



- ES** Manual de instrucciones
- IT** Istruzioni d'uso
- GB** Operating instructions
- FR** Instructions d'emploi
- P** Manual de instruções

Gama MIG/MAG

MIG160Multi
MIG170Multi
MIG200Multi
MIG250BM/BT
MIG350BT
MIG500BT



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FIG.1

► MIG 160 Multi / MIG 170 Multi

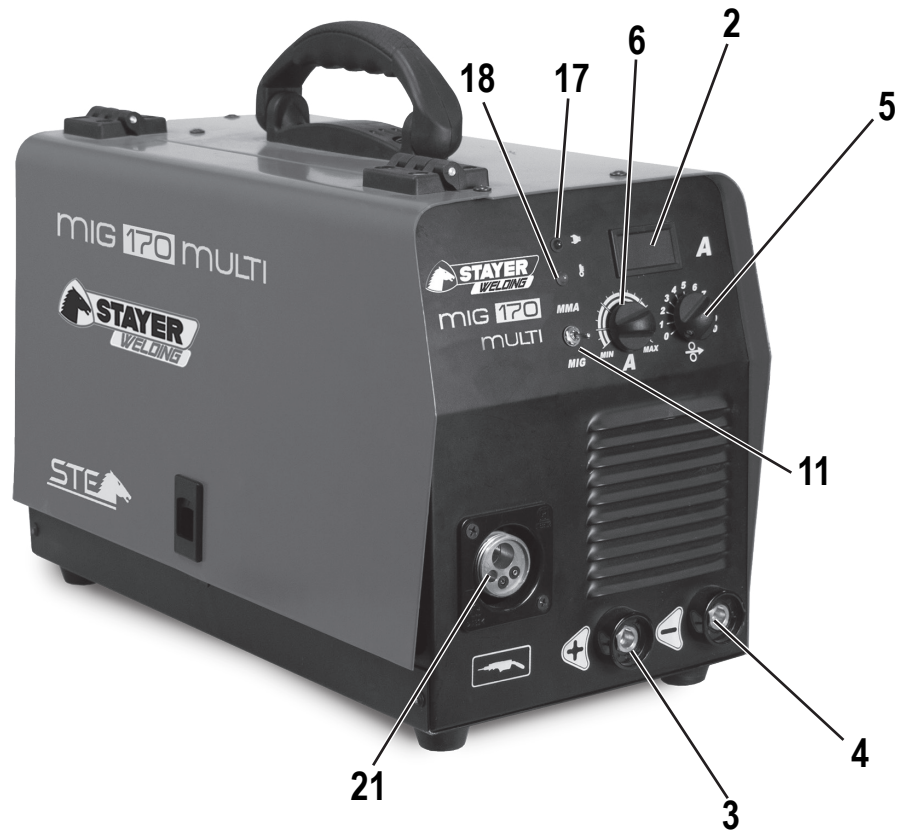


FIG.2

► MIG 200 Multi

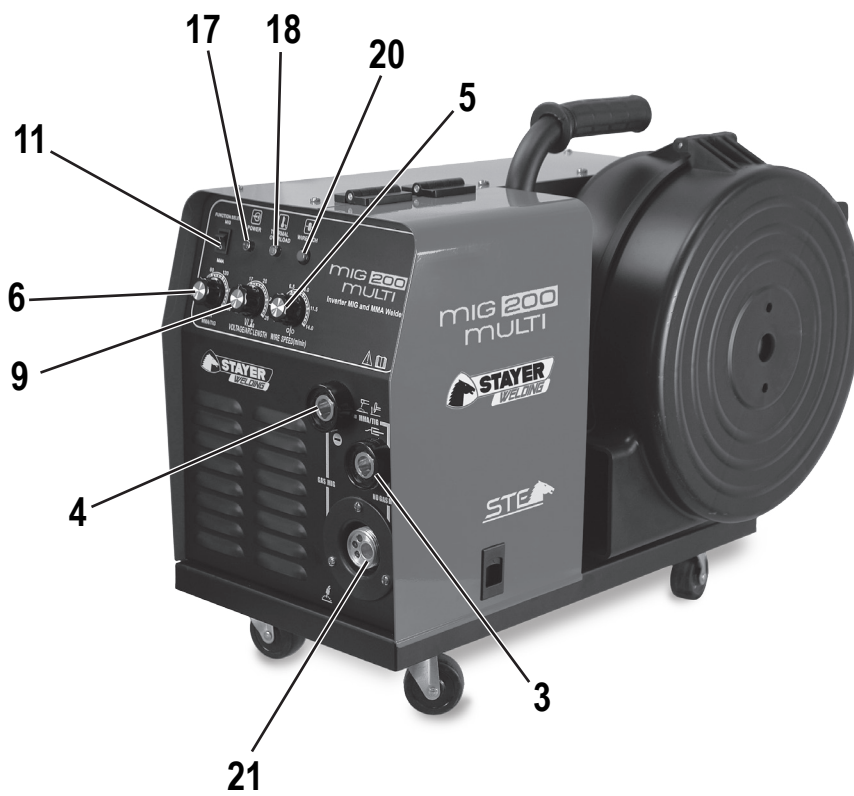


FIG.3

► MIG 250 BM / MIG 250 BT

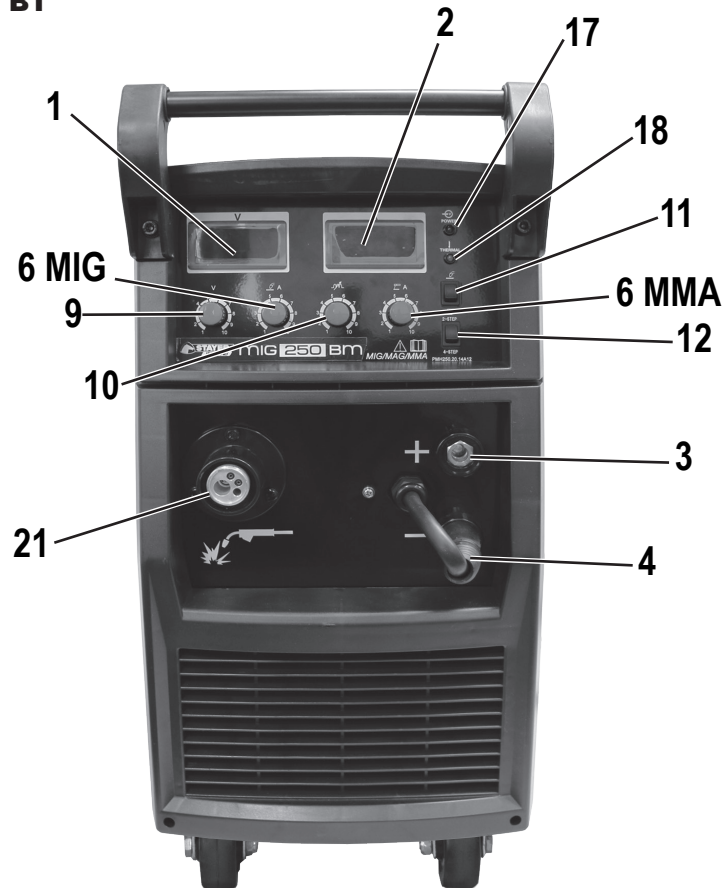


FIG.4

► MIG 350 BT

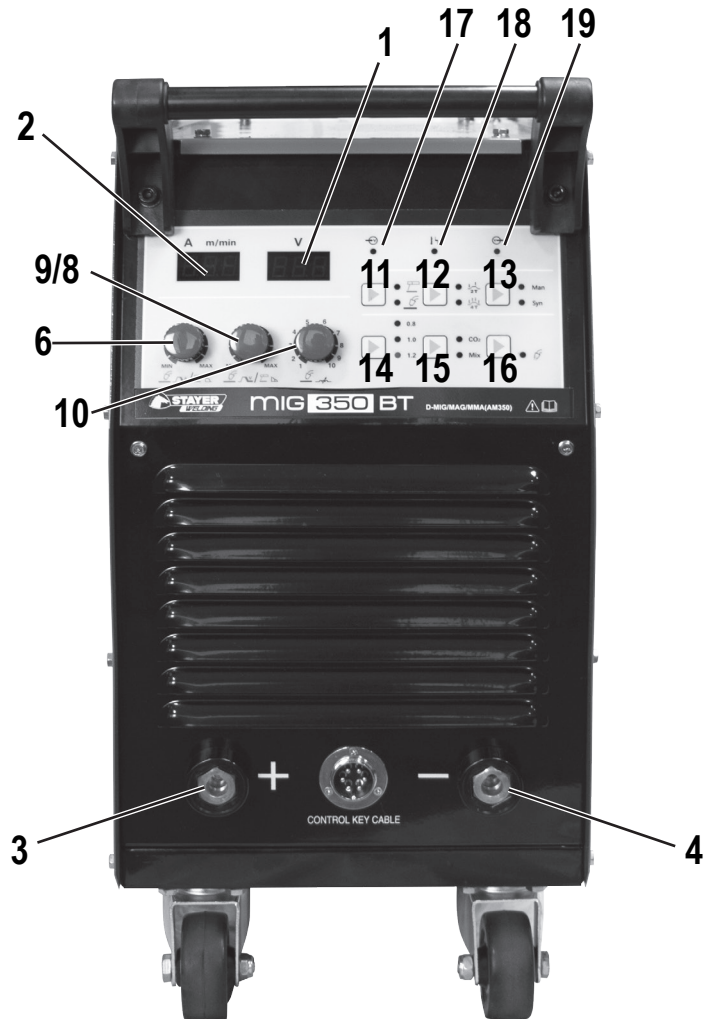


FIG.5

► MIG 500 BT

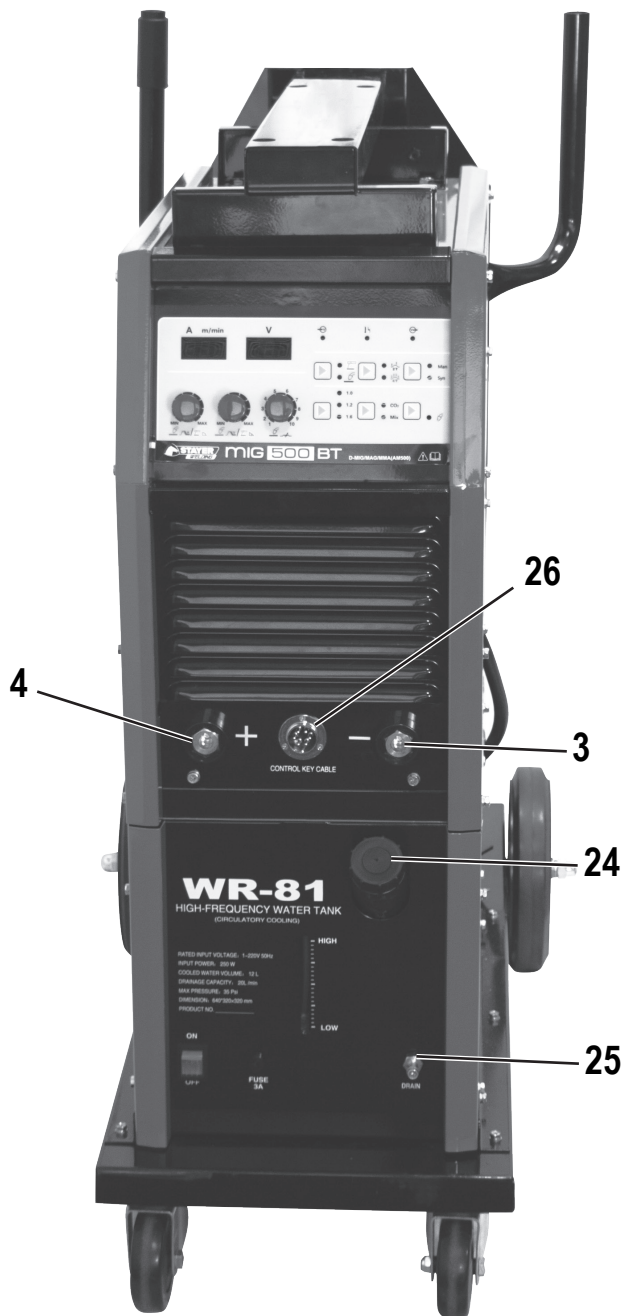
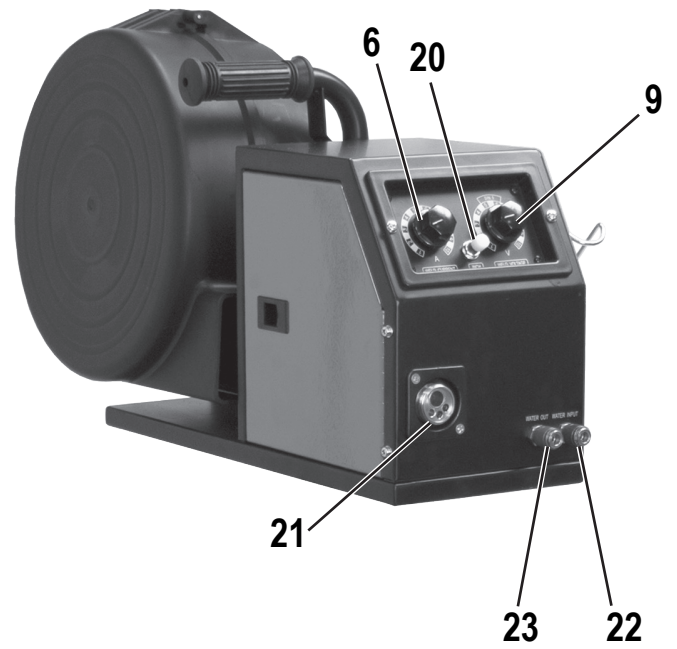


