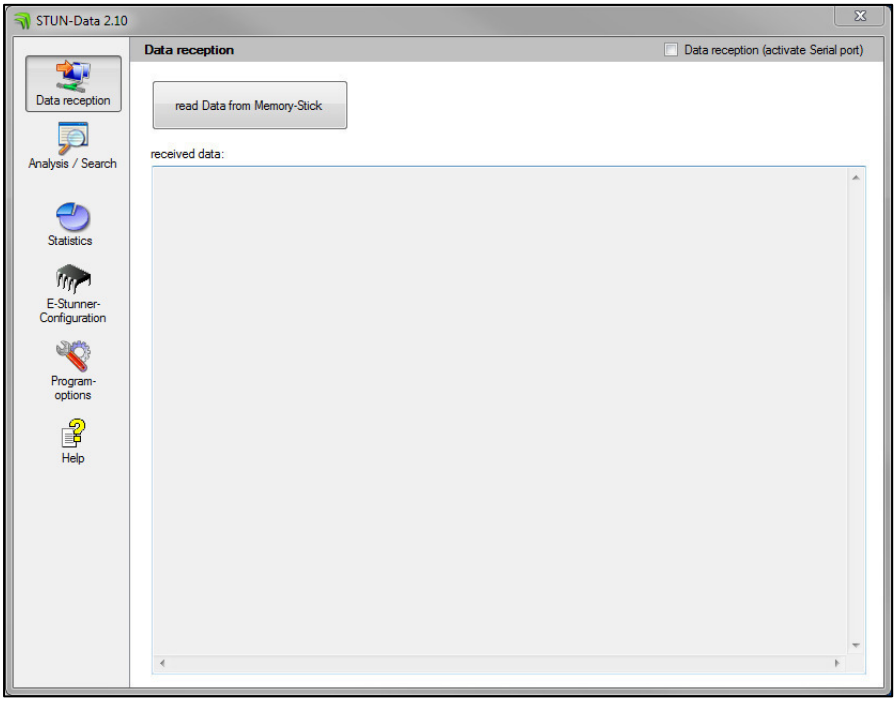
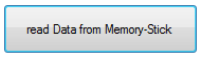


Fig. 6-6 Empty list before reading of STUN-EMEM01 data memory

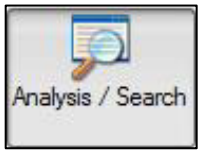


3. Click on “read data from Memory-Stick”.
   *The data records are read from the data memory and displayed in the “Incoming Data” list in the **Data reception** menu (→ Fig. 6-5).*

6.8.3 Analysis of stun data

Column	Data format	Description
Curr. Nr.	seven-digit number	A sequential number assigned to a stunning operation
Date	dd.mm.yyyyy	Date of stunning
Time	N or no value	N = rise error, 1.3A not reached in first second
Head Amperage	Numbers with one decimal place A/s	Volume of charge at the head in amperes per second
Head Time	Numbers with one decimal place	Duration of head stunning
N	x	Time error, set minimum time not reached
Heart Amperage	Numbers with one decimal place A/s	Volume of charge at the heart in amperes per second
Heart Time	Numbers with one decimal place	Duration of heart stunning
N	x	Time error, set minimum time not reached

"Analyse/Search" menu



After stunning, stun data in the STUN-Data program can be filtered, displayed, exported and printed according to certain criteria.

➢ Click on "Analysis/Search" on the program interface.
The Analysis/Search menu is displayed (→ Fig. 6-7).

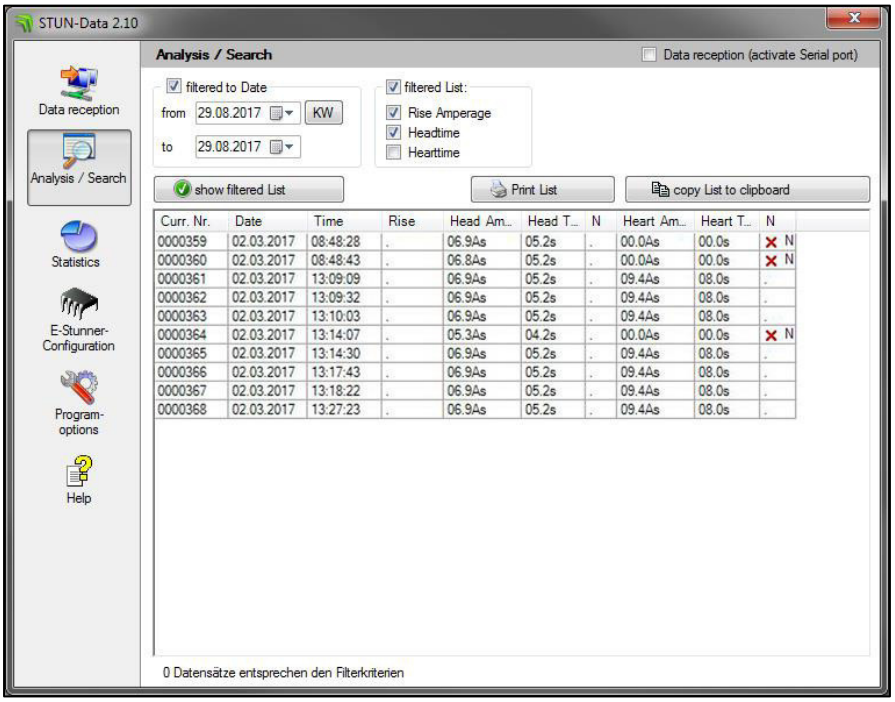


Fig. 6-7 “Analysis/Search” menu

Display all data records

➢ Remove the checkmark in front of the ”filtered to Date“ entry.

➢ Remove the checkmark in front of the ”filtered List“ entry.

➢ Click on “show filtered list”.
All data records are listed.

Show filtered data records

according to date

➢ Check the checkmark in front of the “filtered to Date” entry.

➢ Select the period (“from”, “to”) or the calendar week (“CW”).

➢ Click on “show filtered list”.

The data records are listed for the selected period or the chosen calendar week.

according to error

➢ Check the checkmark in front of the " filtered List” entry.

➢ Check the checkmark in front of the

- “current increase“ entry in order to display errors relating to current strength increase behaviour.
- “head time” entry in order to display stun time errors during head stunning.
- “heart time” entry in order to display stun time errors during heart stunning.

➢ Click on “show filtered list”.

The data records are listed for the selected error categories.

Export list of data records

The data records listed can be exported to a Word or Excel file.

➢ Filter the data records as needed according to date and/or errors.

➢ Click on “copy list to clipboard”.

➢ Open a Word or Excel file and insert the clipboard data into the document.

Print list of data records

The data records listed can be printed to a printer set up on your computer.

➢ Filter the data records as needed according to date and/or errors.

➢ Click on “Print list”.

The list is printed.

6.8.4 Calculate average current

A/s (volume of charge)
divided by
s (duration of stunning)
equals
average current

6.9 Stun errors and stun error display

STUN-E512
STUN-E513

If one or more errors occur during stunning, the yellow signal light **F** lights up in the electric stunner's control and display panel.

