

# RWS - 350

This manual must be completed by the "CE Operating and service maual"

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#### WARNING

IMPORTANT: BEFORE STARTING THE EQUIPMENT, READ THE CONTENTS OF THIS MANUAL, WHICH MUST BE STORED IN A PLACE FAMILIAR TO ALL USERS FOR THE ENTIRE OPERATIVE LIFE-SPAN OF THE MACHINE.THIS EQUIPMENT MUST BE USED SOLELY FOR CUTTING OPERATIONS.

#### INTRODUCTION

To obtain the best performance from the machine and ensure the longest possible life of all its components you must careffully follow the instructions for use and maintenance detailed in this manual. In the interest of our customers we suggest any maintenance or repair of the equipment is made by qualified personnel. All our products are subject to a constant development. We are therefore constrained to reserve the right to make any necessary or useful changes in design and equipment.

#### ROUTINE MAINTENANCE

Prevent metal powder from accumulating inside the equipment. Disconnect the power supply before every operation ! Carry out the following periodic controls on the power source:



 $\ensuremath{\cdot}$  Clean the power source inside by means of low-pressure

compressed air and soft bristel brushes.

Check the electric connections and all the connection cables.

For the use and maintenance of the pressure reducers, consult the specific manuals.





1. DECLARATION OF CONFORMITY

TER SRL - Via Leopardi, 13 - 36030 Caldogno (VI) Italy

declares that the machines descripted in this manual must be use solely for professional purposes in an industrial environment and they are manufactured in compliance with the instructions contained in the harmonized standard:

2006/95/CE (LDV) – 2004/108/CE (EMC) – 2002/95 (RoHs)

and with the instructions contained in the harmonized standard, if applicable:

EN 60974-1 EN 60974-2 EN 60974-3 EN 60974-5 EN 60974-7 EN 60974-10 EN 60974-12

Maurizio Terzo Direttor Generale

Date 30/01/2012

(Maurizio Terzo

# IN CASE OF ANY TECHNICAL PROBLEM ASK FOR QUALIFIED SERVICE ASSISTANCE





#### 2. RAEE STANDARDS

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The symbol on the product or on its packaging indicates that this product may not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropiate waste handling of this product. For more

detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

#### **3. SAFETY PRECAUTIONS**

WELDING AND ARC CUTTING CAN BE HARMFUL TO YOURSELF AND OTH-ERS. The user must therefore be educated against the hazards, summarized below, deriving from welding operations.

#### ELECTRIC SHOCK – May be fatal



Install and earth the welding machine according to the applicable regulations. Do not touch live electrical parts or eletrodes with bare skin, gloves or wet clothing. Isolate yourselves from both the earth and the workpiece. Make sure your working position is safe.

#### FUME and GASES – May be hazardous to your health



Keep your head away from fumes. Work in the presence of adequate ventilation, and use ventilators around the arc to prevent gases from forming in the work area.

#### ARC RAYS - May injure the eyes and burn the skin



Protect yuor eyes with welding masks fitted with filtered lenses, and protect your body with appropiate safety garments.

Protect others by installing adequate shields or curtains.

#### **RISK of FIRE and BURNS**



Sparks (sprays) may cause fires and burn the skin; you should therefore make sure there are no flammable materials in the area, and wear appropriate protective garments.

#### NOISE



This machine does not directly produce noise exceeding 80dB. The plasma cutting/welding procedure may produce noise levels beyond said limit; users must therefore implement all precautions required by law.

#### PACE MAKER



The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

#### **EXPLOSIONS**



Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes. All cylinders and pressure regulators used in welding operation should be handled with care.

#### **4. GENERAL DESCRIPTION**

This machine is a constant direct current power source, designed for welding electrically conductive materials (metals and alloys) using the electical arc procedure.









Connect the negative polarity of the the power generator to the metallic frame where the RWS-350 is used for welding.

## **RWS-350 POWER SUPPLY CONNECTIONS**



It is suggested a short cable less than 3 meters and a size of 30mm<sup>2</sup> for each RWS-350 connected to the generator.

