

HAKAS PLUSTIG[®] 200 AC/DC



USER MANUAL • ENGLISH

HAKAS[®]

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CONGRATULATIONS ON YOUR NEW HAKAS® WELDING MACHINE!

You have made an excellent choice by selecting a genuine, original HAKAS welding machine. HAKAS portable welding machines are designed to be easy to use, trouble-free, and of high quality.

The first HAKAS welding machine was delivered to a customer in 1972. Since then, HAKAS has been known for its welding machines, which combine high-quality welds with excellent performance and durability.

Your HAKAS welding machine comes with the most comprehensive warranty on the market. Please read the warranty terms carefully and register your warranty within 30 days of purchasing the welding machine. Our extensive service and dealer network is ready to assist you and ensure that your welding machine remains in top condition by providing the necessary maintenance and repairs. You can find your nearest service center on our website at www.hakas.fi.

Please read this user manual carefully. It will guide you in the proper use of the welding machine and also highlight the risks associated with its use. We want to provide you with the best user experience so that your welding work goes smoothly, without problems, and with high quality. When used correctly, your new HAKAS welding machine will produce high-quality welds for many years to come.

We are confident that the HAKAS welding machine you have chosen will meet your welding needs not only now, but for many years to come.



User Manual

HAKAS PLUSTIG 200 AC/DC

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1. INTRODUCTION

1.1 . General

You have made an excellent choice by selecting a genuine, original HAKAS welding machine. HAKAS welding machines are designed for simple, efficient, and high-quality welding work. When used correctly, your welding machine will provide reliable performance and high-quality results for many years to come.

This user manual contains important information, general instructions, and safety warnings regarding the use, operation, service, and maintenance of your new welding machine. Read this manual carefully before putting the machine into service and starting to weld.

This manual is not intended to train the user as a welder, nor is it a complete maintenance guide. Instead, it is intended as a reference guide for trained and qualified users of welding equipment



NOTE

Review this manual before operating or servicing the welding machine. After reading it, store it in a dry place near the machine for future reference. The manual must accompany the machine throughout its entire service life.

For more information on HAKAS® products, including compatible accessories, spare parts, and consumables for this welding machine, visit:

www.hakas.fi

To ensure long-term reliability and performance, use only HAKAS ORIGINAL™ genuine parts, accessories, and consumables. The complete range is listed on the website above.

1.2 Device Features

The HAKAS PLUSTIG 200 AC/DC welding machine is designed for the easiest and most effortless welding possible. The welder can be used to weld, for example, standard steel structures, aluminum, and many other weldable metals of varying thicknesses. The HAKAS PLUSTIG 200 AC/DC welder is intended for use on a single-phase electrical network.

The HAKAS PLUSTIG 200 AC/DC welding machine is equipped with a sturdy carrying handle for transporting it to the workstation. The machine's control panel is equipped with a flip-up transparent cover. A wide range of accessories is available for HAKAS welding machines. The separately available HAKAS YELLOWTAXI™ two-wheeled welding machine

cart makes it easy to transport and store gas cylinders, the welding machine, and welding supplies.

The HAKAS PLUSTIG 200 AC/DC welding machine is suitable for stick welding with 1.6–4.0 mm electrodes. For TIG welding, 1.6 mm, 2.0 mm, 2.4 mm, or 3.2 mm electrodes can be used.

**NOTE**

The welding machine is intended for welding only! Do not use the welding machine for any other purpose. Any other use may damage the machine or pose a hazard to the user.

1.3 Intended Use, General Information on Welding, and Key Machine Components

When used correctly, the HAKAS PLUSTIG 200 AC/DC welding machine delivers high-quality welding results with all of its included welding processes (TIG AC, TIG DC, and stick welding). In addition to the welding machine, the welding result is influenced by the welder's experience, the available electrical current, the filler materials and accessories used, as well as the settings and adjustments made by the user to the machine. Settings and adjustments must be made correctly to achieve the desired welding result.

In welding, an arc is formed between the workpiece and the welding electrode. To create the closed circuit necessary for successful welding, a ground cable must be attached to the workpiece. The attachment point of the ground cable must be clean to ensure that an arc forms and the weld is of high quality. The welding torch (TIG welding) must be assembled correctly, and wear parts must be replaced with new ones as needed to ensure successful welding and high-quality welds. Similarly, in stick welding, a electrode holder is used to create the arc.

1.4 Different product versions

Different product versions of the HAKAS PLUSTIG 200 AC/DC welding machine may be available. This user manual describes the HAKAS PLUSTIG 200 AC/DC welding machine equipped with a remote-control feature, which also comes with the HAKAS EWT PRO remote-control torch.

1.5. Parts of the Welding Machine

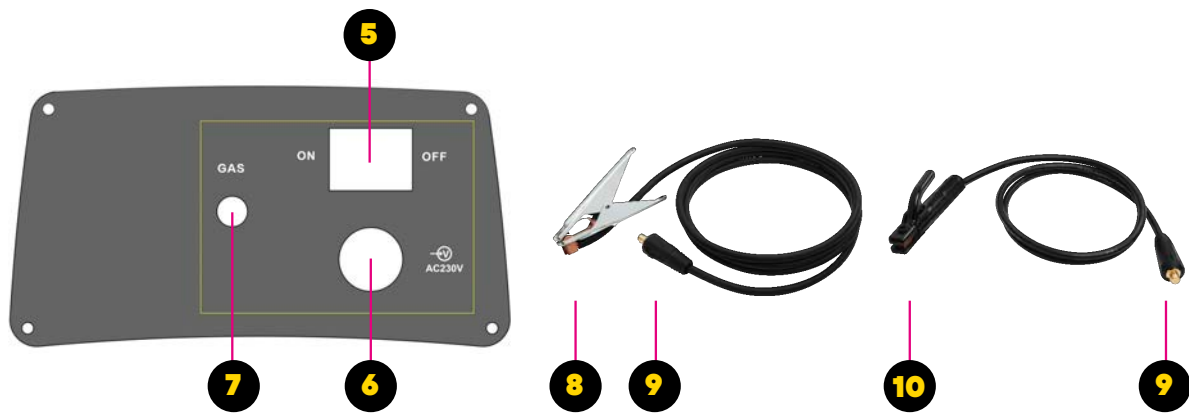
This section presents the HAKAS PLUSTIG 200 AC/DC welding machine, its main components, and any accessories that may be included in the welding machine package, illustrated with images. These images are also referenced later in the user manual. Please note that the images are for reference only, and the accessories included in the package you purchased may differ in both content and appearance from the products shown in the images in this manual. Please check the contents of the package of the welding machine you purchased.