A signal tone is emitted simultaneously.

STUN-E514

If one or more errors occur during stunning, the yellow **Error** signal light lights up in the electric stunner's control and display panel.

A signal tone is emitted simultaneously.

6.9.1 Stun error during head stunning

Fault	Possible cause	Log entry
Stunning device switches back to starting position.	Carcass resistance is greater than 1400 ohms.	
Stunning device switches off and begins break period.	Carcass resistance is greater than 1400 ohms.	
	Head stunning current is temporarily interrupted or fallen below within 800 ms of starting.	Within 1000 ms: head current increase error
		More than 100 ms: head current stopping error
Stun procedure is halted prematurely. The stun procedure can then be restarted.	Head minimum current is temporarily or continuously fallen below.	Head current increase error Head current stopping error
	Head minimum current is interrupted or fallen below before the specified head minimum time has lapsed.	Head time error

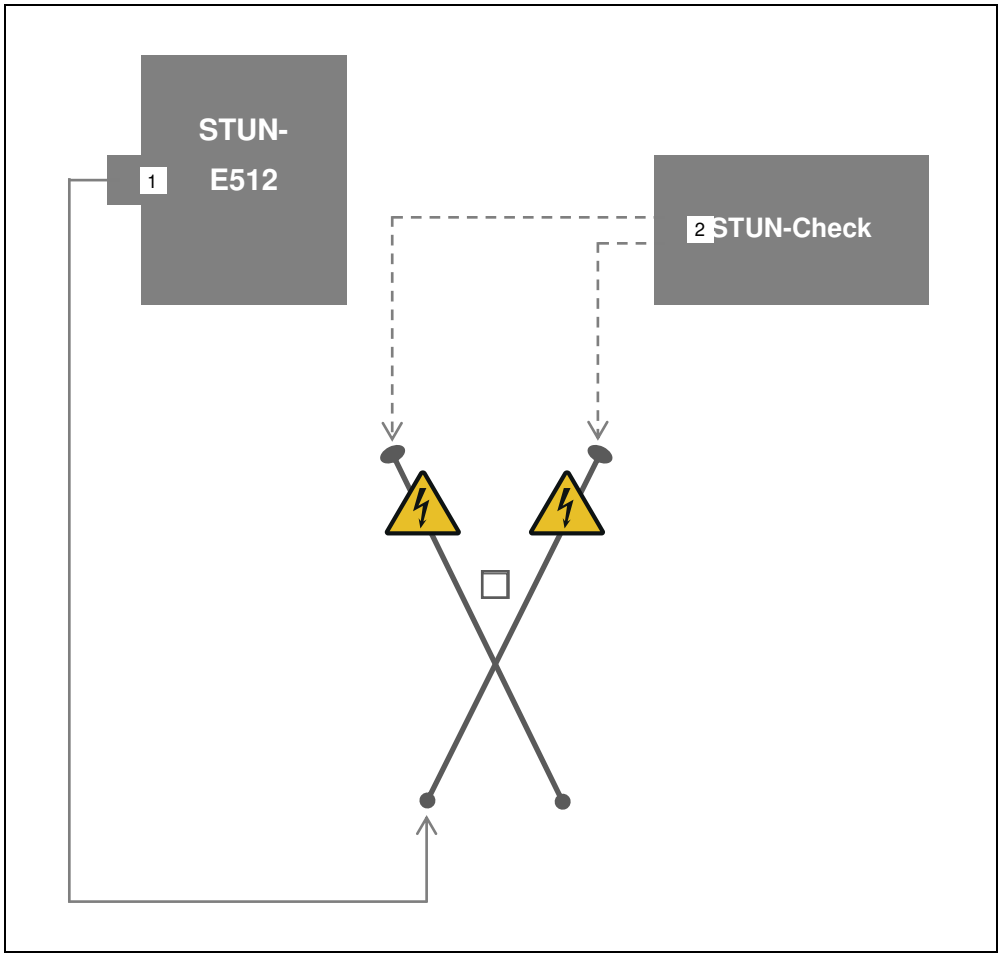
6.9.2 Stun error during heart stunning

Fault	Possible cause	Log entry
Stunning device starts the reset period.	Carcass resistance is greater than 1400 ohms.	
Stunning device switches off and begins break period.	Carcass resistance is greater than 1400 ohms.	Unsuccessful heart stunning
Stun procedure is halted prematurely. The stun procedure can then be restarted.	Heart minimum current is temporarily or continuously fallen below.	Heart current error
	Heart minimum current is interrupted or fallen below before the specified head minimum time has lapsed.	Heart time error

6.10 Testing the electric stunner

Connection diagram

The following illustration shows connection of the STUN-Check testing device to a stun tong connected to the STUN-E512 electric stunner by way of example.



Item	Description
——	Stunning power cable
- - -	Testing line (red and black cable)
1	Stun tong connection
2	Test line connections
3	Stun tong

The current strength of the connected electric stunner can be read on the LED display of the STUN-Check testing device throughout the testing process.

1. Connect the stun tong to the electric stunner.
2. Connect both of the STUN-Check testing device's connection terminals to the stun tong's electrodes.
3. Switch on the electric stunner.
4. Select the stun program (P1 - P7) to be used for testing on the electric stunner.

5. Press the “Start” button on the STUN-Check testing device.

6. Select the corresponding program from the test programs (P1-P6).

7. Press the “Start” button on the STUN-Check testing device.

The test is started:

Phase 1
Safety test

The STUN-Check testing device tests the switch-on threshold.

For safety reasons, a stunning device can only start if the resistance to the electrodes is under 1500 ohms.

This prevents the electric stunner from being switched on by touching the electrodes.

The STUN-Check testing device initially applies resistance of 1600 ohms to the electrodes. The electric stunner should not start.

The STUN-Check testing device then applies resistance of 1400 ohms to the electrodes. The stunning device starts.

The test result is indicated by lighting LEDs underneath “Thresholds”:

The green “Thresholds” LED is lighting: both conditions are satisfied.

The red “Thresholds” LED is lighting: one or both of the conditions have not been satisfied.

Phase 2a
Testing in accordance with the German Animal Protection Slaughter Regulation (TierSchlV)

According to the German Animal Protection Slaughter Regulation (TierSchlV), full current strength must be reached within one second. The STUN-Check tests the current strength’s ramping behaviour:

The test result is indicated by lighting LEDs underneath “Ramping” :

The green “Ramping” LED is lighting: the full current strength has been reached.

The red “Ramping” LED is lighting: only 95% or less of the full current strength has been reached within the first second.

Phase 2b

Testing in accordance with the German Animal Protection Slaughter Regulation (TierSchIV)

According to the German Animal Protection Slaughter Regulation (TierSchIV), the full current strength must be maintained over the following 3 seconds. The STUN-Check tests the stopping period behaviour of the current strength:

The test result is indicated by lighting LEDs underneath "Stopping Period":

The green "Stopping Period" LED is lighting: the configured current strength has been maintained throughout the stopping period (3 seconds).

