zanardi

ZEUS-MMA

SAFETY INSTRUCTION FOR USE AND MAINTENANCE

CONTENTS

We kindly thank You for the confidence You showed in purchasing one of our products. We are sure You will not disappoint Your expectations; we ask You to read the instructions of this manual very carefully.

WARNING

This welding equipment has been designed, manufactured and tested to the highest quality standards to ensure long and trouble free life. However, regular maintenance is an essential part of keeping the machine operating in a reliable and safe manner and Your attention is drawn to any maintenance instructions that are contained in this manual.
In general, all welding equipment should be thoroughly inspected, tested and serviced at least annually. More frequent checking will be required when the equipment is heavily used.
Wear and tear, particularly in electro-machanical and moving components, are gradual processes. Caught in time, repair costs are small and the benefits in performance, reliability and safety are significant. Left alone, they can put the equipment, and You, at risk.

GENERAL

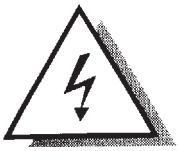
The ZEUS-MMA wire Feeder is a feeding unit designed for use in CC and CV welding installations to feed hard, soft or tubular (cored) wires.
Details of the wire sizes handled are given in the specification (see technical notes).

This unit is a benchmounted, semiautomatic, wire feeder which operates on the arc voltage from a constant current or constant potential dc arc welding power source. The two drive roll feeder and permanent magnet motor are housed in a Polypropylene case.

Excellent starts and improved superior arc performance for all types and sizes of wires whether using CV or CC power supply. Best low-end CC arc in the industry
Polypropylene case with built-in slide rails and the ability to open the door to change wire with the feeder in a vertical position.

SECURITY NORMS

The worker must follow some security norms in order to safeguard his and the neighbour workers' safety.



-Do not make any reparations with the live machine.

-Before checking the machine or making any servicing operations, unplug the main switch.

-Make sure that the machine is connected to the ground plate.

-The machine installation must be performed by skilled people. All connections must be made according to the norms in force and following anti-accident prescriptions.

-Do not weld or cut in damp or wet environments or in the rain.

-Do not weld if the cables are used up or badly connected or whit loosened clamp cables. Frequently check all cables and make sure there are no insulation faults, uncovered wires or loosened connections.

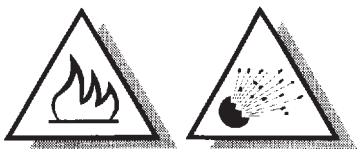
-Do not weld if the cables do not have the right section and stop welding if they get overheated. Cables with wrong sections would cause a quick deterioration of the insulation, if they got overheated.

-Keep the environment clean of the fumes and gases exhaled from welding operations, especially when working in small places.

-Take off the paint from the workpieces to be welded. Its burning might produce poisonous gases.

-Do not weld in environments where there is a danger of gas leaks.

-Set up the welding equipment far from degreasing tubs where solvents like trichloro-ethylene or other chlorinated hydrocarbons are used. The ultraviolet rays exhaled by the arc can turn these steams into highly poisonous gases, even though the concentration of the chlorinated hydrocarbon steams is not strong enough to be smelt.



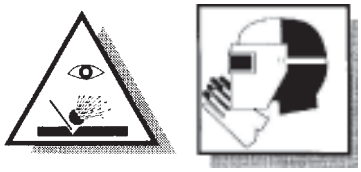
-Do not weld near inflammable materials or liquids or in environments full off with explosive gases.

-Do not wear oily or greasy clothes as the flakes might burn them.

-Do not weld on vats which have contained fuels or inflammable materials; do not weld either on materials that may produce either poisonous or inflammable steams if they are overheated: in this case, first clean them accurately.

-Keep a fire extinguisher near the workplace.

-Never use oxygen in a welding torch but only inert gases and their mixtures as requested by the specific process.



-Do not use faulty or broken helmets protection masks.

-Do not look at the electric arc without the suitable screen or protection helmet.

-Immediately replace faulty or unsuitable adiactinic glasses (see table on page 13)

-It is advisable to protect the adiactinic glass by placing a transparent glass before it.

-Do not strike the arc before making sure that neighbouring people wear the necessary protections.

-Always wear protection aprons, antisplinter glasses and gloves.

-Do not touch the welded workpieces before they are completely cold.

-Be careful when handling gases compressed in bottles.

-Avoid any contacts between gas bottles and the electrode, the clamp or other electric circuits.

-Keep gas bottles far from flakes, hot slags, free flames and other possible overheat sources.

-When the work is done or the bottle is empty, carefully close the bottle valves.

-Place the bottles in such a way that they are protected against knocks or casual drops.

-Use a fitting gas manometer, set it on the bottles and immediately replace it in case of wrong working.
-Slowly open the bottle valve so that the pressure of the gas manometer gets slowly high.
This welding machine is manufactured under IP21 protection value; for this reason, it cannot be placed in the rain, neither during the storing up nor during working operations.

INSTALLATION

GENERAL INFORMATION

This instruction manual has been written in order to give basic information to the people in charge of the installation, use and servicing of a welding machine. If what is explained here is carefully followed, it is possible to get excellent results.

