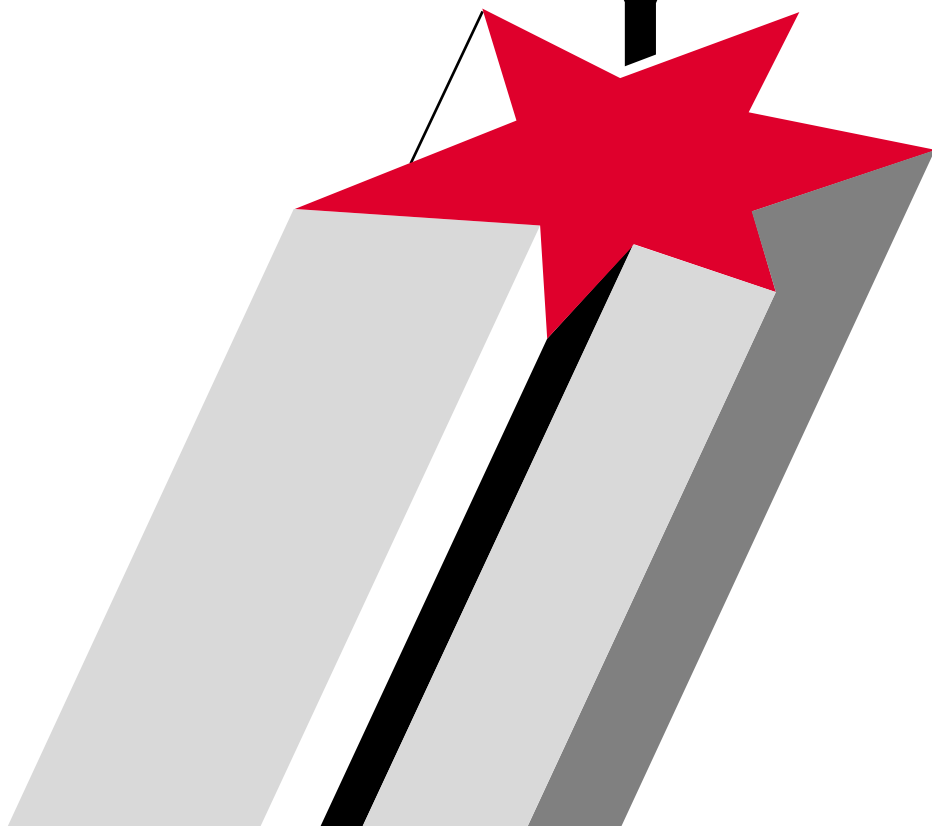


Operating Instructions

Stud Welder
BMS-8N

soyer®





Operating Instructions



Stud Welder BMS-8N

Serial number*
Stud Welder BMS-8N _____

* Please enter the serial number, so that this data is immediately available if you need service support.

Heinz Soyer Bolzenschweißtechnik GmbH
Ettersschlag
Inninger Straße 14
82237 Wörthsee

Phone 08153 - 885 - 0
Fax 08153 - 8030
Telex 5270 295 heso d



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We have certified that the contents of this pamphlet correspond to the hard- and software described. Deviations, however, cannot be excluded, so that we cannot warrant for absolute compliance. The data in this documentation, however, have been verified regularly and necessary corrections will be incorporated in future impressions. We appreciate any suggestions for improvement.

Date of issue revision 1:
Aug. 1, 2000

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Subject to technical alterations

Printed in the Federal Republic of Germany



EC Conformity Declaration

in compliance with EC Directive on Machinery 89/392/EEC, annex IIA

Producer: **Heinz Soyer Bolzenschweißtechnik GmbH**
Ettersschlag
Inninger Straße 14
D-82237 Wörthsee

Declaration: We herewith declare that the machine described in the following and the version available on the market correspond in design and construction to the fundamental safety and health requirements stipulated by the EC Directive on Machinery. Any modification of this machine without confirmation shall automatically annul this declaration.

Designation of machine: **Stud welder with tip ignition**

Machine type: **BMS-8N**

Machine no.:

Applicable EC directives: EC Directive on Machinery (89/392/EEC) in the version 91/368/EEC
EC Directive on Low Voltage (73/23/EEC)
EC Directive on Electromagnetic Compatibility (89/336/EEC) in the version 93/31 EEC

Applied harmonised standards, in particular: EN 292-1 and EN 292-2, EN 60 204-1
EN 60 974-1

Applied national standards and technical specifications, in particular: VBG 1, VBG 5,
VDE 0544

Date: December 1, 1997

Producer's signature:

Signer's function: Technical Management

**EG-
KONFORMITÄTSBESTÄTIGUNG** über die elektromagnetische Verträglichkeit
im Rahmen der unten aufgeführten Normen
EC CONFIRMATION OF CONFORMITY on electromagnetic compatibility
according to the standards mentioned below

Zertifikat-Nr. / Certificate No.

EMA-299/2288


Prüfstelle: <i>Testing Body:</i>	EMV-Prüfzentrum der LGA / EMC Test Center Tillystr. 2 D - 90431 Nürnberg (Germany)
Inhaber der Bescheinigung: <i>Holder of certificate:</i>	Heinz Soyer Bolzenschweißtechnik GmbH Inninger Str. 14 D - 82237 Wörthsee-Etterschlag
Hersteller: <i>Manufacturer:</i>	dto.
Prüfbericht vom: <i>Technical Report, Date:</i>	25. Jan. / 22. April 1999, Auftr.-Nr. / Order no.: 429 1043
Objektbezeichnung: <i>Object Identification:</i>	Bolzenschweißer Typ / type: BMS-8N
Prüfbeschreibung: <i>Test Description:</i>	EMV-Prüfungen EMC-Tests
Prüfstandards: <i>Standards:</i>	EN 50 199, EN 61 000-3-2, EN 61 000-3-3

Diese Konformitätsbestätigung wurde gemäß Artikel 10, Abs. 1 der Richtlinie des Rates vom 03. Mai 1989 zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten über die elektromagnetische Verträglichkeit (89/336/EWG) vom EMV-Prüfzentrum der LGA erstellt. Die Bestätigung macht keine Aussagen in bezug auf die Schutzanforderungen zur elektromagnetischen Verträglichkeit nach anderen Rechtsvorschriften, die der Umsetzung anderer Richtlinien der Europäischen Union als der EMV-Richtlinie dienen. Diese Bestätigung bezieht sich auf das geprüfte Muster.

This Confirmation of Conformity was issued by the EMC Test Center of the LGA in accordance with Article 10 (1) of the Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This certificate does not contain any statements pertaining to the EMC protection requirements pursuant to other laws which serve to implement EC Directives other than the aforementioned Council Directive. This Confirmation of Conformity only relates to the sample submitted for testing or to the technical report.

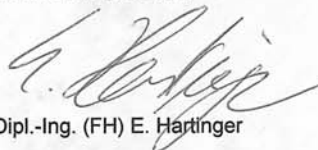
Datum der Bestätigung / Date of certificate : 28. Juli 1999

LGA
Zertifizierungsstelle Produkte (EMV)



Dr.-Ing. E. Zeitler
KON22288.DOC

EMV-Fachzertifizierer



Dipl.-Ing. (FH) E. Hartinger



CERTIFICATE



DVS ZERT® e.V.

Aachener Str. 172, D - 40223 Düsseldorf

This is to certify that the company

soyer.



Heinz Soyer

Bolzenschweißtechnik GmbH

Inninger Straße 14

D - 82237 Wörthsee-Etterschlag

has implemented a quality system in the following areas of application.

Development, Production and Sales of Stud Welding Equipment

Production of Welding Studs


By way of a quality audit it was proved that this quality system has been put into service and fulfils the requirements of the Standard

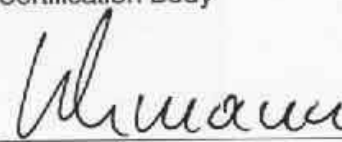
DIN EN ISO 9001:2000

Registration No.: DE-1996-001-2
Valid until: 09.19.2005
Lead Quality Auditor

First Certification: 02.12.1996
Düsseldorf: 09.19.2002
Certification Body




Ing. W. Pupp


Dipl.-Ing. M. Lehmann



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1 General

1.1 The following should be principally observed ...

With this stud welder you have purchased a product which

- is state-of-the art technology
- fully complies with the current safety requirements and
- enables successful working.

Before putting the stud welder into operation, always observe the following :

- Store the operating instructions in a place accessible to every operator
- Ensure that the respective operator has read and understood the operating instructions prior to installation. Each operator should confirm this by signature
- Prevent the stud welder being operated by unauthorized persons
- Only trained personnel may operate the stud welder



MORTAL DANGER

Persons with pacemakers must not operate the stud welder and must not stay in the vicinity of the stud welder while it is running.
Ensure that the stud welder is not operated near electronically sensitive life-supporting equipment, such as in intensive care units in hospitals.

WARNING

Keep sufficient distance from electronic devices. When stud welding, highly intensive electromagnetic fields are created which may permanently damage these devices (e.g. television sets).

- Moreover, observe the safety instructions in chapter 3.
- Call a doctor in case of an accident.



MORTAL DANGER

The "S" symbol is the symbol for welding current sources permitted for operation with increased electric danger. The "S" symbol on our stud welders refers exclusively to the welding current circuit and not to the complete stud welder.



1.2 Application

The SOYER® stud welder BMS-8N with tip ignition allows you to weld pins and threaded studs of M3 - M8 or \varnothing 3 - 7.1 mm as well as numerous various fastening elements made of steel and stainless steel (see chapter 2.4, Technical Data). It is also possible to weld fastening elements made of aluminium and brass depending on the respective requirements.

The visible side of the workpiece is spared to a large extent from pressure marks or deformations, so that even thin sheet metals under 1 mm sheet thickness retain their decorative appearance.

If you need consultation or assistance in solving problems, please contact either our parent company or our field engineers.

1.3 Information on the product

Manufacturer	Heinz Soyer Bolzenschweißtechnik GmbH Etterschlag Inninger Straße 14 D-82237 Wörthsee Phone 08153-885-0 Fax 08153-8030 Website http://www.soyer.de (national) http://www.soyer.com (international)
Product designation	Stud welder BMS-8N
Country of origin	Germany

1.4 Type plate

The type plate is located on the rear side of the stud welder. It contains the following information:

- Manufacturer's name
- Manufacturer's address
- Country of origin
- Product designation
- Method of welding
- Date of construction
- Production number
- Performance data
- Mains connection values

1.5 Information on the documentation

The following operating instructions are supplied with the BMS-8N stud welder:

- Operating instructions for stud welder BMS-8N
Order no.: P00298

For repeat-orders please contact:

Heinz Soyer Bolzenschweißtechnik GmbH
Ettersschlag
Inninger Straße 14
D-82237 Wörthsee
Phone 08153-885-0
Fax 08153-8030
Telex 52700295 heso d
E-mail export@soyer.de
verkauf@soyer.de

1.5.1 Chapters of the operating instructions

The operating instructions describe the initiation and operation of the stud welding system under normal conditions and comprise the following chapters in detail:

- Chapter 1 "General"
Information on application and product, as well as supplementary information
- Chapter 2 "Description of stud welder"
Description of tip ignition technology and of the stud welder
- Chapter 3 "Safety instructions"
All safety regulations which are relevant with regard to initiation and operation of the stud welding system
- Chapter 4 "Installation of stud welder"
- Chapter 5 "Initiation"
- Chapter 6 "Quality control"
- Chapter 7 "Maintenance"
Maintenance measures
- Chapter 8 "Spare parts"
- Chapter 9 "Troubleshooting"
Errors, possible causes and remedies
- Chapter 10 "Transport and storage"
- Chapter 11 "List of standards and guidelines"
- Chapter 12 "Terms of warranty"

1.5.2 Information on operating instructions

Legal relationship

We draw your attention to the fact that the contents of these operating instructions are neither part of any former or existing arrangement, pledge or legal relationship nor are designed for modifying the latter. All obligations of Heinz Soyer Bolzenschweißtechnik GmbH result from the respective contract of purchase which also comprises the complete and generally valid warranties. These contractual warranty terms are neither extended nor restricted by the implementation of these operating instructions.

