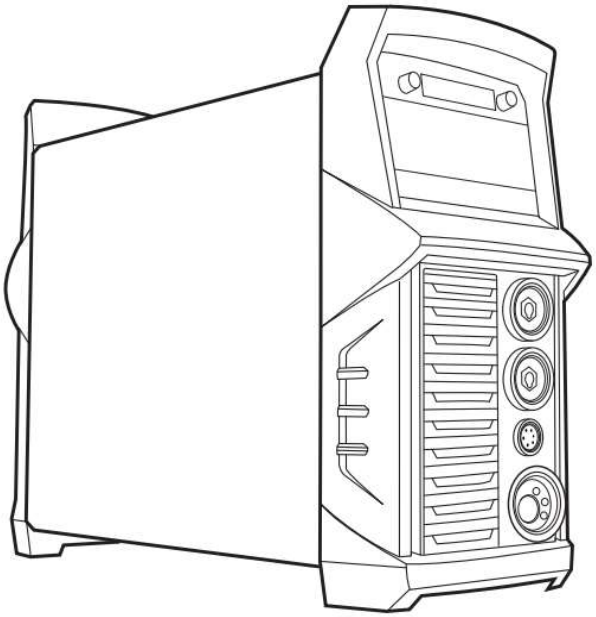
TitanMig Pulse 2700 Compact

OPERATING MANUAL



Operating manual EN

Brugsanvisning DA

Gebrauchsanweisung DE

Manual de instrucciones ES

Käyttöohje FI

Manuel d’utilisation FR

Manuale d’uso IT

Gebruiksaanwijzing NL

Bruksanvisning NO

Instrukcja obsługi PL

Manual de utilização PT

Инструкции по эксплуатации RU

Bruksanvisning SV

操作手册 CN

English

SAFETY RULES

Explanation of safety symbols

These general safety norms cover both arc welding machines and plasma cutting machines unless otherwise noted.

DANGER! indicates immediate and real danger. If it is not avoided, death or serious injury will result.

WARNING! indicates a potentially dangerous situation. Death or serious injury may result if appropriate precautions are not taken.

CAUTION! indicates a situation where damage or injury could occur. If it is not avoided, minor injury and/or damage to property may result. NOTE! indicates a risk of flawed results and possible damage

NOTE! indicates a risk of flawed results and possible damage to the equipment

IMPORTANT! indicates tips for correct operation and other particularly useful information. It does not indicate a potentially damaging or dangerous situation.
If you see any of the symbols depicted in the "Safety rules", special care is required.

Intended purpose

The equipment must only be used for the purpose it was designed for. Using it in any other way could result in damage or injury and in breach of the safety rules. Only suitably trained and competent persons should use the equipment. Operators should respect the safety of other persons.

Prevention against electric shock

The equipment should be installed by a qualified person and in accordance with current standards in operation. It is the users responsibility to ensure that the equipment is connected to a suitable power supply. Consult with your utility supplier if required.
If earth grounding of the work piece is required, ground it directly with a separate cable.
Do not use the equipment with the covers removed.
Do not touch live electrical parts or parts which are electrically charged.
Turn off all equipment when not in use.
Cables (both primary supply and welding) should be regularly checked for damage and overheating. Do not use worn, damaged, under sized, or poorly jointed cables.
Ensure that you wear the correct protective clothing, gloves, head and eye protection.
Insulate yourself from work and ground using dry insulating mats or covers big enough

to prevent any physical contact with the work ground.
Never touch the electrode if you are in contact with the work ground, or another electrode from a different machine.
Do not wrap cables over your body.
Ensure that you take additional safety precautions when you are welding in electrically hazardous conditions such as damp environments, wearing wet clothing, and metal structures. Try to avoid welding in cramped or restricted positions.
Ensure that the equipment is well maintained. Repair or replace damaged or defective parts immediately. Carry out any regular maintenance in accordance with the manufacturers instructions.

Safety against fumes and welding gases

Locate the equipment in a well-ventilated position.
Keep your head out of the fumes. Do not breathe the fumes.
Ensure the welding zone is in a well-ventilated area. If this is not possible provision should be made for suitable fume extraction.
If ventilation is poor, wear an approved respirator. Read and understand the Material Safety Data Sheets (MSDS's) and the manufacturer's instructions for metals, consumable, coatings, cleaners, and de-greasers.
Do not weld in locations near any de-greasing, cleaning, or spraying operations. Be aware that heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
Do not weld on coated metals, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings on many metals can give off toxic fumes if welded.

Prevention against burns and radiation

Arc rays from the welding process produce intense, visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.
Wear an approved welding helmet fitted with a proper shade of filter lens to protect your face and eyes when welding or watching
Wear approved safety glasses with side shields under your helmet.
Never use broken or faulty welding helmets.
Always ensure there are adequate protective screens or barriers to protect others from flash, glare and sparks from the welding area. Ensure that there are adequate warnings that welding or cutting is taking place.
Wear suitable protective flame resistant clothing. The sparks and spatter from welding, hot work pieces, and hot equipment can cause fires and burns
Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode.
Accidental contact of electrode to metal objects can cause arcs, explosion, overheating, or fire.
Check and be sure the area is safe and clear of inflammable material before carrying out any welding.

Protection against noise

Some welding and cutting operations may produce noise.

Wear safety ear protection to protect your hearing.

Protection from moving parts

When the machine is in operation keep away from moving parts such as motors and fans. Moving parts, such as the fan, may cut fingers and hands and snag garments.

Protections and coverings may be removed for maintenance and controls only by qualified personnel, after first disconnecting the power supply cable.

Replace the coverings and protections and close all doors when the intervention is finished, and before starting the equipment.

Take care to avoid getting fingers trapped when loading and feeding wire during set up and operation.

When feeding wire be careful to avoid pointing it at other people or toward your body.

Always ensure machine covers and protective devices are in operation.

Precautions against fire and explosion

Avoid causing fires due to sparks and hot waste or molten metal

Ensure that appropriate fire safety devices are available near the cutting / welding area.

Remove all flammable and combustible materials from the cutting / welding zone and surrounding areas

Do not cut/weld fuel and lubricant containers, even if empty. These must be carefully cleaned before they can be cut/welded.

Always allow the cut/welded material to cool before touching it or placing it in contact with combustible or flammable material.

Do not work in atmospheres with high concentrations of combustible fumes, flammable gases and dust.

Always check the work area half an hour after cutting to make sure that no fires have begun

Risks due to magnetic fields

The magnetic fields created by high currents may affect the operation of pacemakers or electronically controlled medical equipment.

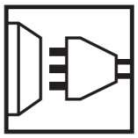
Wearers of vital electronic equipment should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

Do not go near welding equipment with any sensitive electronic equipment as the magnetic fields may cause damage.

RF Declaration

Equipment that complies with directive 2004/108/EC concerning electromagnetic compatibility (EMC) and the technical requirements of EN60974-10 is designed for use in industrial buildings and not those for domestic use where electricity is provided via

the low voltage public distribution system. Difficulties may arise in assuring class A electromagnetic compatibility for systems installed in domestic locations due to conducted and radiated emissions.
In the case of electromagnetic problems, it is the responsibility of the user to resolve the situation. It may be necessary to shield the equipment and fit suitable filters on the mains supply.

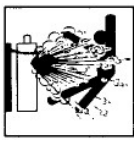


LF Declaration

Consult the data plate on the equipment for the power supply requirements.
Due to the elevated absorbance of the primary current from the power supply network, high power systems affect the quality of power provided by the network. Consequently, connection restrictions or maximum impedance requirements permitted by the network at the public network connection point must be applied to these systems.
In this case the installer or the user is responsible for ensuring the equipment can be connected, consulting the electricity provider if necessary.

Materials and their disposal

The equipment is manufactured with materials, which do not contain any toxic or poisonous materials dangerous to the operator.
When the equipment is scrapped, it should be dismantled separating components according to the type of materials.
Do not dispose of the equipment with normal waste. The European Directive 2002/96/EC on Waste Electrical and Electronic Equipment states the electrical equipment that has reached its end of life must be collected separately and returned to an environmentally compatible recycling facility.



Handling of Compressed gas cylinders and regulators

All cylinders and pressure regulators used in welding operations should be handled with care.
Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a cylinder.
Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
Always secure the cylinder safely.
Never deface or alter any cylinder

Contents

1. PREFACE

1.1 General

Congratulations on choosing TitanMig Pulse 2700 Compact welding machine. Used correctly, our products can significantly increase the productivity of your welding, and provide years of economical service.
This operating manual contains important information on the use, maintenance and safety of your product. Please read the manual carefully before using the equipment for the first time.
For your own safety and that of your working environment, pay particular attention to the safety instructions in the manual.
For more information on our products, us, consult an authorised dealer, or visit company web site.
The specifications presented in this manual are subject to change without prior notice.

Important notes

Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with the **'NOTE!'** notation. Read these sections carefully and follow their instructions.

Disclaimer

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. We reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from us.

1.2 Introduction

TitanMig Pulse 300 Compact (TMP 2700C) is CC/CV welding power sources designed for demanding professional use. It is suitable for synergic Pulsed MIG/MAG, synergic 1-MIG/MAG,Lift-Tig, Tig Pulse and MMA welding in DC current. TMP 2700C offers both technical and commercial welding solutions matching a wide range of applications from sheet metal fabrication to heavy industry segments.

The TMP 2700C power sources is digitised microprocessor-controlled inverter power sources. The TMP 2700C features an integral 4-roller drive. There is no longer an interconnecting hosepack between the power source and wire-feed unit. Its compact design makes the 2700C particularly suitable for mobile applications. All models are multiprocess devices: - MIG/MAG welding - TIG welding with touchdown ignition- Manual metal arc welding

The TMP 2700C is used in workshops and industry for manual and automated applications with classical steel, galvanised sheets, chrome/nickel and aluminium. The integral 4-roller drive, high performance and light weight of the TMP 2700C power source make it the ideal choice for portable applications on building sites or in repair workshops.