RECEIPT AND CHECKING

Use fit machines to lift the power source and make sure that the lifting crutches are well positioned. When You receive the welding machine, immediately check if there are any broken or faulty parts before setting it up. Any complaint for losses or faults must be addressed by the buyer to the carrier. Do read all instructions before starting the machine.

PRECAUTIONS
Make sure that the welding machine is unplugged from the power line, before opening it (by taking off the side panels or the cover) to make any kind of servicing such as connections to the primary or the secondary, replacements or repairings, cleaning operations from dust. Be extremely careful when check-operations due to any fault inside machine must be done.
You must carefully avoid any contacts between body parts of the machine run by the current.
When setting up the welding machine, make sure that the earth wire (yellow-green) is really connected to a good earth connection.
Before starting the machine it is advisable to read all security norms explained in this manual very carefully, so that accidents caused by a wrong use of the machine can be avoided.

ATTENTION

When connecting the machine to the main switch, make sure that the switch itself is open or that the main fuses have been taken off.
It is advisable to follow every single detail of the instructions shown in this paragraph. A suitable installation helps the right working of the welding machine and avoids a lot of inconveniences.

BASIC INFORMATION

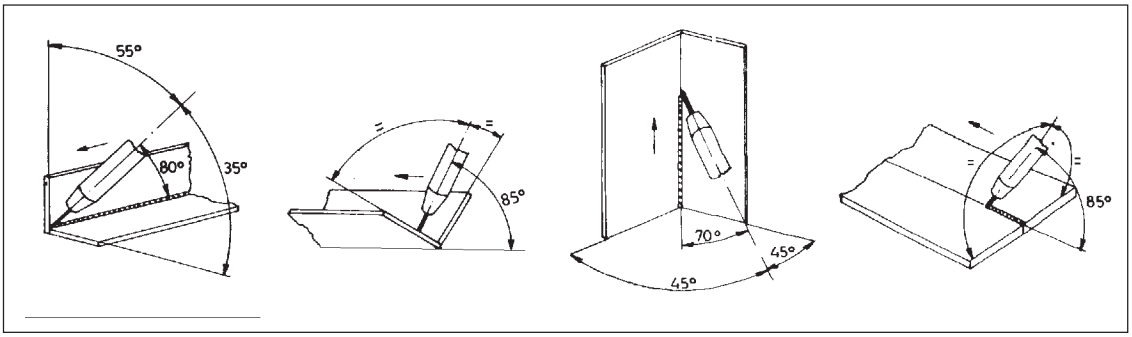
The gas used for the protection of the welding bead determines the kind of process. When using carbon dioxide (CO2) the process is called MAG (Metal Active Gas); this shows an active gas action towards the melted metal. When argon or its CO2 mixtures or oxygen are used, the process is called MIG (Metal Inert Gas), this determines the gas inert behaviour towards the melted metal.

The use of the MAG method is possible only for the welding of ordinary carbon or low-alloyed steels. The welding operations obtained by the MAG process show a deeper penetration and are less sensible to the formation of porosities, above all in presence of humidity and foreign substances (rust, paint, oils, etc.).

The welding process with argon mixture (MIG) can be used not only with carbon and high/low alloyed steels, but also with stainless steels, copper and aluminium.

With medium and thin thicknesses the most used and advisable procedure is the MIG process with argon CO2 mixture, whose advantages in comparison with the MAG (CO2) process are the following:

- higher arc stability
- formation of smaller drops of melted metal with decrease of spray throwings
- more regular and aesthetically better welding beads
- lower overmetal
- higher workspeeds
- increase in the wire efficiency as there are fewer losses because of sprays losses
- lower arc voltages with consequent easier and less critical adjustments
- lower gas consumption so as to balance the higher mixture cost.



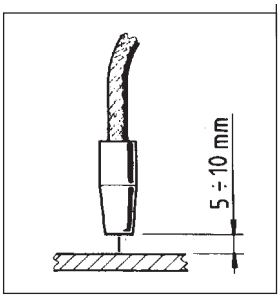
HOW TO WELD

Put the wire extremity on the starting welding point. Press the torch button and following functions will start:

- energizing of the gas valve and consequent gas flow;
- energizing of the power contactor and current output from the welding machine and arc starting;
- wire feeding through the feeding motor.

In order to obtain good welding results it is necessary for the torch to be well directed towards the welding puddle.

The distance of the gas guiding nozzle from the workpiece must be 5 to 10 mm. A different positioning causes a spray increase,



exaggerated or insufficient penetration and more blowholes (see the drawing indicating the various directions of the torches in the different welding positions).

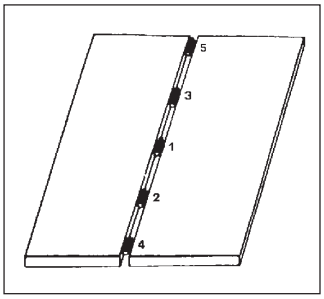
The torch movement must be steady, preferably in the direction of the wire thrust, so as to obtain flatter and clearer welding puddles.