WARNING

Do not carry out any activities on the stud welding system without specifically knowing the operating instructions or the respective part. Ensure that only qualified personnel familiar with the operating instructions and the necessary technical activities (training!) operate the system.

1.5.3 Conduct in the case of malfunctions

If malfunctions occur, first try to detect and eliminate the causes according to the list in chapter 9 "Troubleshooting". In all other cases, contact our service department.

Important information if service is required

If you require our service, please make sure that you supply the following information:

- Customer number
- Product designation
- Serial number
- Year of construction
- Options
- Material of stud and workpiece
- Stud dimensions

This information will help us both to save time and unnecessary costs, e.g. caused by delivering the wrong spare parts.

1.6 Contacts and service address

If you have any questions regarding the operation of the stud welding system, retrofits or if you require service, please contact your responsible service office or the following address:

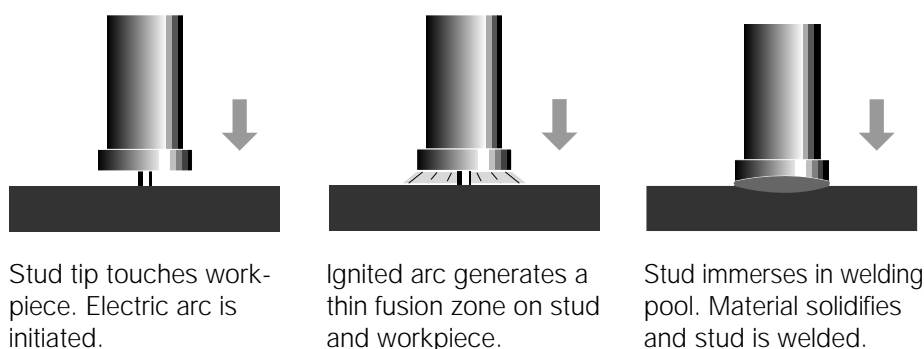
Heinz Soyer Bolzenschweißtechnik GmbH
Ettersschlag
Inninger Straße 14
D-82237 Wörthsee
Phone 08153-885-0
Fax 08153-8030
Telex 52700295 heso d
E-Mail export@soyer.de
verkauf@soyer.de

2 Description of stud welder

2.1 Tip ignition technology

The SOYER stud welding systems with tip ignition run according to the principle of capacitor discharge as defined in DVS Leaflet 0903 (German Welding Society).

This system uses the abrupt discharge of a capacitor battery to generate electric arc energy.



SZ.0078.E

The electric arc is initiated via the calibrated and close-fit ignition tip on the welding studs and welding elements. The stud weld base and the opposite surface of the workpiece are melted on. The stud is then automatically dipped in the thin fusion zone or liquid weld pool. After the immediate solidification of the material, an homogenous high-strength joint is produced in an extremely short welding time of only 1 - 3 milliseconds (0.001 - 0.003 sec.).

2.2 Stud welder set-up

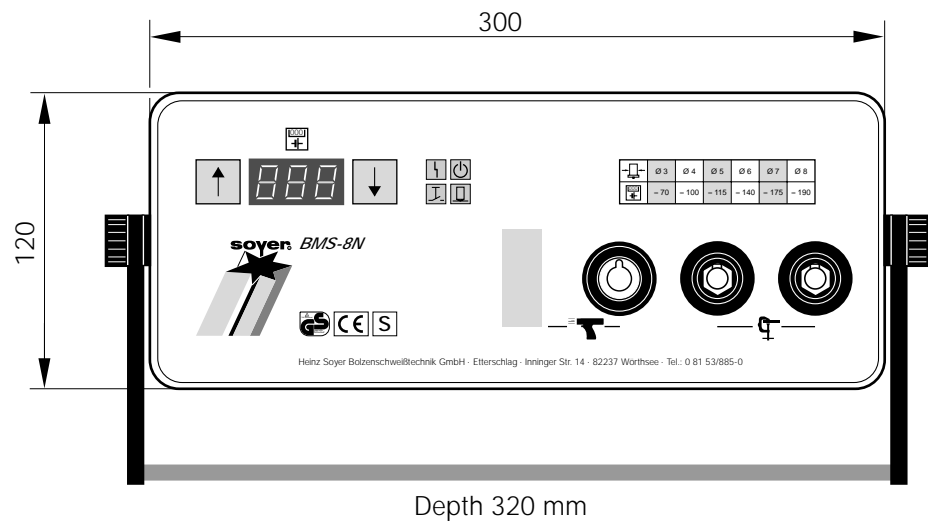
The standard pistol to be connected to the stud welder BMS-8N is the stud welding pistol PS-1K with control cable.

Optionally it is possible to connect the stud welding pistols PS-0K, PS-1 and PS-3K. These operating instructions exclusively describe the stud welder BMS-8N.

For information regarding the stud welding pistols required and their setting, please refer to the respective operating instructions of the stud welding pistols.

2.3 Dimensions

The stud welder BMS-8N has a handy and compact design. It has a carrying handle and can be optionally equipped with a shoulder strap.



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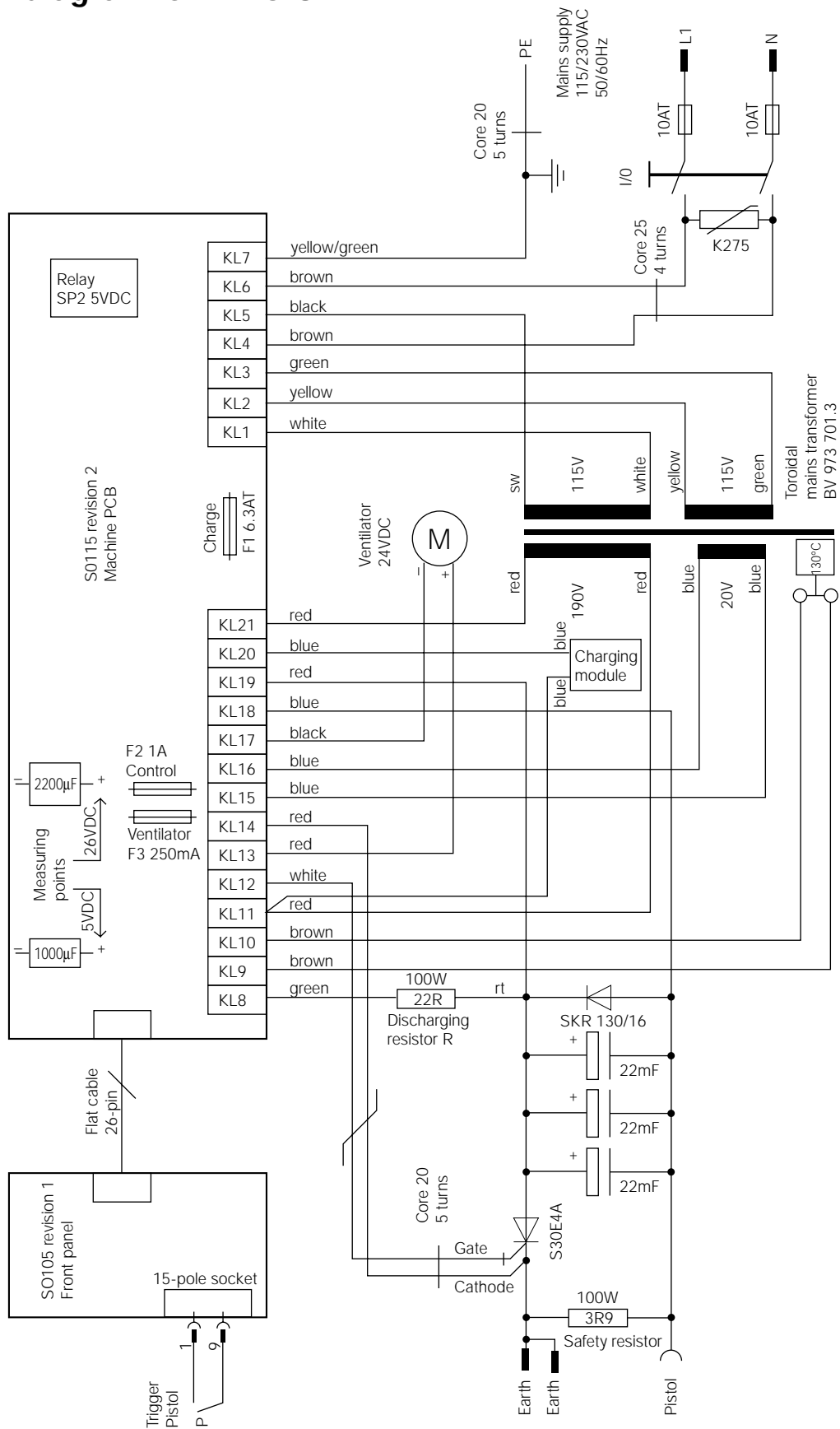


2.4 Technical data

Description	BMS-8N
Welding range	M3 - M8 or Ø 3 - 7.1 mm
Material	Steel, stainless steel. Aluminium and brass conditionally, depending on the respective requirements
Welding method	Tip ignition according to DVS Leaflet 0903
Standard pistol	Stud welding pistol PS-1K
Current source	Capacitor battery
Charging capacity	66,000 µF
Charging voltage	50 - 200 V infinitely variable up/down
Welding time	0.001 - 0.003 sec.
Welding sequence	up to 20 studs/min., depending on stud diameter
Mains supply	115/230 V AC, 50/60 Hz, 10/16 AT shock-proof socket (automatic voltage selection 115/230 V AC)
Fuse element	G - fuse link 5 x 20 mm, 2 x 10 A slow, 250 V. The fuse links are integrated in the unit mounting plugs at the rear side of the stud welders.
Welding cable	3 m highly flexible
Earth cable	2 x 3 highly flexible
Weight	10 kg
Colour	RAL 5009 azure
Subject to technical changes	

SZ.0125.E

2.5 Block diagram of BMS-8N



3 Safety instructions

These operating instructions contain basic instructions which have to be complied with during installation and/or operation. It is therefore absolutely necessary that these operating instructions are read by the operator and responsible specialist staff prior to assembly and initiation. They must always be available at the installation site.