1.3 Technical Specifications

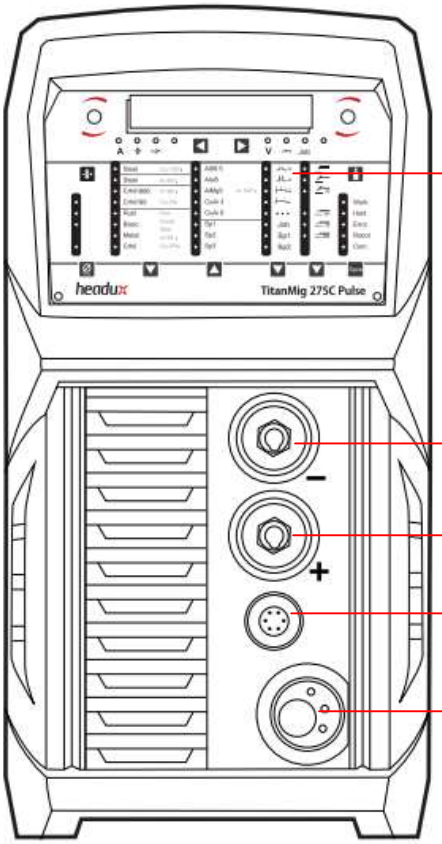
	TMP 2700C
Power Supply / Phases (V-Ph)	220/230/240 V 1 Phase
Duty Cycle@40°c to AS/NZ60974	35% @ 270Amps MIG (35% @ 270 Amps TIG, 35% @ 270 Amps MMA)
Rated Output Power Rate	270/27.5V
Rated Input Current	50 A
Power Factor	0.75
Efficiency	90%
Gas pre-flow time (Preg)	0～15s
Post-flow time(Posg)	0～15s
Soft start speed (Stfd)	Auto，0.5～22 m/min
Wire Feeder Type	Gear Driven 4 Roll
Protection Class	IP 21S
Insulation Class	H
Dimensions Power Source (LxWxH)	685x295x560mm
Weight Power Source	38 Kgs

1.4 Overview of machine

Front View

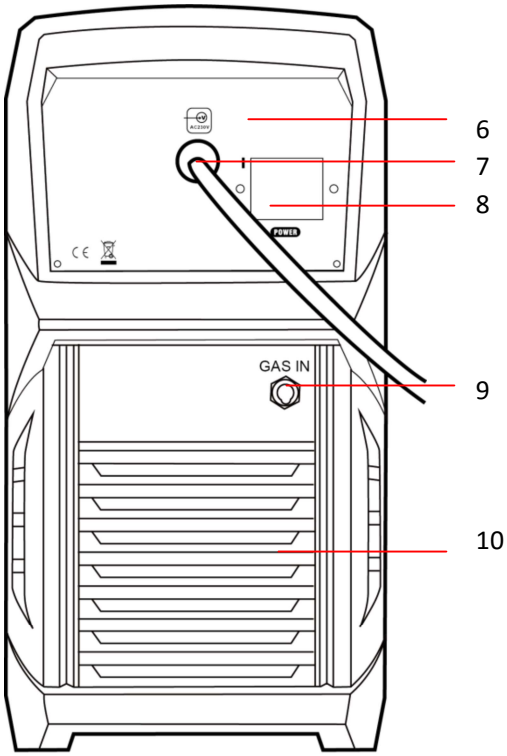
Power Source Front Panel Layout

1. Control Panel
2. “—” output terminal
3. “+” output terminal
4. Socket of wire pull torch control cable
5. Euro connector of the welding torch in MIG



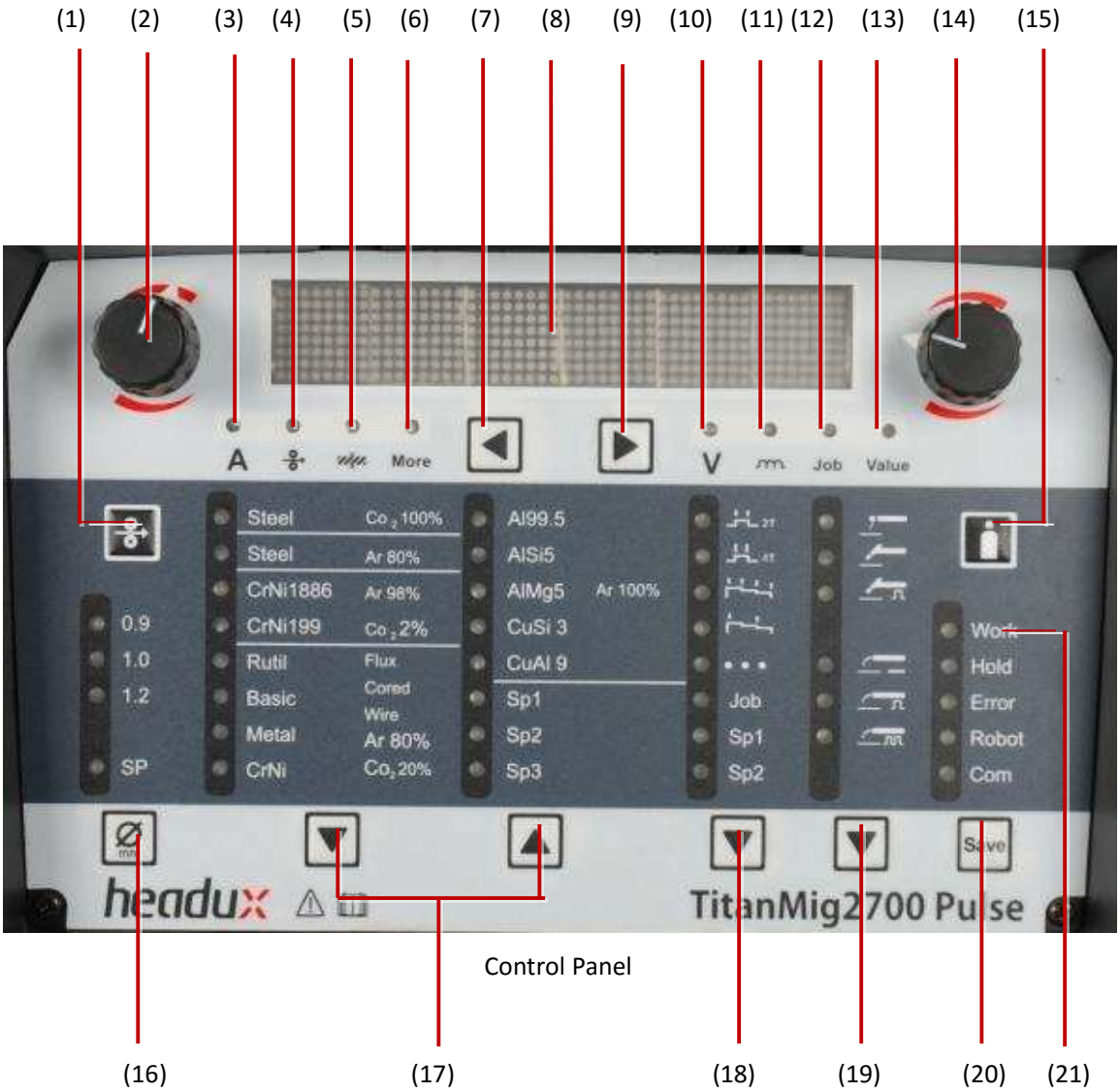
Rear View

6. Rating Plate
7. Input cable
8. Power switch
9. Gas solenoid inlet fitting
10. Fan



Rear

1.5 Description of the control panels



Control Panel

(1) Feeder inching button

for feeding the wire electrode/wire into the torch-hosepack without any flow of gas or current.The inching speed is preset in 3m/min but can be adjusted in setup setting (more details please check section **1.7**)

(2) Knob L (left)

for altering the following welding parameters.

Welding current in Amps (*Syn)

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. During welding, the actual value is displayed.

Wire feed speed(*Syn)

Wire feed speed in m/min or ipm.

Sheet thickness(*Syn)

Sheet thickness in mm or in.

More indicator

indicates more parameters that not be showed on the panel could be selected. If the indicator on the adjusting dial is lit up, then the selected parameter is one that can be altered.

Note: (*Syn)

The synergic function means that if one of these parameters is selected during MIG/MAG pulse synergic welding or MIG/MAG standard synergic welding, then all other parameters including the welding voltage parameter are automatically set as well.

(3) Welding current LED

lights up when the welding current parameter is selected

(4) Wire feed speed LED

lights up when the wire feed speed parameter is selected

(5) Sheet thickness LED

lights up when the sheet thickness parameter is selected

(6) More indicator

lights up when the other parameters are selected(more parameters set up please check section 1.7)

(7) Parameter selection button(Left)

for selecting the following parameters:

Welding current in A (*Syn)

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. During welding, the actual value is displayed.

Wire feed speed(*Syn)

Wire feed speed in m/min or ipm.

Sheet thickness(*Syn)

Sheet thickness in mm or in.

More indicator

indicates more parameters that not be showed on the panel could be selected.

(8) Digital display

(9) Parameter selection button (Right)

for selecting the following parameters:

Arc length /Welding voltage (*Syn)

displays arc length in % of standard voltage value based on the programmed parameters , During welding, the actual voltage is displayed in V

Droplet detachment correction/arc force dynamic correction/arc force dynamic

has a different function assigned to it, depending on the process being used. A description of the various functions can be found in the Welding chapter under the corresponding process.

Job No

In the job mode, the welding parameter can be stored and recalled.

Value indicator

indicates more parameters could be selected.

Note: (*Syn)

Synergic function, the voltage value automatically matches with the adjusted current. So the display value is zero. But it can be adjusted within the rang ±50% of the matched voltage value.

(10) Welding voltage LED

lights up when the welding voltage parameter is selected.

