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Originalfassung

**DE BETRIEBSANLEITUNG**

**ELEKTRODEN INVERTER SCHWEISSANLAGE**

Übersetzung / Translation

**EN USER MANUAL**

**WELDER INVERTER DC MMA**


CE

**EISA162** **EISA200**

YOUR JOB. OUR TOOLS.

Edition: 16.05.2023 – Revision - 00 – EcC - DE/EN

# 2 SICHERHEITSZEICHEN / SAFETY SIGNS

| | | | |
|---|---|---|---|
| **DE** | SICHERHEITSZEICHEN<br>BEDEUTUNG DER SYMBOLE | **EN** | SAFETY SIGNS<br>DEFINITION OF SYMBOLS |

**DE** **CE-KONFORM!** - Dieses Produkt entspricht den EU-Richtlinien.

**EN** **CE-Conformal!** - This product complies with the EC-directives.

**DE** BETRIEBSANLEITUNG LESEN! Lesen Sie die Betriebs- und Wartungsanleitung Ihrer Maschine aufmerksam durch und machen Sie sich mit den Bedienelementen der Maschine gut vertraut, um die Maschine ordnungsgemäß zu bedienen und so Schäden an Mensch und Maschine vorzubeugen.

**EN** READ THE USER MANUAL! Read the user and maintenance carefully and get familiar with the controls in order to use the machine correctly and to avoid injuries and machine defects.

**DE** Maschine vor Reparatur, Wartung oder Pausen ausschalten und Netzstecker ziehen

**EN** Switch off the machine before repairing, servicing or stopping work and disconnect mains plug from electrical outlet

**DE** Persönliche Schutzausrüstung tragen!

**EN** Wear personal protective equipment!

**DE** Gefährliche elektrische Spannung

**EN** Dangerous electrical voltage

**DE** Warnung vor heißer Oberfläche

**EN** Warning of hot surface

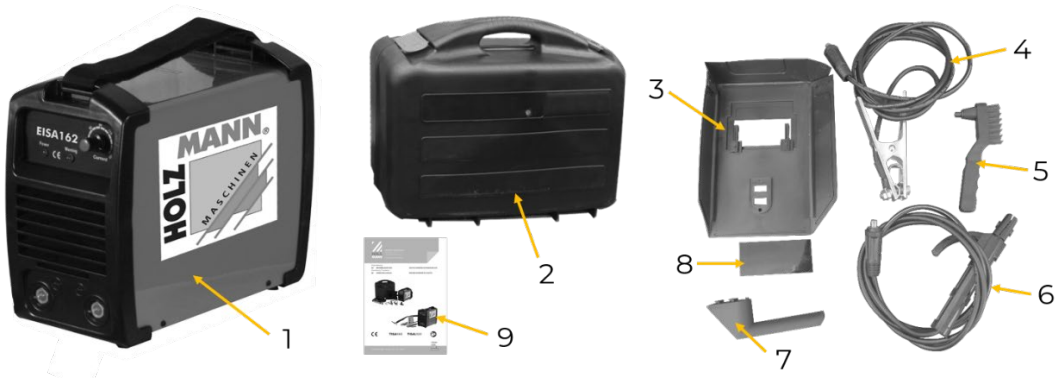
**DE** **Warnschilder und/oder Aufkleber an der Maschine, die unleserlich sind oder die entfernt wurden, sind umgehend zu erneuern!**

**EN** **Missing or non-readable safety stickers have to be replaced immediately!**

# 3 TECHNIK / TECHNICS

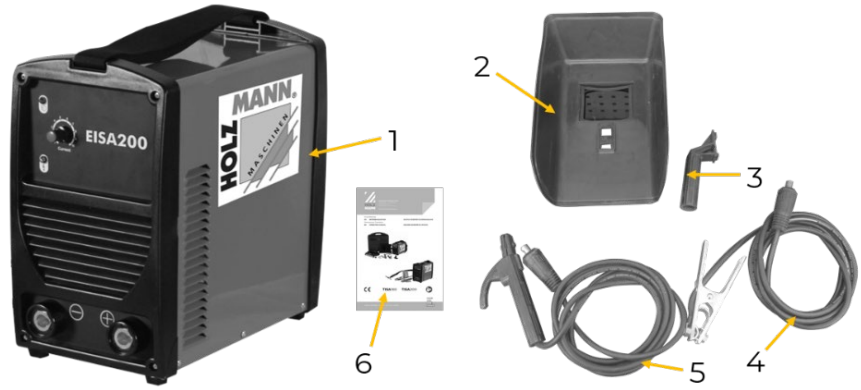
## 3.1 Lieferumfang / Delivery content

**EISA162**




| | |
|---|---|
| **1** | Maschine / machine |
| **2** | Tansportkoffer / carrying case |
| **3** | Schweißschirm / welding screen |
| **4** | Massekabel / earth cable |
| **5** | Schlackenhammer mit Bürste / chipping hammer with brush |
| **6** | Elektrodenhalter / electrode holder |
| **7** | Schweißschirmgriff / handle welding screen |
| **8** | Schweißschirmglas / welding screen glass |
| **9** | Betriebsanleitung / user manual |

**EISA200**




| | |
|---|---|
| **1** | Maschine / machine |
| **2** | Schweißschirm / welding screen |
| **3** | Schweißschirmgriff / handle welding screen |
| **4** | Massekabel / earth cable |
| **5** | Elektrodenhalter / electrode holder |
| **6** | Betriebsanleitung / user manual |

## 3.2 Komponenten / Components

### EISA162


| | |
|---|---|
| **1** | Schweißstromregler / welding current controller |
| **2** | Warnleuchte Überlastschutz / warning lamp overload protection |
| **3** | Betriebskontrollleuchte / power indicator light |
| **4** | Negative (-) Schweißstrombuchse / negative (-) welding current terminal |
| **5** | Positive (+) Schweißstrombuchse / positive (+) welding current terminal |
| **6** | Ein-Aus-Schalter / ON-OFF switch |
| **7** | Masseklemme / earth clamp |
| **8** | Elektrodenhalter / electrode holder |
| **9** | Trageriemen / carrying strap |
| **10** | Gehäuse / housing |