Not only the general "safety instructions" listed under this main item, but also the special safety instructions e.g. for high temperatures, voltages, etc. listed under the other main items have to be complied with.

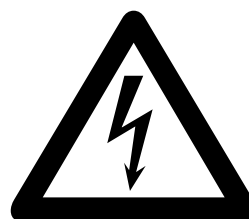
3.1 Description of reference signs in the operating instructions

The non-observance of safety instructions can cause damage to persons. The safety instructions of this manual are marked with the general symbol for danger



safety symbol in compliance with DIN 4844 - W9

Warning of electric voltage is specially marked with the



safety symbol in compliance with DIN 4844 - W8

In addition to these symbols, the words "DANGER TO HEALTH" or "MORTAL DANGER" refer to the degree of a possible danger.

Safety instructions the non-observance of which may endanger the machine and its functions are marked with the terms

"CAUTION" or "WARNING".

General instructions are marked with the hand symbol.



3.2 Staff qualification and training

The staff responsible for operation, maintenance, inspection and assembly must have the respective qualification for carrying out these works. Field of responsibility, competence and the supervision of staff has to be exactly regulated by the user. If your personnel do not have the necessary knowledge, they have to be trained and instructed. If necessary, this can be done by the manufacturer/supplier on behalf of the welding equipment user. Furthermore, the user must ensure that the contents of the operating instructions are fully understood by the staff.

The training and testing institute of welding in Munich (SLV: Schweißtechnische Lehr- und Versuchsanstalt) offers the appropriate training courses for your personnel.

3.3 Dangers in the case of non-compliance with safety instructions

The non-compliance with safety instructions may not only endanger persons, but also the welding system and its environment. Any non-compliance with safety instructions may result in a complete loss of damage claims.

Non-compliance with safety instructions may have the following consequences:

- Failure of important system functions
- Failure of prescribed methods for maintenance
- Danger to persons through electric, mechanic, thermal and acoustic influences

3.4 Safety-conscious working

The safety instructions listed in this manual, existing national accident prevention regulations and possible international working, operating and safety regulations of the user must be complied with.

3.5 Safety instructions for the operator/user

When stud welding, danger may result from

- electric current
- optical radiation
- harmful substances (smoke)
- acoustic shock
- spraying sparks

You are therefore obliged to restrict the dangers to an inevitable degree and to point these dangers out to the operator and other persons involved.



MORTAL DANGER

Persons with pacemakers must neither operate the stud welder nor stay near it.

3.6 The following should be observed before starting the system...

Before starting the system, pay attention to the following information:

- Juveniles under the age of 16 years must not operate the stud welding system.
- Read all of the operating instructions before starting the system.
- Only qualified personnel are allowed to operate the system.
- Prevent unauthorized use of the system by children or unqualified personnel.
- Wear non-combustible, closed working clothes.
- Wear a leather apron to protect your clothes from welding spatters that are generated during the welding process.
- Wear a head protection when carrying out welding works above your head.



MORTAL DANGER

When welding, do not wear clothes soiled with easily combustible substances such as oil, grease and paraffin oil, etc.



- Wear gauntlet gloves made of leather.
- Wear neither rings, watches nor electrically conductive jewellery.
- Wear protective goggles to protect your eyes from welding spatters and flashes of light that are generated during the process.
- Wear ear protection. Capacitor discharge generates a loud bang.

3.7 Before starting welding ...

- Check the state of all cables before starting to weld.
- Immediately replace defective cables and cable connections.
- Ensure that the air apertures of the housing are not covered. Heat accumulation may damage the stud welder.

3.8 Safety precautions at installation site

- When placing the stud welder on tables or similar workshop furniture, ensure that the stud welding system stands firmly and that the table can bear its weight.
- Make sure mains socket and stud welder are properly earthed.
- Comply with fire prevention regulations and do not weld in hazardous locations.
- Make sure room is well ventilated or extract welding fumes, if necessary.



DANGER TO HEALTH

When welding, fumes and suspended matters may be generated. Beware of fumes detrimental to health, particularly when using surface-treated materials. If possible, only weld in rooms which are higher than 3 m. As per VBG 15, special regulations are applicable for narrow rooms.

3.9 Working with the stud welder

- Comply with all accident prevention regulations which apply to the operation of your stud welder



One of the accident prevention regulations applicable for stud welders is VBG15 "Welding , cutting and similar working methods". For more information, contact the Employer's Liability Insurance Association.



MORTAL DANGER

When welding, do not wear clothes soiled with easily combustible substances such as oil, grease and paraffin oil, etc.

If an accident happens,

- switch off the stud welder and disconnect it from the mains supply
- call a doctor.

3.10 Safety instructions for maintenance, inspection and assembly works

Only carry out maintenance works when stud welder has been switched off

The user must ensure that all maintenance, inspection and assembly works are only carried out by authorized and qualified technical personnel.

Generally, only work at the system when it has been switched off and after having disconnected it from the mains supply. It is indispensable to comply with the procedure for stopping the stud welding system described in the operating instructions (chapter 3.13).

Immediately after having completed your work, re-install and activate all safety and protective devices.

3.11 Unauthorized retrofit and spare parts production

The system may only be retrofitted and modified after consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer guarantee safety. The use of other parts may result in the cancellation of warranty for any consequences thus caused.


3.12 Inadmissible operating methods

Limit values

Working safety of the stud welding system supplied can only be guaranteed when the stud welder is used in accordance with its purpose. The limit values indicated in the chapter "Technical data" must never be exceeded.

3.13 Stopping the stud welder


- Switch off the mains switch (chapter 5.1, item 9) located at the stud welder's rear side.
- Disconnect the mains plug from the socket.
- Disconnect
 - the earth cables (chapter 5.1, item 5)
 - the control cable (chapter 5.1, item 7)
 - the welding cable (chapter 5.1, item 6) from the stud welder.
- Roll up the cables without buckling them.



Our tool and gear wagon GW-1 is the optimum solution for installing SOYER stud welders and for properly storing welding pistols, cables, studs, retrofit kits etc.

- Make sure stud welder cannot be used by unauthorized persons.
- Check the welding cable and connections of the stud welder for damage such as burn-off, mechanical wear etc. and have damaged parts replaced by SOYER customer service.

3.14 The "S" symbol



MORTAL DANGER

The "S" symbol is the symbol for welding current sources permitted for operation with increased electric danger. The "S" symbol on our stud welders refers exclusively to the welding current circuit and not to the complete stud welder.

4 Installation of stud welder

- Only install the stud welder on an even surface. The four anti-vibration pads located on the bottom of the stud welder guarantee its anti-skid position and serve as vibration dampers.
- Although the stud welder is resistant to environmental influences, it should be protected against dampness and dust.
- Please pay particular attention to the bearing strength of the workshop furniture and ensure a safe and stable position.
- Make sure there is sufficient free space around the air apertures.
- Install the stud welder close to the welding location.
- Ensure correct connected loads with mains operation.
- The electrical connecting cable used for mains operation is of adequate length. Additional extension cables cause a voltage drop, possibly leading to unit disturbances.
- Ensure sufficient ventilation of the working room when operating the system.



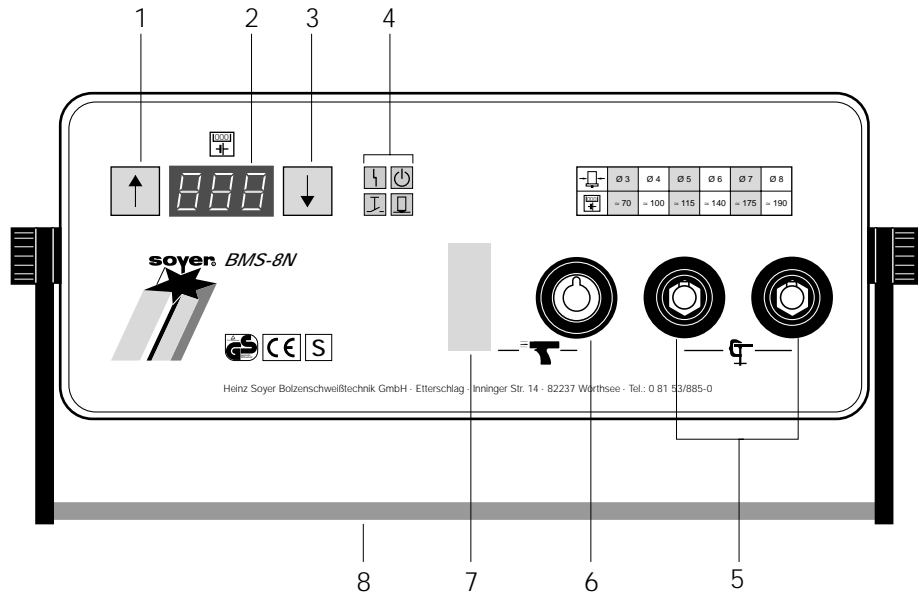
The housing of stud welder BMS-8N corresponds to safety class IP 21. Please observe e.g. that this system of protection is not suitable for being operated or transported in the rain.



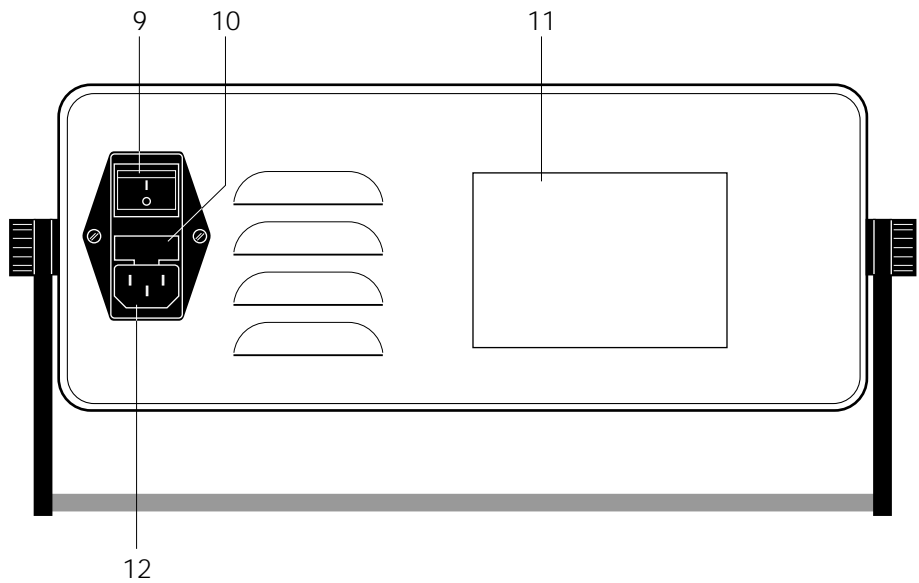
5 Initiation

5.1 Total view

Front view



Rear view



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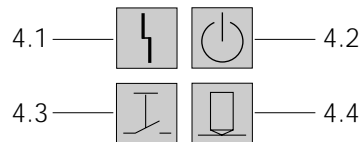
- | | |
|---|----------------------------|
| 1 Function key "Arrow up"
Increase of charging voltage | 6 Welding cable socket |
| 2 Charging voltage display | 7 Control cable connection |
| 3 Function key "Arrow down"
Decrease of charging voltage | 8 Carrying handle |
| 4 LED displays | 9 Mains switch |
| 5 Earth cable connectors | 10 Fuses |
| | 11 Type plate |
| | 12 Mains connector |

5.1.1 Operating elements

- **Mains switch (item 9, chapter 5.1)**
The mains switch located at the rear side of the stud welder serves to switch the stud welder on and off.
- **Function key "Arrow up" (item 1, chapter 5.1)**
The function key "Arrow up" (1) enables continuous increase of the charging voltage for larger stud diameters (for setting values, refer to the table).
- **Function key "Arrow down" (item 3, chapter 5.1)**
The function key "Arrow down" (3) enables continuous decrease of the charging voltage for smaller stud diameters (for setting values, refer to the table).