FRONT PANEL

1. DIX 50 positive terminal
2. Torch shielding gas connector

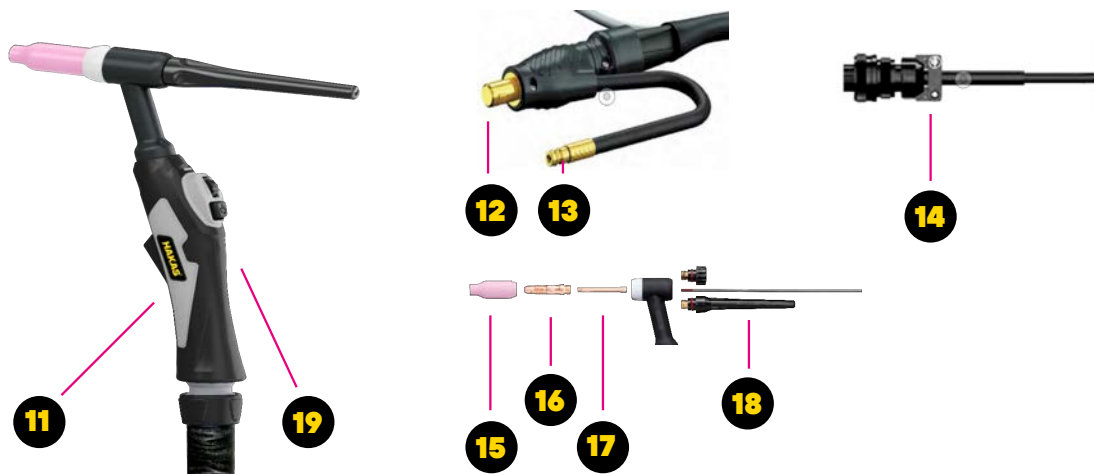
3. DIX 50 negative terminal
4. Torch control connector



REAR PANEL AND ACCESSORIES

- 5. On/off switch
- 6. Power cord with plug
- 7. Shielding gas connection

- 8. Ground clamp
- 9. DIX 50 connector
- 10. Electrode holder



TIG TORCH

- 11. TIG torch
- 12. DIX 50 connector
- 13. Shielding gas connector
- 14. Control connector
- 15. Gas nozzle

- 16. Collet socket
- 17. Collet
- 18. Electrode shield (short and long) and electrode
- 19. Remote control torch adjustment wheel and selection button

2. SAFETY INSTRUCTIONS

2.1 Explanation of Markings and Warning Symbols



WARNING

Indicates sections of the user manual that are particularly important for the effective operation, proper use, and proper maintenance of the welding machine



WARNING (related to the illustration)

Used in conjunction with illustrations where safety-related aspects must be carefully observed.



NOTE

Indicates sections of the user manual that are particularly important for the efficient operation, proper use, and proper maintenance of the welding machine.

2.2 Instructions for safe use of the equipment

2.2.1 General safety instructions



WARNING

Follow these general safety instructions when using the welding machine:

Read this user manual carefully before using the welding machine. Keep it in an easily accessible place—it must accompany the machine throughout its entire service life.

- > If you need more detailed instructions than those provided here, contact Wallius Welding Machines' service department.
- > Never use a defective or damaged welding machine.
- > Do not use the machine if it has been dropped or subjected to strong impacts. It must be inspected and approved by an authorized service center before further use.
- > Modifying the welding machine's structure without the manufacturer's permission is strictly prohibited. Unauthorized modifications void the product warranty.
- > Use only original spare parts approved by the manufacturer for repairs and maintenance.
- > A clean and organized work area is essential for safe operation. Always check the work area before starting work and remove any potential hazards.
- > Do not weld near sensitive electronic equipment, as electromagnetic interference may cause malfunctions or damage.

2.2.2 Welding Safety Instructions

Follow these safety instructions during operation:

Personal protective equipment

- > Wear protective clothing that covers exposed skin. UV radiation from the welding arc can cause burns.
 - > Do not wear flammable clothing during welding work.
 - > Wear protective gloves that protect against heat and sparks.
 - > Wear appropriate hearing protection and other necessary personal protective equipment (PPE).
-

General safety during work

- > Handle hot workpieces and welding tools with care. Warn people nearby of potential hazards.
 - > Ensure that everyone nearby is aware of the welding work and the associated risks.
 - > Never use a welding machine without protective shields.
 - > Never point the welding electrode at yourself or others.
-

Electrical Safety

- > If you receive an electric shock, stop welding immediately and disconnect the machine from the power source.
 - > High currents can generate strong electromagnetic fields that may interfere with the operation of devices such as pacemakers.
 - > Always ensure that welding equipment is electromagnetically compatible with other nearby devices.
-

Eye and vision protection

- > Always wear a welding helmet with an appropriate shade (DIN 8–13).
 - > It is strictly prohibited to look directly at the arc without protection. The arc can cause serious eye injuries from a distance of up to 15 meters.
 - > Do not wear contact lenses while welding, as they may melt onto the eye due to the heat.
 - > Be careful of light reflected from the arc.
-

Workplace Safety

- > Protect the welding area with non-reflective shields or, if possible, work in a separate welding area.
- > Welding fumes may contain hazardous substances. Protect yourself by using:
 - > fume extraction systems
 - > air-purifying welding masks
 - > appropriate protective clothing

- > Do not inhale welding fumes or welding gases.
 - > Weld only clean, untreated, and stainless materials to minimize harmful emissions.
 - > Ensure adequate ventilation or use appropriate respiratory protection.
 - > Never use oxygen for ventilation.
-

Fire and Explosion Safety

- > Keep children and unauthorized persons away from the work area.
 - > Comply with all local fire safety regulations regarding hot work.
 - > Ensure that fire extinguishers are readily available.
 - > Remove combustible materials from the welding area whenever possible.
 - > Note that heat transfer through materials can create hidden fire hazards.
 - > Sparks, molten metal, and hot surfaces can ignite nearby materials.
 - > Never weld near flammable or explosive substances.
 - > Avoid welding in enclosed or confined spaces unless appropriate safety measures and supervision are in place.
 - > Welding containers that have held flammable liquids poses a high risk of explosion and must be handled with extreme caution.
-

Machine Placement and Handling

- > Place the welding machine on a stable, level surface.
 - > Ensure that the ventilation openings are not blocked.
 - > Blocking the airflow can cause overheating and equipment failure.
 - > Do not use the device on surfaces with a slope greater than 10°.
-

Electrical Installation and Grounding

- > The welding machine is an electrical device. Moisture, damaged cables, or mechanical faults can cause electric shock.
 - > Ensure that all electrical connections comply with current regulations.
 - > The power cord has a **yellow-green protective conductor**, which must always be connected to a protective earth.
 - > **Never connect the protective conductor to a live circuit.**
 - > After installation, check that the grounding is working properly.
-

Cable and Equipment Safety

- > Protect cables from sharp edges and falling objects.
 - > Repair damaged cables immediately.
 - > Never move the machine by pulling on the cables.
 - > Keep cables clear and untangled—do not wrap them around metal objects, as this can cause inductive interference.
-

Safety in damp conditions and storage

- > Do not use the device in wet or damp environments.

