

Operating Instructions
Welding Set

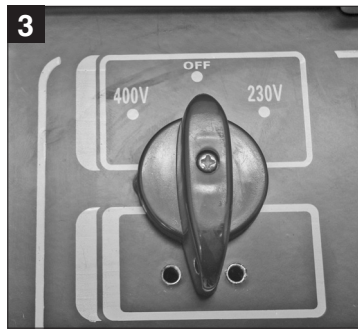
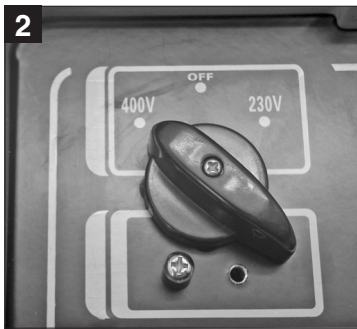
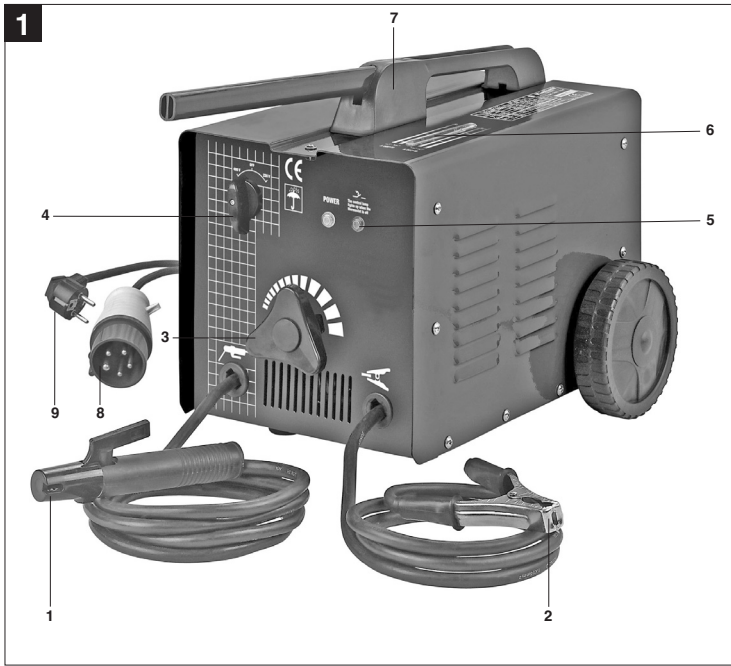
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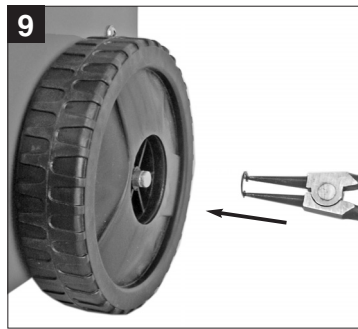
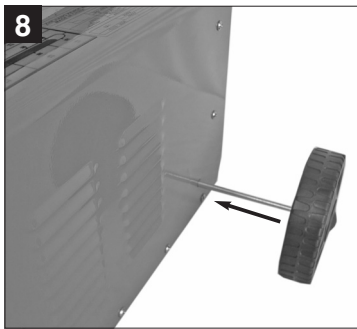
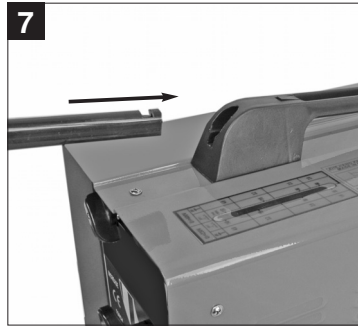
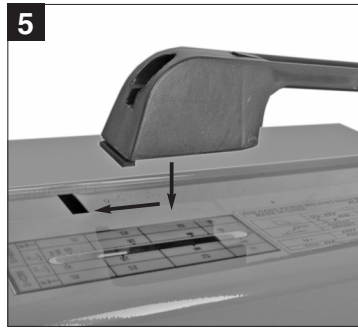
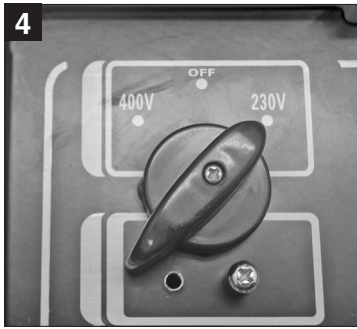
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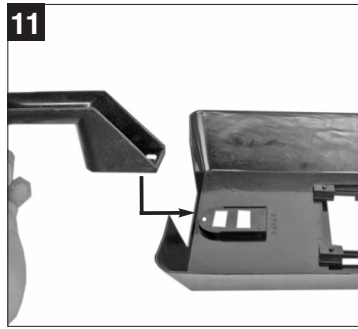
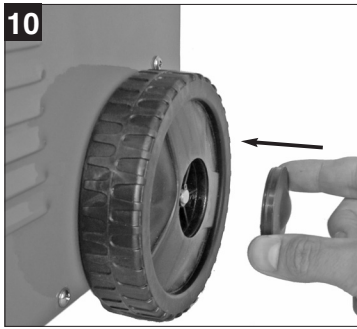
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⚠ Important!

