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STAHLWERK CTM-250 ST

STAHLWERK CTM-250 ST 4-in-1 Combined Welding Machine User Manual

Model: CTM-250 ST | Brand: STAHLWERK

1. Introduction

The STAHLWERK CTM-250 ST is a versatile 4-in-1 combined welding machine designed for a wide range of applications. This powerful 200A inverter integrates TIG DC, MIG/MAG, MMA welding, and an integrated CUT plasma cutting function. It offers a complete and compact solution suitable for demanding workshop, assembly, and renovation tasks. This manual provides essential information for safe and efficient operation, setup, maintenance, and troubleshooting of your CTM-250 ST.

2. Safety Information

Always prioritize safety when operating welding and cutting equipment. Failure to follow safety guidelines can result in serious injury or death.

- **Personal Protective Equipment (PPE):** Always wear appropriate PPE, including a welding helmet with proper shade, flame-resistant clothing, welding gloves, and safety shoes.
- **Ventilation:** Ensure adequate ventilation to remove welding fumes and gases from the work area.
- **Fire Hazards:** Keep flammable materials away from the welding area. Have a fire extinguisher readily available.
- **Electrical Safety:** Ensure the machine is properly grounded. Do not operate in wet conditions. Inspect cables and connections for damage before use.
- **Arc Rays:** Protect eyes and skin from arc rays, which can cause burns and eye damage.
- **Hot Metal:** Allow welded or cut materials to cool before handling. Use appropriate tools to move hot workpieces.
- **Compressed Gas Cylinders:** Handle gas cylinders with care. Secure them properly to prevent falling.

3. Product Overview and Components

The STAHLWERK CTM-250 ST is a robust and versatile machine. Below are key components and features:



Image: STAHLWERK CTM-250 ST complete welding kit. This image displays the main unit along with various accessories including TIG torch, MIG/MAG torch, plasma cutting torch, welding helmet, ground clamp, electrode holder, gas regulator, wire spool, and consumables.



Image: STAHLWERK CTM-250 ST machine with plasma torch connected. The machine's side panel shows the plasma cutting torch connected, highlighting its integrated cutting capability.

Key Features:

- **4-in-1 Combined Welder:** Powerful 200A inverter integrating TIG DC, MIG/MAG, MMA, and CUT plasma functions.
- **Integrated 45A Plasma Cutter:** Precision cutting of steel, stainless steel, and conductive metals up to 14 mm thick using compressed air. Contact ignition for clean cuts.
- **MIG/MAG with 4-Roller Drive:** Robust 4-roller system ensures constant feeding of solid or flux-cored wire. Automatic wire speed adjustment with current and voltage correction for penetration control.
- **Precision TIG & MMA Welding:** Extended TIG menu for gas flow and current down-slope control. MMA mode features Hotstart and Anti-Stick for easy electrode ignition.
- **IGBT Technology & Portability:** Weighs only 12.9 kg, featuring IGBT technology for stable arc, intelligent cooling, and ST-Guard housing for durability.



Image: STAHLWERK CTM-250 ST control panel with feature descriptions. This image illustrates the various welding and cutting modes (CUT, DC TIG, MIG MAG, Flux-cored, MMA) and key functionalities like synergistic wire feed and 4-roller drive.



Image: Digital display of STAHLWERK CTM-250 ST. This close-up shows the digital display and control knobs for precise parameter setting.



Image: STAHLWERK CTM-250 ST connection ports. This image highlights the easily accessible connection points for various welding and cutting processes.

4. Setup

4.1. Power Connection

Connect the machine to a suitable 230V power supply. Ensure the power outlet is properly grounded and can handle the machine's maximum current draw.

4.2. Ground Clamp Connection

Connect the ground clamp cable to the appropriate terminal on the machine (usually marked with a ground symbol or '-'). Attach the clamp securely to a clean, bare metal section of your workpiece to ensure a good electrical connection.

4.3. Gas Connection (for MIG/MAG, TIG, and CUT)

For processes requiring shielding gas (MIG/MAG, TIG) or compressed air (CUT), connect the gas hose from your gas cylinder/compressor to the corresponding 'GAS IN' inlet on the rear of the machine. Ensure all connections are tight to prevent

leaks.

4.4. Welding Wire Installation (MIG/MAG)

Open the side panel of the machine to access the wire feed mechanism. Install the appropriate welding wire spool (solid or flux-cored) onto the spindle. Thread the wire through the guide tube and into the drive rollers. Adjust the tension of the drive rollers to ensure smooth wire feeding without crushing the wire.

