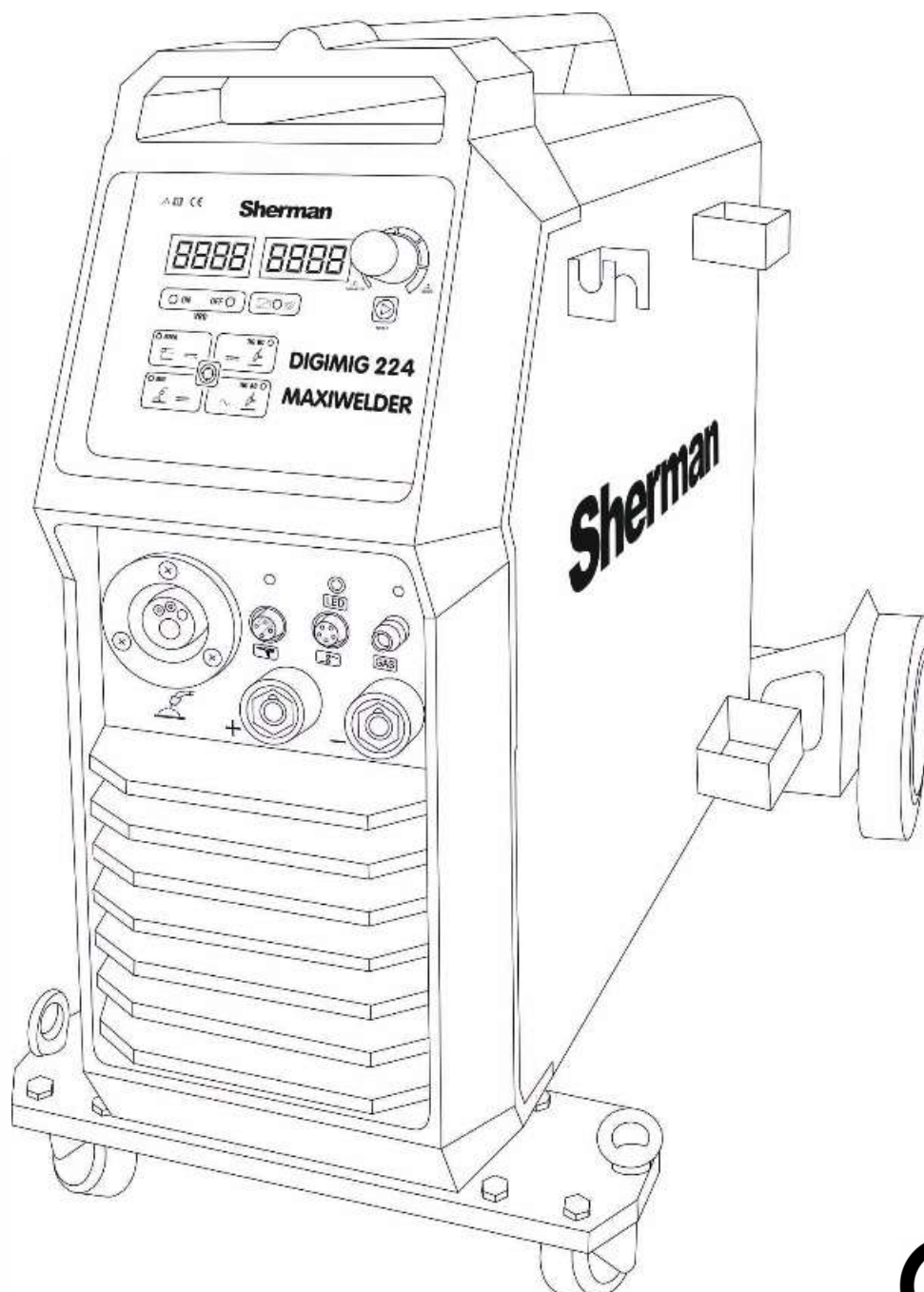


Sherman

ENG V1.5 7/27/26

USER MANUAL

SYNERGIC INVERTER WELDER DIGIMIG 224 MAXIWELDER



CE



ATTENTION!

Before installing and starting the appliance, please refer to this manual

1. GENERAL COMMENTS

The device can only be commissioned and operated after carefully reading these Operating Instructions.

Due to the continuous technical development of the device, the external appearance and some of its functions may be modified and their operation may differ in detail from the descriptions in the manual and on the carton. This is not a fault of the device, but the result of progress and continuous modification work of the device. The standard equipment of the device may also change.

Damage to the device caused by improper operation will void your warranty rights.
Any modifications to the welding machine are prohibited and will void the warranty.

2. SAFETY

Employees operating the device should have the necessary qualifications to perform welding work:

- they should have an electric welder license in the field of welding in gas shields,
- know the health and safety rules in the operation of electric power equipment, such as welding equipment and auxiliary equipment powered by electricity,
- know the rules of health and safety when operating cylinders and installations with compressed gas (argon),
- Be familiar with the contents of this manual and operate the appliance for its intended purpose.



WARNING



Welding may endanger the safety of the operator and other people in the vicinity. Therefore, special precautions must be taken when welding. Before starting welding, you should familiarize yourself with the health and safety regulations applicable at the workplace.

The following hazards exist during MIG/MAG electric welding:

- **ELECTRIC SHOCK**
- **NEGATIVE EFFECTS OF THE ARC ON HUMAN EYES AND SKIN**
- **VAPOR AND GAS POISONING**
- **BURNS**
- **EXPLOSION AND FIRE HAZARDS**
- **NOISE**

Electric shock prevention:

- connect the device to a technically efficient electrical system with proper protection and zeroing efficiency (additional protection against electric shock); other devices at the welder's workplace should also be checked and correctly connected to the network,
- install power cables when the device is switched off,
- Do not touch the non-insulated parts of the electrode holder, electrode and welded object at the same time, including the device housing,
- do not use torch and power cords with damaged insulation,
- in conditions of particular risk of electric shock (work in environments with high humidity and closed tanks), work with an assistant supporting the welder's work and watching over safety, use clothing and gloves with good insulating properties,
- if you notice any irregularities, you should contact competent people to remove them,
- It is forbidden to operate the device with the covers removed.

Preventing the negative effects of the electric arc on the eyes and skin of a person:

- Wear protective clothing (gloves, apron, leather shoes),
- Use protective shields or visors with a properly selected filter,
- Use protective curtains made of non-flammable materials and properly choose the colors of the walls that absorb harmful radiation.

Prevention of poisoning by vapours and gases emitted during welding from the electrode coating and metal evaporation:

- Use ventilation devices and exhausts installed in positions with limited air exchange,
- Blow fresh air when working in confined spaces (tanks),
- Use masks and ventilators.

Burn prevention:

- Wear appropriate protective clothing and footwear to protect against burns caused by arc radiation and spatter,
- Avoid staining the garment with greases and oils that may lead to its inflammation.

Explosion and fire prevention:

- It is forbidden to operate the device and weld in rooms at risk of explosion or fire,
- The welding station should be equipped with fire-fighting equipment,
- The welding station should be located at a safe distance from flammable materials.

Preventing the negative effects of noise:

- Use earplugs or other noise protection equipment,
- Warn of danger to people nearby.

**WARNING!**

Do not use a power source to defrost frozen pipes.

Before starting the device, you should:

- Check the condition of electrical and mechanical connections. It is forbidden to use torch and power cords with damaged insulation. Improper insulation of torch and power wires may result in electric shock,
- Ensure proper working conditions, i.e. ensure proper temperature, humidity and ventilation in the workplace. Outside closed rooms, protect against precipitation,
- Place the welding machine in a place that allows it to be easily operated.

Welding machine operators should:

- have a license for electric welding using the MIG/MAG process,
- know and comply with health and safety regulations applicable when performing welding work,
- use appropriate, specialized protective equipment: gloves, apron, rubber shoes, welding shield or visor with a properly selected filter,
- Know the contents of this instruction manual and operate the welding machine as intended.

Any repairs to the appliance may only be carried out by unplugging the plug from the power socket.

When the appliance is connected to the mains, it is not allowed to touch any components that make up the welding current circuit with your bare hand or through damp clothing.

It is forbidden to remove the external covers when the device is plugged in.

Any modifications to the welding machine on your own are prohibited and may impair safety conditions.

All maintenance and renovation work may only be carried out by authorized persons in compliance with the occupational safety conditions applicable to electrical equipment.

It is forbidden to operate the welding machine in rooms with a risk of explosion or fire!

The welding station should be equipped with fire-extinguishing equipment.