(11) Droplet detachment correction/arc force dynamic correction/arc force dynamic LED

lights up when the Droplet detachment correction/arc force dynamic correction/ arc force dynamic parameter is selected

MIG/MAG pulse synergic welding:

for continuous correction of the droplet detachment energy

- lower droplet detachment force

0 neutral droplet detachment force

+ higher droplet detachment force

MIG/MAG standard synergic welding:

for influencing the short-circuiting dynamic at the instant of droplet transfer

- harder, more stable arc

0 neutral arc

+ soft, low-spatter arc

MMA welding

Arc-force dynamic to influence the short-circuiting dynamic at the instant of droplet transfer

0 soft, low-spatter arc

100 harder, more stable arc

(12) Job no. LED

lights up when the job number parameter is selected(more details please check section 1.6)

(13) Value indicator

lights up when other parameters are selected(more parameters set up please check section 1.7)

(14) Knob R (Right)

for altering welding parameters.

If the indicator is lit up, then the selected parameter is one that can be altered

(15) Gas test button

for setting the required gas flow rate on the pressure regulator.

If you press the gas test button, the gas will flow without pressing gun trigger. Gas flow can be measured by the CO2 or Argon flow meter.

Gas flow will be stopped when release the button.

(16) Wire diameter button

for selecting the diameter of the wire to be used.

Press to choose welding wire diameter orderly from 0.8mm, 1.0mm, 1.2mm. Only be used in MIG, Pulse MIG and Double pulse MIG welding processes. Parameter SP is reserved for additional wire diameters.

(17) Material button

for selecting the filler metal and shielding gas to be used.

Parameters SP1 and SP2 are reserved for additional materials.

No.	Material	Protect gas	Welding Wire (AWS)
1	Steel	100% CO2	Carbon Steel wire
2	Steel	80% Ar + 20% CO2	Carbon Steel wire
3	CrNi 18 8 6	98% Ar + 2% CO2	ER307 SS solid wire
4	CrNi19 9	98% Ar + 2% CO2	ER308 SS solid wire
5	Rutil	80% Ar + 20% CO2	Acid/Rutil flux-cored wire
6	Basic	80% Ar + 20% CO2	Basic flux-cored wire
7	Metal	80% Ar + 20% CO2	Metal flux-cored wire
8	CrNi	80% Ar + 20% CO2	CrNi flux-cored wire
9	Al99.5	100% Ar	ER1050 Al wire
10	AlSi 5	100% Ar	ER4043 AlSi wire
11	AlMg 5	100% Ar	ER5356 AlMg Wire
12	CuSi 3	100% Ar	ER Cu Si wire
13	CuAl 9	100% Ar	ER Cu Al wire

(18) Mode button

for selecting the mode

2-step mode

4-step mode


Special 4-Step Mode


Special 4-Step Mode

 Spot welding mode

Job N/A at moment

Sp1 Special Mode 1, N/A

Sp2 Special Mode 2, N/A

(19) Process button(s)

for selecting the welding process

 Manual metal arc welding

 Lift-TIG welding

 Pulse Lift-TIG welding

 MIG/MAG standard synergic welding

 MIG/MAG single pulse synergic welding

 MIG/MAG double pulse synergic welding

When a process is selected, the LED on the relevant symbol lights up.

(20) Save Button:

For saving the welding parameters and opening the Setup menu

(21) Function

Work Lights up when under welding process.

Hold lights up when under no-load working, the display shows the average current and voltage during the welding

Error lights up if an error has occurred

Robot Lights up when connecting Robot

Com Lights up when connecting other equipments

1.6 Job Mode

Job mode enhances the quality of welding engineering fabrication. Up to 100 common jobs (operating points) can be reproduced in job mode, avoiding the need to document parameters by hand.

The suitable welding parameters value for different welding application can be stored at any time. Its very convenience to recall the stored welding parameter when use it next time. No need to preset and adjust the welding parameter value each time before welding.

Selecting Job indicator

1) Press ***Parameter selection button (Right)***  to select “Job” indicator.

2) Turn ***Knob R(Right)***  to select the **Job 0** (*)

3) The display shows the last welding parameter.

**** Job 0*** is specially used for automatically memory storage, which can store the last welding parameter automatically. The last welding parameter can be retrieved from Job 0 when restart the welding machine.

Creating a job

1) Set the desired welding parameters that you want to store as a Job (The display shows the welding parameters which will be stored.

2) Press ***Parameter selection button (Right)***  to select “Job” indicator. The display shows “Job No”.

3) Press ***Save Button***  , the display shows “ – Job No.” (Reference: **Figure 1.6.1**)

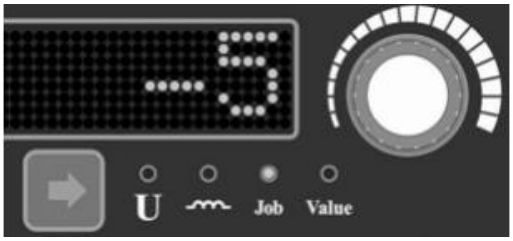


Figure 1.6.1

4) Turn ***Knob R(Right)***  to select the desired program location/Job No.

5) Press ***Save Button***  , the display shows "Finished", means the parameter has been stored to the Job number you just selected .

Retrieving a job

1) Press ***Parameter selection button (Right)***  to select ”Job” indicator. The display shows “Job No.”

2) Turn ***Knob R(Right)***  to select the desired Job No. The display shows the welding parameters which has been stored in this Job No.

1.7 Setup Settings

NOTE! Please make sure the machine is installed and *not turned on before the* Setup setting.

Opening Setup Menu and adjust the parameters

1) Press and hold ***Save Button***  , and turn on the power switch of the machine.
After few seconds, it opens the Setup Settings Menu. The display shows "Preg" as Figure 1.7.1.

Figure 1.7.1.

2) Press ***Parameter selection button (Left)***  to select “More” indicator, then the left part of the display shows the parameter name, and the right part of the display shows the parameter value.

4) Turn ***Knob L(left)***  to select the parameter name, turn ***Knob R(Right)***  to adjust the parameter value.

5) Press ***Save Button***  , the display shows "Finished", means the parameter has been reset and stored. Then restart the machine and start to weld.

Welding Parameters in Setup Menu:

1) PreG

Pre-gas flow time

Unit S

Setting Range 0-15

Factory Setting 0.1 , the default value is 0.1s.

It works for MIG, Pulse MIG, Double Pulse MIG, TIG, Pulse TIG and Spot TIG.

2) PosG

Post-gas folw time

Unit S

Setting Range 0-15

Factory Setting 0.1 , the default value is 0.1s.

It works for MIG, Pulse MIG, Double Pulse MIG, TIG, Pulse TIG and Spot TIG welding processes.

3) Stfd

Soft start wire feed speed

Unit m/min

Setting Range 1-22 or Auto

It works for MIG, Pulse MIG and Double Pulse MIG welding process.

4) Infd

Inch wire feed speed

Unit m/min

Setting Range 1-22 or Auto

It works for MIG, Pulse MIG and Double Pulse MIG welding process.

5) NetP--Master station MACID of Devicenet: 0-63.(N/A)

6) NetS –Slave station MACID of Devicenet: 0-63. (N/A)

7) Netb-Device net baud rate (N/A)

Unit k

Setting Range 0-125 / 1-250 / 2-500

8) Set1 (N/A)

System Set 1

1 allow the simulation remote control,

0 Not allow the simulation remote control,

9) Set2

System Set 2
N/A

10) Fdp
Wire feed machine coefficient **(Please see Fdc)**

11) Fdc
wire feed machine constant
According the different wire feed motor, setting up different coefficient.
First Type, 24V, 22M/Min, 5A motor: Fdp = 400; Fdc = 426;
Second Type, 24 v, 22 m, 3.5 A motor: Fdp = 371; Fdc = 400;
11) Pas1/ Pas2/ Pas3/ Pas4
Setting up Password (Password setting for upgrading functions)

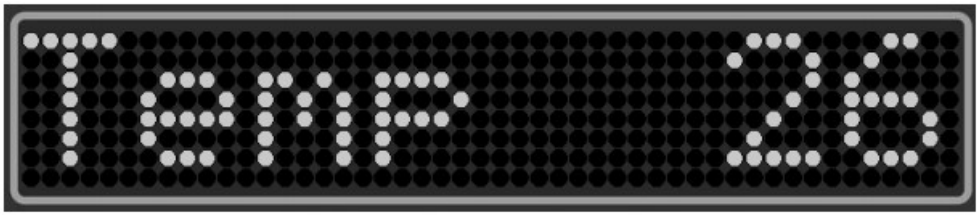
1.8 Machine status display

TMP series welding machine can display some information and status of the welder. After startup welding, the LED will display the company LOGO, hardware, software version, 25 welding process, expert database material type and whether support DEVICENET and WIFI one by one.
Operation process of the welding machine status display

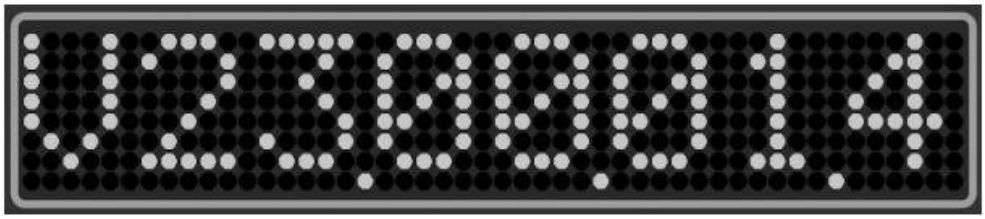
1) Press  to choose the display value as 

.