For example if 4 RWS-350 wire feeder are connected to the same power source, use a cable of 120mm<sup>2</sup>

WARNING : BEFORE POWER ON THE MACHINE MAKE SURE THE ELECTRICAL CONNECTIONS OF POWER SUPPLY ARE CORRECT



IMPROPER CONNECTION CAN CAUSE DAMAGE TO EQUIPMENT









b) Connect the gas to each RWS 350. It is suggest to avoid pressure higher then 6 BAR

c) The size of the positive cable depends from their lenghts, for 50 meters use 35mm<sup>2</sup>, for 100 meters use 70mm<sup>2</sup>.





#### 5. MAIN FEATURES



RWS (Remote Welding System).

The RWS is a unique invention powered by the + terminal of a DC Power source, either an MMA DC Inverter or Generator Welder using only a single black welding cable.

The RWS is powered by the OCV of the Power Supply and will operate within a OCV range of 35-110V.

Safety is a prime concern when welding on site, and the RWS is one of the safest working from such low currents.

The RWS Wire Feeder offers MIG/MAG and MMA welding at distances of up to

150 mtrs + from the Power supply. The RWS is equipped with full Synergic functions, including Pulse and Double Pulse programmes as standard. This unique system requires no interconnecting cable, it is powered by a simple copper welding cable from the positive terminal of the Generator Welder or welding power source.

The system allows for more than one RWS to operate from a single power source. Up to six RWS can be connected to one power source offering the client reduced power consumption and lower running costs. The system can be moved without the need of heavy lifting gear as the power source does not need to be re-positioned, the operator simply carries or pulls the RWS by the trolley the next Job position. The system is light and easy to operate, It's performance has no parallel giving the operator 350 amp output with 60% duty cycle 150 mtrs + away from the power source.

#### MAIN FEATURES

$\checkmark$	Auto-feed from the input power
$\checkmark$	Controlling of the quality of the supply low voltage power.
$\checkmark$	Compensation of supply voltage variations.
$\checkmark$	Self-modulating output inductance.
$\checkmark$	Increased Welding Speed.
$\checkmark$	Increased control of the deposit.
$\checkmark$	Arc stability and control.
$\checkmark$	Higher Penetration.
$\checkmark$	Quality of the Deposit.
$\checkmark$	Selecting Between manual set or synergistic Program.
$\checkmark$	MIG/MAG mode with high speed program, already installed.
$\checkmark$	Pulsed MIG/MAG mode with high efficiency fast pulse, already installed.
$\checkmark$	MIG/MAG Double Pulsed, already installed.
$\checkmark$	Digital control of gas flow.
$\checkmark$	Storing of 6 different "job" working for each procedure.
$\checkmark$	Possibility, in Set manual, to change all the parameters of MIG/MAG - MMA (Stick) cycle.
	MMA (Stick) mode with synergic programs or manual set.
	Full digital control of cycle.





RWS 350

TECHNICAL DATA					
DESCRIPTION	WIRE FEEDER RWS CHO¬PPER-350				
CODE	V0134AA				
POWER SUPPLY RANGE	MIN35VDC - MAX110V DC				
SECTION OF POWER SUPPLY CABLES	50MM2				
MAX LENGTH OF POWER SUPPLY CABLES	150MT				
MAX INPUT RATED SUPPLY CURRENT (I1 MAX)	240A				
EFFECTIVE INPUT CURRENT (I1 EFF.)	185A				
RATED POWER (MIG AT 80V)	24KVA				
PERMANENT POWER 100% (MIG AT 80V)	18.5KVA				
MIG					
REGULATION FIELD IN MIG-MAG MODE (A)	10A – 350A				
RATED SECONDARY CURRENT (40°C)	350A (60%ED)				
PERMANENT SECONDARY CURRENT 100% (A)	260A				
NO LOAD VOLTAGE					
MMA (STICK)					
REGULATION FIELD IN STICK MODE (A)	20A – 300A				
RATED SECONDARY CURRENT (40°C)	350A (40%ED)				
PERMANENT SECONDARY CURRENT 100% (A)	260A				
NO LOAD VOLTAGE	VRD OFF 72V - VRD ON 20V				
OVERLOAD PROTECTION	THERMAL				
PROTECTION CLASS	IP21				
INSULATION CLASS	Н				
HOT START	YES				
ANTI STICKING	YES				
ARC FORCE	YES				
DIMENSIONS : WIDTH-HEIGHT-LENGTH (MM)	295X440X665MM				
WEIGHT (KG)	19,6KG				