When you have finished working, the power cord of the appliance must be unplugged.

The hazards and general health and safety rules presented above do not exhaust the issue of welder's work safety, as they do not take into account the specifics of the workplace. An important complement to them are workplace health and safety instructions as well as training and instructions provided by supervision employees.

3. GENERAL DESCRIPTION

DIGIMIG 224 MAXIWELDER is an inverter synergic welding machine, made in IGBT technology and designed for welding steel and non-ferrous metals. It enables MMA, TIG AC/DC and MIG/MAG welding and brazing of thin sheets. Full pulse, AC current, and waveform control is available in the TIG process, with two arc ignition options: HF (ionizing) and Lift (contact). The MIG/MAG mode offers both manual and synergic parameter selection. The device automatically changes polarity, which allows the use of solid and self-shielding (FLUX) wires. The welding machine is equipped with a 4-roller wire feeder and allows you to operate Spool Gun torch. The device has numerous functions to support welding: Hot Start, Arc Force, VRD and Soft Start. It also has a memory of 10 sets of parameters. The Fan Stop function automatically shuts off the fan at low load, reducing noise, energy consumption and sucking debris inside.

4. TECHNICAL PARAMETERS

4.1 Welding Machine

Supply Voltage:	AC 230V 50Hz
Rated welding current / duty cycle	200 A / 60%
Rated no-load voltage	65 V
Wire spool diameters:	200mm, 300mm
Maximum power consumption:	41.7 A
Fuse protection	25 A
Weight:	44 kg
Dimensions:	894 x 505 x 769 mm
Degree of protection:	IP21S

4.1.1 Parameter control ranges

MMA

Welding Current	20 – 200 A
Arc Force	0 – 100 %
Hot Start	0 – 100 %
VRD	On / Off

TIG

Welding Current	5 – 200 A
Current build-up	0 – 15 s
Current Drop	0 – 25 s
Gas pre-outflow	0.1 – 1 s
Gas outflow	0 – 30 s
Base Current	5 – 95 %
Pulse width	5 – 95 %
Pulse Rate	0.5 – 200 Hz
AC Current Frequency	40 – 200 Hz
AC current balance	30 – 70 %
AC waveform	Sine Wave / Rectangular
Spot welding time	0 – 10 s
Break time during spot welding	0 – 10 s
Electrode diameter	1,0 – 3,2

MIG

Inductance	-10 – +10%
Wire Diameter	0.6 – 1.2 mm
Material thickness	0.9 – 6.4 mm
Soft Start (SWF)	On / Off
Spot welding time	0 – 10 s
Break time during spot welding	0 – 10 s

4.2 MIG Torch

Torch Type:	TW-15
Maximum current carrying capacity:	200 A (CO ₂)
Cooling Type:	gas
Cooling Gas Flow:	10-18 l/min
Length:	3 m

4.3 TIG Torch

Torch Type:	T-17
Maximum current carrying capacity	200 A
Gas Flow	10-20 l/min
Ignition of the arc	Non-contact (HF)
Length	4 m

Duty cycle

The duty cycle is based on a 10-minute period. A 60% duty cycle means that a 4-minute break is required after 6 minutes of operation of the device. A 100% duty cycle means that the device can operate continuously, without interruptions.

Attention! Heating tests were carried out at the temperature of the surrounding air. The duty cycle at 40°C was determined by simulation.

Degree of protection

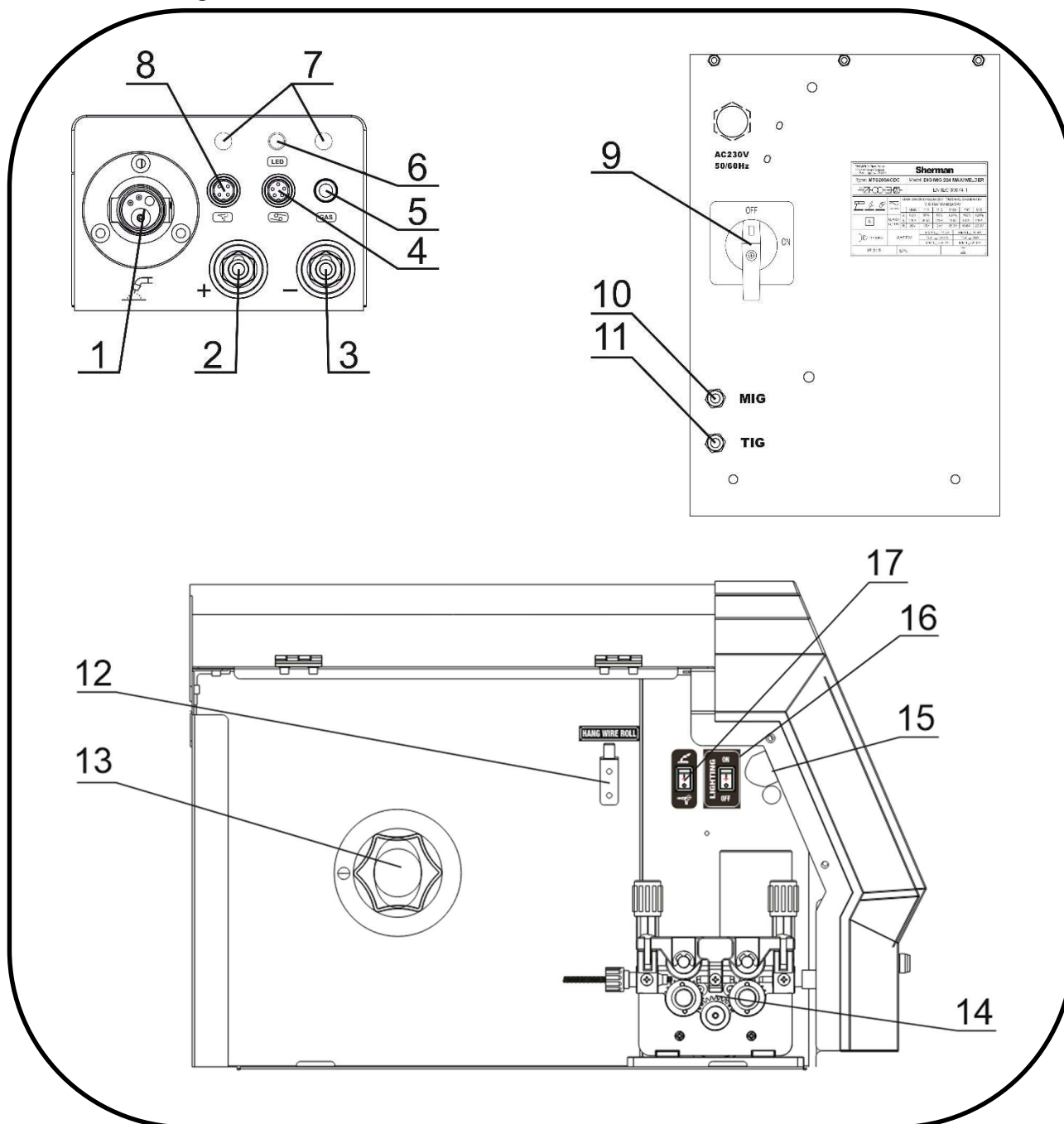
IP determines the degree to which a device is resistant to solid and water contaminants entering the interior. IP21S means that the device is suitable for indoor use.

Overheating protection

The IGBT module is protected from overheating by a protective installation that switches off the welding circuit of the device. The activation of the protection is signaled by the appearance of the Err inscription on the display. After a few minutes, the welding machine is cooled down to a temperature that allows it to be switched on again. Do not disconnect the power supply during this time, as the continuously running fan cools the internal heatsinks of the device to reduce the temperature faster. After restarting, remember to limit the welding parameters in order to continue to operate the device continuously.

5. PREPARING THE DEVICE FOR OPERATION

If the device is stored or transported in freezing conditions, bring the device to a temperature above zero before starting work.