### EISA200


| | |
|---|---|
| **1** | Warnleuchte Überlastschutz / warning lamp overload protection |
| **2** | Schweißstromregler / welding current controller |
| **3** | Betriebskontrollleuchte / power indicator light |
| **4** | Negative (-) Schweißstrombuchse / negative (-) welding current terminal |
| **5** | Positive (+) Schweißstrombuchse / positive (+) welding current terminal |
| **6** | Ein-Aus-Schalter (Leistungsschalter) / ON-OFF switch (circuit breaker) |
| **7** | Masseklemme / earth clamp |
| **8** | Elektrodenhalter / electrode holder |
| **9** | Trageriemen / carrying strap |
| **10** | Gehäuse / housing |

## 3.3 Technische Daten / Technical data

| Parameter / parameters | EISA162 | EISA200 |
|---|---|---|
| Spannung (Frequenz) / voltage (frequency) | 230 V (50/60 Hz) | 230 V (50/60 Hz) |
| Eingangsleistungskapazität / input power capacity | 4,8 KVA | 6 KVA |
| Leerlaufspannung / no load voltage | 70 V | 70 V |
| Schutzart / protection mode | IP21S | IP21S |
| Schutzklasse / protection class | F | F |
| MMA Schweißstrombereich / MMA welding current range | 10A / 20,4V - 150A / 26V | 10A / 20,4V - 200A / 26V |
| max. Primärstrom $I_{1max}$ / max. rated input current $I_{1max}$ | 30 A | 38 A |
| max. effektiver Primärstrom $I_{1eff}$ / max. effective input current $I_{1eff}$ | 12 A | 23 A |
| min. Energieeffizienz der Stromquelle / min. power source efficiency | 83 % | 83 % |
| max. Leistungsaufnahme im Leerlaufzustand / max. idle state power consumption | 63 W | 57 W |
| Masseklemme / earth clamp | 200 A | 300 A |
| Elektrodenhalter / electrode holder | 200 A | 300 A |
| Massekabellänge / earth cable length | 2,5 m | 3 m |
| Elektrodenhalterkabellänge / electrode holder cable length | 2,5 m | 3 m |
| Anschlusskabel / cord | H05VV-F 3G 1,5mm² | H05VV-F 3G 2,5mm² |
| Anschlusskabellänge / cord length | 1,8 m | 2,3 m |
| Kühlung / cooling | Lüfter / fan | Lüfter / fan |
| Einschaltdauer (MMA) / duty cycle (MMA) | 15% 150A<br>60% 75A<br>100% 60A | 35% 200A<br>60% 160A<br>100% 130A |
| Netto-Gewicht (mit Zubehör) / net weight (with equipment) | 4 (5,5) kg | 11 (13) kg |
| Brutto-Gewicht / gross weight | 8 kg | 15,5 kg |
| Verpackungsmaße (LxBxH) / packaging dimensions (LxWxH) | 505x210x465 mm | 420x410x400 mm |
| Maschinenmaße (LxBxH) / machine dimensions (LxWxH) | 310x135x245 mm | 320x185x325 mm |

**(DE)** Das Gerät erzeugt einen maximalen Schallleistungspegel <80dB(A) bei Leerlauf sowie in der Kühlungsphase nach Betrieb entsprechend dem maximal zulässigem Arbeitspunkt bei Normlast gemäß EN 60974-1.

Ein arbeitsplatzbezogener Emissionswert kann beim Schweißen (und Schneiden) nicht angegeben werden, da dieser verfahrens- und umgebungsbedingt ist. Er ist abhängig von den verschiedensten Parametern wie z.B. Schweißverfahren (MIG/MAG-, WIG/TIG-Schweißen), der angewählten Stromart (Gleichstrom, Wechselstrom), dem Leistungsbereich, der Art des Schweißgutes, dem Resonanzverhalten des Werkstückes, der Arbeitsplatzumgebung u.a.m.

**(EN)** The unit generates a maximum sound power level <80dB(A) at no load as well as in the cooling phase after operation according to the maximum permissible operating point at standard load in accordance with EN 60974-1.

A workplace-related emission value cannot be specified for welding (and cutting), as this is process and environment dependent. It depends on various parameters such as the welding process (MIG/MAG-, WIG/TIG- welding), the type of current selected (direct current, alternating current), the power range, the type of material to be welded, the resonance behaviour of the workpiece, the workplace environment, and many more.

# 11 PREFACE (EN)

## Dear Customer!

This operating manual contains information and important notes for safe commissioning and handling of the WELDER INVERTER DC MMA EISA162 and EISA200, hereinafter referred to as "machine".

The manual is an integral part of the machine and must not be removed. Keep it for later use in a suitable place, easily accessible to users (operators), protected from dust and moisture, and enclose it with the machine if it is passed on to third parties!

**Please pay special attention to the chapter Safety!**

Due to the constant further development of our products, illustrations and contents may differ slightly. If you notice any errors, please inform us.

Technical changes reserved!

**Check the goods immediately after receipt and make a note of any complaints on the consignment note when the delivery person takes them over!**

**Transport damage must be reported separately to us within 24 hours.**

**Holzmann Maschinen GmbH cannot accept any liability for transport damage not noted.**

## Copyright

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Court of jurisdiction is the Landesgericht Linz or the competent court for 4170 Haslach, Austria!

## Customer service contact

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AUSTRIA
Tel +43 7289 71562 - 0
**info@holzmann-maschinen.at**

# 12 SAFETY

This section contains information and important notes on safe start-up and handling of the machine.

For your own safety, read these operating instructions carefully before putting the machine into operation. This will enable you to handle the machine safely and prevent misunderstandings as well as personal injury and damage to property. In addition, observe the symbols and pictograms used on the machine as well as the safety and hazard information!

## 12.1 Intended use of the machine

The machinery is intended exclusively for the following operations: for MMA (electrodes) - welding with direct current of unalloyed and alloyed steels, stainless steels and non-ferrous metals (except aluminium and aluminium alloys), each within the prescribed technical limits.

**NOTE**

HOLZMANN MASCHINEN GmbH assumes no responsibility or warranty for other activities and any resulting property damage or injuries!

### 12.1.1 Technical restrictions

The machine is intended for use under the following ambient conditions:

| | |
|---|---|
| Rel. Humidity: | max. 50 % at 40 °C; max. 90 % at 20 °C |
| Temperature (Operation) | -10 °C to +40 °C |
| Temperature (Storage, Transport) | -20 °C to +50 °C |

### 12.1.2 Prohibited Applications / Hazardous misapplications

- Operating the machine without adequate physical and mental aptitude.
- Operating the machine without knowledge of the operating instructions.
- Changes in the design of the machine.
- Operating the machine in rooms that do not have sufficient ventilation.
- Operating the machine in a damp or wet environment.
- Operating the machine in a potentially explosive environment (machine can generate ignition sparks during operation).
- Operating the machine close to flammable materials.
- Operating the machine to defrost pipes.
- Operating the machine close to people who have a pacemaker.
- Operating the machine outside the technical limits specified in this manual.
- Remove the safety markings attached to the machine.
- Modify, circumvent or disable the safety devices of the machine.