- > Store the device in a dry environment.
 - > If the device gets wet (e.g., from rain or condensation), allow it to dry completely before use.
-

Operational safety

- > Always use the welding machine under supervision.
- > Turn off the device and unplug it from the outlet when not in use.
- > Prevent foreign objects from entering the machine—they can cause damage or serious hazards.

3. PREPARATIONS BEFORE USE

3.1 Removing Packaging Materials and Inspecting the Product

Unpack the welding machine and its accessories from the shipping carton. At the same time, check that the machine has not been damaged during transport. If the welding machine has been damaged during transport, contact the relevant shipping company immediately and file a damage report.



NOTE

Under no circumstances should a damaged welding machine be connected to the power supply.

If the contents of the delivery do not match your order, contact the equipment supplier or dealer.

3.2 Connection to the power supply

The HAKAS PLUSTIG 200 AC/DC welding machine is supplied with a single-phase connection for a 230 V/50 Hz power supply.

Always plug the power cord into a grounded outlet.



NOTE

Before connecting the welding machine to the power supply, verify the correct voltage level. If the voltage is too low or too high, the AL warning light on the control panel will illuminate and welding will not be possible.



WARNING

The protective conductor insulation is yellow-green. Electrical connections must only be made by a qualified electrician.



WARNING

Incorrect electrical connections can cause serious injury or death.

3.3 Installation of Accessories

1. Connect the DIX 50 quick connector (12) on the welding torch to the DIX 50 negative terminal (3) on the front panel of the welding machine.



NOTE

Before beginning installation, check that the contact surfaces of the welding torch quick connector and the welding machine quick connector are intact and clean.

2. Tighten the welding torch connection to the machine by hand until it is tight. A loose connection may damage both the welding machine and the welding torch.
3. Insert the TIG torch gas hose quick-connect fitting (13) into the shielding gas connector (2) on the machine's front panel. The quick-connect fitting will click into place to indicate it is locked. (To release the fitting, push the locking ring inward, causing the gas hose to pop out of the connector).
4. Install the TIG torch control connector (14) into the control connector (4) on the machine's front panel. Screw the locking ring onto the threads. Tighten lightly.
5. Remove any protective cap from the shielding gas cylinder valve, as well as the cap nut.



NOTE

The shielding gas used must be 100% argon or another shielding gas intended for TIG welding. Gases intended for MAG welding that contain carbon dioxide are NOT suitable for TIG welding.

6. Attach the pressure reducer/flow meter to the valve of the shielding gas cylinder.
7. Run the gas supply hose from the flow meter to the shielding gas connection on the welding machine (7).
8. Tighten the hose clamp on the hose connection.
9. Carefully open the valve on the shielding gas cylinder. Monitor the flow meter on the gas supply hose at the same time.
10. Adjust the correct gas flow using the screw on the pressure regulator. The correct gas flow varies depending on the workpiece, material, and environment.
11. Check the tightness of the hose connections by closing the valve on the shielding gas cylinder. If the pressure on the cylinder pressure gauge begins to drop immediately even though the welding machine's solenoid valve is closed, there is a leak somewhere.

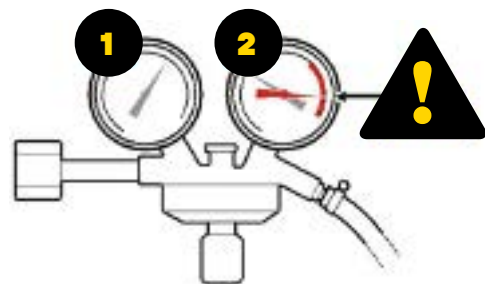


WARNING

If the pressure regulator is defective, immediately close the valve on the shielding gas cylinder and release the pressure. It is dangerous to disconnect the gauge and hoses while they are under pressure.

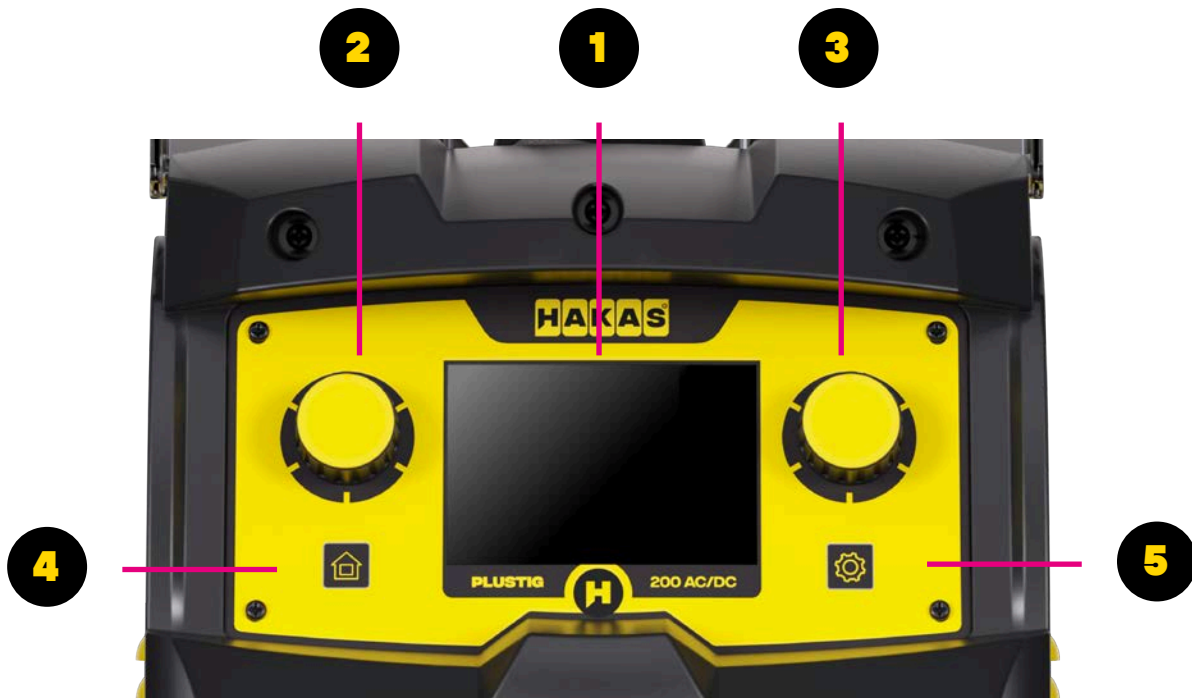
Here is a picture of the flow regulator.