FIG.6

► MIG 350 BT / MIG 500 BT





		MIG160 Multi	MIG170 Multi	MIG200 Multi	MIG250BM	MIG250BT	MIG350BT	MIG500BT
	V	230	230	230	230	3 x 400	3 x 400	3 x 400
	A	160	170	200	250	250	350 - 271	500 - 387
	%	60	60	60	60	60	60 - 100	60 - 100
	mm	4-5	4	5	6	6	8	8
	mm	0.8	0.8 - 0.9	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0 / 1.0 - 1.2	0.8 / 1.0 - 1.2 / 1.6
	kg	8	17	22	42	42	45	50
	kg		5	5-15	5-15	5-15	5-15	5-15
	KVA	6	6	6	8	8	17	22
	cm	37 x 24 x 18	23 x 50 x 36	23 x 50 x 36	70 x 32 x 90	70 x 32 x 90	114 x 30 x 90	160 x 33 x 100

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1. INTRODUCTION

This produce is a MIG/MAG equipment for continuous wire metal, shielded electrode and TIG process welding. Technologically, the STAYER WELDING equipment is a power supply source for high-frequency power transfer managed y intelligent control logics.

In contrast to traditional technology which is based on transformers operating at 50 Hz public grid frequency, STAYER WELDING has a larger power density per weight unit, is more economizing and has the possibility of accurate, instantaneous and automatic control of all welding parameters.

As a result, you will more easily produce improved welding with equipments that consume less and have a lower mass than equivalent traditional equipments based on heavy transformers.

2. SAFETY INSTRUCTIONS

READ THE INSTRUCTIONS.

- Read the User Manual completely and understand it before using or giving service to the unit.
- Only use genuine manufacturer's parts.

Symbols used



Indicates a dangerous situation which, when not avoided, will lead to death or serious injury. Possible hazards are shown in the attached symbols or explained in the text.



Indicates a dangerous situation which, when not avoided, will lead to serious injury. Possible hazards are explained in the text.

Arc-welding hazards



Only qualified persons may install, operate, maintain and repair this machine.



During its operation, keep anyone away, especially children.



An electric shock may kill you.

Touching live current carrying parts may cause fatal electric shock or serious burns. The working and electrode circuit is always electrically live when the machine output is on. The input circuit and the inner circuits of the machine are also electrically live when the machine is on. When welding with automatic or semiautomatic equipment, the wire, the reel, the frame containing the supply rolls and all metal parts touching the welding wire are electrically live. Incorrectly-installed or not-earthed equipment is a very serious danger.

- Do not touch electrically live parts.
- Use dry isolating gloves without openings, and protection on your body.
- Isolate yourself from the work and from the ground by using carpets or covers that are sufficiently large to prevent any physical contact with the work or ground.
- Do not use the AC output in humid areas, if its movement is restricted or when in risk of falling gown.
- Use an AC output ONLY when required by the welding process.
- When an AC output is required, use a remote control if there is one present in the unit.
- Additional safety precautions are required when any of the following dangerous electric conditions is present in humid rooms or while you are wearing humid clothing, when working on metal structures such as floors, grates or scaffolds; when you are in a tight position such as seated, kneeling, laying down or when there is a high risk of having unavoidable or accidental contact with the workpiece or ground.
- Disconnect power input and stop the motor before installing or servicing this equipment.
- Install equipment and connect it to ground in accordance with the operator's manual and national, state and local codes.
- Always check the supply to ground – check and make sure that the power input to the ground wire is appropriately to the grounding terminal at the disconnection box or that its plug is appropriately connected to the output receptacle that is connected to ground. When making these input connections, first connect the ground conductor and double-check the connections thereof.

- Keep supply cords free of oil and fat, and protected from hot metal and sparks.
- Inspect power input cord frequently regarding damage or bare cable. Replace cord immediately if damaged – a bare cable may kill you.
- Switch off the whole equipment when you are not using it.
- Do not use cables which are worn-out, damaged, very small-sized or wrongly connected.
- Do not wrap cables around your body.
- A grounding clamp is required for a work; make a ground connection using a separate cable.
- Do not touch the electrode when you are in contact with the work or the grounding circuit or another electrode of a different machine.
- Do not put into contact two electrode carriers that are connected to different machines at the same time, because in that case there will be open-circuit double voltage.
- Use equipment in a well-maintained condition. Repair or replace damaged parts immediately. Maintain the unit in accordance with the manual.
- Use safety braces to prevent it from falling down when working above floor level.
- Keep all panels and covers in place.
- Put the clamp of the work cable in good metal-to-metal contact to the work or the work table as close as possible to the weld as it is practical.
- Keep or isolate the grounding clamp so that there is no contact with any metal or any grounded article.
- Isolate the grounding bracket when not connected to the workpiece to avoid it contacting any metal article.



HOT PARTS may cause serious burns.

- Do not touch hot parts with your hand without glove. Allow that there is a cooling period before working at the machine.
- To handle hot parts, use appropriate tools and/or put on heavy gloves, with insulation for welding and clothing to prevent burns.



