SPARTUS®

EASY MASTER PRO

URZĄDZENIA SPAWALNICZE

WELDING MACHINES

INSTRUKCJA OBSŁUGI


CE

USER'S MANUAL

SPRZĘT SPAWALNICZY NA MIARĘ DZISIEJSZYCH POTRZEB
WELDING EQUIPMENT SUITABLE FOR TODAY'S NEEDS

Dziękujemy Państwu za zakup naszego produktu. Dokonaliście Państwo trafnego wyboru. Procesy spawania i cięcia plazmowego, prowadzone są w ciężkich warunkach, wystawiając sprzęt spawalniczy niejednokrotnie na ekstremalną próbę wytrzymałości. Tylko sprzęt wysokiej jakości może zapewnić odpowiednią niezawodność i wydajność przy prowadzeniu w/w procesów. I takie właśnie są produkty **SPARTUS®,** przede wszystkim niezawodne i trwałe, ale również wszechstronne. Wnikliwie wsłuchujemy się w potrzeby klientów, stąd w naszej ofercie znajduje się tak bogaty asortyment. Ale dobry produkt to nie wszystko, równie ważna jest opieka serwisowa. I tutaj możemy Państwa zapewnić, że dzięki temu, że wybraliście Państwo produkty **SPARTUS®**, nie musicie się martwić o ewentualną opiekę serwisową. Nasz wykwalifikowany serwis jest zawsze do waszej dyspozycji. Jeszcze raz dziękujemy za powierzone nam zaufanie i zapraszamy Was do zapoznania się z naszą pozostałą ofertą na stronie **www.spartus.pl** lub bezpośrednio u lokalnego dystrybutora produktów **SPARTUS®**.

Thank you for deciding to purchase our product. You have made a right choice. Plasma welding and welding processes are carried out in difficult conditions that expose welding equipment to extreme tests of its strength. Only high quality equipment can ensure required reliability and performance during realization of the above-mentioned processes. **SPARTUS®** products are characterized by precisely such features: they are primarily reliable and durable, but they are also versatile. We listen carefully to clients' needs. Therefore, our offer covers such a wide assortment of products. Thank you very much for your trust in our company. We would like to invite you to get acquainted with the remaining products on offer at www.premiumweld.pl or directly at a local distributor of **SPARTUS®** products.

EASY MASTER PRO

PON-PT 8:00-16:00

info@spartus.pl

INFOLINIA TECHNICZNA*
801-060-101

*Infolinia dostępna tylko dla użytkowników na terenie Polski.
*Helpdesk available only for users in Poland. For more info ask your local country distributor.

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1. SAFE USE – HAZARDS ASSOCIATED WITH ARC WELDING AND PLASMA CUTTING

Arc welding and plasma cutting are processes that can ex pose hazards for the operator and persons in his vicinity. The operator and his close surroundings are exposed, among others, to the risk of fire, explosion, electric shock, burning, as well as the risk of getting injured by moving parts of the device.
Once proper safety measures are provided, electric welding and plasma cutting are relatively safe processes. For this reason, it is crucial to strictly follow the valid OSH principles during welding operations.
The information provided below does not release the operator from the obligation to follow the OSH rules that are binding in his plant/workplace.

1.1. GENERAL SAFETY RULES

Welding operators and persons working in the vicinity of the welding process should be made aware of the following hazards associated with arc welding. They should be made aware of protective measures as specified in relevant international and national standards and regulations.

1.1.1. EQUIPMENT CONDITION AND MAINTENANCE

- Check the technical condition of the device and accessories before starting to weld/ plasma cutting. It is forbidden to use equipment that is unserviceable..
- Equipment damaged or defective should be repaired immediately or removed from service.

1.1.2. OPERATION AND CARRYING

- Apply appropriate protective measures in the space around the zone, where welding operations are expected to be carried out.
- All equipment should be in place so that it does not present a hazard in passageways, to ladders or stairways, etc..
- Falling objects can cause injuries or kill. Protect device from unintensional falls.
- Welding equipment may be heavy (e.g. wire feeder fitted with spool and harness). Specjal care shaeld be taken during manual handling.
- To handle heavy elements, use hoists/ trucks/transport equipment designed especially for this purpose. Make sure the weight of equipment to be handled does not exceed the admissible maximum lifting capacity of used hoist/truck/transport equipment.
- It is forbidden for unauthorized persons, especially children, to be in the vicinity of the device during its use.
- The device is not suitable for pipe defrosting.
- Non-compliant use of device is forbidden.

1.1.3. TRAINING

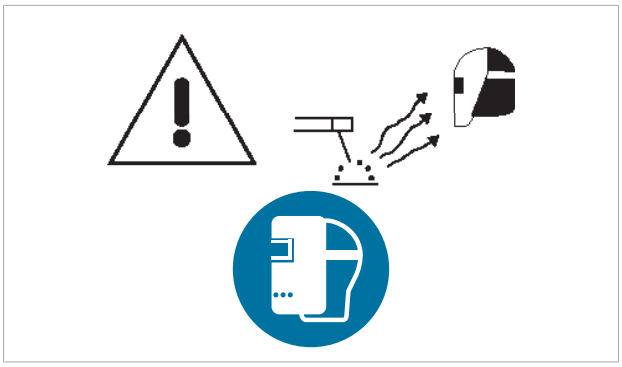
- Only professionally trained and qualified personnel may install, operate, maintain and repair the device.
- For operators and their supervisors training is essential in: the safe use of the equipment; the processes; the emergency procedures.

1.2. ELECTRIC SHOCK CAN KILL

- Before starting to weld and during the welding process, the operator should insulate himself from the ground and the environment by means of dry and undamaged protective clothes. It is forbidden to work on wet ground.

- It is forbidden to touch SK sockets („+" and/or „-„) when the device is in operation (connected to a power supply source).
- It is forbidden to touch live electric components of the device.
- Power supply must never be connected before the accessories of SK sockets/ connectors are properly installed in the device.
- Use dry and undamaged welding gloves and protective clothing, in order to ensure proper insulation of the body. It is forbidden to touch with a bare hand any elements that are parts of an electric circuit.
- The operator must always make sure that there is a good electric connection of the return conductor to the element to be welded. The connection should be located as close to the welding zone as possible.
- Maintain the electrode grip, the welding torch, the chassis ground clamp, welding cables and the welding machine in proper technical condition that ensures safe operation. Damaged cable insulation should be replaced with new insulation.
- Never dip an electrode into water, to cool it down.
- When working above the floor level (at a height), use a safety harness to protect yourself against falling, in the case of potential electric shock.
- Exercise special caution, when using the device in small rooms or in rooms with high humidity level.

1.3. WELDING ARC RADIATION CAN BE DANGEROUS



The arc generates:
- ultraviolet radiation (can damage skin and eyes);
- visible light (can dazzle eyes and impair vision);
- infrared (heat) radiation (can damage skin and eyes).

Such radiation can be direct or reflected from surfaces such as bright metals and light coloured objects.

1.3.1. EYE AND FACE PROTECTION

- Use welder's helmet/shield with an appropriate filter to protect you face and eyes against sparks and welding arc radiation.
- Welding helmet/shield should prevent injuries from flying particles, e.g. slag, fragments from grinding or wire bristles, etc.
- Welding helmet/shield should be made in accordance with applicable standards.

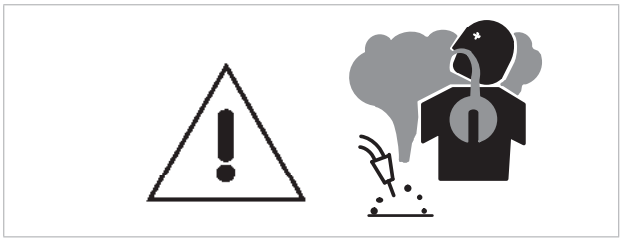
1.3.2. BODY PROTECTION

- The body should be protected by suitable clothing in accordance with applicable standards.
- Use appropriate protective clothing made of durable and fire-resistant material, to ensure proper skin protection.
- The use of neck protection can be necessary against reflected radiation

1.3.3. PROTECTION OF PERSONS IN THE VICINITY OF AN ARC

- Protect the remaining personnel present in the vicinity of welding works against negative impact of arc radiation and welding splatters. Warn them about the hazard resulting from exposure to the welding arc.
- In the vicinity of an arc, non-reflective curtains or screens should be used to isolate persons from the arc radiation. A warning, e.g. a symbol for eye protection, should refer to the hazard of arc optical radiation.
- Welder's assistants should also wear appropriate protective clothing.

