

Operating Instructions

Stud welding device

BMS-4 ACCU-DUO



DE: English version

Read these operating instructions before starting any work!



CE

Device numbers

We recommend entering your device numbers here so that they can be accessed quickly if servicing is required.

Device	Type	Serial number
Stud welding device	BMS-4 ACCU-DUO	
Stud welding gun	PS-0DV	

Operating Instructions

Document no.: P00225, 05-2022, translation of the original German manual (German: P00125)

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Revision status

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1 General information

These operating instructions contain important information and rules for the operation of the devices. Keep the operating instructions in a readily accessible location close to the devices.

The term 'Devices' in the operating instructions refers to the stud welding device BMS-4 ACCU-DUO and the stud welding gun PS-0DV.

Carefully read the operating instructions and any other documents contained in the technical documentation. Pay particular attention to the safety instructions which are intended to help you recognise any possible residual risks and prevent hazards.

The drawings and diagrams in these operating instructions are for illustration purposes and may vary slightly from the actual equipment.

The manufacturer reserves the right to make technical changes.

1.1 Validity of the operating instructions

These operating instructions apply to the following devices:

Stud welding device	BMS-4 ACCU-DUO
Stud welding gun	PS-0DV

1.2 Registered trademarks

The following terms in these instructions are used with registered trademarks:

SOYER®: Developments/technologies of Soyer GmbH.

1.3 Declaration of conformity

The devices are designed and constructed in accordance with the generally accepted codes of practice.



Please note that significant changes to the device will cause the declaration of conformity to become void.


Furthermore, the manufacturer's warranty may be rendered invalid.

Declaration of conformity – Stud welding device

Heinz Soyer Bolzenschweißtechnik GmbH
Inninger Straße 14
82237 Wörthsee

CE Declaration of Conformity

We herewith declare that the machine described in the following and the version available on the market correspond in design and construction to the safety and health requirements of the listed guidelines and standards. Any unauthorised modification to this machine automatically annuls this declaration.

Designation of machine	:	<u>Stud welding device</u>
Machine type	:	<u>BMS-4 ACCU-DUO</u>
Machine no.	:	_____
Applicable EU directives	:	RoHS Directive (2011/65/EU) Low Voltage Directive (2014/35/EU) EMC Directive (2014/30/EU)
Applied harmonised standards, in particular	:	EN 60 974-1:2018 + A1:2019 EN 60 974-10:2016
Applied national standards	:	DGUV Regulation 1
Date	:	01 November 2021
Producer's signature	:	 _____
Signer's function	:	Managing Director

1.4 Manufacturer

The manufacturer of the devices is:
Heinz Soyer Bolzenschweißtechnik GmbH
Inninger Straße 14
82237 Wörthsee
Phone: 0049-8153-885-0
Fax: 0049-8153-8030
Email: info@soyer.de
Web: www.soyer.de, www.soyer.com

1.5 Instruction, training

Soyer GmbH offers optional and individual instruction in the operation of the devices.

Moreover, Soyer GmbH offers training for customer-specific use of the devices.

Information on the scope and costs of instruction and training can be obtained from Soyer GmbH.

1.6 Standards and directives

The following standards, inter alia, must be observed for carrying out stud welding work and for the qualification of personnel:

- DIN EN ISO 14555 Welding - Arc stud welding of metallic materials
- DIN EN ISO 14732 Welding personnel - Qualification testing of welding operators and weld setters for mechanised and automatic welding of metallic materials
- DIN EN IEC 60974-9 Arc welding equipment - Installation and use
- Technical Bulletin DVS 0904 Instruction for practice - Arc stud welding










2 Important safety instructions

Read the following chapters carefully and follow the safety instructions. If you are uncertain or if an instruction cannot be followed, please contact the manufacturer.

The devices have been constructed according to the generally accepted codes of practice and in compliance with, and application of, the recognised safety requirements. To achieve the greatest possible safety, it is essential that all of the safety instructions in these operating instructions are heeded and followed.

2.1 Warning signs used

Warning signs are used in this document, depending on the potential danger of the situation.




Safety and information symbols used in this manual	
	Imminent danger leading to severe injuries or death.
	Potentially dangerous situation that may lead to severe injuries or death.
	Potentially dangerous situation that may lead to minor injuries. This notice is also used, without a warning triangle, in the event of imminent damage to property/material.
	Additional note on danger due to electric current. The additional sign is used in conjunction with a warning sign.
	Additional sign indicating the danger of burns. The additional sign is used in connection with a warning sign.
	Do not touch the surface or the housing: Risk of electric shock.
	Do not touch or open, danger to unauthorised persons.
	Danger to persons with medical implants such as pacemakers.
	The information sign is not a warning sign. It indicates important and useful information on the relevant topic.

Safety instructions on the devices

As an additional warning of danger, warning labels may be found on the devices. Warning labels are affixed by the manufacturer and must not be removed. If a warning label is damaged and thus becomes unrecognisable, a new warning label must be affixed immediately.

Warning labels must be obtained from the manufacturer.

2.2 General safety instructions



Danger from electric current, general information

When working on live components, there is a danger to life from electric current.

- Work on electric or electronic components may only be performed by trained electrotechnical personnel in accordance with currently applicable electrotechnical regulations.
- Protective devices must not be manipulated or disabled. Protective devices include, for example, housing and housing covers, fuses or power switches.
- If protective devices have to be removed for maintenance work, the device may only be switched on again when all protective devices are installed and their functionality has been checked.
- Starting the device with faulty protective devices is not permitted. Faulty protective devices must be repaired or replaced immediately. Unintentional operation by third parties must be prevented.

DANGER



Danger from electric current during maintenance and repair

When working on live components, there is a danger to life from electric current.

- Work on electric or electronic components must only be carried out by trained electrotechnical personnel of Soyer Bolzenschweißtechnik.
- Before performing any work on the stud welding device or stud welding gun, the mains switch of the device must be switched off and the mains plug of the stud welding device must be disconnected. The battery of battery-operated devices must be removed.
- If protective devices have to be removed for maintenance work, the device must only be switched on again when all protective devices are installed and their functionality has been checked.

DANGER



Danger from magnetic fields

In the area surrounding the device, strong magnetic fields occur during the welding process. These may influence medical auxiliary aids and can therefore result in danger to life.

- Persons with electrical medical aids (such as pacemakers) must keep away from the devices.
- The operating personnel must ensure that persons with medical aids keep away from the devices.

DANGER

Danger of explosion from an inappropriate installation site in explosive atmospheres

The device is not designed for use in potentially explosive zones.

- The device must not be installed and operated in potentially explosive atmospheres.

CAUTION



Risk of burns due to hot surfaces

During the welding process, the workpieces and some parts of the welding gun get so hot that touching them may cause burns.