The improper use or disregard of the versions and instructions described in this manual will result in the voiding of all warranty and compensation claims against Holzmann Maschinen GmbH.

## 12.2 User Requirements

The machine is designed for operation by one person. The physical and mental aptitude as well as knowledge and understanding of the operating instructions are prerequisites for operating the machine. Persons who, because of their physical, sensory or mental abilities or their inexperience or ignorance, are unable to operate the machinery safely must not use it without supervision or instruction from a responsible person.

Basic knowledge of welding and metal working especially the correlation of material, electrodes, and current.

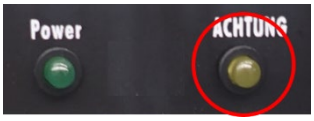
**Please note that local laws and regulations may determine the minimum age of the operator and restrict the use of this machine!**

Put on your personal protective equipment before working on the machine.

**Work on electrical components or equipment may only be carried out by a qualified electrician or under the instruction and supervision of a qualified electrician.**

## 12.3 Safety devices

The machine is equipped with the following safety devices:

| | |
|---|---|
|  | • Overload protection:<br>Warning lamp lights up in case of overload. Let the machine cool down! |
|  | • Circuit breaker (EISA200):<br>Switches the machine off at too high current |

## 12.4 General safety information

To avoid malfunctions, damage and health hazards when working with the machine, in addition to the general rules for safe working, the following points must be observed:

- Before start-up, check the machine for completeness and function. Only use the machine if the guards and other non-parting guards required for machining have been fitted, are in good operating condition and have been properly maintained.
- Choose a level, vibration-free, non-slip surface for the installation location.
- Ensure sufficient space around the machine!
- Ensure sufficient lighting conditions at the workplace to avoid stroboscopic effects.
- Ensure a clean working environment.
- Keep the area around the machine free of obstacles (e.g. dust, chips, cut workpiece parts etc.).
- Only use perfect tools that are free of cracks and other defects (e.g. deformations).
- Remove tool keys and other adjustment tools from the machine before switching it on.
- Check the machine connections for strength before each use.
- Never leave the running machine unattended. Switch off the machine before leaving the working area and secure it against unintentional or unauthorised recommissioning.
- The machine may only be operated, serviced or repaired by persons who are familiar with it and who have been informed of the dangers arising during this work.
- Ensure that unauthorised persons maintain a safe distance from the machine and keep children away from the machine.
- When working on the machine, never wear loose jewellery, loose clothing, ties or long, open hair.
- Hide long hair under hair protection.
- Wear close-fitting protective clothing (flame resistant) and suitable protective equipment (eye protection, welding helm, welding screen, ear protection, welding gloves, stout footwear).
- Metal dust can contain chemical substances that can have a negative effect on health. Work with the machine should only be carried out in well-ventilated rooms. If necessary, use a suitable extraction system.
- If there are connections for dust extraction, make sure that they are properly connected and in working order.
- Always work with care and the necessary caution and never use excessive force.
- Do not overload the machine!
- Shut down the machine and disconnect it from the power supply before carrying out any adjustment, conversion, cleaning, maintenance or repair work
- Before starting any work on the machine, always wait until all tools or machine parts have come to a complete standstill and secure the machine against unintentional restarting.

- Do not work on the machine if it is tired, not concentrated or under the influence of medication, alcohol or drugs!
- Do not use the machine in areas where vapours from paints, solvents or flammable liquids represent a potential danger (danger of fire or explosion!).

## 12.5 Electrical safety

- Make sure that the machine is grounded.
- Only use suitable extension cables.
- A damaged or tangled cable increases the risk of electric shock. Handle the cable with care. Never use the cable to carry, pull or disconnect the power tool. Keep the cable away from heat, oil, sharp edges or moving parts.
- Proper plugs and outlets reduce the risk of electric shock.
- Water entry into the machine increases the risk of electric shock. Do not expose the machine to rain or moisture.
- The machine may only be used if the power supply is protected by a residual current circuit breaker.
- Use the machine only when the ON-OFF switch is in good working order.
- Before connecting the machine always make sure that it is switches off.

## 12.6 Special safety instructions for this machine

- Only electrodes (rod electrode) suitable for the machine may be used.
- Never immerse the electrode (rod electrode) in liquids for cooling.
- Never touch the electrode (rod electrode) when the power source is switched on.
- Do not expose yourself or other persons without protection to electric arc or hot metal. Spraying welding pearls may cause burns.
- Do not carry out welding or cutting work on sealed tanks, vessels or pipes unless these have been prepared in accordance with the relevant national and international standards.
- Do not carry out welding on containers that are being or have been used to store gases, propellants, mineral oils or similar products. Residues pose an explosive hazard.
- Workplaces shall be shielded in such a way that persons in the vicinity are protected.
- Keep your face away from welding fumes and gases.
- Ensure an adequate supply of fresh air. Otherwise, a welding helmet with an air supply must be worn.
- Sparks and pieces of hot metal may also get into adjacent areas through small gaps or openings. Take appropriate precautions to prevent any danger of injury or fire.
- A suitable, tested fire extinguisher must be available and ready for use.
- Make sure that you and others are protected with an adequately insulated, dry base or cover for the earth or ground potential. This base or cover must extend over the entire area between the body and the earth or ground potential.
- Do not wrap cables or leads around the body or parts of the body.
- Ensure that the earth clamp is firmly connected to the workpiece as close as possible to the welding point. Make sure that the connection at the contact point is metallically bright!

## 12.7 Hazard Warnings

Despite the intended use, certain residual risks remain.

- Never touch the workpiece during or after welding
  - risk of burns
- Slag can jump off cooling workpieces
  - The specified protective equipment must therefore also be worn when reworking workpieces and steps must be taken to ensure that other people are also adequately protected.
- Risk of electric shock if incorrect electrical connections are used.
- Risk of tripping due to supply lines on the floor.
  - Properly route supply lines and cables

Residual risks can be minimized if the "Safety instructions" and the "Intended use" as well as the operating instructions are observed. Due to the design and construction of the machine, hazardous situations may occur when handling the machines, which are identified in these operating instructions as follows:

| DANGER | |
|---|---|
|  | A safety instruction designed in this way indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. |

| WARNING | |
|---|---|
|  | Such a safety instruction indicates a potentially hazardous situation which, if not avoided, may result in serious injury or even death. |

| CAUTION | |
|---|---|
|  | A safety instruction designed in this way indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. |

| NOTE | |
|---|---|
|  | A safety notice designed in this way indicates a potentially hazardous situation which, if not avoided, may result in property damage. |

Irrespective of all safety regulations, your common sense and appropriate technical suitability/training are and will remain the most important safety factor for error-free operation of the machine. Safe working primarily depends on you!