#### **5. GENERALE DESCRIPTION**

#### **5.1 RWS FRONT PANEL CONNECTIONS**

#### **5.2 RWS REAR SIDE CONNECTIONS**



#### 6. FRONT PANEL FUNCTIONS AND ADJUSTMENTS





#### 7. Operation mode

The RWS generators serie can be divided in three categories: Depending on the machine model, are available only the following working modes <u>Operation mode 1</u> RWS Base : operation in STICK and MANUAL MIG. <u>Operation mode 2</u> RWS Advanced : operation in STICK, MANUAL MIG, SYNERGIC MIG. <u>Operation mode 3</u> RWS Top : peration in STICK, MANUAL MIG, SYNERGIC MIG, PULSE SYNERGIC MIG and DOUBLE PULSE SYNERGIC MIG.

7.1 Operation Mode 1 The machine can be work in STICK and MANUAL MIG

7.2 Operation Mode 2 The machine can be work in STICK, MANUAL MIG, SYNERGIC MIG.

7.3 Operation Mode 3 The machine can be work in STICK, MANUAL MIG, SYNERGIC MIG, PULSE SYNERGIC MIG and DOUBLE PULSE SYNERGIC MIG.

Refer to the technical manual how to change the operation mode.





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8. Power On display Messages

When you turn on RWS, you can read the following identification data of the machine. example:



first screen: "cho 350" identifies machine version 350A



second screen: "rel 1.01" means the hardware and software version.



third screen: "r. 1 t. 3 "identifies the software revision (r. 2) and the mode of operation of type 3 (t. 3)



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#### 9. - WELDING MODE SELECT



Push knob K1, rotate K1 for select the welding mode, push K1 for confirm. Push K1 and then rotate K1 for Select MMA mode



Push K1 and then rotate K1for Select synergic MIG PULS mode



Push K1 and then rotate K1for Select Manual MIG mode



Push K1 and then rotate K1 for Select Twice MIG mode



Push K1 and then rotate K1for Select synergic MIG mode







#### 10. MMA MODE : PARAMETER SETTING

By KNOB K1 the set of current by KNOB K2 set the arcforce from 0 to 20. The value of arcforce represents both the current increase in the case of a short circuit that the increase of initial current (function hot\_start). The current is adjustable from 20A to 350A. If the cycle led is flashing, the VRD function is disabled. To enable the VRD see section to enable VRD



Rotate K1 for set current Display-1 show set current.

Rotate K2 for set AF





 $\sim$ Instruction Manual 

#### 11. MIG-MAG WELDING:

RWS POWER SOURCE HAS THE POSSIBILITIES TO PERFORM MIG-MAG WELD- c) connect the mig torch to the machine euro adaptor. ING IN MANUAL OR IN SYNERGY, FOR ADVANCED

PULS MIG FOR THE MOST COMMON MATERIALS.



The wire feeder unit can receive 200 or 300 mm size wire spools. Make sure your wire spool is correctly and safely fixed to the pinion than adjust the friction screw.

a) match the driving rolls located into the driving motor with your wire type and size.

b) insert the wire into the driving rolls and push it till the machine euro adaptor. Lock the driving rolls properly.

APPLICATION, THERE ARE ALSO THE POSSIBILITIES TO USE THE PROCESS d) press the torch trigger: wire drives for 5 sec. and stops once the display will light "INC".

> e) release the torch trigger and press it again: wire drives now into the torch at 10 mt/ min, until trigger remain pressed.

f) Fit the shielding gas hose in to the back panel of the machine (gas nipple marked with MIG).

Adjust the flow rate between 16/22 lt/min. depending on the welding task.

g) To set GAS flow, follow the procedure:

By the manual valve in the rear side to adjust the gas flow: clockwise rotation to decrease gas flow, counterclockwise rotation to increase gas flow.



In mig mode can activate the test gas by pressing the torch switch After about 3 seconds the message "INC" for loading wire, after about 3 seconds the message appears LT.M and the relative measurement of flow in liters per minute.

It is possible in this condition adjust the desired flow by acting on the tap on.

(The flow rate measurement refers to the CO2 gas, for ARGON consider that the actual extent is about 7% lower.)