The red "Ramping" LED is lighting: the configured current strength falls under 95% within the stopping period (3 seconds).

The safety test (phase 1) and the functional test (phase 2a, 2b) are complete.

The final test simulates a stun time that is too short and that should trigger an error message on the electric stunner.

➢ Briefly press the "Start" button twice.

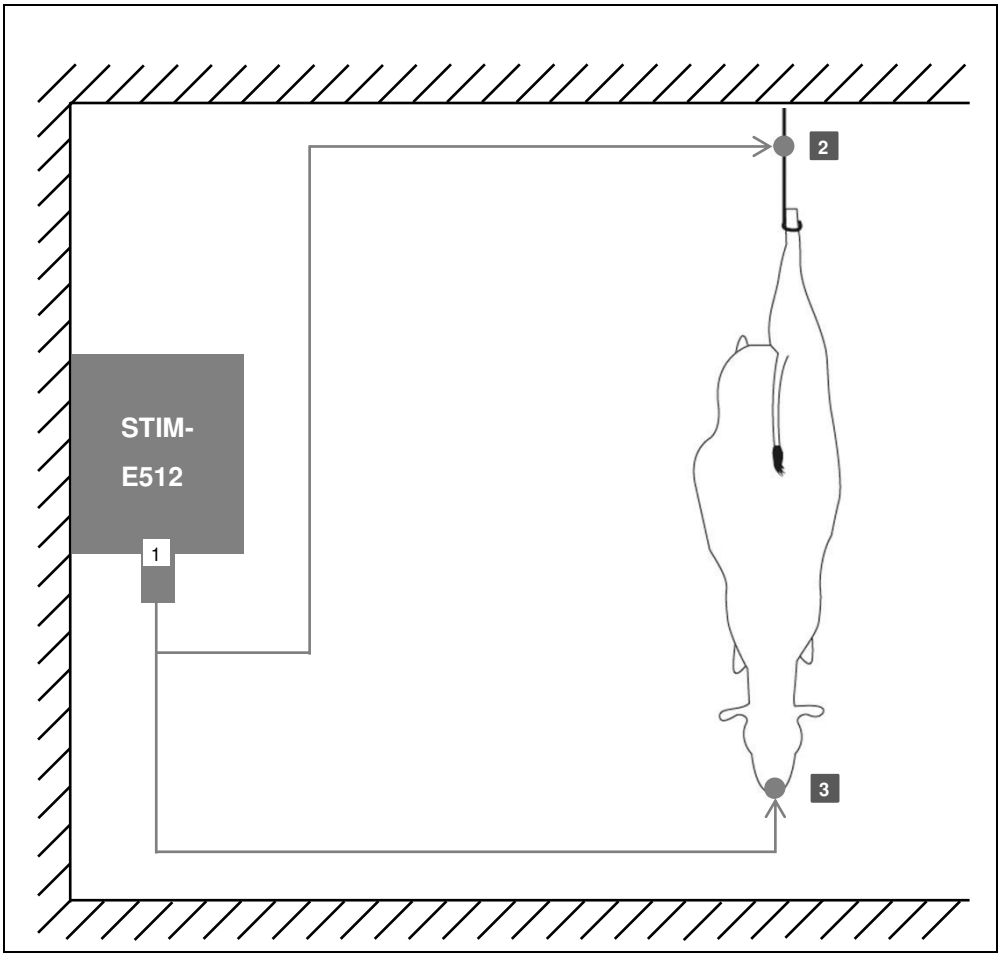
The "Start" button flashes and the current flow is interrupted prematurely after 3.5 seconds.

The connected electric stunner must report the stun time, which is too short, as an error.

6.11 Stimulation of cattle and calves

Stimulation connection diagram

The following diagram shows connection of electrodes (tube-rail connection and nose clamp) to the animal carcass.



Item	Description
——	Stimulation power cable
1	STIM-E512 stimulator ground and phase connections
2	Tube-rail connection (ground)
3	Nose clamp (phase)

6.11.1 Preparatory measures

Connect electrode cable

1. Insert the plug of the electrode cable into the stimulator's connection socket.
2. Attach the tube-rail connection to the conductive connector to the suspension device.
3. Place the nose clamp near to the carcass.

Switch on stimulator

4. Switch on the stimulator:

To do this, turn the 0/I switch.

The LED display shows the last program set and the value of the measuring voltage:

The stimulator is activated for stimulation.

Select program

5. Select another stimulation program as required (stimulation programs P1-P5).

To do this, press the “Data ↑” button or the “Data ↓” button

6.11.2 Perform stimulation

➢ Place the nose clamp on the muzzle of the animal.

The stimulator activates the stimulation process after the nose clamp has been placed on the carcass.

The voltage applied to the electrodes is indicated on the right LED display.

The current strength during stimulation is indicated on the left LED display.

An acoustic signal is emitted when the preset stimulation period has lapsed. The stimulation process is finished.

➢ Remove the nose clamp from the muzzle of the carcass.

The stimulator is ready for the next stimulation procedure.

7 Cleaning and disinfection

The purpose of cleaning is to remove particles of dirt, meat and fat and dried-on blood from stun tongs and devices. All surfaces must be visually clean after cleaning.

For reasons of hygiene, the machine must be cleaned thoroughly at least once per day after the end of a shift, and more regularly in the event of heavier soiling.

Follow the safety instructions provided in the cleaning products' and disinfectant product datasheets.

7.1 Safety information

WARNING!

Live machine parts.

Danger to life and most severe injuries are possible.

- Before beginning any installation, maintenance and repair work, disconnect the machine from the power supply.
- Secure the machine against being inadvertently switched back on.

WARNING!

Risk of accident caused by insufficiently qualified personnel

Danger to Life and most severe injuries are possible.

- The machine may only be maintained, repaired and cleaned by qualified personnel.
- All works to live components may only be performed by approved electricians.

WARNING!

Highly irritant or corrosive detergents and disinfectants.

Breathing difficulties and other health damage is possible.

- Always take note of the hazardous substance symbols and the safety data sheets issued for the relevant detergent or disinfectants.
- Wear the personal protective equipment specified by the manufacturer of the detergents and disinfectants.

7.2 Personal protective equipment

7.3 Daily cleaning

For cleaning only use detergents and disinfectants approved for the food industry.

- Disconnect the machine from the power supply.
- Disconnect the connected stunning device from the machine.
- Do not use high-pressure cleaners.
- Avoid a direct jet of water on all electrical control panels and the housing.

7.4 Cleaning the Stun-tong

The cleaning may only done by hand with detergents and disinfectants approved for the food industry.

1. Disconnect the electric-stunner from the power supply.
2. Disconnect the stun-tong from the Electric-stunner.
3. Clean the dirty electrodes with a steel brush.

8 Maintenance and repairs

The electric stunner and devices must be inspected and serviced regularly in order to prolong the life of the electric stunner as much as possible and to ensure minimal wear.

The workbench area must be clean and free from foreign matter for disassembly and maintenance.

Repairs and maintenance may be performed by qualified and authorised specialists only.