SMOKE and GASES may be dangerous.

Welding produces smoke and gases. Breathing in these gases and smoke may be dangerous or mortal.

- Keep your head out of the smoke. Do not breathe in smoke.
- When you are indoors, ventilate the area and/or use forced local ventilation in front of the arc to withdraw welding smoke and gases.
- When ventilation is use an authorized respirator.
- Read and understand the Data Sheets on Material Safety (MSDSs) and the manufacturer's instructions regarding materials, consumables, coatings, cleansers, degreasing agents and any other chemical products.

- Do only work within a closed space if it is well ventilated or while using an air respirator. Always have near a trained person. Welding smoke and gases may displace air and reduce oxygen level causing harm to health or death. Make sure that air for breathing is safe.

- Do not weld at locations near to operations involving grease, cleaning or paint spraying. Heat and bolts of the arc may react with vapors and form strongly irritating and toxic gases.

- Do not weld on coating materials such as galvanized steel, lead, or cadmium-coated steel, unless the coating has been removed from the welding area, the area is well ventilated and while using a respirator with a source of air. Coatings of any material containing these elements may cause smoke being emitted when welding.



BOLTS EMITTED BY THE ARC may burn your eyes and skin.

Bolts emitted by the arc of a welding process produce intense heat and strong ultraviolet rays that may burn eyes and skin.

- Use an authorized welding mask having a lens-filter shade to protect your face and eyes while welding or looking, cf. safety standards ANSI Z249.1, Z175, EN379.
- Use authorized safety goggles having lateral protection.
- Use protective screens or barriers to protect others from flashes, reflections and sparks; alert other not to look at the arc.
- Use protective clothing made of durable, flame-resistant material (leather, thick cotton or wool) and protection to your feet.



WELDING may cause fire and explosion.

Welding a closed container such as tanks, drums or tubes may cause explosion. Sparks may fly from the welding arc. Flying sparks, the hot workpiece and the hot equipment may cause fire and burns. Accidental contact of the electrode with metal articles may cause sparks, explosion, overheating, or fire. Check and make sure that the area is safe before starting any welding.

- Withdraw any inflammable material from within a distance of 15 m of the welding arc. When this is not possible, cover it tightly with authorized covers.
- Do not weld where sparks may impact on inflammable material. Protect yourself and others from flying sparks and hot metal.
- Be alert to weld sparks and hot materials from the welding operation may pass through small cracks or openings in adjacent areas.
- Always watch that there is no fire and keep near an extinguisher.
- Be alert to that, when welding a ceiling, floor, wall or any kind of separation, heat may cause fire at a hidden part which cannot be seen.
- Do not weld within closed receptacles such as tanks or drums or piping unless they have been prepared appropriately in accordance with AWS F4.1.
- Do not weld where the atmosphere might contain inflammable dust, gas or vapors from liquids (such as gasoline).

- Connect the work cable to the work area as near as possible to the place where you will be welding, in order to prevent welding current from long traveling possibly through unknown parts causing electrical shock, sparks and fire hazard.
- Do not use welding to deice frozen pipes.
- Remove electrode from the electrode carrier or cut the welding wire close to the contact pipe when you are not using it.
- Use protective clothing without oil, such as leather gloves, heavy shirt, closed trousers without patches, high shoes or boots and a cap.
- Keep away from you any fuel as butane lighters or matches, before starting to weld.
- After completing work, inspect area to make sure that it is free of sparks, embers and flames.
- Only use correct fuses or circuit breakers. Do not put ones of larger size or pass them by one side.
- Follow the regulations in OSHA 1910.252(a) (2) (iv) and NFPA 51B for hot work and have a person close to take care of fire and an extinguisher.



FLYING METAL OR SLAG may injure eyes

- Welding, grinding, wire brushing or polishing may produce sparks or flying metal. When welds are cooling down they may release slag.
- Use authorized safety goggles with lateral guards down to underneath your mask.



GAS ACCUMULATION may make you sick OR KILL YOU.

- Close shielding gas when not using it.
- Always give ventilation to close spaces, or use an authorized respirator that replaces air.



MAGNETIC FIELDS may affect implanted medical devices.

- Persons using pace makers or other implanted medical devices must stay away.
- Persons using implanted medical devices must consult their doctor and the manufacturer before approaching arc welding, point welding, slotting, plasma cutting, or induction heating operations.



NOISE may injure your inner ears.

- The noise of some processes or equipment may harm your inner ear. Use authorized ear protection when the level of noise is very high or above 75 dBa.



THE CYLINDERS may burst when they have failures.

Cylinders containing shielding gas contain that gas under high pressure. The cylinders may burst when they have failures. As the cylinders are usually part of the welding process, always handle them with care.

- Protect the gas cylinders in a vertical position securing them to a stationary support or a cylinder holder to prevent them from falling down or collapsing.
- Keep cylinders far away from electric or welding circuits.
- Never wrap the welding torch about a gas cylinder.
- Never allow an electrode to contact any cylinder.
- Never weld at a pressurized cylinder; there will be an explosion.
- Use correct shielding gas only, as well as regulators, hoses and connections designed for the specific application; maintain them, the same as the parts, in a good condition.
- Always keep your face away from a valve outlet except when operating the cylinder valve.
- Keep the protective cover in place over the valve except when the cylinder is in use or connected for being used.
- Use the correct equipment, correct proceedings and a sufficient number of persons to lift and move the cylinders.
- Read and follow the instructions regarding the compressed gas cylinders, associated equipment and the publication of the Compressed Gas Association (CGP) P-1 as well as local regulations.



FIRE OR EXPLOSION hazard.

- Do not place the unit on, over or near to combustible surfaces.
- Do not install the unit near to inflammable articles.
- Do not overcharge your building's wiring – make sure that your power supply system es suitable in size, capacity and protected to comply with the requirements of this unit.



A DOWN-FALLING UNIT may cause injuries.

- With heavy equipment, do use the lifting eye only for lifting the unit, nut NOT the wheel train, gas cylinders or other accessories.
- Use equipment having a suitable capacity to lift the unit.
- When using a fork lift, make sure that the dimension of the fork lift is sufficiently long to extend beyond the opposite side of the unit.



OVERUSE may cause OVERHEATING OF THE EQUIPMENT.