To exit the function, release the torch switch, for a few seconds display show the measurement of inlet pressure

h) connect the earth clamp plug to the negative polarity.

i) adjust the welding parameter in one of the following three mode : MANUAL, SYN-ERGY OR PULSE MIG.









#### Wire Speed Setting - Mig Manual



rotate KNOB K1 to set wire feed speed, rotate KNOB K2 to set voltage,

Adjust the value of inductance : press push button K2 and then adjust by knob K2.

#### Select type of cycle

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pressing 2 times the burtton K2, then by knob K2 select type of cycle the torch button: 2-stroke, 2-stroke with ramps, 4-stroke, 4-stroke with ramps, timer. If you are in the timer mode by pressing the push button K2 after setting the inductance value up to the setting of the welding time.





#### Wire Voltage Setting - Manual MIG mode



# Rotate K2 for set voltage Display-2 show the set voltage.

#### Inductance Setting - Manual MIG mode



Push knob K2 until the icon Inductance (L14) is on. Rotate K2 for adjust the inductance setting. Display-2 show the set inductance. The display return to show the default setting value 5 seconds after last

adjustment.







#### Select the Torch switch cycle - Manual MIG mode



Push knob K2 until icon CYCLE (L15) is ON. Rotate K2 for select the torch switch Cycle.



Set 2T cycle with icon L16 is on.



Set 2T slope cycle with icon L16 and L18 are on.



Set 4T cycle with icon L17 is on.



Set 4T slope cycle with icon L17 and L18 are on.



Timer cycle with icon L19 is on.



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#### 13. SYNERGIC MIG MODE : PARAMETER SETTING

The synergic mode are:

SYNERGIC MIG, SYNERGIC PULSED MIG, SYNERGIC DOUBLE PULSED MIG. In all synergic mig modes the type of wire setting is displayed by the respective LED.

To change the material of the wire press for 3 seconds the knob K1, then select the WIRE you want and confirm by pressing the knob K1.

To select the diameter of the wire use in the same way the knob K2

#### Arc Lenght Setting - Synergic MIG mode



Rotate knob K2 for adjust the setting of lenght arc. Display-2 show the set arc lenght.

#### Inductance Setting - Synergic MIG mode



Push knob K2 until the icon Inductance (L14) is on. Rotate K2 for adjust the inductance setting. Display-2 show the set inductance. The display return to show the default setting value 5 seconds after last adjustment

#### Current Setting- Synergic MIG mode



Default icon lset is on Rotate K1 for adjust set current, or use wire speed setting.

#### Wire Speed Setting - Synergic MIG mode



Push K1 until icon ser speed L1 is on. Rotate K1 for adjust wire speed. Display-1 show the wire speed in mt/min.

#### Thickness Setting - Synergic MIG mode



Push knob K2 until the icon Thickness setting (L13) is on. Rotate K2 for adjust the thickness. Display-2 show the set of value. The display return to show the default setting value 5 seconds after last adjustment .



#### 14. PULSE MIG MODE: PARAMETER SETTING

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#### Current Setting - PULSE MIG mode



Rotate K1 for adjust set current, or use wire speed setting.

#### Wire Speed Setting - PULSE MIG mode



Push K1 until icon ser speed L1 is on. Rotate K1 for adjust wire speed. Display-1 show the wire speed in mt/min.

#### Arc Lenght Setting - PULSE MIG mode



Rotate knob K2 for adjust the setting of lenght arc. Display-2 show the set arc lenght.

#### Inductance Setting - PULSE MIG mode



Push knob K2 until the icon Inductance (L14) is on. Rotate K2 for adjust the inductance setting. Display-2 show the set inductance. The display return to show the default setting value 5 seconds after last adjustment

#### Thickness Setting - PULSE MIG mode



Push knob K2 until the icon Thickness setting (L13) is on. Rotate K2 for adjust the thickness. Display-2 show the set of value. The display return to show the default setting value 5 seconds after last adjustment .



#### TWICE MIG MODE: PARAMETER SETTING

#### Arc Lenght Setting - Twice MIG mode

#### Current Setting - Twice MIG mode



Wire Speed Setting - Twice MIG mode

Rotate K1 for adjust set current, or use wire speed setting.