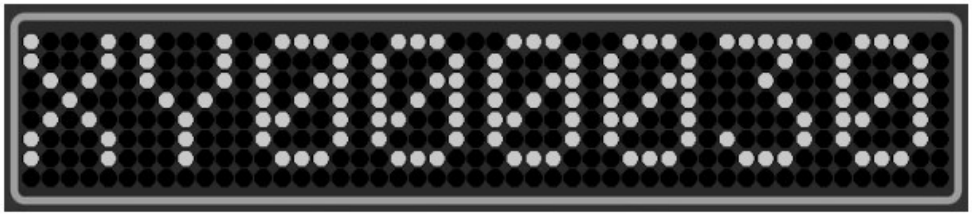
2) Turn the left side  to show different status of the welding machine as following:



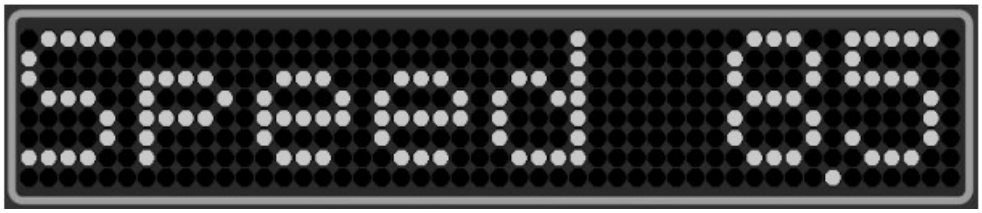
Machine internal temperature is 26℃



Hardware version for V23, software version for V1.4



Machine serial number as XY000030



Actual wire feed speed in 8.5 m/min

2. INSTALLATION

Unpacking

Check the packaging for any signs of damage.

Carefully remove the machine and retain the packaging until the installation is complete.

Location

The machine should be located in a suitable position and environment. Care should be taken to avoid moisture, dust, steam, oil or corrosive gases

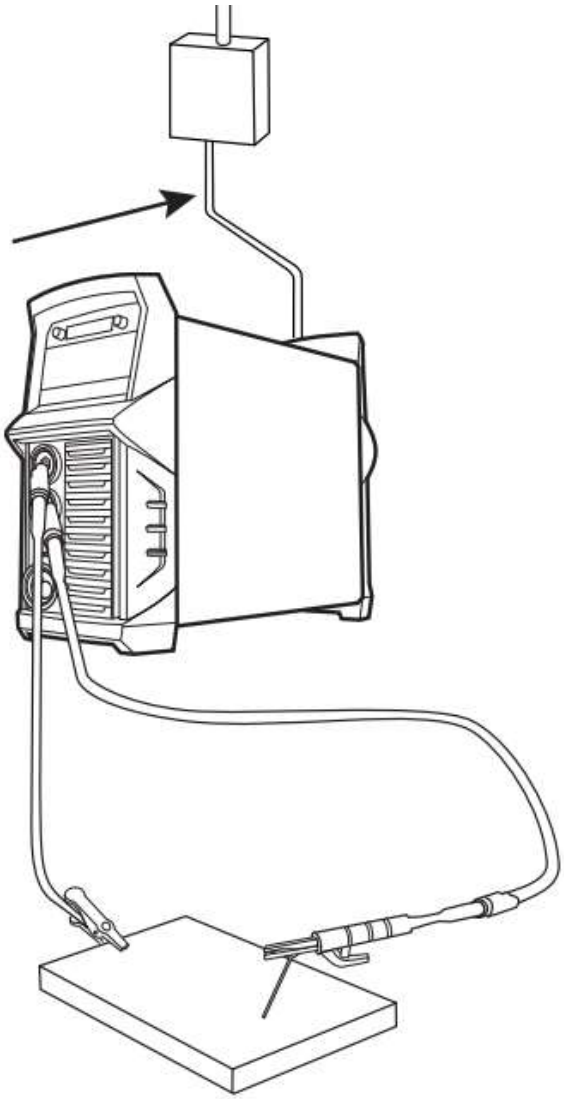
Place on a secure level surface and ensure that there is adequate clearance around the machine to ensure natural airflow.

Input connection

Before connecting the machine you should ensure that the correct supply is available. Details of the machine requirements can be found on the data plate of the machine or in the technical parameters shown in the manual.

The equipment should be connected by a suitably qualified competent person. Always ensure the equipment has a proper grounding.

Never connect the machine to the mains supply with the panels removed.



Output connections

Electrode polarity

In general when using manual arc welding electrodes the electrode holder is connected the positive terminal and the work return to the negative terminal. Always consult the electrode manufacturer's data sheet if you have any doubts.

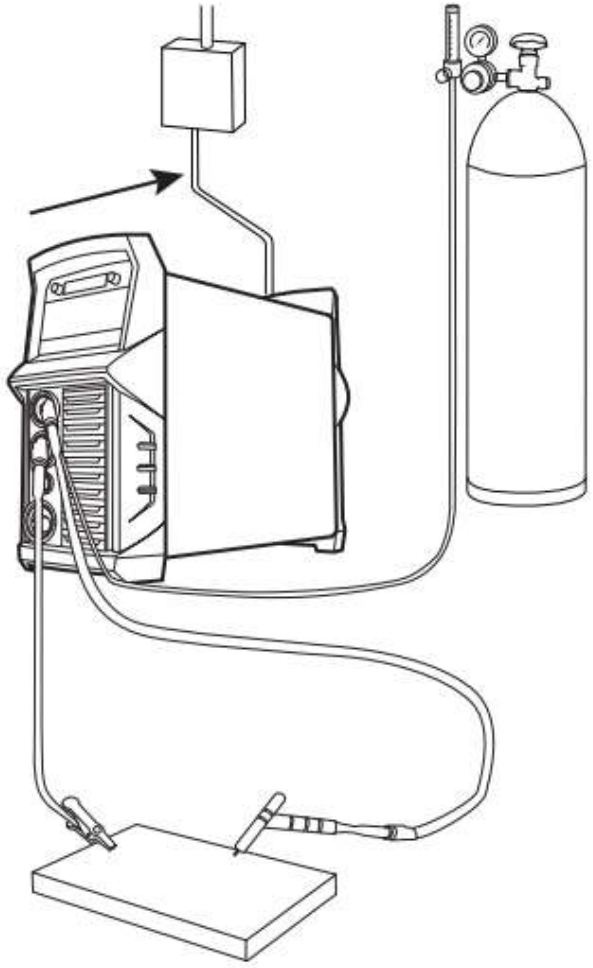
When using the machine for TIG welding the TIG torch should be connected to the negative terminal and the work return to the positive terminal

MMA welding

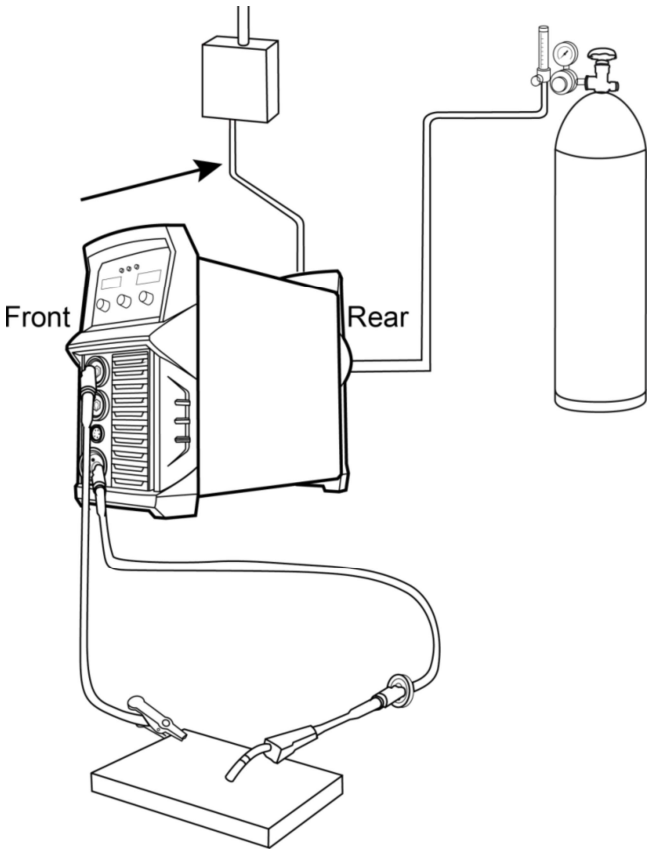
Insert the cable plug with electrode holder into the “+” socket on the front panel of the welding machine, and tighten it clockwise.
Insert the cable plug of the work return lead into the “-” socket on the front panel of the w e l d i n g machine, and tighten it clockwise

TIG Welding

Insert the cable plug with the work clamp into the “+” socket on the front panel of the welding machine, and tighten it clockwise.
Insert the cables plug of the TIG torch into the “-” socket on the front panel of the machine and tighten clockwise.
Connect the gas hose to the regulator / flow meter located on the shield gas cylinder and connect the other end to the machine.
Open the valve on the TIG torch and “scratch” the electrode on the work piece to start the arc.



MIG Welding



Insert the welding torch into the "Euro connector for torch in MIG" output socket on the front panel of the machine, and tighten it.
Install the wire spool on the spindle adapter.
Connect the cylinder equipped with the gas regulator to the gas inlet on the back panel of the machine with a gas hose.
Insert the cable plug with work clamp into the "-" output terminal on the front panel of the welding machine, and tighten it clockwise.
Insert the quick plug of the gas / no gas selector into the "+" output terminal of the welding machine, and tighten it clockwise.
Ensuring that the groove size in the feeding position on the drive roll matches the contact tip size of the welding torch and the wire size being used. Release the pressure arm of the wire feeder to thread the wire through the guide tube, and into the drive roll groove. Adjust the pressure arm, ensuring no sliding of the wire. Too high pressure will lead to wire distortion, which will affect wire feeding. Press the wire inch button to thread the wire out of the torch contact tip.