1. Shielding gas cylinder pressure gauge
2. Gas supply hose flow meter



4. OPERATION

4.1 Control Panel



1. LCD color display (1)
 - > Welding machine main menu
 - > Welding method menus and welding parameters
 - > Welding current and voltage meters
2. Left selection wheel/button (2)
 - > Selecting the welding method or adjusting welding parameters
3. Right selection wheel/button (3)
 - > Selecting the welding method or adjusting welding parameters
4. Home button (4)
 - > Welding process selection button
5. Settings button (5)
 - > Parameter adjustment button

To navigate the welding machine menus, turn the left (2) or right (3) selection wheel, press the right (3) or left (2) selection wheel, or press the Home (4) or Settings (5) button.

4.2 Language selection

The HAKAS PLUSMIG 200 AC/DC is equipped with menus in Finnish, Swedish, and English, with English selected as the default language. You can switch between the three languages from any menu by pressing the Home button (4) twice in succession, then turning the left selection wheel (2) to the desired language, and selecting it by

pressing the left selection wheel (2) once. You can change the language again by following the steps described above.

4.3 Navigating the machine menus

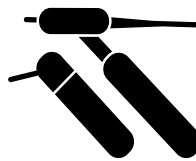
The HAKAS PLUSMIG 200 AC/DC main menu (see image below) includes the following functions: welding methods, memory slots, display brightness adjustment, and reset settings. To navigate the main menu, press the Home button (4). The selectable option is highlighted on the display with a black rectangle.



4.4 Starting a TIG welding job

Start TIG welding as follows:

1. Make sure you have completed all the steps mentioned in the third section of this user manual before starting to weld.
2. Turn on the welding machine using the power switch (5) on the rear panel.
3. Once the machine has started, navigate through the main menu by repeatedly pressing the home button (4). Go to the welding methods section in the main menu.



4. Navigate through the welding method menu by turning the left selection wheel (2). Select the desired TIG welding method by pressing the left selection wheel (2) once.



The following welding methods are available:

- a. Alternating current with high-frequency ignition - HF TIG AC
- b. Alternating current with lift-off ignition - LIFT TIG AC
- c. Direct current with high-frequency ignition - HF TIG DC
- d. Direct current with lift-off ignition - LIFT TIG DC

- e. Stick welding with direct current - MMA DC and
- f. AC stick welding - MMA AC

In the welding method menu, you can select the TIG and stick welding methods, the TIG ignition method to be used, and between direct current and alternating current. The TIG welding method is selected based on the material to be welded:

- a. alternating current (AC) is used, for example, for aluminum and its various alloys, and
- b. direct current (DC) is used, for example, for steel, stainless steel, and acid-resistant steel.

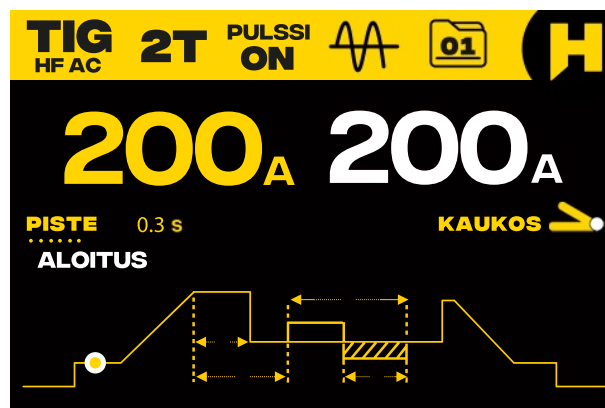
The HAKAS PLUSMIG 200 AC/DC welding machine offers two different ignition methods for TIG welding:

- a. high-frequency (HF TIG)
- b. lift ignition (Lift TIG)

In high-frequency (spark) ignition, the arc is ignited using a high-voltage pulse. In the Lift TIG ignition method, physical contact between the electrode and the workpiece is required.

5. Each of the six welding methods has its own settings menu. The options displayed in the settings menu vary depending on which functions are available for each welding method. Adjust the following parameters in the yellow top menu and the spot welding time by pressing the settings button (5) and navigating to the desired parameter. Turn the right selection wheel (3) to cycle through the available parameters. You can confirm your selection by pressing the right selection wheel (3) once. Selectable parameters for HF TIG AC welding include:

- a. Welding torch trigger operating mode: 2T, 4T, and 4T MLogic
- b. Pulse on/off (ON/OFF)
- c. AC waveform: AC sine wave, AC square wave, and AC Optima
- d. Spot welding spot cycle time (seconds)
- e. In addition, the display shows whether remote control mode is activated



Adjust the welding current and other settings according to the material and thickness of the workpiece being welded, as described in section 5.4 of this user manual.

6. For HF TIG welding, move the torch electrode 2–10 mm away from the workpiece; for Lift TIG welding, quickly touch the workpiece with the tip of the electrode.
7. Press the torch trigger; the gas valve opens and the arc ignites (HF ignition).
8. If necessary, adjust the welding current using the selector wheel.

9. Releasing the torch trigger stops welding after the post-arc time has elapsed.
10. Keep the electrode at the end point for the duration of the post-gas flow to protect the cooling weld.

4.5 Adjusting TIG Welding Parameters

The HAKAS PLUSTIG 200 AC/DC is equipped with a visual parameter curve. The parameter curve is used to make changes to the welding parameters. Use the left (2) or right (3) selection wheel to move from one parameter to another. The selected parameter is highlighted on the curve, and its value is adjusted by turning the right selection wheel (3). Please note that depending on other settings (such as pulse on/off), the parameter curve only displays options allowed by the other settings.

The selected welding parameters are saved to memory locations 1–6.