Inductance Setting - Twice MIG mode

Push knob K2 until the icon Inductance (L14) is on. Rotate K2 for adjust the inductance setting. Display-2 show the set inductance. The display return to show the default setting value 5 seconds after last adjustment

Rotate knob K2 for adjust the setting

Display-2 show the set arc lenght.

of lenght arc.



Push K1 until icon ser speed L1 is on. Rotate K1 for adjust the wire speed. Display-1 show the wire speed in mt/min.

#### Twice Frequenzy Setting - Twice MIG mode



Push K1 until icon Twice set L8 is on. Rotate K1 for adjust twice frequency. Display-1 show the frequency.

#### Thickness Setting - Twice MIG mode



Push knob K2 until the icon Thickness setting (L13) is on. Rotate K2 for adjust the thickness. Display-2 show the set of value. The display return to show the default setting value 5 seconds after last adjustment.



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#### **15. WIRE AND SIZE SELECTION**

#### Select WIRE type

Press push button K1 for 3 second until the led "type of material" start to flash. Rotate K1 for selection and confirm by pressing the knob K1.



#### Select TICKNESS of material

Pres K2 push button for 3 second until the led "size of wire" start to flash. Rotate K2 for change wire, then confirm by pressing the knob K2.





ERRATA CORRIGE : in synergic programs when it is on the led of icon "CuSi", the material selected of synergic program is "FLUX".





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#### 16. RWS-350 SYNERGIC PROGRAMS

MIG SYNERGIC PROGRAMS	PULS MIG SYNERGIC PROGRAMS		
SG2 0.8 CO2			
SG2 0.9 CO2			
SG2 1.0 CO2			
SG2 1.2 CO2			
SG2 0.8	SG2 0.8		
SG2 0.9	SG2 0.9		
SG2 1.0	SG2 1.0		
SG2 1.2	SG2 1.2		
SST 0.8	SST 0.8		
SST 0.9	SST 0.9		
SST 1.0	SST 1.0		
SST 1.2	SST 1.2		
ALMG 1.0	ALMG 1.0		
ALMG 1.2	ALMG 1.2		
ALSI 1.0	ALSI 1.0		
ALSI 1.2	ALSI 1.2		
FLUX 1.2			





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#### 17. TWIN MIG Function

in double synergic mig for RWS series machines.

For all mig synergic programs in addition at the mig pulse mode (PULSE) is aviable the double pulse mig mode (TWIN)

This mode requires a variation of the arc in a continuous manner between two different values at a frequency set by the operator. All parameters (current, speed of wire, voltage, inductance, etc.). moving in synergy mode between the two different values. The set of current that is set on the panel corresponds to the average value of the current between the two different values.

Select TWIN mode by press K1 and then rotate K1 untill frequency LED flashes and display show "OFF", appears to indicate that the frequency mode is not active. By knob K1 you can set the frequency of double pulse from minimun of 0,5 Hz to a maximun of 4,0 Hz.

When the double pulse mode is active the frequency led flashes.

It si possible to select the two following functions : "SPC" and "UP"

#### 17.1 "TWIN SPECIAL MODE " FUNCTION : SPC

To select TWIN SPECAL MODE, in the following procedure.

By SELECT switch select the mode of frequency variation of the double pulse mode.

By knob (ENC1) increase the parameter untill display show "SPC" .

Now it is possible modify frequency, balance and level, for modify this parameter enter in the thecnical parameter mode.

To enter in the thecnical parameter mode by press 3 seconds the K2 pushbutton.

The double pulse frequency can be set from 0,5Hz to 4,0Hz

The Balance can be set from 5 to 90.

This parameter is the the percentage of pulse to the level of low current.

Th level is adjustable from 20 to 90 and represents the percentage of the current value lower than the current value high.

#### 17.2 "TWIN TWIN SPECIAL MODE" FUNCTION : UP

This function is only present in some pulse programs.

This double pulsed function is useful to carry out any ascending welding vertical up. To select TWIN SPECIAL MODE, in the following procedure.

Press and then rotate K1 to select the mode of frequency variation of the double pulse mode. Then by K1 increase the parameter untill display show "SPC" and "UP" (re-

member, this function is enabled not in pulsed all programs) "Twin -up" program works in double pulsed with the parameters of the synergic pro-

gram.

When TWIN UP program is active the "mode pulse " led flashes.



When digital torch is working, it is possible to save a program with function pulse-up activated, and another program with "pulse-up disactived. You can then enable or disable the function, by selecting differents job.