Besides, it is important to clear the metal sheets to weld from varnish and rust which provoke arc starting

difficulties and sprays.
The choice of the wire diameter depends on the sheet metal thickness and the intensity of the current used (see following table).
When welding thin metal sheets, above all in case of rim overlap and breakings.

Thicknesses (mm)	Wire diameter (mm)	Current intensity (A)
0,5 - 0,8	0,6	35 - 60
0,8 - 3	0,8	50 - 130
2 - 8	1	80 - 200
da 4	1,2	120 - 350
	1,6	da 230

joining between two face-to-face rims, it is important to previously stitch the same sheets with stitches distanced 30-40 mm. from one another (see the figure).
This avoids non alignments,



STAINLESS STEEL WELDING

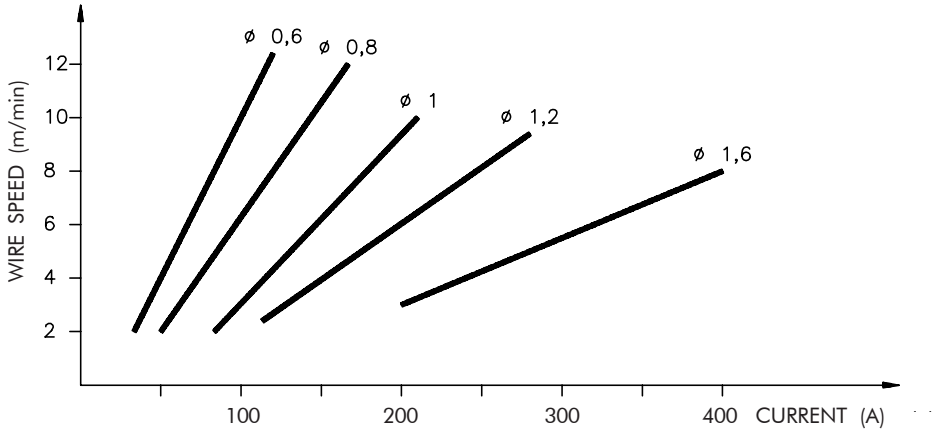
The gases to be used in this field are: argon mixture + 2-3% oxygen for more demanding metallurgical welding processes and argon + CO2 for steel work welding processes.
The welding machines must be equipped as for standard steel welding.
The welding wire must be compatible with the material to be welded. Generally, it is better to use stainless steel wires with a low carbon part; this avoids corrosion phenomena occuring when a temperature of 650°C is overcome.
The welding parameters are similar to those of the welding process with standard steel except for the welding voltage which, with the same wire speed, differs of about 1-2 volts.

It is necessary for the joint edges to be free from any greasy substances and varnishes to avoid corrosions, porosities and noxious gases to the welding operation. The advisable minimum thickness for the welding process is 0,8-1 mm.

ALUMINIUM AND LIGHT ALLOYS WELDING

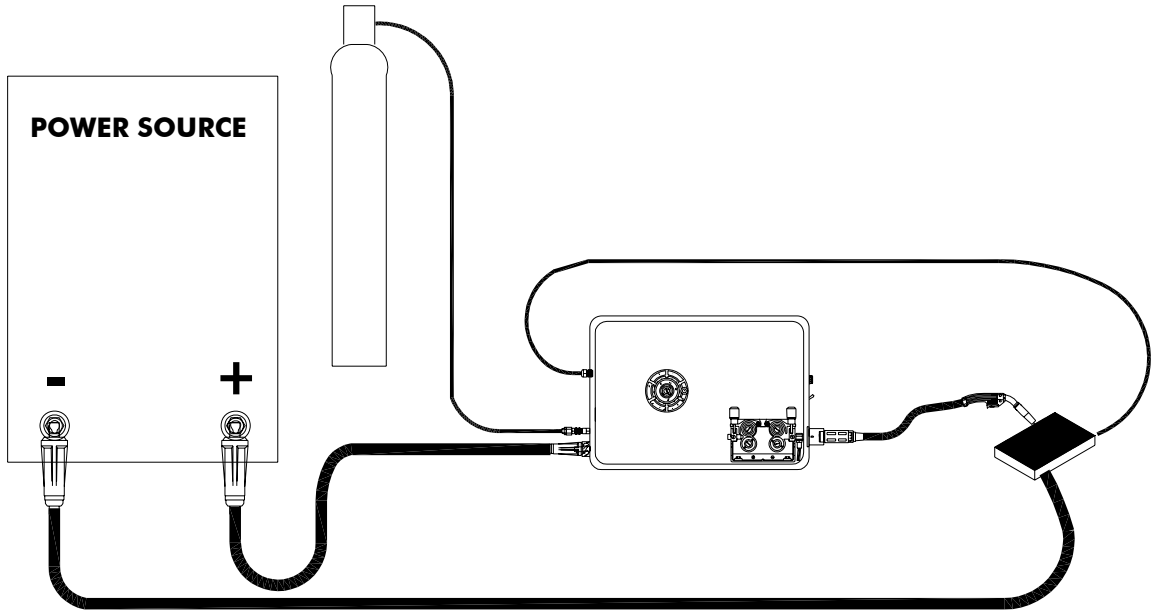
The minimum thickness to weld manually is 3mm. The gas to use in this field is pure argon. The wire must be made of a suitable quality and with surface without any oily or dirty substances and without any wire drawing faults(chips, clefts). The winding must be perfect and the storage accurate. Do not touch the wire surface with your hands. When welding, watch carefully the arc length (3-6 mm.). The piece surface must not show any greasy or oily substances; it must be possibly brushed, so as to take away the surface oxide.
In windy places increase the gas quantity and protect the welding place with windscreens.

