

## INSTRUCTION MANUAL

**CAREFUL:**

READ THE INSTRUCTION MANUAL CAREFULLY BEFORE USING THE WIRE FEEDER.

**1. GENERAL SAFETY FOR ARC WELDING**

Scrupulously follow the safety instructions given in the generator manual.



The guards and mobile parts of the wire feeder casing must be in position before connecting the welding machine to the power supply.



**CAREFUL!** Any manual intervention on moving parts of the wire feeder, such as, for example:

- Replacing the feeder and/or wire guide;
- Inserting the wire into the feeders;
- Loading the reel of wire;
- Cleaning the feeders, gears and the area below them;
- Lubricating the gears.

**MUST BE CARRIED OUT WITH THE WELDING MACHINE OFF AND DISCONNECTED FROM THE MAINS.**

- Do not use the handle to hang the welding machine.

**2. INTRODUCTION AND GENERAL DESCRIPTION****WIRE FEEDER**

This wire feeder must be connected to an electric generator that has been suitably configured to run MIG-MAG short and spray arc welding.

Its specific characteristics, such as the precision of the wire speed adjustment and the regular feeding of the 4-roll wire feeder unit make it particularly suitable for MAG welding carbon steel or low-alloy steel with CO<sub>2</sub> protective gas or Argon/CO<sub>2</sub> mixes using full or cored (tubular) electrodes. It is also ideal for MIG welding stainless steel with Argon gas containing 1-2% oxygen, and aluminium with Argon gas, using electrode wires for analyses that are suitable for the workpiece to be welded.

Perfect also for MIG soldering galvanized plates with copper alloy wires (e.g. copper-silicone or copper-aluminium) with pure Argon protective gas (99.9%).

**3. TECHNICAL DATA****3.1 DATA PLATE**

The main data regarding wire feeder use and performance are given in the data plate and have the following meaning:

Fig. A

- 1- EUROPEAN reference standard for wire feeder safety and production.
- 2- Power supply line symbol.
- 3- Casing protection rating.
- 4- Welding circuit performance:
  - I<sub>n</sub>: Nominal welding current
  - X: Intermittence ratio: indicates the time during which the welding machine can supply the corresponding current. It is expressed as a % on the basis of a 10 min. cycle (e.g. 60% = 6 working minutes, 4 pause minutes and so on).
- 5- Power supply line characteristic data:
  - U<sub>i</sub>: Wire feeder alternate power supply voltage.
  - I<sub>i</sub>: Nominal current at maximum wire feeder charge.
- 6- Serial number for identifying the wire feeder (essential for technical help, when requesting spare parts, product origin search).
- 7- Symbols referring to safety regulations, the meaning of which is given in chapter 1 "General safety for arc welding".

Note: The example plate shown indicates the meaning of the symbols and numbers; the exact values of the welding machine technical data in your possession must be identified directly on the welding machine plate.

The main data regarding wire feeder use and performance are given in table 1 (Tab.1).

**OTHER TECHNICAL DATA**

- WELDING MACHINE: see generator manual
- TORCH: see table 2 (Tab. 2)

The weight of the wire feeder is given in table 1 (Tab. 1).

**4. WELDING MACHINE DESCRIPTION**

Control devices, adjusting and connecting (Fig. B)

**5. INSTALLATION**

**CAREFUL!** CARRY OUT ALL INSTALLATION AND ELECTRICAL CONNECTION OPERATIONS WITH THE WELDING MACHINE RIGOROUSLY SWITCHED OFF AND DISCONNECTED FROM THE MAINS.

THE ELECTRICAL CONNECTIONS MUST ONLY BE CARRIED OUT BY EXPERT OR QUALIFIED TECHNICIANS.

**PREPARATION**

Unpack the wire feeder.

**CONNECTION TO THE POWER NETWORK**

When connecting to the power network scrupulously follow the indications given in the generator manual.