Programs with function PULSE -UP:

SG2 1,0 SG2 std 1,2 SST 1,0 SST std 1,2



#### 18. STAND BY

The RWS enters standby mode automatically after a certain time that is not used (about 10 minutes). In this mode are reduced to a minimum consumption, moreover, if the RWS has been used for the last time in stick mode disables the possibility to start the arc. To exit standby mode, simply press one of the encoders or the trigger, if you press knob K1 or K2 you bring in the latest welding method used, and if you press the button mig torch you carry the last mode used.

#### **19. VRD - VOLTAGE REDUCTION DEVICE**

In MMA mode by holding down the K2 push button for about 5 seconds you can arm / disarm function VRD\_ON. The display will show the state of VRD.

The presence of the function is displayed on LED cycle flashing. Led cycle flashing : VRD OFF Led cycle close: VRD ON

#### 20. ALARMS AND SETTINGS

The power sources are completed with a monitoring system of the machine conditions in order to avoid failure in the machine and in the welding.

In particular the alarms involve in:

Power supply quality in the voltage, undervoltage and overvoltage .

Output welding conditions, short circuit or welding over limits Inverter over heating or over load or over current.

REFER TO THE ALARM LIST PARAGRAPH FOR THE DETAILS

# 21. POWER SUPPLY QUALITY IN THE VOLTAGE: UNDERVOLTGE, OVERVOLTAHGE CONTROLS

The welding generators have an DC input voltage of 80V (min 35V - max 95V). RWS versions can be supplied with DC generators and/or long cables (within the min/max input voltage limits).

In case power supply exceeds the mentioned limits, machine functions stop and display shows the detected anomaly in the DC BUS. Reset the machine by turn off and then turn on.

# 22. OUTPUT WELDING CONDITIONS, SHORT CIRCUIT OR WELDING OVER LIMITS

A circuit test is released every time you switch "ON" the machine. The correct output polarities are checked-out and in case of an eventual short circuit detection, machine enters in alarm standby showing on the display:

Once short circuit conditions are removed, machine test will continue correctly. Short circuit conditions may appear even during the welding job: in case they persist continuously for more than 5 sec, generator enter in "short circuit alarm". The "anti sticking" icon lights too.

Fires, burns and shocks may be caused by uncorrected current outputs. Reasons may be found on:

• involuntary failures on mig jobs which may release, without any control, the weld ing wire: it melt entering in contact with negative polarities generating possible fire and burn conditions

• damaged cables, with insulation losses, etc.





## 23. ALLARMS

Error Nr.	ALARM	DISF	PLAY-1	DISPLAY2		DESCRIPTION	ACTION
15	HI DC POWER	ALL	Err		15	alarm supply voltage too high (xxx is the value read), is obtained if the supply voltage exceeds 95 volts for 1 second	check DC power supply. turn of and tun on again
16	LO DC POWER	ALL	Err		16	alarm supply voltage too low (xxx is the value read), is obtained if the supply voltage drops below 35 volts for 1 second	check DC power supply. turn of and tun on again
20	OVERCURRENT PROTECTION	ALL	Err	CUR	20	not controlled overcurrent alarm	turn of and tun on again
21	INTERNAL ALARM OF POWER DRIVER	ALL	Err	СНО	21	alarm of IGBT driver: missing feedback	turn of and tun on again
22	HARDWARE ALARM	ALL	Err	HAR	22	alarm of internal hardware	turn of and tun on again
24	HAL SENSORE ALARM	ALL	Err	HAL	24	Hall probe alarm	turn of and tun on again
26	OFFSET HALL SENSOR ALARM	ALL	Err	DAC	26	INTERNAL Alarm internal DAC or comparator	turn of and tun on again
30	THEMPERATURE ALARM	ALL	Err	°C	30	Alarm too high temperatur. Over temperature of the power section.	wait a few minutes
31	NTC OPEN ALARM	ALL	Err	NTC	31	Alarm temperature sensor NTC open. Over temperature of the internal power supply board.	wait a few minutes
32	NTC SHORT CIRCUIT ALARM	ALL	Err	THC	32	alarm of NTC temperature sensor is close. Possible fault in the pre- charging board.	turn of and tun on again
40	ENCODER ALARM	ALL	Err	ENC		alarm of encoder of the wire feeder motor.	to do speed moto calibration
41	BREAK MOTOR FEEDER ALARM	ALL	Err	BRA	41	alarm brake of wire feeder motor.	possible fault of motor driver board. turn of and tun on again
42	SPEED MOTOR OF WIRE FEEDER ALARM	ALL	Err	MOT	42	alarm of motor feeder	to do speed moto calibration
50	ERROR IN THE MEMORY EEPROM	ALL	Err	ТАВ	50	wrong data in the EEPROM	turn of and tun on again
51	MEMORY ALARM	ALL	Err	MEM	51	alarm during writing the eeprom	turn of and tun on again
52	COMUNICATION ALARM OF I2C	ALL	Err	I2C	52	Error in the comunication from external memory to microprocessor	turn of and tun on again
60	SHORT CIRCUIT ALARM	ALL	Err	SC	60	ALARM SHORT CIRCUIT OCCURS WHEN SHORT CIRCUIT IN THE OUTPUT	OUTPUT CABLE IN SHORT CIRCUIT, CHECK OUTSIDE THE MACHINE
90	CLOSED CIRCUIT OF PRECHARGE AT THE START UP	JUS	Err	CLO	90	PRECHARGE CLOSE ALARM	turn of and tun on again
91	NOT CLOSED CIRCUIT OF PRECHARGE	NOT	Err	CLO	91	PRECHARGE NOT CLOSE ALARM	turn of and tun on again
92	OPEN CIRCUIT OF PRECHARGE	OPE	Err	NED	92	PRECHARGE OPEN ALARM	turn of and tun on again