4.6 TIG Welding Parameters

PRE-GAS

Pre-gas, or the pre-gas flow time, determines how long gas flows before the arc is ignited. Gas flow before arc ignition ensures that the metal does not come into contact with air during the initial phase of welding. Used for all metals, but especially for stainless steel and titanium.

- > Available with both 2T and 4T trigger functions.
- > Adjustment range 0.0 – 1 s
- > Factory setting 0.0 s

START

Start, i.e., the starting current level, determines the current used in the 4T mode for arc ignition.

- > Available only with the 4T trigger function
- > Adjustment range 10–200 A
- > Factory setting 50 A

UPSLOPE

Upslope (ramp) is a function that determines the time it takes for the current to rise from arc ignition to the welding current level (ITIG).

- > Available with 2T and 4T trigger functions
- > Adjustment range 0.0–5.0 s
- > Factory setting 0 s

WELDING CURRENT (ITIG)

Welding current

- > 10–200 A

BASE CURRENT

Base current, i.e., the base current level of the pulse welding wave.

- > Used only in pulse welding
- > Adjustment range 10–200 A
- > Note! The pulse base current cannot be greater than the welding current (ITIG)
- >

WIDTH

Width, i.e., the width of the pulse wave, determines the amount of welding current (ITIG) relative to the base current.

- > Used only in pulse welding
- > Adjustment range 5–100%
- > Factory setting 5%

PULSE FREQUENCY

The pulse frequency determines the frequency of the welding pulse.

- > Used only in pulse welding
- > Adjustment range 0.5–100 Hz

DOWNSLOPE

The downslope (end ramp) determines the duration of the current decay to the post-weld current level.

- > Used with both 2T and 4T trigger functions
- > Adjustment range 0.0–5.0 s
- > Factory setting 0.0 s

STOP

Stop, or end current, determines the end current (crater fill) for the 4T function.

- > Available only with 4T trigger function
- > Adjustment range 10–200 A
- > Factory setting 15 A

POST-GAS

Post-gas flow time determines how long gas is supplied after the arc extinguishes.

- > Available with 2T and 4T trigger functions
- > Adjustment range 0.1–10.0 s
- > Factory setting 0.1 s

BALANCE

Balance: AC balance, +/- ratio, electrode cleaning, electrode temperature.

- > Operates only with alternating current (AC)
- > Adjustment range 20–50%
- > Factory setting 20%
- > Default settings:
- > 15–25% for a 1.6 mm electrode
- > For a 2.4 mm electrode: 20–40%
- > For a 3.2 mm electrode: 50%

AC FREQUENCY

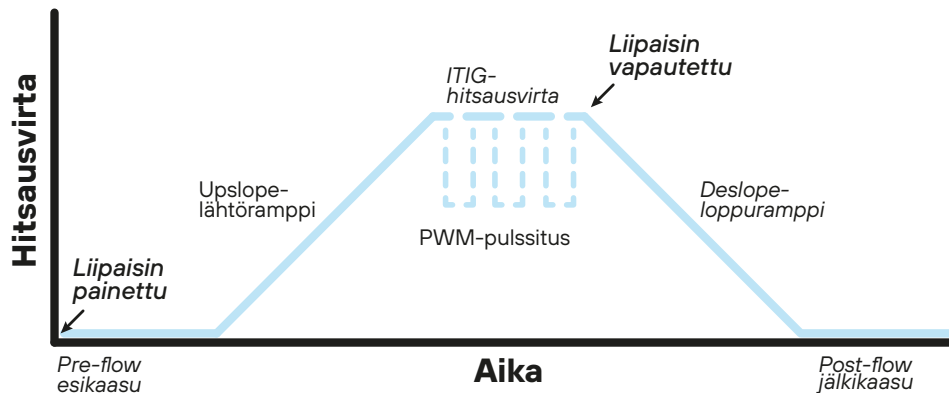
- > AC frequency (alternating current frequency)
- > Operates only on alternating current (AC)
- > Adjustment range 10–100 Hz
- > Factory setting 10 Hz

4.7 Description of 2T, 4T, and 4T MLogic Trigger Functions

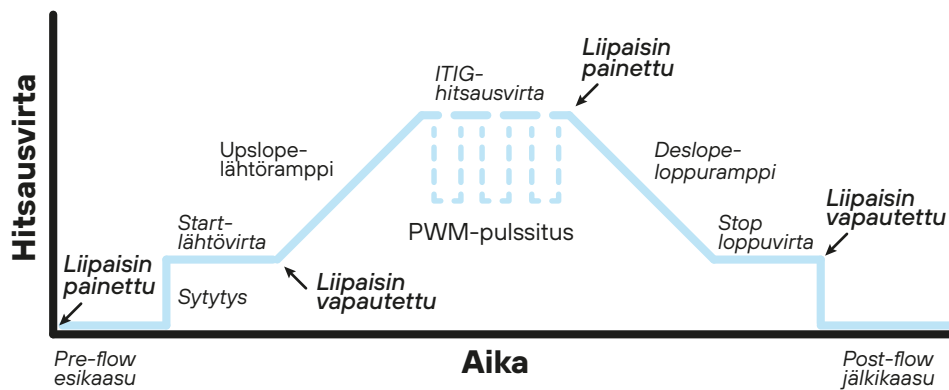
The HAKAS PLUSTIG 200 AC/DC welding machine has two alternative torch trigger operating modes: 2T and 4T, as well as a special 4T MLogic mode. In 2T mode, the trigger is held down throughout the weld, whereas in 4T mode, the trigger is first

pressed and then released to start the weld, and pressed again to stop it, as well as to activate special trigger functions such as the special 4T MLogic function.

2T-LIIP AISINTOIMINTO



4T-LIIP AISINTOIMINTO



The 4T MLogic TIG welding function is a special trigger function designed as a professional tool, where the torch switch in 4T mode allows numerous functions to be performed with different presses, which facilitate, for example, crossing over tack welds and, for example, setting the hold current when changing welding positions required for welding complex parts. 4T MLogic works as follows:

1. Trigger is pressed: gas starts, arc ignites, welding start current
2. Trigger is released: welding current rises to the set level
3. Trigger is pressed quickly: welding current drops rapidly to the set level
4. Trigger is pressed again quickly: welding current rises back to the set level
5. Trigger is held down: welding current drops to the down-current level, after which the arc extinguishes and the gas flow stops according to the settings.

4.8 TIG Electrodes and TIG Welding Accessories

A wide selection of high-quality TIG electrodes, gas caps, other torch components, and torches from the HAKAS ORIGINAL series is available. The electrode type, size, and bevel angle suitable for the welding application and welding method, as well as the projection from the edge of the gas cap, can be found in TIG welding instructional materials and through trial and error.