5.1.2 Display elements

- **Charging voltage display (item 2, chapter 5.1)**
The digital display shows the adjusted energy value. (charging voltage in volts)
- **LED display (item 4, chapter 5.1)**
The LED display shows the respective operational states.













- 4.1 LED "Malfunction"
- 4.2 LED "Ready"
- 4.3 LED "Release"
- 4.4 LED "Stud on workpiece"

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5.1.3 Connecting elements

- **Earth cable connectors (item 5, chapter 5.1)**
The earth cable connectors serve to connect the earth terminals to the stud welder.
- **Welding cable socket (item 6, chapter 5.1) and control cable connection (item 7, chapter 5.1)**
The control cable connection and the welding cable socket serve to connect the stud welding pistol to the stud welder.
- **Mains connector (item 12, chapter 5.1)**
The mains connector is located at the rear side of the stud welder. Use the mains cable supplied to connect the stud welder to the power supply.

5.1.4 Symbols

Symbol	Description	Function
	Digital display of measured values	Digital display of charging voltage in volts.
	Function key "Arrow up"	Increase of charging voltage.
	Function key "Arrow down"	Decrease of charging voltage.
	LED "Malfunction"	LED lights up when stud welder fails.
	LED "Ready"	LED lights up when stud welder is ready for operation.
	LED "Stud on workpiece"	LED lights up when earth terminal is connected and stud touches the workpiece.
	LED "Release"	LED lights up when trigger switch on welding pistol or weldig head is pressed.
	Stud diameter	Symbol for stud diameter.
	Earth	Marks where earth cable connectors are for earth cable connection.
	Pistol	Marks where control and welding cable sockets are for pistol connection.

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5.1.5 Fuse elements

The stud welder BMS-8N is protected by the following fuses:

- Mains supply fuses: 2 x 10 A slow Plug-in unit (item 10, chapter 5.1)
- Charging fuse F1: 6.3 A slow Control board S0-115
- Control fuse F2: 1 A slow Control board S0-115
- Fuse for ventilator F3: 250 mA slow Control board S0-115

**WARNING**

Should it become necessary to replace fuses, only use those with specified electrical values. Oversized fuses could either cause defects to the electrical system or a fire.

**MORTAL DANGER**

Always disconnect the mains plug from the power supply when replacing fuses!

5.2 Preparation for initiation

Connect the stud welding pistol and the earth cables to the stud welder prior to initiation.

5.2.1 Earth connection

- Connect earth cables to earth cable connectors (item 5, chapter 5.1) and lock by turning to the right until stop.
- Connect earth clamps to the workpiece.



Ensure optimum contact with workpiece.

5.2.2 Connection of stud welding pistol

- Connect welding cable of welding pistol to the welding cable socket (item 6, chapter 5.1) and lock by turning to the right until stop.
- Insert control cable into the control cable socket (item 7, chapter 5.1) and secure with both locking screws.
- Please observe the connecting instructions (see operating instructions for the welding pistols).

5.2.3 Mains supply

- Insert mains cable into mains connector (item 12, chapter 5.1) and connect to the power supply.

**MORTAL DANGER**

Only connect stud welder to authorized shock-proof sockets.



5.3 Operation

- Switch on mains switch.
The 4 LED displays (item 4, chapter 5.1) on the front panel of the stud welder shortly light up after switching the stud welder on.
- Select charging voltage by means of function key "Arrow up" (item 1, chapter 5.1) or "Arrow down" (item 3, chapter 5.1) depending on the respective stud diameter.
- Position pistol with welding stud on the workpiece.
When earth connection is made and the stud in the pistol touches the workpiece, the LED "Stud on workpiece" (item 4.4, chapter 5.1.2) lights up.
- Press pistol switch. LED "Release" (item 4.3, chapter 5.1.2) lights up and welding process is released.

Note regarding stud welding pistol PS-1

Pull the trigger handle of the stud welding pistol PS-1 rapidly to be sure to release a welding process. Please also observe chapter 9.2, Troubleshooting.





Hold the pistol still during the welding process and wait until the welding process has been completed before removing it vertically from the welded stud. A possible operating error e.g. the welding pistol glides off during welding, is identified by the stud welder and indicated as failure by LED "Malfunction" (item 4.1, chapter 5.1.2) lighting up (also refer to chapter 9.1 "Error code").

After removing the welding pistol from the welded stud, the capacitor battery is recharged. The stud welder is ready for welding again after a few seconds (LED "Ready", item 4.2, chapter 5.1.2, lights up).

5.4 Welding parameters

The welding parameters of the stud welder BMS-8N were determined by using the stud welding pistols PS-1 and PS-1K.

The charging voltages shown in the table on the right are standard values. They vary from the stated setting depending on the material type, workpiece thickness and surface condition of the workpiece.

	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8
	≈ 70	≈ 100	≈ 115	≈ 140	≈ 175	≈ 190

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6 Quality control

6.1 General

The 0905 DVS Guideline, part 2, of April 1979 is applicable with regard to quality assurance of stud weld joints. The tests described in this section are written in simplified terms, following above regulation. They refer to work tests that are carried out and supervised by the user prior to and during welding.

Heinz Soyer Bolzenschweißtechnik GmbH is a member of the German Welding Society (DVS = Deutscher Verband für Schweißtechnik e.V), Munich.

6.2 Demands on the company

The company must employ a technical supervisor responsible for welding matters, as well as qualified operating personnel for stud welding (see DVS Guideline 0905, part 2, section 4).

6.3 Proof of qualification

In the case of components which documentation must be provided for, or stud welding works which as per DIN 4100, DIN 4113 are subject to acceptance, the processing company must submit a certificate of competence or a proof of qualification for working with stud welding equipment (see DVS Guideline 0905, part 2, sections 4.1 and 4.2). The proof of qualification applies in particular to the fastening of structures that are relevant in terms of safety regulations. When being used in the building industry, only approved base and stud materials may be used (for example, see DIN 4100, section 2.1, certificate of approval for stainless steel ifBT; DIN 4113, part 2).

6.4 Type and scope of test

Provided that the SOYER stud welding system is properly used and the materials are appropriately selected, the strength of the welding joint (welding zone) will always be stronger than that of the stud or base material. The following tests are carried out in general practice:

- Standard work test (see DVS Guideline 0905, part 2, section 5.1.2)
- Simplified work test (see DVS Guideline 0905, part 2, section 5.1.2)



6.4.1 Standard work test

Generally, standard work tests have to be carried out and supervised by the user before welding at a structure and after a certain number of welds has been made. The number of welds after which a standard work test is required is agreed upon with the customer.

The standard work test is restricted to the stud diameter, base material and type of equipment used. It comprises the following tests:

- Visual inspection (all samples)
- Tensile test (at least 3 samples)
- Bend test (at least 3 samples)

In case of doubt, the test scope should be extended in compliance with DVS Guideline 0905, part 2, section 5.1.1.

6.4.2 Simplified work test

Simplified work tests serve to check the correct setting and function of the equipment. They are carried out at the beginning of every working shift and after several hours of interruption.

Simplified work tests include:

- Visual inspection (all samples)
- Bend test (all samples)

6.5 Test execution

6.5.1 Production of samples

The studs for the work test are welded on a sheet metal the minimum size of which is 700 mm x 200 mm. Use the same welding positions and edge distances as on the component to be welded later. If it is possible and sensible from an economical point of view, use parts that are identical to those used in later production.

6.5.2 Visual inspection

The visual inspection serves as a rough check for major defects. The uniformity of the weld is assessed. When in doubt, tensile and bend tests should be carried out.

6.5.3 Tensile test

The tensile test serves to test the metallic bond of the stud with the base metal. At least 3 studs are welded and then axially loaded by means of an appropriate tension device until they break. If the customer demands that a certain percentage of the welded studs should be tested with a specific test load in production, a tension device with load indicator should be used.

If the stud breaks outside the welding zone, the test is regarded as successful. If it breaks within the welding zone, however, the fractured surface must be examined. The unwelded surface may not exceed a maximum of 20 % of the welding surface. When in doubt, the breaking load in accordance with DIN 267, part 3, should be determined.

If the quantity of defective studs in one random test exceeds the acceptance number specified in DIN 267, part 5, as per AQL 4, it is necessary to find out the reason for the faults. The setting values must be modified and the test repeated.

6.5.4 Bend test

The bend test is a simple work test which serves to roughly check the setting values selected. The welding zone is subjected to undefined tension, pressure and bending. A minimum of 3 studs is welded and bent to an angle of 30° by means of a tube that is slipped over the stud. The test is considered as successful, if no superficial fissure or fracture is detected in the welding zone. The acceptance number in accordance with DIN 267, part 5, as per AQL 4 must be complied with. If the quantity of defective parts in one inspection lot exceeds the acceptance number AQL 4 (see DIN 267), the cause of trouble must be determined and the test repeated again.



7 Maintenance

7.1 Stud welder

The stud welder is constructed in such a way that only a minimum of maintenance is required. The interior of the stud welder should, however, be cleaned at regular intervals depending on the environmental conditions at the location of use. Any defects of the system's control part can easily be eliminated by replacing the printed circuit board and/or the clearly arranged fuses.



MORTAL DANGER

Before replacing any components, disconnect the mains cable from the mains supply. Electric and electronic components may only be replaced by a specialist. Contact the SOYER® service department if necessary.

7.2 Replacement of components

Defective components may only be replaced by trained SOYER servicemen. Perfect function of your stud welder can only be guaranteed when original SOYER spare parts are used.



MORTAL DANGER

Ensure that the capacitors are discharged before replacing any components.

7.3 Fuses

The stud welder BMS-8N is protected by the following fuses:

- | | | |
|---------------------------|---------------|-------------------------------------|
| - Mains supply fuses: | 2 x 10 A slow | Plug-in unit (item 10, chapter 5.1) |
| - Charging fuse F1: | 6.3 A slow | Control board S0-115 |
| - Control fuse F2: | 1 A slow | Control board S0-115 |
| - Fuse for ventilator F3: | 250 mA slow | Control board S0-115 |



DANGER TO HEALTH

Should it become necessary to replace fuses, only use fuses with the specified electrical values. Oversized fuses could either cause defects to the electrical system or a fire.