# 13 TRANSPORT

For proper transport, follow the instructions and information on the transport packaging regarding centre of gravity, attachment points, weight, means of transport to be used and prescribed transport position, etc.
Transport the product in its packaging to the place of installation. When lifting, carrying and depositing the load, make sure that you are in the correct posture:

- **Lifting, Depositing** Ensure stability when lifting / setting down (legs hip width). Lift / lower load with bent knees and straight back (like weightlifter). Do not lift / lower the load jerkily.

- **Carrying** Carry load with both hands as close to body as possible. Carry load with straight back.

Always secure the assembled product during transport in the transport position to prevent damage to the product.

- Do not lift or transport operational devices
- Switch off devices before transport or lifting
- Before transporting the device detach the shielding gas cylinder

# 14 ASSEMBLY

## 14.1 Preparatory activities

### 14.1.1 Checking delivery content

Always note visible transport damage on the delivery note and check the machine immediately after unpacking for transport damage or missing or damaged parts. Report any damage to the machine or missing parts immediately to your retailer or freight forwarder.

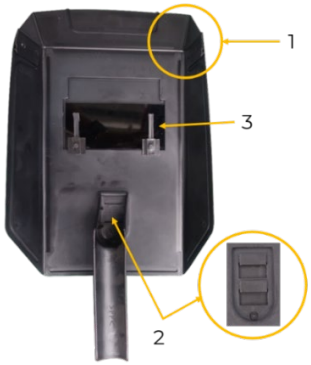
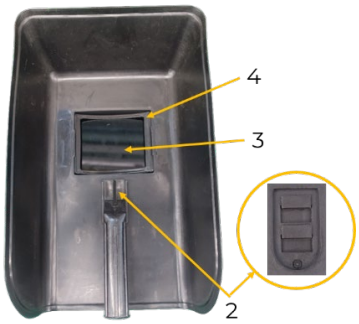
### 14.1.2 Site requirements

Place the machine on a level (max. permissible tilt angle ≤10°) solid surface. The space required by the machine and the required load-bearing capacity of the subfloor result from the technical data (dimensions, weight) of your machine. When designing the working area around the machine, observe the local safety regulations. When dimensioning the required space, ensure there is an all-round clearance of 0.5 m to ensure that cooling air can flow in and out freely and take into account that the operation of the machine must be possible without restrictions at all times. The selected installation location must ensure a suitable connection to the power supply.

Use spot extraction and room extraction. Ensure sufficient fresh air supply - ventilation rate of at least 20 $m^3$ / hour.

### 14.1.3 Assembling

The machine is pre-assembled, the parts removed for transport must be assembled (instructions at the respective welding type) and the connection to mains have to be made.

| **EISA162:** | **EISA200:** | **Welding screen:** |
|---|---|---|
|  |  | • Fold the side parts together and snap the rivets into place (1).<br>• Push the handle into the cutouts and snap both connectors into place (2)<br>• Insert welding glass (3)<br>• Fix the welding glass with inlet (4) |

## 14.2 Electrical connection

**WARNING**

**Dangerous electrical voltage!**

→ The machine may only be connected to the power supply and the associated checks carried out by a qualified electrician or under the instruction and supervision of a qualified electrician!

1. Check that the neutral connection and protective earthing are functioning properly
2. Check that the supply voltage and current frequency correspond to the specifications of the machine

**NOTE**

**Deviation of the supply voltage and current frequency**

A deviation from the value of the supply voltage of ± 5% is permissible.

A short-circuit fuse must be provided in the power supply system of the machine!

3. Use a supply cable that fulfils the electrical requirements (e.g. H07RN, H05RN) and take the required cross-section of the supply cable from a current carrying capacity table. Pay attention to the measures for protection against mechanical damage.
4. Make sure that the power source is protected by a residual current circuit breaker.
5. Connect the unit only to a properly grounded outlet.
6. When using an extension cable, make sure that it is dimensioned appropriately for the connected load of the machine (the connected load can be found in the technical data). You can find the correlation between cable cross-section and cable length in specialist literature or consult an electrician.

**NOTE**

- Operation is only permitted with residual current device (RCD) with maximum residual current of 30 mA. Mains fuse 16 A (C)

# 15 OPERATION

## 15.1 Basic knowledges

Basically, welding is divided into two types of processes: fusion joint welding (joint without force) and pressure joint welding (joint with force). In fusion welding, two workpieces (usually metals of the same kind) are melted at the joints and joined with or without the addition of filler materials. The energy required for this is supplied from outside. The most common fusion welding processes include electrode welding (MMA) and shielding gas welding (TIG/WIG, MIG, MAG).

Before starting work, thoroughly remove rust and paint from the workpieces and grind them bright. Then place the parts to be welded together (if necessary, fix them with gripping pliers or a screw clamp) and attach the earth cable to a bare spot on the workpiece. First weld the seams with spots only - this way you can still correct the position of the parts if necessary and still prevent the material from warping due to the heat of the arc by fixing the spots. After you have removed the slag from the welding spots, weld the seams through.

Note: Slag will form along the weld and you will have to tap or grind it off. If the weld seam is only slightly raised after removing the slag, you have chosen the optimal welding current. If you finish it with a roughing wheel, the bare metal appears.

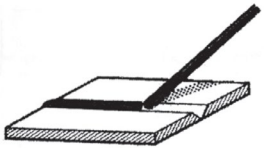
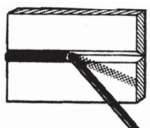
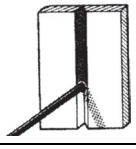
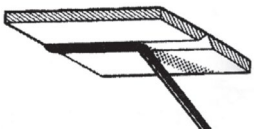
Welding current too weak or too strong: If the seam is only on the surface of the workpiece, the connection between the materials is not strong enough. This means that you have selected a welding current that is too weak. If the welding current is too high, too much material is melted from the workpiece. Thinner workpieces can even burn through.

When igniting, do not hold the electrode anywhere on the workpiece, but always in the area of the later weld seam. This way you avoid cracks and binding errors and the weld seam becomes more even.