For novice welders, we recommend the red or violet electrodes from the HAKAS ORIGINAL™ series for DC TIG welding of steel and stainless steel materials. The green electrode is suitable for AC TIG welding of aluminum and its alloys. We recommend that all welders purchase the HAKAS ORIGINAL TIG consumable set. The HAKAS ORIGINAL consumable set includes high-quality consumables required for TIG welding. HAKAS ORIGINAL consumable sets are available in two different sizes for electrode thicknesses of 1.6 mm, 2.0 mm, 2.4 mm, and 3.2 mm.

The electrode is sharpened to a point for TIG DC welding. The sharper the angle, the narrower the arc and the greater the penetration. A blunter angle widens the arc and improves electrode life.

In AC TIG welding, the electrode temperature may exceed its melting point. To improve electrode life, it is ground to a round shape. For thin material thicknesses, it is possible to grind the electrode to an angle and round the tip.

**NOTE**

Always sharpen the electrode lengthwise.

**NOTE**

Sharpen the electrode regularly to ensure it remains clean. If the electrode comes into contact with the workpiece or filler wire, stop welding immediately, sharpen the electrode again, and clean the workpiece if necessary.

4.9 Starting MMA Stick Welding

Start MMA stick welding as follows:

**NOTE**

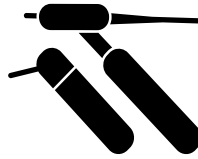
In stick welding, the correct polarity is selected based on the welding rod being used. You can find the correct setting on the welding rod package. Always follow the welding rod manufacturer's instructions.

**WARNING**

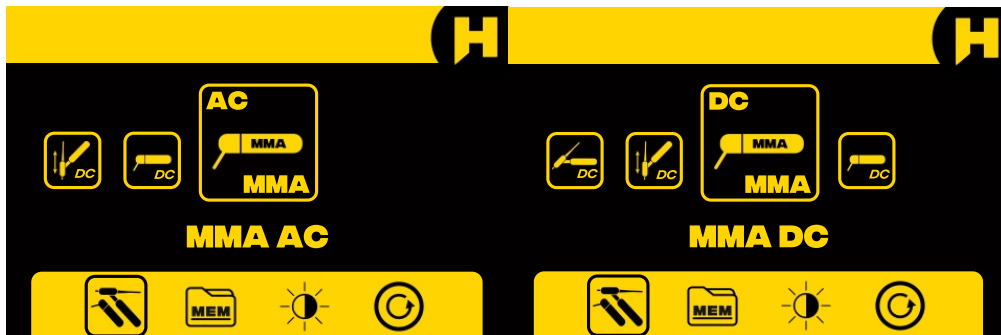
The power switch must be in the OFF position when connecting the torch cable, ground cable, electrode holder cable, or other accessories to the welding machine.

1. If a TIG welding torch has been in use, disconnect the TIG welding torch (11) and, if applicable, the ground cable (9) from the welding machine.
2. Connect the DIX 50 connector (9) of the stick welding cable to either the DIX 50-plus (1) or DIX 50-minus (3) connector, depending on the type of electrode being used. The most common types of electrodes are welded with positive polarity.
3. Connect the DX50 connector (9) of the ground cable to either the DX50-plus (1) or DX50-minus (3) connector, depending on the type of electrode being used.

- Turn on the welding machine using the power switch (5) on the rear panel.
- Navigate through the main menu by repeatedly pressing the home button (4). Go to the welding methods section in the main menu.



- Navigate the welding methods menu by turning the left selection wheel (2). Select AC stick welding (MMA AC) or DC stick welding by pressing the left selection wheel (2) once when the correct option is highlighted.



- Adjust the welding current using the right selection wheel (3) according to the material to be welded, its thickness, and the size and type of the electrode.
- Strike the arc by lightly scraping the electrode against the surface of the workpiece.
- If the electrode sticks, the ANTI-STICK function activates and cuts off the welding current. Remove the electrode, check the electrode and the correct welding current. Repeat step eight (8).
- If necessary, adjust the welding current using the right-hand selector wheel (3).
- If necessary, adjust the duration and intensity of the HOT-START ignition pulse and the intensity of the ARC-FORCE function according to the welding target and your personal preferences. The selected setting is highlighted on the parameter curve. Press the right selection wheel (3) to move from one setting to another. You can change the setting by turning the right selection wheel (3). Press the right selection wheel (3) to confirm your selection.
- You can turn the VRD setting (Voltage Reduction, i.e., the open-circuit voltage reduction function) on or off (ON/OFF) by pressing the setting button (5). When the VRD selection is highlighted, turn the right selection wheel (3) to make your desired selection.



13. The most recently used welding parameters are automatically saved to the active memory slot. The active memory slot is displayed in the top menu (01-06).

5. MAINTENANCE

5.1 General

HAKAS welding machines are designed to be reliable and of high quality. All electromechanical devices, such as welding machines, require regular maintenance to function properly and safely. Maintenance must take into account the frequency of use and environmental conditions.

By using the equipment properly and maintaining it regularly, you can avoid unnecessary malfunctions. A thorough maintenance inspection of the equipment is recommended every six months. The electrical connections of all electromechanical devices can become loose and oxidized when used in varying conditions. An authorized HAKAS service provider performs all maintenance and repair work.



NOTE

The welding machine may only be serviced by a **qualified professional** who is familiar with its operation and use.

Warranty service may only be performed by **an authorized HAKAS service provider**. A list of authorized service centers is available on the HAKAS website

5.2 Daily Maintenance

Perform the following checks regularly:

- > Check that there is no visible damage to the machine
- > Check that the grounding cable connections are secure
- > Check that the connections to the electrode cables are secure
- > Keep the machine clean and dry
- > Prevent metal dust from accumulating inside the machine
- > Ensure that the power cord and welding cables are intact



WARNING

Stop using the machine immediately if:

- > the power cord is damaged
- > the welding cables show signs of wear or damage

If the maintenance procedures described in this manual are insufficient, contact HAKAS Service.

5.3 Cleaning

The power source must be cleaned every six months or at most once a year, depending on how often it is used. Cleaning must be performed by an authorized service center.

1. Clean the power source annually by either vacuuming it or gently blowing compressed air into it.
2. At the same time, check all cable connections on the welding machine.

**NOTE**

The power cable must be disconnected from the mains.