MORTAL DANGER

Disconnect the mains plug from the mains supply when replacing fuses.

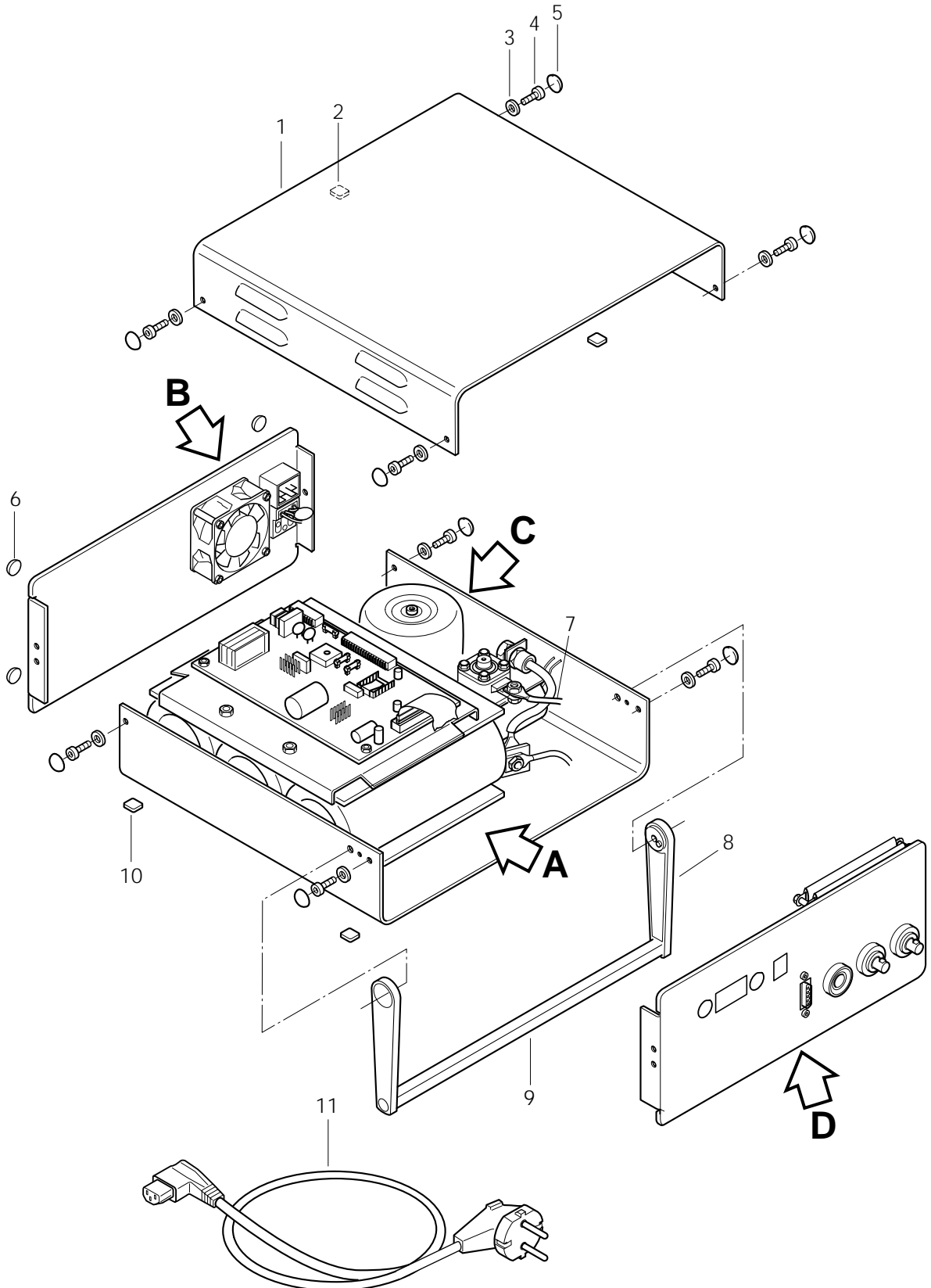


8 Spare parts

8.1 Spare parts list for BMS-8N stud welder - Overview

Item No.	Quantity	Description	Order No.
1	1	Upper part of housing _____	F03938
2	2	Rubber foot, internal _____	M01121
3	8	Washer M4, nylon _____	M01251/01
4	8	Fillister head screw M4x8 _____	M03509
5	8	Cap PVC, grey _____	M01251
6	4	Rubber foot, round _____	M03582
7	1	Lower part of housing _____	F03952
8	1	Holding device for carrying handle _____	M03562
9	1	Handle _____	F03957
10	5	Rubber foot _____	M01121
11	1	Mains cable _____	E03683

8.2 Exploded view of BMS-8N stud welder - Overview

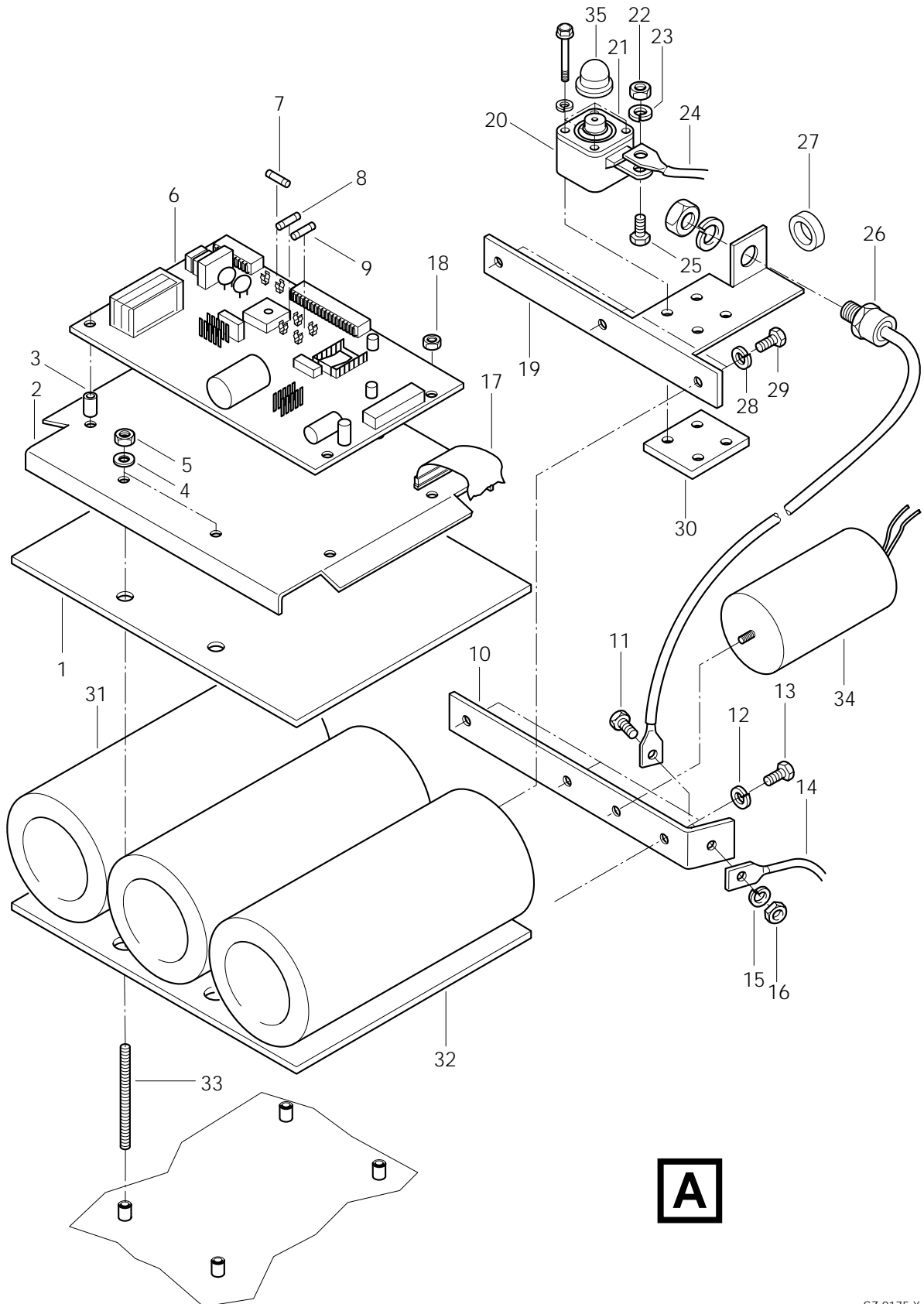




8.3 Spare parts list for BMS-8N stud welder - View A

Item No.	Quantity	Description	Order No.
1	1	Rubber mat _____	F03951
2	1	Capacitor mounting plate _____	F03949
3	4	Spacing bolt M4x10 _____	M03553
4	4	Spring ring M4 _____	M01074
5	4	Hexagon nut M4 _____	M01012
6	1	PC Board SO-115, revision 2 _____	F04295/FA
7	1	Fine-wire fuse 6.3AT _____	E01897
8	1	Fine-wire fuse 1AT _____	E01892
9	1	Fine-wire fuse 0.25AT _____	E03535
10	1	Busbar - _____	F02226
11	1	Hexagon head cap screw M8x16 _____	M01129
12	3	Spring ring M5 _____	M01075
13	3	Hexagon head cap screw M5x12 _____	M01117
14	1	Cable harness 160 mm _____	F03947/FA-E
15	1	Spring ring M8 _____	M01077
16	1	Hexagon nut M8 _____	M01015
17	1	Flat cable 26-pole _____	F03851/FA-E
18	4	Synthetic nut M4 _____	M03538
19	1	Busbar + _____	F04297
20	1	Thyristor clamping cap _____	E01987
21	1	Thyristor S30E4A _____	E01361
22	1	Hexagon nut M8 _____	M01015
23	1	Spring ring M8 _____	M01077
24	1	Cable harness 160 mm _____	F03947/FA-E
25	1	Hexagon head cap screw M8x16 _____	M01129
26	1	Diode SKR 130/16 _____	E01203
27	1	Toroidal core, coated _____	E03607
28	3	Spring ring M5 _____	M01075
29	3	Hexagon head cap screw M5x12 _____	M01117
30	1	Thyristor mounting plate _____	F03593
31	3	Capacitor 22000 μ F _____	E01199
32	1	Rubber mat _____	F03950
33	4	Threaded rod M4x85 mm _____	M01244
34	1	Charging module _____	E03795
35	1	Protecting cap (R 1/2") _____	M03641