- Always use personal protective equipment.
- Before working on hot parts of the device, check that they have cooled down.
- Do not hold the gun in the welding area.

WARNING



Risk of burns from hot welding spatter

Dangerous welding spatter can occur during the welding process.

- Always use personal protective equipment.

WARNING



Fire hazard from hot welding spatter

Welding spatter or hot workpieces produced during the welding process can result in fire hazard.

- Do not store combustible or highly inflammable materials in the welding area.

2.3 Safety instructions for the mode of operation

WARNING

Hazards due to incorrect working method

Hazards for operators and third parties can arise due to an incorrect working method.

- Ensure sufficient stability and a dry installation location for the device.
- Make sure you do not knock over the device or pull it down from its position with the gun cables.
- Make sure, especially with mobile use, of your own good stability during welding.
- Do not hold the workpiece in your hands during welding. The workpiece must be securely fixed during the welding process.
- Never wrap the gun lines around parts of your body (e.g. arm) as electric fields can occur.
- If the gun is not positioned properly or the gun settings are incorrect, a flash can occur during welding. Do not look directly into the flash.
- The gun carries out lifting movements during the welding process. Do not hold the gun tight in the area of moving parts.

2.4 Personal protective equipment






It is recommended to wear personal protective equipment when working with the stud welding device.

WARNING

Danger due to a lack of or incorrect PPE

During stud welding, there is a risk of burns, especially due to hot welding spatter. The formation of strong electric arcs can also cause a glare hazard.

- Always wear suitable, closed protective clothing.
- Type and extent of the protective equipment depends on the respective occurrence and intensity of welding spatter, arcs and/or noise. This varies depending on the basic material, stud material, stud size and required welding performance.
- Please observe the following instructions for protective equipment.

Recommended personal protection equipment	
	Protective goggles During welding, welding spatter and a flash of light occur. Wear appropriate safety goggles with side protection and a filter protector, if necessary.
	Protective gloves During welding, the workpieces and parts of the welding gun get hot and welding spatter occurs. Wear appropriate, non-combustible, heat-resistant protective gloves.
	Protective clothing Welding spatter occurs during the welding process. Wear appropriate, non-combustible and, if necessary, heat-resistant, protective clothing.
	Safety shoes Welding spatter occurs during the welding process. Wear appropriate, non-combustible, heat-resistant safety footwear.
	Hearing protection Depending on the welding device and the welding application, relatively loud welding noises may occur. Wear appropriate hearing protection.

2.5 Intended use of the stud welding device BMS-4 ACCU-DUO

The SOYER® BMS-4 ACCU-DUO stud welding device with capacitor discharge allows two M3 weld studs to be simultaneously welded. It is specifically used for attaching heat cost allocators and suchlike. A separate earth connection is not necessary due to the double welding gun.

Depending on the individual requirements, the stud distance of the PS-0DV welding gun can be variably adjusted from approx. 20 - 60 mm.

The battery operation enables mobile working even without power supply. A charging device included in the scope of delivery is required to charge the battery.

The stud welding device must be operated within the scope of the technical data.



Not all radiators on the market are suitable for welded installation of heat cost allocators.

Please ensure that you follow the installation instructions and specifications of the respective manufacturers of the heat cost allocators and radiators.

2.5.1 Incorrect use

Any use of the device deviating from the intended use is considered improper use.

Improper use, unauthorised modification or manipulation of the device will void the declaration of conformity and all warranty claims against the manufacturer.

Misuse of the welding gun as a tool, e.g. as a hammer for checking the weld quality, is not permitted.

2.6 Requirements on the part of the operator

The operator of the device must ensure that the preconditions described in this operating manual regarding safe operation of the device are met.

These include, for example, the conditions at the installation location, regulatory requirements for a safe workplace, training of the operating personnel and qualified personnel in using the device, if applicable, compliance with required maintenance work as well as monitoring the intended use of the device.

These operating instructions must be stored in the vicinity of the stud welding device.

The operator of the unit must ensure that the unit is only used if all protective devices are present, active and undamaged.

2.6.1 Prerequisites for personnel

Operating personnel

The persons authorised to operate the device must be familiar with the stud welding device and trained accordingly. They must have read and understood these operating instructions. Furthermore, they must be able to avert or minimise as far as possible any residual dangers to themselves and third parties when working on the equipment.

To maintain the qualification, safety briefings must be carried out at least once a year. In the event of malfunction or for maintenance, specially trained personnel or the manufacturer must be called in if necessary.

Operators of stud welding equipment must have technical expertise for operating and adjusting the devices properly as well as for properly carrying out welds.

If welding personnel have to be qualified for certification of welding, the DIN EN ISO 14555 and DIN EN ISO 14732 standards are to be observed.

Trained electrotechnical personnel

The following applies as a general rule: Work on live elements may only be performed by authorised electricians.

This work must be performed in line with the applicable technical rules for electrotechnical devices.



All devices of Soyer Bolzenschweißtechnik GmbH must only be opened by Soyer personnel or personnel authorised by Soyer.

3 Important safety instructions for battery operation

These operating instructions describe the operation of a stud welding device which is operated by a lithium-based high-performance battery.

The battery consists of several connected individual cells.

Due to the very high energy density and the technical design of these batteries, the batteries must be handled very carefully.



Hazards due to improper battery handling

Improper handling and use of a battery may lead to electric shocks, skin irritations, chemical burns, fire or explosion.

- For safe handling and operation, the following instructions and recommendations must be strictly observed.

General safety information

- Do not disassemble, open or shred batteries.
- Store batteries out of the reach of children and unauthorised persons.
- Do not expose batteries to heat or fire. Avoid storage in direct sunlight.
- Do not short-circuit batteries.
- Do not store batteries in a hazardous manner in a box or drawer where they can short-circuit each other or can be short-circuited by other conductive materials.
- Do not expose batteries to mechanical impact.
- A battery must not be removed from its original packaging until it is to be used.
- If a cell is leaking, do not allow the liquid to come into contact with the skin or get into the eyes. If contact has occurred, please rinse the affected area with plenty of water and consult a physician.
- Only use chargers which are especially designed for this type of battery.
- Do not use rechargeable batteries, cells or other batteries which are not designed for the use in combination with the device.
- If the connections of batteries are soiled, clean them using a dry, clean cloth.
- Keep batteries clean and dry at all times.
- Batteries must be charged before use. Always use the proper charging device and observe the manufacturer's instructions for correct charging.
- Do not charge batteries for an extended period if they are not to be used.
- Do not charge batteries at temperatures below 0 °C.
- The batteries may only be used in the SOYER® devices for which they are intended.
- If possible, batteries should be removed from devices, if the devices are not in use for several weeks.
- Never use or store batteries and devices with inserted battery in an explosive environment or in an environment with highly flammable substances.
- Ambient temperature during operation of the device: -20 °C to +50 °C.