When using the equipment, a few safety precautions must be observed to avoid injuries and damage. Please read the complete operating instructions and safety regulations with due care. Keep this manual in a safe place, so that the information is available at all times. If you give the equipment to any other person, hand over these operating instructions and safety regulations as well. We cannot accept any liability for damage or accidents which arise due to a failure to follow these instructions and the safety instructions.

1. Layout (Fig. 1)

1. Electrode holder
2. Earth terminal
3. Adjustment wheel for welding current
4. Selector switch 230 V / 400 V
5. Control lamp for overheating
6. Welding current scale
7. Carry handle
8. Power cable 400 V
9. 230 V mains cable

2. Items supplied

Welding set
Welding screen

3. Important information

Please read the directions for use carefully and observe the information provided. It is important to consult these instructions in order to acquaint yourself with the machine, its proper use and safety precautions.

⚠ Safety information

Please note

IMPORTANT

Only use this appliance for the purpose for which it is designed and as described in these instructions: Manual arc welding with coated electrodes.

Handling this system incorrectly may be hazardous for persons, animals and property. The user of this system is responsible for his/her own safety and for the safety of others.

Read these operating instructions and follow all the regulations.

- Repairs and/or maintenance work may only be carried out by qualified personnel.
- Use only the power cables and welding cables supplied. (16 mm² rubber-sheathed welding cables)
- Ensure that the appliance is looked after properly.
- To ensure that sufficient air can be drawn in through the ventilation slits, the appliance should not be constricted or placed next to a wall while it is operating. Make sure that the appliance is correctly connected to the mains supply (see 6.). Do not subject the mains lead to any tensile stress. Unplug the appliance before you change its position.
- Check the condition of the welding cables, the electrode tongs and the earth terminals (-); wear on the insulation and the live parts may result in dangerous conditions and reduce the quality of the welding work.
- Arc welding generates sparks, molten metal particles and smoke, so the following is required: Remove all inflammable substances and/or materials from the working area.
- Ensure that there is adequate ventilation.
- Do not weld on tanks, vessels or pipes that have contained inflammable liquids or gases. Avoid all direct contact with the welding circuit; the idling voltage between the electrode tongs and the earth terminal (-) may be dangerous.
- Do not store or use the appliance in wet or damp conditions or in the rain.
- Protect your eyes with specially designed goggles (DIN level 9-10), which you can attach to the supplied safety shield. Wear gloves and dry safety clothing that are not contaminated by any oil or grease to ensure that your skin is not exposed to ultraviolet radiation from the arc.

Remember.

- The radiation from the arc can damage your eyes and cause burns on skin.
- Arc welding generates sparks and droplets of molten metal; the welded workpiece may start to glow and will remain very hot for a relatively long period of time.
- Arc welding releases vapors that may be harmful. Every electric shock is potentially fatal.
- Do not approach the arc within a radius of 15 m unprotected.
- Protect yourself (and others around you) against the possible hazardous effects of the arc.
- Warning: Depending on the mains connection conditions at the connection point of the welding set, other consumers connected to the mains may suffer faults.

GB**Important!**

If the supply mains and circuits are overloaded, other consumers may suffer interference during the welding work. If you have any doubts, contact your electricity supply company.

Proper use

The machine is to be used only for its prescribed purpose. Any other use is deemed to be a case of misuse. The user / operator and not the manufacturer will be liable for any damage or injuries of any kind caused as a result of this.

Please note that our equipment has not been designed for use in commercial, trade or industrial applications. Our warranty will be voided if the machine is used in commercial, trade or industrial businesses or for equivalent purposes.

Sources of danger during arc welding

Arc welding results in a number of sources of danger. It is therefore particularly important for the welder to comply with the following rules so as not to place himself or others in danger and to avoid endangering people and equipment.