Warranty

If errors or defects occur in the electric stunner and devices within the statutory warranty period, please contact our Sales department. The address and telephone number can be found at the top of the copyright page.

Only use original spare parts or replacement parts recommended by FREUND Maschinenfabrik.

For maintenance and repairs, use only measuring instruments with protective insulation. The internal resistance of the connected measuring instrument must be at least 100 kOhm.

8.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before beginning any installation, maintenance or repair work, place the stun tong on a non-conductive surface.
- Before beginning any installation, maintenance or repair work, disconnect the electric stunner from the mains.
- Secure the electric stunner against being switched on accidentally.
- Before beginning any installation, maintenance or repair work, disconnect the stun tong from the electric stunner.

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The stun tong may only be connected to the electric stunner by instructed and authorised personnel only. Only instructed and authorised personnel may commission and operate the stun tong.
- Maintenance work on live components must only be performed by trained electricians.

WARNING!

Sharp-edged electrodes.

Risk of cutting on sharp-edged electrodes.

- Wear protective gloves when performing any installation, maintenance or repair work.

8.2 Personal protective equipment

8.3 Periodic inspection of electrical equipment

Inspection intervals

Periodic inspections of non-stationary electrical machinery and equipment that is used in slaughtering and cutting plants must be carried out at intervals of six months in accordance with EN 60204-1.

The electrical test must be carried out by an electrically skilled person in the sense of the accident prevention regulation “Electrical installations and equipment” or by an electrically instructed person.

We recommend that you should document the inspections and test results in a test logbook. This will enable you any time to furnish proof that you have inspected your machinery and equipment in accordance with requirements.

Service

We at FREUND Maschinenfabrik would like to give you the option to arrange for the next periodic inspection of your machinery or equipment to be carried out at our factory. Our service includes a complete inspection of the electrical system with inspection report and test sticker.

If you are interested in arranging for a periodic inspection at our factory or by a service technician on-site, contact our sales staff. Please refer to the company information at the imprint for address and telephone numbers.

8.4 Electric stunner

8.4.1 Required inspection of stunning devices

The relevant national legislation of your country on operational safety and accident prevention is applicable.

Example: Federal Republic of Germany

According to the Ordinance on Industrial Safety and Health (BetrSichV)e operational safety regulation and accident

prevention regulations, the operator of a slaughterhouse is obliged to

inspect all electric stunning devices at least once each year for compliance with the requirements of the German Animal Protection Slaughter Regulation (TierSchlV).

The required annual inspection must be carried out by an electrician or an electrically trained person in accordance with accident prevention regulations governing *Electrical Systems and Operating Materials*.

Service FREUND Maschinenfabrik offers a full inspection service with an inspection log and inspection tag. In addition, we can provide you with a replacement stunning

device for the duration of the inspection, subject to an additional charge.

If you are interested in having the inspection conducted, please contact our Sales department. The address and telephone number can be found at the top of the copyright page.

8.4.2 Replace fuses

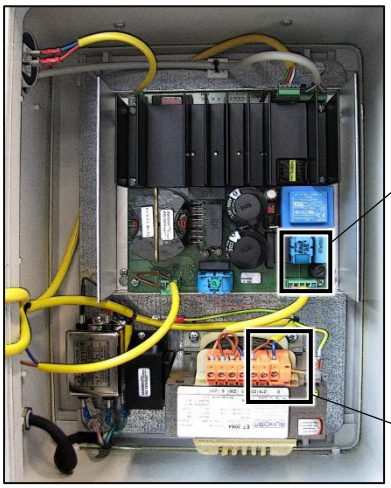


Fig. 8-1 Interior view of the machine

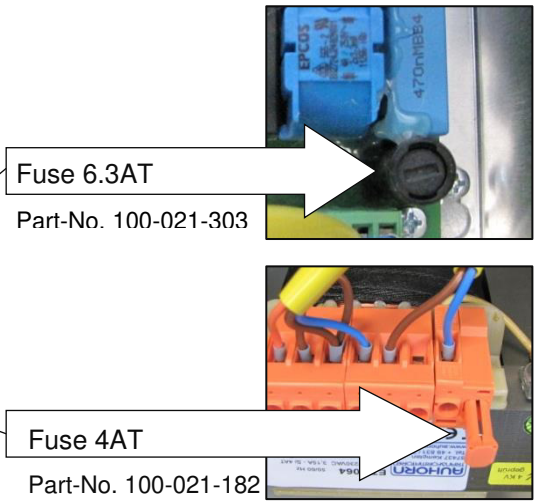


Fig. 8-2 – Fig. 8-3
Detail view of fuses

➢ Replace defective fuses only with fuses of the same amperage.
Defective fuses may only be replaced with fuses of the same type and rating.

8.4.3 Taking electrical control measurements

Council Regulation (EC) No. 1099/2009, Annex 1, section 6.8 on protection of animals at the time of killing requires that an electric stunning system must have a mechanism for connection of an external device to enable display of stunning voltage and stunning current strength.

You need

- a tong ammeter for current measurement.
- a multimeter for voltage measurement.

Electrical measurements may be taken by trained specialists or personnel with specialist training only.

Measuring stunning current strength

1. Open the machine with a square electrical cabinet key (included in scope of supply).
2. Set the tong ammeter's measurement range to 10A/AC.
3. Encircle the brown curved cable with a tong ammeter.
4. Take the measurement.
5. Close the machine with the square electrical cabinet key.

Fig. 8-4 Stunning current strength measurement

Measuring stunning voltage

1. Open the machine with a square electrical cabinet key (included in scope of supply).
2. Set the tong multimeter's measurement range to 600V/AC.
3. Plug the multimeter probes into the PIN 1 and PIN 3 slots on the green PCB terminal.
4. Take the measurement.
5. Close the machine with the square electrical cabinet key.

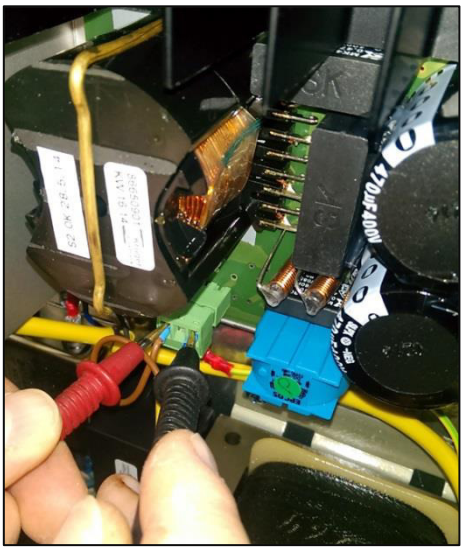


Fig. 8-5 Stunning voltage measurement

8.5 Stun tongs

Replacing electrodes

Dirty and burnt electrodes result in poor contact with the skin and do not facilitate optimal stunning.

Burnt electrodes are recognisable by rounded electrode tips.

Replace worn and burnt stun tong electrodes of the stun tongs in a timely manner in order to avoid downtime.

For information on replacing electrodes, please refer to the assembly manual accompanying the stun tong/stun fork.