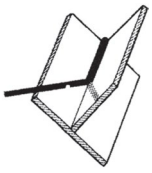
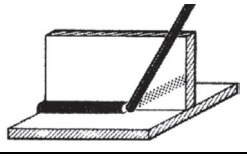
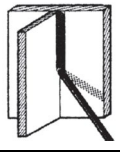
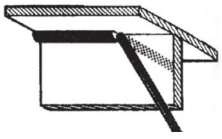
Note: Before working on the actual workpiece, first gain some experience on residual or test pieces.

### 15.1.1 Weldseams

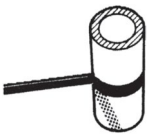
**Butt welds:**

| | | | |
|---|---|---|---|
| **PA** – Flat position  | **PC** – Transverse position  | **PG** – Vertical down position  | **PE** – Overhead position  |

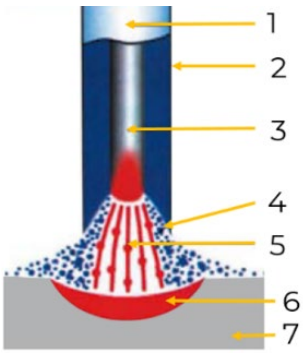
**Fillet welds:**

| | | | |
|---|---|---|---|
| **PA** – Flat position  | **PB** – Horizontal-downhand position  | **PG** – Vertical down position  | **PD** – Horizontal-overhead position  |

**Pipe-Butt welds:**

| | | | |
|---|---|---|---|
| **PA** – Pipe: rotated<br>Axis: horizontal<br>Welding: flat<br>  | **PC** – Pipe: fixed<br>Axis: vertical<br>Welding: transverse<br>  | **PF** – Pipe: fixed<br>Axis: horizontal<br>welding: vertical up<br>  | **PG** – Pipe: fixed<br>Axis: horizontal<br>Welding: vertical down<br>  |

## 15.2 MMA-Welding




1) Stick electrode
2) Coating
3) Metalic core
4) Gas / Slag
5) Arc
6) Weld pool
7) Parent material

The electric arc burns between the workpiece and a consumable electrode. The electrode thus simultaneously supplies the filler metal. The stick electrode is clamped in an electrode holder and guided by the welder at the seam. Stick electrodes are generally coated. The coating also melts before the outside air enters. After the weld pool has cooled, slag is removed.

Almost all weldable materials can be welded with stick electrodes, e.g. structural steel, boiler steel, tubular steel, cast steel, stainless steel, hardfacing steels, etc.

MMA welding is simple and safe. The compact devices are easy to handle and easy to transport. As no gas is required, welding can be done outdoors, even in windy conditions.

Welding behaviour and seam appearance are largely determined by the coating. Rutile-coated and basic stick electrodes are used.

Rutile coated electrodes have a fine droplet material transition and result in fine-flake, smooth and flat seams. They can be welded to both direct current and alternating current. The slag can be easily removed, in some cases it is self-dissolving.

Basic coated electrodes can only be welded with direct current (electrode at the positive pole). Due to the coarser drop transfer, they can be welded well in forced positions. Due to their good gap bridging properties, they are often used for root welds. Compared to the rutile coated stick electrodes, the weld is coarser and the slag is comparatively more difficult to remove. With both types of coating, the arc should be as short as possible.

### 15.2.1 Choosing the electrodes

Electrode designation according to EN ISO 2560

**Codes for the strength and expansion properties of the weld metal**

| Code | Min. yield strength | Tensile strength | Min. fracture strain |
|---|---|---|---|
| **35** | 355 N/mm² | 440 – 570 N/mm² | 22 % |
| **38** | 380 N/mm² | 470 – 600 N/mm² | 20 % |
| **42** | 420 N/mm² | 500 – 640 N/mm² | 20 % |
| **46** | 460 N/mm² | 530 – 680 N/mm² | 20 % |
| **50** | 500 N/mm² | 560 – 720 N/mm² | 18 % |

**Codes for the coating types**

| Type | Coating | Type | Coating |
|---|---|---|---|
| **A** | acid | **RC** | rutile cellulose |
| **C** | cellulose | **RA** | rutile acid |
| **R** | rutile | **RB** | rutile basic |
| **RR** | thick rutile | **C** | basic |

**Codes for the impact energy of the weld metal**

| Code | Temperature for min. notch impact energy 47J |
|---|---|
| **Z** | No requirements |
| **A** | +20 °C |
| **0** | 0 °C |
| **2** | -20 °C |
| **3** | -30 °C |
| **4** | -40 °C |
| **5** | -50 °C |
| **6** | -60 °C |

**Codes for efficiency and current type**

<table>
<tr><th>Code</th><th colspan="2">Efficiency</th><th>Current type</th></tr>
<tr><td>1</td><td colspan="2" rowspan="2">≤105 %</td><td>AC and DC</td></tr>
<tr><td>2</td><td>DC</td></tr>
<tr><td>3</td><td rowspan="2">>105 %</td><td rowspan="2">≤ 125%</td><td>AC and DC</td></tr>
<tr><td>4</td><td>DC</td></tr>
<tr><td>5</td><td rowspan="2">>125 %</td><td rowspan="2">≤ 160%</td><td>AC and DC</td></tr>
<tr><td>6</td><td>DC</td></tr>
<tr><td>7</td><td colspan="2" rowspan="2">< 160 %</td><td>AC and DC</td></tr>
<tr><td>8</td><td>DC</td></tr>
</table>

**Codes for position**

| Code | Position |
|---|---|
| **1** | All positions |
| **2** | all positions except vertical-down |
| **3** | Butt weld in position PA, fillet weld in position PA and PB |
| **4** | Butt weld in position PA, fillet weld in position PA |
| **5** | Positions as for 3 plus position PG |

**Codes for the hydrogen content of the weld metal**

| Code | Hydrogen content of weld metal |
|---|---|
| **H5** | max. 5 ml/100g |
| **H10** | max. 10 ml/100g |
| **H15** | max. 15 ml/100g |

**Example:**

| E | 46 | 3 | B | 4 | 2 | H5 |
|---|---|---|---|---|---|---|
| stick electrode | strength and expansion properties | notch impact energy | coating | current type | position | hydrogen content |