8.4 Exploded view of BMS-8N stud welder - View A



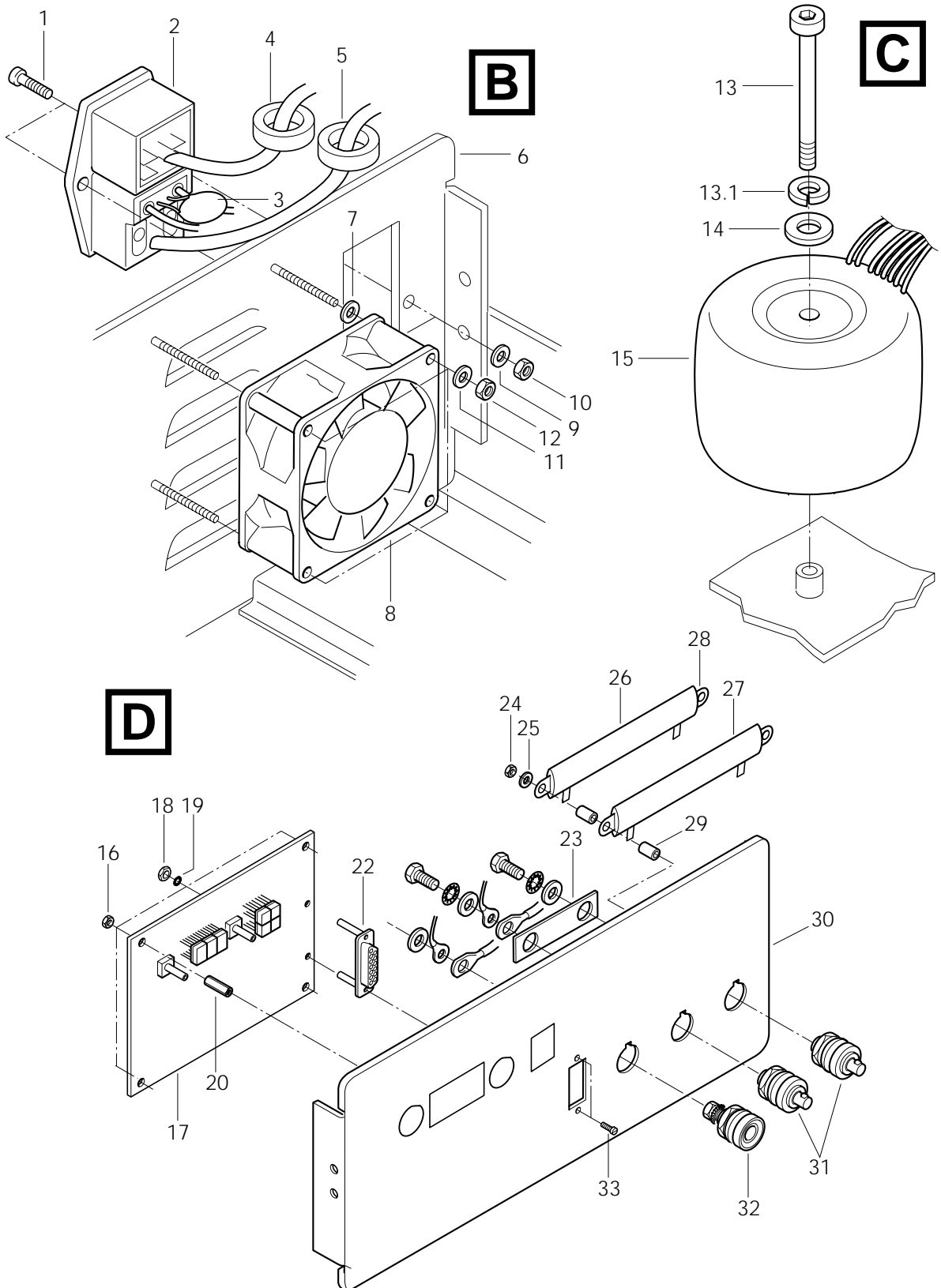
A



8.5 Spare parts list for BMS-8N stud welder - View B, C and D

Item No.	Quantity	Description	Order No.
1	2	Flat head screw M3x10 _____	M01348
2	1	Mains switch _____	E03685
3	1	Varistor _____	E01347
4	1	Coated toroidal core, large _____	E03607
5	1	Coated toroidal core, medium-sized _____	E03635
6	1	Rear panel of housing _____	F03939
7	4	Washer M4 _____	M01062
8	1	Fan 24VDC _____	E03684
9	2	Spring ring M3 _____	M01073
10	2	Hexagon nut M3 _____	M01011
11	4	Tooth lock washer M4 _____	M01221
12	4	Hexagon nut M4 _____	M01012
13	1	Cheese-head screw M6x70 _____	M03584
13.1	1	Spring ring M6 _____	M01076
14	1	Washer M6 _____	M01707
15	1	Toroidal mains transformer _____	E03689
16	4	Synthetic nut M4 _____	M03538
17	1	PC Board SO-105, revision 1 _____	F03941/FA
18	2	Slotted screw M3x6 _____	M01001
19	2	Spring ring M3 _____	M01073
20	4	Spacing bolt M4x20, synthetic _____	M03550
22	1	Panel jack 15-pole _____	E03714
23	1	Copper bar _____	F03942
24	2	Hexagon nut M4 _____	M01012
25	2	Spring ring M4 _____	M01074
26	1	Wire resistor 22R _____	E02881
27	1	Wire resistor 3.9R _____	E03687
28	4	Resistor mounting plate _____	F01296
29	4	Distance sleeve 7x1.4x10mm _____	M01261
30	1	Front panel _____	F03944/FA
31	2	Earth connector SEM-25 _____	E01964
32	1	Earth socket BEM-25 _____	E01958
33	2	Spacing bolt UNC 4-40 _____	M03576

8.6 Exploded view of BMS-8N stud welder - View B, C and D



9 Malfunctions

The following list of errors, their causes and remedies is designed to help you eliminate any trouble immediately on the spot. If it is difficult or impossible to eliminate the trouble, please contact the SOYER customer service responsible for your area or Heinz Soyer Bolzenschweißtechnik GmbH. For address and telecommunication data, please refer to chapter 1.6, page 1-4.



MORTAL DANGER

Always disconnect the connecting plug from the mains socket before opening the housing of the stud welding system. Only trained and appropriately qualified personnel are allowed to carry out works on the electric power supply and stud welder.



WARNING

Only trained and appropriately qualified personnel are allowed to replace components of the stud welding system.



MORTAL DANGER

Before replacing components, ensure that the capacitors are discharged.

9.1 Error codes

The stud welder switches off when malfunctions occur. The charging voltage of the capacitors is internally discharged. An error message appears as code on the charging voltage display (item 2, chapter 5.1):

Error code	Description	Possible cause
E-1	Safety circuit activated	Welding operating error
E-2	Charging duration exceeded	Charging fuse defective
E-3	Internal error	Safety circuit defective
E-4	Mains voltage not in order	Mains voltage deviation too large 115/230 V AC + 10 % - 15 %



The error message is acknowledged by switching the stud welder off and then switching it on again. If the error message appears again, please inform the customer service responsible for your area.

E-5	Excess temperature of transformer	Excessive welding cycle
-----	-----------------------------------	-------------------------



If the error message E-5 appears, please do not switch off the stud welder. The stud welder is ready for welding again after it has cooled down.

E-6	Software fault or hardware failure → Elimination by SOYER customer service only
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E-7	Hardware failure in charging circuit → Elimination by SOYER customer service only
-----	--



9.2 Troubleshooting

Error	Cause → Elimination
System does not weld, no sparking	System is not switched on → Switch on system, LED "Ready" and charging voltage display must light up
	Welding cable or control cable are not connected properly or damaged → Connect cables properly or check for damage. Replace if necessary
	Both earth cables are not connected or are not properly connected and/or earth clamps are not attached to the workpiece. → Connect earth cables, attach earth clamps to the workpiece
	Welding points and/or earth connection points at the workpiece are not metallicly blank → Prepare workpiece and/or studs
System is switched on, but does not function	Mains supply is defective → Check mains supply fuse
	Fuse of stud welder is defective → Replace defective fuse (see chapter 7.3)
There is no arc even though system is ready for operation	Stud without ignition tip or centre mark too deep for the ignition tip → Use stud with ignition tip or reduce centre mark
	Control of stud welder or welding pistol is defective → Inform SOYER customer service
	Stud is too loose in stud holder → Press stud holder together or tighten it
Stud thread scorched	Stud holder worn → Replace stud holder
Varying welding results	Welding energy not correctly adjusted → Adjust welding energy
	Cable connections are too loose. Transition resistances are generated → Check all cable connections and earth clamps for tight fit.
	Stud too loose or not fully inserted into stud holder until stop → Insert stud into stud holder until stop. If necessary, replace stud holder
Varying welding results	Magnetic blowing action. Arc is forced into a certain direction → Alter earth clamp fixture, place iron parts on the edges and/or rotate welding pistol



Error	Cause → Elimination
Intensive sparking, stud flange almost melted away	Welding energy is set too high → Reset welding energy
Stud not welded with total flange surface, deficient weld joint strength	Welding energy is set too low → Reset welding energy
	Poor earth connection → Check earth cables and earth clamps for tight fit, tighten if necessary
	Workpiece surface too soiled → Clean workpiece surface
	Stud weld base deformed → Use new welding studs
	Stud projection over stud holder incorrectly set → Set projection to 2-3 mm (distance between stud holder and stud weld base)
	Spring pressure incorrectly set → Set spring pressure
	Welding pistol in tilted position → Ensure that all 3 pistol legs are simultaneously and evenly positioned on the workpiece
	Base metal not weldable → Use suitable material combinations
System does not weld	Release period of 0.6 sec. exceeded after pressing the pistol trigger switch → Trigger handle of welding pistol PS-1 too slowly pulled → Pistol trigger switch incorrectly set or defective → Welding pistol mechanically defective (e.g. jammed or sluggish piston)
	Release period For safety and welding quality reasons, the ignition tip of the welding stud must touch the workpiece and be ignited within 0.6 sec. after pressing the pistol trigger switch. The welding process is not released when exceeding this period of time.



10 Transport and storage

The stud welder is sturdily designed and has a two-piece metal case with front and rear panel. Owing to the electronic components, however, please ensure that transport is free from vibrations.

The stud welder BMS-8N is equipped with a carrying handle for easy transport.

The unit suitcase GK-2 is the optimum solution for storing and transporting the stud welder BMS-8N and the stud welding pistol PS-1K.



Prevent unauthorized use of the stud welding system by children and unqualified personnel.

After long system standstill, we recommend having the stud welder checked by SOYER® servicemen prior to initiation.



The housing of stud welder BMS-8N corresponds to safety class IP 21. Please observe e.g. that this system of protection is not suitable for being operated or transported in the rain.