Gas less Self Shielded Welding

Insert the welding torch into the "Euro connector for torch in MIG" output socket on the front panel of the machine, and tighten it.
Insert the cable plug with work clamp into the "+" output terminal on the front panel of the welding machine, and tighten it clockwise.
Insert the quick plug of the gas / no gas selector into the "-" output terminal on the middle plate of the welding machine, and tighten it clockwise.
Install the wire spool on the spindle adapter, ensuring that the groove size in the feeding position on the drive roll matches the contact tip size of the welding torch and the wire size being used. Release the pressure arm of the wire feeder to thread the wire through the guide tube, and into the drive roll groove. Adjust the pressure arm, ensuring no sliding of the wire. Too high pressure will lead to wire distortion, which will affect wire feeding. Press the wire inch button to thread the wire out of the torch contact tip.

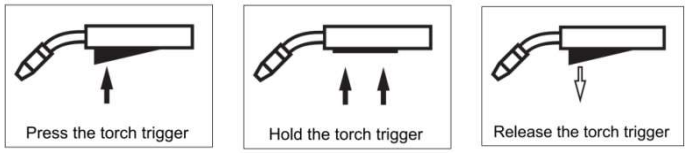
3. Operation

WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents: - these operating instructions - all the operating instructions for the system components, especially the safety rules

3.1 MIG/MAG modes

See the Setup menu for information on settings, setting range and units of measurement for the available parameters.

Symbols and their explanations



1) PreG

Pre-gas flow time

2) PosG

Post-gas folw time

3) I

Welding-current time: uniform thermal input into the base material, whose temperature is raised by the advancing heat

4) HotI

Initial current time: the base material is heated up rapidly, despite the high thermal dissipation that occurs at the start of welding

5) SLOP

Slop time: the time between two currents, the initial current is continuously lowered as far as the welding current and the welding current as far as the final current

6) EndI

End current time, as figures shown, its function is to fill the crater.

7) Sptt

Spot time: the duration of the spot welding.

8) Burn

Burn time: it is to adjust the effect of ball cutting when finish welding.

2 Step mode(2T)

“2-step mode“ is suitable for - Tacking work - Short weld seams - Automated and robot welding

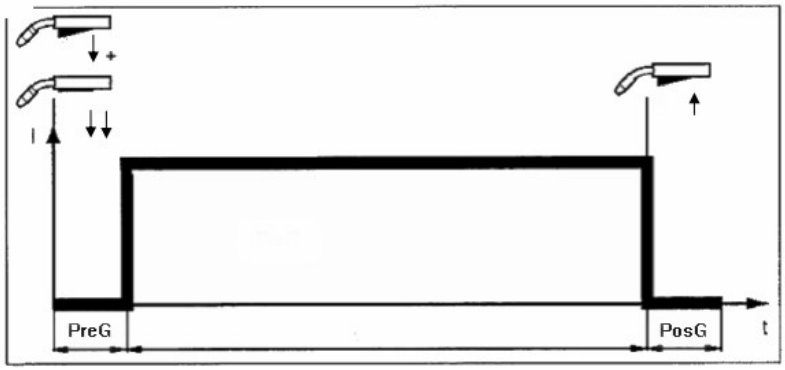


Figure 3.1.1

4-step mode(4T)

"4-step mode" is suitable for longer weld seams

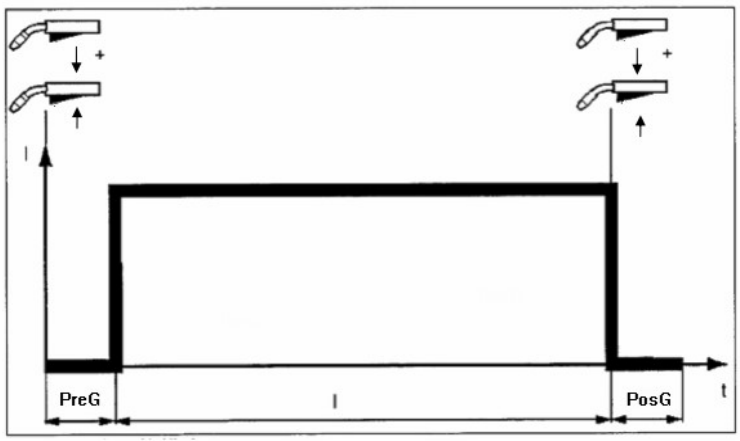


Figure 3.1.2

Special 2 step mode

The special 2-step mode function is suitable for a robot interface or field bus system is connected to the LocalNet.

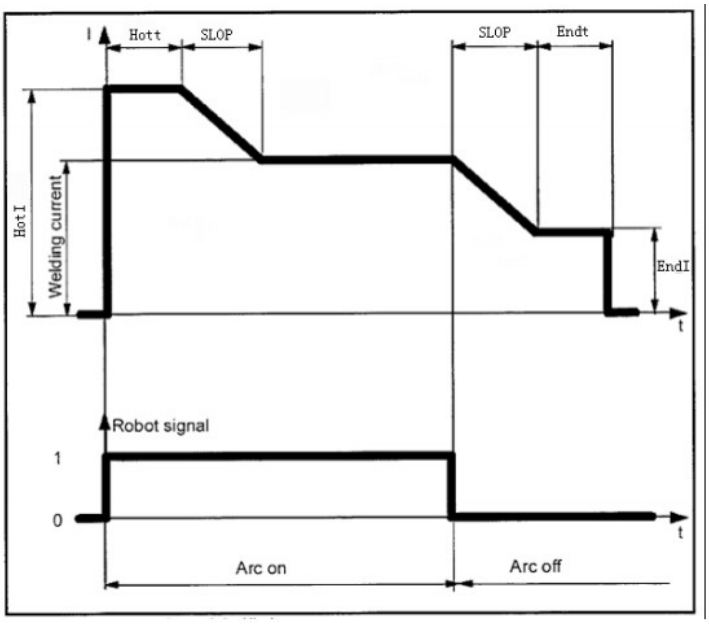


Figure 3.1.3

Hott:

Initial current time: the duration of the initial current, it is only suitable for S2T.

Endt

End current time, the duration of the end current, it is only suitable for S2T.

Special 4 Step modemode(2T)

"Special 4-step mode " is particularly suitable for welding aluminium materials. The special pattern of the welding current curve takes account of the high thermal conductivity of aluminium.

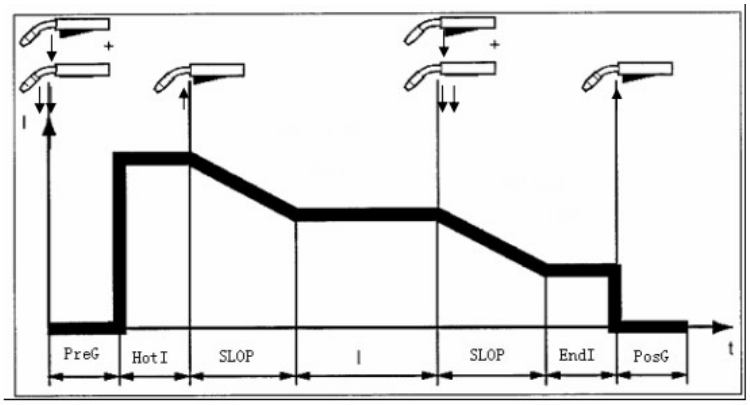


Figure 3.1.4

Spot welding

The "Spot welding" mode is suitable for welding joins on overlapped sheets. Procedure for spot welding:

1） Hold welding torch in the vertical Press and release the torch trigger

2） Keep the torch in the same position

3） Wait until the end of the gas post-flow time

4） Lift the torch off the workpiece

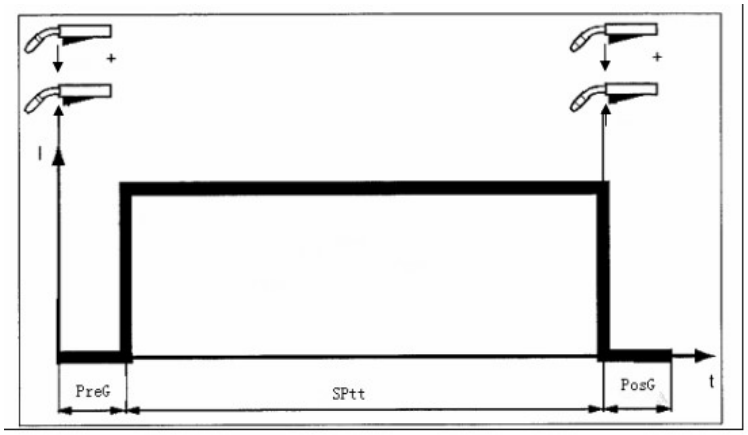


Fig3.1.5

3.2 MIG/MAG synergic welding

General

The inputs required for MIG/MAG synergic welding (pulse/standard) are described by reference to the Comfort control panel.

MIG/MAG synergic welding

1) Press the ***Process button*** to select the desired welding process:

 MIG/MAG standard synergic welding

 MIG/MAG single pulse synergic welding

 MIG/MAG single pulse synergic welding

2) Press the ***Material button*** to select the filler metal and shielding gas used
   The assignment of SP1 and SP2 depends on the welding database used for the power source.
3) Press the ***Wire diameter button*** to select the diameter of the wire electrode
   The assignment of SP depends on the welding database used for the power source.
4) Press the ***Mode button*** to select the desired MIG/MAG mode:
   2-step mode
   4-step mode
   Special 2-step mode (aluminium welding start-up)
   Special 4-step mode (aluminium welding start-up)
   Spot welding
   See the Setup menu for details of how to set the parameters for Special 4-step and Spot welding modes.
5) Press the ***Parameter selection button(left)*** to select the welding parameters to be used to specify the welding power:
   Welding current
   Sheet thickness
   Wire feed speed
6) Use ***Knob L(Left)*** to set the selected parameter to the desired value. The parameter value is displayed in the digital display located above it. The welding current, sheet thickness, wire feed speed and welding voltage parameters are directly interlinked. It is only necessary to alter one of the parameters, as the other parameters are immediately adjusted to match. All welding parameter set values that have been set using the adjusting knob or buttons on the welding torch remain stored until the next time they are changed. This applies even if the power source is switched off and on again in the meantime.

