

INSTRUCTIONS AND SPARE PARTS HANDBOOK FOR TIG WELDING MACHINE

1) INTRODUCTION

GENERALITIES

This instruction manual is meant to be an help for the personnel in charge for the installation, for the use and for the maintenance of this welding machine. Therefore please read this manual carefully and follow the directions scrupulously.

On receipt of this welding machine check that there are no broken or damaged parts and, if any, inform the carrier.

DESCRIPTION

This welder can give both D.C. and A.C. and it is possible to weld in TIG process and with and kind of electrodes. The current regulation is stepless for the whole welding range by magnetic shunt. The arc stability and the easy triggering are obtained by the high no load voltage and by the right adjustment of the high frequency device (TIG process); moreover an equalization inductance allows to optimize the welding performances in D.C., both in TIG and in electrodes process.

Hereunder is a table with TIG process features.

2) INSTALLATION

ARRANGEMENT

As it is forced ventilated, it is necessary that a good air circulation is allowed.

IMPORTANT: It is forbidden to make it working without cover or without the side panels: the forced air cooling system should be modified and therefore its performances are no longer warranted.

MAINS CONNECTION

This welder is a single-phase one: the mains must absolutely meet its characteristics indicated on the plate.

A mains cable is provided:

— the yellow green thread must be connected to the earth: when a cable extension is required, its cross section has not to be smaller than that one of the supply cable itself.

3) OPERATING FEATURES

ON/OFF MAINS SWITCH

«ON» position: red light open — the fan turns — the working circuits are feeded and the welder is ready.

«OFF» position: the welder is switched off, but not disconnected: to do so pull off the plug from the mains.

AC/DC WELDING SWITCH

It should never be used during welding.

WELDING CURRENT REGULATION

To get the required current value, the handle in the middle of front panel has to be turned and the approximate value is indicated on the graduated scales: (one for AC and the other one for DC).

WELDING PROCESS SELECTOR



It allows to weld in two ways:

TIG position: the press button on the torch controls every working condition.

Electrode position: any types of coated electrode can be welded.

In this position, the mains remote control switch is always on; therefore a tension exists at the welding tap.

		U ₂₀ (V)	I ₂ (A)	60% (A)	35% (A)	25% (A)
	A.C.	60 ÷ 67	20 ÷ 200	130	170	200
	D.C.	50 ÷ 58	18 ÷ 180	135	180	
I ₁ (A) 380 V	A.C.			33	48	54
	D.C.			27	35	
I ₁ (A) 220 V	A.C.			57	83	93
	D.C.			47	60	
I ₁ (A) 415 V	A.C.			30	44	49
	D.C.			25	32	

HIGH FREQUENCY FOR (HF A.C./D.C.)


AC position: HF is always overlapped to the welding current in triggering as well as during the welding time, controlled by the torch press button.

DC position: HF remains for enough time to allow the easy arc triggering.

The HF device is automatically cut off, when the welding selector is switched on the electrode.

STEPLESS - PULSE SELECTOR

— stepless position (): keep on pressing the torch button during the whole welding time; on releasing, the welding stops.

— pulse position (): press the button once and leave it for starting welding and it will stop welding only when it is pressed again.

GAS DELIVERY TIMER

The tungsten electrodes used in the TIG process become fragile and do not allow a good arc triggering if oxidized: it is absolutely necessary therefore to maintain around them an inert gas atmosphere even for a certain time after welding termination. The timer allows a gas delivery from the torch for a time to be preselected on the scale up to about 30" after the welding end.

4) WELDING

COATED ELECTRODE

- to switch on accordingly the welding selector (the HF device is automatically excluded)
 - to put in the required position the AC/DC switch
 - to choose the required current by using the handle
 - to connect the welding cable to their sockets (in DC the plier of the electrode holder is generally positive and the earth negative: it is however possible to reserve the polarities by reversing their connections)
 - to switch on the mains switch.
- The welder is now ready for working.

TIG PROCESS

It is possible to weld every metal with or without welding material in AC or DC depending on the kind of metal or metal alloy carry out following operations:

- to connect the gas tube coming out from the rear panel to the gas bottle (generally pure Argon for welding) and to set the rate of flow on the flowmeter in between 6-12 lt/min. according to the requirements
- to connect the ground cable to the unit to be

welded and plug it in the socket marked (+): when in DC, the ground is positive and the torch negative (STRAIGHT POLARITY)

— to put the torch press button plug in its socket and the gas tube coming out from the torch sheath in the solenoid valve, both close to the clamp marked with (—)

— to connect the torch cable to socket marked with (—)

— the HF AC/DC selector has to be in AC when operating in alternating current; in DC when in direct current: in this case the HF only helps a better arc triggering

— to handle the welding current to the required value

— to adjust the gas delivery timer at the required time, bearing in mind that after operation the tungsten electrode must be bright; a dark blue and mat colour means a surface oxidation of the electrode, not allowing a good welding and easy arc triggering: in this connection the gas delivery time after welding has to be increased.

IMPORTANT NOTICE: The electrode diameter choice has to be made by using the following table.

WARNING: The chosen electrode has to be exclusively used in the indicated current range: a higher current will fuse it (mixing it up with the welding material), while a too large electrode will have a very difficult arc triggering and arc instability, easy to quick movements and displacements.

— Pure tungsten electrode: green colour at one end - mostly used in AC.

— Tungsten with 2% Thorium electrode: red colour at one end and most used in DC.

— AC electrode with round end.

— DC electrode with pointed end.

5) SERVICE AND MAINTENANCE WARNING:

Before starting inspection, disconnect the machine from the mains.

TRANSFORMER AND RECTIFIER

— To take out the side panels and periodically remove dust and dirt by means of an air compressor gun.

POWER SUPPLY AND WELDING CABLES

Their condition has to be frequently checked, because worn cables or bad connections cause overheating.

Torch cable sheath has to be also in good condition, otherwise the HF will be dispersed on ground causing a difficult triggering.

SPARK GAP

Spark gap can be reached by removing the lid. The spark points are adjusted at 0,2 mm. gap: that gap has to be periodically checked mainly when an irre-

gular sparring appears with the HF.

The tungsten pads of the spark points have not to be cleaned: they must be replaced when it is no longer possible to set their gap because tungsten layer has become too thin.

WELDING CURRENT (A)

Ø electrode		A.C. with H.F. Argon gas		D.C. straight polarity negative electrode Argon gas
mm.	inches	pure tungsten	2% Thorium	2% Thorium
0,5	(0,020)	—	—	5 - 30
1	(0,040)	20 - 60	20 - 70	30 - 90
1,6	(1/16)	50 - 100	50 - 120	70 - 150
2,4	(3/32)	90 - 170	90 - 200	140 - 250
3,2	(1/8)	160 - 250	160 - 280	200 - 280