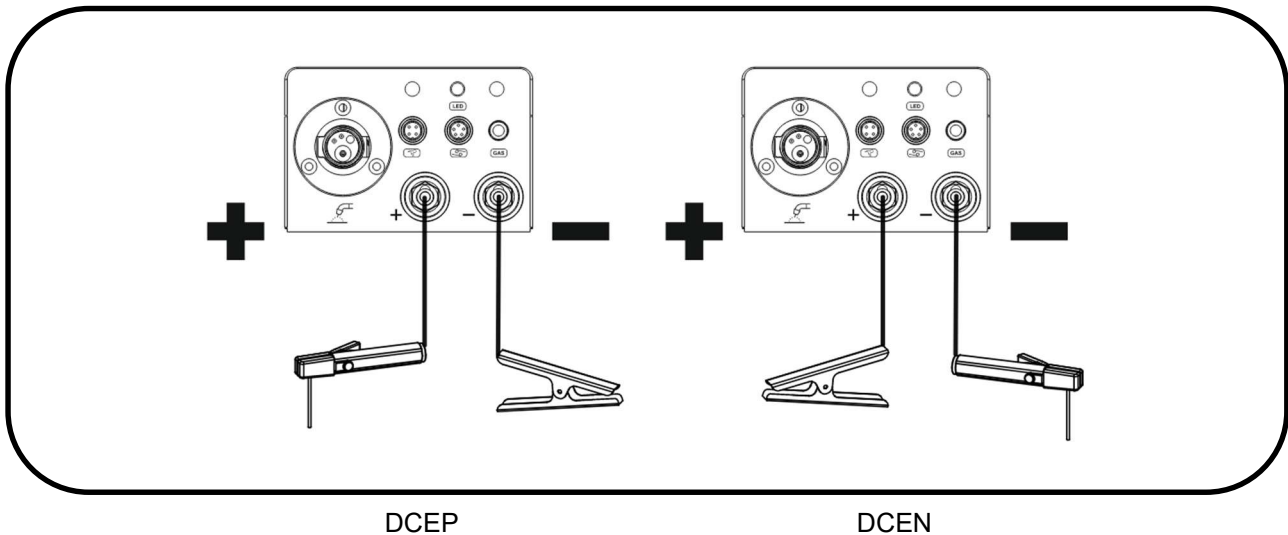
1. MIG Holder Socket
2. "+" socket
3. Socket "-"
4. TIG Torch Control Socket
5. Shielding Gas Socket (TIG)
6. LED Lighting Switch
7. LEDs
8. Spool Gun control socket
9. Power Switch

10. MIG shielding gas connector connector
11. TIG shielding gas connector connector
12. Roller hanger
13. Wire spool shank
14. Wire feeder
15. Feeder chamber lighting
16. Feeder Chamber Lighting Switch
17. Spool Gun Torch Switch

5.1 Connecting the Wires

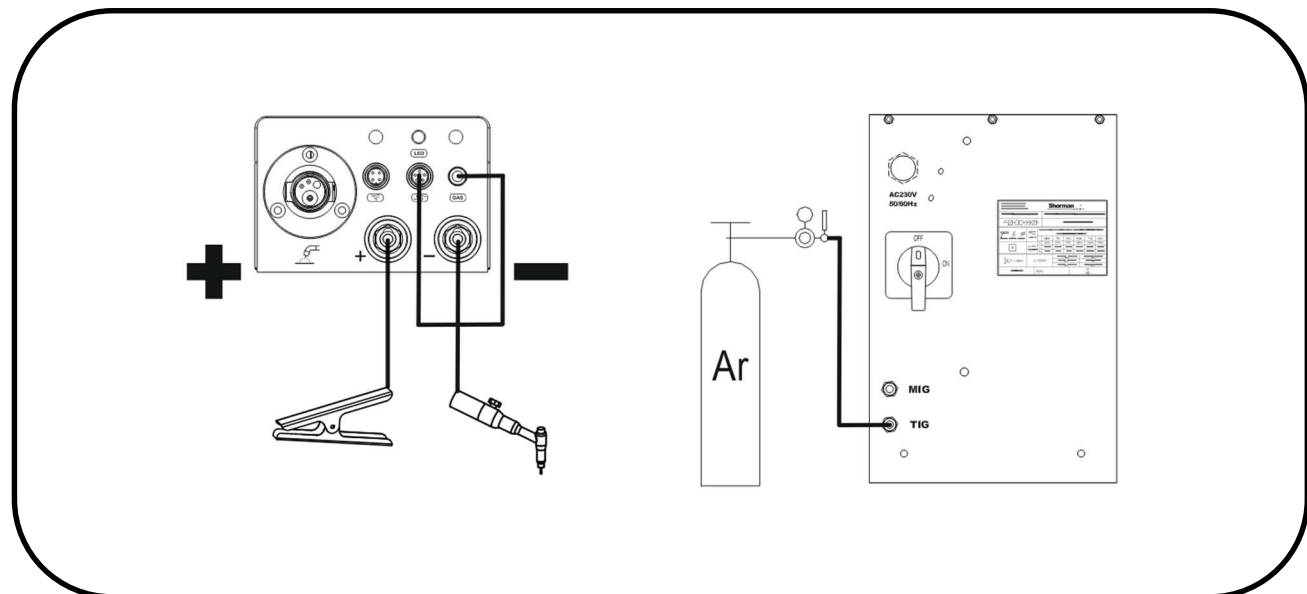
5.1.1 MMA process

Connect the ends of the welding wires to the sockets (2) and (3) on the faceplate so that the electrode holder has the correct pole for the electrode. The polarity of the connection of the welding wires depends on the type of electrode used and is indicated on the electrode packaging (DCEN negative polarity or DCEP positive polarity). The ground wire clamp must be carefully fixed to the welded material. Connect the appliance plug to a 230V 50Hz mains socket.



5.1.2. TIG process

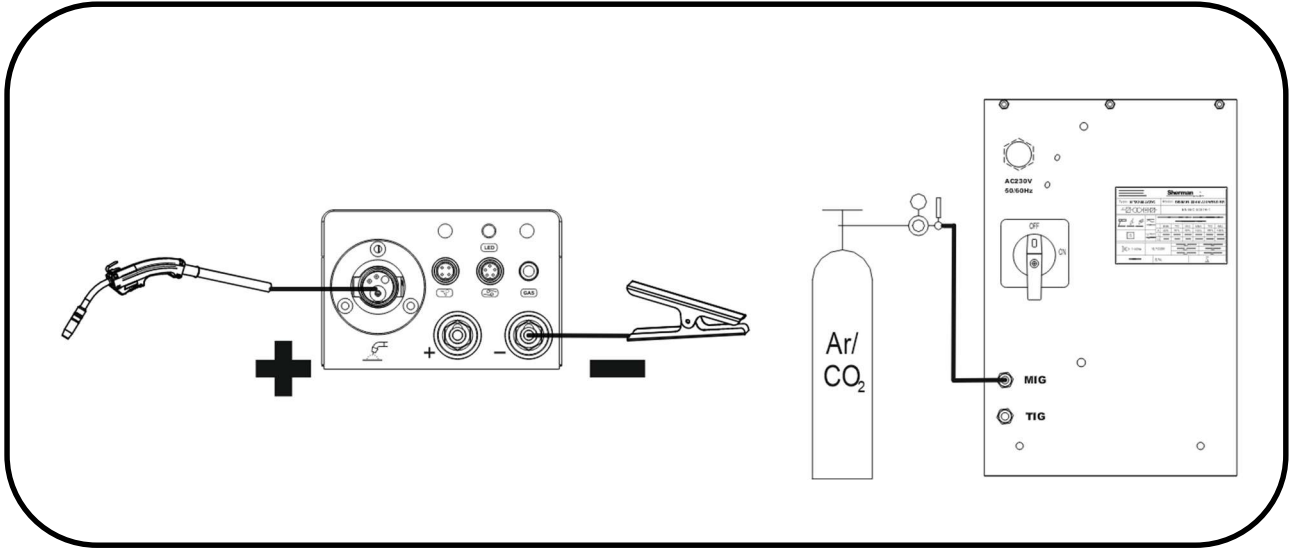
Connect the gas hose from the reducer to the connector (11) on the back of the welding machine. Connect the torch contact tip to the negative bias socket (3), the gas line to the socket (5) and the control wire to the socket (4). Connect the positive pole of the source (2) to the welded material using a clamp cable. Connect the appliance plug to a 230V 50Hz mains socket.