Maintenance

- Regularly check whether the battery is in clean and dry condition.
- Use a clean and dry cloth to remove dirt.

Safe storage

- Always store batteries in a clean and dry place. Ideally store them at room temperature as a maximum or in colder environments (e. g. fridge).
- Admissible temperature during storage: -20 °C to +60 °C (recommended: 0 °C to +20 °C).
- Do not store batteries in discharged condition. The residual capacity should be at least 50 - 80%.
- Check stored batteries every 2 - 3 months and charge them, if required, to prevent deep discharge which results in the destruction of the battery.

Handling of defective batteries and disposal

- Always dispose of batteries in an environmentally compatible way in accordance with applicable local provisions. Consult the local waste disposal company.
- Never dispose of batteries in household waste.
- Do not dispatch batteries. If a battery is defective, please contact Soyer GmbH.
- Do not touch any leaking fluid with bare hands. Collect the fluid and dispose of it in the correct manner. Wear goggles and protective gloves.

Dealing with battery malfunctions

Abnormal battery performance such as incorrect charging or unusually long charging times, noticeable sudden power loss, unusual LED messages or leaking fluids can indicate a battery defect.

- In case of obvious or suspected battery malfunctions, please consult the Soyer customer service.

Procedure in case of battery fire

- Do not touch the burning battery, not even with protective gloves. A burning battery is extremely hot due to plasma formation!
- In case of battery fire, remove all flammable objects around the burning battery and call the fire brigade if required.
- Ensure sufficient ventilation to ensure that hazardous and explosive vapours can escape.
- In case of significant smoke development, please leave the room immediately.
- In case of respiratory tract irritation, consult a physician.
- Fight a battery fire with water only. Powder extinguishers and fire blankets only serve to extinguish surrounding fires but are not an effective method to fight the battery fire.

4 Transport

When transporting the device, make sure that it cannot be damaged. Appropriate packaging can protect the device against weathering effects, especially moisture.



Do not dispatch the battery.

Please observe chapter “3. Important safety instructions for battery operation” on page 17 ff.

5 Storage, shutdown

During storage or shutdown, make sure to protect the device against dirt and humidity. Protect the device against unauthorised access by third parties.



For the storage of the battery, please observe chapter “3. Important safety instructions for battery operation” on page 17 ff.

6 Disposal

Local environmental directives must be observed when disposing of the device. Water-endangering as well as environmentally hazardous substances must be disposed of in accordance with legal regulations.

Any material separation must be carried out in accordance with the regulations.



For the disposal of the battery, please observe chapter “3. Important safety instructions for battery operation” on page 17 ff.

7 Description of the BMS-4 ACCU-DUO stud welding device

The main elements of the stud welding device and its features are described in the following.

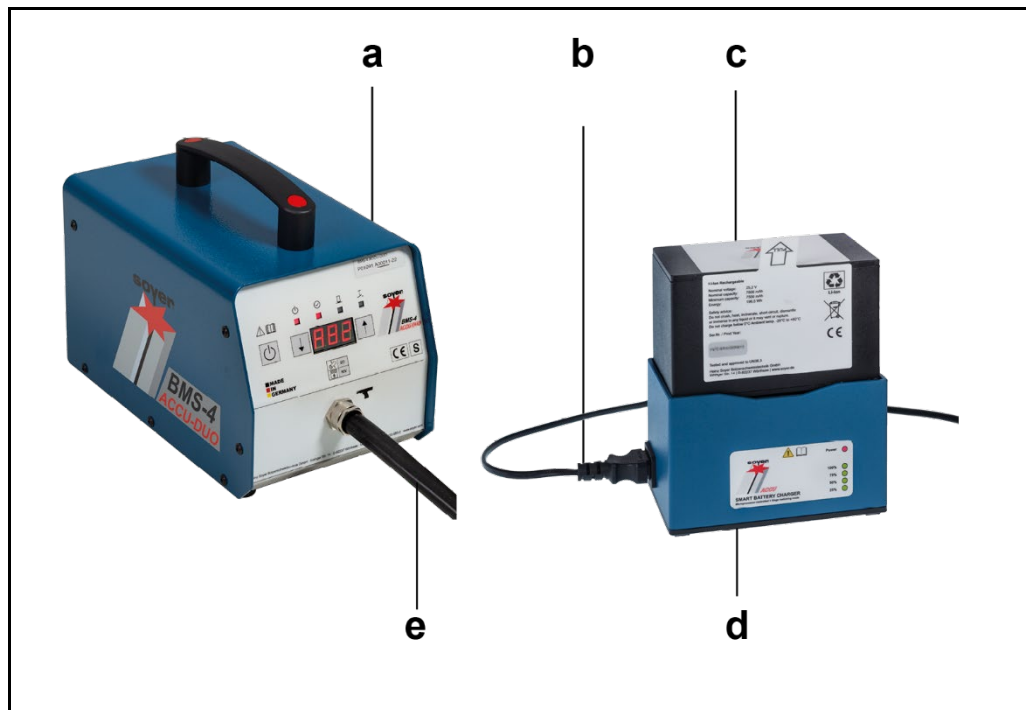


Figure 01: BMS-4 ACCU-DUO stud welding device

Item	Designation
a	BMS-4 ACCU-DUO stud welding device
b	Mains cable for battery charging device
c	Battery
d	Battery charging device
e	Gun cable with PS-0DV stud welding gun

7.1 Working method

The welding capacitors with a capacity of 100 Millifarad are charged with up to 99 V using the energy from the battery. The charging unit corresponds to a state-of-the-art inverter power source. The welding current output is exclusively via the welding capacitors.

The SOYER® BMS-4 ACCU-DUO stud welding device with capacitor discharge allows two M3 weld studs to be simultaneously welded. It is especially suitable for fastening heat cost allocators and suchlike. A separate earth connection is not necessary due to the double welding gun.