- Allow for a cooling period, follow the nominal working cycle. When the thermal protection goes on, change to other, more powerful equipment.
- Reduce the working cycle or current before welding again.
- Do not block or filter the airflow to the unit.



FLYING SPARKS may cause injuries.

- Use a face guard to protect your eyes and face.

• Shape the tungsten electrode only in a grinder with appropriate guards at a safe location using necessary protection for your face, hands and body. Do not breathe-in filings.

• Sparks may cause fire – keep inflammables far away.



THE WELDING WIRE may cause you injuries.

- Do not press the trigger of the torch until receiving these instructions.
- Do not point the tip of the torch towards any point of your body, other persons or any metal object when passing the wire.



MOVING PARTS may injure.

- Keep away from any moving parts such as fans.
- Keep any doors, panels, lids and guards close and in place.
- Achieve that only qualified persons remove doors, panels, lids and guards to provide maintenance as necessary.
- Reinstall doors, panels, lids and guards after having completed provision of maintenance and before reconnecting input power.



HIGH FREQUENCY RADIATION may cause interferences.

- High frequency radiation (H.F.) may interfere with radio navigation, safety services, computers and communication equipment.
- Make sure that only qualified persons familiarized with electronic equipment install the equipment. The user takes responsibility for having a trained electrician who will correct any problem caused by the installation soon.
- Make sure that the installation receives regular checking and maintenance.
- Keep doors and panels of a high frequency source completely shut, keep the distance of the spark at the contact points in its correct fixation and is grounded and protects countercurrent to minimize the possibility of interference.



ARC WELDING may cause interference.

- Electromagnetic energy may interfere with sensitive electronic equipment such as computers or computer-driven equipment such as industrial robots.
- Make sure that any equipment within the welding area is electromagnetically compatible.
- To reduce possible interference, keep welding cables as short as possible, as close together as possible or, on the floor, if possible.
- Place your welding operation at a distance of at least 100 meters from any electronically sensitive equipment.
- Make sure that the welding machine is installed and grounded in accordance with this manual.
- If there still is interference, the operator has to take extraordinary measures, such as moving the welding machine, use shielded cables, use line filters, or shield the work area in one way or another.

Reducing electromagnetic fields

To reduce magnetic fields (EMF) in the work area, the following proceedings should be used:

1. Keep cables as close together as possible, by braiding them, or joining them with sticky adhesive tape, or using a cable cover.
2. Place cables at one side and away from the operator.
3. Do not wrap or hang cables about your body.
4. Keep welding power sources and cables as far away as practical.
5. Connect grounding clamp to the piece you are working at, as near as possible to the weld.

In environments with increased risk of electric shock and fire, such as in the proximity of inflammable products, explosives, height, restricted free moving space, physical contact with conductive parts, warm and humid environments that reduce the electrical resistance of human skin and apparatus, observe the risk prevention in the workplace and the national and international provisions as pertinent.

3. INSTRUCTIONS FOR PUTTING INTO OPERATION

3.1. Positioning

Position the machine in a safe and dry environment and with a flat surface.

3.2. Assembling

3.2.1 Models with internal winder

They come fully assembled.

3.2.2 Models with external winder

Power, logics and water connection with the machine is carried out by means of the linking hose. Simply connect the positive pole cable, the logics connector and the water circuit (MIG500BT) located at the rear of the main machine, with the corresponding connectors of the spooler. The negative pole connection is made independently of the hose.

In Model MIG500BT which carries the cooling water unit for the water-cooled torch. Refill the front tank with water and prime the circuit if necessary.

Both models are delivered with the gas cylinder support tray. Use the chain as delivered to secure the welding cylinder against overturning.

3.3. Mains connection

Welding equipment need appropriate current supply and sufficient power to work at full capacity. The whole range is prepared to work with certified generators that comply with the regulations and operate properly. Power to be supplied is at least:

MODEL	VOLTAGE	MINIMUM POWER, KVA	RECOMMENDED POWER, 7KVA	Amperage and voltage for magnetothermal or differential circuit breaker
MIG 160 Multi	230, single-phase	5	7	2 poles, 230v, 32 Ah
MIG 170 Multi	230, single-phase	5	7	2 poles, 230v, 32 Ah
MIG 200 Multi	230, single-phase	6	7	2 poles, 230v, 32 Ah

MIG 250 BM	230, single-phase	8	10	2 poles, 230v, 40 Ah
MIG 250 BT	3x400 triphase	8	10	3 poles, 400v, 40 Ah
MIG 350 BT	3x400 triphase	14	16	3 poles, 400v, 25 Ah
MIG 500 BT	3x400 triphase	25	27	3 poles, 400v, 40 Ah

3.4. Illustrated description of functions

1. display showing welding arc voltage
2. Screen indicator intensity of the welding arc
3. Connecting DINSE, positive terminal.
4. Connection DINSE, negative terminal.
5. Adjust output speed of the thread
6. Set amperage arc welding
7. Main switch machine
8. Set the Arc Force Arc Welding
9. Adjust the welding arc voltage
10. Setting the inductance of the welding arc
11. I Selector MIG or coated electrode / TIG
12. Selector 2T / 4T
13. Manual Selector / Synergistic
14. Selector wire diameter
15. Gas type selector
16. Button Purge Gas
17. Light machine on
18. Light thermal overload
19. Light welding machine
20. Push priming thread
21. Torch Connector thread
22. Cooling water inlet
23. Cooling water outlet
24. Filling the cooling circuit
25. Drain the cooling circuit

3.5. Limitations to environmental conditions

Equipment shall be installed respecting their IP21 class; this means that the equipment is protected at the most against vertical impact of water drops and access to dangerous parts with one finger against solid foreign bodies of 12.5 mm Ø or larger.

The equipment is prepared for working within a temperature range from -15°C to 70°C, taking into account the limitation of a decrease in performance (duty cycle) as of ambient temperatures above 40°C.

4. OPERATING INSTRUCTIONS

4.1 Positioning and testing

Any model of this equipment is turned on by operating switch No. 7. Before turning equipment on, check safety and comply with your risk prevention in the workplace, and carry out the functions explained below as a function of the machine's service time.

4.1.1 Shielded Metal Arc Welding (MMA)

Connect ground cable to machine connector 4. And connect the ground clamp to the workpiece. Make sure that there is a good electric contact on a solid and clean surface.