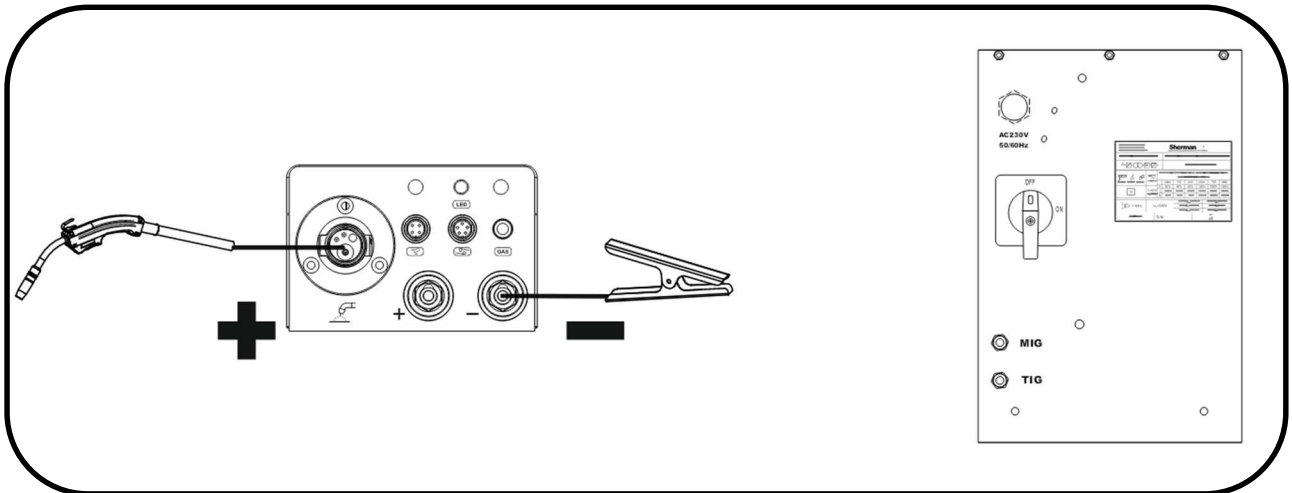
5.1.3 MIG Process and Brazing

5.1.3.1 Shielded Gas Welding and Brazing

The gas line from the reducer must be attached to the gas connector (10) located on the back of the appliance. The current clamp of the torch must be connected to the socket of the MIG torch (1). Connect the negative pole of the source (3) to the welded material using a clamp cable. Connect the appliance plug to a 230V 50Hz mains socket.



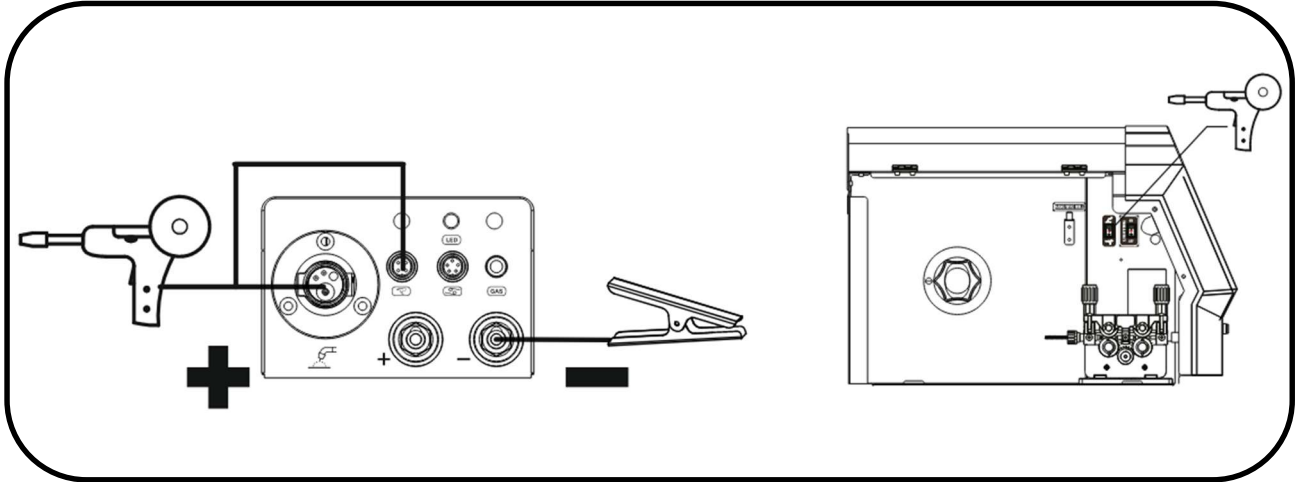
5.1.3.2 Welding with steel self-shielding wire



When welding with steel self-shielding wire, the MIG torch and ground wire must be connected in the same way as when welding with solid wire in a gas shield. When the self-shielding wire welding mode is selected, the machine will automatically switch the polarity. Connect the appliance plug to a 230V 50Hz mains socket.

5.1.4 Spool Gun Torch (Optional)

The DIGIMIG 224 MAXIWELDER allows you to connect an additional Spool Gun with a mini wire feeder mounted in it and a D100 spool of steel or colored wire, so you can weld with two different wires without having to change the welder. This is a time-saving solution when you need to weld different materials or occasionally use different wire thicknesses. To use the Spool Gun, connect the torch power cord to the socket (1), the control plug to the socket (8) and the torch switch (17) located in the feeder compartment is set to the



5.2 Shielding Gas Connection

1. Secure the gas cylinder from tipping over.
2. Unscrew the cylinder valve for a moment to remove any debris.
3. Install the reducer on the cylinder.
4. Connect the reducer with the gas connector (10) for the MIG process or with the connector (11) for the TIG process with a hose.
5. Unscrew the cylinder and reducer valve.

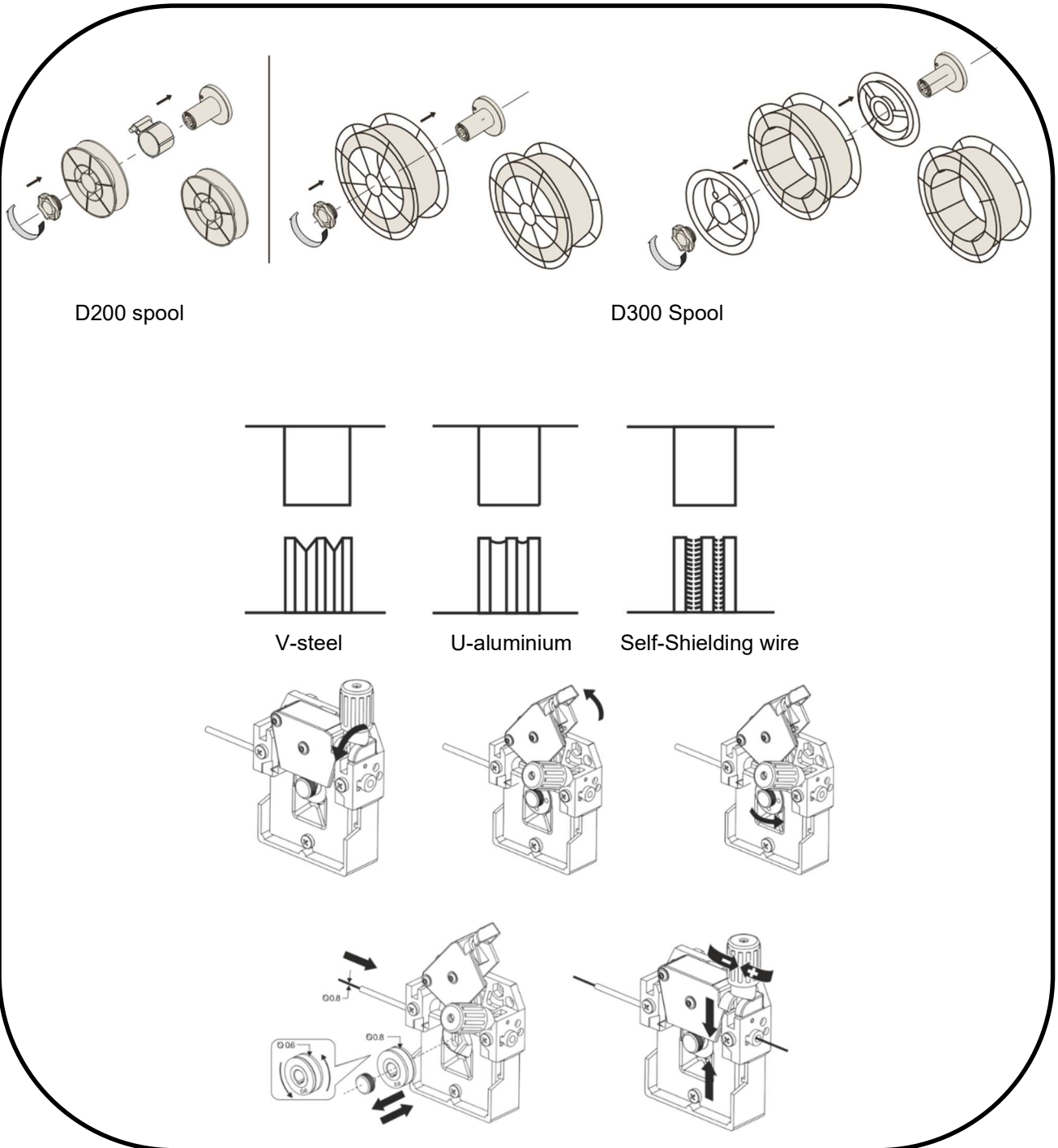
5.3 Connecting to the power supply

1. The appliance should only be used in a single-phase, three-wire, grounded zero point power supply system.
2. The DIGIMIG 224 MAXIWELDER inverter rectifier is designed to work with a 230 V 50 Hz network protected by 25 A delay-acting fuses. The power supply should be stable, with no voltage drops.
3. Before connecting the power supply, make sure that the power switch (9) is in the OFF (off) position.