7.1.1 Product features

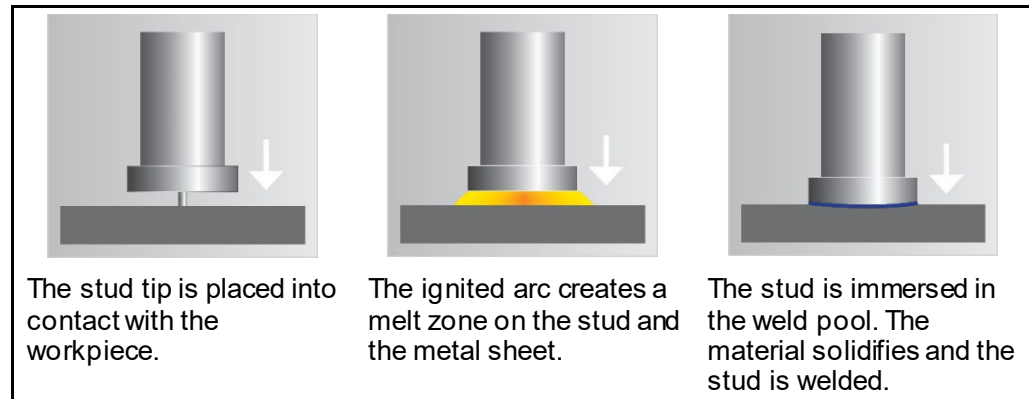
- Power supply via high performance battery
- Inverter switching power supply for maximum welding power
- High performance with a compact design and low weight
- Automatic storage of the charging voltage
- Short charging cycles to increase productivity
- Precise digital display of the charging voltage
- Monitoring of all functions via a clear function display field

7.1.2 Capacitor discharge stud welding

The SOYER® BMS-4 ACCU-DUO stud welding device operates according to the principle of capacitor discharge with tip ignition as defined in DVS Leaflet 0903 (DVS = German Welding Society).

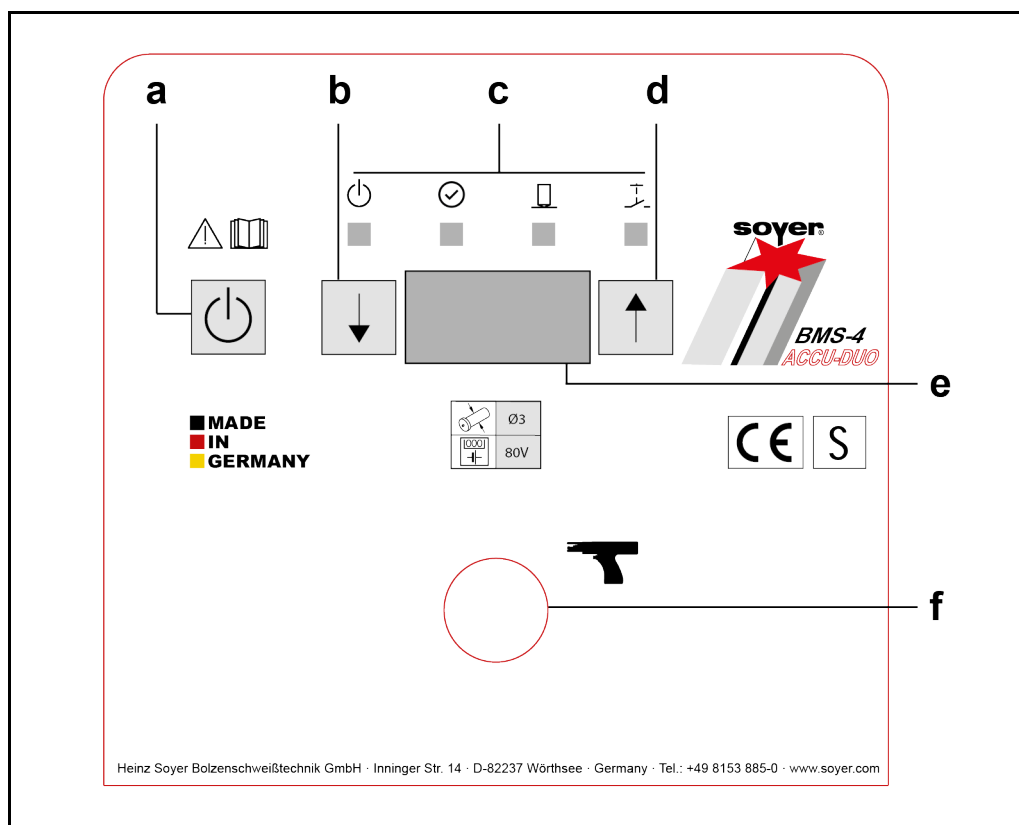
This system uses the sudden discharge of a capacitor bank to generate arc energy.

Functional principle



For more information on this subject, please visit: www.soyer.com.

7.2 Overview of the controls



Item	Designation
a	Power button for turning the device on/off
b	Function key for reducing displayed charging voltage
c	Display of operating states, see chapter "7.2.1. Displaying the operating states" on page 24
d	Function key for increasing displayed charging voltage
e	Display
f	Gun cable with PS-0DV welding gun (permanently connected)

7.2.1 Displaying the operating states

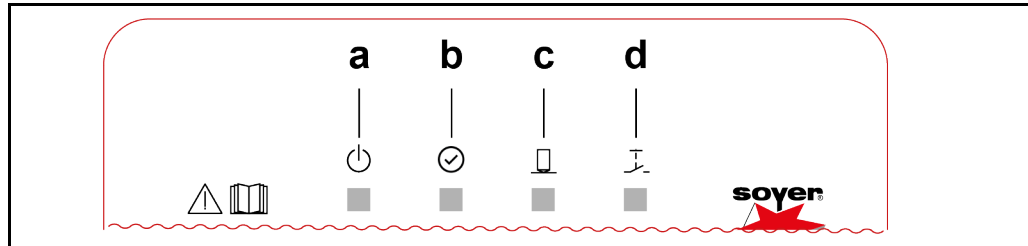


Figure 03: Operating states

Item	Designation
a	Device ready The LED lights up when the stud welding device is ready for operation in normal mode. When the LED flashes, the device is in the standby mode to save battery power. When the gun is operated, the device restarts.
b	Indication of the charging voltage The LED lights up as soon as the set charging voltage has been reached. After the welding process, the LED is off.
c	Stud on workpiece The LED lights up when both studs touch the workpiece.
d	Release The LED lights up when the trigger button on the welding gun is pressed.

7.2.2 Indication of the battery charging status on the device display



Figure 04: Indication of the battery charging status (70% in the example)

On the device display, the charging status of the battery is displayed. It is displayed as a capital "A" followed by the charging status in percent. You see this when you switch on the device directly after the charging voltage has been displayed (the charging voltage is displayed as a small "u" followed by the voltage in volts).

7.3 Charging and inserting the battery

The BMS-4 ACCU-DUO is operated exclusively by a battery. Please ensure that the device battery is always charged and ready for operation.

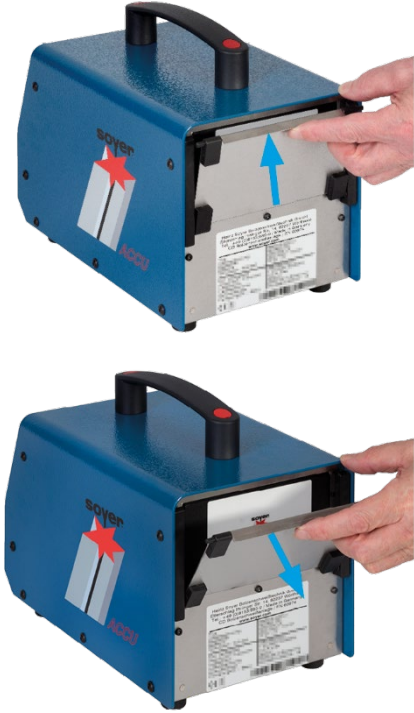

To charge the battery, you need the dedicated original charging device (item number F07051/FA).