1. Have all work on the mains voltage system, for example on cables, plugs, sockets, etc., performed only by trained electricians. This particularly applies to configuring intermediate cables.
2. If an accident occurs, disconnect the welding power source from the mains immediately.
3. If electric touch voltages occur, switch off the welding set immediately and have it checked by an expert.
4. Always check for good electrical contacts on the welding current side.
5. Wear insulating gloves on both hands for welding. These offer protection from electric shocks (idling voltage in the welding circuit), harmful radiation (Heat and UV radiation) and from glowing metal and slag spatter.
6. Wear firm, insulated footwear. Your shoes should also protect you in wet conditions. Open-toed footwear is not suitable since falling droplets of glowing metal will cause burns.
7. Wear suitable clothing, do not wear synthetic clothes.
8. Do not look into the arc with unprotected eyes, use only a welding safety shield with the proper safety glass in compliance with DIN standards. In addition to light and heat, which may cause

dazzling and burns, the arc also gives off UV radiation. Without proper protection, this invisible ultraviolet radiation causes very painful conjunctivitis, which will only be noticeable several hours later. In addition, UV radiation will cause sunburn-type symptoms on unprotected parts of the body.

9. Personnel or assistants in the vicinity of the arc must also be notified of the dangers and provided with the required protection; if necessary install safety walls.
10. Ensure adequate ventilation for welding, particularly in small rooms since the process causes smoke and harmful gases.
11. Do not carry out any welding work on tanks that have been used to store gases, fuels, mineral oil or the like, even if they have been empty for a lengthy period of time, since any residue will result in a danger of explosion.
12. Special regulations apply in areas where there is a potential risk of fire and/or explosion.
13. Welds that are exposed to large stresses and must comply with safety requirements may only be completed by specially trained and approved welders. Examples of such welds include pressure vessels, rails, trailer hitches, etc.
14. Note: It must be noted that the protective conductor in electrical systems of appliances may be destroyed by the welding current in the event of negligence, for example if the earth terminal is placed on the welding set casing to which the protective conductor of the electrical system is connected. The welding work is completed on a machine with a protective conductor connection. It is therefore possible to weld on the machine without having connected the earth terminal to it. In this case the welding current will flow from the earth terminal through the protective conductor to the machine. The high welding current may cause the protective conductor to melt.
15. The fuses on the supply cables to the mains sockets must comply with the relevant regulations (VDE 0100). To comply with these regulations, only fuses or circuit breakers suitable for the cross-section of the cables may be used (for earthing contact sockets max. 16 A fuses or 16 A circuit breakers). The use of too high a fuse may result in the cable burning and fire damage to the building.

Constricted and wet areas

When working in constricted, wet or hot areas, use insulating supports and intermediate layers as well as slip-on gloves made of leather or other non-



conductive materials to insulate your body against the floor, walls, conductive parts of the machine and the like.

If you use small welding transformers for welding in places with an increase electrical risk, for example in constricted areas with conductive walls, (tanks, pipes, etc.), in wet areas (which make work clothes wet) and in hot areas (perspiration on work clothes), the output voltage of the welding set when idling must not exceed 42 V (effective value). Therefore, the appliance may not be used for these purposes because its output voltage is higher than this.

Safety clothing

1. While working, the welder must protect his entire body from radiation and burns by wearing suitable clothing and a face guard.
2. Slip-on gloves made of a suitable material (leather) must be worn on both hands. They must be in perfect condition.
3. Suitable aprons must be worn to protect clothing from sparks and burns. A safety suit and, if necessary, head protection must be worn if required by the type of work in question, e.g. overhead welding.
4. The protective clothing used as well as all accessories must be in compliance with the "Personal safety equipment" EU Directive.

Protection from radiation and burns

1. Provide information about the risk to eyes at the working site in the form of a poster with the wording "Caution – do not look at the flames". Workplaces are to be screened off wherever possible so that personnel in the vicinity are protected. Unauthorized persons are to be kept away from the welding work.
2. The walls in the immediate vicinity of stationary workplaces should not have a light color or a sheen. Windows up to head height are to be protected against radiation passing through them or reflecting off them, for example by coating them with a suitable paint.



Do not store or use the equipment in wet conditions or in the rain. Use the equipment only indoors.

4. SYMBOLS AND TECHNICAL DATA

EN 60974-6 European standard for arc welding sets and welding power supplies with limited on time (Part 6).

Symbol for welding power supplies which are suitable for welding in environments with increased electrical danger.

~ 50 Hz Alternating current and rated frequency value [Hz]

U₀ Rated idling voltage [V]

55A/ 20,2 V
160A/24,4 V Maximum welding current and the corresponding standardized operating voltage [A/V]

Ø Electrode diameter [mm]

I₂ Welding current [A]

Line input; number of phases, the alternating current symbol and the rated frequency value
1(3) ~ 50 Hz

U₁ Line voltage [V]

I_{1max} Highest rated value of the line current [A]

I_{1eff} Effective value of the highest line current [A]

IP 21 S Protection type

H Insulation class

The set is interference-suppressed in compliance with EC Directive 89/336/EEC

Mains connection:	230 V/400 V ~ 50 Hz				
Welding current (A) at cos φ = 0.73:	55- 160				
Electrode Ø (mm):	2,0	2,5	3,2	3,2	4,0
I ₂ 400 V	55	85	120		170
I ₂ 230 V	50	80	110	130	
Idling voltage (V):	48				
Power input:	4 kVA at 80 A cos φ = 0.73				
Fuse (A):	16				

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5. Assembly Instructions

See Figure 5-12.