1.4. VAPOURS AND GASES CAN BE DANGEROUS



Arc welding and allied processes produce welding fume which may pollute the atmosphere surrounding the work. Welding fume is a varying mixture of airborne gases and fine particles which, if inhaled or swallowed, constitute a health hazard.
The degree of risk is depend on:

- the composition of the fume;
- the concentration of the fume;
- the duration of exposure.

A systematic approach to the assessment of exposure is necessary, taking into account the particular circumstances of the operator and the ancillary worker who can be exposed.
Welding fume may be controlled by a wide range of measures, e.g. process modifications, engineering controls, methods of work, personal protection and administrative action. First it is necessary to consider whether exposure can be prevented by eliminating the generation of welding fume altogether. Where this cannot be done, measures for reducing the quantity of welding fume generated should be investigated, after which the control of welding fume at source should be considered. The use of respiratory equipment should not be contemplated until all other possibilities have been eliminated. Normally, respiratory protective equipment should be used only as an interim measure. There will, however, be circumstances where, in addition to ventilation measures, the use of personal protection can be necessary.

1.4.1. VAPOURS AND GASES. ADDITIONAL PRECAUTIONS

- Welding operations can involve generation of vapours and gases that are hazardous to health. Inhaling the vapours should be avoided. Keep your head away from vapours during welding operations. Ensure proper ventilation and/or mechanical welding exhaust draught to keep vapours and gases away from the breathing zone.
- When welding is carried out in a confined space, operators should only be permitted to weld when other persons, who have been instructed and who are able to react in case of an emergency, are in the immediate vicinity.
- In closed rooms or in certain circumstances during outdoor operations, it may be required to use individual equipment for the protection of the welder's airways, e.g. a respirator. Additional safety measures are also required when galvanized steel is welded.
- Welding operations must not be performed in the vicinity of chlorinated hydrocarbons generated during degreasing, cleaning or spraying operations. Heat and radiation generated by the arc may enter into a reaction with vapours of solvents, which may lead to the formation of phosgene – a highly toxic gas..
- The shielding gas used during arc welding may force the air out of a room. This may lead to a health hazard or even death. Proper ventilation, especially in closed rooms, should always be provided, to ensure appropriate amount of air that is indispensable for safe breathing.

1.5. NOISE CAN BE HARMFUL

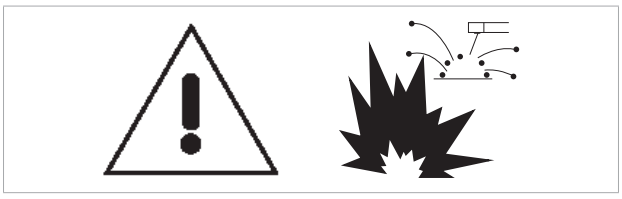
In the welding environment, damaging levels of noise can exist. Continued exposure to a high noise level on the unprotected ear is injurious. The noise levels should be reduced to the lowest practicable level.
High levels may be tolerated for very short periods of time by wearing adequate ear protection in accordance with the national or local regulation.

In case of doubt, checks by an expert should be made to establish noise levels in any particular environment, and, if these are in excess of the prescribed limit, one of the following alternatives may apply:
a) Insulation of the noise source as far as possible, e.g. by fitting silencers or sound proof enclosures
b) Insulation of the operator from the noise source
c) Effective maintenance of sound protection devices
d) Indication as „ear protection areas" where applicable
e) Restriction of entry to these „ear protection areas" to authorized persons.
f) Protect your hearing with appropriate personal protection measures, e.g. earplugs or hearing protectors.

1.6. FIRE AND EXPLOSION

Arc welding and allied processes can cause fire and explosions and precautions should be taken to prevent these hazards.

1.6.1. FIRE

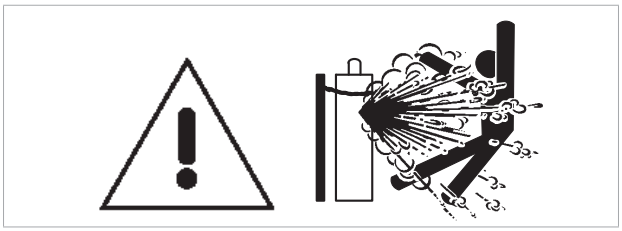


- Before setting to perform welding operations, ensure that elements involving fire hazard are removed from the zone where welding operations are to be performed. If this is impossible, protect all flammable elements against the impact of sparks. Remember that sparks and hot metal may penetrate through small cracks and openings into the adjacent area.
- Avoid welding in the vicinity of hydraulic conduits.
- The welding arc throws sparks and splatters out. Welders should wear clean and dry protective clothing (staining with oil should be avoided in particular) such as welding gloves, welder's apron, welder's trousers, welder's boots, protective hood/cap, etc.
- When no welding operations are carried out, make sure no part of the electrode is in contact with the material to be welded or chassis ground. Accidental contact may lead to overheating and create a fire hazard.
- An extinguisher should always be ready for use and available in an easily accessible place nearby.
- The surroundings of the work should be observed for an adequate period after its termination.
- „Hot spots" and their immediate surroundings should be observed until their temperature has dropped to normal.

1.6.2. EXPLOSION

- It is forbidden to heat up, cut or weld tanks, barrels or containers that contained toxic or flammable materials. For there is an explosion hazard, even if the containers have been emptied and cleaned.

1.6.3. USE OF CYLINDERS WITH SHIELDING GAS



- In case compressed gases are used in the work place, apply special safety measures to prevent dangerous situations.
- Use gas cylinders with appropriate shielding gas, foreseen for a particular process. Additional equipment (pressure regulator, hoses, connectors) should be in good technical condition. A gas cylinder and accessories should have the required valid attestations and approvals for use.
- Gas cylinders should always be stored in vertical position, fixed to an undercarriage or permanent support.
- Gas cylinders should be placed far away from areas, where they could be exposed to the risk of being overthrown or suffering physical damage.
- Ensure gas cylinders are at a safe distance

from places where electric welding or cutting operations are to be performed, away from other sources of heat, sparks or flames.
- Care shall be taken to prevent gas cylinders in the vicinity of the workpiece becoming part of the welding circuit.
- Never allow the electrode, electrode holder or any other live electric part to get in contact with the gas cylinder.
- Keep your face and head away from the cylinder valve socket when the valve is being opened.
- Special valve shield should always be installed during cylinder transportation or when the cylinder is not used.

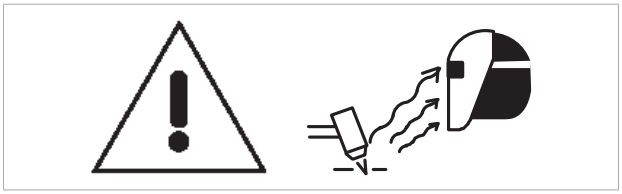
1.7. OTHER HAZARDS

Arc welding and allied processes carrying other hazards not listed before.

1.7.1. HOT PARTS CAN CAUSE BURNS

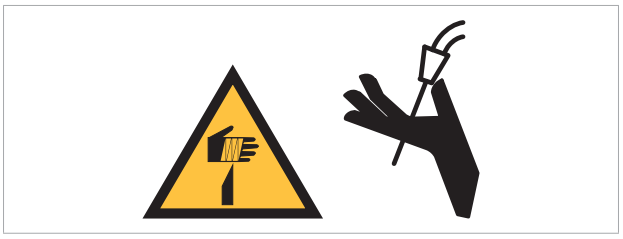
- Never touch hot parts with bare hands.
- Before handling an element, wait until it cools down.
- Use appropriate tools to grip and handle hot elements and wear special welding gloves and clothing that protects against burns.

1.7.2. PLASMA ARC IS DANGEROUS



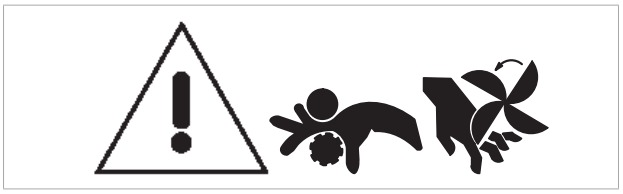
- Highly concentrated plasma arc poses a hazard for health and life. It is forbidden to aim plasma arc at people.

1.7.3. WELDING WIRE CAN CAUSE INJURIES



- Accidental pressing of the button on the welding torch can cause welding wire to advance in an uncontrolled manner. The welding wire tip may be sharp.
- Never aim the burner tip of the welding torch at your face, eyes or other people.