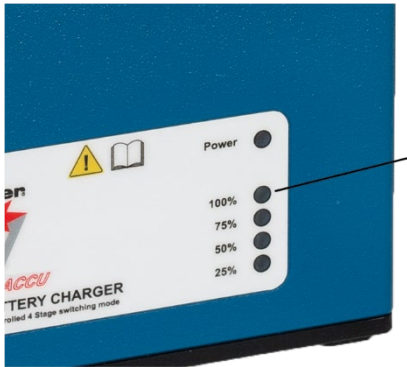
Figure 05: Battery charging device

Item	Designation
a	Battery charging device
b	Connection socket for the mains cable
c	Charging contacts for the battery
d	The power LED is illuminated if the charging device is connected to the mains supply
e	Charging status indicators for the current charging status of the battery



Removing, charging and inserting the battery

<p>Step 1:</p>	<p>To remove the battery, pull the cover up to open it.</p> 
<p>Step 2:</p>	<p>Pull out the battery.</p> 

Removing, charging and inserting the battery

<p>Step 3:</p>	<p>Place the battery on the charging station. Ensure that the battery is positioned correctly on the charging contacts (a).</p> 
<p>Step 4:</p>	<p>Pull out the battery. Charge the battery until the 100% charging status indicator (a) of the charging device is illuminated.</p>  <p>i</p> <p>Remove the battery from the charging device when it is fully charged. The charging device is not suitable as a permanent storage location for the battery.</p>

Removing, charging and inserting the battery

<p>Step 5:</p>	<p>Push the charged battery into the device to the stop.</p> <p>Ensure correct orientation so that the device contacts can engage with the battery. If the labelling on the battery can be read the right way round (a), the position is correct.</p>  <p>i</p> <p>If the battery cannot be pushed completely into the device, check the orientation and the contacts.</p>
<p>Step 6:</p>	<p>Close the cover.</p> 
<p>The exchange of the battery is complete.</p>	

7.4 Technical data of the BMS-4 ACCU-DUO stud welding device

Stud welding device:

Designation	BMS-4 ACCU-DUO stud welding device
Welding procedure	Capacitor discharge stud welding
Standard gun	PS-0DV (permanently connected)
Welding area	Simultaneous welding of two M3 studs on steel and stainless steel
Power source	Capacitor bank 100,000 µF
Energy	490 Ws
Charging voltage	40 - 99 V infinitely variable up - down
Welding sequence	3 double welds/min.
Power supply	Battery
Battery capacity	800 double welds M3
Cooling method	S, or passive by convection
Protection class	IP 21
Dimensions	180 x 235 x 300 mm (w x h x d)
Weight approx.	7.5 kg with inserted battery and welding gun
Item number	P01091
Subject to technical changes	

Battery charger:

Designation	Battery charging device
Mains connection	Wide-range power supply 100 - 240 V, 50/60 Hz
Power output	28.8 V, 2 A
Protection class	IP 30
Dimensions	83 x 96 x 152 mm (w x h x d)
Weight approx.	0.5 kg with mains cable
Item number	F07051/FA
Subject to technical changes	

Battery:

Designation	Battery for SOYER® stud welding device
Type	Lithium-ions
Rated voltage	25.2 V
Rated capacity	7800 mAh
Minimum capacity	7500 mAh
Energy	196.5 Wh
Battery charging time	5 hours maximum
Charging cycles	750 minimum
Dimensions	89 x 77 x 142 mm (w x h x d)
Weight approx.	1.2 kg
Colour	RAL 5009 azure
Item number	F07016/FA
Subject to technical changes	



Please also observe chapter “3. Important safety instructions for battery operation” on page 17 ff.

7.5 Permitted stud welding guns

Permitted stud welding gun: PS-0DV

The PS-0DV stud welding gun is permanently connected to the welding device. It is not possible to change the stud welding gun.



The use of other guns or guns from another manufacturer invalidates the declarations of conformity and the Soyer guarantees.

7.6 Cleaning the stud welding device

DANGER

Dangers during cleaning

Improper cleaning of the stud welding device can endanger personnel.

- The device may only be cleaned by trained specialists.
- Before any cleaning work is done, the stud welding device must be disconnected from the main power supply and secured against accidental switch-on. The battery of battery-operated devices must be removed.
- Work on electrical devices and components may only be performed by skilled electricians in accordance with electrotechnical regulations.
- Make sure that no liquids get into the device.

Do not use aggressive detergents for cleaning the device.

Please make sure that any cleaning waste is disposed of in an environmentally safe manner. Comply with the instructions of the detergent manufacturer.

CAUTION

Damage to the device due to incorrect cleaning

Improper cleaning may cause damage to the device.

- Make sure that no detergents get into the device.
- Do not use aggressive detergents for cleaning the device.

The frequency of cleaning depends on the operating conditions of the stud welding device.

8 Description of the PS-0DV stud welding gun

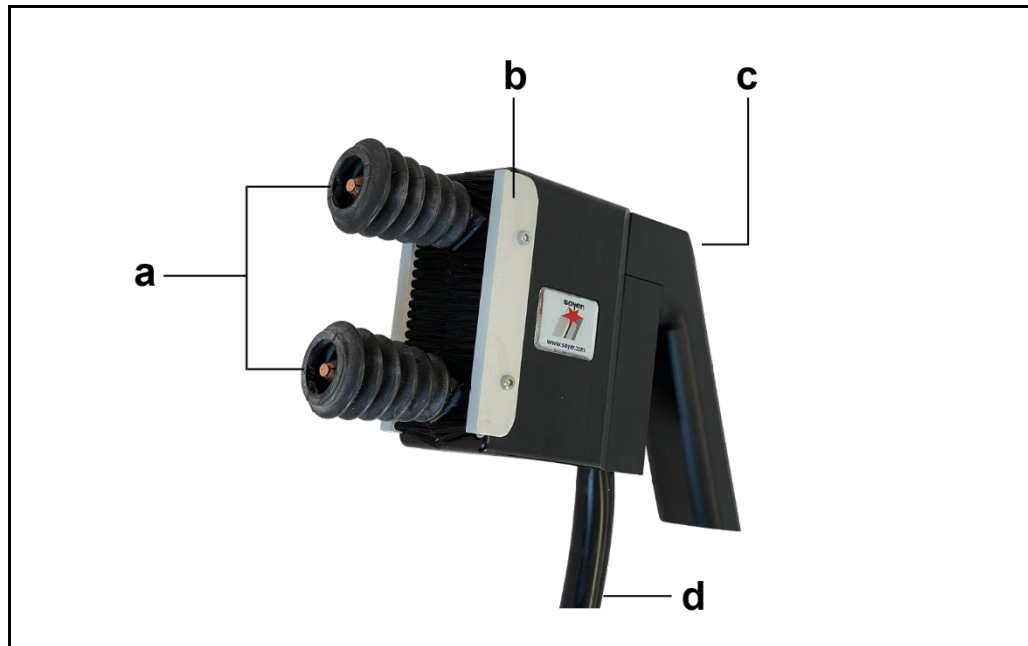


Figure 06: PS-0DV stud welding gun

Item	Designation
a	Bellows with stud chuck
b	Protective plate/wiper
c	Release button
d	Power and control cable for connection with the stud welding device

With this gun, the studs are pressed firmly onto the workpiece by a projection on the stud chuck and a spring in the gun (contact gun). The weld studs are not lifted before welding.