CURRENT WIRE SPEED DIAGRAM



CONNECTION TO POWER SOURCE

1. Place the ¼ female turn on power cable, then connect cable to the ZEUS-MMA terminal on the rear.
2. Connect the other end of cable to + terminal of power source.
3. Connect power source - plug to the workpiece.
4. Connect the ZEUS-MMA earth clamp to the workpiece.
5. Connect the MIG torch on ZEUS-MMA
6. If you have a complete ZEUS-MMA, place the gas hose on the regulator of gas installation (use specified gas for MIG-MAG welding).
7. Adjust the gas flow.



ADJUSTMENT

The ZEUS-MMA has a Microprocessor based system that allows it to automatically recognize whether the generator works in Costant-Current (CC) or Costant-Voltage (CV) and to adapt accordingly without any selector.

Adjust the power on power source and the wire speed on ZEUS-MMA according to the advice placed on ZEUS-MMA door.

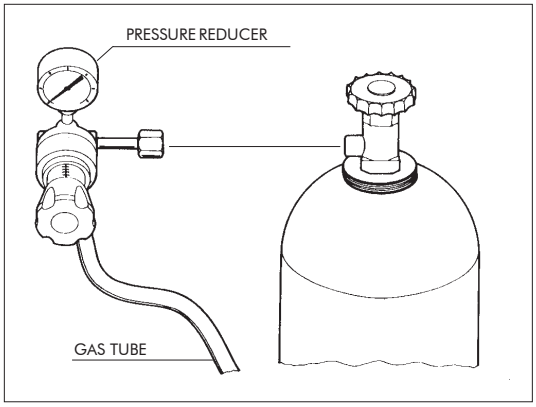
Close the wire feed unit door and press the torch trigger. Let the wire appears at the torch end, on the contact tube output.
Your installation is ready to weld.

1. Feed Rolls

Before connecting the electrical and gas supplies, ensure that the equipment is set for the type and size of wire to be used. Check that the stamped on the feed roll is the same of the diameter of the wire used.

2. Interconnections

While the machine is switched off, connect the wire feeder to the power source with the fit connection cable. It is advisable to lay out the lead as straight as possible.



3. Gas

Connect the gas nipple placed on the rear of the wire feeder with the gas manometer of the gas bottle.

4. Torch

Check that the contact tip mounted on the torch head is fit for the wire used.

Remove the contact tip and using the torch button, feed the wire till it comes out of the torch itself. Refit the contact tip and ensure it is well tightened.

HUB ASSEMBLY MOUNTING

1- Remove the hand (hub) nut from the hub assembly wire guide.

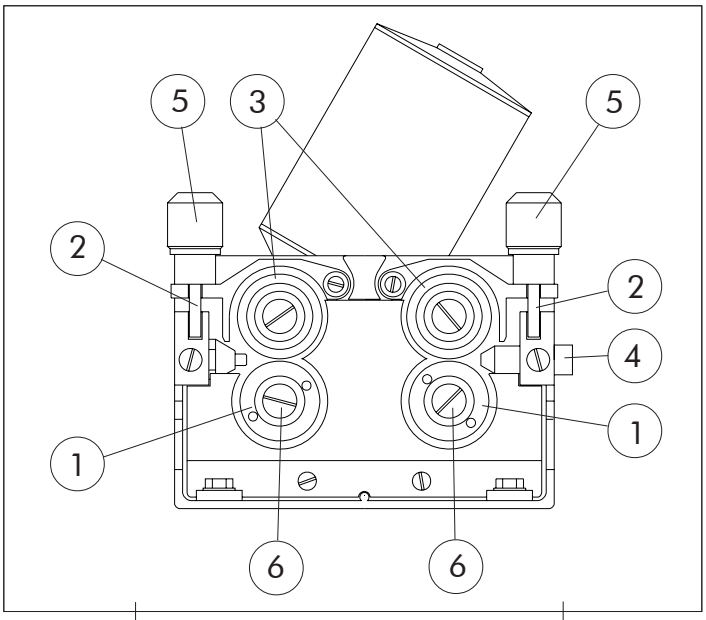
2- Place the wire reel on the hub so that the wire will be drawn off from the top.

Ensure that the wire spool locates correctly on the small pin on the flange of the hub assembly wire guide.

Refit the hub nut.