5.4 Replacement of Wear Parts

The welding machine's wear parts must be replaced as needed. The wear parts of the welding equipment are

- > welding torch parts
- > grounding cable parts
- > ampermeters

**NOTE**

Wear parts must be replaced at the owner's expense even during the warranty period.

5.5 Disposal of the device

Do not dispose of the device with household waste. Discarded electrical and electronic equipment must be taken to an authorized waste collection point designated for this purpose.

The owner must take the end-of-life device to a regional collection point designated by the authorities.

Think of the environment!

6. STORAGE

6.1 Storage of the device

The welding machine is an electrical device that must be stored in a dry environment. Store the device in a location where it is protected from impacts and other mechanical stresses.

6.2 Storage of consumables

Always store consumable spools in a dry place with a stable temperature.



NOTE

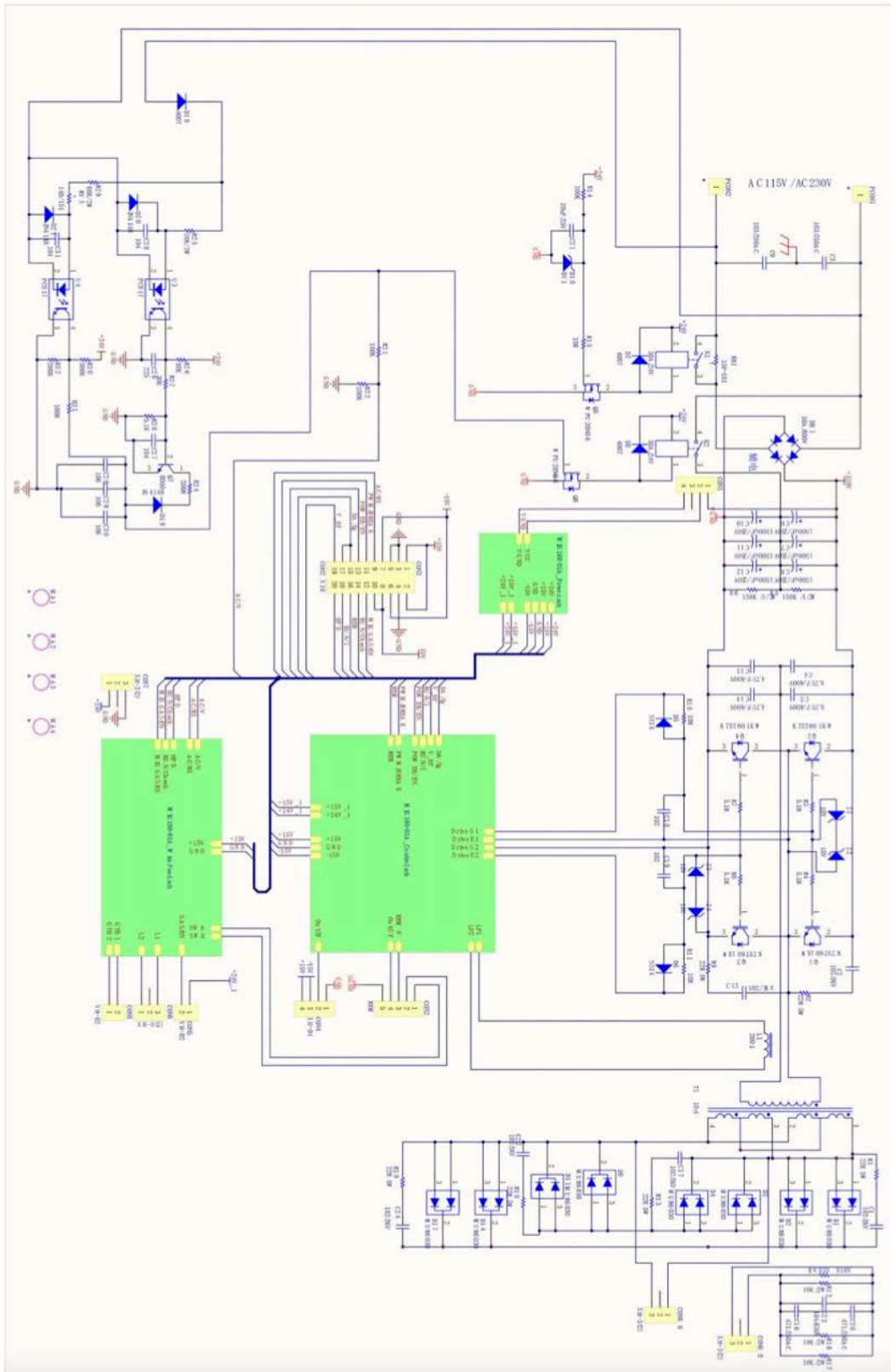
Do not use oil or other anti-corrosion agents to protect the wire spool, as oil, dust, and other contaminants will clog the wire feed and cause porosity in the weld.

If necessary, remove the filler wire from the machine and store it in a dry place.