5.4 Fitting the Electrode Wire Spool

1. Open the side cover of the case.
2. Place the electrode wire spool on the mandrel.
3. Protect the spool from falling.
4. Release the pressure of the feed rollers.
5. Check that the drive rollers are suitable for the type and diameter of the wire. Put on the correct roller if necessary. For steel wires, use rollers with V-grooves, and for aluminum wires with U-shaped grooves.
6. Blunt the end of the electrode wire.
7. Feed the wire through the feeder drive roller into the holder.
8. Press the wire into the grooves of the drive roller.
9. Remove the contact tip from the holder, turn on the power to the welding machine and pull the wire into the welding machine holder using the quick wire extension function by pressing the button on the holder.
10. When the wire appears in the outlet of the torch, release the button and screw on the power tip.

11. Adjust the pressure force of the feeder roller by turning the pressure knob. Too little clamping force will result in the drive roller slipping, too much clamping force will cause the feeding resistance to increase, which may lead to wire deformation and damage to the feeder.



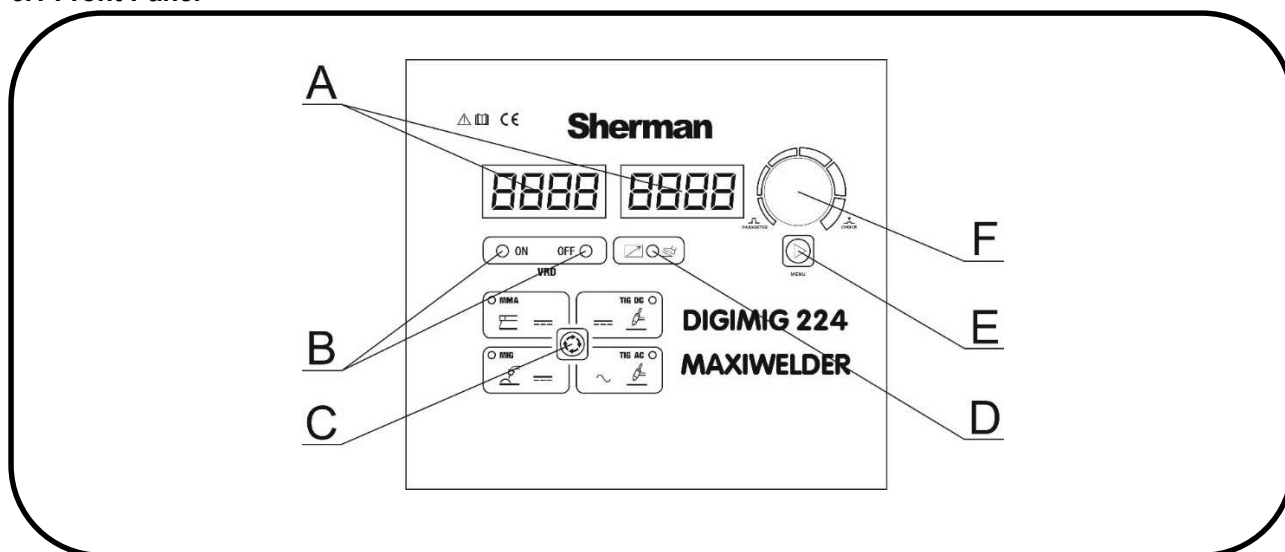
5.5 Preparing the MIG Torch for Operation

Depending on the type of material to be welded and the diameter of the electrode wire, fit the appropriate contact tip and wire guide insert to the MIG holder.

For steel welding, use steel welding contact tips and a steel cartridge. For aluminum welding, use aluminum welding terminals and a Teflon cartridge.

6. OPERATION

6.1 Front Panel

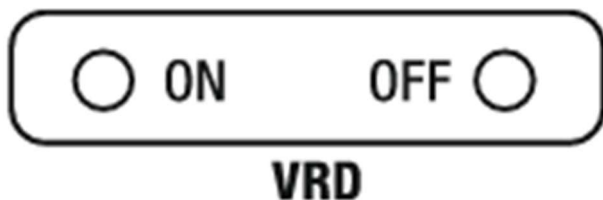


A – Welding Parameter Displays



Displays indicate welding parameters and their unit and function values.

B – VRD function control diodes

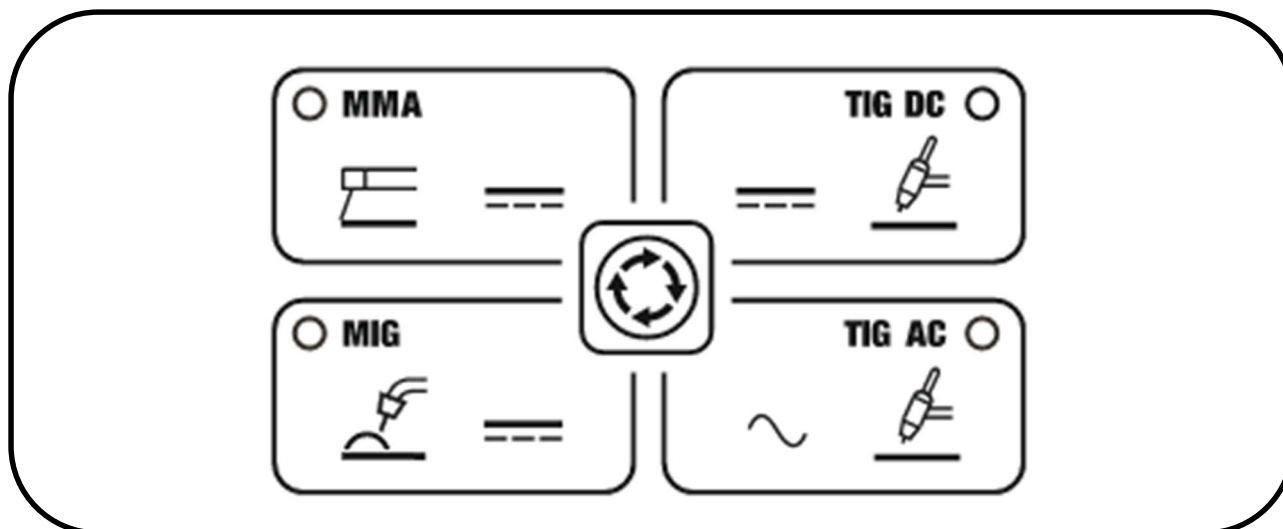


LEDs indicate the status of the VRD function

ON – On

OFF - off

C – Welding process selection button



The button is used to select the welding process:

☐ MMA 	MMA – coated electrode welding
☒ TIG DC 	TIG DC – welding with a non-fusible (tungsten) electrode with direct current in an argon shield
☐ TIG AC 	TIG AC – welding with a non-fusible (tungsten) electrode with alternating current in an argon sheath
☐ MIG 	MIG – electrode wire welding in shielded gases

D – Remote Control Diode



During TIG welding, it is possible to remotely control the welding current using the control pedal (optional equipment). When the TIG torch control plug is disconnected and the pedal control plug is connected to the jack (4), the LED (D) on the panel will light up and the unit will enter pedal control mode.