**Reference values for butt welds on unalloyed and low-alloy sheet materials**

| Sheet thickness | Welding position | Elektrode type | Ø Electrode in mm | Current intensity in A |
|---|---|---|---|---|
| 4 mm | PA | RA | 2,5 | 75 |
| 6 mm | | | 3,2 | 140 |
| | | | 4,0 | 180 |
| 10 mm | | B | 3,2 | 120 |
| | | | 4,0 | 170 |
| | PF | RB | 3,2 | 95 |
| | | | 4,0 | 160 |
| 15 mm | PA | B | 3,2 | 130 |
| | | | 4,0 | 170 |
| | PF | B | 3,2 | 90 |
| | | | 4,0 | 140 |
| 20 mm | PA | B | 4,0 | 160 |
| | | | 5,0 | 220 |
| | PF | B | 3,2 | 90 |
| | | | 4,0 | 140 |

**Reference values for fillet welds on unalloyed and low-alloy steels**

| Eff. throat thickness | Welding position | Electrode type | Ø Electrode in mm | Current intensity in A |
|---|---|---|---|---|
| 2 mm | PG | RC | 2,5 | 70 |
| 3 mm | PB | RR | 3,2 | 130 |
| | | | 4,0 | 180 |
| 4 mm | | RR160 | | 190 |
| 5 mm | | RR | | 180 |
| | | | 5,0 | 240 |
| 6 mm | | RR160 | | 290 |
| | | RR | 4,0 | 180 |
| | | | 5,0 | 240 |
| 8 mm | PF | B | 3,2 | 110 |
| | | | 4,0 | 140 |

**Reference values for butt welds on pipes made from unalloyed and low-alloy steel**

| Wall thickness | Welding position | Electrode type | Ø Electrode in mm | Current intensity in A |
|---|---|---|---|---|
| 8 mm | PG | C | 4,0 | 125 - 170 |
| 10 mm | | | 4,0 | 130 - 150 |
| | | | 5,0 | 175 - 190 |
| | | | 4,0 | 130 - 180 |
| 12 mm | | | 5,0 | 175 - 200 |

## 15.3 Operating the machine

**WARNING**

**Danger due to electrical voltage!**

Handling the machine with connected power supply may result in serious injury or death.

→ Always disconnect the machine from the power supply before maintenance or repair work and secure it against unintentional reconnection.

**CAUTION**

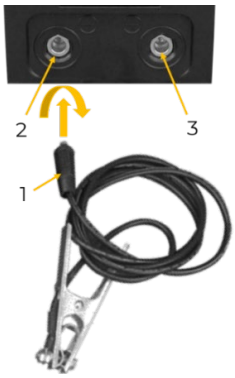
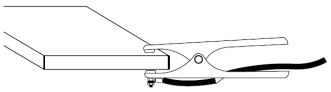
Danger of personal injury and damage to property due to electric shock.

As soon as the machine is switched on, the electrode is live. Make sure that the electrode does not touch any persons or electrically conductive or earthed parts (e.g. housing, etc.).

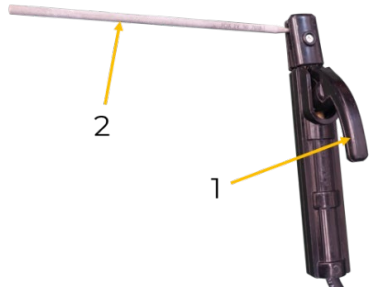
### 15.3.1 Switch the machine on and off

| | | |
|---|---|---|
| **EISA162:** |  | Position I: Switch on<br>Position 0: Switch off |
| **EISA200:** |  | Position left: Switch on<br>Position right: Switch off |

### 15.3.2 Connecting the earth clamp

| | |
|---|---|
|  | Plug the earth cable (1) into the (-) welding current terminal (2) or into the (+) welding current terminal (3) depending on the electrode type and welding mode and lock it by turning. |
|  | Use the earth clamp to make a connection with the workpiece |

### 15.3.3 Clamping stick electrodes




- Open the electrode holder by pushing the handle (1).
- Insert electrode (2)
- Release the handle to clamp

### 15.3.4 Configuration MMA-Welding EISA162


- Plug the earth cable into the (-) welding current terminal or into the (+) welding current terminal depending on the electrode type and lock it by turning
- Depending on the electrode type, insert the current plug of the electrode holder into the free current socket with opposite polarity and lock it by turning

**NOTE:** For information on whether the stick electrodes are to be welded at the positive pole or at the negative pole, refer to the manufacturer's instructions for the electrodes.

### 15.3.5 Configuration MMA-Welding EISA200


- Plug the earth cable into the (-) welding current terminal or into the (+) welding current terminal depending on the electrode type and lock it by turning
- Depending on the electrode type, insert the current plug of the electrode holder into the free current socket with opposite polarity and lock it by turning

**NOTE:** For information on whether the stick electrodes are to be welded at the positive pole or at the negative pole, refer to the manufacturer's instructions for the electrodes.

### 15.3.6 MMA-Welding EISA162


- Switch on the machine
- Power indicator light lights up
- Set welding current with welding current controller
- Perform welding process

### 15.3.7 MMA-Welding EISA200


- Switch on the machine
- Power indicator light lights up
- Set welding current with welding current controller
- Perform welding process

# 16 CLEANING, MAINTENANCE, STORAGE, DISPOSAL

**WARNING**

**Danger due to electrical voltage!**

Handling the machine with connected power supply may result in serious injury or death.

→ Always disconnect the machine from the power supply before maintenance or repair work and secure it against unintentional reconnection.

## 16.1 Cleaning

Regular cleaning guarantees the long service life of your machine and is a prerequisite for its safe operation.

**NOTE**

Incorrect cleaning products can attack the finish of the machine. Do not use any solvents, nitro thinners or other cleaning products that could damage the machine's finish.
Observe the specifications and instructions of the cleaning agent manufacturer.

Therefore, clean the device after each use of chips and dirt particles.

## 16.2 Maintenance

The machine is low-maintenance and only a few parts have to be serviced. Nevertheless, any faults or defects which may affect the safety of the user must be rectified immediately!

- Before each start-up, make sure that the safety devices are in perfect condition and function properly.
- Check all connections for tightness at least once a week.
- Regularly check that the warning and safety labels on the machine are in perfect and legible condition.
- Only use original spare parts recommended by the manufacturer.

### 16.2.1 Inspection and maintenance plan

The type and degree of machine wear depends to a large extent on the operating conditions. The following intervals apply when the machine is used within the specified limits:

| Interval | Component | Action |
|---|---|---|
| Before start of work or after every maintenance or servicing | Cable and plug | Check for damage and replace if necessary |
| Monthly | Screw connections | Check for tightness |
| If needed | Cooling holes | Cleaning |

## 16.3 Storage

**NOTE**

Improper storage can damage and destroy important components. Only store packed or unpacked parts under the intended environmental conditions!