The PS-0DV stud welding gun may only be operated with the stud welding devices specified in the technical data.

8.1 Technical data of the PS-0DV stud welding gun

Designation	PS-0DV stud welding gun
Item no.	P01053
Welding process	Capacitor discharge stud welding
Stud diameter	2 x M3
Stud chuck	Adjustable
Stud length	Adjustable stud chuck up to a maximum of 35 mm Longer stud lengths with special accessory possible
Stud welding devices	The gun is approved for operation on the following SOYER® stud welding devices: <ul style="list-style-type: none"> • BMS-4 Akkumat • BMS-4 ACCU-DUO
Weight	1.7 kg with connecting cable
Subject to technical changes	

8.2 Cleaning of the welding gun

On a regular basis, remove slag and welding spatter from the gun and the stud chuck using a suitable tool.
The frequency of cleaning depends on the operating conditions of the stud welding gun.

CAUTION

Risk of injury during cleaning

Welding spatter and slag can be sharp-edged.

- Wear protective gloves when cleaning.



We recommend the use of SOYER® separating spray (order number M01464) in order to prevent impurities from welding spatter and slag and to simplify the cleaning process.

9 Description of the stud chuck

The PS-0DV welding gun is usually provided ex works with two adjustment-free stud chucks for M3 (item no.: F01148).

Unlike adjustable stud chucks, these adjustment-free stud chucks do not need to be set to the length of the welding stud.

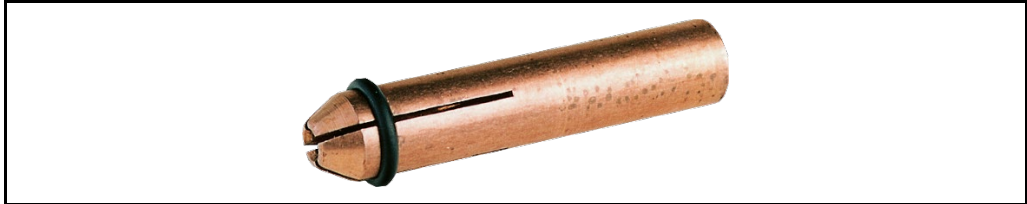


Figure 07: Adjustment-free M3 stud chuck (item no.: F01148)

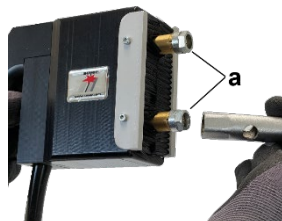
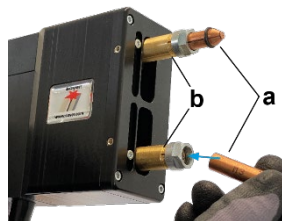
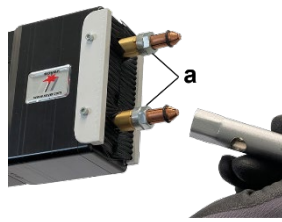


To attach heat cost allocators, two capacitor welding studs with M3 thread are usually welded on. Please ensure that you follow the installation instructions and specifications of the respective heat cost allocator manufacturers.

9.1 Installation of the stud chuck

The installation of the stud chuck is shown using the PS-0DV welding gun.

Installation of the stud chuck

Step 1:	⚠ WARNING Switch off the stud welding device. The stud welding device must be switched off when installing the stud chuck.	
Step 2:	Select the stud chuck according to the required stud diameter. Usually, two capacitor welding studs with M3 thread are welded.	
Step 3:	Loosen both sleeve nuts (a) by means of a SW 14 socket wrench.	
	Bellows not pictured	
Step 4:	Slide the stud chucks (a) up to the stop into the working pistons (b) of the gun.	
	Bellows not pictured	
Step 5:	Hand-tighten both sleeve nuts (a).	
	Bellows not pictured	
The assembly is complete.		



- The stud chucks must always be changed in pairs.
- Ensure that you always use two identical stud chucks.



The bellows (splash guard) was removed to achieve a better view. In practice, the bellows is not removed when installing or replacing the stud chucks.

9.2 Setting the stud distance

The PS-0DV stud welding gun allows stud distances of approximately 20 - 60 mm to be adjusted depending on the respective requirements.



NOTE

Make sure that the stud distance is adjusted according to your requirements before starting the welding process.

Upon request, a stud distance of 32, 40, 50, 52 or 57 mm can be permanently adjusted. The appropriate spacers can be obtained from our company. Please refer to chapter "15. Spare parts" on page 48.

If a distance has already been permanently set, remove both spacers or replace with another spacer, if need be.

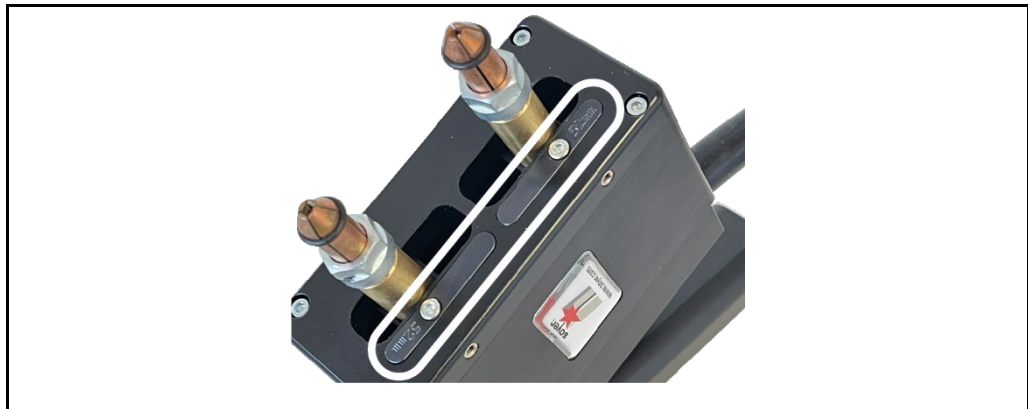
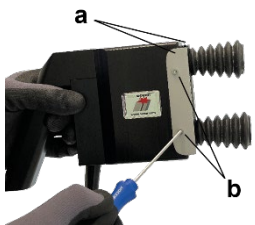
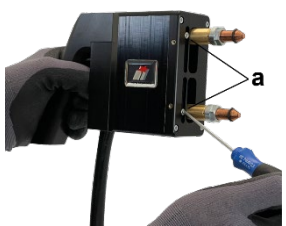
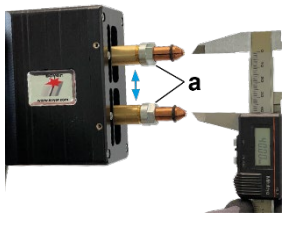


Figure 8: Stud distance is permanently set by means of two spacers.