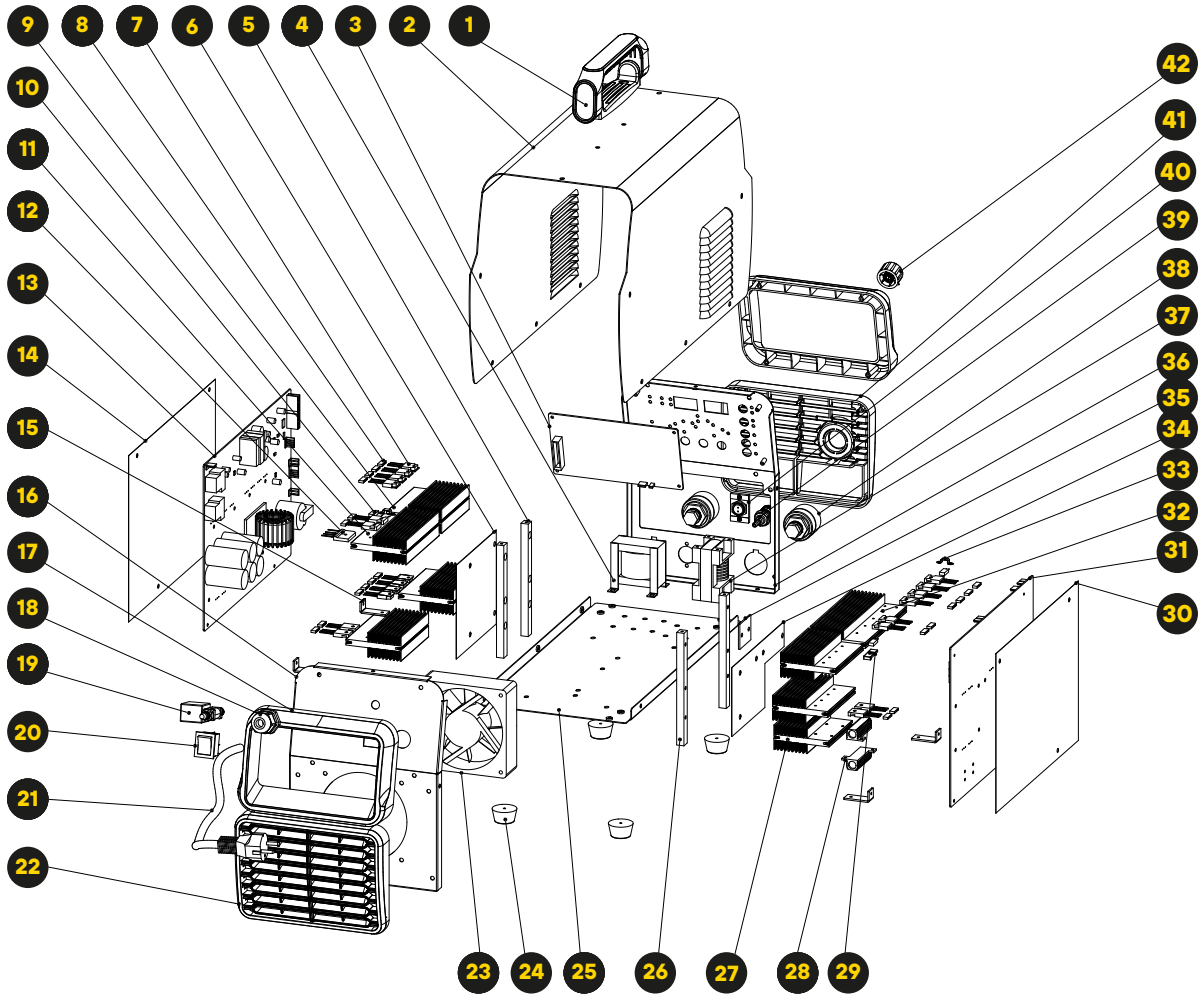
7. TECHNICAL SPECIFICATIONS

Technical data/tekniset tiedot/teknisk information/tehnilised andmed	
Welding current range/hitsausvirta-alue/svetsströmsområde/ keevitusvoolu vahemik (A min/max)	10/200 A (TIG DC) 10/200 A (TIG AC) 10/160 A (MMA)
Maximum welding current/maksimi hitsausvirta/max. svetsström/maksimaalne keevitusvool TIG AC/TIG DC	200 A (30 % ED)
Load capacity/kuormitettavuus/belastningsförmåga/kandevõime (40 °C) 60% ED	141 A/15,7 V (TIG)
Load capacity/kuormitettavuus/belastningsförmåga/kandevõime (40 °C) 100% ED	110 A/14,4 V (TIG)
Open circuit voltage/tyhjäkäyntijännite/tomgångsspänning/ koormamata pinge	68 V
Control panel/käyttöpaneeli/kontrollpanel/juhtpaneel	LCD screen, 2 knobs and 2 push buttons, welding programs/LCD näyttö, 2 säätöpyörää ja painonapit, hitsausohjelmat/LCD displayer, 2 justeringshjuler och 2 tryckknappar, svetsprogram/LCD-ekraan, 2 reguleerimisratas ja 2 nappu, keevitusprogrammid
Welding current adjustment/hitsausvirran säätö/svetsström justering/keevitusvoolu reguleerimine	Stepless/portaaton/steglös/astmeline
Electrode diameter/elektroodin halkaisija/elektrod diameter/ elektroodi diameeter (mm)	1,6–2,0–2,4–3,2 (TIG) 1,6–4,0 (MMA)
Power supply voltage/liitännätännite/aslutningspänning/ ühenduspinge	230 V
Connection power max/maksimi liitännätäteho/anslutningseffekt max./ühendusvõimsus max	8,5 KVA (TIG) 9,2 KVA (MMA)
Fuse size/sulakekoko/säkringsstorlek/kaitsme suurus	16 A, slow/hidas/långsam/aeglane
Protection class/suojausluokka/skyddklass/kaitseklass	IP23S
Operating temperature/käyttölämpötila/arbets-temperature/ töötemperatuur	-10..+40, humidity/kosteus/fuktighet/niiskus <90%
Power cord length/verkkojohdon pituus/anslutningskabelns längd/toitejuhtme pikkus	3,0 m
W/H/L; L/K/P; B/H/L; P/L/K	215x385x520 mm
Weight/paino/vikt/kaal	13 kg

8. BLOCK DIAGRAM



9. EXPLODED VIEW



1. Kahva
2. Päälipelti
3. Ohjauspaneeli
4. Toisiomuuntaja
5. Jäähdytyslementin tuki
6. Eristelevy
7. Tasasuuntaaja
8. Pölysuoja
9. Jäähdytyslementti 1
10. Lämpötila-anturi
11. Jäähdytyslementti 2
12. Tasasuuntaussilta
13. Pääkortti
14. Eristelevy
15. Jäähdytyslementin tuki
16. Metallinen takapaneelin tuki
17. Ylempi takapaneeli
18. Vedonpoistin
19. Magneettiventtiili
20. Virtakytkin
21. Virtakaapeli

22. Alempi takapaneeli
23. Tuuletin
25. Pohjapelti
26. Jäähdytyslementin tuki
27. Jäähdytyslementti 3
28. Vastus
29. IGBT-toisiotransistorit
30. Eristelevy
31. Toisiokortti
32. Jäähdytyslementti 4
33. Pidike
34. Eriste
35. Muuntaja
36. Metallinen etupaneelin tuki
37. Kuristin
38. DX50-liitin
39. Suojakaasun pikaliitin
40. Polttimen ohjausliitin
41. Etupaneeli
42. Nuppi

10. WARRANTY AND CONTACT INFORMATION

Wallius Hitsauskoneet Oy provides a warranty for HAKAS welding machines that covers defects resulting from material or manufacturing faults. The warranty does not cover consequential damages.

More detailed information on the warranty period and warranty terms can be found in the warranty document supplied with the machine and at www.hakas.fi. Read the warranty terms carefully before putting the machine into service.

Wear parts of the welding machine, such as welding torch parts, ground cable parts, wire feed rollers, other wear parts of the wire feeder, flow meters, and the machine's wheels, must be replaced at regular intervals at the owner's expense.

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