3- Release the end of the wire , but do not allow the wire to loosen. Cut off the kinked portion of the wire removing any deformations. This must be done every time the wire is refed through the equipment.

4- Adjust the hub assembly by using the screw inside the hub assembly wire guide, so as to prevent the wire reel over-run (and subsequent wire entanglements), once the motor of the wire feeder stops. Do not tighten the hub assembly too much: too much pressure will cause excessive drag.



5- By the fitting lever release the pressure roll (3) revolving on ball bearings and lift it.

Thread the wire through the fitting inlet guide (4) and feed it out of the central adaptor.

6- Lower the pressure roll (3), refit it into the initial position by the lever (2), adjusting the pressure with the knob.

Minimum pressure is sufficient so as not to allow the feeding rolls to slip.

Excessive pressure will cause

wire deformations and entanglements inside the liner (in case of alu wires) and generally early wear-and-tear of the wire feeding motor bushings.
A scanty pressure will cause welding unevennesses.
7- Connect the torch to the fitting adaptor and ensure that the wire is positively fed inside the torch lead liner.
Remove the nozzle from the torch extremity and unscrew the contact tip. Feed the wire till it comes out of the torch.
8- Refit the contact tip keeping in mind that it must have the same diameter of the wire diameter used.

FEED ROLL REPLACEMENT

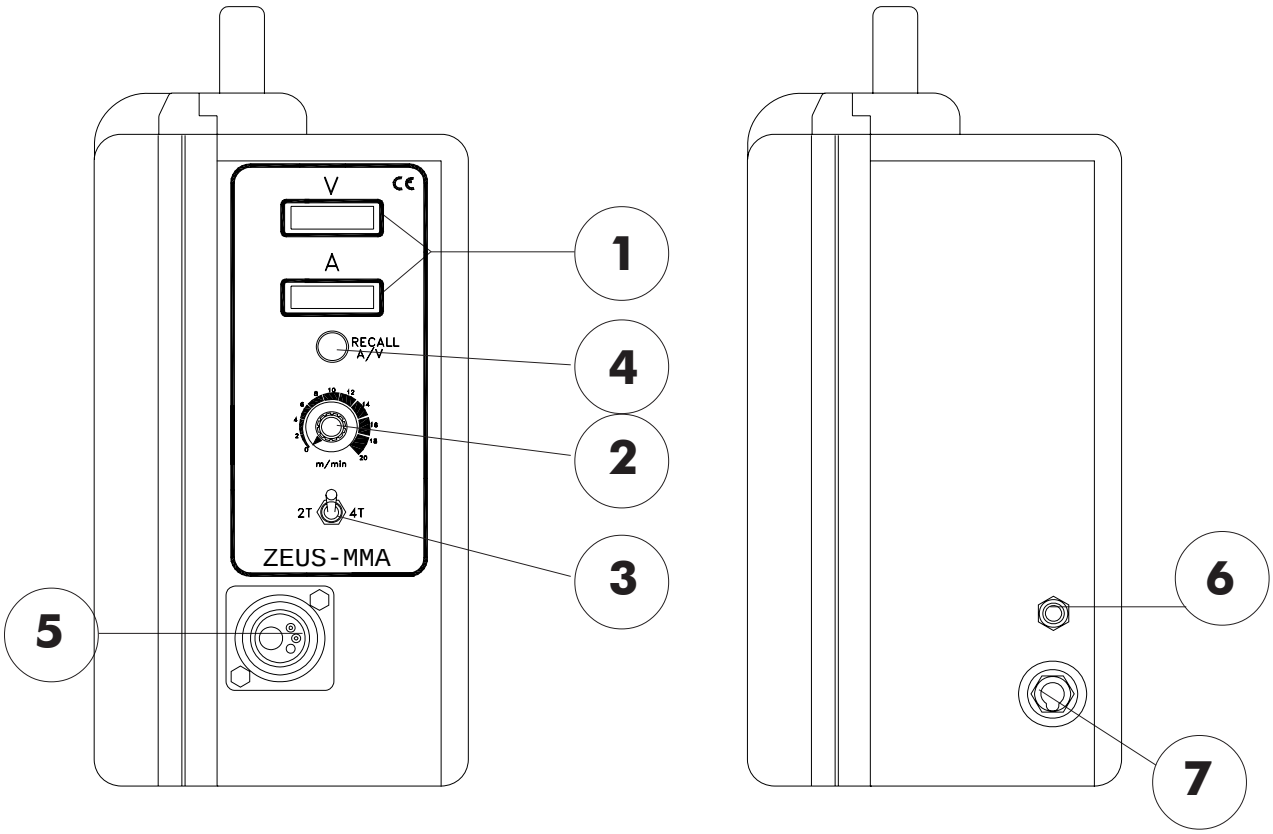
The feeding roll bears on its visible side the diameter of the wire which can be fed.
Should this diameter not want to use, untighten the screw (6) blocking the feed roll and turn it or replace it.
Every roll is provided with two grooves fitted for the feeding of wires with different diameters.
Special feed rolls are available for flux cored and alu wires.