7) Open the gas cylinder valve
8) Set the shielding gas flow rate
   Press the ***Gas test button*** - Turn the adjusting screw on the underside of the pressure regulator until the pressure gauge shows the required gas flow rate
   CAUTION! Risk of injury and damage from electric shock and from the wire electrode emerging from the torch. When pressing the torch trigger: - keep the torch away from your face and body - do not point the welding torch at people - make sure that the wire electrode does not touch any electrically conducting or earthed (grounded) parts, such as the housing, etc.
9) Press the torch trigger and start welding

Corrections during welding

In order to obtain the best possible welding results, the following parameters can be corrected in certain circumstances:

Arc length correction
for correcting the arc length (in % of standard voltage)
- shorter arc length
0 neutral arc length
+ longer arc length

Droplet detachment correction/arc force dynamic correction/arc force dynamic

MIG/MAG pulse synergic welding:
for continuous correction of the droplet detachment energy
- lower droplet detachment force
0 neutral droplet detachment force
+ higher droplet detachment force

MIG/MAG standard synergic welding:
for influencing the short-circuiting dynamic at the instant of droplet transfer
- harder, more stable arc
0 neutral arc
+ soft, low-spatter arc

Freq
Double pulse frequency

AL2
The arc length of double pulse **:** as figures shown, it is the High arc length value of the double pulse MIG, The lowe arc length decided by

corresponding arc in the indicator lamp I

Fd2

The scope of the double pulse() , as below figures shown in, it is the rangeability of wire speed for double pulse.

v

Wire feed speed

Frequency F for alternating between operating points

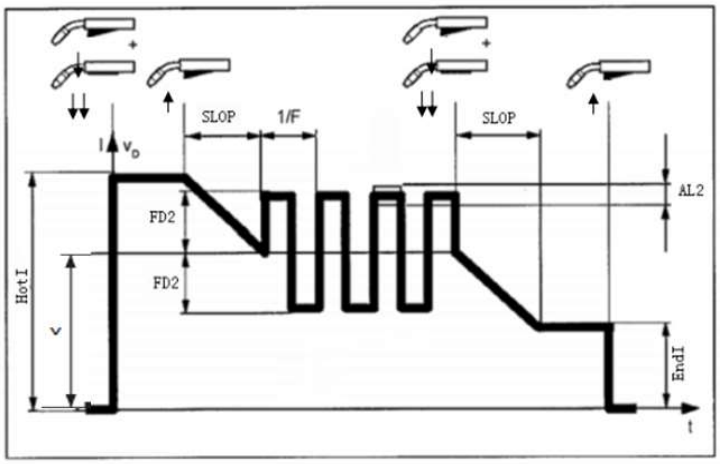


Figure 3.2.1 Double pulse

Adjusting parameters for correction

1) Press ***Parameter selection button (Left)***  to select “More” indicator, then the left part of the display shows the parameter name, and the right part of the display shows the parameter value.

2) Turn ***Knob L(left)***  to select the parameter name, turn ***Knob R(Right)***  to set the selected parameter to the desired value. The parameter value is displayed in the digital display located above it.

The expert database for MIG, Pulse MIG and double pulse MIG

No.	material	AWS specification	Protective Gas	Remark
1	Steel:G3/4 Si		CO2%	
2	AlMg4,5Mg	ER5083 H	Ar+50%He	Optional
3	AlSi 5	ER4043	Ar 100%	
4	AlMg 5	ER5356	Ar 100%	
5	Al99.5	ER1050	Ar 100%	
6	AlSi12	ER4047	Ar 100%	Optional
7	CuAl9	ER Cu Al	Ar 100%	
8	CuSi3	ER Cu Si	Ar 100%	

9	NiCr 21 Mo 9 Nb	ER NiCrMo	Ar 100%	Optional
10	CrNi 18 8 6	ER307	A r 97.5% CO2 2.5%	
11	CrNi19 9	ER308	A r 97.5% CO2 2.5%	
12	CrNi 22 12	ER 309	A r 97.5% CO2 2.5%	Optional
13	CrNi 25 20	ER 310	A r 97.5% CO2 2.5%	Optional
14	CrNi 19 12 3	ER 316	A r 97.5% CO2 2.5%	Optional
15	CrNi 13 4	ER 410	A r 97.5% CO2 2.5%	Optional
16	CrNb 16	ER 430	A r 97.5% CO2 2.5%	Optional
17	CrNi 22 9	ER 2209	Ar 82% CO2 18%	Optional
18	CrNi 19 12 3	ER 316	Ar 82% CO2 18%	Optional
19	CrNi 13 4	ER 410	Ar 82% CO2 18%	Optional
20	CrNi Flux cored		Ar 82% CO2 18%	
21	Rutil Flux cored		Ar 82% CO2 18%	
22	Basic Flux cored		Ar 82% CO2 18%	
23	Metal Flux core		Ar 82% CO2 18%	
24	Steel:G 3/4 Si 1		Ar 82% CO2 18%	
25	Hard facing		Ar 82% CO2 18%	Optional

3.3 TIG /TIG PUSLE Welding

Symbols and their explanations

Press the torch trigger

Release the torch trigger

Hold the torch trigger

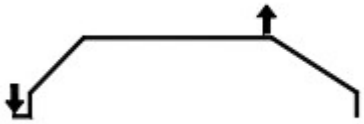
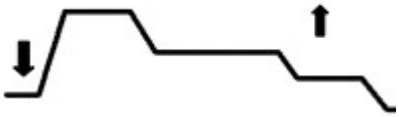
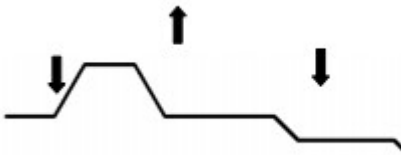
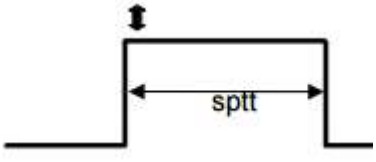
	operation mode	TIG torch switch & Current Curve
2T mode	①Press the torch trigger, ignite the arc, upslope ②Release the torch trigger, down slop and the arc goes out ③I Press the torch trigger again before the arc goes out, it will continue the slope to the preset current,repeat ②	
4T mode	①Press the torch trigger, ignite the arc, start upslope to the welding current ②Re-press the torch trigger, down slop and the arc goes out	
Special 2T mode	①Press the torch trigger, ignite the arc, upslope to initial current HotI ②Last Hott time, then down slope to the welding welding current ③Release the torch trigger,, down slop to end current EndI ④Last Endt time, the arc goes out	
Special 4T mode	①the torch trigger, ignite the arc, upslope to initial current HotI ②Release the torch trigger,, down slop to the welding current ③Re-press the torch trigger ,down slop to end current EndI ④Release the torch trigger, the arc goes out	
Spot welding mode	①Press the torch trigger, ignite the arc, to the welding current ②Last spot time, the arc goes out.	

Table 3.3.1 TIG welding mode

TIG /TIG PUSLE Welding

1)Press the ***Process button*** to select the desired welding process:

 Lift-TIG welding

 Lift-TIG pulse welding

1) Press the ***Mode button*** to select the desired Tig mode:
   2-step mode
   4-step mode
   Special 2-step mode
   Special 4-step mode
   Spot welding
2) Press the ***Parameter selection button(left)*** to select the welding current
3) Use ***Knob L(Left)***  to set welding current

4) Open the gas stop valve on the TIG gas valve torch
5) Set the desired shielding gas flow rate on the pressure regulator
6) Start welding
   All the parameters in steps 1.2.3,4 could be saved automatically when the machine is working.

7) **Current**: 2～Rated Current The welding current of DC TIG and Spot TIG, the peak current of the Pulse TIG, please adjust the suitable current according to the welding technology.
   Operation Mode: TIG operation is the operation mode, which use the torch switch to control the welding current during working of DC TIG and PULSE TIG. There are 5 ways for TIG welding, including 2T, 4T, S2T, S4T and Spot Welding, The TIG welding ways should be selected according to the technical requirements and the operation habit of the operator.

Adjusting parameters for correction

SLPU

Upslope time: 0～15s The upslope time means the time, which the current from 0 to set current, it should be set according to the technological requirements

SLPD

Downslope time:0～15s The downslope time means the time, which the current from the set current to 0, it should be set according to the technological requirements

HF

Arc strike mode: the welder provide two arc strike modes including lift (HF) arc strike

and contact arc strike.

EndI

End current:0～200%, it means the percent of the set current, it is used for filling the crater.

HotI

Initial current:0～200%, it means the percent of the set current.. The higher initial current, the easier arc striking, but it is not suggest to use when welding the sheet metal. Otherwise, it will burn out the workpiece easily. After ignition arc under some operation mode, the current should keep the initial current, in order to heat up the workpiece or lighting.

Hott

Initial time : it means the last time of the initial current, it is only valid in the S2T.

Endt

End current time : it means the duration of the end current, it is only valid in the S2T.

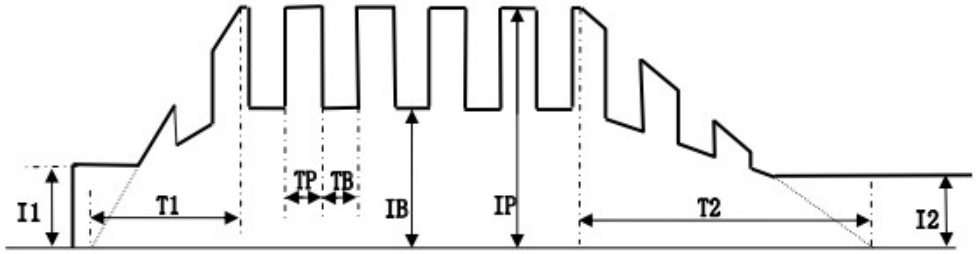
Spot time: 0.1～2s Spot welding time is the time of the SPOT TIG;

Other parameters please refer to the PULSE TIG diagram below

Base current: it is the base current of the PULSE TIG, the peak current is the set current

Duty ratio: it is the ratio of the peak time and cycle in the Pulse TIG.