1.7.4. MOVING ELEMENTS CAN BE DANGEROUS



- All protective elements and device housing should be in place and in good technical condition. Keep your hands, hair, clothes and tools away from gear wheels, fans and other moving parts during their operation.
- Do not bring your hands close to fan motors. It is forbidden to try to stop a fan by pressing its axle.

1.7.5. HF – HIGH FREQUENCY IGNITION MAY CAUSE INTERFERENCE

- As welding by the TIG method or plasma cutting involves high frequency ignition, it can interfere with mobile phones, radio equipment, TV equipment or improperly protected computers and industrial robots, which leads to total disabling of such devices.

1.8. OTHER INFORMATIONS

- When performing welding work, you must apply equally to the health and safety requirements contained in the current normative acts, applicable in your country..

WARNING: The maximum voltage of 15kV. Accidental pressing of the microswitch results in unintentional arc ignition. Never bring a bare hand close to the electrode, when the device is connected to a power source.

1.9. SYMBOLS USED IN INSTRUCTIONS

We use this symbol to pay your attention about important information.

2. ELECTROMAGNETIC FIELD (EMF)

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). All welders should use the following procedures in order to minimize the risk associated with exposure to EMF from the welding circuit:

- Route the welding cables together – secure them with tape when possible
- Place your torso and head as far away as possible from the welding circuit
- Never coil welding cables around your body
- Do not place your body between welding cables. Keep both welding cables on the same side of your body
- Connect the return cable to the workpiece as close as possible to the area being welded
- Do not work next to, sit or lean on the welding power source
- Do not weld whilst carrying the welding power source or wire feeder

WARNING: The electromagnetic field (EMF) generated during welding (and allied processes) may interfere with the operation of implanted medical devices for example: cardiac pacemakers. Persons with implanted medical devices such as cardiac pacemakers are obliged to consult a doctor before starting to weld/ plasma cutting and to exercise special caution during work. It is forbidden for such persons to be present in the vicinity of the place where welding/plasma cutting processes are realized without previous consultation of a doctor.

3. ELECTROMAGNETIC COMPATIBILITY (EMC)

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WARNING: This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations due to conducted as well radiated radio-frequency disturbances.

3.1. GENERAL

The user is responsible for installing and using the arc welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected, then it shall be the responsibility of the user of the arc welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit. In other cases, it could involve constructing an electromagnetic screen enclosing the welding power source and the work complete with associated input filters. In all cases electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.

Welding and plasma cutting processes may emit additional interferences. User is responsibility for the interferences caused by welding and plasma cutting.

3.2. ASSESMENT OF AREA

Before installing arc welding equipment, the user shall make an assessment of potential electromagnetic interferences in the surrounding area. The following shall be taken into account:

a) other supply cables, control cables, signaling and telephone cables, above, below and adjacent to the arc welding equipment
b) radio and television transmitters and receivers
c) computer and other control equipment
d) safety critical equipment, for example guarding of industrial equipment
e) the health of the people around, for example the use of pacemakers and hearing aids
f) equipment used for calibration or measurement
g) the immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures.
h) the time of day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises

3.3. METHODS OF REDUCING EMMISIONS

Methods of reducing electromagnetic interference are listed in detail in the standard EN 60974-9 - „Arc welding equipment - Part 9: Installation and use".

4. CONFORMITY WITH STANDARDS

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The SPARTUS®: EasyMIG 220E PULSE SYNERGY, EasyMIG 250Y, EasyMIG 315Y are in conformity with the relevant Union harmonization legislation:

LVD 2014/35/UE	**Low Voltage Directive**
EMC 2014/30/UE	**Electromagnetic Compatibility Directive**

harmonized standards:

EN 60974-1	**Arc Welding Equipment – Part 1: Welding Power Sources**
EN 60974-10	**Arc Welding Equipment – Part 10: Electromagnetic Compatibility Requirements**

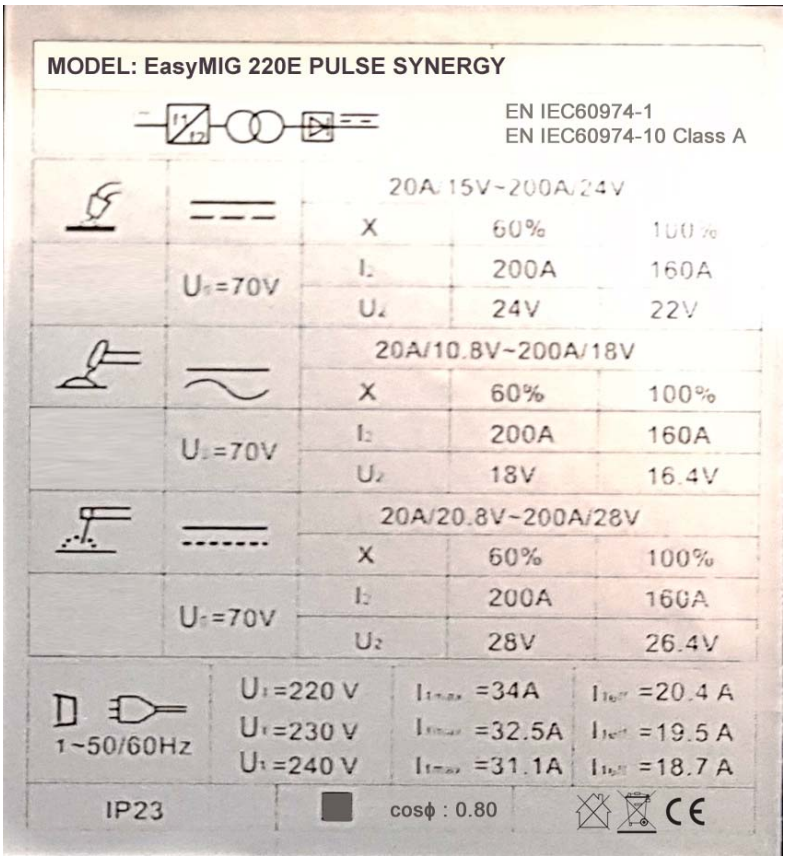
4.1. CE MARKING

CE marking is placed on the nameplate of device and/or on the front panel of device.

CE

4.2. NAME PLATE

Name plate with serial nuber is placed on the rear panel or uderside of device.



5. GENERAL DESCRIPTION

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SPARTUS® EasyMIG 220E PULSE SYNERGY

SPARTUS Easy MIG220E PULSE SYNERGY is a modern multi-purpose 3in1 welding machine: MIG/MAG, TIG and MMA. The latest technologies such as IGBTs and MCU control system ave been used within the production proccess. Powered with a single--phase 230V source power, which allows welding with current up to 200 amperes for all three methods.

Easy to use and intuitive control panel allows precise control of parameters for MIG/MAG, TIG and MMA welding. Moreover the device is equipped with a synergic MIG/MAG welding function. After defining parameters such as: the type of shielding gas, type and diameter of welding wire and expected welding current - welding voltage and wire feed speed are selected automatically by the device. Additionally the user has an option to manually adjust the programmed parameters in the device such as welding voltage, wire feed speed, pre-gas, post-gas, slow feed, burn back, control 2T/4T/SPOT and spot time.

Built-in 2-roll wire feeder, provides stable wire feed. Intuitive control panel allows for smooth and precise control of parameters: welding voltage, wire feed speed, inductance control (MIG/MAG mode); welding current (MMA mode). Device is additionally equipped with digital displays that provide full parameters control at every stage.

Examples of use: light industrial, portable repair, workshop, automotive, exhaust silencer welding, constructions, manufacturing.

5.1. PURPOSE OF USE

SPARTUS EasyMIG 220E PULSE SYNERGY is designed for:

- Metal inert gas welding (MIG) or metal active gas welding (MAG)
- Tungsten inert gas welding (TIG)
- Manual metal arc welding (MMA). [GMAW - gas metal arc welding SMAW - shielded metal arc welding].

6. TECHNICAL SPECIFICATIONS

6.1. OPERATION, STORAGE AND TRANSPORT

Conditions during operation, storage and transport	
Range of ambient air temperature during operation	-10°C to +40°C
Relative humidity of the air	up to 50% at 40°C
	up to 90% at 20°C
Ambient air	Free from abnormal amounts of dust, acids, corrosive substances etc. other than those generated by the welding process.
Base of the welding power source inclined	up to 10°
Range of ambient air temperature during storage and transport	-20°C to +55°C
Height above sea level	≤1000 m

Duty cycle
Duty cycle is the time during which You can weld or cut at a certain load without causing overload. It is expressed in percent for time period of complete cycle which equals 10 minutes. For example: 60% duty cycle means that for 6 minutes device can operate at given load, after that required 4 minutes time break (no-load operation). Duty cycle is given to ambient temperature of 40°C.