SPECIFICATION

INPUT WELDING		16-100Vdc
DIMENSIONS:	height (inc. of handle)	420 mm
	width	220 mm
	length (inc. of connectors)	600 mm
WEIGHT (approx.)		12,8 Kg

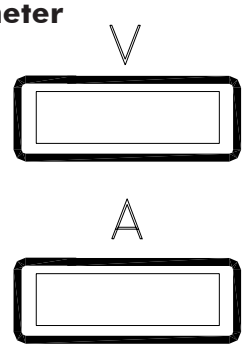
SPECIFICATION

	zanardi
	N°
	EN 60974-5 CE
Supply voltage	16-100 VDC
Max absorbed current	5 A
60% duty cycle	387A
100% duty cycle	300A
Protection class	IP 23

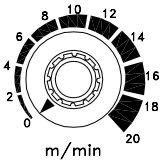


CONTROLS

1- Digital voltmeter and ammeter



2 - Wire feed speed adjustment



Provides continuously variable wire feed speed control. The wire speed is directly proportional to welding current so that increasing the wire speed increases the current and vice-versa.

3 - 2T/4T SWITCH

4 -RECALL A/V

5 -Central adaptor
Allows an easy connection to the welding torch simultaneously carrying power, torch button connection, gas and liner connections.

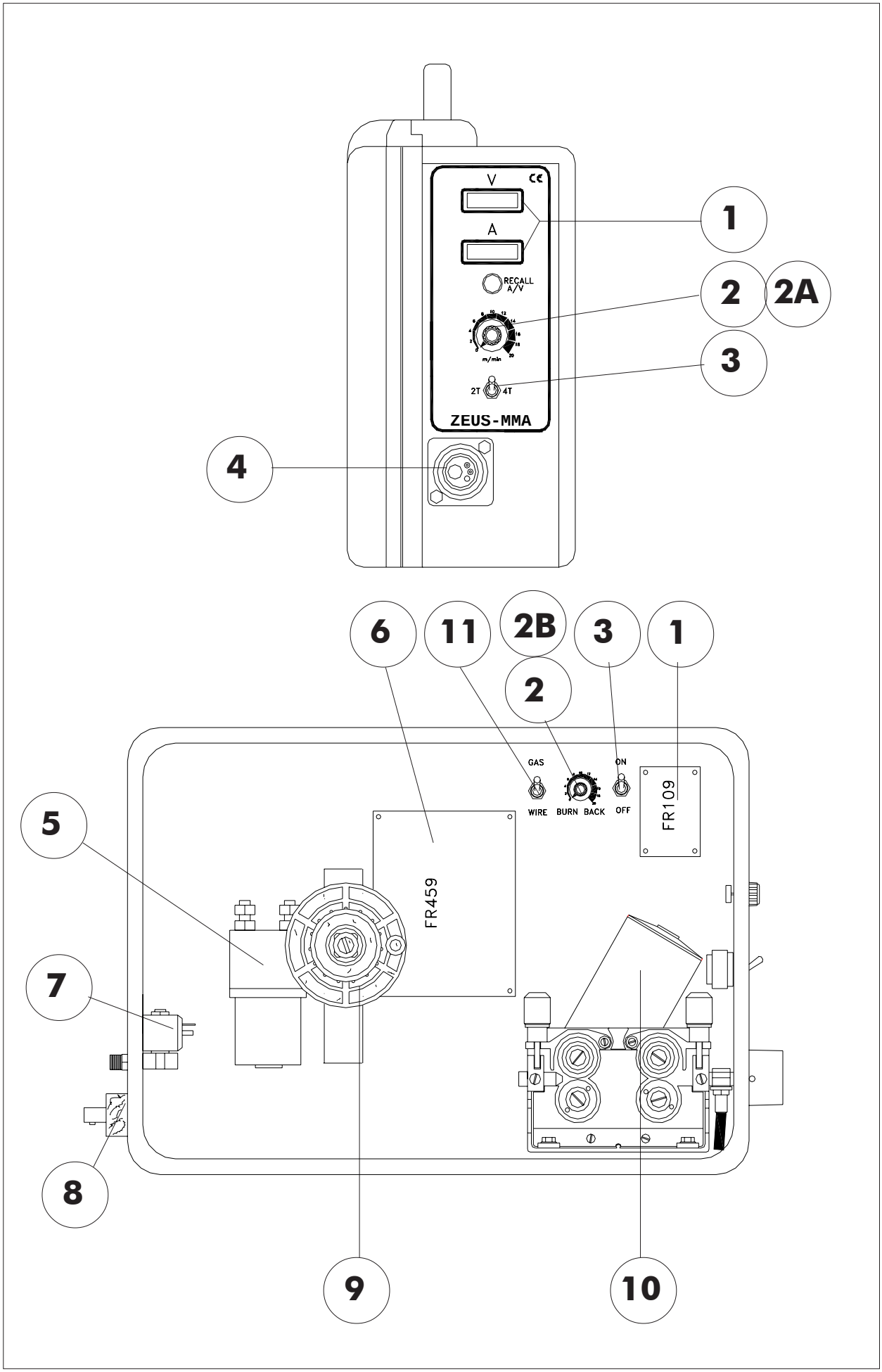
6 -Connecting Gas Hose

7 -Connecting Weld Cable

Attention

Zanardi alternatori reserves the rigth to alter characteristics at any time without notice.