E – MENU button



MENU

The button is used to select more advanced welding functions and parameters. The parameters are adjusted using the multifunction knob (F). Pressing the button moves to the next function or parameter. The sequence of functions and parameters depends on the welding process:

MMA:

VRD	Enable/disable VRD
FACT DFLT	Factory reset

TIG DC:

STRT	Process of igniting the arc
TORCH	Selecting the device control mode (2T/4T)
TUNG	Electrode diameter selection
SPOT TIME	Spot welding time
PAUSE TIME	Break time during spot welding
UP SLOPE	Current build-up
DOWN SLOP	Current Drop
BEFORE	Gas pre-outflow
POST	Gas outflow
FACT DFLT	Factory reset

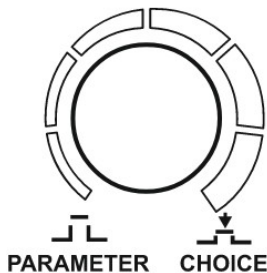
TIG AC:

TORCH	Selecting the device control mode (2T/4T)
WAVE	Choosing a waveform
TUNG	Electrode diameter selection
SPOT TIME	Spot welding time
PAUSE TIME	Break time during spot welding
UP SLOPE	Current build-up
DOWN SLOP	Current Drop
BEFORE	Gas pre-outflow
POST	Gas outflow
FACT DFLT	Factory reset

MIG:

PROCESS	Selection of material and shielding gas
TORCH	Selecting the device control mode (2T/4T)
WIRE DIAM	Wire Diameter
MAT	Thickness of the welded material
INDU	Inductance
SWF	Soft Start
MIG MODE	Manual/synergic settings
SPOT TIME	Spot welding time
PAUSE TIME	Break time during spot welding
FACT DFLT	Factory reset

F – Multifunction knob



The multi-function knob is used to adjust parameters, select functions, and save and load stored parameter sets. Turning the knob to the left or right changes the value of a parameter or function. Pressing the knob remembers the current value of the parameter or function and moves on to the next parameter or function. The sequence of functions and parameters depends on the welding process:

MMA:

A	Welding Current
HOT	Hot Start Function
FORC	Arc Force Function

TIG DC:

A	Welding Current
PULSE	Pulse mode on/off
PPS	Pulse Rate
BASE	Base (base) current
DUTY	Pulse width

TIG AC:

AC. AV	Welding Current
BALL	AC current balance
AC.FR	AC Current Frequency
PULSE	Heart rate on/off
PPS	Pulse Rate
BASE	Base (base) current
DUTY	Pulse width

Manual MIG:

V	Welding Voltage
m/s	Wire feed speed

Synergic MIG:

V and m/s	Welding Voltage and Wire Feed Speed
V	Welding Stress Correction

Pressing and holding the knob activates the save and playback mode of the stored parameters:

SAVE – saving parameters

LOAD – loading of stored parameters

To save the set parameters, press and hold the multifunction knob. Then select the SAVE option by turning the knob to select the channel number under which the parameters will be stored and confirm by pressing the knob.

To load a set of parameters, press and hold the multi-function knob. Then select LOAD, turn the knob to select the desired channel number and confirm by pressing the knob.

7. PARAMETER SETTINGS

7.1 MMA process

After selecting the MMA process, it is possible to adjust the welding current and the following functions:

HOT	Hot Start function. It operates when the arc ignites, causing the welding current to temporarily increase above the value set by the welder. Hot Start is designed to prevent the electrode from sticking to the material and is a great convenience when igniting the arc. When welding small components, it is recommended to use low values of this function, as it may cause the weld material to burn out. Adjustment range: 0 – 100 %
FORC	Arc Force function. This function allows you to adjust the dynamics of the arc. The shortening of the arc length is accompanied by an increase in the welding current, which stabilizes the arc. A decrease in value results in a soft arc and a shallower penetration depth, while an increase in value results in deeper penetration and the possibility of short arc welding. With a high value of the Arc Force function, you can weld while maintaining a minimum arc length and a high melting speed of the electrode. Adjustment range: 0 – 100 A%
VRD	VRD function. This function lowers the voltage in the no-load state. The correct voltage value is only restored just before the arc is ignited. This minimizes the risk of electric shock, but in some cases it can make it difficult to ignite the arc. ON – function on OFF – function off
FACT DFLT	Factory reset

7.2 TIG DC Process

After selecting the TIG process, it is possible to adjust the welding current and the following functions:

PULSE	Switching on/off the welding current pulsator ON – pulsator on OFF – pulsator off
PPS	Pulse Frequency - The frequency with which the pulse current value between the welding current and the base current changes. Control range: 0.5 – 200 Hz
BASE	Base (base) current. current responsible for maintaining the welding process, the lower value of the current pulse. It makes it easier to control the amount of heat introduced into the material. Base current adjustment is only possible during pulse welding Adjustment range: 5 – 95 % welding current
DUTY	Pulse width - the duration of the current pulse, allows you to adjust the depth of the penetration. Increasing the width increases the depth of penetration, reducing reduces the amount of heat introduced into the material, reducing the risk of burning through thinner sheets or smaller components. Lower pulse width values should be used for higher currents. A larger pulse width should be used for small currents, for example, a width above 50% should be used for currents below 100A. Adjustment range: 5 – 95 %

TORCH	Welding machine control mode 2T - Two-stroke mode. In this mode, pressing the switch in the torch of the torch will turn on the ionizer and ignite the arc. Welding is carried out with the switch pressed. Releasing the switch will end welding. 4T - Four-stroke mode. In this mode, pressing the switch in the torch of the torch will turn on the ionizer and ignite the arc, then release the switch and perform welding with the switch released. Pressing the switch again will end welding.
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STRT	Process of igniting the arc LIFT – TIG LIFT mode. To ignite the arc in this mode, press the button in the torch of the torch, touch the welded material with the electrode and immediately after igniting the arc, tear off the electrode. This process of ignition can be useful when welding near electronic devices whose operation may be disrupted by the welding machine ionizer system, e.g. in cars HF – HF TIG mode with ionization ignition. To ignite the arc in this mode, bring the electrode close to the welded material and press the button in the torch of the torch. The arc will be ignited without the electrode coming into contact with the welded material.
TUNG	Selection of tungsten electrode diameter. Once the electrode diameter is selected, the welder will limit the parameter control range to the values most commonly used when welding with an electrode of that diameter. To allow the full range of adjustments, select GENERAL. Adjustment range: 1.0 – 3.2 mm
SPOT TIME	Spot welding time Adjustment range: 0 – 10 s
PAUSE TIME	Break time during spot welding Adjustment range: 0 – 10 s
UP SLOPE	Current rise time – this is the time when the current builds up to the set value of the welding current. Adjustment range: 0 – 15 s
DOWN SLOP	Current descent time – this is the time when the current drops until the arc expires after welding is completed. Adjustment range: 0 – 25 s
BEFORE	Gas pre-flow time - the time from pressing the button in the torch torch to the moment the arc is ignited. It should usually be longer than 0.5 s to deliver shielding gas to the torch nozzle outlet to cover the welding start point and the tungsten electrode. In the case of a longer gas supply line from the cylinder, the pre-flow time should be longer Adjustment range: 0.1 – 1 s
POST	Gas discharge time after welding is complete. This is the time from the arc extinguishing to closing the gas valve to shield the solidifying weld pool from air and to cool the tungsten electrode. Too short a run-out time can result in oxidation of the weld. When welding in TIG AC (alternating current) mode, this time should be longer. Adjustment range: 0 – 30 s
FACT DFLT	Factory reset

7.3 TIG AC Process

In the TIG AC process, arc ignition is only possible with the use of an ionizer (HF). In addition, after selecting the TIG AC process, it is possible to adjust the same parameters as in the TIG DC process, and in addition:

BALL	AC current balance - the ratio of the duration of the positive phase of the current to the negative phase. Reducing the balance causes more heat to be introduced into the material, resulting in a narrower weld and deeper penetration, while reducing the heat load on the tungsten electrode. Increasing the balance introduces less heat into the material, resulting in better cleaning, a wide weld seam and a shallower penetration, but puts a significant strain on the tungsten electrode. Adjustment range: 30 – 70%
AC.FR	AC current frequency: a feature useful for aluminum welding. The higher the frequency, the better the weld quality and the better the arc focus

	Control range: 40 – 200 Hz
WAVE	Choosing a waveform  Sine wave: A classic wave, similar to transformer welders, preferred by older welders.  Square Wave: A universal, commonly used waveform for welding any material. It generates more heat in the welding zone, more fusion than other shapes.
FACT DFLT	Factory reset

7.4 MIG Process

After selecting the MIG process, the device can work in manual or synergic mode. The synergic mode allows less experienced users to select welding parameters. In this mode, the device automatically selects the welding voltage and welding current as well as the corresponding wire feed speed depending on the diameter of the electrode wire. When the multifunction knob is pressed, it is possible to correct the welding tension. In manual mode, the user sets the welding voltage and welding current and the corresponding wire feed speed.