Always replace both electrodes at the same time.

8.6 Testing device for electric stunner

8.6.1 Charging accumulators

The accumulators may lose charge of their own accord if the STUN-Check testing device for electric stunners is unused for a long period of time. FREUND Maschinenfabrik recommends recharging the testing device at least every 6 weeks.

Do not conduct tests while charging the accumulators. Test precision is not guaranteed during this period.

Deep discharging

If the accumulators deep-discharge, they can no longer be recharged with the testing device.

Remove the deep-discharged accumulators from the testing device and charge it with an external accumulator charging unit. The accumulators can be used in the testing device again as normal after charging.

Accumulator and battery polarity:

Always set the accumulators or batteries to the negative pole initially.

1. Plug the network adapter cable plug into the charging socket on the testing device (the charging socket is on the top of the testing device, beside the handle).
2. Plug the network adapter into a socket.
   The green charging LED begins to flash.
   Charging takes 2 to 4 hours, depending on charge level.
3. Remove the network adapter from the testing device when the charging-LED is no longer flashing.
   The accumulators are now charged.

8.6.2 Operating testing device with batteries

If the accumulators are empty but you need to perform a test urgently, replace the accumulators with six ordinary, new batteries (AA cell).

Never charge batteries!

Use batteries only in the event of an emergency, and remove them as soon as possible.

Reinsert the empty accumulators and recharge them.

9 Troubleshooting

If malfunction or faults occur during the operation, you can look for possible causes and remedies in this chapter.

If you do not find the malfunction or fault of your machine in the following table, contact our sales staff. Please refer to the company information at the imprint for address and telephone numbers or on our website *www.freund-germany.com.*

9.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before beginning any installation, maintenance or repair work, place the stun tong on a non-conductive surface.
- Before beginning any installation, maintenance or repair work, disconnect the electric stunner from the mains.
- Secure the electric stunner against being switched on accidentally.
- Before beginning any installation, maintenance or repair work, disconnect the stun tong from the electric stunner.

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The stun tong may only be connected to the electric stunner by instructed and authorised personnel only. Only instructed and authorised personnel may commission and operate the stun tong.
- Maintenance work on live components must only be performed by trained electricians.

WARNING!

Sharp-edged electrodes.

Risk of cutting on sharp-edged electrodes.

- Wear protective gloves when performing any installation, maintenance or repair work.

9.2 Personal protective equipment

9.3 Overview of possible faults

9.3.1 Electric stunner

Fault	Possible cause	Remedy
Unreadable display when switched on.	Control unit or display circuit board defective.	Contact the manufacturer. The address and telephone number can be found at the top of the copyright page.
Display flickers when switched on.		
Display does not illuminate.	Power supply is interrupted.	Check the mains supply line for interruptions.
	Fuse has tripped.	Change the fuse. Do not use higher current or other tripping characteristics for replacement fuses.
Yellow light is lighting.	Stunning current was not reached within four seconds.	Repeat stun procedure. The yellow light automatically turns off during the next stun procedure. The stun error is also signalled acoustically.
	Stun procedure was interrupted within the first four seconds.	
Yellow and red signal lights flashing simultaneously.	Control unit defective.	Contact the manufacturer. The address and telephone number can be found at the top of the copyright page.

Fault	Possible cause	Remedy
Current strength set is not reached. The stun process does not start.	Electrodes are soiled.	Clean the electrodes using a wire brush.
	Electrodes are burnt through.	Change the electrodes. → *separate installation manual (included with stun tong).*
	Water ingress near the electrodes.	Disassemble the electrodes. Allow the water to drain. Leave the stun tong to air until they are completely dry. Install the electrodes. → *separate installation manual (included with stun tong).*

10 Disposal and Recycling

The machine must be disposed of in accordance with the pertinent national regulations.

More Information

For more information about our materials and their disposal please contact our sales staff.

Please refer to the company information in the imprint for the address and telephone numbers.

10.1 Disassembling and disposing of the machine

Old machines contain recoverable materials which you can return for recycling.

When disposing of the machine, make sure to observe local environmental regulations.

1. Disconnect all connections and supply lines from the machine.
2. Completely disassemble the machine.
3. Segregate all materials.
4. Dispose of waste oil and components and materials soiled with oil in accordance with the applicable environmental regulations.
5. Send the individual materials to the appropriate recycling or disposal facilities.
6. Send hazardous waste to a local hazardous waste site.

10.2 Disposing packaging material

All packaging materials used by FREUND Maschinenfabrik are environmentally friendly and can be recycled.

You can safely dispose of the packaging materials through your local waste collection system or return them for recycling.

11 Technical Data

11.1 Electric stunner

11.1.1 STUN-E512/STUN-E513

	STUN-E512	STUN-E513
Dimensions (H x W x D)	400 x 300 x 200 mm	
Weight (kg)	13	
Operating voltage	230 V 10 % 115[1] V 10 %	
Frequency	50/60 Hz	
Max. current consumption	4.6 A	
Temperature range	0–40 °C	
Fuse	6.3 AT[2]	
Protection type	IP44	
Protection class	I	
Stunning voltage	80–400 VAC	
Stunning frequency	50–1000 Hz (in stages)	
Stunning current	1.5 A 30% ED[3]	2.5 A 80% ED[3]

1 Special voltage

2 Electric fuse for electrode short circuit, short circuit and/or defect in stunning current circuit

3 Duty cycle

11.1.2 STUN-E514

	STUN-E514
Dimensions (H x W x D)	400 x 300 x 160 mm
Weight (kg)	16
Operating voltage	230 V 10 % 115[1] V 10 %
Frequency	50/60 Hz
Max. current consumption	4.6 A
Temperature range	0–40 °C
Fuse	6.3 AT[2]
Protection type	IP44
Protection class	I
Stunning voltage	80–400 VAC
Stunning frequency	50–1000 Hz (in stages)
Stunning current	2.5 A 30 % ED[3]