Protection against overheating
Security system from overheating will turn on when the welder is overheat (possibility of welding is turned off, abnormal indicator on front panel lights up). In such a situation, You should not turning off the unit immediately. Wait some time until fan cools the unit. Time to return to the state from overheating can take up to approx. 15 minutes.

The device has a degree of protection IP23S. Which means that it is intended to be used in closed and covered areas and suitable for use outdoors. However it is not designed to be used outdoor during precipitation if it is not covered.

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6.2. TECHNICAL PARAMETERS OF DEVICES

	EasyMIG 220E PULSE SYNERGY
Input	~1× 230V ± 10% 50 / 60 Hz
Welding current [A]	20 – 200
Duty cycle [%]	60 @200A 100 @160A
MIG PARAMETERS	
Output working voltage MIG [V]	15 – 24
Wire feeding speed [m/min]	2 – 16
Wire feeder	built-in, 2-roll gear
Welding wire spool [mm]	≤ 5[kg], Ø200[mm]
Wire diameter ∅ [mm]	0.6 / 0.8 / 1.0
Pulse welding	✓
Synergy programs	✓ (9)
Control 2T / 4T	✓ (MIG / TIG)
SPOT	✓ (MIG / TIG)
Pre Gas [s]	0.0 – 10.0
Post Gas [s]	0.1 – 10.0
SPOT Time [s]	0.1 – 10.0
Slow Feed [s]	1.0 – 22.0
Burn Back [s]	0.1 – 2.0
Burn Back [V]	12 – 20
TIG PARAMETERS	
Arc ignition	LIFT
Welding current MMA [A]	20 – 200
MMA PARAMETERS	
MMA welding mode	✓
Welding current MMA [A]	20 – 200
OTHER	
Inductance control (Dynamics)	✓
Gas test	✓
Max. current consumpiton [A]	32.5
Power factor (cosφ)	0,80
Efficiency η [%]	85
Insulation class	H
Protection class	IP23
Weight [kg]	19.0
Dimensions [mm]	540 × 245 × 470
Network security (fuse) [A]	25

It is forbidden to carry out work related to metalworking (for example grinding, drilling, etc.) near the welding device, especially near the vents. Sparks and metal shavings may penetrate the inside of device, which can lead to failure or damage of welder.

7. INSTALLATION AND USE

WARNING: SPARTUS® EasyMIG 220E PULSE SYNERGY is intended for professional and industrial applications. Installation and use of the device may only be carried out appropriately trained professionals.

It is forbidden to carry out work related to metalworking (for example grinding, drilling, etc.) near the welding device, especially near the vents. Sparks and metal shavings may penetrate the inside of device, which can lead to failure or damage of welder.

Qualified person (def.)
A person who has gained the relevant technical education, training took place and / or gained experience to perceive the risk and avoid hazards during use of the product (IEC 60204-1).

7.1. PROPER COOLING

Unit should stand stable on dry and level surface. Avoid too much slope and slippery surfaces. Regularly check that the vents (inlet, outlet) are not covered. The minimum distance between the welder vents and walls should be 50 [cm].

7.2. MOVEMENT AND HANDLING

When moving the welding machine please take extra care. The device should be moved by using specially designed transport lugs.If transport handle is damaged, then it needs to be repaired at an authorized service center.

7.3. DESCRIPTION OF CONSTRUCTION

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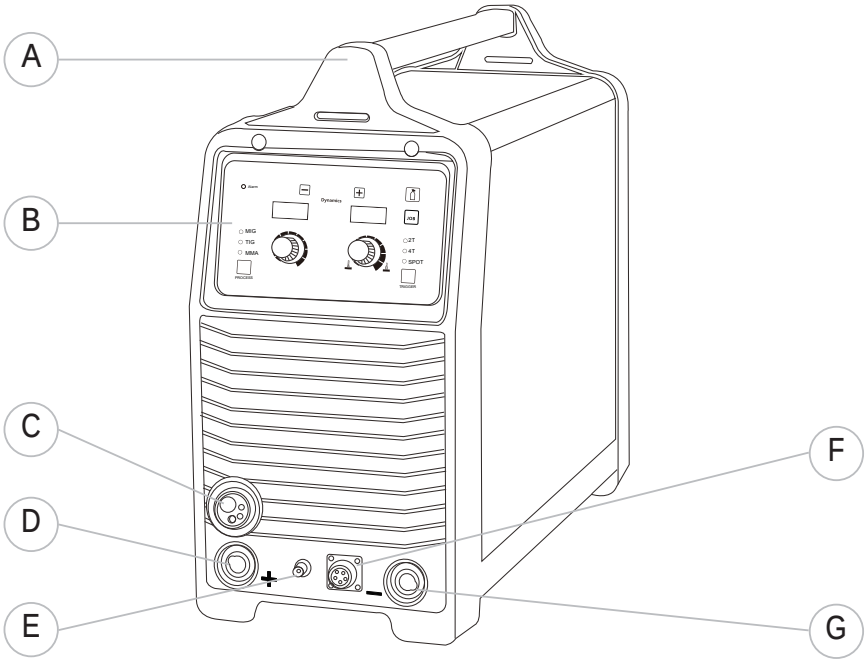
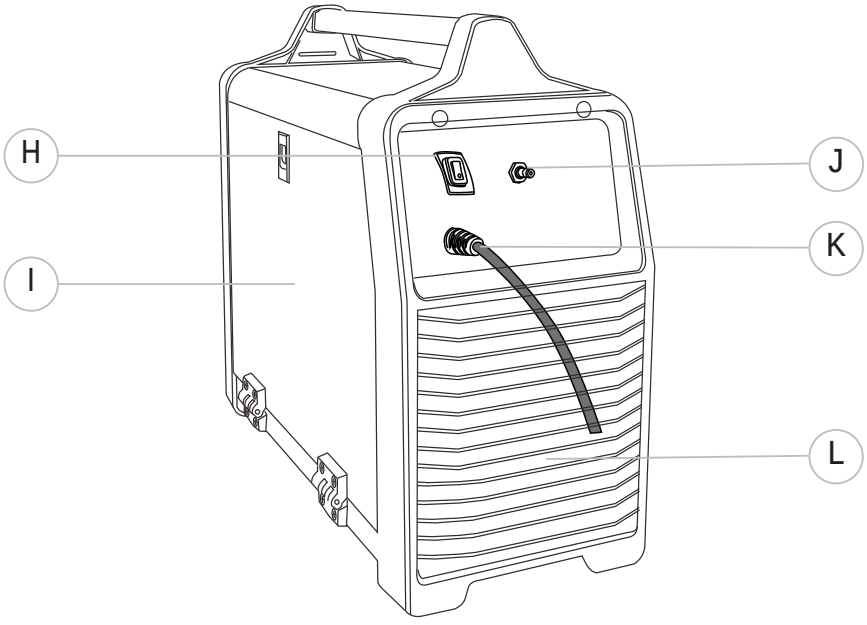
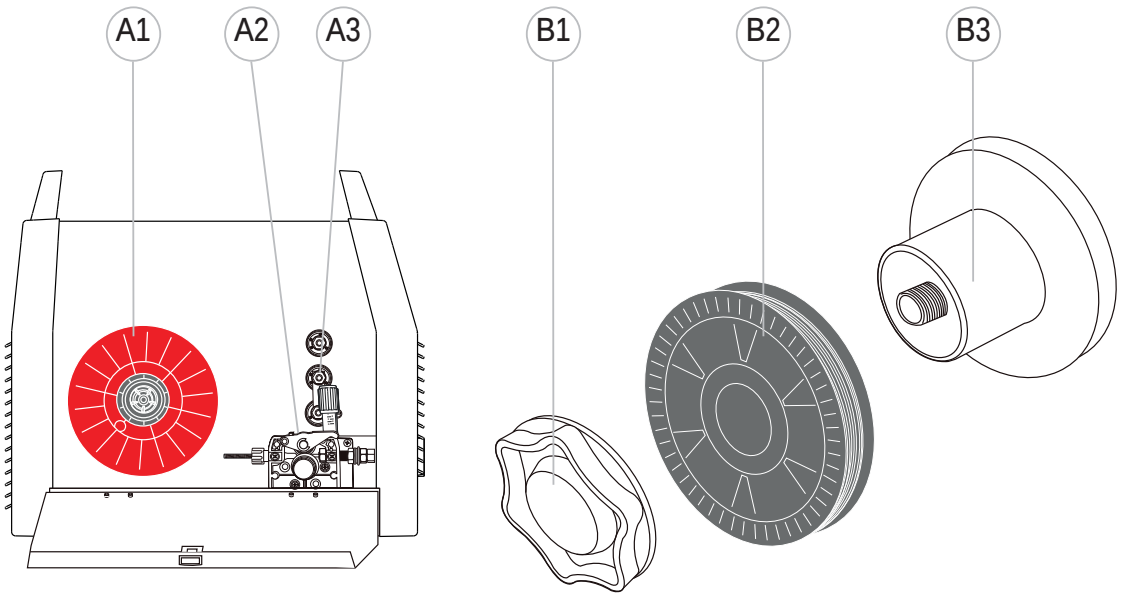
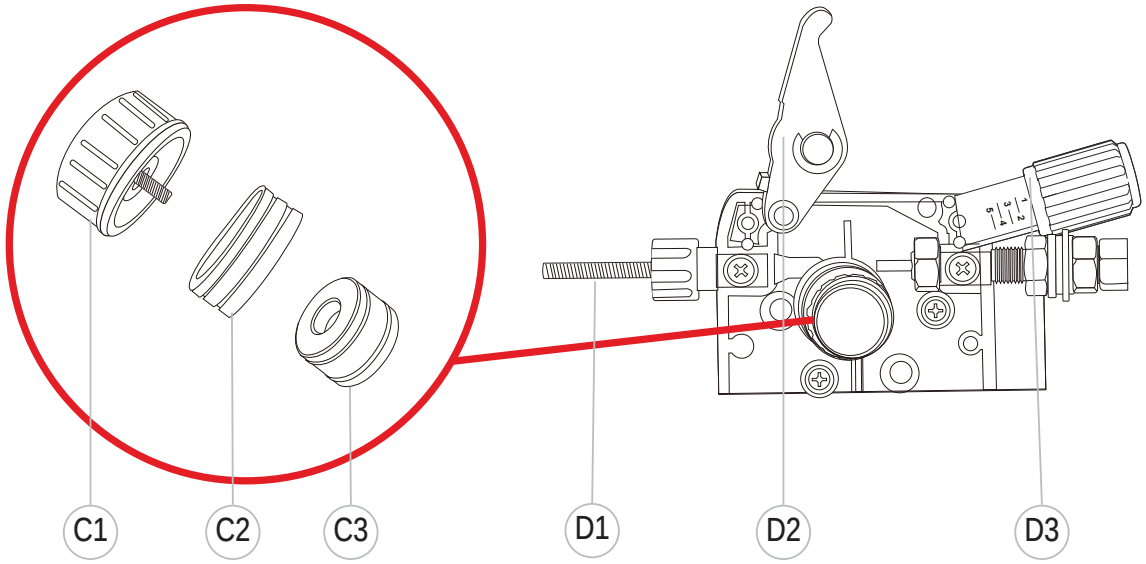