Zanardi alternatori assumes no liability for results of a wrong application of the products which may cause damage to persons or equipment.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A/V
m/min
2T
4T
ZEUS-MMA
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2A
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4
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2B
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1
GAS
WIRE
BURN BACK
ON
OFF
FR109
FR459
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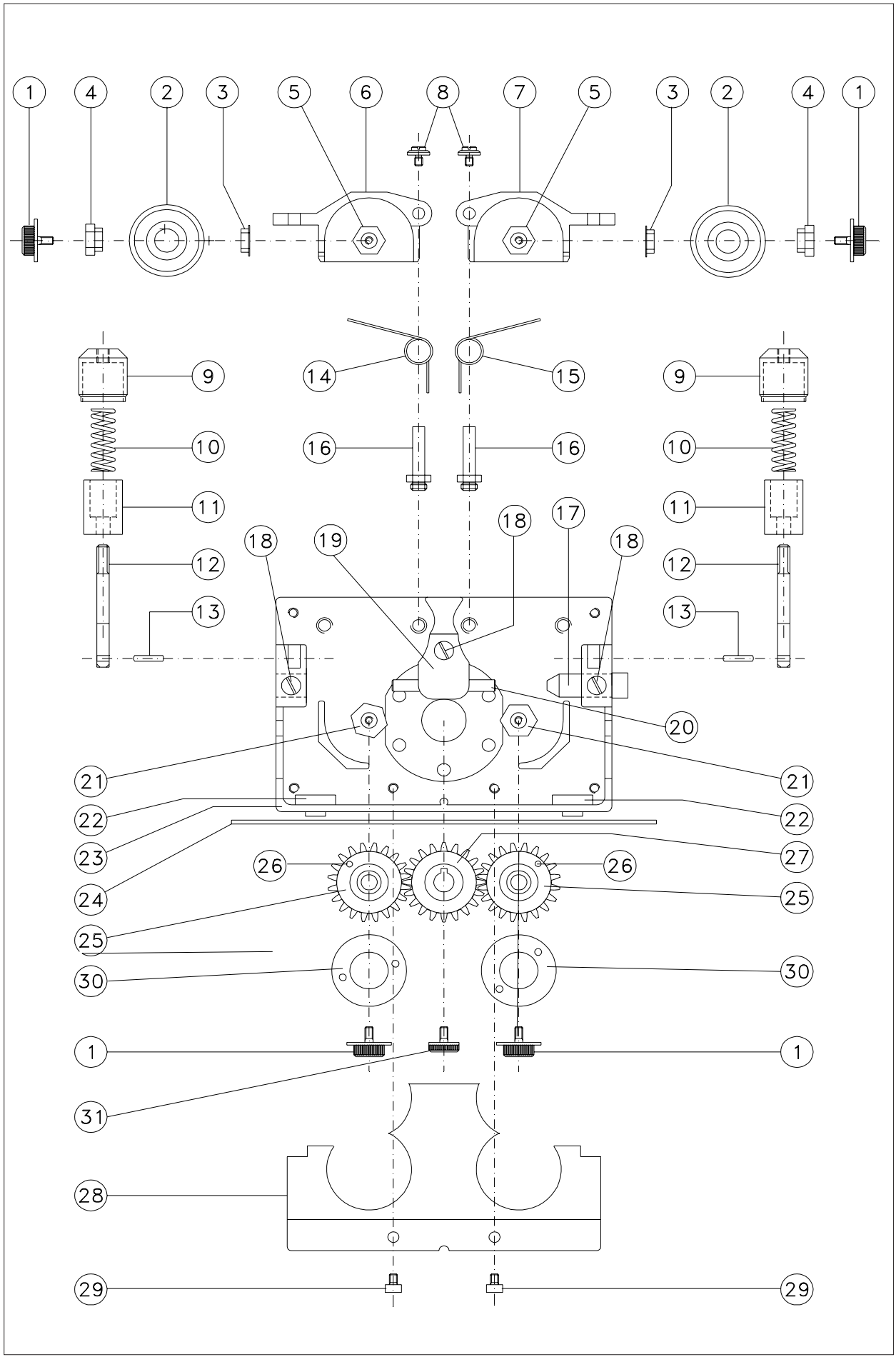
10

POS.	DESCRIPTION	PART NO.
1	PCB FR 109	FR0000109
2	1 kohm potentiometer	POT002872
2A	Larg Knob	MAN002226
2B	Small Knob	MAN002227
3	1 pole switch	DVT000827
4	Central adapter	ATC000027
5	contactor	TLT000002
6	PCB FR 459	FR0000459
7	24 V AC gas valve	ETV000001
8	Welding connetcor	CPP000004
9	Reel hub assy	PBN000001
10	24V 70W left motor	MTR000773
11	2 Pole switch	DVTM00002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TYPE NW 01042