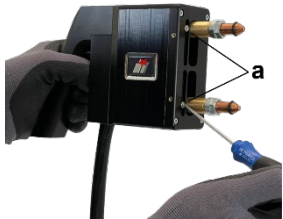
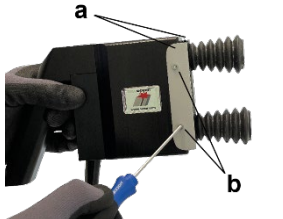


Figure 9: Without spacers. Stud distance must be adjusted.

Setting the stud distance

Step 1:	<p>⚠ WARNING</p> <p>Switch off the stud welding device. The stud welding device must be switched off when setting the stud distance.</p>	
Step 2:	Dismount both protective plates/wipers (a). To do so, loosen the screws at the side (b).	
Step 3:	Slightly loosen the locking screws (a).	
	Bellows not pictured	
Step 4:	Set the required distance between 20 mm and 60 mm by sliding the working pistons (a).	
	Bellows not pictured	

Setting the stud distance

Step 5:	Hand-tighten the fastening screws (a). Bellows not illustrated	
Step 6:	Install both protective plates/wipers (a). Hand-tighten the fastening screws (b) again.	
The assembly is complete.		



The bellows (splash guard) was partly removed to achieve a better view. In practice, the bellows is not removed when adjusting the stud distance.

10 Setup and connection

10.1 Requirements for the installation site




The installation site for the stud welding device must be clean and dry. Observe the permissible temperatures in chapter “3. Important safety instructions for battery operation” on page 17 ff. Ensure that ventilation for the stud welding device is sufficient. Do not install the stud welding device in an unventilated room. There is a danger of overheating.



Ensure that the installation surface is flat, clean and stable.

The installation location and workplace must comply with legal requirements.

Ensure that the installation site has good accessibility for maintenance work.

Make sure that the stud welding device cannot be soiled by dust (especially metal dust or chips) caused by work in the immediate surroundings (e.g. grinding work).

		
Danger from damp operation site or mobile use		
<p>There is a danger of electrocution when operating the stud welding device in a damp environment.</p>		
<ul style="list-style-type: none">• The stud welding device should only be operated in a dry environment.• The battery charging device should only be operated stationary and in closed and dry rooms. Mobile use is not permissible.		

	
Danger from welding vapours	
<p>Hazardous fumes may occur, depending on the material of the workpiece and/or the welding stud.</p>	
<ul style="list-style-type: none">• Ensure suitable suction of welding vapours, if necessary.	

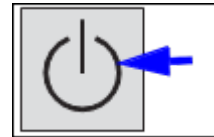
10.2 Connection of the stud welding device

10.2.1 Power supply

The BMS-4 ACCU-DUO stud welding device is operated exclusively by a battery. To use the battery, please observe chapter “7.3. Charging and inserting the battery” on page 25 ff.

10.2.2 Switching the device on and off

Use the power button to switch the stud welding device on or off.



- Switching on the device: Push button once briefly.
- Switching off the device: Push button once briefly.
- Switching off the device if the device is in the standby mode: Push button twice briefly (the device switches to normal operation first and then off).

10.3 Connecting the stud welding gun

The PS-0DV stud welding gun is permanently connected. It is not necessary to mount the stud welding gun on the stud welding device.

10.4 Adjusting the charging voltage on the stud welding device

The following describes how to set the charging voltage.

In order to achieve an optimal stud welding result, it is necessary to carry out some test welds with different settings.

The charging voltage to be set on the stud welding device depends, among other things, on the following influencing factors:

- Material of the workpiece
- Thickness of the workpiece
- Material of the welding stud
- Diameter of the welding stud (usually M3)

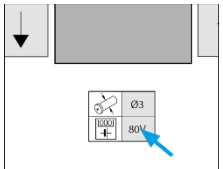



Usually two capacitor welding studs with M3 thread are welded. We recommend a charging voltage of 80 V as a basic setting.

This value serves as a guideline and normally has to be adjusted by test welding with the arrow keys.

The value set with the arrow keys remains stored even after the unit is switched off and on again until a new value is entered.

Adjusting the charging voltage

Step 1:	Connect the device as described in chapter "10. Setup and connection" on page 39 ff.
Step 2:	<p>Observe the charging voltage required for the relevant stud diameter.</p> 
Step 3:	<p>On the display, a charging voltage value will be displayed in [V]. Use the arrow keys ↑↓ to increase or decrease the value, if required.</p> 
<p>The charging voltage is adjusted.</p> <p>i</p> <p>The set value is saved and retained even after the unit is switched off and on again.</p>	

11 Welding operation



Not all radiators on the market are suitable for welded installation of heat cost allocators.

Please ensure that you follow the installation instructions and specifications of the respective manufacturers of the heat cost allocators and radiators.

11.1 Carrying out welding

The following describes how to carry out welds and prevent possible welding errors.



Danger from incorrect operation

A variety of hazards can occur during stud welding if the equipment is operated incorrectly.

Before using the stud welding device, see chapter “2. Important safety instructions” on page 9 ff.

If you have any problems understanding the operating instructions, please contact the manufacturer, Soyer.

Carrying out welding

Step 1:	Before welding, see chapter “2. Important safety instructions” on page 9 ff.
Step 2:	Insert the appropriate stud chuck and a welding stud (see chapter “9. 1. Installation of the stud chuck” on page 35). Only use SOYER® welding studs.
Step 3:	Check the charging voltage (see chapter “10.4. Adjusting the charging voltage on the stud welding device” on page 40).
Step 4:	Ensure that the welding points on the radiator are metallically bright. Grind welding points if need be.