NO.	DESCRIPTION	NO.	DESCRIPTION
A	Transport handle	G	SK „-" socket
B	Control panel	H	Toggle switch ON/OFF
C	EURO socket – MIG gun connector	I	Door the wire supplying
D	SK „+" socket	J	Gas connector
E	Gas connector for TIG	K	Power cable
F	Control plug socet	L	Fan





NO.	DESCRIPTION	NO.	DESCRIPTION
A1	Wire spool	**B1**	Nut
A2	Wire feeder	**B2**	Wiwe spool
A3	Welding polarity on Euro socket	**B3**	Mountig mechanism of spool



NO.	DESCRIPTION	NO.	DESCRIPTION
C1	Nut	**D1**	Wire inlet guide
C2	Drive roll	**D2**	Tension roll
C3	Adapter	**D3**	Tension adjustment knob

7.4. CONNECTING TO POWER SUPPLY

ENG

Requirements for power network parameters (voltage, permissible range of mains voltage fluctuations etc.) are given in the table with technical parameters of device and on the rating plate of welding machine.

Before connecting the unit to the power source:

- Check whether the parameters comply with the requirements for unit.
- Check: mechanical condition of the power cord and plug. The connection status of the power cord with plug and unit (loose not allowed). If the power cord or plug is damaged or loose connection is between them, it is forbidden to connect the welder until fault has been rectified.
- Connect the welding machine only to the network where the power outlet is properly grounded.

WARNING: It is forbidden bridging PE and N cables. it may cause serious risk of electric shock.

7.5. INSTALLATION – MIG/MAG WELDING

Before installation the welding wire spool, make sure that weight and dimension of the spool meet the requirements set out in the table with technical data of device.

Before connecting hardware and shielding gas to the device, make sure that the device is disconnected from power source and switch (H) is in the OFF position.

7.5.1. CONNECTING THE GAS CYLINDER

1. The cylinder with appropriate shielding gas, should stand upright and be secured against tipping over in accordance with safety requirements.
2. Make sure that the valve cylinder is closed.
3. Connect properly gas regulator to cylinder valve.
4. Connect the gas hose into gas regulator outlet. Use special clamps to seal connection.
5. Connect gas hose to the device (J)

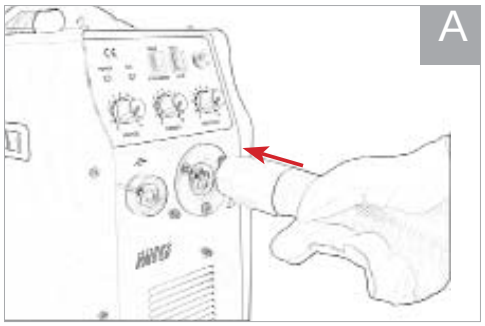
Valve in the cylinder should be opened immediately before welding. After welding is complete it should be closed.

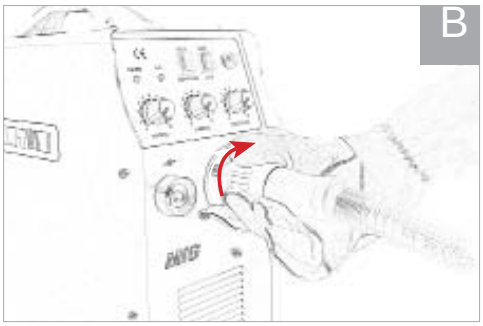
7.5.2. WELDING WIRE SPOOL INSTALLATION

1. Unlock the mounting block (B1) in the mounting bracket (B3).
2. Place the wire spool on mounting mechanism. Pay attention to direction of unwinding welding wire (basic criterion - minimum bending radius of wire, linearly to wire inlet guide D1). Locking pin should be placed in special hole in wire spool.
3. Lock the mounting block in the mounting bracket.
4. Unlock tension knob (D3). Check if the feed rolls are proper to type and diameter of welding wire.
5. Pass end of wire through wire inlet guide (D1), through groove of drive roll and EURO socket guide. The end of welding wire should leave a distance approx. 10 mm beyond outline of EURO socket (C).
6. Lock tension knob (D3)

7.5.3. MIG GUN INSTALLATION

1. Connect properly MIG gun plug to EURO socket (C)
2. Pay special attention to the correct fit of the control pins and input welding wire from wire feeder to the wire inlet guide in MIG gun.
3. Tighten the MIG gun plug nut clockwise until it stops. Incorrectly mounted MIG gun can cause damage





7.5.4. ASSEMBLING WELDING WIRE INTO LINER

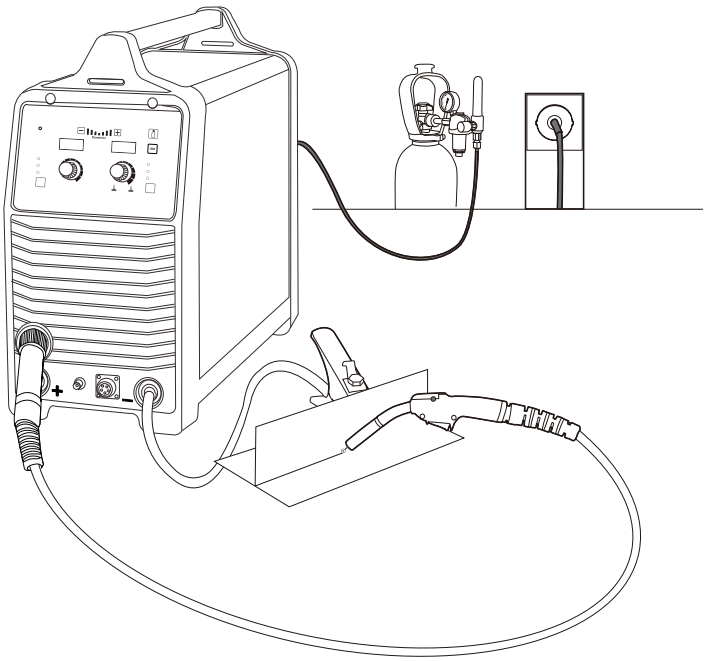
1. Connect properly MIG gun into welding machine see 7.5.3
2. Dismantle the torch consumables (gas nozzle, contact tip).
3. Connect the welder into power supply. Turn on the machine using power switch (H).
4. Expand MIG gun as straight as it is possible.
5. Using the switch of torch, start wire feeding into MIG gun liner. Make sure that pressure tension of feeder rolls is suitable. Remember! Never point torch into direction eyes / face or others.
6. When wire end comes out to a distance approx. 30 mm beyond the torch outline, release the handle switch.
7. Connect the torch consumables (gas nozzle, contact tip).
8. Cut off the end of wire properly.