**WELDING CIRCUIT CONNECTIONS (FIG. C)**

**ATTENTION!** BEFORE CARRYING OUT THE FOLLOWING CONNECTIONS, MAKE SURE THE WELDING MACHINE IS OFF AND DISCONNECTED FROM THE MAINS.

**Connecting the welding current return cable**

Connect the cable to the piece to be welded or the metal bench on which the workpiece is placed, as close as possible to the joint being worked.

Connect this cable to the clamp with the symbol (-).

**Connecting the torch**

- Insert the torch into the dedicated connector, fully tightening the locking ring nut manually. Prepare the torch to receive the wire for the first time, removing the nozzle and the contact pipe, to make exiting easier.
- Connect the water pipes to the quick couplings (for R.A. version only).

**CONNECTING THE WIRE FEEDER**

- Connect to the current generator:



- welding current cable to the quick coupling (+);
- control cable to the relative 14-pole connector.
- Make sure the connectors are well tightened to avoid overheating and loss of efficiency.
- Connect the gas hose coming from the wire feeder to the cylinder pressure reducing valve and tighten with the supplied strip.
- Connect the water pipes coming from the wire feeder to the quick couplings on the cooling unit (for R.A. version only).

**CONNECTING G.R.A. TO THE MAINS NETWORK (for R.A. version only)**

- Before making any electrical connections, make sure the rating data of the cooling unit corresponds to the mains voltage and frequency available at the place of installation.
- The cooling unit must only be connected to a power supply system with neutral conductor connected to earth.
- Connect the supplied cable to the cooling unit (FIG. I), using the relative coupling (female 5-pole). Connect the free end of the cable to a normalised plug (2P + E); the relative earth lug must be connected to the power supply protective ground wire (yellow-green).
- Both the plug and socket must have the rated voltage and current requirements.

**MANAGING THE WIRE FEEDER (FIG. D)**

To use the wire feeder for general purposes, the 14-pole control cable

must be connected respecting the following pinout:

- 24 VAC 50/60 Hz 10 VA between pins 1 and 2; solenoid valve supply input.
- 32 VAC 50/60 Hz 190 VA between pins 1 and 3; motor supply input.
- The unification of the 0 VAC must be performed on pin 1.
- Generator activation on pin 4; generator control output. When the torch push-button is pressed, pin 4 is taken to the same potential as pin 1. In other words, with the motor active, it returns from the 24 VAC wire roller between pins 4 and 2.
- When suitably managed this signal warns the generator that it must supply current.
- Negative potential input of the welding machine output voltage on pin 5; this allows the reading of the output voltage on the display in Fig. B (6).
- Potentiometer in Fig. B (3) on pins 6 (minimum), 7 (maximum) and 8 (cursor). The potentiometer used is the 10KΩ 0.2W linear type.
- wire roller recognition input: wire feeder presence on pin 10. This pin has the same potential as pin 6. When the control cable is connected to the generator, pins 10 and 6 are short-circuited. When suitably managed

### Recommendations

- Fully rotate the welding cable connectors in the quick couplings (if present), to guarantee perfect electric contact; if this is not the case the connectors will overheat with relative fast deterioration and loss of efficiency.
- Use the shortest welding cables possible.
- Do not use metal structures that are not part of the workpiece, to replace the welding current return cable; this can be dangerous for safety and give unsatisfactory welding results.

### LOADING THE REEL OF WIRE (FIG. E)



**CAREFUL! BEFORE LOADING THE WIRE, MAKE SURE THE WELDING MACHINE IS OFF AND DISCONNECTED FROM THE MAINS.**

MAKE SURE THE WIRE FEEDERS, THE WIRE GUIDE HOSE AND THE TORCH CONTACT PIPE CORRESPOND WITH THE DIAMETER AND NATURE OF THE WIRE TO BE USED AND THAT THEY ARE CORRECTLY MOUNTED. DO NOT WEAR PROTECTIVE GLOVES WHEN THREADING THE WIRE.