After selecting the **MIG process**, it is possible to adjust the following functions and parameters:

V	Welding Voltage
m/s	Wire feed speed
PROCESS	Selection of material and shielding gas C18 Welding of steel in an Argon+CO2 shielding gas in a ratio of 18% argon and 82% carbon dioxide C100 CO2 Shielded Steel Welding FLUX Welding of steel using self-shielding powder wire ALUM Argon Shielded Aluminum Welding
TORCH	Welding machine control mode 2T - Two-stroke mode. In this mode, pressing the switch in the torch of the torch will ignite the arc. Welding is carried out with the switch pressed. Releasing the switch will end welding. 4T - Four-stroke mode. In this mode, pressing the switch in the torch of the torch will ignite the arc, then release the switch and weld with the switch released. Pressing the switch again will end welding.
WIRE DIAM	Selection of electrode wire diameter. Depending on the selected process (material and shielding gas), it is possible to adjust in the following areas: C18 0.6 – 1.0 mm C100 0.6 – 1.0 mm FLUX 0.8 – 1.0 mm ALUM 1.0 – 1.2 mm -
MAT	The thickness of the welded material. Depending on the selected process (material and shielding gas), it is possible to adjust in the following areas: C18 0.9 – 6.4 mm C100 1.2 – 6.4 mm FLUX 1.2 – 6.4 mm ALUM 1.2 – 4.8 mm
INDU	Inductance – its adjustment allows you to optimize the arc characteristics depending on the thickness of the welded element and the welding process and conditions. Adjustment range: -10 – +10 %
SWF	Soft Start function – activating this function allows the wire feed to start gently to the target feed value ON – function on OFF – function off

MIG MODE	Synergy mode on/off MAN – manual settings SYN – synergic settings
SPOT TIME	Spot welding time Adjustment range: 0 – 10 s
PAUSE TIME	Break time during spot welding Adjustment range: 0 – 10 s
FACT DFLT	Factory reset

Inductance control

The inductance control allows the arc characteristics to be optimized depending on the thickness of the component to be welded and the welding process and conditions. This function is useful when welding thin components with the MIG/MAG process, preventing them from burning through, and when brazing galvanized components.

A change in the inductance value also reduces the amount of welding spatter during welding in a CO₂ shield. The higher the inductance value (+), the number of spatters decreases, when the value is negative (-), the number of spatters increases. The optimal setting of the inductance value depends on several factors and may differ from standard recommendations, so it should be selected experimentally during welding tests. Adjusting this parameter also allows for brazing thin (up to 3 mm) elements galvanized with wires made of CuSi3 copper alloy in a sheath of pure argon or, in some cases, an Ar/CO₂ mixture.

Soldering

When selecting parameters, low voltage values and high wire feed speeds should be selected. It is recommended to use argon as a shielding gas. Due to the required shape of the weld, the inductance should be selected experimentally depending on the thickness and type of material to be welded.

Copper-based binders are most often used as an additional material. These are wires marked as CuSi3 or SG –CuAl.

It is recommended to use a torch with a length of no more than 3 m equipped with a Teflon insert.

8. WELDING OF ALUMINUM ALLOYS

Welding aluminum is not a simple activity, it requires experience, knowledge and certain practices from the welder that will facilitate the execution of welds on aluminum elements.

First of all, it is important to remember about a few important things that significantly affect the appearance of the weld and affect the correct course of the welding process.

Before starting welding work on aluminum components, the following steps should be performed:

Device:

- Make sure that the feed rollers are designed to work with aluminium: the groove is U-shaped and is dedicated to the correct diameter of the welding wire. Using the wrong rollers will cause wire deformation and problems in the welding process.
- Make sure that the feed rollers are not positioned too tightly. Excessive wire tension can cause a feeding problem.
- Make sure the torch is equipped with a Teflon guide cartridge designed for aluminium. Using steel components used to feed steel wire will cause feeding problems.
- Make sure the current tip is the correct size and is designed for aluminum wire
- It is worth replacing the wire guide insert in the feeder with a Teflon version, which improves wire feeding as it does in the welding torch.

Job position:

- Attention should be paid to the proper preparation of the welding site: the hall should be clean, have good ventilation and low air humidity should be maintained. The presence of iron oxide dusts or dust after electro-air gouging of steel is unacceptable.
- Aluminum welding stations should be vacuumed with industrial vacuum cleaners once a day, after work.
- Welders' clothes should be clean, gloves must not be greasy.

Material preparation:

- The welding site should be cleaned and degreased just before welding,
- Degrease the aluminium elements by wiping them with a clean cloth soaked in a degreasing agent, e.g. acetone (Alcohol is not a good degreasing agent, we advise against using it when cleaning aluminium).
- Remove heavy oxide residues before welding. As a standard, this is done manually or mechanically with a steel wire brush. If the material has been heavily contaminated, it may be necessary to use a grinder.
- Once the surface has been properly prepared, the welding process should be carried out as quickly as possible.
- If the part has to remain unwelded for a long period of time, it must be protected with brown kraft paper and covered with adhesive tape.

Proper storage of welding wire

- Aluminum welding wire should be stored in a clean, dry environment, preferably in its original packaging.
- The wire does not need to be stored in air-conditioned rooms, it works best to store it in conditions with low humidity. Do not soak the wire in water.
- If a wire that is relatively cold is brought into the room on a hot, humid day and opened immediately, it is possible that the humid air will pollute the wire. Therefore, when storing the wire in an air-conditioned room, remember not to unpack the wire until it is heated and adapted to the ambient temperature.
- When the work is complete, the wire should be removed from the feeder and secured in a plastic bag for the next use.

Pure argon with a high quality class, recommended not less than 4.8 should be used for welding aluminum alloys as shielding gas. The gas flow should be selected according to the thickness and speed of the welding. Good welding results are achieved when the direction of the process overlaps to the left.

9. ARC INITIATION

9.1 MMA process

1. Touch the electrode to the welded material, rub briefly and tear off.
2. In the case of arc initiation with electrodes, the coating of which forms non-conductive slag after solidification, pre-clean the tip of the electrode by hitting the hard surface several times until metallic contact with the welded material is achieved.

9.2 TIG process

9.2.1 TIG HF mode with ionization ignition

1. Bring the electrode closer to the welded material at a distance of 2 millimeters
2. Press the button in the torch of the torch. The arc will be ignited without the electrode coming into contact with the welded material.

9.2.2 TIG LIFT Mode

1. Press the button in the torch torch
2. Touch the welded material with the electrode and detach the electrode immediately after igniting the arc. This process of ignition can be useful when welding near electronic devices whose operation may be disrupted by the welding machine's ionizer system, e.g. in cars.

9.3 MIG/MAG Process

1. Bring the torch closer to the welded workpieces so that the distance between the nozzle and the welded workpieces is approx. 10 mm.
2. Press the button on the welding torch and start welding.

10. BEFORE YOU CALL FOR SERVICE

In the event of malfunction, open the housing and remove dust and metallic deposits from the inside of the welder with dry, compressed low-pressure air before sending the welder for service. Then check the list of basic failures and try to fix them yourself.

Any repairs to the appliance may only be carried out by unplugging the plug from the power socket.

Attention! The device is not sealed and the user can remove the welding machine housing to remove minor malfunctions.

ATTENTION! The welding machine is equipped with a Fan Stop function that turns off the fan a few minutes after welding is finished and the device has cooled down. The fan restarts under load.

Symptoms	Cause	Procedure
Lack of power, malfunction signal, or malfunction of the device	No connection or loose plug inside the device	Check and correct the connections of all electrical plugs inside the device
	Dirty interior of the device	Remove the housing and clean the unit inside by blowing with compressed air to remove dust and metal filings from the control boards and wiring and electrical connections.
When the power is turned on, the displays and LEDs do not light up	No supply voltage	Check the fuses on the mains connection
Control panel lights up, welding machine does not ignite the arc	No connection in the welding circuit	MMA: Check the terminals and the correct electrical conductivity of the electrode and ground wire
		TIG or MIG: Check the connection of the holder to the device, pay attention to whether the pins in the control socket / plug are broken or not jammed.
		TIG or MIG: Unscrew the torch torch and check that the switch in the torch is working
Control panel lights up, Display indicates Err-02 message	The device has overheated.	Wait a few minutes. Do not turn off the power. After the LED goes out, continue welding.
The fan does not work during welding	The fan has been blocked by a bent cover	Straighten the fan cover
Unsatisfactory weld quality in MMA welding, the electrode sticks to the welded material	Incorrect polarity of the connection of welding cables	Connect the welding wires correctly
	Damp electrode.	Replace the electrode
	The welding machine is powered by a generator or through a long extension cord with too small a cable cross-section	Connect the device directly to the mains
Unsatisfactory weld quality in TIG welding	Check the quality of the materials and consumables used, especially the tungsten electrode and shielding gas	Replace consumable parts, replace shielding gas with higher quality
	Shielding gas does not flow out or flows out with insufficient intensity	Check the cylinder reducer, gas supply hose, improve the connection of the hose with the fittings and the condition of the quick connectors
No electrode wire feeding (feeder motor running)	Too little roller pressure	Set the correct pressure
	Incorrect diameter of guide roller groove	Fit the correct guide roller
	Contaminated liner	Clean the electrode wire guide
	Blocked electrode wire in the current tip	Replace the contact tip
No electrode wire feeding (feeder motor not running)	Spool Gun Welding Set	Set the torch type switch (17) in the feeder chamber to the 
Irregular electrode wire feed	Damaged contact tip	Replace the contact tip
	The groove of the feed roller is dirty or damaged	Clean the roller groove or replace the roller
	The wire spool rubs against the walls of the welding machine cover	Fix the wire spool correctly
Curve too long and irregular	Welding Voltage Too High	Reduce welding tension
	Wire feed speed too low	Increase wire feed speed
Arc too short	Welding Voltage Too Low	Increase welding tension
	Wire feed speed too high	Reduce wire feed speed