Store the machine in a dry, frost-proof and lockable place when not in use. Disconnect the machine from the power supply. Make sure that unauthorised persons and especially children do not have access to the machine.

## 16.4 Disposal

Observe the national waste disposal regulations. Never dispose of the machine, machine components or equipment in residual waste. If necessary, contact your local authorities for information on the disposal options available.
If you buy a new machine or an equivalent device from your specialist dealer, he is obliged in certain countries to dispose of your old machine properly.

# 17 TROUBLESHOOTING

**WARNING**

**Danger due to electrical voltage!**
Handling the machine with connected power supply may result in serious injury or death.

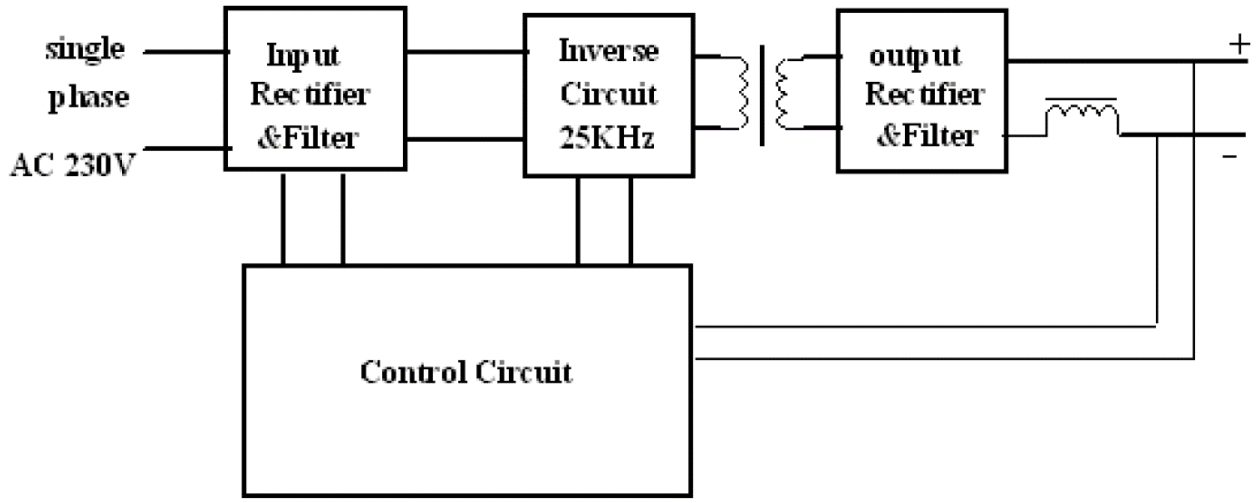
→ Always disconnect the machine from the power supply before maintenance or repair work and secure it against unintentional reconnection.

Many possible sources of error can be excluded in advance if the machine is properly connected to the power supply.

If you are unable to carry out necessary repairs properly and/or do not have the required training, always consult a specialist to solve the problem.

| Fault | Possible cause | Correction |
|---|---|---|
| Machine does not start | Power supply incorrect | Check all electrical connections |
| | Defective switches | Exchange |
| | Fuse or contactor broken | Change fuse, activate contactor |
| Overheated machine | Overload | Let the machine cool down |
| No welding current | Earth connection incorrect | Ensure good contact at earth clamp |

# 18 BLOCKSCHALTBILD / SYSTEMTIC BLOCK DIAGRAMM



# 19 ERSATZTEILE / SPARE PARTS

## 19.1 Ersatzteilbestellung / Spare parts order

**(DE)** Mit HOLZMANN-Ersatzteilen verwenden Sie Ersatzteile, die ideal aufeinander abgestimmt sind. Die optimale Passgenauigkeit der Teile verkürzen die Einbauzeiten und erhöhen die Lebensdauer.

**HINWEIS**

Der Einbau von anderen als Originalersatzteilen führt zum Verlust der Garantie! Daher gilt: Beim Tausch von Komponenten/Teile nur vom Hersteller empfohlene Ersatzteile verwenden.

Bestellen Sie die Ersatzteile direkt auf unserer Homepage – Kategorie ERSATZTEILE.

oder kontaktieren Sie unseren Kundendienst

- über unsere Homepage – Kategorie SERVICE – ERSATZTEILANFORDERUNG,
- per Mail an service@holzmann-maschinen.at.

Geben Sie stets Maschinentype, Ersatzteilnummer sowie Bezeichnung an. Um Missverständnissen vorzubeugen, empfehlen wir mit der Ersatzteilbestellung eine Kopie der Ersatzteilzeichnung beizulegen, auf der die benötigten Ersatzteile eindeutig markiert sind falls sie nicht über den Online-Ersatzteilkatalog anfragen.

**(EN)** With original HOLZMANN spare parts you use parts that are attuned to each other shorten the installation time and elongate your products lifespan.

**NOTE**

The installation of parts other than original spare parts leads to the loss of the guarantee! Therefore: When replacing components/parts, only use spare parts recommended by the manufacturer.

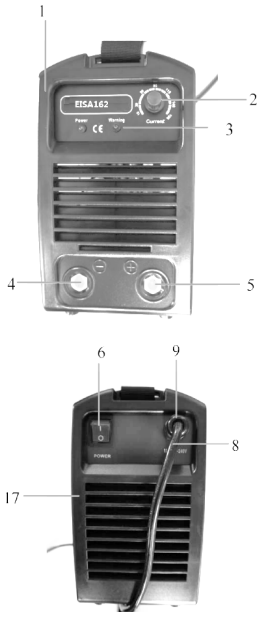
Order the spare parts directly on our homepage – category SPARE PARTS or contact our customer service

- via our Homepage - category SERVICE - SPARE PARTS REQUEST,
- by e-mail to service@holzmann-maschinen.at.

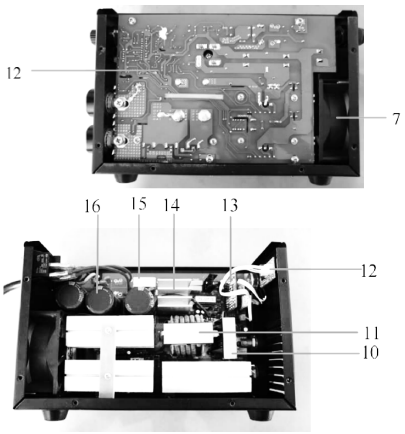
Always state the machine type, spare part number and designation. To prevent misunderstandings, we recommend that you add a copy of the spare parts drawing with the spare parts order, on which the required spare parts are clearly marked especially when not using the online-spare-part catalogue.