ENG

7.5.5. DEVICE INSTALLATION - MIG/MAG WELDING

For most applications during MIG/MAG welding the polarity of the welding should be positive ‚+' on the EURO socket and negative ‚-' on the return cable.

1. Connect the gas hose to the machine.
2. Connect the MIG/MAG handle to the machine, according to 7.5.3.
3. Connect the return cable to the SK „-„ (G) socket and the mass clamp to the welded part.
4. Make sure that all threaded connections are not loose and that the shielding gas connection is tight.
5. Connect the machine to the power supply in accordance with the guidelines in 7.4.6.
6. Turn the machine on by setting the (H) switch to ON.
7. Insert the welding wire to the handle according to 7.5.4.
8. Unscrew the valve in the gas cylinder and set the appropriate value for the shielding gas flow. By using the gas test (K7 see page 20) button on the front function panel.
9. The machine is ready for welding

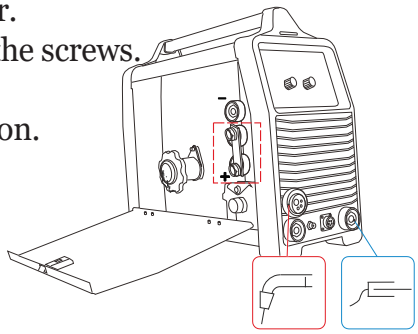


7.5.6. CHANGING THE WELDING POLARITY ON EURO SOCKET

Before connecting hardware and shielding gas to the device, make sure that the device is disconnected from power source and switch (H) is in the OFF position.

Welding polarity depends on type of used electrodes. Before connecting the cables refer to the requirements specified by the manufacturer of electrodes.

1. Turn the device off and disconnect the power cord and wait for 15 minutes.
2. Open the feeder door.
3. Loosen the screws above the wire feed unit using a screwdriver.
4. Set the jumper to the desired polarity, make sure and tighten the screws.
5. Tighten the bolts to 20 Nm.
6. Adjust the polarity of the return line to the current configuration.
7. Put on the right wire (FLUX cored).
8. Follow the procedures: **7.5.2, 7.5.3, 7.5.4**.
9. The device is ready for work.



7.6. INSTALLATION – TIG WELDING

Before connecting hardware and shielding gas to the device, make sure that the device is disconnected from power source and switch (H) is in the OFF position.

7.6.1. CONNECTING THE GAS CYLINDER

1. The cylinder with appropriate shielding gas, should stand upright and be secured against tipping over in accordance with safety requirements.
2. Make sure that the valve cylinder is closed.
3. Connect properly gas regulator to cylinder valve.
4. Connect the gas hose into gas regulator outlet. Use special clamps to seal connection.
5. Connect gas hose to the device (J)

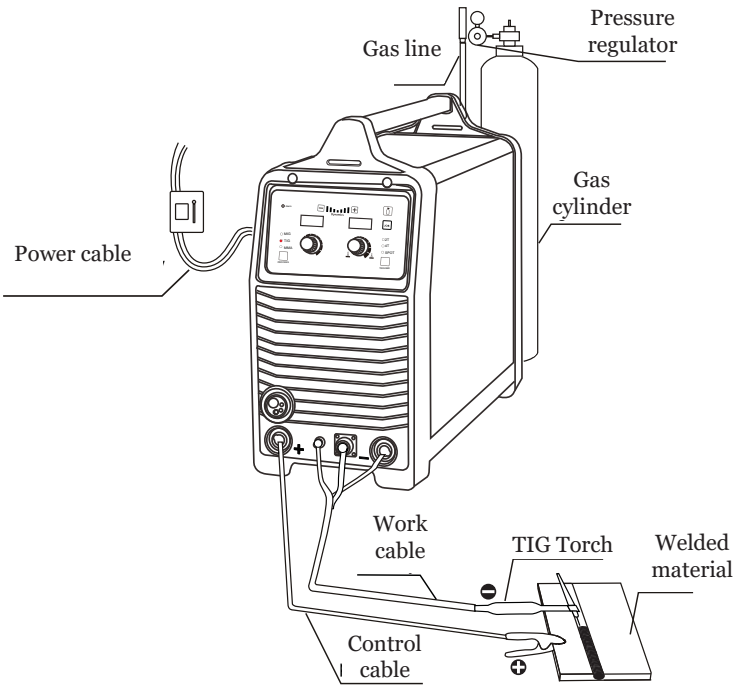
Valve in the cylinder should be opened immediately before welding. After welding is complete it should be closed.

7.6.2. TIG TORCH INSTALLATION

1. Connect properly TIG torch plug into DINSE „-" (G)
2. Connect properly TIG torch control plug into control socket (F). Pay attention to suitable fitting of control pins.
3. Connect gas hose into shield gas connector at the front panel. (E)

7.6.3. DEVICE INSTALLATION

1. Connect gas hose into device (see 7.6.1)
2. Connect TIG torch into device (see 7.6.2)
3. Connect return cable into DINSE socket „+" (D) and the earth clamp into workpiece.
4. Connect the welder into power supply (see 7.4)
5. Turn on the welder by setting power switch (H) in the ON position.
6. Device is ready to work.



ENG

TIG plug socket

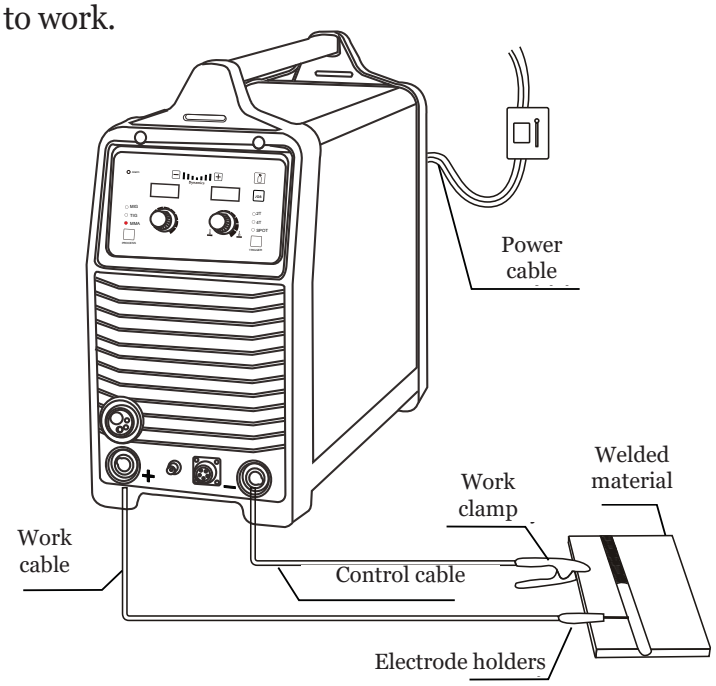
Pin	Description
1	START +
2	START -
3	nn
4	nn
5	nn