Unsatisfactory weld quality in MIG welding	Inadequate or poor-quality materials or consumables used,	Replace consumable parts. Change the welding wire or gas cylinder to suitable or higher quality materials
	The shielding gas comes out with the wrong intensity.	Check the gas supply hose, improve the hose connection to the fittings and the condition of the quick connectors Check the cylinder regulator, adjust the inductance.

List of error codes

Err-03	Wire feeder failure
Err-02	Activated thermal protection. Wait a few minutes to cool the welding machine to a temperature that allows it to turn on again on its own. Do not disconnect the power supply during this time, as the continuously running fan cools the internal heatsinks of the device to reduce the temperature faster. After restarting, remember to limit the welding parameters in order to continue to operate the device continuously.
Err-01	Welding current too high

11. OPERATING INSTRUCTIONS

The operation of the DIGIMIG 224 MAXIWELDER should take place in an atmosphere free of corrosive components and high dust. Do not place the appliance in dusty areas, near running grinders, etc. Dust and metallic swarf contamination of control boards, cables and connections inside the device can lead to an electrical short circuit and, as a consequence, damage to the welding machine.

Avoid use in environments with high humidity, especially in situations where dew occurs on metal components. In the event of dew on metal elements, e.g. after introducing a cold device into a warm room, wait until it is completely dry and the device warms up to ambient temperature. Running a cold welding machine under these conditions may cause damage to the welder. It is recommended that the welding machine be placed under a roof in order to protect it from adverse weather conditions.

The DIGIMIG 224 MAXIWELDER should be operated under the following conditions:

- changes in the rms value of the supply voltage not greater than 10%
- ambient temperature from -10°C to $+40^{\circ}\text{C}$
- atmospheric pressure 860 to 1060 hPa
- relative humidity of atmospheric air not exceeding 80%
- altitude up to 1000m above sea level

List of consumable parts:

Lp.	For steel wires	For aluminum wires
1	Feeder roller 30x15x12mm	Feeder roller Al 30x15x12mm
2	Contact tip TW-15 M6x25	Al TW-15 M6x25 Terminal
3	TW-15 contact tip	
4	Gas nozzle TW-15	
5	3m steel insert	3m Teflon Cartridge

A full list of consumables and spare parts is available on the www.tecweld.pl website and at TECWELD. It is possible to purchase these parts directly.

12. MAINTENANCE INSTRUCTIONS

Daily maintenance

1. Visual Inspection:
 - Inspect the welding wires, TIG torch and connectors for mechanical damage.
 - Inspect the condition of the MIG torch, power cord, gas line and connector for damage and abrasion.
 - Check the condition of the power tip and gas nozzle – whether they are excessively worn or dirty.
2. Cleaning:
 - Remove dust and swarf from the housing and air vents with compressed air (low force so as not to damage the electronics).
 - Clean the MIG torch of welding spatter, especially the gas nozzle and the current tip.

Weekly maintenance

1. Checking the electrical connections:
 - Check that all connectors are securely tightened and there are no signs of overheating.
2. Checking the feeder and MIG holder:
 - Check the condition of the wire feeder rollers and their pressure.
 - Inspect the liner to make sure it is not contaminated or worn.
 - Check the tightness of the gas line and the correct gas flow.

Monthly maintenance

1. MIG Torch Control:
 - Check the hoses and quick couplings for leaks.
 - Inspect the condition of the MIG torch, power cord, gas line and connector for damage and abrasion.
 - Check the condition of the power tip and gas nozzle – whether they are excessively worn or dirty.
2. Welding Machine Parameter Test:
 - MIG: Check the wire feeding stability and weld quality.
 - TIG: Perform test welding and check the arc stability and HF function.
3. Cleaning:
 - Remove the housing, remove dust and swarf from the control boards and wiring and electrical connections from inside the device with compressed air. (low force so as not to damage the electronics).
 - Clean the wire feeder mechanism and check the condition of the chain.

Six-month maintenance

1. Checking the condition of electrical connections:
 - Check the condition of the electric shock protection, insulation, protection system, tightness of hoses and quick couplings.
2. MIG Torch Control:
 - Replace the (liner) if it shows signs of wear.
 - Check the condition of the MIG holder and replace worn components (power tips, gas nozzles).

Annual maintenance (or every 1000 hours of operation)

1. Electronics Overview:
 - Inspect IGBTs, capacitors, and control boards for dirt and corrosion.
2. Wire Feeder Overview:
 - Perform a full inspection of the wire feeder, replace worn rollers.
 - Check the tightness of the gas system and the condition of the pipes.

Additional recommendations

- Never use water instead of coolant – there is a risk of corrosion and damage to the pump.
- Store the welding machine in a dry, ventilated place, away from dust and moisture.
- Regularly apply SPAWMIX anti-splinter formulations to the gas nozzle and current tip to prevent spatter from sticking.

Damage resulting from operating the welding machine under improper conditions and failure to follow maintenance recommendations are not covered by warranty repairs.

13. STORAGE AND TRANSPORT INSTRUCTIONS

Store the appliance at a temperature of -10°C to $+40^{\circ}\text{C}$ and a relative humidity of up to 80% free of corrosive fumes and dust. Transport of packaged equipment should be carried out by covered means of transport. During transport, the packaged device should be protected against movement and provided with the correct position.

14. SET SPECIFICATION

1. Welding Source	1 pc.
2. TW-15 welding torch	1 pc.
3. TIG T-17 welding torch	1 pc.
3. Clamp Clamp Ground Cable	1 pc.
4. Electrode wire	1 pc.
5. Gas hose	1 pc.
6. Cylinder safety chain	2 pcs.
6. User Manual	1 pc.
7. Packaging	1 pc.

15. WARRANTY

The warranty is granted for a period of 12 months for business entities, but excluding warranty claims, or 24 months for consumers from the date of sale.

The warranty will be respected upon presentation by the complainant of proof of purchase (invoice or receipt) and a warranty card with the product name, serial number, date of sale and stamped point of sale.

To order a warranty repair, you need to fill in the form on the www.tecweld.pl website in the SERVICE tab. On the basis of the notification, the device will be transported to the service by a courier company. Devices sent in any other way at TECWELD's expense will not be accepted!

The welding machine must be supplied with the welding torch. Complaints about a device without a welding torch will not be considered.

The device sent for complaint must be packed in the original cardboard box, secured with original polystyrene fittings. TECWELD is not responsible for damage to the welding machine resulting from transport.



If you are going to dispose of this product, do not throw it away with ordinary household waste. According to the WEEE Directive (Directive 2012/19/EU) in force in the European Union, separate disposal processes must be used for used electrical and electronic equipment.

In Poland, in accordance with the provisions of the Act of 11 September 2015 on Waste Electrical and Electronic Equipment, it is prohibited to place waste equipment marked with the crossed-out bin symbol together with other waste.

The user who intends to dispose of this product is obliged to take the waste electrical and electronic equipment to a waste equipment collection point. Collection points are run, m.in, by wholesalers and retailers of this equipment and by municipal organizational units conducting waste collection activities.

The above statutory obligations have been introduced in order to reduce the amount of waste generated from waste electrical and electronic equipment and to ensure an appropriate level of collection, recovery and recycling of waste equipment. The correct implementation of these obligations is especially important when there are hazardous components in used equipment that have a particularly negative impact on the environment and human health.

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