Connect cables of the electrode carrier clamp of the machine 4. Connect the electrode to the electrode carrier clamp making sure that it fits into the directional slots.

Select the electrode mode selector 11 and adjust the intensity adjustment 6. In MIG350BT / MIG500BT adjust Arc Force 8 min-put means basic electrode and medium-Max for cellulosic models

Note: the electrode is almost always connected to the positive terminal (reverse polarity). But under certain circumstances it is to be connected the negative one (direct polarity) as it is usually the case of the base electrode. Refer to the electrode documentation to be sure.

4.1.2 TIG Welding

It is necessary that you obtain a TIG torch (5ref. 4120.81) the gas of which is governed at the handle of the torch. Connect the TIG torch to connector 4 and ground to connector 3 of the machine (direct polarity).

4.1.3 MIG/MAG Welding

Connect ground cable 2 to machine connector 4 Connect torch to the Eurotorch outlet 21 of the machine. Secure the connection by screwing the safety ring of the torch connector.

When hollow fiber (flux core, no need gas supply) is used it is necessary to reverse the polarity reverse to work directly (positive to the workpiece). Use the terminals exchange connection prepared for this purpose in all models.

4.2. Tool replacement

Replacement of consumables of the three execution devices: electrode carrier for shielded electrodes, continuous wire torches in MIG/MAG processes and tungsten-electrode torches in TIG processes.

4.2.1 MMA process (shielded electrode)

Replace the shielded electrode utilizing the 4 pressure channels practiced in the electrode carrier clamp to secure position and best electric contact. Make sure that the clamp presses onto the electrode's bare metal and that there is no false contact cutting into the wire's coating.

4.2.2 TIG process

Here, the wear and tear element is the tungsten electrode itself of the TIG torch. Despite its good performance, it is recommended to avoid thorium-doped electrodes (red strip) for reasons of absolute safety in respect of pollution as explained below.

The electrode carrier clamps themselves and the gas conducting nozzles suffer from wear and tear in the vicinity of the electrode. The electrode carrier clamp will always have the same diameter as the electrode. The nozzle will have the diameter (as indicated by its number) indicated for the kind of work and gas consumption. The elements are of easy manual disassembly by simple threads and knurlings.



Do neither use nor sharpen thorium-doped tungsten electrodes because of the risk derived from the moderate radioactive activity. You may recognize the presence and concentration of thorium dioxide by the indicative strip on the electrode according to EN ISO 68848:2004 (colors: yellow, red, purple and orange). Avoid these electrodes and use substitute products without contents as for example electrodes with lanthanum and cerium derivatives (strips: black, grey, blue, gold) which do not have radioactive activity.

Prepare the electrode by sharpening the tip with the emery stone in such a way that a cone with a height of approximately 2 times the electrode's diameter. For a better arc and current handling capacity, the correct attack of the tip on the stone must be longitudinal and the tip must be slightly flat.

4.2.3 MOG/MAG process

Here, the wear and tear element is the contact tip of the torch which will be exchanged always with the same diameter as the continuous wire being used. The nozzle of the torch will also suffer from wear and tear due to high temperatures and projections. The elements are of easy manual disassembly by simple wide pitched threads. For special welding of aluminum, contact your distributor regarding the replacement of the Teflon-based low-friction inner conduct (liner).

The spooler mechanism No. 8 presents easy to operate replacement of the grooved presser rollers (pulley wheels). This is done by releasing the threaded knob that releases the pulley wheel, the position of which may be reversed to select the supplementary diameter (for example 0.8 mm at one side and 1.0 mm at the other). Note: Be careful not to lose the pin (of the spooler) when releasing the pulley wheel.

The welding wire is received from its reel and installed by introducing it into the axle of the spooler and guiding it to the outlet of the torch through traction grooves No. 8 of the hose of the torch No. 1 and the contact tip of the torch. The contact tip may be accessed by removing the nozzle from the torch No. 1 by rotating it by hand.

The contact tip is removed with a fixed spanner or pliers, and it must be of the same diameter as the welding wire. The pulley wheels are accessed removing the pressure bearing that releases them. Once the wire has been passed through the pulley wheels, close the presser rollers and adjust pressure to make the wire advance correctly without sliding and without being crushed.

The groove of the pulley wheel must be of the same diameter as the welding wire.

When using hollow wire, the nozzle may be removed from the torch as it is not required. In this way it will have more visibility and not harm the nozzle with projections.

4.3 Setting operations

4.3.1 MMA process

Stayer offers quality shielded electrodes under the below indicated references. Use the following table as a first approach for amperage adjustment regarding any model:

STAYER ref.	MODEL	DIAMETER	AMPERES (A)
38.93	E6013	2.5	60-100
38.94	E6013	3.25	90-140
38.99	E6013	2.5	60-100
38.100	E6013	3.25	90-140
38.96	E7018	3.25	110-150
38.102	E7018	3.25	110-150

Refer to intensities recommended by your supplier in respect of diameters larger than 3.25 mm.

4.3.2 TIG process

Use the following table as a first approach for amperage adjustment regarding any model:

Thickness of the piece to be welded	Tungsten electrode diameter	Filler rod diameter
mm	mm	mm
0.6	1.0 - 1.6	0 - 1.0
1.0	1.0 - 1.6	0 - 1.6
1.5	1.0 - 1.6	0 - 1.6
2.5	1.6 - 2.4	1.6 - 2.4
3.0	1.6 - 2.4	1.6 - 2.4
4.0	2.4	1.6 - 2.4
5.0	2.4 - 3.2	2.4 - 3.2
6.0	2.4 - 3.2	2.4 - 3.2
8.0	3.2 - 4.0	3.2 - 4.0
12.0	3.2 - 4.0	3.2 - 4.0

Amperage adjustment range	Argon gas flux	Connection size
A	L/min	mm
15 - 30	4 - 5	1
25 - 30	4 - 7	1
50 - 70	6 - 9	1
65 - 95	6 - 9	1
65 - 95	6 - 9	1
110 - 150	10 - 15	2 - 3
120 - 180	10 - 15	2 - 3
150 - 200	10 - 15	2 - 3
160 - 220	12 - 18	4 - 5
180 - 240	12 - 18	6 - 8

4.3.3 MIG/MAG process

Use the following table as a first approach for adjustment regarding any model. Wire speed will depend on the thickness of the piece and the required welding mode.