1 Special voltage

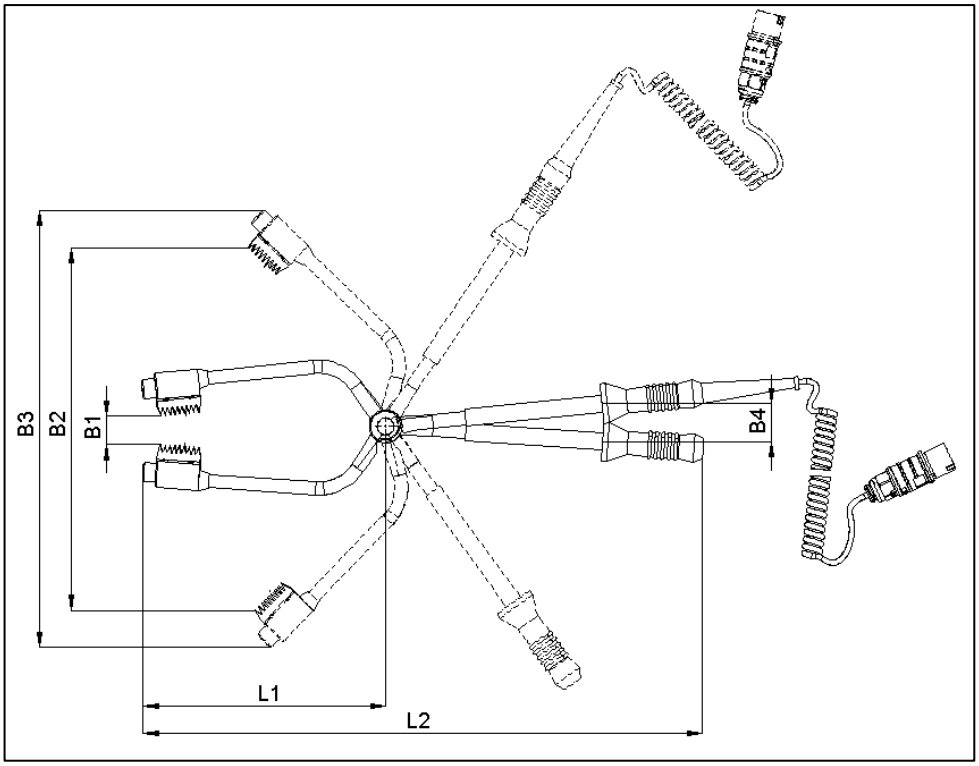
2 Electric fuse for electrode short circuit, short circuit and/or defect in stunning current circuit

3 Duty cycle

11.2 Stun tongs

11.2.1 STUN-TONG-EP/STUN-TONG-EA Steel, -EP LS

Dimensions

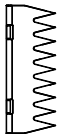
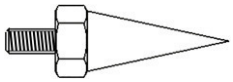


	STUN-TONG-EP Steel	STUN-TONG-EP Steel	STUN-TONG-EP LS
Weight [kg]	3.5	3.5	3,5
Length L1 [mm]	370	370	370
Length L2 [mm]	850	850	850
Width B1 [mm]	45	10	65
Width B2 [mm]	550	525	550
Width B3 [mm]	660	660	660
Width B4 [mm]	60	60	110

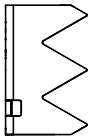
IP protection type

IP65

Electrodes

Electrode shape	Designation	Part no.
	Electrode set for pigs	077-000-006
	Centre electrode (electrode set for pigs)	077-000-009

Electrodes

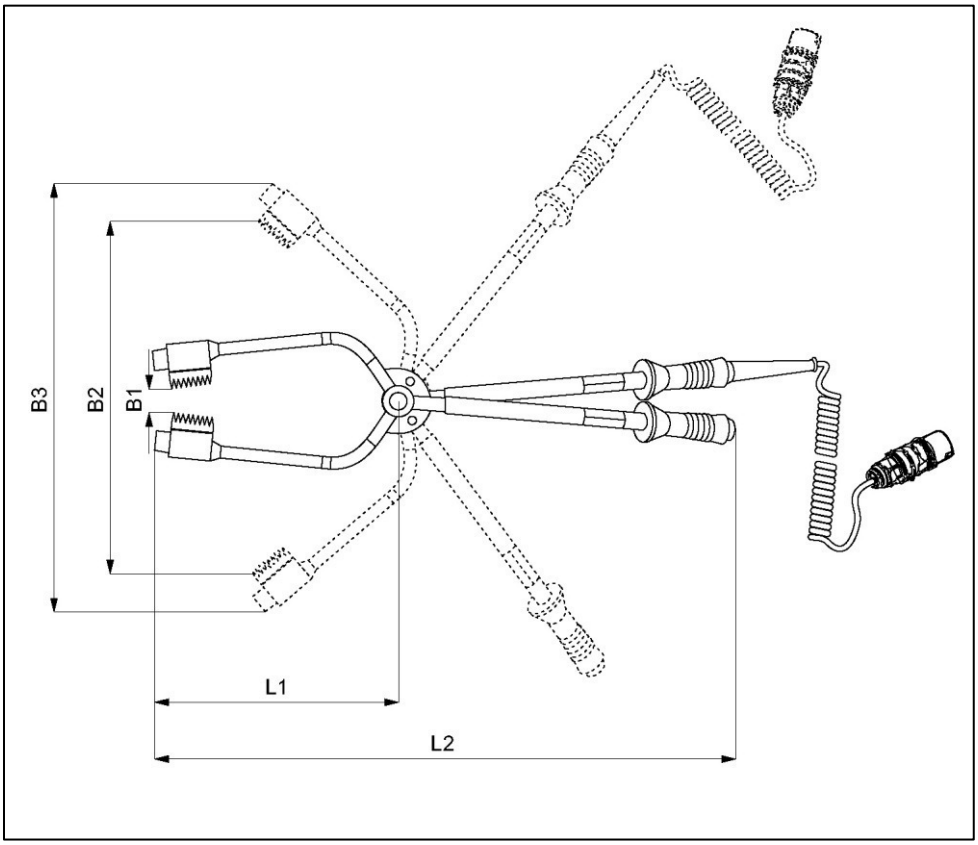
Electrode shape	Designation	Part no.
	Electrode set for sheep, goats, lambs	077-000-021

Optional accessories

Component	Part no.
Wall unit	164-010-001

11.2.2 STUN-TONG-EP titanium

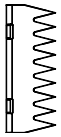
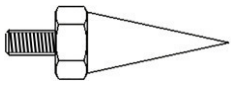
Dimensions



	STUN-TONG-EP titanium
Weight [kg]	2.8
Length L1 [mm]	460
Length L2 [mm]	940
Width B1 [mm]	40
Width B2 [mm]	530
Width B3 [mm]	640

IP protection type	IP65

Electrodes

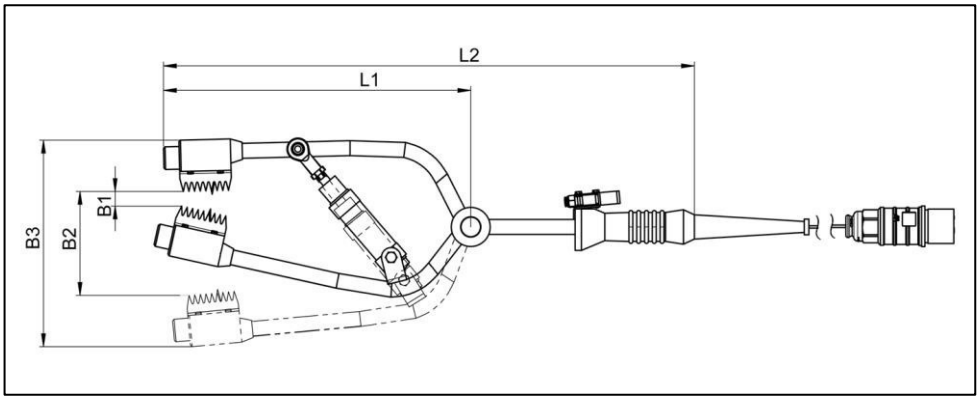
Electrode shape	Designation	Part no.
	Electrode set for pigs	077-000-006
	Centre electrode (electrode set for pigs)	077-000-009