Frequency: it is the frequency of the pulse TIG. These three parameters are for the:



Current curve of PULSE TIG

I1 is initial current,

IB is base current,

IP is peak current(set current),

I2 is end current.

T1 is upslope time,

T2 is downslope time.

TP is the duration of the peak current,

TB is the duration of the base current,

TP+TB is the pulse cycle, the pulse frequency is the c reciprocal of the cycle: 1/(TP+TB), the duty ratio is the percentage of the duration of peak current in the pulse cycle: 100*TP/(TP+TB), changing the pulse frequency and duty ratio could adjust the TP and TB value.

3.3 MMA welding

1) Use ***Process Buttons(19)***  to select MMA  welding method.
2) Turn left side  to alter A to adjust welding current
3) Turn right side  to set the arc force.
4) Start welding

All the parameters in steps 1.2.3 could be saved automatically when the machine is working and remain the same even if the machine is killed halfway. The MMA welding has seven adjustable parameters:

Current: The range (10A ~ rated current) is welding current, please choose the proper current according to welding technology.

Arc force: 1 ~ 100, refers to the slop of current rise in the process of short circuit. It should be settled based on electrode diameter, set current value and welding procedure requirements. The stronger arc force, the faster droplets, the less sticking. However, too strong arc force would increase splashes. The weaker arc force, the lower splashes, the better welding seam, but sometimes, people feel that the arc is soft or cause sticking. So the arc force should be increased when use wide electrode rod (4mm) with small current (120A). The arc force should be 10~50 in general.

Hot starting arc current (HotI) : 0 ~ 100%, 20 refers to Hot starting arc current = welding current + 20% * welding current. The hot starting arc time (Hott) : 0 ~ 1.5 s, refers to the duration of Hot starting arc time. In order to strike arc successfully, the welder would output a high current as striking current, the duration of striking current is determined by the ignition time. The two parameters should be set according to the welding situation, the higher striking current and the longer duration, the easier ignition. But for sheet welding, the striking current and duration can not be too high and too long, so as not to burn the workpiece. In general, the striking current should be 1.5 times of welding current, and striking time is 0.02~0.05s.

External characteristics (Slop): In order to fit different kinds of electrodes, the MMA welding machine own adjustable external characteristics curve. Adjust the SLOP to change external characteristics. CC: constant-current characteristic. Arcing current is constant, independent of the welding voltage. Adapted to acid electrode, basic electrode and groove weld.. 1-20 is decreasing characteristic of adjustable slope, the lower the voltage, the greater the current. 20 represents the

voltage drops each 1V, the current increases 20A. Adapted to the cellulose electrodes. CP: Constant power characteristics: Output power (I × V) remains the same, especially for cellulose electrodes.

Arc-break adjustment: It is for snapping the arc easily when intermittent welding. It can be set as 30V、40V、50V、 60V,The greater the value, the more difficult to pull off the arc, the parameter should be off when continuous welding.

Anti-sticking function (Felt) When it is on, it can prevent red and failure electrodes caused by striking. The machine would stop till the striky electrode is away from workpiece. Then the machine would continue to work.

VRD function (VRD), There are ON and OFF available for VRD function. When it is ON, the main circuit would not work under welder not welding. Only output less than 12V voltage. It can not only avoid no-load voltage injury, but also save electrical energy, reduce noise and increase the life-span.

3.4 **Software Upgrade**

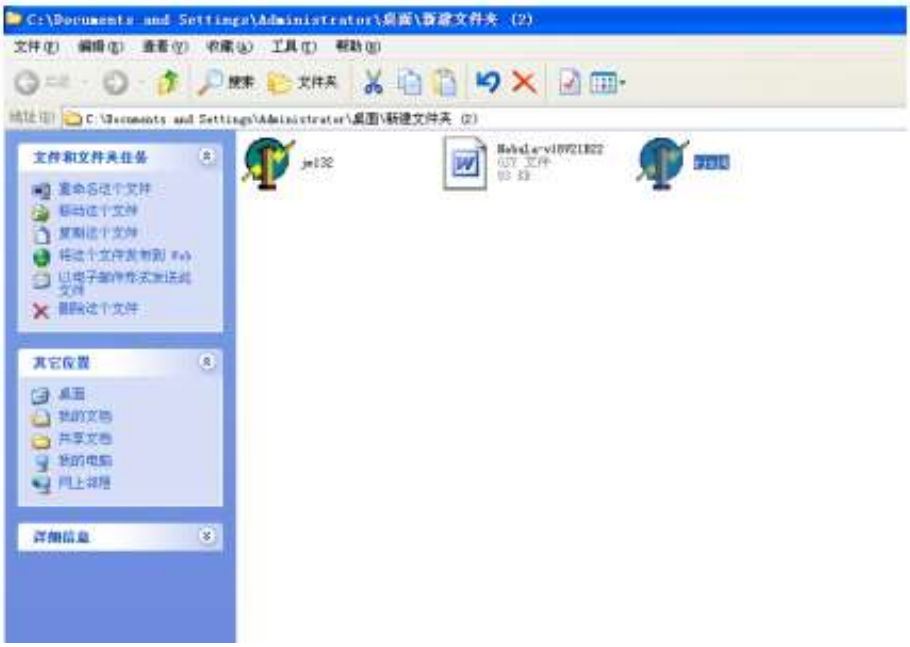
It is the most important advantage that the software can be upgraded for digital welding machines. And the welding performance can be improved, add and change the function by upgrading software. It is very easy to operate. The steps are as following:

1） Insert the USB of UT-850  to computer, another side to the welding machine.

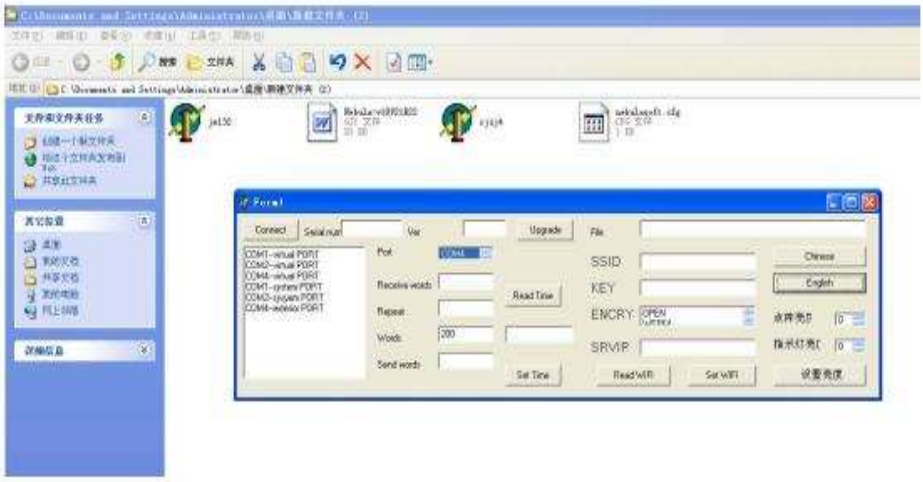
2） Turn on the computer and welding machine.

3） Run the rjsj4. exe in the computer as following(a~k)

A. Double click “rjsj4”

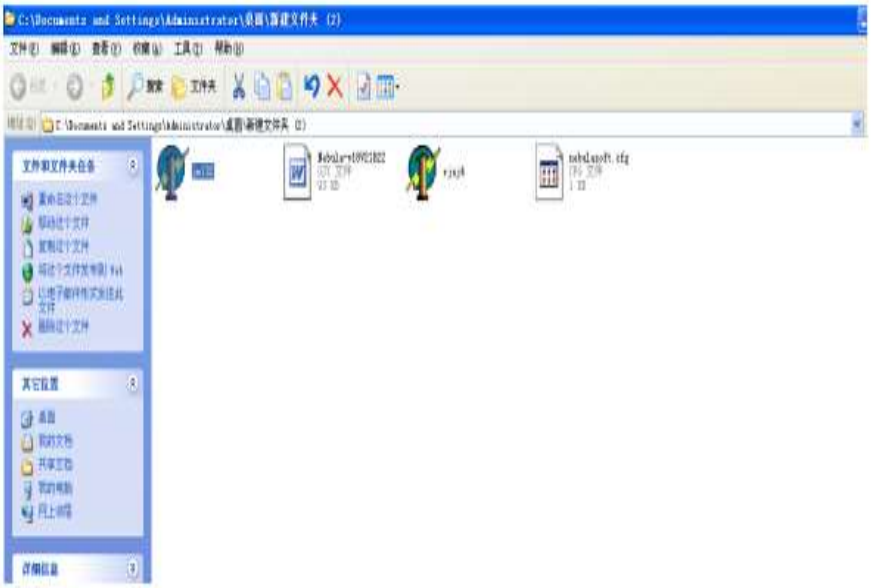


B. Choose “English”



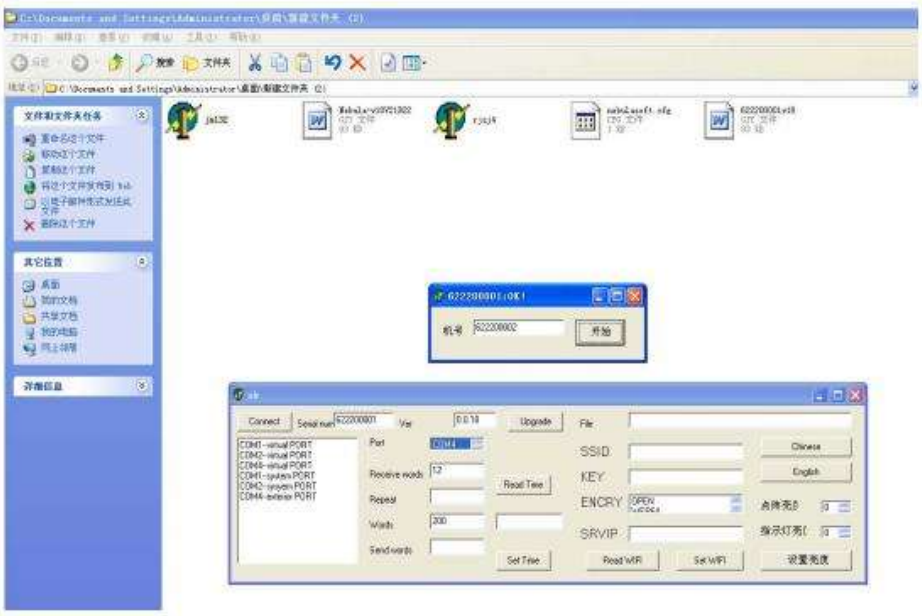
C. Click “Connect”