6. Power supply

This welding set can be operated with a rated voltage of 230 V and 400 V. The desired rated voltage can be set by means of the rotary switch illustrated in Figure 2-4. Please follow the operating instructions, as described below:

Figure 2:

In its initial position the rotary switch is set to 400 Volt. The welding set is operated at a rated voltage of 400 Volt in a closed electric circuit. To prevent accidental selection of the wrong rated voltage, please secure the setting position by inserting a screw into the respective hole on the left below the rotary switch.

Figure 4:

To operate the appliance with a rated voltage of 230 V, please slacken and remove the screw located below the rotary switch on the left and then turn the switch to the desired position, which is labeled 230 V. After this, please tighten the screw in the marked drill hole located below the rotary switch on the right.

Please observe the following instructions in order to avoid the risk of fire, electric shock or personal injuries.

- Never use the appliance with a rated voltage of 400 V if the appliance is set to 230 V. Caution: Fire risk!
- Please disconnect the appliance from the power supply before setting the rated voltage.
- Adjusting the rated voltage during operation of the welding set is strictly prohibited.
- Before operating the welding set, please ensure that the rated voltage selected on the appliance complies with that of the power source.

Note:

The welding set is supplied with 2 power cables and plugs. Please connect the appropriate plug to the appropriate power source (connect a 230 V plug to a 230 V socket-outlet and a 400 V plug to a 400 V socket outlet)

7. Welding preparations

Connect the earth terminal (-) (2) direct to the part to be welded or to the support on which the part is resting. Ensure that the earth terminal (-) is in direct contact with the part to be welded. You should therefore avoid coated surfaces and/or insulated materials. The electrode holder cable has a special clamp at one end, which is used to secure the electrode. The welding safety shield must be used at all times for welding. It protects your eyes from the radiation emitted by the arc and nevertheless enables you to watch the welding process.

8. Welding

After you have made all the electrical connections for the power supply and for the welding circuit, you can proceed as follows:

Insert the unsheathed end of the electrode into the electrode holder (1) and connect the earth terminal (-) (2) to the part you wish to weld.

Ensure that a good electric contact is made.

Switch on the welding set at the switch (4) and set the welding current using the hand wheel (3) to suit the electrode you wish to use.

Hold the safety shield in front of your face and rub the tip of the electrode on the part you wish to weld as if you were striking a match. This is the best method of igniting the arc.

Check that you have the correct electrode and current strength on a test part.

Electrode (Ø mm):	Welding current (A)
2	40 – 80
2,5	60 – 110
3,2	80 – 160
4	120 – 200

Important!

Do not dab the workpiece with the electrode since it could be damaged, making it more difficult to ignite the arc.

As soon as the arc has ignited, attempt to keep it a distance from the workpiece equivalent to the diameter of the electrode.

This distance should be kept as constant as possible during the welding process. The angle of the electrode in the direction in which you are working should be 20/30°.

Important!

Always use tongs to remove spent electrodes and to move parts that you have just welded. Please note that the electrode holder (1) must always be put down so that it is insulated after you have completed the welding work.

Do not remove the slag until the weld has cooled. If you want to continue a weld after an interruption, the slag from your initial attempt must first be removed.

9. Overheating guard

The welding set is fitted with an overheating guard that protects the welding transformer from overheating. If the overheating guard trips, the control lamp (5) on your set will be lit. Allow the welding set to cool for a time.

10. Maintenance

Remove dust and dirt from the machine at regular intervals. Cleaning is best carried out with a fine brush or a cloth.

11. Ordering spare parts

Please quote the following data when ordering replacement parts:

- Type of machine
- Article number of the machine
- Identification number of the machine
- Replacement part number of the part required

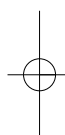
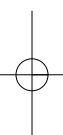
For our latest prices and information please go to www.isc-gmbh.info

12. Disposal and recycling

The unit is supplied in packaging to prevent its being damaged in transit. This packaging is raw material and can therefore be reused or can be returned to the raw material system.

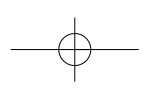
The unit and its accessories are made of various types of material, such as metal and plastic. Defective components must be disposed of as special waste. Ask your dealer or your local council.

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