Diameter (mm)	Amperages (A)	Volteje (V)	Gas Flow (L/min)
0.8	50 - 100	15 - 21	7 - 12
0.9	60 - 120	16 - 22	8 - 12
1.2	120 - 250	22 - 28	12 - 14
1.6	200 - 500	25 - 32	14 - 16

MIG/MAG SPECIAL SETTINGS

Depending on the transfer mode, for instance when the user wishes to work with short arc (coarse drop, short-circuit) or wishes to work in long-arc mode (fine drop, spray), it is possible to act on two detail setting controls.

A. SYNERGIC MODE: Press 13

Amperage: To carry out fine adjustment of overall power, master amperage control located on the upper portion of the front panel of the spooler, buttons No. 12 and No. 13 may be actuated. These controls are duplicated on the main machine, group No. 17.

Voltage: To carry out fine adjustment of the feature of the arc, actuate voltage master control No. 13 located on the lower portion of the front panel of the spooler. When turning the control to the left, voltage will be reduced whereby the arc is closed and deposition in short-circuit mode will take place with high-penetration, minimum projections and a characteristic sound. According voltage is increased, there will be a tendency to high-performance spray welding mode with a more silent sound. You are recommended to start regulating voltage just at the middle point indicated by a white point within the scope marked in the synergic mode.

Wire speed: The amperage control modifies at the same time the wire discharge speed in accordance with the working conditions indicated to the machine. When, due to special circumstances, it should not be possible to adjust the exact speed, a speed increase or decrease may be selected by adjusting the wire diameter to the size that is immediately above or below that which is really installed.

B. MANUAL MODE: Press 13

- With the knob 6 you can adjust the output speed of the thread from 1.6m / s to 20m / s

- With the knob 9 you can adjust the output voltage of the device from 13V to 40V

SPLASH CONTROL

Electric inductance **10** allows reducing splashes from the wire welding process. Try empirically by raising or lowering the control until achieving the best result.

4.4. Limits regarding the size of the workpiece

The main restriction regarding the piece to be welded is its thickness which is limited by the power of the equipment. At increasing power, you will be able to make correct welds (with suitable penetration of the welding bead) on pieces of increased thickness.

The following table may serve you as an orientation:

KINDS OF MMA WORK		
PIECE THICKNESS	ELECTRODE	SETTING
1,5 - 5 mm	2,0 - 3,25 mm	40 - 140 A
2,5 - 5 mm	4,0 mm	120 - 190 A
5 - 12 mm	5,0 mm	> 180 A

KIND OF MMA WORK	
WIRE	PIECE THICKNESS
0,6 mm	1 - 8 mm
0,8 mm	2 - 10 mm
1,0 mm	2 - 25 mm
1,2 - 1,6 mm	5 - 50 mm

4.5 General instructions for use

4.5.1 Specific instructions MMA welding (shielded electrode)

In this class of electric arc welding, the electrode itself produces heat in the form of an electric arc, the shielded environment, and it improves the weld puddle and the filler metal itself as the electrode's metal core progressively melts as welding is carried out.

You have to choose the electrode (size and type) that is suitable for carrying out the work to be performed.

An electrode we recommend due to its medium quality, suitability for most works and for being easy to find, is electrode E-6013, popularly known as the "rutile electrode". The material par excellence for welding with shielded electrode is carbon steel.

After having confirmed all safety measures and inspected the equipment, prepared and fastened the piece to be welded, cables are connected according to the indications in the tables. For the usual case of an E-6013 electrode, the output of negative polarity (marked -) shall be connected to the piece by means of the grounding clamp. The output of positive polarity (marked +) shall be connected to the electrode carrier clamp the working electrode is connected to the bare end thereof.

The welder will put on his/her individual protective equipment using a welding mask or helmet that is suitable for the work, and suitably covering any portion of his/her skin to avoid splashed or radiation.

Welding shall be started by priming the arch. There are several proceedings, the simplest of which is scratching the piece.

Once the arc has commenced, the electrode shall be kept at a distance approximately equal to the diameter of the electrode as such, and advancing of the weld shall be commenced by drawing backwards as if a right-handed occidental person started writing. The electrode shall be held in a position close (65° to 80°) to the vertical with respect to the horizontal and balanced with respect to weld puddle center. Depending on the kind of weld pass (initial or filling) and the need of covering the joint, advance in a straight line, zigzag movement or little circles. Good setting of intensity, position and advance speed of the weld will result in a pleasant, gentle sound, similar to that of a good barbecue roast. When performing an accurate work, the resulting bead will be homogeneous, with uniform surface marks shaped as half moons.

Once the bead has been made, remove slag with a hammer and brush before making the subsequent bead.

4.5.2 Specific instructions TIG welding

In electric arc welding by means of a inert-gas-protected tungsten electrode, the consumable material is not the electrode itself but a material filler rod similar to, or compatible with the material to be welded. Compared with the shielded electrode system, this system has greater productivity and greater difficulty in exchange for very high weld quality on almost any metal and alloys thereof, including all stainless steels and situations of joints of low thickness with or without filler material. Welding takes place without slag, projections or smoke.

In order to correctly position the electrode in the torch, it must protrude about 5 mm above the nozzle.

As a general rule, connect the output inversely than the usual connection of the electrode i.e. the TIG torch to the equipment's negative terminal and the grounding clamp to the positive terminal. Prepare and secure the piece.

Adjust current intensity in accordance with the needs of the kind of material and the joint to be made, making first a test on a test piece. Refer to specialized literature or regulated professional training for further information in respect hereof.

The torch shall receive inert gas supply (usually pure argon) proceeding from a cylinder, through a pressure reducing system capable of suitably regulating the necessary gas flow volume. All equipments need a TIG torch (not included, STAYER references 38.71 and 38.73) with direct connection to the flow meter and gas control by the flow valve in the TIG torch itself.

Once the arc has started, proceed to carry out welding according to the needs thereof. As a general orientation, you have to advance reversely to electrode welding so that, instead of drawing backwards, you apply pushing frontwards as if you were helping the gas flow impinge on the weld puddle. Incline the torch in such a way, that it impinges in a position near (70° to 80°) to the vertical with respect to the centered horizontal and with respect to the weld puddle.