- Open the reel area door.
- Position the coil of wire on the reel; make sure the reel pulling pin is correctly housed in its hole (1a).
- Free the pressure counter feeder/s and distance it/them from the lower feeder/s (2a).
- Make sure the pulling feeder/s is/are suitable for the wire being used (2b).
- Free the wire end, cut off the misshaped end by cutting it cleanly and without leaving a burr; rotate the reel counter-clockwise and position the wire end into the wire feed input, pushing it by 50-100 mm into the torch connecting wire feed (2c).
- Reposition the counter-roller/s, adjusting the pressure at an intermediate value, make sure the wire is positioned correctly in the hollow of the lower feeder (3).
- Gently stop the reel, using the relative adjustment screw in the centre of the reel itself (1b).
- Remove the nozzle and contact tube (4a).
- Insert the welding machine plug into the mains socket, switch on the welding machine, press the torch push-button or the wire forward push-button on the control panel (if present) and wait for the end of the wire, which is running along the whole wire feed casing, to exit by 10-15 cm from the front of the torch, then release the push-button.



**CAREFUL! During these operations the wire is being powered and is subject to mechanical force; if suitable precautions are not taken there is a danger of electric shock and wounds, and electric arcs striking:**

- Do not place the torch mouth against parts of the body.
- Do not approach the torch gas bottle.
- Remount the contact tube and the nozzle onto the torch (4b).
- Make sure the wire exits regularly; set the roller pressure and reel braking to the lowest values possible, making sure the wire does

not slide in the hollow and that when the drive stops the wire turns do not become loose because of too much coil inertia.

- Cut the end of the wire that exits from the nozzle by 10-15 mm.
- Close the reel area door.

### 6. WELDING: PROCESS DESCRIPTION PRELIMINARY OPERATIONS

- Open and adjust the protective gas flow using the pressure regulator.
- Switch on the welding machine and set the welding voltage/current from the generator, using the potentiometer seen in Fig. B (3).

### WELDING

Once the machine has been set following the operations indicated previously, place the earth clamp in contact with the workpiece to be welded, keep the torch at a suitable distance from the workpiece and press the torch push-button.

For difficult welding operations it is a good idea to practice on scraps, using the adjustment knobs contemporaneously in order to improve welding. If the arc melts into drops and tends to extinguish, increase the wire speed or select a lower current value. If the wire points violently on the piece and causes the material to project, reduce the wire speed or select a higher welding current.

Remember that each wire gives best results with a specific forward speed. If welding difficult pieces or for a long time, it is a good idea to test different wire diameters to select the most suitable one.

Approximate values of current for the most commonly used wires are given in Table (Tab. 3).

### WELDING ALUMINIUM

ARGON or an ARGON-HELIUM mix of gas is used for this type of welding. The wire to be used must have the same characteristics as the base material. It is always preferable to use an alloy wire (e.g. aluminium/silicon) and never a pure aluminium wire.

The only problem when MIG welding aluminium is that of managing to pull well the wire along the whole torch, because aluminium has scarce mechanical characteristics and the pulling problems increase as the wire diameter decreases.

This problem can be avoided by making these modifications:

- 1 - Replace the torch casing with the Teflon model. To remove it, just loosen the dowels at the torch ends.
- 2 - Use contact pipes for aluminium.
- 3 - Replace the wire feeders with the type for aluminium.
- 4 - Replace the steel casing of the input wire feed with the corresponding one in Teflon.

### SPOT WELDING (FIG. F)

With a spot welding system you can unite overlying sheets with welding spots of filler metal.

The system is particularly suitable for this purpose because equipped with an adjustable timer, which can be used to select the most suitable spot welding time and, as a result, create spots with the same characteristics.