7.7. INSTALLATION – MMA WELDING

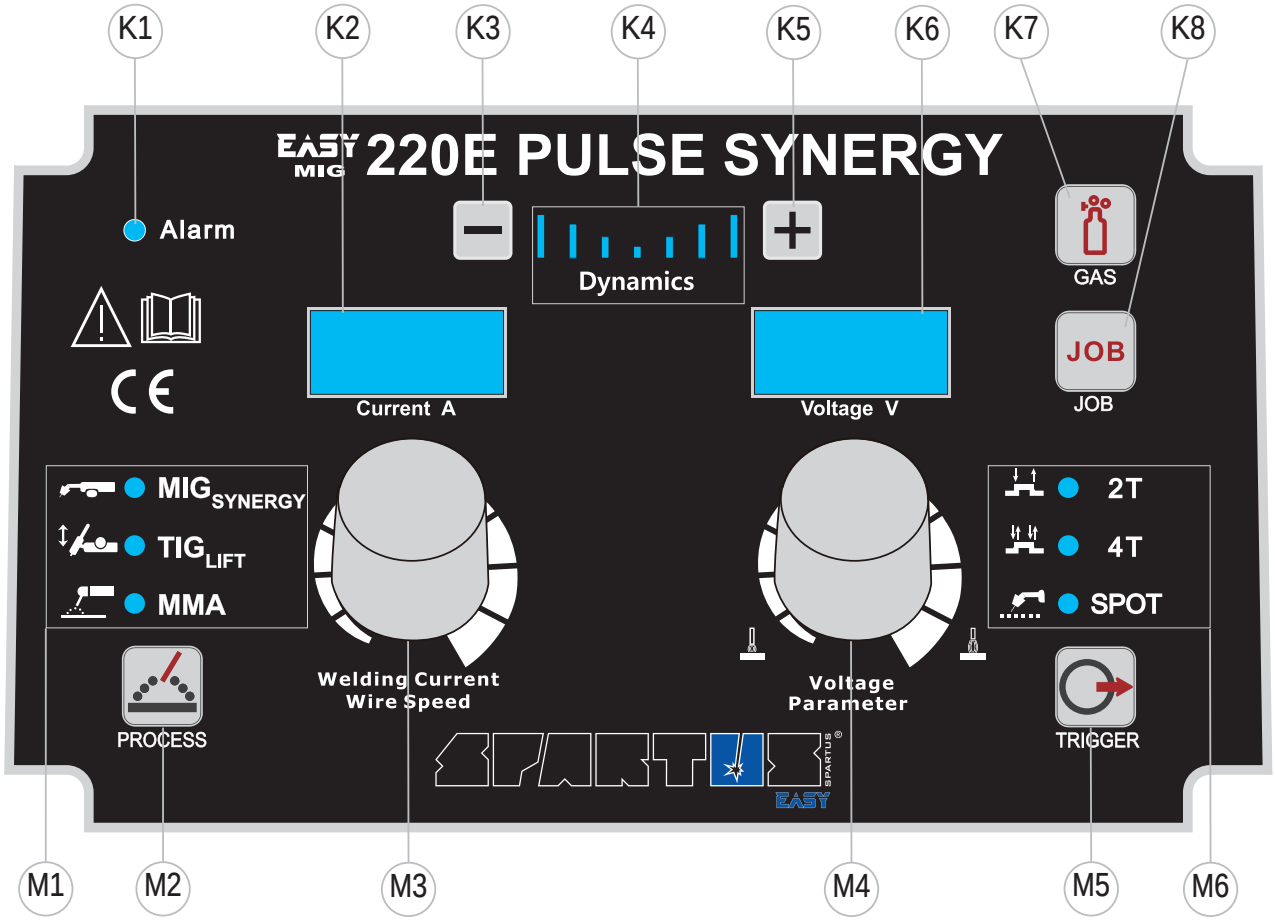
Before connecting hardware and shielding gas to the device, make sure that the device is disconnected from power source and switch (H) is in the OFF position.

Welding polarity depends on type of used electrodes. Before connecting the cables refer to the requirements specified by the manufacturer of electrodes.

1. Connect electrode cable plug into SK socket (for example: SK „+")
2. Connect return cable plug into appropriate SK socket (for example: SK „-").
3. Connect earth clamp into workpiece.
4. Connect the welder into power supply in accordance with appropriate guidelines (see 7.4)
5. Turn on the welder by setting power switch in the ON position.
6. Device is ready to work.



7.8. CONTROL PANEL



K1 Abnormal indicator
K2 Digital meter welding current / functions no.
K3 Button „-" dynamic
K4 Indicator dynamic
K5 Button „+" dynamic
K6 Digital meter welding voltage / programs no. / parameters
K7 Switch „Gas Test"
K8 The choice button Synergy program

M1 Welding method indicator
M2 The choice welding method
M3 Welding current adjustment knob / choice function
M4 Welding voltage adjustment knob / choice parameters welding
M5 Operation mode 2T/4T/SPOT
M6 Mode indicator

ENG

Welding method:

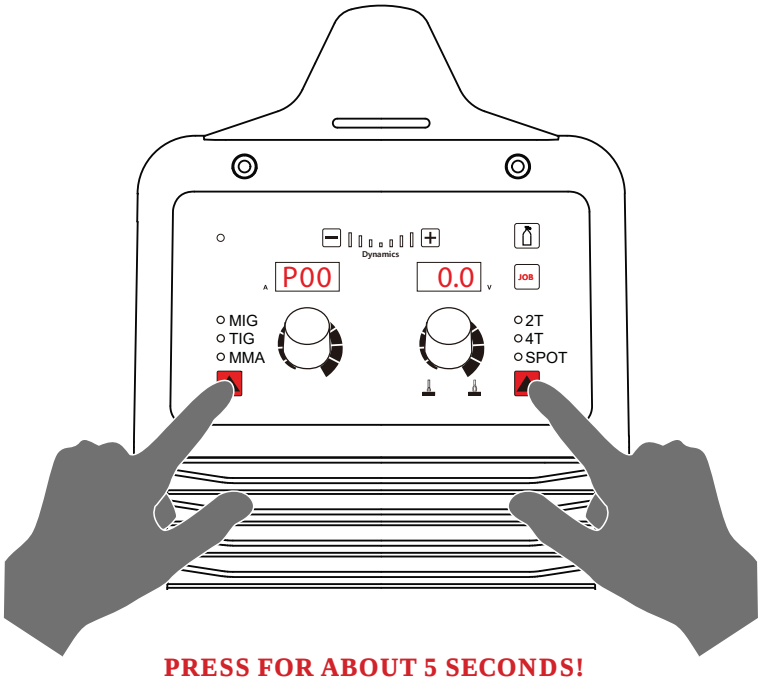
$MIG_{SYNERGY}$	welding synergy MIG/MAG
TIG_{LIFT}	TIG welding with arc ignition by scratch
MMA	manual metal Arc Welding

Operation mode:

2T	2T Trigger
4T	4T Trigger
SPOT	spot welding

7.8.1 ADVANCED FUNCTIONS:

To enter advanced functions menu hold (M2) and (M5) buttons for 5 seconds. To exit hold (M2) and (M5) buttons for 5 seconds again.



PRESS FOR ABOUT 5 SECONDS!

Symbol	Meaning	Value	Mode
P00	PREGAS time	0.0 – 10.0s	MIG / TIG
P01	POSTGAS time	0.1 – 10.0s	MIG / TIG
P02	SLOW FEED time	1.0 – 22.0s	MIG
P03	BURN BACK time	0.1 – 2.0s	MIG
P04	BURN BACK voltage	12 - 20 V	MIG
P05	SPOT time	0.1 – 10.0s	MIG / TIG

7.8.2. SYNERGIC PROGRAMS - SPECIFICATION :

PROGRAM No. [JOB]	MATERIAL	DIA WIRE [mm]	GAS
101	Fe	0,6	CO2
201	Fe	0,6	80%Ar 20% CO2
102	Fe	0,8	CO2
202	Fe	0,8	80%Ar 20% CO2
104	Fe	1,0	CO2
204	Fe	1,0	80%Ar 20% CO2
302*	SS ER 316	0,8	98%Ar 2% CO2
404*	Al99,5	0,8	Ar 100%
502	Fe FLUX	0,8	Self-shield

* 302 and 404 a pulsation was recorded.

8. MAINTENANCE

WARNING: Before performing any maintenance or repairing of device, disconnect welder from the power source and wait for at least 5 minutes. The voltage accumulated in capacitors should be discharged at this time to a safe level. But even after that operation you should be careful.

Maintenance and repair work may be performed only by qualified personnel with the appropriate certificates and permits. Regular maintenance provides adequate service and hassle-free using of the device.

Routine maintenance (Daily: before use/installation):

- Perform a visual inspection of the housing, knobs, control panel.
- Inspect (visual inspection) the power cord and power plug. Check the insulation of the cable.
- Check the condition of welding cables and their connectors. If cable insulation is damaged - replace it. If connection is too loose - eliminate backlash.
- Check if cooling fan is working properly
- Make sure that all vents are not obstructed.

At least once a month:

- Regularly remove dust from inside of the machine. Using compressed air. The pressure should be sufficiently low to prevent small components inside the machine from damaging. If in the workplace, dust level is high, you should clean machine often.

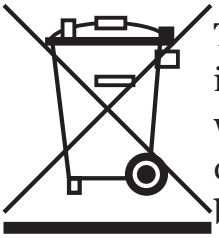
ENG

- Perform inspection of connection of internal electrical components. If any joint is loose, tighten them.