4.5. Torch Connections

- **MIG/MAG Torch:** Connect the MIG/MAG torch to the central Euro connector on the front panel.
- **TIG Torch:** Connect the TIG torch to the 'TIG' terminal and the control cable to the corresponding socket.
- **MMA (Electrode Holder):** Connect the electrode holder cable to the appropriate terminal (usually '+' for most applications).
- **CUT (Plasma Torch):** Connect the plasma cutting torch to the 'CUT' terminal and its control cable.

5. Operating Modes

The CTM-250 ST offers multiple operating modes. Select the desired mode using the control panel.



Image: STAHLWERK CTM-250 ST control panel showing various welding modes. The digital display and mode selection buttons are visible, allowing users to switch between CUT, DC TIG, MIG/MAG, and MMA.

5.1. Plasma Cutting (CUT)

Select the CUT mode. Adjust the cutting current (up to 45A) based on the material thickness (up to 14 mm). Ensure compressed air is connected and flowing. Use contact ignition for precise and clean cuts.

5.2. TIG DC Welding

Select TIG DC mode. Connect the TIG torch and gas. Adjust welding current, gas pre-flow, and post-flow settings for optimal results. The extended TIG menu provides total control for spatter-free welds.

5.3. MIG/MAG Welding

Select MIG/MAG mode. Ensure the correct wire type and gas (if required) are set up. The 4-roller drive system ensures constant wire feeding. Wire speed automatically adjusts to the current, and voltage correction allows for customized penetration.

5.4. MMA (ARC) Welding

Select MMA mode. Connect the electrode holder and ground clamp. The Hotstart function ensures easy ignition of the electrode, while Anti-Stick prevents the electrode from sticking to the workpiece.



Image: STAHLWERK CTM-250 ST showing Hotstart and Anti-Stick functions. This image highlights the benefits of these features for MMA welding, ensuring optimal ignition and preventing electrode sticking.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your STAHLWERK CTM-250 ST.

- **Cleaning:** Regularly clean the machine's exterior and ventilation openings to prevent dust and debris buildup. Use compressed air to blow out internal components periodically.
- **Cable and Connection Inspection:** Inspect all cables, torches, and connections for wear, damage, or loose fittings before each use. Replace damaged components immediately.
- **Consumables:** Regularly check and replace worn-out consumables such as MIG contact tips, TIG electrodes, plasma cutting nozzles, and electrodes.
- **Wire Feed Mechanism (MIG/MAG):** Clean the wire feed rollers and guide tubes regularly to ensure smooth wire feeding.

Check roller tension.

- **Gas System:** Check gas hoses and regulators for leaks. Ensure proper gas flow for processes requiring shielding gas.

7. Troubleshooting

If you encounter issues with your CTM-250 ST, refer to the following common troubleshooting steps:

Problem	Possible Cause	Solution
No power	Power switch off, circuit breaker tripped, loose power cable	Turn on power switch, reset breaker, check power cable connection
No arc/poor arc stability	Poor ground connection, incorrect settings, worn consumables, wrong gas	Ensure good ground, adjust settings, replace consumables, check gas type/flow
Wire feeding issues (MIG/MAG)	Incorrect roller tension, clogged liner, wrong wire size, worn contact tip	Adjust roller tension, clean/replace liner, use correct wire/tip, replace tip
Poor plasma cut quality	Incorrect air pressure, worn plasma consumables, wrong cutting speed	Adjust air pressure, replace consumables, adjust cutting speed

If problems persist after attempting these solutions, please contact STAHLWERK customer support.

8. Specifications

Feature	Value
Manufacturer	STAHLWERK
Product Dimensions (L x W x H)	45 x 25 x 35 cm
Weight	12.9 Kilograms
Model Number	CTM-250 ST
Power Type	Electric
TIG/MIG/MMA Amperage	Up to 200 A
CUT Plasma Amperage	Up to 45 A
CUT Cutting Capacity	Up to 14 mm
Material	METAL AND RIGID PLASTIC
Included Components	CTM-250 ST (main unit)

9. Warranty and Support

STAHLWERK is committed to providing high-quality products and excellent customer service.

- **Warranty:** The product comes with extended warranty benefits. Please refer to your purchase documentation for specific warranty terms.
- **Customer Support:** Specialized customer support is available for assistance with product operation, maintenance, and any technical queries.

- **Repairs:** In-house workshops are available for fast repairs.

For further assistance, please visit the official STAHLWERK store or contact their customer service directly.

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