To use the machine for spot welding, it must be prepared as follows:

- Replace the torch nozzle with the one for spot welding. This nozzle is characterised by its cylindrical shape and because it has vents for gas at its ends.
- Adjust the output voltage/current at a high value (voltage 28-40 V corresponding to a current of 300-500 A).
- Suit the wire feed speed to the output voltage/current that was set.
- Adjust the spot welding time according to the thickness of the sheets to be joined.

To spot weld place the torch nozzle flat against the first sheet, then press the torch push-button to weld: the wire melts the first sheet, passes through it and penetrates into the second one, creating a melted wedge between the two.

Keep the push-button pressed until the timer stops welding.

With this procedure you can spot weld even in conditions where it is not possible to weld using traditional spot welding machines, given that you can join sheets that cannot be accessed from the rear, for example boxed structures

In addition to that the operator's work is greatly reduced given the extreme lightness of the torch.

The limits of use of this system are tied to the thickness of the first sheet, while the second can be extremely thick.

### RIVETING (FIG. G)

This is a procedure that can be used to repair dented or deformed

sheets without having to beat them on the reverse. This is essential in the case of bodywork that cannot be accessed from the rear.

The operation is carried out as follows:

- Replace the torch nozzle with the one for riveting, which has a seat for the nail on the side.
  - Adjust the output voltage/current at an intermediate value (voltage 20-30 V corresponding to a current of 120-320 A).
  - Adjust the feeder speed according to the current and diameter of the wire used, as if carrying out normal welding.
  - Adjust the spot welding time to approx. 1 - 1.5 seconds.
- Spot weld the head of the nail, uniting it with the sheet. Using the correct tool, you can at this point lift the dented sheet.

#### SHEET DRAWING PROCEDURE (FIG. H)

Sheets lose their initial characteristics after being welded or hammered in bodyshops, but the drawing process returns them to their original state. The procedure consists of heating the sheet to be drawn up to a temperature of approx. 800° C and then cooling it rapidly with a cloth soaked in water.

To draw using the MIG welding circuit, proceed as follows:

- Modify the MIG torch, positioning the relative electrode holder and then the carbon electrode in place of the nozzle, then tighten the knob.
- Adjust the output voltage/current at a medium/low value (voltage 18-24 V corresponding to a current of 80-200 A).
- Release pressure from the wire feed by unhooking the spring to prevent the wire from being dragged on the torch.

Place the end part of the electrode in contact with the sheet, leaving it until the sheet has heated, then cool the sheet quickly with a cloth soaked in water. If the area to be drawn is small, work as if spot welding. If instead the area to be drawn is extended, rotate the electrode.

#### 7. MAINTENANCE



**WARNING! BEFORE CARRYING OUT MAINTENANCE OPERATIONS MAKE SURE THE WELDING MACHINE IS SWITCHED OFF AND DISCONNECTED FROM THE MAIN POWER SUPPLY.**

#### ROUTINE MAINTENANCE:

**ROUTINE MAINTENANCE OPERATIONS CAN BE CARRIED OUT BY THE OPERATOR.**

#### Torch

- Do not put the torch or its cable on hot pieces; this would cause the insulating materials to melt, making the torch unusable after a very short time;
- Make regular checks on the gas pipe and connector seals;
- Every time the wire reel is changed, blow out the wire-guide hose using dry compressed air (max. 5 bar) to make sure it is not damaged;
- Before every use, check the wear and correct assembly of the parts at the end of the torch: nozzle, contact tip, gas diffuser.

#### Wire feeder

- Make frequent checks on the state of wear of the wire feeder rollers, regularly remove the metal dust deposited in the feeder area (rollers and wire-guide infeed and outfeed).