Step 5:	Place the welding gun on the bare spots on the radiator. The integrated spirit level helps to align the welding position exactly.
Step 6:	Press the gun evenly and firmly against the radiator.
Step 7:	<p>Press the release button of the gun. Welding is carried out. Both welding studs are simultaneously welded to the radiator.</p> <p>i</p> <p>During the welding process, hold the gun steady and only remove it vertically from the welded stud after the welding process is finished. This will prevent the stud chuck from being widened and damaged.</p>
<p>The welding process is finished.</p> <p>After the welding gun has been removed from the radiator, the capacitor bank is recharged. After a few seconds, the stud welding device is ready for welding again (LED "Ready" lights up).</p>	



Figure 10: Example - Welding process at a radiator



Please ensure that you follow the installation instructions and specifications of the respective manufacturers of the heat cost allocators and radiators.

11.2 Notes on checking the quality of the weld

If the SOYER® stud welding device is handled correctly and the correct materials are selected, the strength of the welded joint (welding zone) is always higher than the strength of the stud or the base material.

In practice, the following production control tests have proved successful:

- Visual inspection
- Bend test

For further information, see standard:


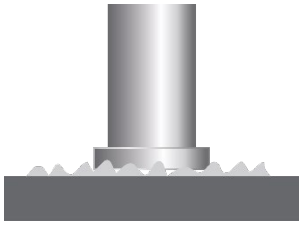


DIN EN ISO 14555 - Arc welding of metallic materials or Technical Bulletin DVS 0904 Instructions for practice - Arc stud welding.

11.2.1 Visual inspection

The visual inspection serves as a rough check for major defects. The uniformity of the weld is assessed here.

The following table serves as an aid for assessing the welding result:

Visual inspection

Welding image	Note
	Good weld joint. Optimum setting. Even, bright and closed welding bead.
	Poor weld joint, e.g. because the welding energy is too high or the immersion distance / lift is too small. The stud is constricted at the weld joint. The stud is only partly welded.
	Poor weld joint, e.g. because the welding energy is too low or the lift is too short. The welding bead is weak and unevenly formed.
	Poor weld joint, e.g. due to a blow effect or a welding gun that was shaken or applied at a slant. The stud flange is not fully welded and has visible imperfections. Undercuts are visible.

11.3 Welding defects and their causes

The following describes the most common welding faults, their possible causes and how to eliminate them.

Please contact Heinz Soyer Bolzenschweißtechnik GmbH if a problem cannot be solved.

Error	Possible cause and troubleshooting
Device does not weld, no sparking	Stud welding device is not switched on or battery is empty. <ul style="list-style-type: none"> Switch on the device, blue indicator lamp "Device ready" must light up.
	Welding points on the workpiece / the radiator are not metallically bright. The LED display "Stud on workpiece" does not light up (see chapter "7.2.1. Displaying the operating states" on page 24). <ul style="list-style-type: none"> Prepare the workpiece or stud. Grind connection points to a bright metal finish.
Scorched stud thread	Stud is too loose in the stud chuck. <ul style="list-style-type: none"> Replace both stud chucks.
	Stud chuck is worn. <ul style="list-style-type: none"> Replace both stud chucks.
Varying welding results with unchanged settings	Stud is too loose or not fully inserted into the stud chuck. <ul style="list-style-type: none"> Push in the stud until stop. If necessary, exchange the stud chuck.
	Welding studs manufactured inaccurately. <ul style="list-style-type: none"> Only use SOYER® welding studs.
Stud is not welded to the whole flange surface, strength of the weld is insufficient	Too much contamination on the surface of the workpiece (radiator). <ul style="list-style-type: none"> Clean or grind the surface of the workpiece to a bright metal finish.
	The front surface of the welding stud is deformed. <ul style="list-style-type: none"> Use new welding studs. Only use SOYER® welding studs.
	The welding gun was placed in tilted position. <ul style="list-style-type: none"> Position the welding gun evenly.

11.4 Malfunctions with an error message on the welding device

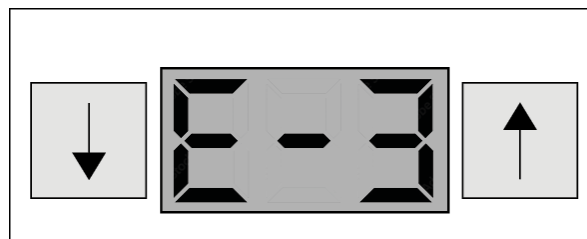
DANGER

Dangers during troubleshooting

During troubleshooting, various dangers may occur.

- All devices of Soyer Bolzenschweißtechnik GmbH must only be opened by personnel of Soyer or personnel authorised by Soyer.
- For troubleshooting, the device must be disconnected from the mains supply and secured against accidental switch-on.

When there is a malfunction of the stud welding device, an error message (code) appears on the display.



Code	Description	Possible cause
E01	Battery is empty	<ul style="list-style-type: none"> • Charge or exchange battery.
E02	Not available (nicht verfügbar)	-----
E03	Error when charging the capacitors	<ul style="list-style-type: none"> • The thyristor is defective, please contact our service.
E04	Excess temperature of the electronic equipment	<ul style="list-style-type: none"> • During high welding sequences, the device may be exposed to an increased ambient temperature (>45°C) or direct sunlight. • The device does not start again, even if the temperature decreases. In this case, switch off and on again.
E05	Capacitors are not being charged	<ul style="list-style-type: none"> • Gun not removed from stud after welding. • Welding capacitor is defective (leakage current). • Charging current source is defective.

12 Maintenance and repair

Maintenance and repair of the stud welding device and the stud welding gun may only be performed by Heinz Soyer Bolzenschweißtechnik GmbH or authorised specialists.

13 Service

If servicing is required, please contact:

Heinz Soyer Bolzenschweißtechnik GmbH
Inninger Straße 14
82237 Wörthsee
Phone: 0049-8153-885-0
Fax: 0049-8153-8030
Email: info@soyer.de

Please have the serial number ready during service requests.

Alternatively, you can also contact your respective Soyer agent. Contact information can be found on our website at

www.soyer.de or
www.soyer.com (English)

14 Warranty conditions

The warranty period for commercial or equal use is 12 months. If repair is required, we guarantee the correction of the defects at the Etterschlag/Wörthsee plant. Wearing parts are excluded.

The warranty claim shall expire if damage is caused through improper operation, repairs or interventions are undertaken by unauthorised persons and accessories and spare parts are used that are not intended for our devices.

When using welding studs from external manufacturers, we cannot guarantee for the proper function of the stud welding device and the quality of the welded joint.

15 Spare parts

Spare parts	Description	Dimension	Number	Order no.
	Stud chuck	M3	2	F01148
	Sleeve nut	SW 14	2	F01469
	Socket wrench	SW 14/17	1	M01444
	Bellows		2	F04671
	Protective plate/ wiper		2	F04671
	Spacer	32 mm	2	F04928
		40 mm	2	F04929
		50 mm	2	F04930
		52 mm	2	F04931
		57 mm	2	F04932
	Battery		1	F07016/F A
	Battery charger		1	F07051/F A

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