11 List of standards and guidelines

- 91/368/EEC
(formerly 89/392 EEC) EC Directive on Machinery
- 73/23/EEC EC Directive on Low Voltage
- 93/31/EEC
(formerly 89/336/EEC) EC Directive on Electromagnetic Compatibility
- EN 292 - 1 Safety of machinery; basic terms, general principles of construction; basic terminology, systems engineering
- EN 292 - 2 Technical principles, specifications
- EN 60204 -1
(formerly VDE 0113) Electric equipment of machinery, general requirements
- EN 60974 - 1 Safety requirements for arc welding equipment, part 1 welding current sources
- EN 292-2 Operating instructions
- VGB 1 General instructions
(instructions for accident prevention)
- VBG 5 Power-operated equipment
(instructions for accident prevention)
- DIN 4100 Welded steel structures with predominantly dead load
- DIN 267, part 5 Screws, nuts and the like, technical terms of delivery, testing and acceptance
- DIN 17100 Constructional steels - general types, quality standard
- DIN EN ISO 14555 Arc welding of metallic materials
- DIN EN ISO 13918 Studs and ceramic ferrules for arc welding
- DIN 50049 Certificate on material tests
- DIN 50125 Testing of metallic materials, tensile tests, guidelines for production
- DIN 54111, part 1 Non-destructive method of testing
- DVS Leaflet 0902 Arc welding with retract ignition
- DVS Guideline 0905, part 1 Quality assurance of stud welding joints



12 Terms of warranty

We warrant for this equipment for a period of 6 months in accordance with our conditions of sale and delivery.

Any claim to a warranty will be forfeited if damage is caused by improper operation, or if repairs or interferences have been made by unauthorized persons, or whenever accessories and spare parts have been used which do not match our equipment.

We cannot guarantee the quality of welding joints if welding studs acquired from another company are used.

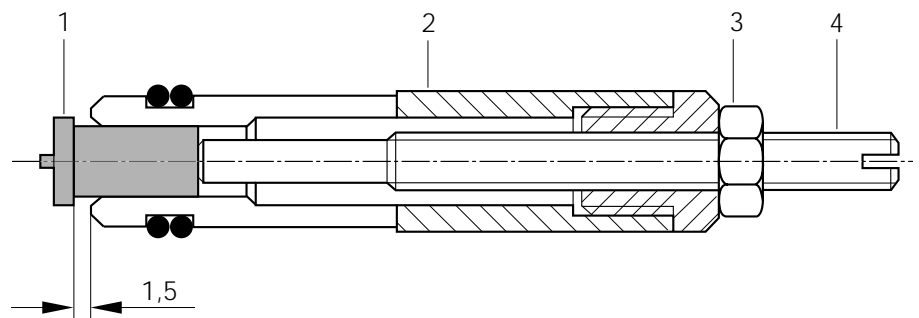
1 Adjustment of stud welding pistol

1.1 Adjustment of stud holder

The stud holders of stud welding pistols PS-1, PS-3K, PS-0K and PS-1K are all of the same style. When using long welding studs with the welding pistols PS-0K and PS-1K, however, it is necessary to shorten the stud holders' stop screw (4) due to these pistols' small size.



For pistols PS-1, PS-3K, PS-0K and PS-1K, use the standard stud holder of 40 mm length with adjusting screw!
Ensure that the maximum stud length does not exceed 35 mm.



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- | | |
|---------------|--------------|
| 1 Stud | 3 Lock nut |
| 2 Stud holder | 4 Stop screw |

Different stud holders are required for different stud diameters.

Adjust the stud holder as follows:

- Loosen lock nut (3)
- Insert stud (1) into stud holder.
The top edge of the stud flange must project for about 1.5 mm from the front edge of the stud holder.



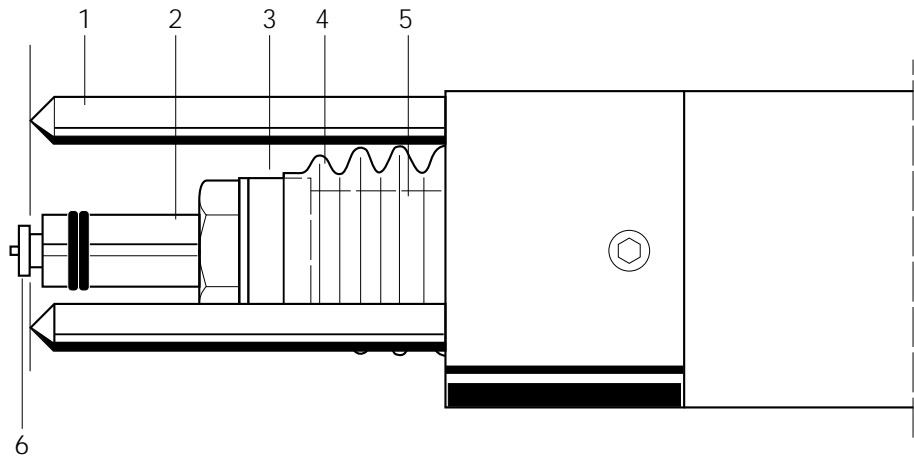
The stud must come into contact with the stop screw (4).

- Adjust stop screw (4) in the stud holder by turning it until the distance from the top edge of the stud flange to the front edge of the stud holder is 1.5 mm.
- Secure stop screw (4) by means of lock nut (3)



1.2 Installation of stud holder into stud welding pistols PS-1 and PS-3K

The illustration below shows how to install the stud holder into the stud welding pistols PS-1 and PS-3K.



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- | | |
|---------------|-----------------|
| 1 Pistol leg | 4 Bellows |
| 2 Stud holder | 5 Spring piston |
| 3 Sleeve nut | 6 Stud flange |

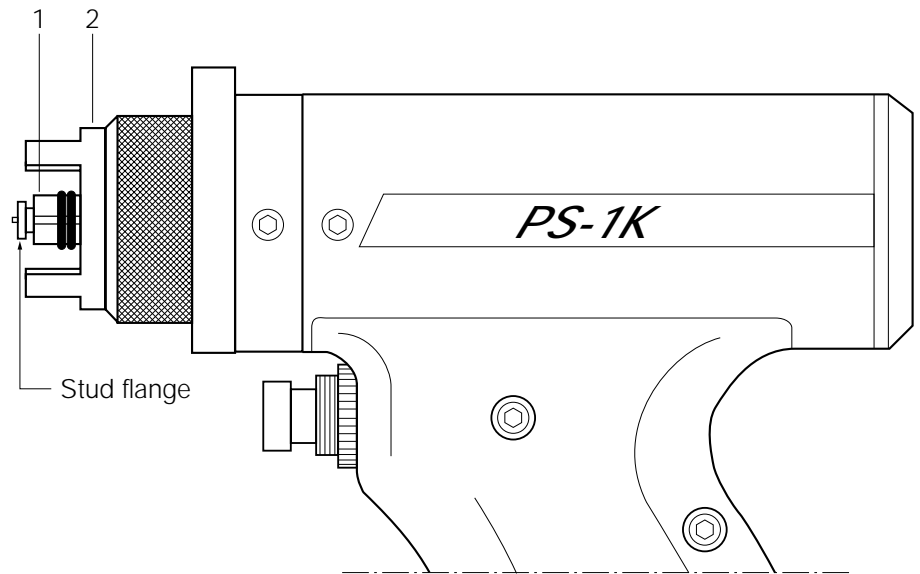
- Loosen sleeve nut (3) by means of socket wrench SW 17.
- Insert stud holder (2) into spring piston (5) until it stops.
- Tighten stud holder (2) by means of the sleeve nut (3).



The stud flange must project beyond the top of the pistol legs or the support tube for the thickness of the flange. If need be, remove stud holder and correct the projection by means of the stop screw.

1.3 Installation of stud holder into stud welding pistol PS-1K and PS-0K

The illustration below shows how to install the stud holder into the stud welding pistol PS-1K. These instructions are also applicable for stud welding pistol PS-0K.



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- 1 Stud holder
- 2 Support tube

- Loosen sleeve nut by means of socket wrench SW 14 .
- Insert stud holder (1) into spring piston until it stops.
- Tighten stud holder (1) by means of the sleeve nut.
Remove the support tube (2) to easily install the stud holder.



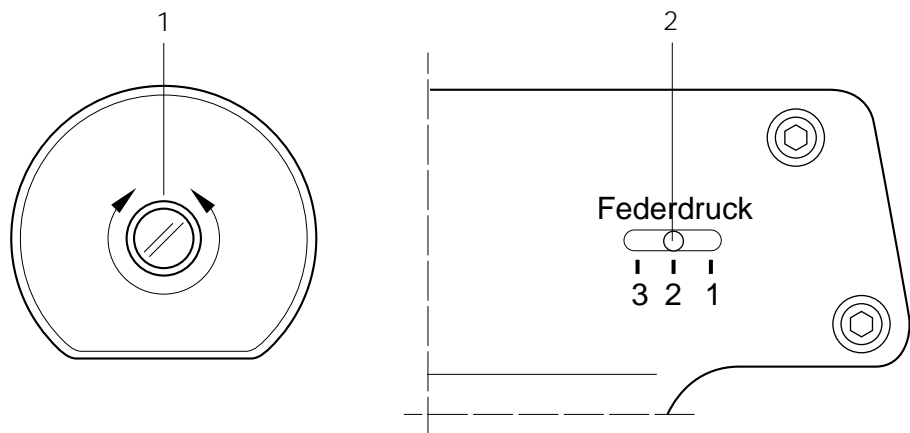
The stud flange must project beyond the top of the pistol legs or the support tube for the thickness of the flange. If need be, remove the stud holder and correct the projection by means of the stop screw.



1.4 Adjustment of spring pressure

The pressure with which the stud is pressed against the workpiece during the welding process is called spring pressure.

The illustration below shows how to adjust the spring pressure of stud welding pistol PS-1 which is equipped with a spring pressure indicator. The stud welding pistol PS-3K is equipped with a similar spring pressure indicator. The welding pistols PS-0K and PS-1K do not have a spring pressure indicator.



SZ.0137.E

- 1 Adjusting screw
- 2 Spring pressure indicator

The spring pressure for all stud welding pistols described here is adjusted by means of the adjusting screw (1). The adjusted spring pressure is indicated on the spring pressure scale (2). Adjust the spring pressure as follows:

- Turn adjusting screw (1) to the left until stop
Indicator position 1 = low pressure
- Turn adjusting screw (1) 3.5 turns to the right
Indicator position 2 = medium pressure
- Turn adjusting screw (1) to the right until stop
Indicator position 3 = strong pressure

The adjustment of spring pressure depends on the material of both the welding stud and the workpiece.

Before starting work, carry out some experimental welds and test them to find out the optimum adjustment.