#### EXTRAORDINARY MAINTENANCE

**EXTRAORDINARY MAINTENANCE MUST ONLY BE CARRIED OUT BY TECHNICIANS WHO ARE EXPERT OR QUALIFIED IN THE ELECTRIC-MECHANICAL FIELD, AND IN FULL RESPECT OF THE IEC/EN 60974-4 TECHNICAL DIRECTIVE.**



**WARNING! BEFORE REMOVING THE WELDING MACHINE PANELS AND WORKING INSIDE THE MACHINE MAKE SURE THE WELDING MACHINE IS SWITCHED OFF AND DISCONNECTED FROM THE MAIN POWER SUPPLY OUTLET. If checks are made inside the welding machine while it is live, this may cause serious electric shock due to direct contact with live parts and/or injury due to direct contact with moving parts.**

- Inspect the welding machine regularly, with a frequency depending on use and the dustiness of the environment, and remove the dust deposited on the transformer, reactance and rectifier using a jet of

dry compressed air (max. 10 bar).

- Do not direct the jet of compressed air on the electronic boards; these can be cleaned with a very soft brush or suitable solvents.
- At the same time make sure the electrical connections are tight and check the wiring for damage to the insulation.
- At the end of these operations re-assemble the panels of the welding machine and screw the fastening screws right down.
- Never, ever carry out welding operations while the welding machine is open.
- After having carried out maintenance or repairs, restore the connections and wiring as they were before, making sure they do not come into contact with moving parts or parts that can reach high temperatures. Tie all the wires as they were before, being careful to keep the high voltage connections of the primary transformer separate from the low voltage ones of the secondary transformer. Use all the original washers and screws when closing the casing.

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#### MANUALE ISTRUZIONE



#### ATTENZIONE:

**PRIMA DI UTILIZZARE L'ALIMENTATORE LEGGERE ATTENTAMENTE IL MANUALE DI ISTRUZIONE.**

#### 1. SICUREZZA GENERALE PER LA SALDATURA AD ARCO

**Attenersi scrupolosamente alle norme relative alla sicurezza riportate nel manuale del generatore.**



Le protezioni e le parti mobili dell'involucro dell'alimentatore di filo devono essere in posizione, prima di collegare la saldatrice alla rete di alimentazione.



**ATTENZIONE!** Qualunque intervento manuale su parti in movimento dell'alimentatore di filo, ad esempio:

- Sostituzione rulli e/o guidafile;
  - Inserimento del filo nei rulli;
  - Caricamento della bobina filo;
  - Pulizie dei rulli, degli ingranaggi e della zona sottostante ad essi;
  - Lubrificazione degli ingranaggi.
- DEVE ESSERE ESEGUITO CON LA SALDATRICE SPENTA E SCOLLEGATA DALLA RETE DI ALIMENTAZIONE.**

**È vietato utilizzare la maniglia come mezzo di sospensione della saldatrice.**

#### 2. INTRODUZIONE E DESCRIZIONE GENERALE ALIMENTATORE DI FILO

Questo alimentatore di filo deve essere collegato ad un generatore di corrente opportunamente configurato per la gestione della saldatrice ad arco MIG-MAG short e spray arc.

Le sue caratteristiche specifiche, quali la precisione della regolazione della velocità del filo e la regolarità di trascinamento del gruppo trainafilo a 4 rulli, lo rendono particolarmente adatto alla saldatrice MAG degli acciai al carbonio o debolmente legati con gas di protezione CO<sub>2</sub> o miscela Argon/CO<sub>2</sub> utilizzando fili elettrodo pieni o anamati (tubolari). Si adatta inoltre alla saldatrice MIG degli acciai inossidabili con gas Argon + 1-2% ossigeno e dell'alluminio con gas Argon, utilizzando fili elettrodo di analisi adeguata al pezzo da saldare.

Adatto anche per la brasatura MIG su lamiere zincate con fili in lega di rame (es. rame-silicio o rame-alluminio) con gas di protezione Argon puro (99.9%).

#### 3. DATI TECNICI

##### 3.1 TARGA DATI

I principali dati relativi all'impiego e alle prestazioni dell'alimentatore di filo sono riassunti nella targa caratteristiche col seguente significato:

**Fig. A**

- 1- Norma EUROPEA di riferimento per la sicurezza e la costruzione dell'alimentatore di filo.