D. Double click “jm132”



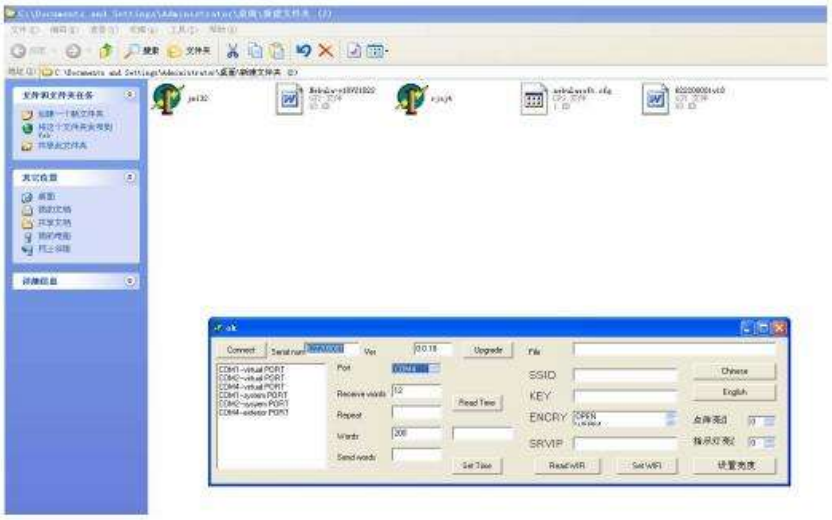
E. Copy and paste the “Serial Number” into “Form1”

F. Click the button “Start”

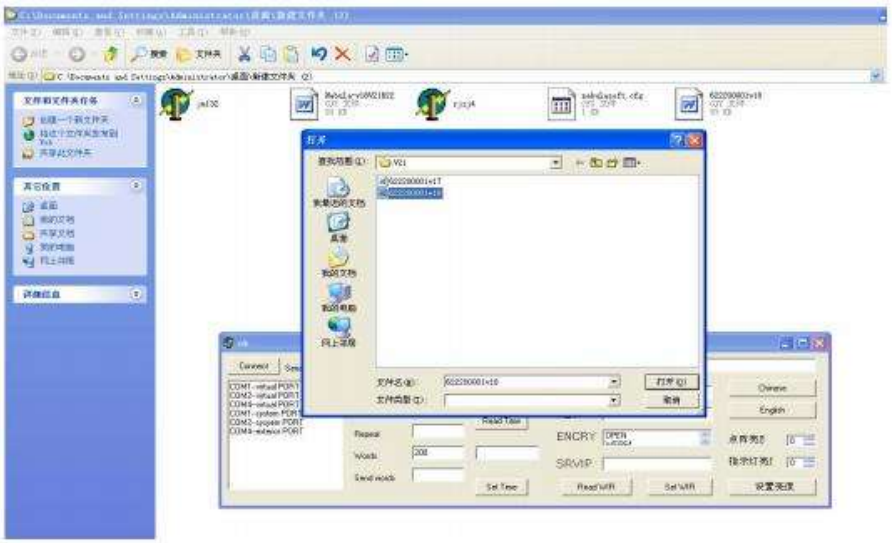


G. When you can see ""OK!", close the small window

H. Click the "Upgrade"



I. Choose the document



J. Now data has being transmitted.

K. k, Complete

If there's something wrong with connecting to the welding machine, the reasons may be following: 1. Disconnection or short circuit of the cable, two 485 cables are in reverse order, please check the cables carefully.

2. Something wrong with the USB-RS485 converter, suggest the UT-850 or

change new qualified one.

3. Driver of USB-RS485 is set wrong, need re-install. If fail to upgrade because of power failure during the process, please restart welding machine, It will check the correctness of software automatically after each restart, if the software isn't correct, it cannot work normally but waiting to upgrade, in this case re-upgrade the software will be OK.

3.5 Add function

TMP series welding machines have preset the welding processes according to user's requirements before delivery, if users need to add other welding processes, please replace the softdog or enter passwords.

Notes: Only the same capacity and type softdog can be used, users cannot change the capacity of welding machine, otherwise the welding machine may be damages permanently.

Replace softdog: Take off the case of welding machine, find the "CFM" on the PCB1, pull out the plug with two pins on "CFM" (it's the softdog),replace a new one.

Enter password: Enter into the menu of start the machine, enter 4 passwords in corresponding options, save the passwords and then exit. When you restart the welder, new processes have been added. Details as following steps(a~e).

A. Long press 

and turn on the switch.

B. Press  , Select "More"

C. Turn  on the left. You will find Pas 1, Pas 2,Pas 3, Pas4. displayed on LED

D. Turn  on the right to make the numbers the same as the codes

E. Press 

again. The screen would show "Finished". Turn off the switch.

Note: The softdog and password need to buy from sellers. Please contact the vendor.

4. TROUBLE SHOOTING

In the event of a failure of the machine, contact an authorised service agent. The following operation requires sufficient professional knowledge on electric aspects and comprehensive safety knowledge. Make sure the input cable of the machine is disconnected from the electricity supply and wait for 5 minutes before removing the machine covers Before taking your unit for servicing, check the list below.

Symptom	Cause	Solution
The welding current is unstable	The pressure arm on the wire feeder is not properly adjusted	Adjust it to get proper pressure.
	The drive roll does not match the wire size being used.	Make sure they match with each other.
	The contact tip of the welding torch is badly worn.	Replace it.
	The wire-feeding tube of the welding torch is badly worn.	Replace it
	The welding wire is of poor quality	Replace it with welding wire of good quality
There is output current when pushing the torch trigger to feed gas, but the wire feeder does not work.	The control cable of the wire feeder is broken	Get it repaired or replaced
	The wire feeder is clogged.	Unclog it.
	The wire feeder fails.	Repair it.
	The control PCB or wire-feeder power PCB inside the machine fails	Replace it.
When the torch trigger is pushed, there is gas output and the wire feeder works, but there is no output current, and the protection LED is off.	The earth cable is not well connected with the workpiece	Reconnect it.
	The wire feeder cable is not well connected.	Reconnect it.
	The wire feeder or welding torch fails	Repair the wire feeder or welding torch
No response when pushing the torch trigger and the protection LED is off	The welding torch is not well connected with the wire feeder.	Reconnect it
	The control cable of the wire feeder is not well connected with the welding power supply	Reconnect it
	The torch trigger fails.	Repair or replace the welding torch.
The fan does not work or it works abnormally	The mains power supply or the mains supply cable is not connected	Reconnect the mains supply cable
	Phase failure	Solve the phase failure problem.
	The mains voltage is too low	Welding can be carried out after the mains voltage recovers
There is no no-load voltage	The mains voltage is too low.	Welding can be carried out after the mains voltage recovers.

	Phase failure	Solve the phase failure problem.
The no-load voltage is “0”, and the overheating LED is on.	Over heating protection	It will recover automatically after the welding machine is cooled.
The electrode holder becomes very hot.	The rated current of the electrode holder is lower than its actual working current	Replace it with a higher rated current holder
Other malfunction		Contact the service centre of your distributor

5 Maintenance

The utilisation level of the power source and its working environment should be taken into consideration in planning the frequency of maintenance of the machine. Appropriate use and preventive maintenance guarantee the trouble-freest use of the equipment. This allows you to avoid interruptions in use and increases the productivity of the machine.

5.1 Cables

Check the condition of welding and mains cables daily. Do not use damaged cables. Also make sure that all extension cables used in the mains connection are in proper condition and compliant with regulations.
NOTE! The mains cables may be repaired and installed only by electrical contractors and installers authorised to perform such operations.

5.2 Power source

Before cleaning the interior of the machine, you need to remove the case by unscrewing the mounting screws at the top and sides of the machine.
NOTE! To prevent damage, wait approximately two minutes after disconnecting the mains cable before removing the machine's case. Perform the following cleaning and maintenance at least every six months:

1. Clean the interior of the machine and the fan grill's net of any dust and stains – for example, with a soft brush and vacuum cleaner.
- Do not use pressurised air. The stain may become compressed into the grooves of the coolers.
- Do not use a pressure-washing device.

2. Check the electrical connections of the machine. Clean any oxidised connections, and tighten the loosened ones.
- Check for the right tension before you start repairing the connections.

NOTE! Remember that the machine may be repaired only by an electrical contractor or installer authorised to perform such operations.

5.3 Regular maintenance

Authorised service agents perform regular maintenance by agreement. Tasks included in regular maintenance:
- Cleaning of equipment.
- Inspection and maintenance of the welding gun.
- Checking of connectors, switches, and control knobs.

- Checking of electrical connections.
- Checking of the mains cable and plug.
- Replacement of damaged or worn parts.
- Calibration testing, with adjustment of the functions and operational values of the

machine, if necessary.

5.4 Diagram