Once a year:

- You should send the device to an authorized service center for a professional inspection.

9. ENVIRONMENTAL PROTECTION



The product must not be disposed of into an ordinary waste container. It is totally forbidden to dispose of electric or electronic equipment marked with a crossed-out trash can symbol by throwing it into ordinary waste containers. According to the WEEE directive (directive 2012/19/UE), binding within the European Union, such products should be disposed of according to local regulations.

10. TROUBLESHOOTING

Not all problems with functioning of the device, are the evidence of failure. You can independently carry out an analysis in search of probable failure. In case of doubt, please contact to SPARTUS® dealer or authorized service center.

During the warranty period all repairs should be carried by authorized service center. Repairs carried out by unauthorized persons will void the warranty.

Trouble	Probable reason	Solution
Display parameters „don't light up" , fan is not working, there is no voltage at the output	• No power supply • Power switch is in the OFF position	• Connect device to power supply • Set the power switch to the ON position
No arc	• No power supply • A break in circuit welding • A break in the control circuit	• Connect device to power supply • Inspect, repair • Inspect, repair

Excessive heating of MIG gun.	• Contact tip is not properly fastened or tightened • Too high welding current in relation into MIG gun capacity	• Inspect contact tip, tighten contact tip • Reduce welding current
Unstable wire feeding – MIG mode.	• Blocked guide wire (liner) • Worn contact tip • Contact tip diameter is not suitable to wire diameter • Wrong adjustment of tension pressure of rolls	• Clean the liner or replace for a new one • Replace contact tip for a new one • Replace contact tip for an appropriate one • Check the adjustment of tension pressure of rolls
Unstable welding arc - MIG	• The current tip is worn out or its diameter is inadequate. • Incorrectly selected welding parameters. • Worn out wire guide.	• Replace the current tip with the new/correct one. • Correct the welding parameters. • Replace the wire guide with a new one.
Gas shield missing - MIG	• Shielding gas is not connected to the machine. • Valve turned off in the shielding gas cylinder • Loose clamps on gas hoses • Damaged or blocked gas hose in the handle	• Connect shielding gas to the machine • Unscrew the valve in the gas cylinder • Check the gas hose connections • Check the condition of the gas hose in the welding handle
Inappropriate gas shield - MIG	• Too low shield gas flow rate • Partially obstructed gas hose in the welding handle • Contaminated and blocked gas nozzle	• Check if the shield gas flow rate is appropriate • Check the permeability of the gas hose in the MIG handle • Clean the gas nozzle or replace it with a new one

ENG

Unstable welding arc, big spatters, bad weld quality - MMA	• Incorrect welding polarity. • The electrode is damp or incorrectly heated. • Unstable input voltage. • Parameters display is damaged, incorrect display readings.	• Check the requirements regarding the polarity on the electrode packaging, change poles if necessary. • Check the manufacturer's specifications for welding electrodes and follow the manufacturer's instructions. • Check the power in the socket, repair it. • Contact the service.
The overheating indicator has lit up	• The machine has been overloaded and thermal protection has been switched on. • Fan failure, overheating occurs. • Function panel is damaged.	• Wait for the machine to cool down and try again. • Check the fan operation, contact the service if it is not working. • Contact the service.

11. NOTES

SPARTUS EASY

Urządzenia, uchwyty i akcesoria spawalnicze oparte na prostych, ale skutecznych rozwiązaniach. Powstały z myślą o łatwej obsłudze i ergonomii podczas użytkowania. Znajdują zastosowanie w pracach warsztatowych, w sektorze produkcji i utrzymania ruchu.

Welding equipment, torches and accessories based on simple but effective solutions. They were created for easy handling and ergonomics during use. They are used in workshops in the production and maintenance sector.

SPARTUS MASTER

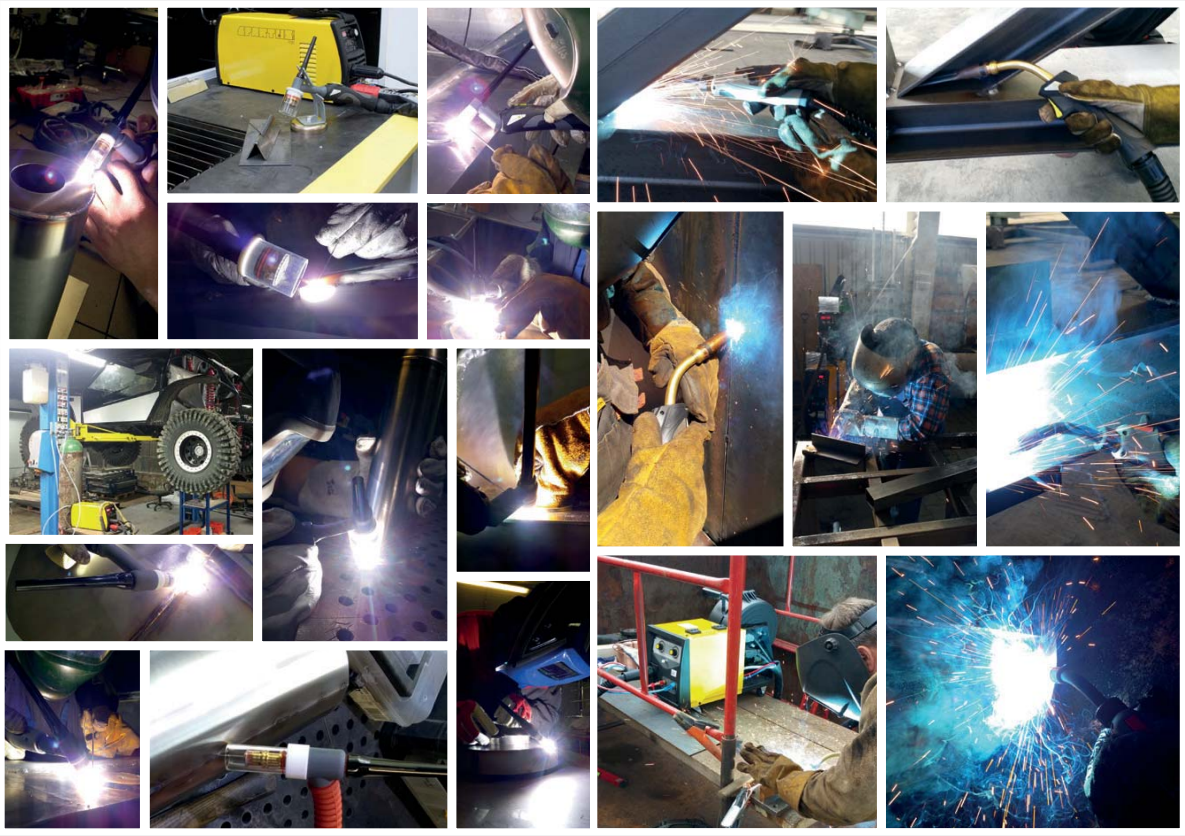
Mistrzowskie połączenie wysokiej jakości wykonania, doskonałych parametrów i ergonomii. Stworzone z myślą o różnorodnych pracach spawalniczych, również takich, które wymagają niejednokrotnie wyjątkowego podejścia do zadania. Urządzenia, uchwyty i akcesoria z serii Master to szeroki wachlarz uniwersalnych produktów, które znajdą zastosowanie w pracach warsztatowych, w sektorze produkcji i utrzymania ruchu oraz w przemyśle lekkim.

A masterful combination of high-quality workmanship excellent parameters and ergonomics. Designed for a variety of welding work including those that often require a unique approach to the task. The devices and accessories from the Master series are a wide range of universal products that can be used in workshops, in the production and maintenance sector in light industry.

SPARTUS PRO

Urządzenia, uchwyty i akcesoria spawalnicze zaprojektowane i wyprodukowane z myślą o ekstremalnych zadaniach. Niezastąpione wszędzie tam, gdzie od sprzętu wymagana jest wysoka jakość wykonania oraz odporność na wysokie obciążenia. Seria Pro to również szeroki wachlarz specjalistycznych rozwiązań, które pozytywnie wpływają na ergonomię i wydajność spawania. Znajdują zastosowanie w sektorze produkcji i utrzymania ruchu oraz różnych gałęziach przemysłu np. w przemyśle stoczniowym.

Welding equipment and accessories designed and manufactured for extreme tasks. Irreplaceable wherever high quality workmanship and resistance to high loads are required. The Pro series also includes a wide range of specialized solutions that positively influence the ergonomics and efficiency of welding. They are used in the production and maintenance sector in various branches of industrylike shipbuilding industry.



YouTube

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