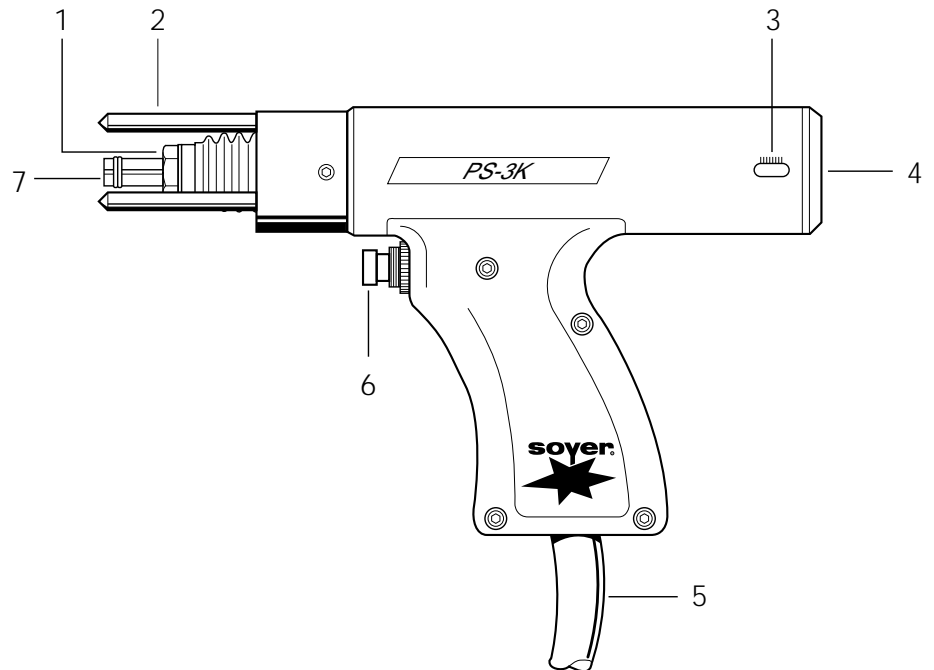
Several samples have to be taken during production to ensure constantly good welding results (see DVS Guideline 0905, part 2, "Quality assurance of stud welding joints").

2 Initiation

2.1 Total view

The illustration below shows stud welding pistol PS-3K. The indicated components are only slightly different from those of stud welding pistols PS-1, PS-3, PS-0K and PS-1K.

- The stud welding pistols PS-0K and PS-1K are equipped with support tubes instead of pistol legs (2).
- The stud welding pistols PS-0K and PS-1K are not equipped with a spring pressure indicator. The stud welding pistol PS-1K is optionally available with 3 pistol legs.



SZ.0135.X

- | | |
|---------------------------------------|--------------------|
| 1 Sleeve nut | 5 Connecting cable |
| 2 Pistol leg | 6 Push-button |
| 3 Spring pressure indicator | 7 Stud holder |
| 4 Adjusting screw for spring pressure | |



2.2 Connecting stud welding pistols to stud welder

The stud welding pistols are connected to the stud welder by means of pistol and control cables.

2.3 Operation

- Connect stud welder to earth
- Connect stud welding pistol as described in chapter 5
- Adjust welding pistol as described in Appendix A, Chapter 1
- Connect stud welder to the mains supply
- Adjust stud welder for the welding studs to be used
- Insert welding stud into stud holder
- Position stud welding pistol on the workpiece and press push-button



3 Spare parts

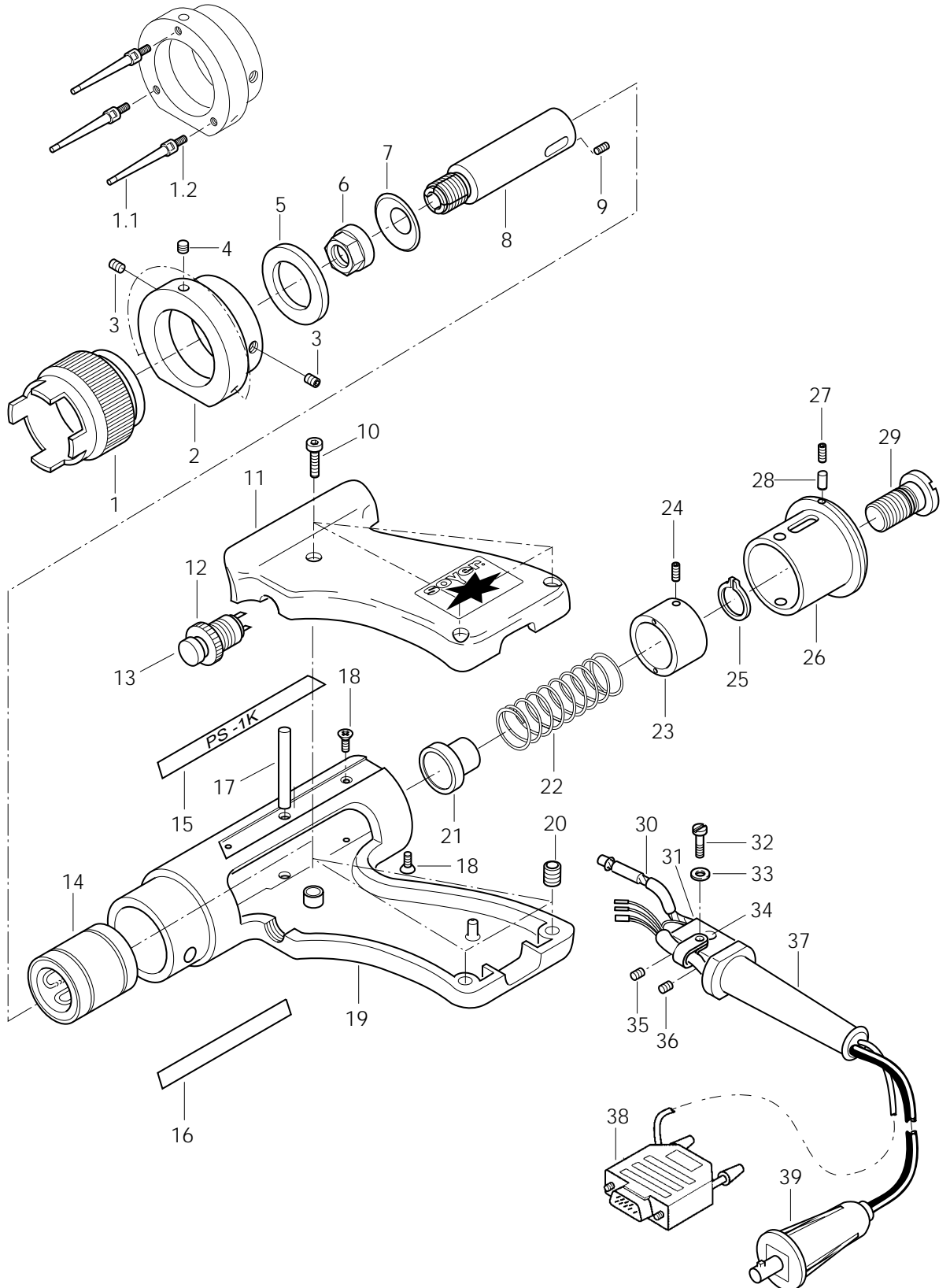


3.1 Spare parts list for stud welding pistol PS-1K

Item	Quantity	Description	Order No.
1	1	Support tube Ø 30 mm _____	F03813
1.1	3	Pistol leg (optional) _____	F03890
1.2	3	Grub screw (optional) _____	M01338
2	1	Support tube retainer _____	F03812
3	2	Grub screw M6 x 5 _____	M03541
4	3	Grub screw with spring M4 x 10 _____	M03542
5	1	Insulating ring _____	F03823
6	1	Sleeve nut _____	F01469
7	1	Bellows _____	F02989
8	1	Working piston _____	F03815
9	1	Grub screw M4 x 6 _____	M01315
10	3	Cheese-head screw _____	M01998
11	1	Pistol half-shell, small (contained in item 19) _____	not numbered
12	1	Push-button, 1-pole _____	E02103
13	1	Cap, PVC _____	E02104
14	1	Ball bearing bush _____	F03824
15	1	Pistol label PS-1K _____	M02042
16	1	Pistol label, company address _____	M01601
17	1	Cylindrical pin Ø 6 x 36 _____	M03594
18	2	Flat-head screw M3 x 6 _____	M01561
19	1	Complete pistol housing _____	F03811/FA
20	3	Insert nut M4 x 6 _____	M01809
21	1	Spring retainer _____	F03814
22	1	Pressure spring _____	F03891
23	1	Adjustable adapter _____	F02397
24	1	Grub screw M4 x 8 _____	M01333
25	1	Locking ring _____	M01374
26	1	Split taper socket _____	F02402
27	1	Grub screw M4 x 6 _____	M01315
28	1	PVC pin _____	F03128
29	1	Adjusting screw _____	F01729
30	1	Earth cable complete (stranded conductor)	F02405/FA
31	1	Strain relief _____	F01715
32	1	Cheese-head screw M4 x 10 _____	M01087
33	1	Spring washer M4 _____	M01074
34	1	PVC clip _____	M01387
35	1	Grub screw M5 x 8 _____	M01337
36	1	Grub screw M8 x 8 _____	M02108
37	1	Anti-kink sleeve _____	E02349
38	1	Control cable complete with plug _____	E02101
39	1	Pistol cable complete with plug _____	F01100/FA
		comprising	
	1	Earth connector SKM-25 _____	E01963
	3 m	Earth cable 25 mm ² _____	E02035



3.2 Exploded view of stud welding pistol PS-1K



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Appendix A/PS-1 and PS-1K - Spare parts - Tip ignition

Änderung der Netzspannung auf 115 / 230 Volt

Alteration of mains voltage to 115 / 230 volt



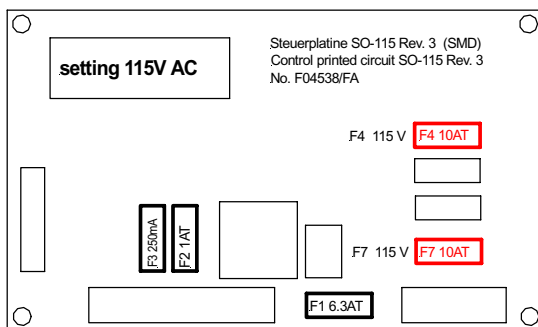
LEBENSGEFAHR

Ziehen Sie vor dem Öffnen des Gehäuses der Bolzenschweißanlage grundsätzlich den Anschlussstecker aus der Netzanschlussdose. Nur ausgebildetes und entsprechend qualifiziertes Personal darf Arbeiten an der elektrischen Stromversorgung und Anlage durchführen.



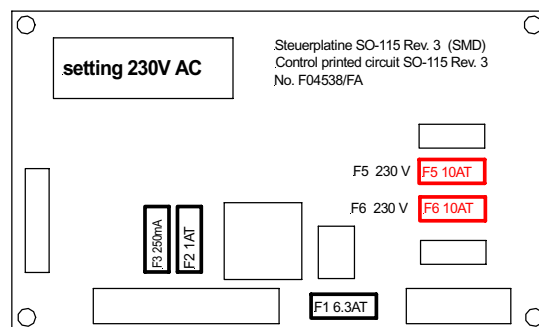
MORTAL DANGER

Always disconnect the connecting plug from the mains supply socket before opening the housing of the stud welding equipment. Only trained and appropriately qualified personnel are allowed to carry out works on the electric power supply and stud welder.



Netzspannung / Line voltage 115 Volt AC

Sicherung 10AT in Sicherungshalter F4 und F7 einsetzen.
Insert fuse 10AT into F4 and F7 fuse holders



Netzspannung / Line voltage 230 Volt AC

Sicherung 10AT in Sicherungshalter F5 und F6 einsetzen.
Insert fuse 10AT into F5 and F6 fuse holders

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