## 19.2 Ersatzteilliste / Spare parts list

**EISA 162**



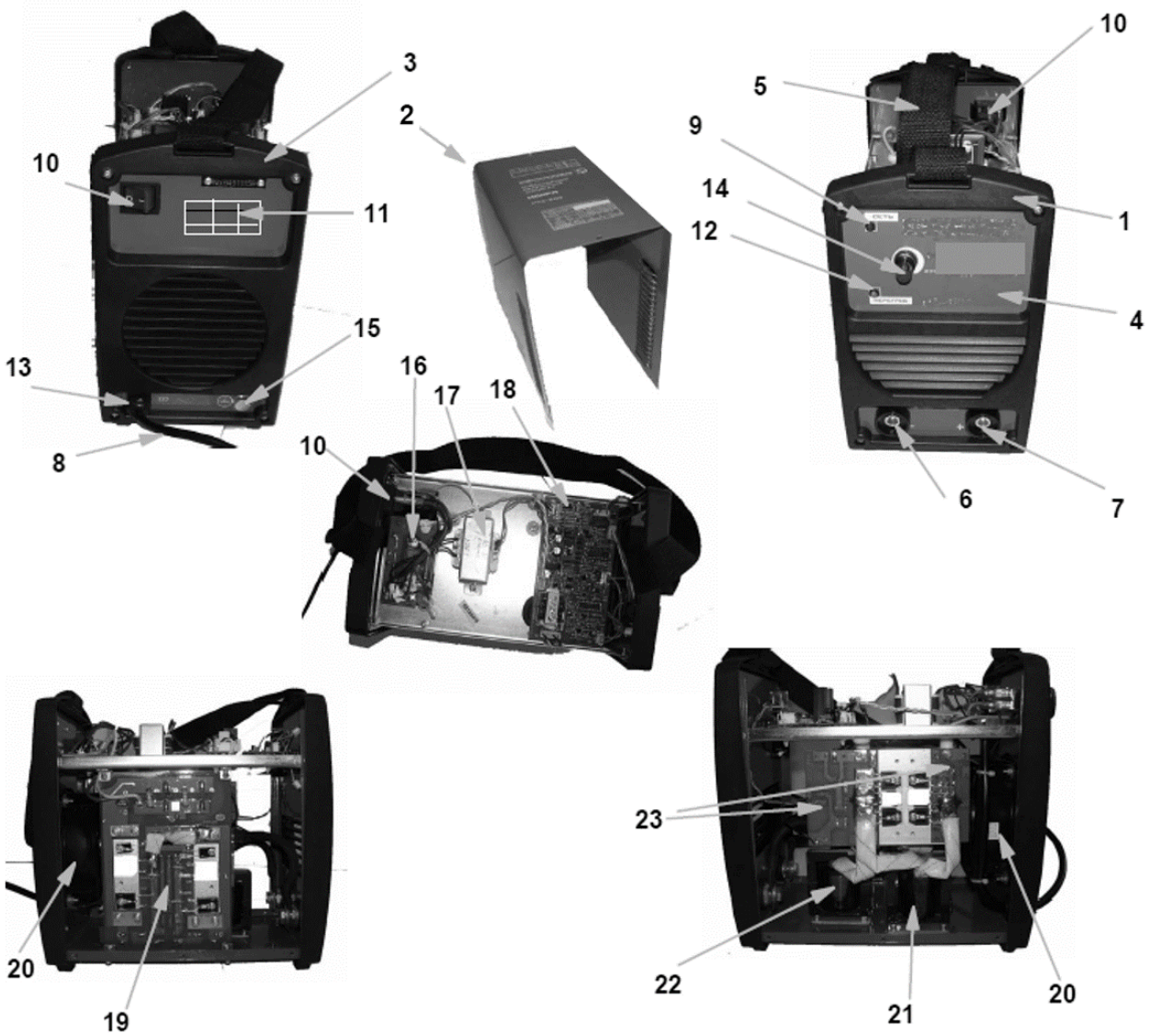

| No. | Description |
|---|---|
| 1 | Front plastic panel |
| 2 | Welding current controller |
| 3 | Warning lamp overload protection |
| 4 | Negative (-) welding current terminal |
| 5 | Positive (+) welding current terminal |
| 6 | ON-OFF switch |
| 7 | Cooling fan |
| 8 | Cord |
| 9 | Cord fixed ring |
| 10 | Output reactor |
| 11 | Main inverter transformer |
| 12 | Complete inveter board |
| 13 | Control board |




| | |
|---|---|
| 14 | Input rectifier |
| 15 | Soft start relay |
| 16 | Capacitor |
| 17 | Rear plastic panel |

| |
|---|
| Elektrodenhalter + 2,5m Kabel / electrode holder 200A + 2,5m cable |
| Elektrodenhalter / electrode holder 200A |
| Masseklemme / earth clamp 200A |

**EISA200**



| No. | Description |
|---|---|
| 1 | Rear plastic panel |
| 2 | Top panel |
| 3 | Front plastic panel |
| 4 | Metalic front panel |
| 5 | Carrying strap |
| 6 | Negative (-) welding current terminal |
| 7 | Positive (+) welding current terminal |
| 8 | Cord |
| 9 | Warning lamp overload protection |
| 10 | ON-OFF switch (circuit breaker) |
| 11 | Type plate |
| 12 | Power indicator light |
| 13 | Cord holder |
| 14 | Welding current controller |
| 15 | Earth bolt |
| 16 | Input EMS PCB |
| 17 | Control transformer |
| 18 | Control PCB |
| 19 | Inverter PCB |
| 20 | Cooling fan |
| 21 | Inverter transformer |
| 22 | Output reactor |
| 23 | Output PCB |

| |
|---|
| Elektrodenhalter + 2,5m Kabel / electrode holder 300A + 2,5m cable |
| Elektrodenhalter / electrode holder 300A |
| Masseklemme / earth clamp 300A |

# 20 ZUBEHÖR / ACCESSORIES

**((DE)** Optionales Zubehör finden Sie online auf der Produktseite, Kategorie EMPFOHLENES ZUBEHÖR ZUM PRODUKT.

**(EN)** Optional accessories can be found online on the product page, category RECOMMENDED PRODUCT ACCESSORIES.