#### 24. SPECIAL FUNCTIONS

#### 24.1 RESET TO DEFAULT SETTING FUNCTION (default working parameters)

Simultaneously press for 10 seconds the push button K1 and K2,

Confirm YES by the push button K2 until the display show the menu load default working parameters.

#### 24.2 LOCK / UNLOCK JOBS FUNCTION

This function is activated only if insert the digital torch and it configurated in job mode. LOCK JOBS :

To activate the LOCK JOB take on the job 2 and then press the torch switch at the top left (like to move to the job 3) for 10 seconds or so, until the message "JOB LOC". If it is activate LOCK JOBS also locks the setting of VRD in MMA mode

#### UNLOCK JOBS:

To deactivate the LOCK JOB take on the job 4, and then press the torch on the bottom left (like to move to the job 3) for 10 seconds or so, until the message "JOB FRE."

#### LOADING WIRE : INC FUNCTION.

To insert the wire to press the torch switch without starting the welding cycle, after about 4 seconds, the display shows "INC". Release and re-press the torch switch within 3 seconds, the wire comes out without gas at speeds up to 10 m / min. To stop, just release the torch switch

#### 24.3 TEST GAS FUNCTION

In one mig mode it is possible to activate the test gas.

Press K2 push-button for about 3 seconds. Once active the test gas after a few seconds the display shows the pressure of the inlet gas in BAR.

If you press the torch switch opens the solenoid valve and the display indicates the number of liters per minute.

In this conditions It is possible adjust the flow by acting on the tap.

(The flow rate measurement refers to the CO2 gas, for ARGON consider that the actual extent is about 7% lower.)



By the manual valve is possible to adjust the gas flow control Rotation clockwise to decrease gas flow. Rotate counterclockwise to increase gas flow



GAS

FLOW CONTROL



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#### 24.5 SPEED WIRE CALIBRATION

When the wire is fully loaded is recommended to perform the wire feeder calibration.

To enter the calibration speed wire function press torch switch for 3 seconds, untill display show INC and the motor stops release the torch switch and press 3 times the push buttom K2, untill display show SPD SET.

Press torch switch again, the wire exits without gas, first at 3 m/min and then to 10 m/min, then stops. This operation serves to control board to calibrate the motor speed and must be performed to load, with the wire inserted in the sheath.

#### 24.6 SEE SET / SEE REAL FUNCTION

Set MANUAL MMA mode, set current 123A (in to display 1), set arcforce 45 (in to dipslay 2).

Press PUSH BUTTON K1 for 3 seconds If is active the function see set, and you want activate the function see real.

Press PUSH BUTTON K1 for 3 seconds If is active the function see real, and you want activate the function see set.