POS.	Q.ta	Descrizione		Codice
1	4	Vite fiss.rulli	screw	VTE000001
2	2	Cuscinetto	Ball bearing	CTS002725
3	2	Distanziale piccolo	Spacer narrow	DPF000895
4	2	Distanziale grande	Spacer large	DGF020040
5	2	Perno portarullo	Axle	PPR100004
6	1	Portarullo sinistro	Pressure arm left	PRS100005
7	1	Portarullo destro	Pressure arm right	PRD100007
8	1	Vite fissaggio portarullo	Screw	VFC100006
9	1	Nottolino x fusione	Fine adjustment	NOT100008
10	2	Molla 30 x 18	Spring	ATC005123
11	2	Bussola x fusione	Pressure base	BFS100010
12	2	Tirante (filetto M5)	Axle	TRF100011
13	2	Perno asticella	Axle	PAS100012
14	1	Molla destrorsa	Spring	MDX100013
15	1	Molla sinistorsa	Spring	MSX100014
16	2	Perno portarulli	Axle	000100015
17	1	Guidafilo d'ingresso	Inlet guide	GFI000254
18	3	Vite T.C. T.cacc. 6x8 zinc.	Screw	VTC008545
19	1	Supporto per fusione	Guide	SPF100022
20	1	Tubetto Centrale	Wire Guide	TCN100023
21	2	Perno per fusione	Axle	PFS100026
22	2	Isolatore	Insulation	ISFRF0027
23	1	Piatto per Fusione	Feed Plate	PPF100028
24	1	Piastra Isolante	Insulation plate	PIS100030
25	2	Ingranaggio Mosso	Gear roll	IRG100002
26	2	Spinetta per ingranaggi	Guide pin	SPN000001
27	2	Ingranaggio Motore	Gear roll	IRG100029
28	2	Protezione per fusione	Protection	PRF100031
29	2	Vite T.C esag.inc.M5x6	Screw	VTC100032
30	2	Rullo D.37 1,0.1,2 C.S.	Drive Roll	RUL005131
	2	Rullo D.37 0,8.1,0 C.S	Drive Roll	RUL005130
	2	Rullo D.37 1,2.1,6 C.S	Drive Roll	RUL005116
	2	Rullo D.37 1,2R.1,2R C.S	Drive Roll	RUL005199
31	1	Vite Fiss.rulli x fus.	Screw	VTE000002

CONDITIONS OF WARRANTY

The machine here indicated is guaranteed from any defect of construction for a period of 12 months for transformers and inductors - 12 months for the other parts starting from the date of the purchase which is proved by this certificate.

In case of disagreement about the taking effect of the period of warranty, the same is considered valid starting from the date of the invoice concerning the purchase.

- During this period Zanardi alternatori will provide to repair or to substitute, according to its unquestionable judgement the pieces which after a careful examination will be retained defective.

- The pieces in substitution will be ex works.
The costs of packing and of transport for the defective pieces, for the ones supplied in substitution and all the necessary costs of labour are not to be considered under warranty.

- The consumable parts like pliers, plasma torches TIG-MIG and all complementary accessories such as pressure adapters, cables, tubes, fuses, sheats .... are not to be considered under warranty.

CANCELLATION OF THE CONDITIONS OF WARRANTY

The warranty is cancelled in case of abnormal use of the machine and in particular for mistakes or negligence of the user as well as in case of breaking or damages caused by a crash, an improper installation or wrong starting of the machine.

- The warranty is cancelled also in case of eventual interventions or alterations made by the purchaser or by people who are not authorized by Zanardi alternatori

- The erasion, the removal or the absence of the serial number on the machine causes the cancellation of the warranty.

MODIFICATIONS

The repair, the alteration or the change of pieces during the period of warranty, cannot justify its prolongation beyond the pre-arranged terms.

- The signalling of the damage will have to be made to Zanardi specifying what follows :

- The type of machine, the serial number, the date of the purchase, the number of the certificate of warranty.

- The cause of the damage, giving as many details as possible, for example :
the broken pieces or the ones out of work.

THIS WARRANTY EXCLUDES ANY DAMAGE FOR THE PERIOD OF INEFFICIENCY OF THE MACHINE.

DIN GRADES FOR NORMAL ADIACTINIC GLASS

GRADE	OPERATING CONDITIONS
9	With electrodes with diameters from 3.5 to 5mm. For inert gas-shielded arc welding with welding current up to 75 Amps.
10	With electrodes with diameters greater than 5mm. For inert gas-shielded arc welding with welding current up to 200 Amps.
11	With electrodes with diameters greater than 5mm. For inert gas-shielded arc welding with welding current up to 250 Amps.
12	With electrodes that generate extremely high amounts of luminosity. For inert gas-shielded arc welding with welding current up to 300 Amps.
13	For welding workpieces with thick walls. For controlled-atmosphere arc welding with welding current greater than 300 Amps, and up to 500 Amps.

Model _____

Serial N. _____

CE