Optional accessories

Component	Part no.
Wall unit	164-010-001

11.2.3 STUN-TONG-EPP2

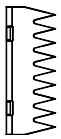
Dimensions



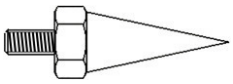
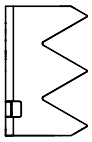
	STUN-TONG EPP2
Weight [kg]	3.2
Length L1 [mm]	375
Length L2 [mm]	640
Width B1 [mm]	70
Width B2 [mm]	220
Width B3 [mm]	375

IP protection type	IP65
Compressed air	5–8 bar

Electrodes

Electrode shape	Designation	Part no.
	Electrode set for pigs	077-000-006

Electrodes

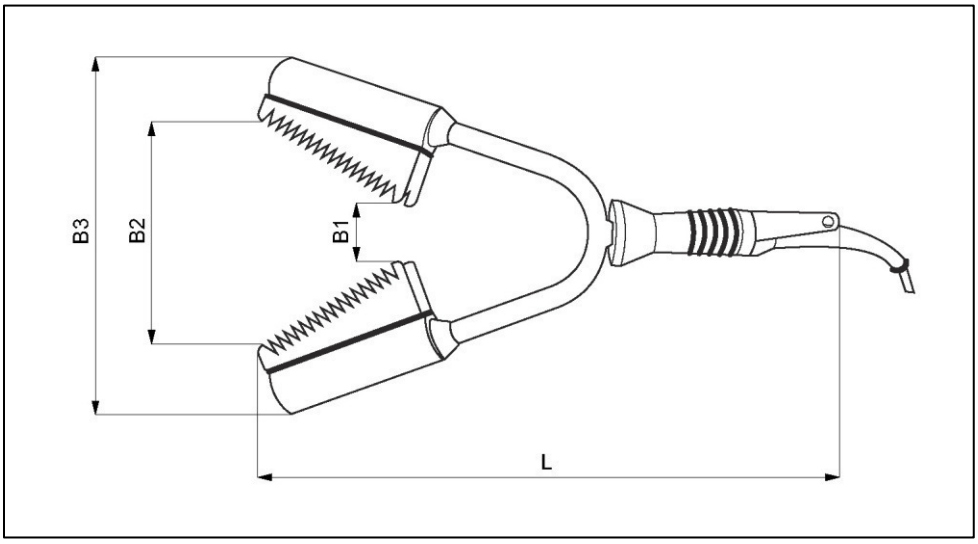
Electrode shape	Designation	Part no.
	Centre electrode (electrode set for pigs)	077-000-009
	Electrode set for sheep, goats, lambs	077-000-021

Optional accessories

Component	Part no.
F4-2.5 spring balancer	920-414-001

11.2.4 STUN-TONG-EF

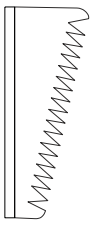
Dimensions



	STUN-TONG-EF
Weight [kg]	2.3
Length L [mm]	510
Width B1 [mm]	50
Width B2 [mm]	220
Width B3 [mm]	310