Slowly deposit the filler material of the rod bringing it closer successively to the puddle of melt material.

To finish, simply stop pushing the switch of the torch, separate the torch very slightly until the torch becomes interrupted and close the manual gas valve. Finally, close the general flow valve of the inert gas cylinder.

4.5.3 Specific instructions MIG/MAG wire welding

The welding torch must maintain a correct position to allow the gas to conveniently shield the melting bed. Hold the torch with both hands and ensure having a fixed support point for more stability of the bead.

An inclination with respect to the vertical of 10° is recommended. The free length of the wire shall be comprised between 8 and 20 mm, so that the melting bed may be observed and adherence of projection to the gas nozzle may be avoided. Avoid working in air currents that snatch technical gas from the weld bead.

Possible problems and solutions MIG/MAG welding

WELD BEAD NARROW AND WITH INTERRUPTIONS

- a) Wire advance speed excessive.
- b) Little gas discharge (start with 5-7 l/min and, if necessary, open the tap of the pressure gauge more).

WELD BEAD VERY HIGH

- A) Wire advance speed very low.
- b) Low welding current.

UNSTABLE ARC, POROSITY OF THE WELD

- a) Torch very distant from the piece.
- b) Piece with grease, oil, dirty, rust.
- c) Insufficient gas flow; check the contents of the gas bottle and the gas regulator.

WIRE MELTS UP TO THE CONTACT TIP AND REMAINS HOOKED THERETO

- a) Very low wire speed
- b) Torch too close to the piece
- c) Momentary interruption of the welding circuit that may be caused by:
 1. Contact tip oxidized.
 2. Difficulties in the wire advancing mechanism.
 3. Contact tip with diameter differing from that of the wire.
 4. Faulty connection of the torch.

5. Little pressure in the wire advance.

6. Wire bobbin tangled or wrongly connected, thereby braking or complicating normal advance of the wire.

WELD LACKING PENETRATION

- a) Torch advance speed too high.
- b) Low welding current.
- c) Wire speed too low.

ARC DOES NOT FLARE UP

A) Check connection of the machine, of the grounding clamp and of the torch.

MACHINE DOES NOT WORK WHEN THE TORCH SWITCH IS CONNECTED

- a) Intervention of the thermostat.
- b) Check operation of the TORCH SWITCH.

MACHINE DOES NOT WORK, THE LUMINOUS SWITCH DOES NOT LIGHT UP

- a) Verify connection to electric mains.
- b) Verify circuit breaker switch or the fuse of the electric mains.

5. SERVICING AND MAINTENANCE INSTRUCTIONS

Torches – specific instructions:

- Clean projections adhered in the torch outlet to avoid short-circuit and gas turbulences. Use a steel brush.
- Avoid adherences of projections using a specific, silicone-free spray.
- Review setting of dragging and braking rollers of the reel periodically.
- Control wear and tear of the calibrated contact nozzle and replace it when necessary to avoid loss of contact of the wire with the nozzle.

Do not use torch as a hammer to remove weld rests or align sheets.

REPAIR SERVICE

The technical service will advise you on questions you might have regarding repair and maintenance of your product, as well as on spare parts. You may obtain exploded drawings and information on spare parts on the internet under: info@grupostayer.com

Our team of technical advisors will be happy to guide you regarding the acquisition, application and setting of products and accessories.

GUARANTEE

Guarantee card

Among the documents that are part of the electric tool, you will find the guarantee card. You will have to fill in the guarantee card completely, apply copy of the sales slip or invoice thereto, and give it to your retailer in exchange for the corresponding acknowledgement of receipt.

REMARK: If this card were missing, immediately ask your retailer for it.

The guarantee is limited to manufacturing or machining failures, and ceases when the parts have been disassembled, manipulated or repaired out of works.

DISPOSAL

We recommend subjecting all electric tools, accessories and packaging to recycling respecting the environment.

For EU countries only:



Do not throw electric tools to the garbage! According to European Directive 2012/19/UE on electric and electronic devices, after transposition thereof into national law, electric tools must be collected separately so as to be subjected to ecologic

recycling.

Right to changes reserved.

6. Regulatory Marking

6.1 Explanation of regulatory markings

1					
23					
45					
6	8	10			
		11	11a	11b	11c
7	9	12	12a	12b	12c
		13	13a	13b	13c
14	15	16		17	
18					

Pos. 1 Name and address of the manufacturer, distributor or importer.

Pos. 2 Identification of the model.

Pos. 3 Model traceability.

Pos. 4 Symbol of the welding power source.

Pos. 5 Reference to regulation complied with by the equipment.

Pos. 6 Symbol for the welding process.

Pos. 7 Symbol for use in environments with increased risk of electric shock.

Pos. 8 Symbol for the welding current.

Pos. 9 Nominal non-load output tension.

Pos. 10 Nominal output voltage and current range.

Pos. 11 Duty cycle of the power source.

Pos. 11a Duty cycle at 45%

Pos. 11b Duty cycle at 60%

Pos. 11b Duty cycle at 100%

Pos. 12 Nominal cut-off current (I₂)

Pos. 12a Current value for 45% duty cycle

Pos. 12b Current value for 60% duty cycle

Pos. 12c Current value for 100% duty cycle

Pos. 13 Load tension (U₂)

Pos. 13a Load tension for 45 % duty cycle

Pos. 13b Load tension for 60 % duty cycle

Pos. 13c Load tension for 100 % duty cycle

Pos. 14 Symbol for power supply

Pos. 15 Nominal value of supply tension

Pos. 16 Maximum nominal supply current

Pos. 17 Maximum effective supply current

Pos. 18 IP degree of protection

6.2 Technical features

= tension input

= current input

= current output

= work cycle

= ground

= bobbin weight

= electrode diameter

= generator power

= dimensions

6.3 Declaration of Conformity

We declare under our exclusive responsibility, that the machines: POWER SOURCES FOR WELDING, models:

MIG160Multi, MIG170Multi, MIG200Multi, MIG250BM, MIG250BT, MIG350BT, MIG500BT satisfy all essential safety and health requirements in conformity with regulations 2014/35/EU, 2014/30/EU, 2011/65/EU, EN 60974-1, EN 60974-10 conforme a WEEE / RoHS.

January 2017
Ramiro de la Fuente
Director Manager

CE  RoHS