In SEE SET mode during the welding the display show setting parameters.

In SEE REAL mode during the welding the display show real working parameters : output current and output voltage.



## 25. DIGITAL TORCH

Special torches can be used.

In MIG, the use of the DIGIT MIG torch allow the direct setting from the handle of the torch. The DIGIT MIG Torch has four push buttons in the top of the handle. It is enough to connect the torch to the Binzel connector and than the machine recognise the external control and accept the remote adjustment. There are two mode of working with the torch: Analog adjustment Jobs adjustment

NOTE: The torch adjust trough its pushbuttons also during welding, but 4 step or 4 step + slopes cycles must be used.







IN JOB MODE ONE OF THESE LEDS IS ON





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#### **DIGITAL TORCH**

The digital torch has two operational mode, SET and JOBS, to switch from one mode to the other one, push together the bottom side of the switches. In JOBS mode any adjustment can be done from the front panel and is stored inside the current JOB.



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#### 26. RWS-350 SPARE PARTS



RWS-350 SPARE PARTS LIST					
NR.	Code	Description	Ref. Diagram		
1	T231PCB	POWER SUPPLY BOARD	PCB3		
2	T232PCB	POWER MODULE DRIVER BOARD	PCB5		
3	T246PCB	PRECHARGE RELE' BOARD	PCB4		
4	E0092AA	IGBT MODULE	MD1		
5	T242PCB	GAS SENSOR BOARD	PCB6		
6	E0033AA	HALL SENSOR	HALL1		
7	A0003AA	GAS ELECTRO VALVE	EV1		
8	A0023AA	WIRE FEEDER MOTOR	MOT1		
9	Z0077AA	wire feeder rolls V type 0,8-1,0 mm			
9	Z0024AA	wire feeder rolls V type 1,2-1,6 mm			
9	Z0121AA	wire feeder rolls U type 1,0-1,2 mm			
10	D0203AA	5 pole plug (female) conector	X42		
11		RWS CONTROL PANNEL	PCB1-PCB2- PCB7		
12	C0415AA	PROTECTION PANEL FOR CON- TROL PANEL			
13		FEMALE DINSE CONNECTOR	X33-X21		
14		MALE DINSE CONNECTOR	X41		
15	D0222AA	FAN 24V DC	FAN1-FAN2- FAN3-FAN4		
16		FLANGE BRASS COMPONENTS	X36		
17	D0227AA	BRASS TUBE			
18	C0144AA	KNOB			
19	T247PCB	PUSH-PULL CONTROL BOARD	PCB8		



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## RWS-350 SPARE PARTS





R



RWS 350

#### 27. RWS 350 WIRE FEEDER DIAGRAM







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28. AUXILIARY CONNECTIONS OF 5 POLES CONECTOR

On the 5 poles male connector in the front side, the following connections are available :

PINS 1-2: AUXILIARY POWE RSUPPLY +24V 1,5A MAX PINS 1-3 : OUTPUT DRIVER MOTOR PUSH-PULL TORCH (AVAILABLE OPTIONS) PINS 4-5 : TORCH SWITCH AND REMOTE CONTROL FOR ADJUSTMENT CUR-RENT SET

PIN 1)+24V : POSITIVE +24V OF AUXILIARY POWER SUPPLY PIN 2)GND : NEGATIVE GND OF AUXILIARY POWER SUPPLY PIN 3)OUT PUSH-PULL; PIN 4) TORCCH SWITCH; PIN 5) TORCH SWITCH





5 POLES FEMALE CONNECTIONS











29. PUSH PULL TORCH CONNECTIONS (OPTIONAL)

It is possible to connect the push-pull torch in the 5 poles male connector in the front side. Thi is optional aviable.

PINS 1-3 : OUTPUT DRIVER MOTOR PUSH-PULL TORCH (AVAILABLE OPTIONS) PINS 4-5 : TORCH SWITCH AND REMOTE CONTROL FOR ADJUSTMENT CUR-RENT SET

PIN 1) POSITIVE of +24V OF POWER SUPPLY PIN 3) OUTPUT DRIVER MOTOR OF PUSH-PULL; PIN 4) TORCCH SWITCH; PIN 5) TORCH SWITCH

If the push-pull installed, it is shown in the screen printing front like pictures:











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