IP protection type: IP65

Electrodes

Electrode shape	Designation	Part no.
	Single electrode	164-100-002

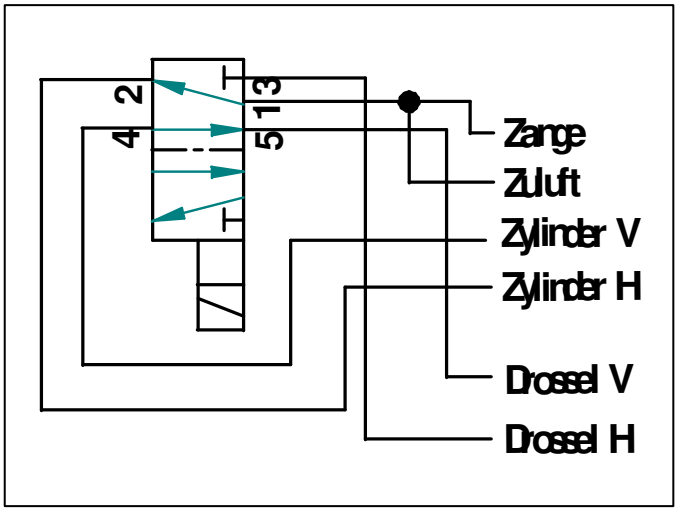
Optional accessories

Component	Part no.
Spring balancer F3-1.6N	920-403-000

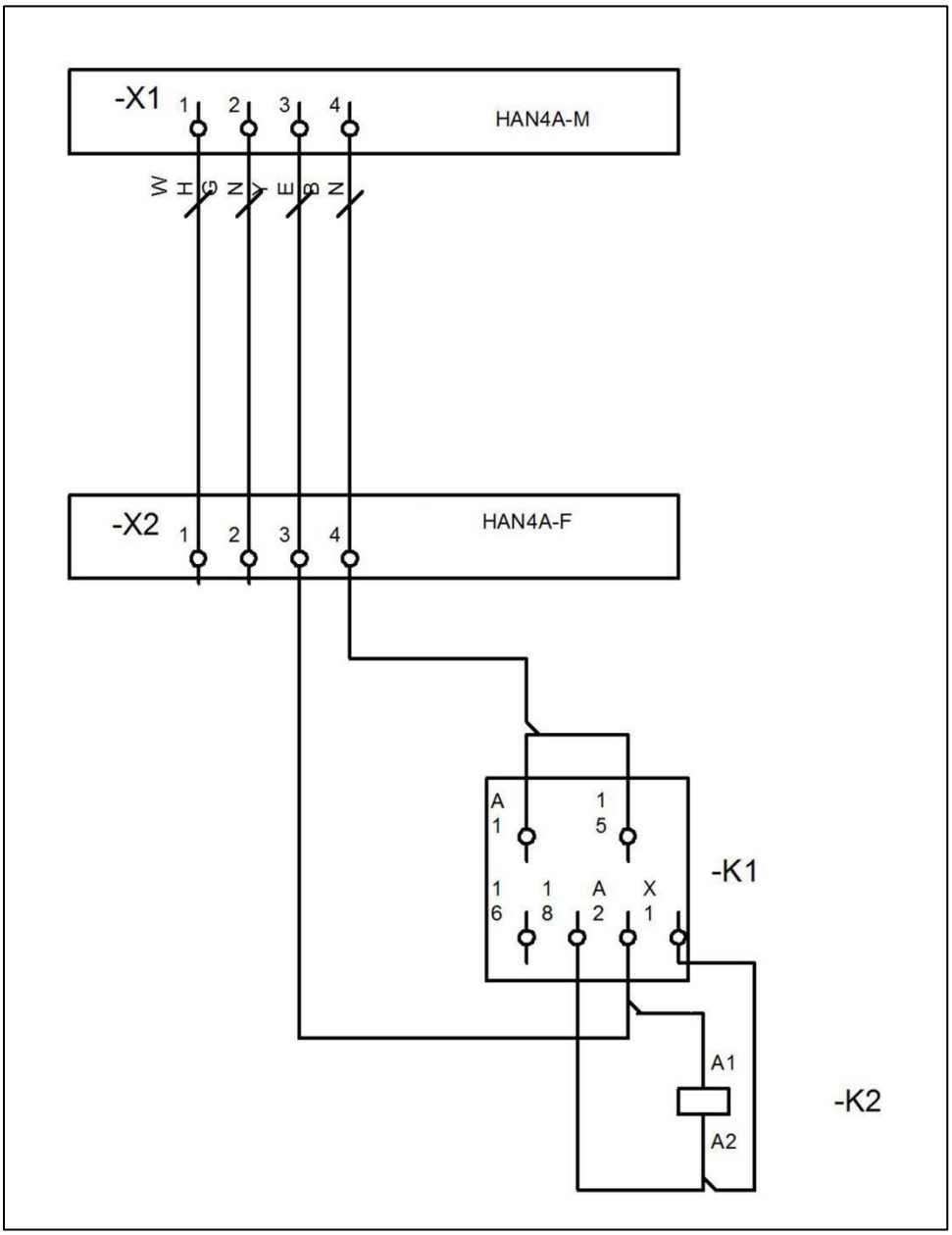
11.3 Interface control box

	Interface control box
Measurements (H x W x D)	400 x 300 x 160 mm
Weight (kg)	3.8
Temperature range	0–40 °C
Protection class	IP44

11.3.1 Pneumatic circuit diagram



11.3.2 Electrical circuit diagram



Item	Description
K1	Time relay
K2	Solenoid valve
X1	Plug
X2	Socket

11.4 STUN-EMEM01 data memory

	STUN-EMEM01
Dimensions L x W (ø)	70 x 30 (ø) mm
Weight (kg)	0.1
Memory size	2 MB
Protection type	IP65

11.5 STUN-Check testing device

	STUN-Check
Dimensions (H x W x D)	250 x 160 x 95 mm
Weight (kg)	0.8
Power supply: accumulator (format: AA) or Batteries (format: AA)	 6 x Ni-MH 1.2 V 1200 mAh 6 x 1.5 V
Network adapter power supply	90–250 VAC
Charge voltage	12 V
Number of tests without interruption	min. 30
Interruption period after 30 tests	min. 60 minutes
Number of tests without charging accumulator	min. 800
Length of measuring lines	2 x 100 cm
Temperature range	0–50 °C

11.6 STIM-E512 stimulator

	STIM-E512
Dimensions (H x W x D)	400 x 300 x 160 mm
Weight (kg)	16
Operating voltage	230 V 10 % 115[1] V 10 %
Frequency	50/60 Hz
Max. current consumption	4.6 A
Temperature range	0–40 °C
Fuse	6.3 AT[2]
Protection type	IP44
Protection class	I
Stimulation voltage	< 50 VAC
Stimulation frequency	16/50 Hz
Stimulation current	0.6 A
Stimulation electrode cable length	10 m

1 Special voltage

2 Electric fuse for electrode short circuit, short circuit and/or defect in stunning current circuit

Appendix

EC declaration of conformity

EG-Konformitätserklärung • EC-Declaration of Conformity •
Declaración CE de conformidad • Déclaration CE conformité

im Sinne der EG-Richtlinie Maschinen 2006/42/EG, Anhang II, Nr.1 A
content according to 2006/42/EC, Annex II, No. 1 A
contendido según 2006/42/CE, anexonex II, núm. 1 A
contenu conforme à la directive 2006/42/CE, annexe II, N° 1

Hersteller • *Manufacturer* •
Constructor • *Constructeur*

FREUND Maschinenfabrik GmbH & Co. KG
Schulze-Delitzsch-Str. 38
D-33100 Paderborn
Germany

Dokumentationsbevollmächtigter
Documentation manager
Responable de la documentación
Mandataire de la documentation

Robert Penner

Hiermit erklären wir, dass **die Maschine** • *We hereby declare that the machinery* •
Por la presente declaramos que **la máquina** •*Nous déclarons par les presentes que la machine*

Typ • *Model* • Modelo • *Type*

Serien-Nummer • *Serial-Number* •
Número de série • *N° de série*

mit allen einschlägigen Bestimmungen der EG-Maschinenrichtlinie 2006/42/EG übereinstimmt.
fulfils all relevant provisions of Directive 2006/42/EC.
concuerdo con todas las disposiciones de la Directiva 2006/42/CE relativa a las máquinas.
satisfait à la ensemble des dispositions pertinentes de la directive 2006/42/CE relative aux machine.

Die Maschine stimmt auch mit allen einschlägigen Bestimmungen der folgenden EG Richtlinien überein:
The machinery is also in compliance with all relevant provisions of the following EC-directives:
La máquina concuerda también con todas las disposiciones pertinentes de las siguientes directivas de la CE:
Cette machine satisfait également à toutes les dispositions pertinentes des directives CE surivantes:

2004/108/EG – EMV-Richtlinie
EGV 1935/2004

Folgende harmonisierte Normen (oder Teile dieser Normen) wurden angewendet:
The following harmonised standards (or parts thereof) were applied:
Se aplicaron las siguientes normas armonzidadas (o partes de estas normas):
Les norms harmonisées suivantes (ou parties de ces normas) ont été utilisées:

DIN EN ISO 12100, EN 12984
DIN EN ISO 13850, EN 563, EN 60204-1
EN 60529, EN 61558, EN 1672-2, DIN 15112,
EN 55022, DIN EN 61000-6-3/-6-4,
EN 55081-2, EN 50082-1, EN 55014-1, EN 55014-2

Name und Unterschrift
Name and Signature
Nombre y firma
Nom et signature

..... Paderborn
Robert Freund
Geschäftsführer • *Managing Director* • Director gerente • *Directeur*

www.freund-germany.com

Conformity

The company FREUND Maschinenfabrik GmbH & Co. KG hereby confirms, for articles and their materials that, when used as intended, come into contact with food comply with the following general requirements.

- Regulation (EC) No. 1935/2004 of 27 October 2004 for articles and materials that are intended to come into contact with food.
- Regulation (EC) No. 10/2011 of 14.01.2011 for plastic articles and materials that are intended to come into contact with food.
- Regulation (EC) No. 2023/2006 of 22 December 2006 for good manufacturing practices for articles and materials that are intended to come into contact with food.
- LFGB - Food, Articles of Daily Use and Feeding Stuff Law, as of 01.09.2005.

This applies to all the following machine types and their spare parts:

STUN TONG

Machine parts that come into contact with food	Material designation	Groups of materials and articles	Notes
Electrode	1.4301	Stainless steel	
Electrode head	Polyoxymethylene	Plastics	

Paderborn, 12.06.2019

Head of Development

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Amtsgericht Paderborn HRA 1865
Pers. Haft. Gesellschafterin:
Freund Maschinenfabrik Beteiligungs-GmbH
Amtsgericht Paderborn HRB 2048
Geschäftsführer: Robert Freund

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